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Indian Point 3

Nuclear Power Plant

Individual Plant Examination

NEW YORK POWER AUTHORITY
REACTOR ENGINEERING
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APPENDIX A

REVIEW OF NRC COMMENTS ON THE INDIAN POINT PROBABILISTIC SAFETY STUDY

The issues addressed in this review of the Indian Point Probabilistic Safety Study (IPPSS) [4] are those identified in NUREG/CR-2934 [11] and listed in NSAC-151 [12]. The references are to documents listed in Section 8 of the main IPE report.

Issue 1: Anticipated transient without scram (ATWS)--loss of main feedwater (MFW)

NRC Comment: The NRC reviewers assigned a 33% probability that loss of main feed was total. This fraction is important for ATWS events since, if some main feedwater is available, the reactor coolant system (RCS) peak pressure would not be expected to reach 3200 psi.

Applicability to IP3 IPE: In the IPE, this scenario was modeled with other T2 events--transients with loss of the main feedwater system prior to or at the unit trip.

Issue 2: ATWS--Reactor protection system (RPS)

NRC Comment: The NRC reviewers accepted the 2×10^{-5}/demand failure probability for the RPS because it compared favorably with the 3×10^{-5}/demand failure probability derived in NUREG-0460. However, they criticized the omission of certain failure modes.

Applicability to IP3 IPE: The RPS failure probability used in the IPE was 1.62×10^{-5}. Manual scrams were addressed explicitly.

Issue 3: Common-cause failures

NRC Comment: The NRC reviewers commented that use of one Beta factor throughout the IPPSS was inappropriate.

Applicability to IP3 IPE: In the IPE, different Beta factors were assigned to specific component types.

Issue 4: Common-cause failures--diesel generators

NRC Comment: The NRC reviewers referenced and applied a study that derived "generic" probabilities of common-cause failure of two and three diesel generators requiring cooling water of 7×10^{-4} and 2×10^{-4}, respectively. A slight reduction in station blackout frequency resulted.

Applicability to IP3 IPE: In the IPE, the common-cause failures of two and three diesel generators were modeled as separate events; Beta factors of 0.038 and 0.018 being applied to the respective events [9]. Coupled with a diesel generator failure rate of 2.63×10^{-3}/demand, the predicted common-cause failure rate for two diesel generators is 10^{-4}/demand and the predicted common-cause failure rate for three diesel generators is 4.74×10^{-5}/demand.

Issue 5: Common-cause failure--operator recovery actions

NRC Comment: The NRC reviewers noted that some common-cause Beta factors were conservative because they did not consider operator recovery actions.

Applicability to IP3 IPE: The same conservatism was applied in this study--no operator recovery actions were considered that are specific to common-cause failures (other than the recovery of pre-accident human errors).

Issue 6: Common-cause failures--service water systems

NRC Comment: The common-cause failure analysis was not applied consistently to all systems.

Applicability to IP3 IPE: The common-cause failure analysis was applied consistently to all systems. In particular, common-cause pump failures were considered in all multi-train systems.

Issue 7: Containment failure

NRC Comment: The IPPSS did not model core melts caused by containment failure due to overpressurization. While such failures have been shown to be important in other probabilistic risk assessments (PRAs), the effect of this potential sequence was found to be negligible because of the low probability of having core cooling but not containment heat removal.

Applicability to IP3 IPE: Core melts caused by containment overpressurization and failure were modeled in the IPE.

Issue 8: Failure data

NRC Comment: The NRC reviewers objected to the use of the 5th and 95th percentiles from WASH-1400 as the 20th and 80th percentiles of known frequency distributions of generic data. They noted that the rationale for discretization of data was not well explained and that the way in which discrete values were chosen may affect results.

Applicability to IP3 IPE: Generic data were used as presented; the stated frequency distributions were not manipulated.

Issue 9: Failure data assumptions

NRC Comment: The NRC reviewers objected to the lack of documentation regarding in changes to assumptions, especially those that impacted the results.

Applicability to IP3 IPE: The changes to the assumptions that so concerned the NRC reviewers were not made in this study--generic data distributions were accepted as cited.

Issue 10: Failure data methodology

NRC Comment: The NRC reviewers noted that the effect of prior distributions is generally unimportant when plant-specific data exist. When such data are not available or used, estimates are quite sensitive to the assumed prior distributions.

Applicability to IP3 IPE: A Bayesian update process was used to aggregate plant and generic data.

Issue 11: Failure data--valves

NRC Comment: The NRC reviewers calculated the unavailability of valves because of stem failures to be 4.8×10^{-5}/demand.

Applicability to IP3 IPE: Stem failures were not addressed as a specific failure mode in this study. They were, however, considered with other valve hardware failures.

Issue 12: Bleed-and-feed

NRC Comment: The NRC reviewers found instances in which the original study took credit for operator actions that were not outlined in the plant emergency operating procedures (EOPs). The reviewers questioned this approach.

Applicability to IP3 IPE: In the IP3 IPE, credit was taken only for operator actions addressed in emergency operating procedures, off-normal operating procedures, and operating procedures. The bleed-and-feed procedures characterized in 1982 by the NRC reviewers as being "limited" have been fully developed (e.g., functional restoration procedure FR-H.1, "Loss of Secondary Heat Sink").

Issue 13: Bleed-and-feed

NRC Comment: The IPPSS assumed that the main feedwater (MFW) system would not be available for removing post shutdown decay heat after all internal and external events. The NRC reviewers noted that this was an unnecessary conservatism since the MFW system would be available, or could be restored, in most reactor trips not caused by a loss of offsite power, and that this conservatism especially impacted the "bleed-and-feed" accident sequences.

Applicability to IP3 IPE: Credit was taken in the models for the potential restoration of the MFW system. However, the probability assigned to this action was very low because current procedures for loss of secondary cooling call for the MFW system to be tripped and the condensate system to be restored.

Issue 14: Flood--circulating water

NRC Comment: In the IPPSS, flood scenarios involving the failure of circulating water systems were assumed to be self-limiting because the condensate pump motors and 6.9-kV switchgear would be flooded, resulting in reactor trip and loss of offsite power, respectively. The NRC reviewers noted that this logic presumes that failure events could be counted upon to limit the event, and recommended that the basis for it should be further qualified.

Applicability to IP3 IPE: Internal flooding scenarios initiated by the rupture of the condensate system in both the turbine and auxiliary feedwater buildings was examined in some detail in the internal flooding analysis. It was concluded that the rupture of the circulating water system within the turbine building will result in a rapid reactor trip (a T2 event), the flooding of circulating water pumps in the pump bay and submergence damage to the 6.9-kV switchgear. It is therefore entirely appropriate to regard the rupture of the condensate system to be self-limiting in that continued discharge is unlikely. Though the cessation of condensate flow into the turbine building will not serve to mitigate the event. In contrast, the rupture of the condensate system in the auxiliary feedwater building was not assumed to be self-limiting.

Issue 15: Flood--control building

NRC Comment: Flooding in the control building due to a service water break was considered. The importance of the 480-V switchgear located at the 15-ft elevation was recognized. The reviewers questioned whether floor drains in the control building would be available and sufficient to mitigate this flooding scenario. While the reviewers concluded that the frequency of power loss due to other causes would exceed that caused by service water line breaks, they requested that further analysis be performed to demonstrate that this additional frequency is small.

Applicability to IP3 IPE: Flooding scenarios initiated by breaks in the service water, fire protection system, and instrument air closed cooling water lines in the control building were examined in great detail in the internal flood analysis prepared for this study. This internal flood analysis is described in Appendix C.

Issue 16: Flood--internal

NRC Comment: The NRC reviewers recommended that the methodology adopted for the internal flooding analysis allow a thorough, systematic analysis of critical events and event sequences that might lead to a transient.

Applicability to IP3 IPE: The methodology adopted for the internal flooding analysis entailed the identification of flood sources and susceptibilities, the development of flood scenarios, the determination of whether the scenario could lead or contribute to core damage, quantification of scenarios in a screening risk assessment to eliminate unimportant scenarios,

and the creation and quantification of event trees for the remaining flooding scenarios that could lead to core damage. This methodology satisfies the criteria set forth by the NRC reviewers.

Issue 17: Human reliability

NRC Comment: The NRC reviewers reduced the probability of recovery actions when an important instruction was placed as a note in a procedure.

Applicability to IP3 IPE: In the HRA performed for this study, steps addressed in notes or cautions were given less credit than steps clearly described in the procedures. Steps addressed in notes or cautions transformed the action from a step-by-step procedure to a dynamic task.

Issue 18: Human reliability

NRC Comment: The NRC reviewers noted that the IPPSS did not calculate a probability for all operator actions which could affect the course of an accident sequence, but rather assumed the operator performed a task with negligible failure probability.

Applicability to IP3 IPE: This comment does not apply to this study--realistic human error probabilities were assigned for all operator actions that could affect the course of an accident sequence.

Issue 19: Human reliability--dependence

NRC Comment: The NRC reviewers accepted the moderate level of dependence assigned to situations in which all control room staff are engaged in the same activity. The NRC reviewers objected, however, to the same (moderate) level of dependence being assigned when some of the control room staff were involved in different activities.

Applicability to IP3 IPE: This study used a different methodology for HRA than was used in the IPPSS. In this study, a high to complete dependency was assigned to post-accident operator actions.

Issue 20: Human reliability--dependence

NRC Comment: The NRC reviewers objected to an assumption applying to the restoration of two or more valves that moderate dependence would be assessed for the restoration of two valves and complete dependence for all other valves where written procedures are used. They believed that if an operator failed to restore one of two or more valves, the operator would always fail to restore the other(s).

Applicability to IP3 IPE: The assumption of complete dependency recommended by the NRC reviewers was used in certain instances. In the IPE, dependencies between pre-accident

human actions were defined as follows: zero dependence was assessed for pre-accident human actions related to series systems/components as with such systems or components, dependency is a moot point. For parallel systems/components, the following dependencies were assumed:

a. Zero dependence was assumed for maintenance errors because maintenance activities will be separated in time.

b. Zero dependence was assumed between maintenance and test errors.

c. Complete dependence was assumed for actions taken in the same step of a given procedure that do not involve individual check-offs.

d. High dependence was assumed for actions taken in the same step of a given procedure that involve individual check-offs.

e. High dependence was assumed for actions taken in different steps of a given procedure that are performed within 2 minutes of each other.

f. Low dependence was assumed for actions taken in different steps of a given procedure that are not performed within 2 minutes of each other.

g. Zero dependence was assumed for actions taken in different procedures or by different crews.

Issue 21: Human reliability--documentation

NRC Comment: The NRC reviewers concluded that the human reliability analysis should be documented in a systematic and reproducible manner so as to allow independent evaluation.

Applicability to IP3 IPE: The human reliability analysis for pre-accident human error is described in Section 3.3 of the report and the results presented. The human reliability analysis for post-accident human error is summarized in Section 3.3 of the report and delineated in Appendix H. In the appendix, the rationale for the selection of all human error probabilities is described.

Issue 22: Human reliability--expert opinion

NRC Comment: The NRC reviewers concluded that little confidence could be placed in data derived from expert opinion because no evidence was provided to show that recognized methods were employed to solicit expert opinion.

Applicability to IP3 IPE: Expert opinion was not used to determine HEPs in this study.

Issue 23: Human reliability--methodology

NRC Comment: The NRC reviewers objected to the use of multiple independent operator actions in the same sequence of events without modifying their human error probabilities (HEPs) to account for the added stress, reduced time, and lack of familiarity with sequence involving multiple faults.

Applicability to IP3 IPE: HEPs assigned to post-accident operator actions accounted for stress, including the failure of previous actions, time available and familiarity with the task (Section 3.3.3).

Issue 24: Human reliability--methodology

NRC Comment: The NRC reviewers objected to obtaining time estimates for various tasks by interviewing personnel when it would have been possible to take actual measurements.

Applicability to IP3 IPE: This study relied on time measurements made in simulator exercises and simulated out-of-control room activities.

Issue 25: Human reliability--staff response

NRC Comment: The NRC reviewers accepted the assumption that, for certain major events, two control board operators, a watch supervisor and a shift technical advisor would be in the control room within half an hour of event initiation.

Applicability to IP3 IPE: The same assumption as to control room staffing was made in this study. It is anticipated, however, that these staff would be present in the control room within 15 minutes.

Issue 26: Human reliability--uncertainty

NRC Comment: The NRC reviewers noted that the use of the upper bound as the 90th percentile of a lognormal distribution would result in more conservative human reliability analysis (HRA) models.

Applicability to IP3 IPE: The HRA performed in this study used the ASEP-HRAP methodology and data. No undue conservatism was therefore introduced into the human reliability analysis.

Issue 27: Initiating event

NRC Comment: The NRC reviewers accepted the handling of initiating events that were not addressed explicitly in the IPPSS but included in the data used to calculate the frequency of reactor trip.

Applicability to IP3 IPE: The scope of initiating events considered in this study is described

in Section 3.1.1.1.

Issue 28: Initiating event

NRC Comment: The NRC reviewers noted that one of the most important tasks in a PRA was to search for failures which could simultaneously cause a reactor trip and fail safety systems.

Applicability to IP3 IPE: Such failures were explicitly addressed in this study and described in Section 3.1.4.

Issue 29: Initiating event--loss of component cooling water (CCW)

NRC Comment: The NRC reviewers noted that a loss of CCW induced by a pipe break was not analyzed in the IPPSS despite the fact that the system responses for such an event are quite different to those following a loss of CCW resulting from other causes.

Applicability to IP3 IPE: A loss of CCW induced by a pipe break was explicitly modeled in this study (Section 3.1.4.4).

Issue 30: Initiating event--loss of instrument and control power

NRC Comment: The NRC reviewers concluded that the analysis of this event was bounded by loss of ac or dc buses.

Applicability to IP3 IPE: In this study, the loss of ac and dc buses, and, in particular, the loss of 118-Vac instrument buses was examined as potential special initiators (Section 3.1.4.4). It was concluded, however, that the loss of a 118-Vac instrument bus is not a special initiator.

Issue 31: Initiating event--loss of ventilation

NRC Comment: The NRC reviewers accepted a report that predicted no safety-related equipment failures within the first 24 hours of a loss of primary auxiliary building ventilation. This loss of ventilation was not addressed in the IPPSS.

Applicability to IP3 IPE: Loss of PAB ventilation will not cause a reactor trip. Accordingly, it was not treated as an initiating event (Section 3.1.4.4).

Issue 32: Initiating event--reactor vessel rupture

NRC Comment: The NRC reviewers questioned the assertion in the IPPSS that the RV rupture event could be ignored because its frequency is small compared to other events that lead to the same plant damage state. Their concern was that the IPPSS did not analyze a

vessel rupture initiated by pressurized thermal shock.

Applicability to IP3 IPE: Accident sequences initiated by reactor vessel rupture were explicitly addressed in this study (Section 3.1.4.6). In addition, the possibility of reactor vessel rupture being initiated by pressurized thermal shock was addressed in the evaluation of main steam line breaks (Section 3.1.4.2).

Issue 33: Initiator frequency--pipe break in CCW.

NRC Comment: The NRC reviewers derived the component cooling water pipe break frequency of 1.5×10^{-4}/year using the piping analysis presented in the IPPSS. The IPPSS did not evaluate this event as an initiating event.

Applicability to IP3 IPE: The pipe break induced loss of CCW was explicitly modeled in this study (Issue 28 and Section 3.1.4.4). The pipe break frequency assumed was derived from data presented by Eide et al [43].

Issue 34: Initiator frequency--small LOCA

NRC Comment: The NRC reviewers stated that the reactor coolant pump (RCP) seal failure initiating event should be treated as a small LOCA. However, the IPPSS did not include this failure in determining small LOCA frequencies though this omission was compensated for by a failure to consider the recovery of stuck-open pressurizer power-operated relief valves (PORVs) by closure of PORV block valves.

Applicability to IP3 IPE: In this study RCP seal failures were addressed as small LOCA events. Spontaneous seal failures were considered as initiating events but were lumped into S2 terms.

Issue 35: Interfacing LOCA

NRC Comment: The NRC reviewers revised the causes of the dominant V-sequence LOCA, the concurrent failure of two motor-operated valves (MOVs) in the RHR suction line.

Applicability to IP3 IPE: Interfacing system LOCAs are addressed in detail in Sections 3.1.4.5 and 3.1.5.

Issue 36: Methodology

NRC Comment: The NRC reviewers, in summary, noted that the following were not treated in the IPPSS:

(a) Pressurized thermal shock.

(b) Steam generator tube rupture coincident with a stuck-open secondary safety valve.

(c) Safety system failure caused by core meltdown phenomena.

(d) A pipe break in the component cooling water system.

(e) Reactor coolant pump seal failures (as a cause of small LOCAs).

(f) Steam generator overfill scenarios.

(g) Cold shutdown events.

(h) Design and construction errors and the effects of aging.

Applicability to IP3 IPE: The items were addressed as follows in this study:

(a) Pressurized thermal shock--in Sections 3.1.4.2 and 3.1.4.6. See Issue 31.

(b) Steam generator tube rupture coincident with a stuck-open secondary safety valve. This possibility was considered in the evaluation of steam generator tube rupture initiating events (Section 3.1.4.3).

(c) Safety system failure caused by core meltdown phenomena--such failures were addressed in the "back end" analysis (Section 4).

(d) A pipe break in the component cooling water system--in Section 3.1.4.4. See Issue 28.

(e) Reactor coolant pump seal failures (as a cause of small LOCAs)--see Issue 33.

(f) Steam generator overfill scenarios--addressed in station blackout and steam generator tube rupture sequences (Sections 3.1.3.3 and 3.1.4.3, respectively).

(g) Cold shutdown events--these events were specifically excluded from this study as dictated by the NRC [1].

(h) Design and construction errors and the effects of aging--to the best of the analysts ability, the plant was modeled as is, reflecting all errors of which Authority staff are aware. In addition, design-related inadequacies were specifically sought in the analysis of subtle system interactions (Section 3.2.3.4). The effects of aging were not addressed specifically but are intended to be reflected in the reactor vessel rupture event (Section 3.1.4.6).

Issue 37: Methodology--documentation

NRC Comment: The NRC reviewers emphasized the need for reliability and reproducibility of the documentation, references and calculations.

Applicability to IP3 IPE: The event trees, failure and unavailability data, and fault tree assumptions are presented in the IPE report. The fault trees and all computer files have been retained.

Issue 38: Methodology--LOCAs

NRC Comment: The NRC reviewers noted that the assumption that fan coolers would be available to mitigate the core melt accident after a LOCA was potentially non-conservative.

Applicability to IP3 IPE: The operation (and unavailability) of the containment fan coolers was explicitly addressed in the LOCA event trees (Section 3.1.3.1).

Issue 39: Missiles

NRC Comment: The NRC reviewers recommended that missiles be considered in system models as a failure mode of components in the vicinity of components capable of producing missiles.

Applicability to IP3 IPE: Potential spatial interactions between components were searched for in plant walkdowns and, where appropriate, included in the models.

Issue 40: Operator action--dc bus failure

NRC Comment: The NRC reviewers noted that the IPPSS did not provide adequate details for the operator action "noticing a failed dc power fuse." The IPPSS assumed that fuse failure would be noticed during the operator check of the status panels each shift.

Applicability to IP3 IPE: Fuse failures were modeled in a manner that accounts for the detection of the failure. The failure of fuses associated with 480-V bus protective devices are annunciated in the control room. These failures will therefore be noted immediately. The failure of all other fuses should be noted at the shift-change checks in the control room.

Issue 41: Operator action--high-head recirculation

NRC Comment: The NRC reviewers felt that the human error probability assumed in the IPPSS for the switchover to high-head recirculation was too high and suggested a 10^{-6} value instead.

Applicability to IP3 IPE: Human error probabilities of 4.8×10^{-4} and 8.6×10^{-4} were assumed for this event during small LOCAs and intermediate LOCAs, respectively. The

justification for these conservative numbers is presented in Appendix H.

Issue 42: Operator action--turbine-driven auxiliary feedwater (AFW) pump

NRC Comment: The NRC reviewers noted that after a total loss of ac power, the operator would have to take local control of the turbine-driven AFW pump because instrument air would not be available. This needs be done within 1 hour. The NRC reviewers assigned a failure to recover probability of 0.1 to this event, a value typically used for situations in which no procedures exist but where the postulated operator action seems likely.

Applicability to IP3 IPE: The instrument air supply to AFW system valves is backed up with an independent nitrogen supply (Section 3.2.2.2). Accordingly, a loss of ac power would not itself lead to a loss of control over the pump. However, it was assumed that once dc power is lost, control of the steam-turbine-driven AFW pump would also be lost.

Issue 43: Operator action--RWST (refueling water storage tank)

NRC Comment: The NRC reviewers did not accept the assumption that the operator will act to refill the RWST if depleted instead of going to the recirculation spray mode by drawing water from the sump.

Applicability to IP3 IPE: In this study, it was assumed that the operators would switch to recirculation modes of operation on depletion of the RWST. Refilling the RWST using the primary water make-up system was considered only if recirculation core cooling is unavailable. Refilling the RWST is addressed in Sections 3.1.4.3 and 3.2.2.14 and in Appendix H.

Issue 44: Plant damage state (PDS)

NRC Comment: The NRC reviewers defined the following PDSs in place of the 22 PDSs used in the IPPSS:

(a) Early core melt with containment cooling

(b) Early core melt without containment cooling

(c) Late core melt with containment cooling

(d) Late core melt without containment cooling

(e) Containment bypass before core melt

(f) Direct containment failure due to a seismic event

(g) Steam generator tube rupture with a stuck-open secondary safety valve.

Applicability to IP3 IPE: The plant damage states defined in the IPE are described in Sections 3.1.5 and 4.3.

Issue 45: Plant response model

NRC Comment: In the IPPSS, two potential problem areas in plant design pertaining to internal events were identified for IP3 and commitments were made to rectify them. The proposed modifications were to:

(a) Rearrange the diesel generator fuel oil transfer pump power supplies such that the primary transfer pump for each diesel is powered from one of that diesel's electrical buses.

(b) Implement plant modifications for ATWS mitigation.

Applicability to IP3 IPE:

(a) The supply of fuel oil to the diesel generators was rearranged to preclude the possibility of the failure of one diesel generator preventing the transfer of fuel oil to a second diesel generator.

(b) ATWS mitigation system actuation circuitry (AMSAC) has been installed and is modeled in this study (Section 3.2.2.2).

Issue 46: Plant response model

NRC Comment: The NRC reviewers noted that the IPPSS did not adequately model RCP seal LOCAs following a sustained loss of component cooling water or service water, systems that respond to a seal LOCA, and station blackout initiated by a loss of service water and followed by a loss of offsite power.

Applicability to IP3 IPE: The initiating events in question were modeled thoroughly in this study (Sections 3.1.3 and 3.1.4).

Issue 47: Plant response model--pressurizer safety valve

NRC Comment: The NRC reviewers noted that the IPPSS did not model demands on the pressurizer safety valves in response to a transient. However, they noted that no important accident sequences were missed because of this.

Applicability to IP3 IPE: In this study, pressurizer safety and power-operated relief valves were addressed in both the event tree and system models (Sections 3.1.3, 3.1.4, and 3.2.2.12).

Issue 48: Operator action--seal LOCA

NRC Comment: The NRC reviewers assigned a failure to recover probability of 0.9 to the recovery action in which the operators connect a spool piece and establish city water cooling to the charging pumps in 20 min. The basis for this probability was that procedures did not address this action and that connection of a spool piece within 20 min. is unlikely.

Applicability to IP3 IPE: At IP3, city water is permanently connected to the charging pumps--the connection of spool pieces is not required. Procedure ONOP-CC-1 addresses the establishment of city water cooling to the charging pumps.

Issue 49: Steam generator tube rupture (SGTR)

NRC Comment: The NRC reviewers found several problems with the treatment of SGTRs. The most significant finding was that the IPPSS event tree did not include the effect of stuck-open secondary safety valves.

Applicability to IP3 IPE: The possibility of stuck-open PORVs was addressed in SGTR models (Section 3.1.4.3). See Issue 36.

Issue 50: Station blackout recovery

NRC Comment: The NRC reviewers noted that diesel generator recovery values used in the IPPSS appeared optimistic when compared to past experience.

Applicability to IP3 IPE: Diesel generator recovery was not examined in this study. Power recovery addressed the recovery of offsite power and the "Appendix R" diesel as alternative sources of power.

Issue 51: Station blackout--seal LOCA

NRC Comment: The NRC reviewers noted that the IPPSS omitted sequences in which a service water system failure was followed by a loss of offsite power. Should ac power not be restored within an hour, an RCP seal LOCA could occur followed by core melt.

Applicability to IP3 IPE: The sequences of concern were addressed in this study (Sections 3.1.4.4 and 3.1.3.3).

Issue 52: Success criteria--diesel-generator cooling

NRC Comment: The NRC reviewers felt that the failure criterion used for diesel generator cooling by service water in the IPPSS was too conservative. They noted that all three diesel generators can be cooled by one essential service water header pump.

Applicability to IP3 IPE: In this study, success of the essential service water system header was defined as adequate flow from at least two of three pumps. This definition was based on the assumption that single pump operation with containment fan cooler temperature control valves TCV-1103/1104/1105 open may result in pump runout and failure--while one essential service water pump was assumed capable of providing adequate heat removal, pump runout concerns mandate two pumps operating in each service water header unless manual action is taken to isolate various loads (Section 3.2.2.6).

Issue 53: System model--containment sprays

NRC Comment: The NRC reviewers noted that after core meltdown, the spray recirculation system may fail because of the failure of motor-operated valves to open (as a result of hydrogen burns or radiation exposure) or because of the failure of two recirculation pumps and two RHR pumps (as a result of core-melt debris in their sump water supply). The NRC reviewers further noted that the IPPSS took no credit for operation of the spray recirculation system after core meltdown.

Applicability to IP3 IPE: In this study, the operation of the spray recirculation system after core meltdown was considered. The probability of the system failing is sequence dependent. Phenomema such as core debris in the sump were considered in the containment event tree.

Issue 54: Station blackout--containment sprays

NRC Comment: The NRC reviewers felt that the containment spray injection system (CSS) was given more credit in the IPPSS than was due because the IPPSS assumed that if the CSS were available in the injection phase, it would also be available in the recirculation phase. The NRC reviewers pointed out that for this to be true, the RWST must be refilled by the operators for use during recirculation, an action not mentioned in the emergency operating procedures.

Applicability to IP3 IPE: In this study, a clear distinction was made between containment spray injection and containment spray recirculation. Success of containment spray injection implies an adequate RWST inventory and the use of at least one containment spray pump to provide early containment decay heat removal. Containment spray operation can continue after RWST depletion if a portion of the long-term recirculation core cooling flow is diverted to the containment spray headers. Recovery of containment spray injection after RWST depletion was not modeled. The containment spray system is addressed in Sections 3.1.3.1, 3.1.3.2, 3.1.4.2, 3.1.4.3, 3.1.4.4, 3.1.4.6, and 3.2.2.3 of this report.

Issue 55: System model--containment sprays

NRC Comment: The NRC reviewers noted that in the IPPSS, no credit was taken for the containment spray recirculation system.

Applicability to IP3 IPE: Containment spray recirculation was modeled in this study. The

impact of the failure of equipment shared by low-pressure recirculation systems and containment spray recirculation systems was addressed in the system and event tree models.

Issue 56: System model--electric power

NRC Comment: The NRC reviewers noted that lightning could cause multiple inverter failures and fail the entire electric power system if circuit breakers fail to open and interrupt the power surge.

Applicability to IP3 IPE: In this study, faults in the offsite power lines and circuit breaker failures were modeled explicitly.

Issue 57: System model--service water

NRC Comment: The NRC reviewers noted that the IPPSS did not consider maintenance unavailability of the essential service water header even though this header could be out for eight hours for maintenance.

Applicability to IP3 IPE: Maintenance of the essential and non-essential service water systems was modeled in this study.

Issue 58: Unavailability--containment sprays

NRC Comment: The NRC reviewers recalculated the unavailability of the containment spray system to account for common-cause pump failures. The recalculated value was 5.3×10^{-4}; the value reported in the IPPSS was 3×10^{-5}.

Applicability to IP3 IPE: The common-cause failure of pumps was included in the containment spray system models (Section 3.2.2.3). The unavailability calculated for this system was 4.9×10^{-4}. The common-cause failure of pump discharge valves was also modeled.

Issue 59: Unavailability--high-head safety injection system

NRC Comment: The NRC reviewers recalculated the unavailability of the high-pressure injection system to account for common-cause pump failures.

Applicability to IP3 IPE: The common-cause failure of valves and pumps was included in the high-head safety injection system models (Section 3.2.2.4).

APPENDIX B

THERMAL-HYDRAULICS ANALYSES

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Section B1

INTRODUCTION

This Appendix describes the analyses performed to support LOCA, transient initiator, steam generator tube rupture and station blackout initiator event tree development. These analyses define event tree success criteria and the assumptions necessary to characterize the accident sequences. The analyses do not, however, focus on the timing of events in as far as this affects the quantification of post-accident human error.

The thermal-hydraulic behavior of IP3 was analyzed using version 192 14APR87 of the Meltdown Accident Response Characteristics Code (MARCH) [1] and version 3.0B, Rev. 16 of the MAAP PWR code [2].

Section B2

LOCA CONTAINMENT DECAY HEAT REMOVAL

B2.1 CONTAINMENT DECAY HEAT REMOVAL

Early and late containment heat removal requirements were calculated assuming the occurrence of a large LOCA. This event was selected in preference to other LOCA events because it rapidly releases a large amount of energy into the containment atmosphere and so poses a greater threat to containment integrity than does any other LOCA. Consequently, the requirements for containment heat removal in a large LOCA exceed those of smaller LOCAs.

The containment spray, fan cooler, and RHR (long-term cooling) systems were addressed in evaluating containment heat removal.

B2.1.1 CONTAINMENT SPRAY SYSTEM (CSS)

Although early CSS operation is not required to prevent core damage or containment failure should a large LOCA event occur, it is included in the event tree because it will significantly affect the timing of containment failure. Early CSS operation will reduce the net transfer of heat into the containment atmosphere and sumps, curtail the increase in containment pressure, and lead to a subsequent gradual decrease in containment pressure.

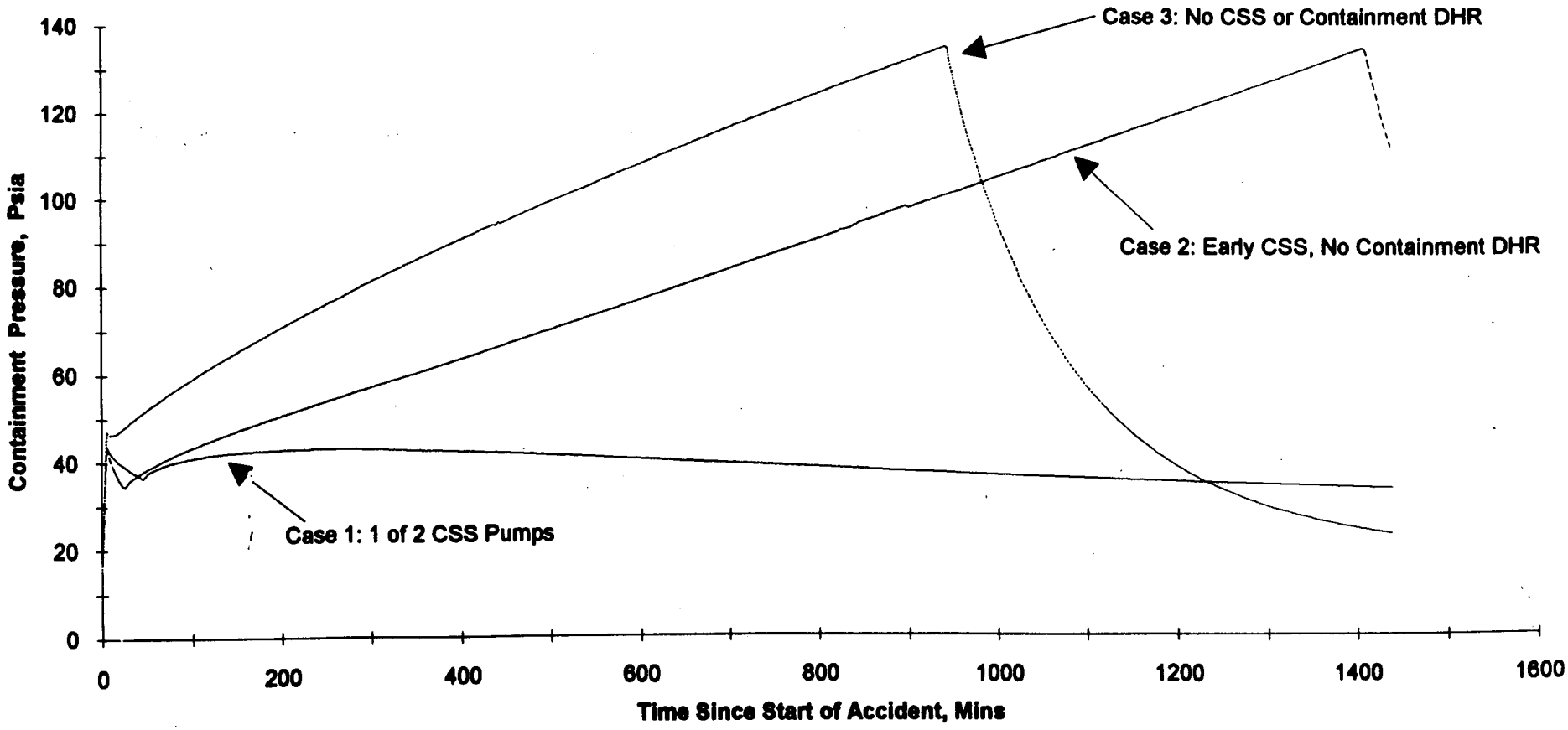
Calculations performed using the MARCH code determined that, if one containment spray pump operates early with a spray flow rate of 2600 gpm, the initial containment atmosphere pressure never rises above its 62-psia design set point (Case 1, Figure B2.1.1).

Other MARCH calculations show that with a complete loss of containment decay heat removal and no early CSS operation, the ultimate containment failure pressure of 132 psia is reached at 11 hours (Case 2, Figure B2.1.1). However, early CSS operation delays the rise to the ultimate containment failure pressure until 16 hours (Case 3, Figure B2.1.1).

B2.1.2 CONTAINMENT FAN COOLERS (EMERGENCY MODE OPERATION)

One containment fan cooler can remove 76.3 x 10^6 BTU/hr (0.74 percent of full power) in its emergency mode of operation. At this rate of heat removal, 3 fan coolers can prevent overpressure failure by providing sufficient early and late (long-term) cooling of the

Figure B2.1.1 Large LOCA Containment Pressure Profile -- Impact of CSS Operation



containment atmosphere and thus, by condensation, cooling of recirculation water flowing to the recirculation or containment sumps. The containment pressure profile predicted by a MARCH code analysis of this scenario is presented in Figure B2.1.2.

B2.1.3 LONG-TERM CONTAINMENT HEAT REMOVAL THROUGH THE RHR HEAT EXCHANGERS

Long-term containment heat removal can then be accomplished using the containment spray system with one RHR heat exchanger in service. Each RHR heat exchanger can remove 56.4 x 10^6 BTU/hr in its accident mode of operation assuming a primary temperature at 213°F and a component cooling water temperature at 126°F. As noted in Section B2.1.1, early operation of the containment spray system is not required to prevent containment failure. However, late operation of the containment recirculation spray system is required--in a large cold-leg LOCA, the recirculation or RHR pumps are unable to force coolant through the hot-leg and steam generator tubes to the break location and consequently, cooling water will bypass the core and flow out of the break. Thus the steam produced by core decay heat (the core is covered by water because of the gravity head in the vessel downcomer) flows directly to the containment atmosphere, and the RHR heat exchangers will not remove core heat unless the containment spray system is functioning (Figure B2.1.3, Cases 1 and 2)..

The criteria for heat removal in intermediate and small LOCAs differ because core injection flow will fill up the vessel and hot legs and thus transfer core decay heat to the circulating water. Consequently, if a containment fan cooler unit is operating, containment spray recirculation operation does not affect the timing of containment failure or the effectiveness of the RHR heat exchangers for heat removal. Therefore, for intermediate and small LOCAs, long-term containment heat removal is achieved by placing a RHR heat exchanger in service. The containment pressure profile for an intermediate LOCA (6-in. break) with a RHR heat exchanger in service is presented as Case 3 in Figure B2.1.3. No containment failure will occur.

B2.2 LOCA CORE COOLING

Following a LOCA event, core decay heat removal is achieved by adequate core water inventory control using one or more coolant injection systems. Core decay heat is then removed by break flow or, in the early stages of a small LOCA, by secondary heat removal. Because the pressure and flow requirements depend upon the size of the break, different LOCAs have different core cooling requirements.

Figure B2.1.2 Large LOCA Containment Pressure Profile -- Impact of Fan Coolers

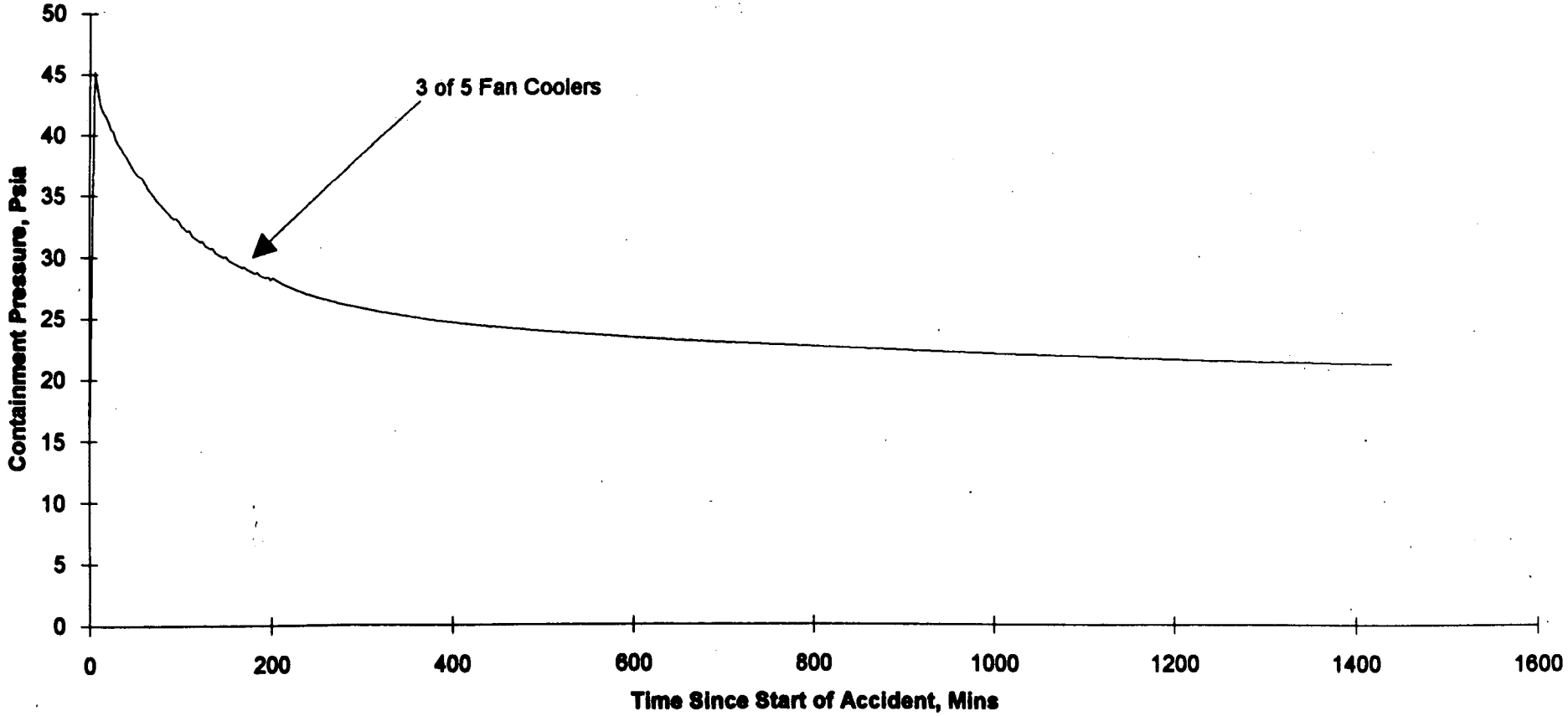
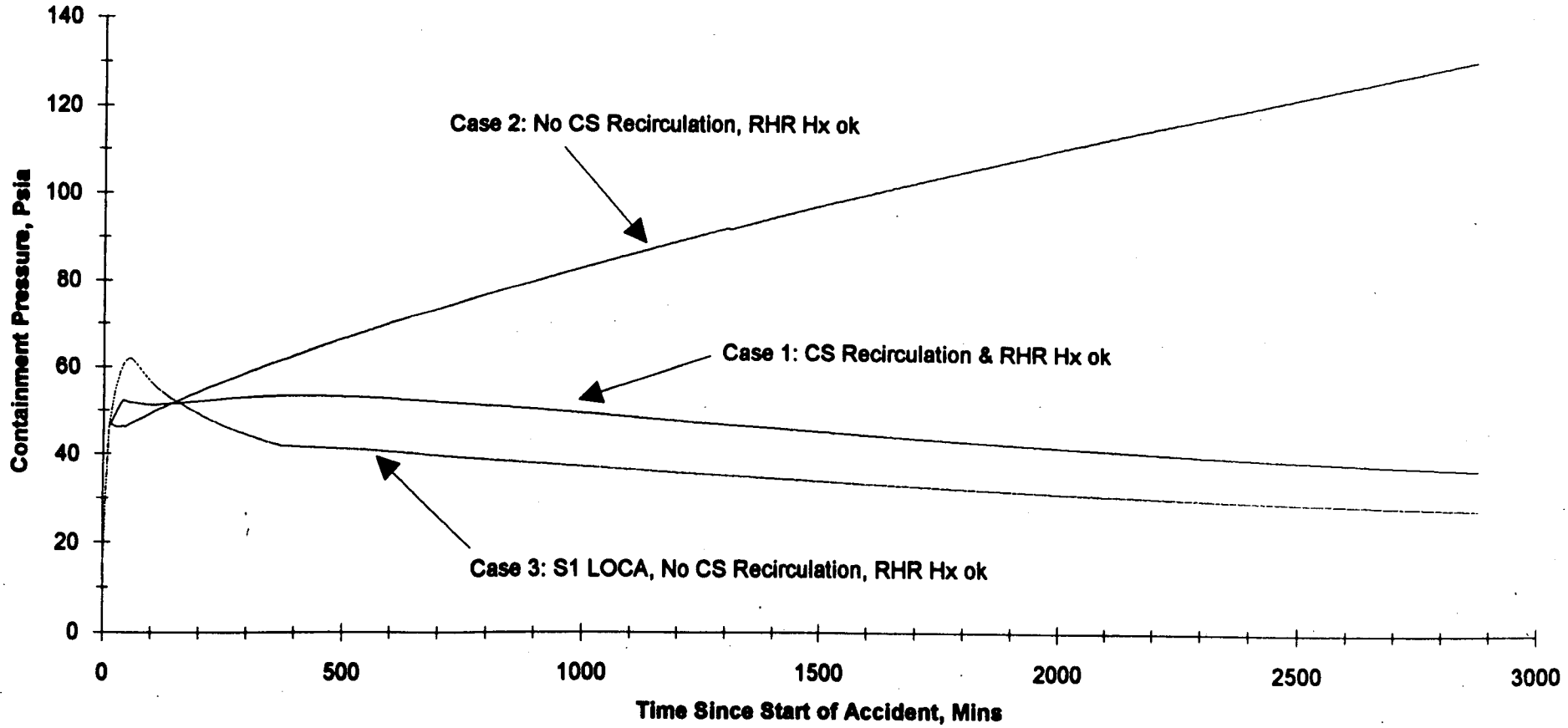


Figure B2.1.3 Large LOCA Containment Pressure Profile -- Impact of Heat Removal



B2.2.1 LARGE LOCA CORE COOLING

The success criteria presented in Table 3.1.3.1 for a large LOCA (diameter >6 in.) are based on MARCH code analyses. These analyses show that in a large LOCA, initial core cooling can be provided by a low-head safety injection (RHR) pump injecting through one 10-in. RCS cold leg. Alternatively, initial core cooling can be provided by two of four accumulators discharging through their associated RCS 10-in. cold legs and by two high-head safety injection pumps injecting through two 2-in. RCS cold legs. Reactor vessel downcomer water level profiles for these alternatives are presented in Figure B2.2.1.

Long-term core cooling for LOCAs is provided by cold-leg recirculation flow from a recirculation or RHR pump, the coolant being injected into at least one RCS 10-in. cold leg.

B2.2.2 INTERMEDIATE LOCA CORE COOLING

Intermediate LOCAs result from RCS breaks with diameters of 2 to 6 in. MARCH code analyses for break sizes 3 to 6 in. show that sufficient RCS depressurization occurs to allow the accumulators to discharge and low-head core cooling to be provided by RHR pumps. As with large LOCAs, at least one RHR pump must inject coolant into one RCS 10-in. cold leg.

For break sizes of 2 to 3 in., adequate core cooling is provided by one high-head safety injection pump discharging into two RCS 2-in. cold legs and two accumulators discharging into their associated RCS cold legs. Secondary heat removal or RCS depressurization are normally not required. However, failure of high-head core cooling will lead to core damage, unless RCS depressurization (through secondary-side depressurization of the steam generators to 95 psig or the opening of a PORV) occurs and a low-head safety injection pump provides low-head injection.

B2.2.3 SMALL LOCA CORE COOLING

Small LOCAs are RCS breaks with diameters of 1/2 to 2 in. MARCH code analysis shows that flow through such breaks does not remove sufficient heat and therefore both secondary heat removal and high-head safety injection flow are required to achieve stable conditions. Figure B2.2.2 shows vessel downcomer elevation for two cases in which high-head injection is provided: in the first, AFW secondary heat removal fails; in the second, AFW secondary heat removal succeeds. From these results, it was concluded that at least one high-head safety injection and one AFW pump must operate to provide core cooling.

Figure B2.2.1 Large LOCA Vessel Downcomer Profile
-- Impact of High-head Safety Injection

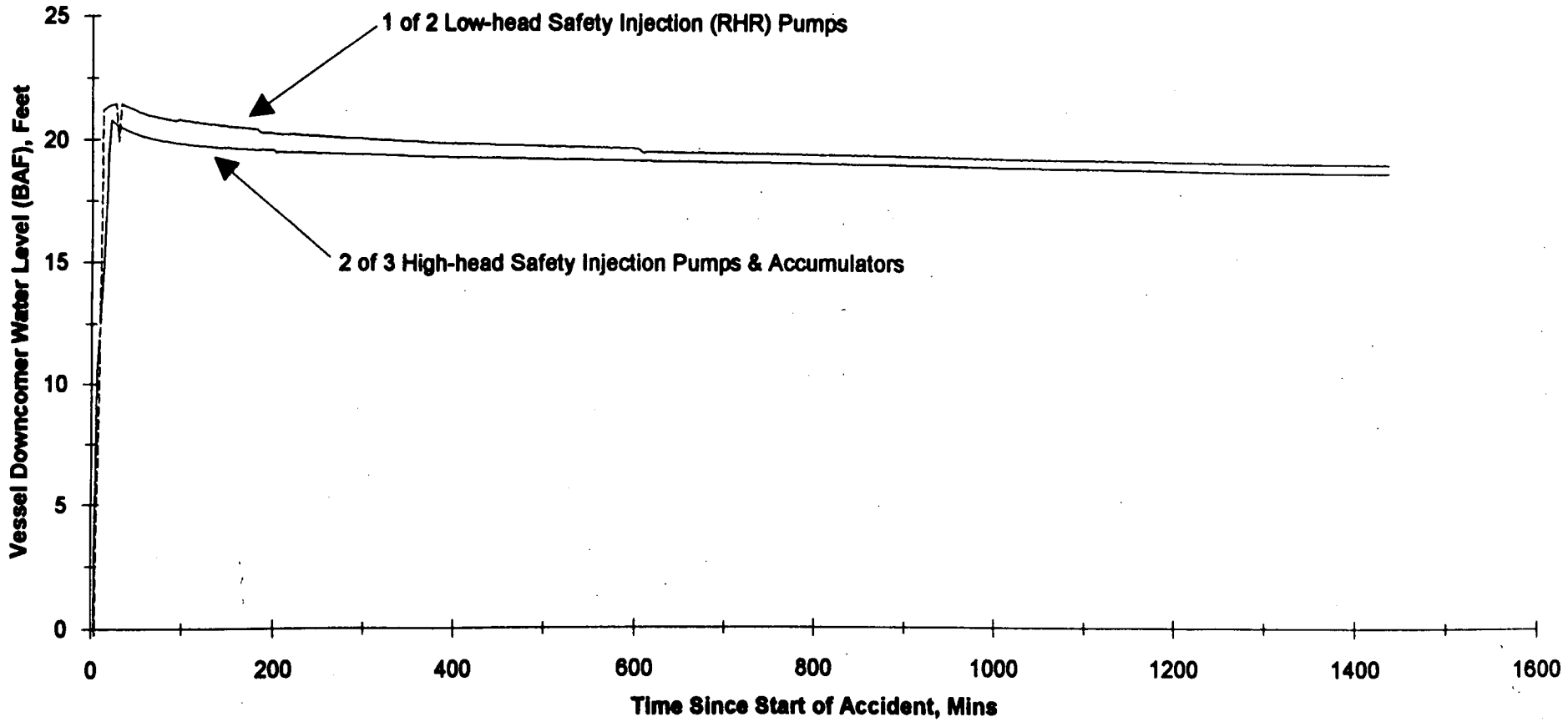
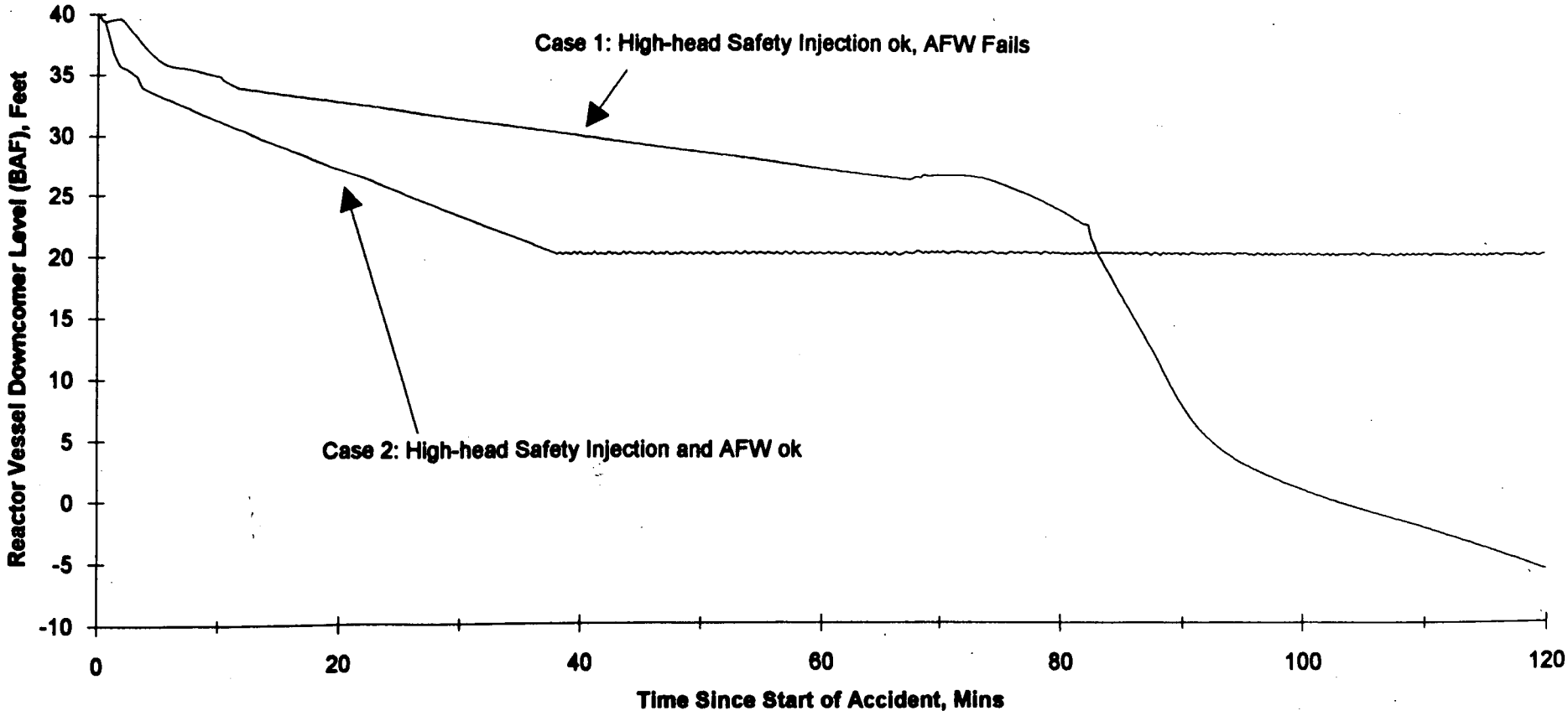


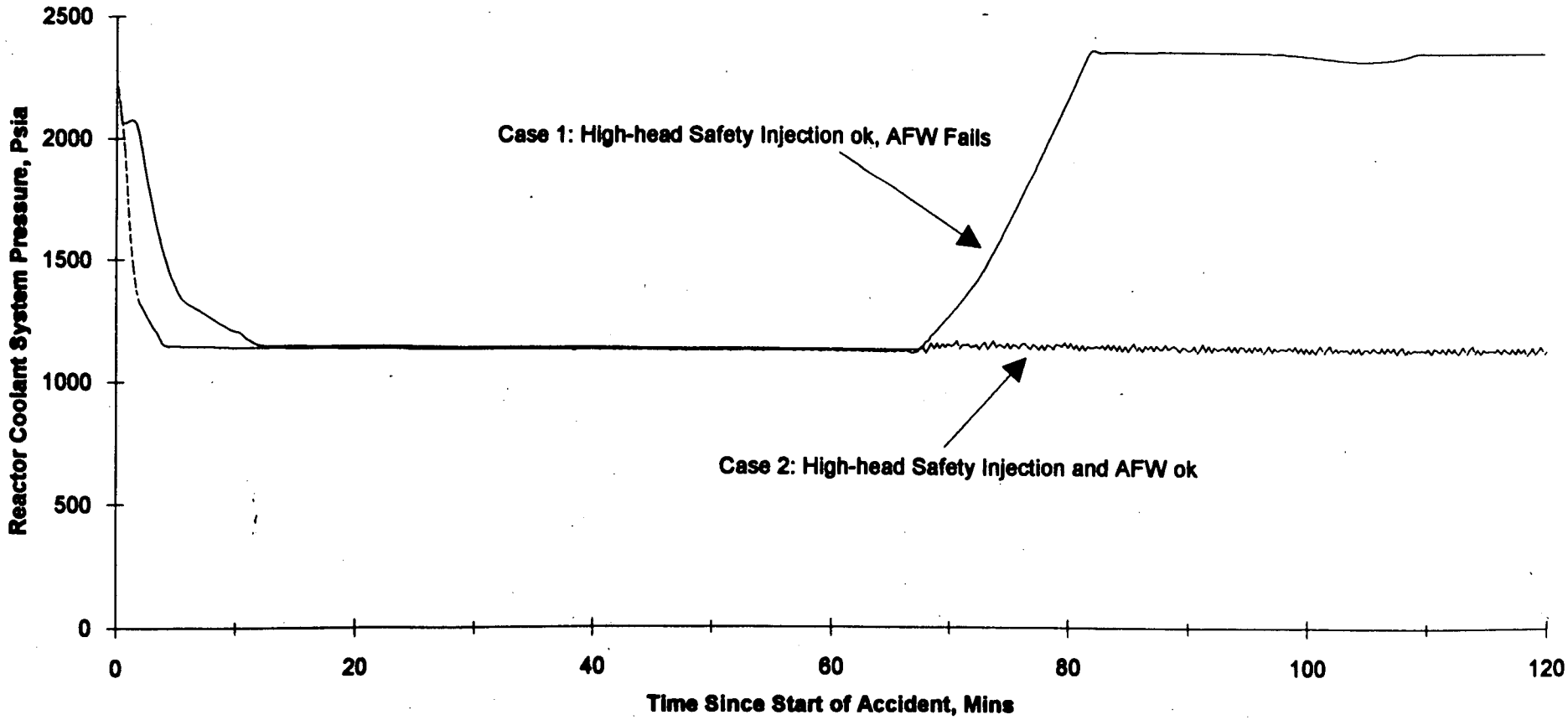
Figure B2.2.2 Small LOCA Vessel Downcomer Profile
-- Impact of High-head Safety Injection



If secondary heat removal fails, MARCH predicts that at least one PORV must be opened within 50 minutes to remove energy from the core and depressurize the RCS. Failure to open a PORV leads to RCS pressure cycles around the PORV setpoint (Figure B2.2.3). Because this pressure is above the shut-off head of the high-head safety injection pumps, injection flow from the high head safety injection pumps will be lost, and vessel boil-off and core damage result. Thus core cooling at this time requires the operation of at least one high-head safety injection pump and, should secondary heat removal fail, the opening of both PORVs.

If the high-head safety injection pumps are unavailable, the RCS must be depressurized to allow for low-head safety injection. In these circumstances, successful core cooling requires RCS depressurization and the operation of one low-head safety injection pump within 120 minutes. RCS depressurization is accomplished by depressurizing the steam generators (opening all steam dump valves) or by opening both PORVs and running all reactor coolant pumps.

Figure B2.2.3 Small LOCA RCS Pressure Profile
-- Impact of High-head Safety Injection



Section B3

TRANSIENT INITIATORS

B3.1 TIMING OF EVENTS AFTER LOSS OF AFW SYSTEM COOLING

A generic analysis has shown that, in the event of a loss-of-feedwater transient, bleed-and-feed cooling must begin within 25 minutes from the start of the transient [3]. However, given that IP3 PORV capacity is less than that assumed in the generic case (118 lb/hr/MWt versus 139 lb/hr/MWt), a second analysis was performed using the MAAP PWR computer code. This analysis verified that, in a loss-of-feedwater transient, bleed-and-feed cooling must be initiated within 25 minutes of the reactor scram, provided the reactor coolant pumps are tripped five minutes after reactor scram.

Should bleed-and-feed cooling not be aligned, steam generator dryout is predicted to occur 76 minutes after reactor scram (Figure B3.1.1). Once the steam generator is dry, RCS pressure increases rapidly to the PORV setpoint (Figure B3.1.2) and primary inventory begins to leak to the pressurizer relief tank (Figure B3.1.3). Approximately 85 minutes after reactor scram, the primary relief tank rupture disk fails discharging sufficient coolant into the containment to generate a high containment pressure signal. This signal starts the containment fan coolers in their emergency mode of operation. MAAP PWR predicts that the core is uncovered (vessel water level at top of active fuel) 106 minutes after reactor scram. Subsequently, core damage occurs 167 minutes after reactor scram, at which time the fuel cladding temperature exceeds 2200°F.

According to the generic analysis [3], feedwater flow must be restored before the core is uncovered to preclude core damage. Therefore, according to the MAAP PWR results described above, the recovery of feedwater flow within 106 minutes of the reactor scram will mitigate the transient. Later recovery of feedwater flow will not prevent core damage.

B3.2 SYSTEM RESPONSE FOLLOWING BLEED-AND-FEED OPERATION

In developing the transient event trees, the final stable operating condition following bleed and feed must be determined. If the 350°F, 450-psig entry conditions for RHR shutdown cooling are reached before depletion of RWST water inventory, the RHR system can be used for long-term decay heat removal. Otherwise, recirculation core cooling is required.

Figure B3.1.1 Steam Generator Water Level Profile
-- Impact of Loss of AFW Operation

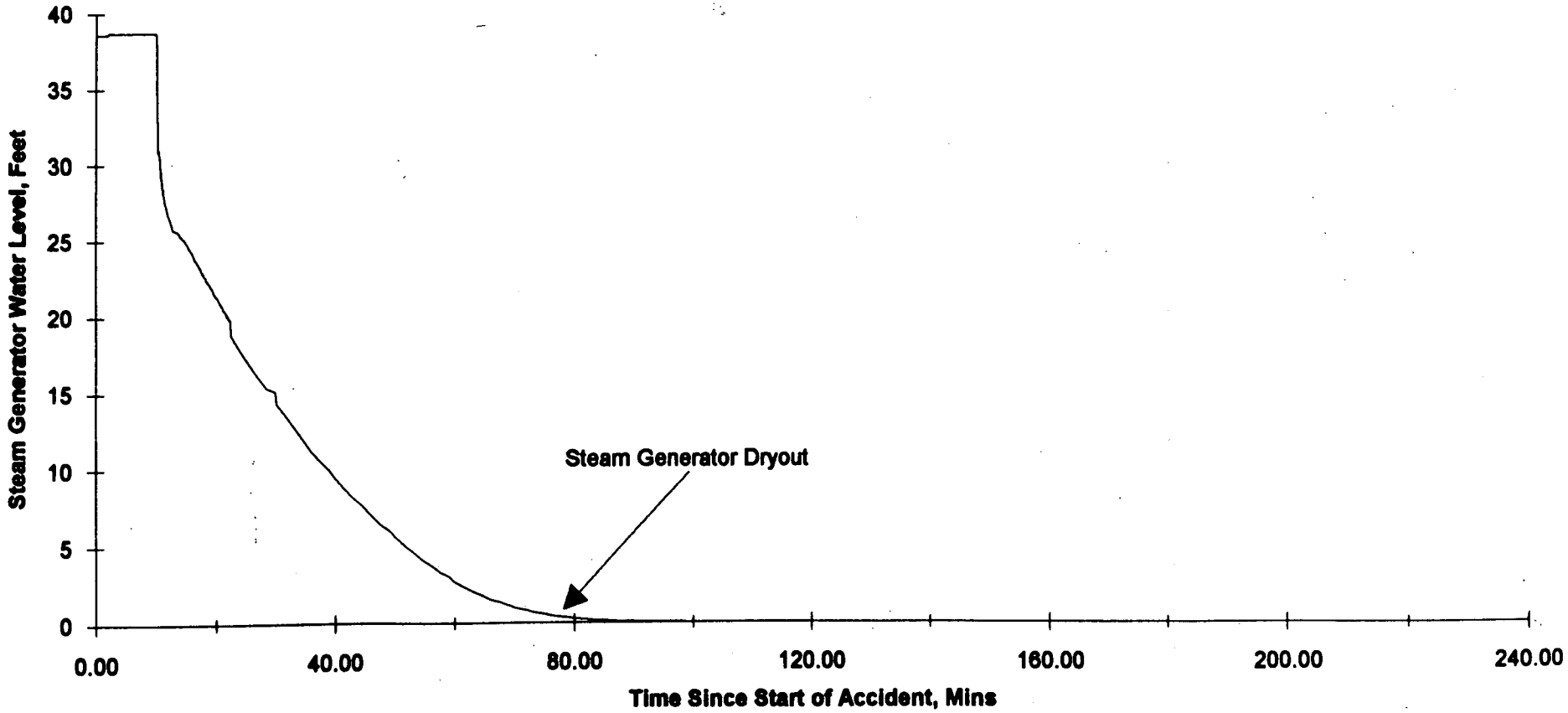


Figure B3.1.2 Reactor Coolant System Pressure Profile
-- Impact of Loss of AFW Operation

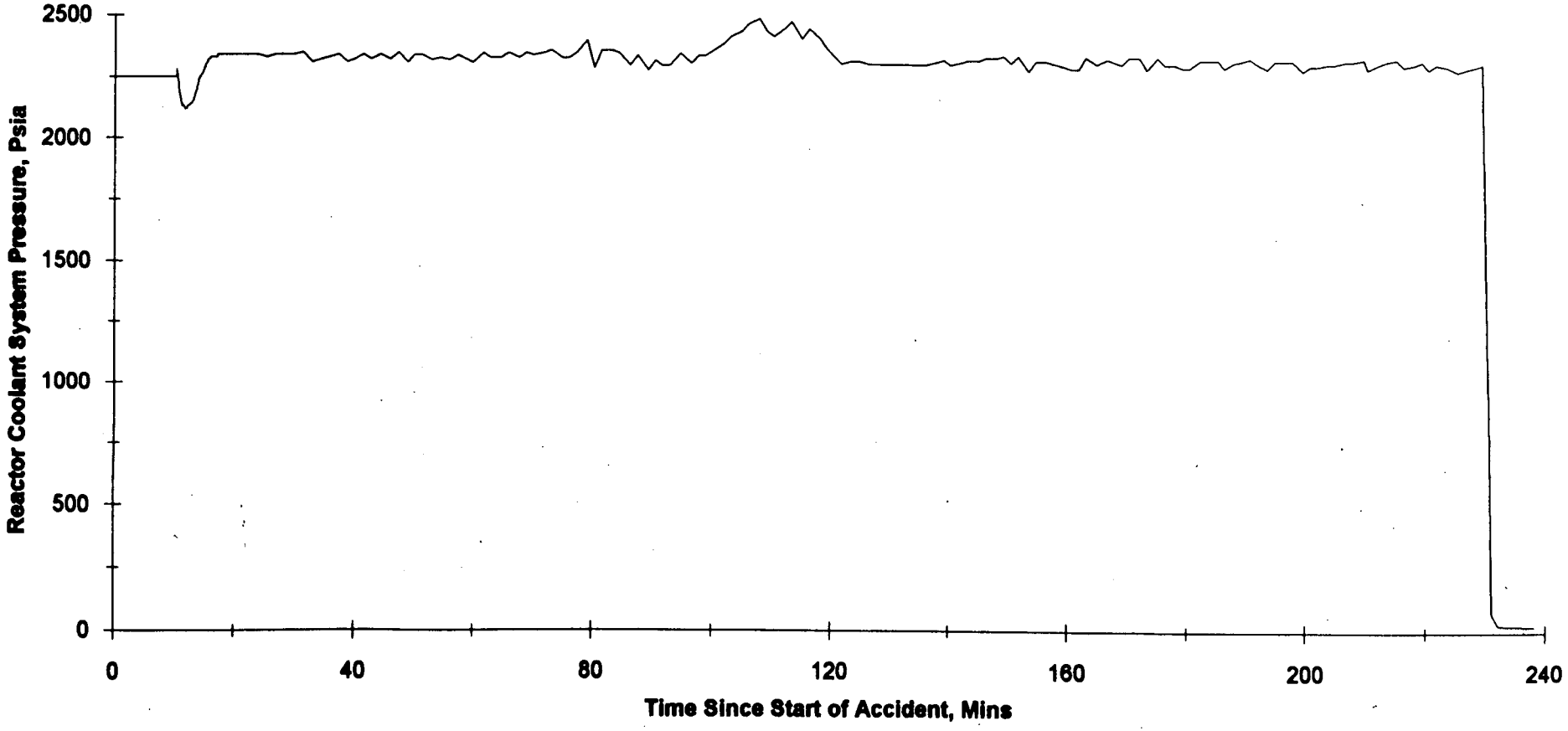


Figure B3.1.3 Reactor Coolant System Water Level Profile
-- Impact of Loss of AFW Operation

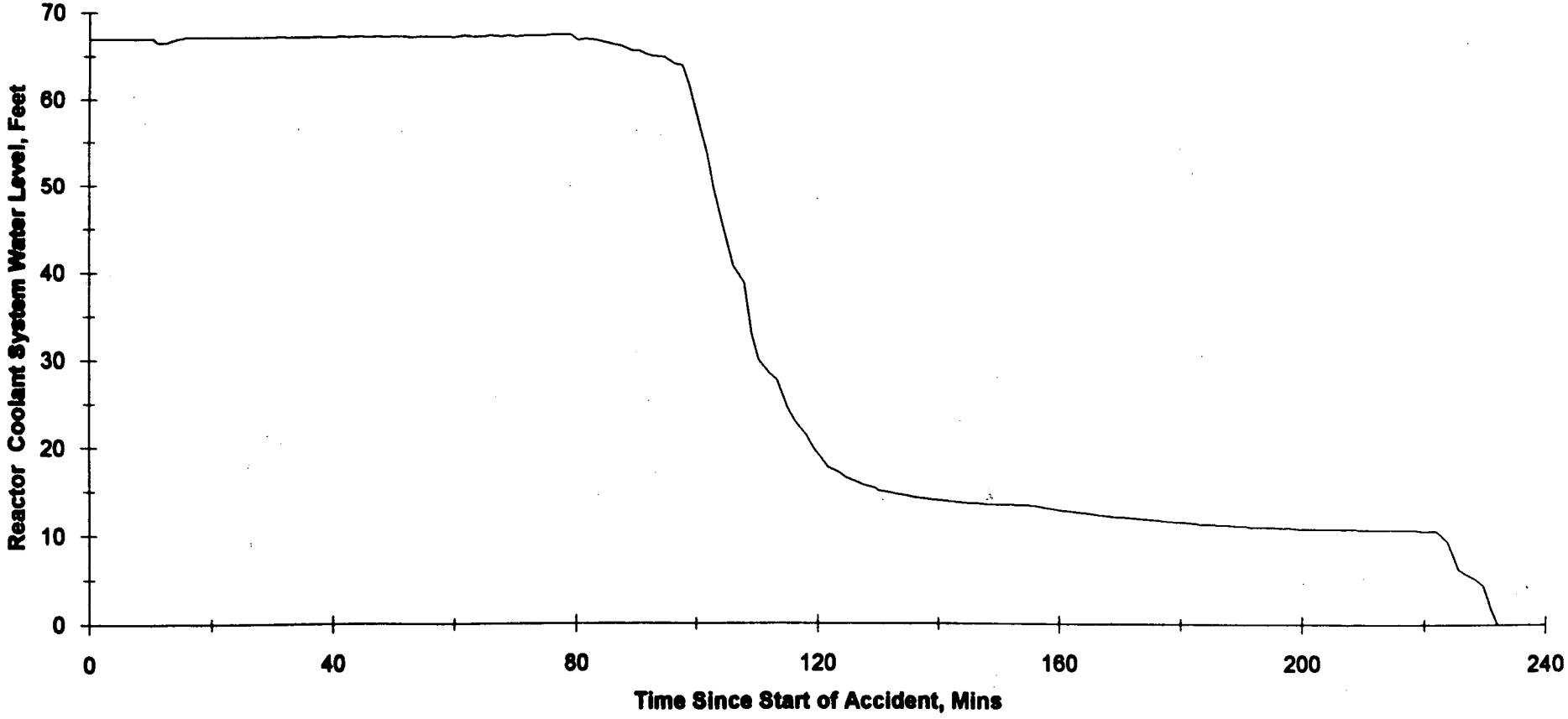
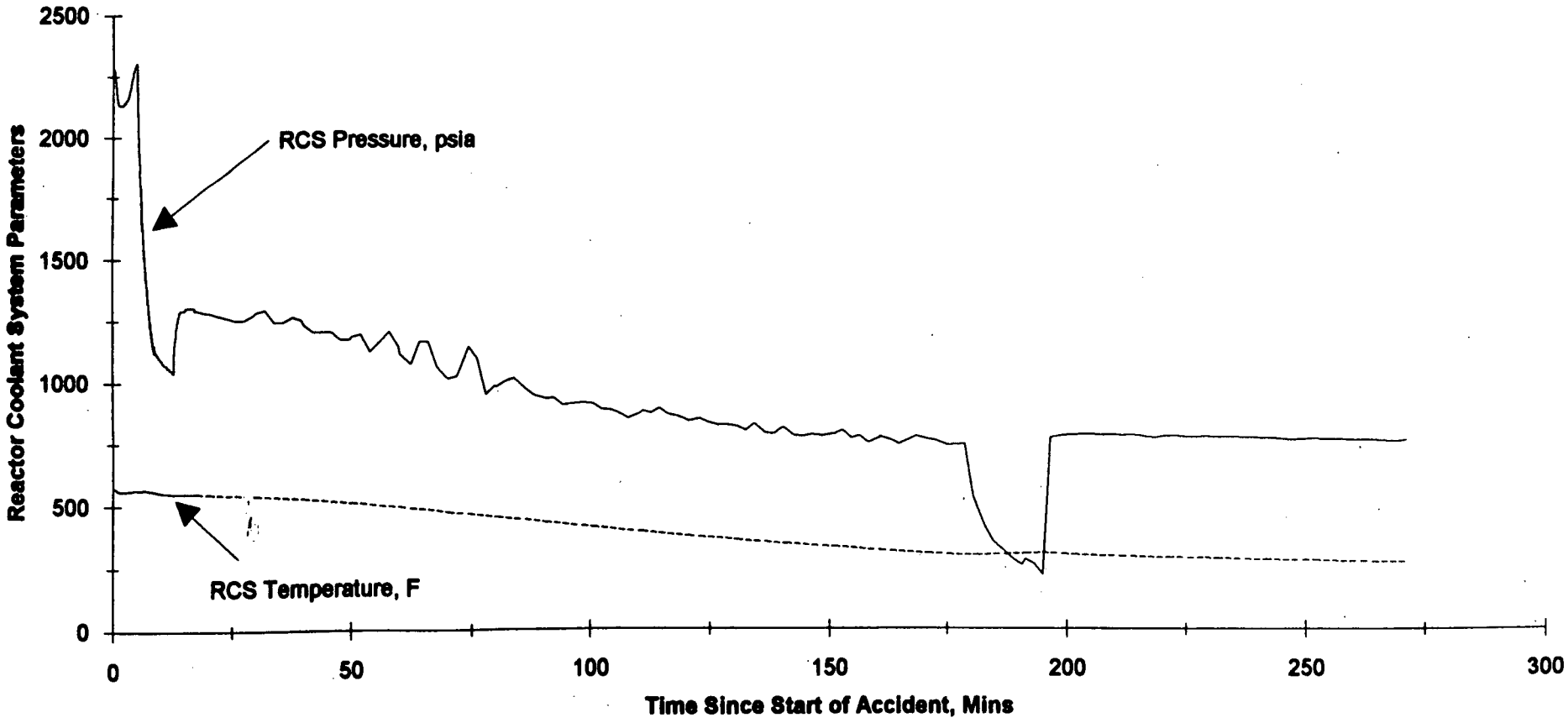


Figure B3.2.1 presents RCS temperature and pressure profiles following bleed-and-feed operation, calculated using MAAP PWR. In this scenario, two PORVs opened and three high-head safety injection pumps are running 5 minutes into the transient. High containment pressure (>3.0 psig) is reached at 99 minutes and results in the containment fan coolers starting in their emergency mode of operation. Recirculation core cooling is implemented 179 minutes after reactor scram upon RWST depletion. Since the RWST inventory depletes before the RHR entry point is reached, recirculation cooling is modeled in the transient event trees instead of RHR shutdown cooling. However, shutdown cooling can be established later when conditions allowing its operation are satisfied.

Figure B3.2.1 RCS Temperature and Pressure Profile
-- Impact of Bleed and Feed Core Cooling



Section B4

STEAM GENERATOR TUBE RUPTURE

The operator actions critical to the mitigation of steam generator tube ruptures are:

- Isolation of the ruptured steam generator
- Early RCS cooldown and depressurization
- Late RCS cooldown and depressurization
- Alignment of RHR shutdown cooling
- Refilling the RWST.

These actions will now be examined.

B4.1 ISOLATION OF THE RUPTURED STEAM GENERATOR

Because steam generator tube rupture provides several potential paths for the release of reactor coolant outside containment, RCS flow into the secondary side must be stopped should tube rupture occur. To accomplish this, the ruptured steam generator must be isolated and RCS pressure reduced below the pressure of the ruptured steam generator. Failure to perform these actions in a timely fashion increases the likelihood of a LOCA event in which the containment is bypassed.

The main concern in early RCS cooldown and depressurization failure is the possibility of overfilling the ruptured steam generator. The flow of water through the SRVs from an overfilled steam generator can result in the SRVs failing open. Furthermore, the main steam line can rupture if it is pressurized to steam generator relief pressure with water because the line is not designed to be filled with water.

The time at which the ruptured steam generator overfills depends on the leak rate through the ruptured tubes and AFW flow to the ruptured steam generator. The initial tube leak rate was assumed to be 400 gpm through a break 0.0033 ft^2 in area; the steam generator vapor space was estimated to be 15,880 gal. Overfilling would then occur 41 minutes after the SGTR event, given AFW isolation 20 minutes after the SGTR event, or after 31 minutes, if the AFW system is not isolated and a 200-gpm AFW flow to the failed steam generator is assumed.

B4.2 EARLY RCS COOLDOWN AND DEPRESSURIZATION

Should high-head safety injection be unavailable, the operator must initiate RCS cooldown using the intact steam generators to allow the accumulators to inject coolant and so ensure adequate core cooling until low-head safety injection is possible. The latest time at which cooldown can be initiated is 5 hours after the incident starts because core damage occurs at 7.5 hours, at least 1 hour is required for RCS cooldown to 650 psig (490°F), the pressure at which accumulators will inject coolant, and at least one more hour is required to bring the RCS below the shutoff head of the RHR pumps. The timing for core damage was taken from a MAAP PWR run in which a 400 gpm RCS break and no emergency core cooling injection were assumed.

B4.3 LATE RCS COOLDOWN AND DEPRESSURIZATION

This action is interrelated with the early RCS cooldown and depressurization action. Failure to perform early RCS cooldown and depressurization leads to overfilling of the ruptured steam generator and a subsequent inability to isolate the ruptured steam generator. A LOCA bypassing containment results. Core damage is prevented only if cooldown and depressurization to cold shutdown conditions (an average RCS temperature < 200°F) is achieved using the RHR system before the RWST depletes its inventory. Under these conditions the time to initiate late RCS cooldown and depressurization depends on the times to reach RHR entry conditions (350°F, 450 psig) and achieve cold shutdown. MAAP PWR code runs showed that for an initial ruptured tube leak rate of 400 gpm, RWST depletion occurs at 8 hours. If it is assumed that the operator takes 2 hours to bring the RCS to RHR entry condition using high-head safety injection (cooldown rate, 100 deg. F/hr) and an additional 3 hours to bring the reactor to cold shutdown (cooldown rate, 50 deg. F/hr), the operator should initiate cooldown within 3 hours for the RCS to be in cold shutdown before a low-low RWST water level is reached.

B4.4 ALIGNMENT OF RHR SHUTDOWN COOLING

Should a containment bypass LOCA be caused by an inability to achieve timely RCS depressurization, or should a ruptured steam generator SRV fail to reclose, cold shutdown is the only effective stable condition. Hot shutdown is not stable because RCS inventory continues to boil off to the atmosphere through the bypass path and consequently, RWST inventory injected into the RCS will be discharged into the atmosphere rather than the containment sumps. Subsequently, with the containment sumps bypassed, long-term recirculation core cooling is unavailable. To preclude core damage, the RCS is cooled down and RHR shutdown cooling is aligned to achieve cold shutdown and prevent any further RCS leakage to the atmosphere. Therefore, as noted in Section B4.3, the operator should initiate RHR shutdown cooling within 3 hours of RCS cooldown for the RCS to be in cold shutdown before a low-low RWST water level is reached after 8 hours.

B4.5 REFILLING RWST

Failure to reduce RCS pressure to a pressure below that of the ruptured steam generator secondary side leads to continued loss of RCS water (RWST inventory) from containment and thus to a lack of make-up for long term recirculation cooling. Under these conditions, replenishment of the RWST is the only effective way to prevent core damage. MAAP PWR calculations predict that core damage occurs 16 hours after RWST depletion, the core being uncovered 6.95 hours after RWST depletion. Therefore, to prevent core damage, the operator should begin to refill the RWST within 6 hours of receiving a low-low RWST water level signal.

Section B5

STATION BLACKOUT

B5.1 TIMING OF CORE DAMAGE FOLLOWING STATION BLACKOUT

During a station blackout, core damage can be prevented in certain sequences if ac power is restored in time. Therefore, to establish the time available for the recovery of ac power, it is important to determine the time to core damage. Three factors that affect this time are: the occurrence of a stuck-open PORV, RCP leakage, and the availability of the steam-turbine-driven AFW pump.

Figure B5.1.1 presents the time to core damage as a function of total RCP seal leak rate and steam-turbine-driven AFW pump operating time. Figure B5.1.2 presents the time to core damage following loss of the AFW steam-turbine-driven pump. Figure B5.1.3 presents the time to core damage as a function of total RCP leakage assuming continuous operation of the steam-turbine-driven AFW pump. Figure B5.1.4 presents the core melt progression as a function of time, assuming one stuck-open PORV, and AFW operation.

The actual time for ac power recovery can be calculated assuming that power must be restored about 30 minutes before core damage occurs to allow sufficient time for the operator to perform the necessary system recovery actions. The lower curve in Figure B5.1.2 represents this timing.

B5.2 REACTOR COOLANT PUMP SEAL LOCA

The station blackout RCP seal LOCA model is based on a Westinghouse analysis detailed in WCAP-10541 [4]. This analysis determined the probability of the core being uncovered and subsequent core damage as a function of time, given non-recovery of ac power and RCP seal failure (Figure B5.2.1). For unqualified RCP seal material, such as is used at IP3, the probability of the core being uncovered after 8 hours is 0.109, with RCS cooldown, and 0.55, without RCS cooldown. At 10 hours the core is assumed to be uncovered. The steam-turbine-driven AFW pump was assumed to be available after RCP seal failure until the core is uncovered.

Figure B5.1.1 Core Damage Time
- - Impact of RCP Leak Rate and Loss of AFW Operation

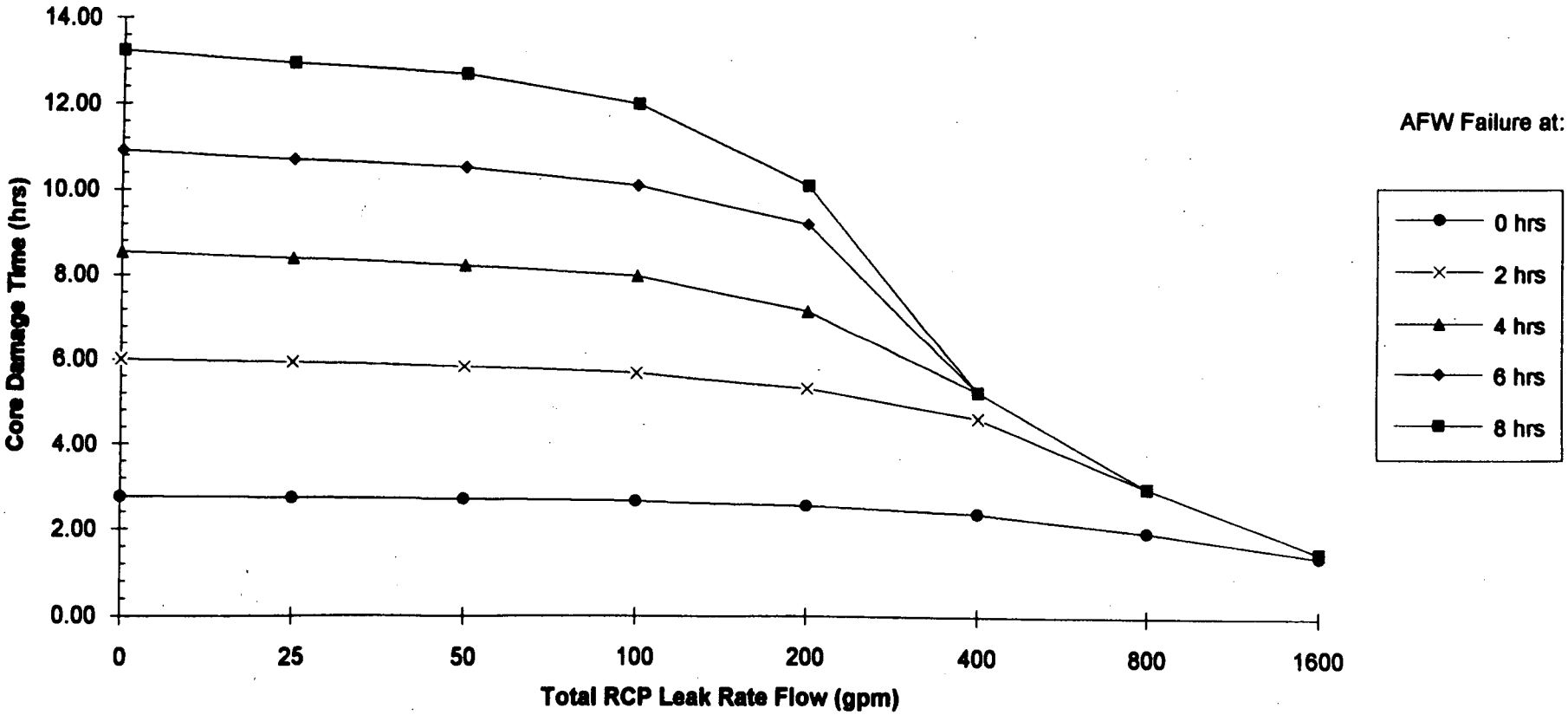


Figure B5.1.2 Core Damage Time
-- Impact of Loss of AFW Operation

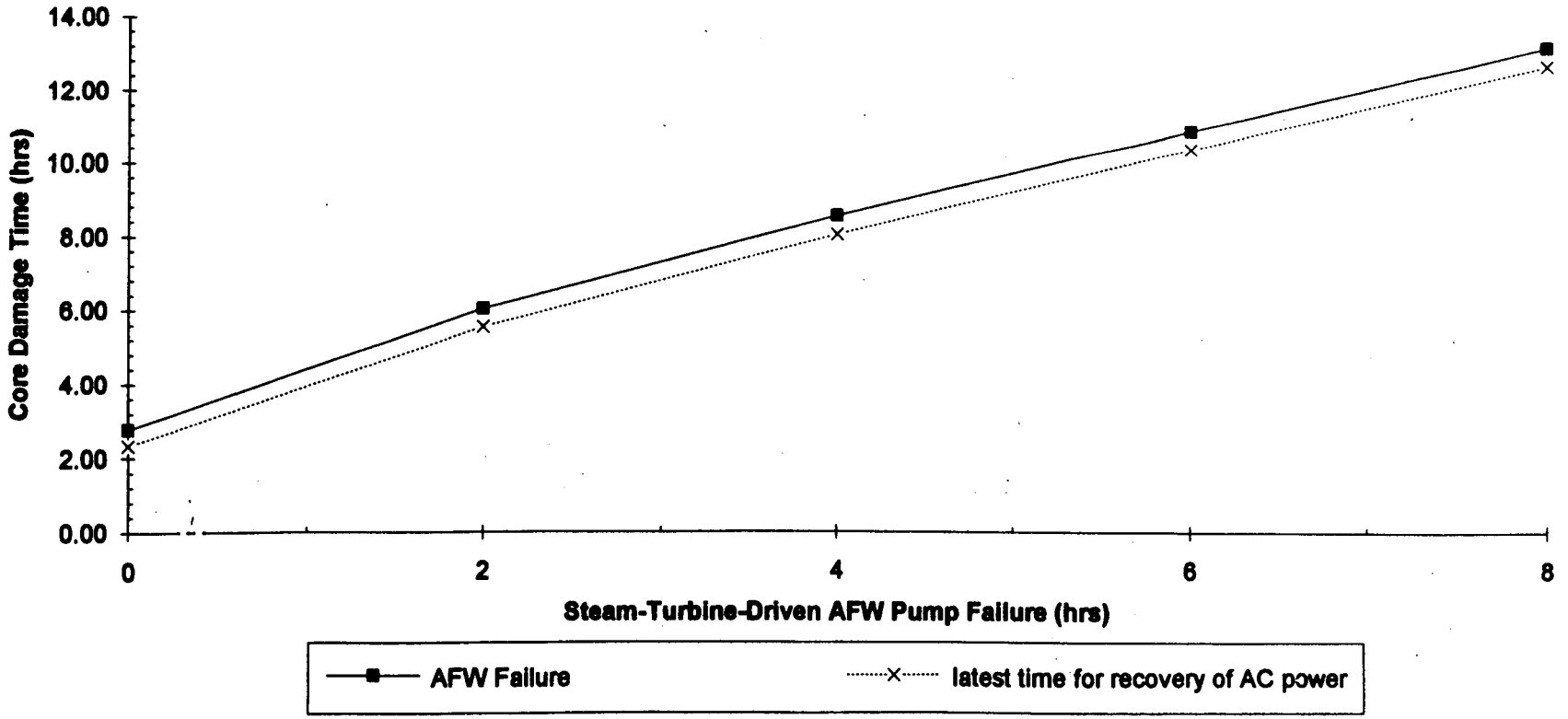


Figure B5.1.3 Core Damage Time
- - Impact of RCP Leak Rate Given Operation of AFW

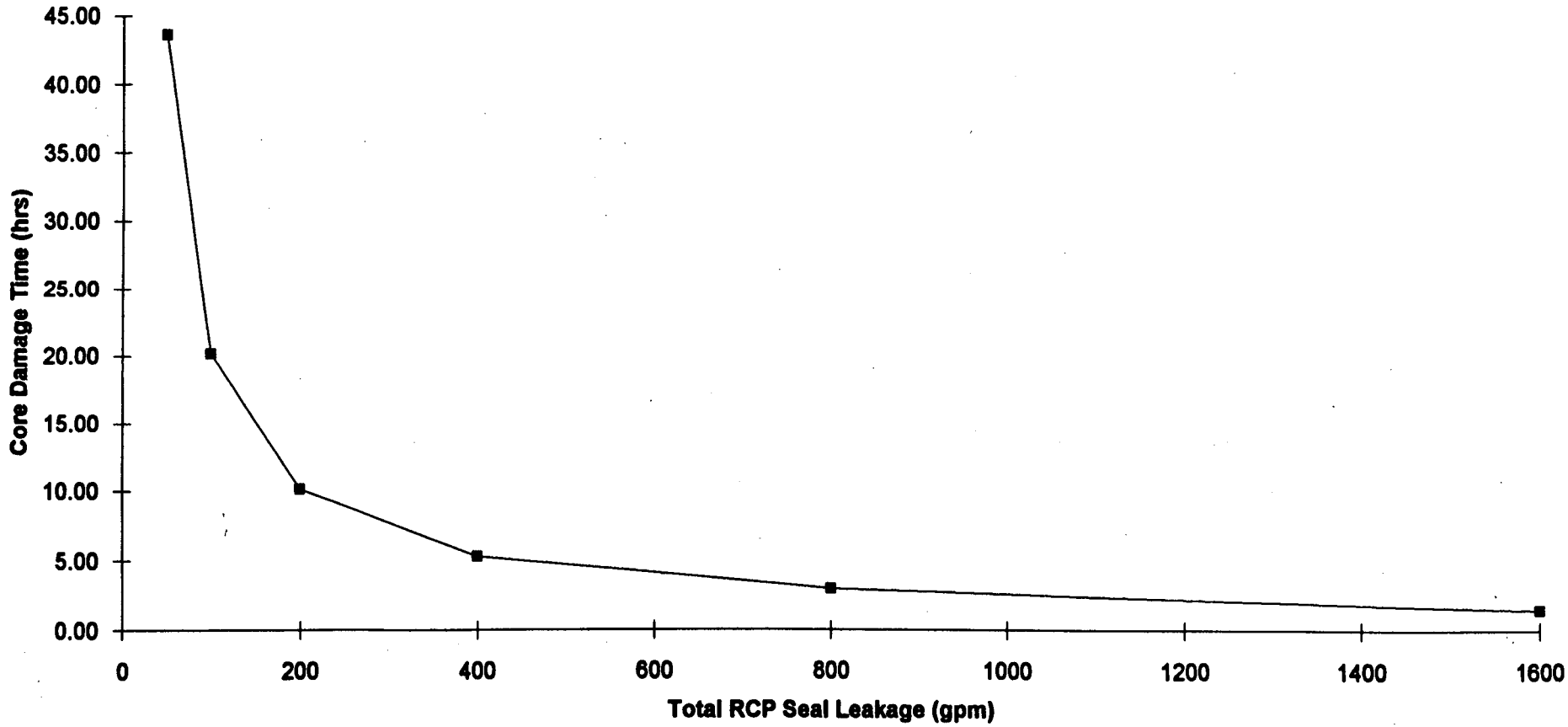


Figure B5.1.4 Core Damage Time
-- Impact of One Stuck-Open PORV

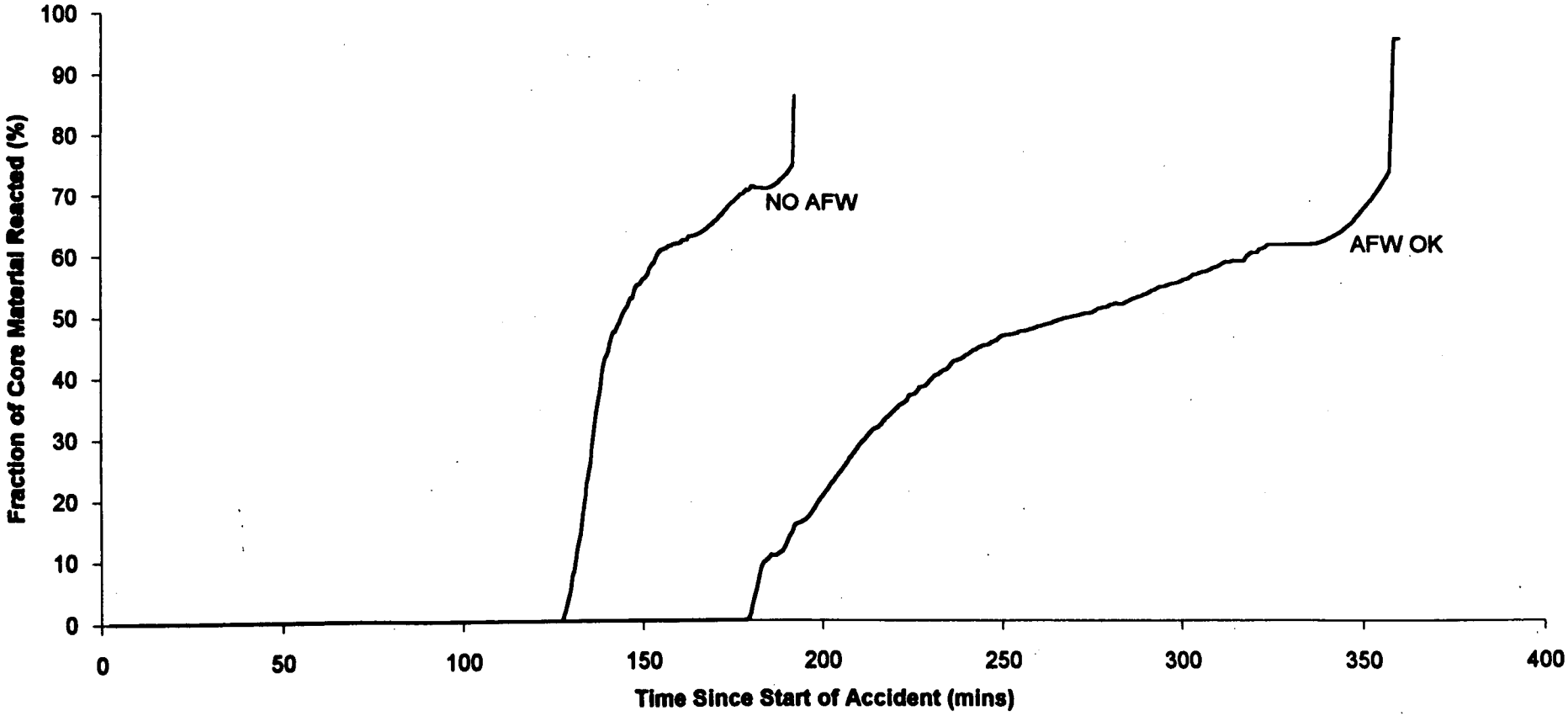
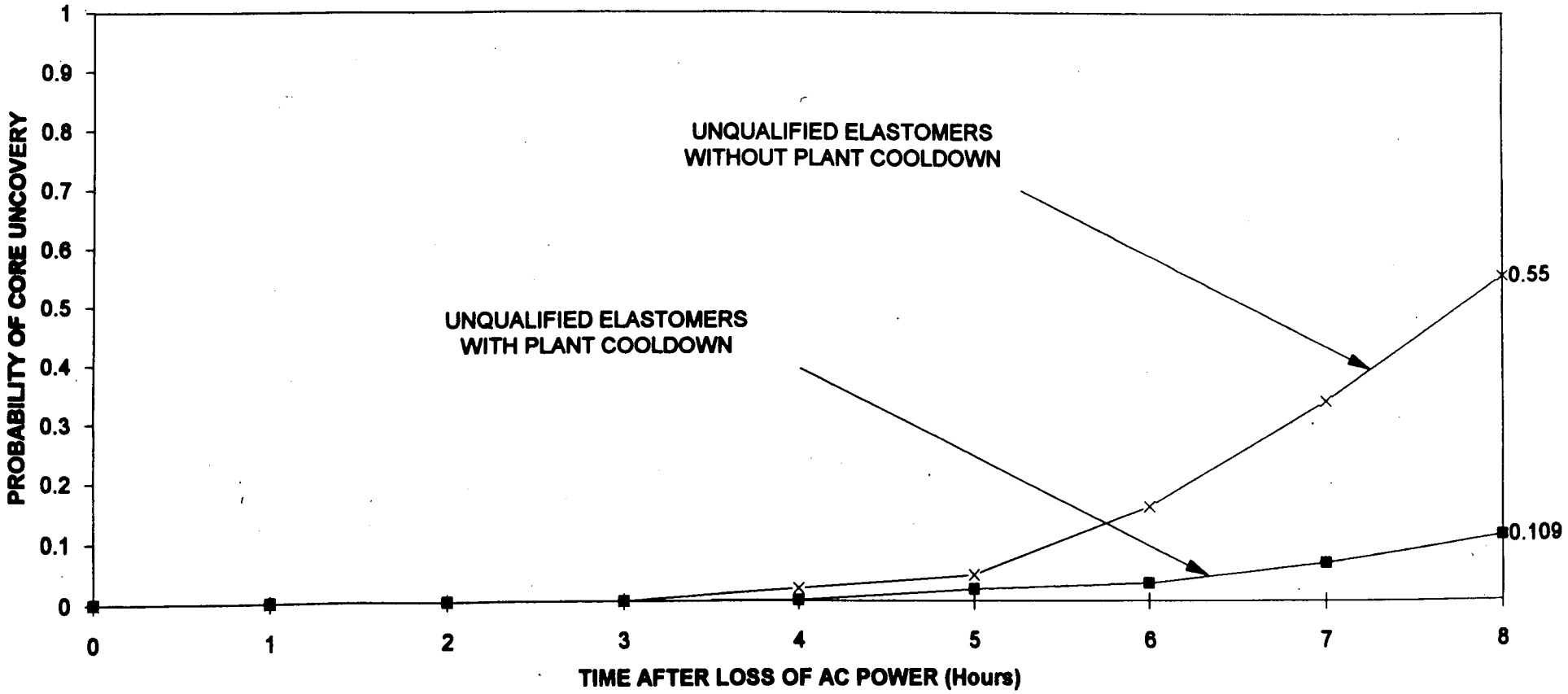


Figure B5.2.1 Probability of Core Uncovered Assuming Loss of all AC Power



Section B6

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APPENDIX C

INTERNAL FLOOD ANALYSIS

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Section C1

INTRODUCTION

This appendix summarizes an assessment of the potential for core damage resulting from internal flooding at the Indian Point Unit 3 Nuclear Power Plant (IP3). The internal flood analysis was performed in response to Generic Letter 88-20 (November 23, 1988) issued by the U.S. Nuclear Regulatory Commission (NRC), which required that an Individual Plant Examination (IPE) be performed on all operating nuclear power plants. The Generic Letter stated that "licensees are requested to proceed with examinations...for internally initiated events (including internal flooding)."

The scope and major assumptions of this internal flood analysis are presented in Section C2. The methodology used is presented in Section C3. The presentation of the results and conclusions follows in Sections C4 and C5, respectively.

Section C2

SCOPE OF ANALYSIS

To focus the analysis on those internal floods that contribute to a severe accident, the following assumptions and guidelines were employed:

- Only the buildings and areas associated with power production were considered: the primary auxiliary, control, diesel generator, auxiliary feedwater, turbine, service water and fuel buildings and the main steam/feed enclosure and pipe bridge. These buildings and areas comprise the power block and the service water building.

- The plant was assumed to be initially running at full power.

- An internal flood can be the initiating event itself or can occur subsequent to some other initiator.

- Pipe breaks, tank and heat exchanger failures, valve and pump failures, and maintenance-induced floods are potential flood sources. Valve and pump failures include ruptures of glands, seals, and gaskets.

- The effects on equipment of steam (including condensation) and of submergence, spraying, and splashing were addressed.

- A series of conservative screening rules was used to eliminate internal flooding events with a low probability of occurrence or a limited potential for core damage. In particular, accident scenarios that result in a contribution to core damage frequency of less than 10^{-8}/yr were not developed.

- Flooding resulting from a loss of primary or secondary coolant [e.g., loss of coolant accidents (LOCAs) and interfacing LOCAs] was not addressed because its potential for core damage is already covered elsewhere in the IPE.

- Missile or whiplash damage resulting from the rupture of high energy lines was not considered.

- The collapse of walls was not considered because rooms in which substantial accumulations of water are possible have concrete walls that are most unlikely to fail.

- Leakage through construction joints was not considered because this leakage will be very small in comparison to flow through or under doors or through drains and piping penetrations.

Subject to these assumptions and guidelines, all potential flooding scenarios were investigated. However, floods of greatest concern are analagous to special initiating events in that they will both require or cause a reactor trip and negate safety functions.

Section C3

METHODOLOGY OVERVIEW

The methodology used to perform the internal flood analysis entailed:

- Identifying potential plant floods and affected areas
- Defining flooding scenarios and eliminating those found to be unimportant
- Quantifying important flooding scenarios and their contribution to core damage frequency.

Figure C3.1.1.1 displays an overview of the internal flooding methodology. Each task is described in the following subsections.

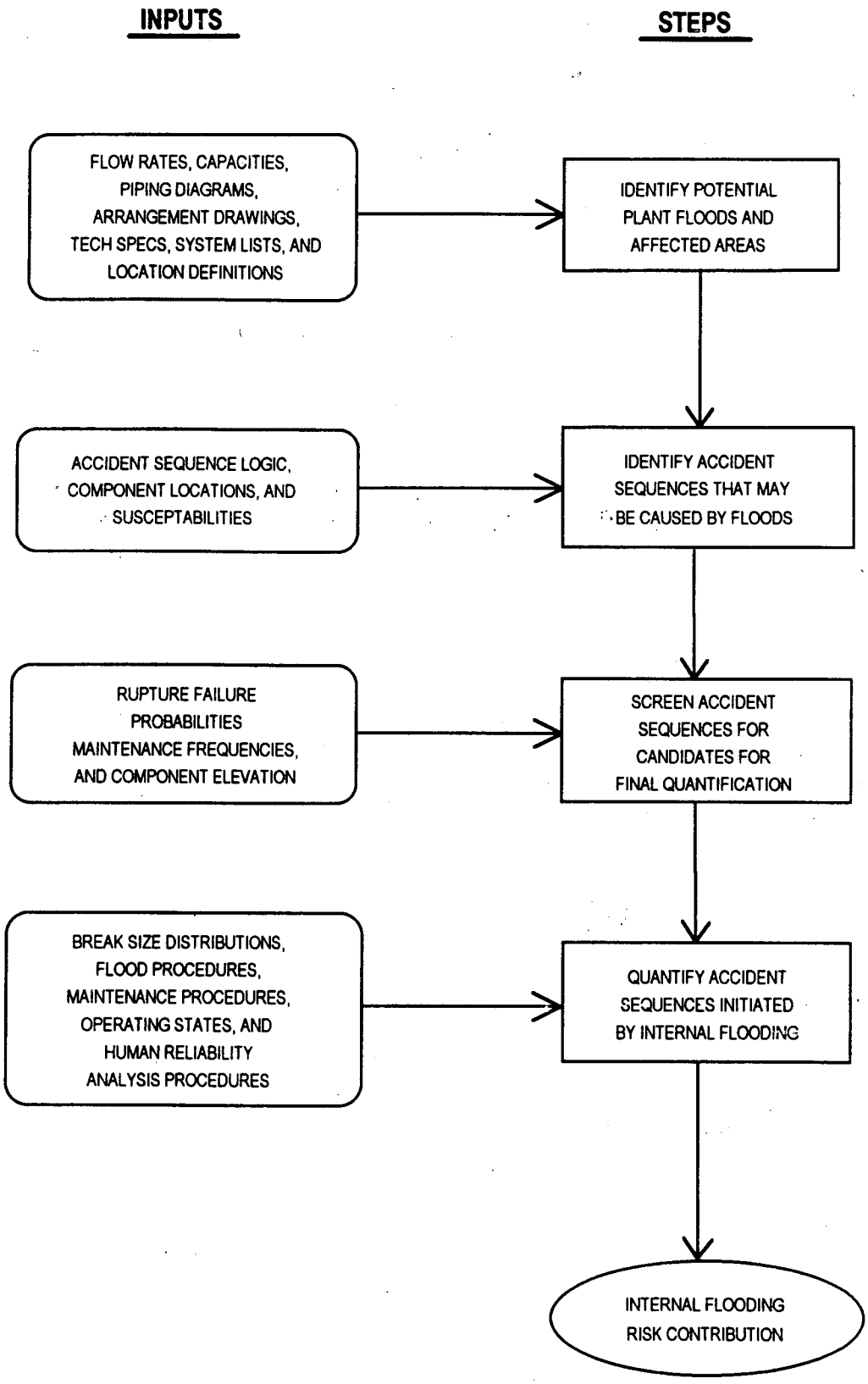
C3.1 IDENTIFICATION OF POTENTIAL PLANT FLOODS AND AFFECTED AREAS

To determine the effects of internal floods on plant operation, the potential sources of floods, the portions of the plant that can be affected (the flood zones), and the routes taken by flood water (the flood propagation pathways) were identified. This information was required to determine how internal flooding could result in core damage.

C3.1.1 PLANT FLOOD ZONES

The flood zones are individual plant areas that could reasonably contain or delay propagation of water. Potential flood zones were identified by dividing the major buildings and areas into "room areas" according to their elevations and whether they are enclosed. Structural considerations, such as walls and doors, and spatial considerations, such as distances from stairways, were used to identify the zones. While flood zones have some degree of independence, particularly with regard to spraying and environmental effects, they may also have interconnections (doors, drains, etc.) that lead to flood propagation. In this analysis, individual rooms were not considered to be individual flood zones if floodwaters cannot propagate from other rooms on the same level or, conversely, if there is no impediment to their propagation.

Figure C 3.1.1.1 Internal Flooding Methodology Overview



C3.1.2 FLOOD SOURCES

Potential flood sources were identified from drawings, walkdowns, and lists of systems and equipment in each flood zone.

The sizes of flood sources were determined assuming guillotine breaks of lines or the catastrophic rupture of valves, tanks, and heat exchangers. This approach is consistent with the NRC Standard Review Plan, Sections 3.6.1 and 3.6.2, for high-energy lines and components. For the medium-energy lines of concern in this analysis, however, the approach is more conservative in that the NRC Standard Review Plan assumes through-wall leakage.

No distinction was made between the various causes of floods because the rupture frequency data used included all floods. However, maintenance-induced floods and water hammer-induced valve or pipe rupture resulting from the failure of open butterfly valves such that the valve disk rotates freely and slams shut are failures of particular concern. Conversely, the mitigating effects of inspection and replacement programs were not addressed as there are no data to quantify these effects.

C3.1.3 PROPAGATION PATHWAYS

The pathways along which floods can propagate from one flood zone to another were identified as a precursor to identifying all the systems and equipment that could be affected by flooding. These pathways include stairways, floor penetrations, drains, doorways (i.e., open doors and leakage around closed doors), and air conditioning ducts. The plant general arrangement drawings and plant walkdowns were used to identify these pathways; the resultant pathways were depicted using schematic drawings.

C3.1.4 EQUIPMENT AND SYSTEMS SUSCEPTIBLE TO FLOODING

Equipment that is safety-related (or impacts accident sequences) and is susceptible to possible submergence, spray/splashing, or exposure to steam was identified. The procedure followed was to use the guidelines presented in Table 3.1.4.1 and then to employ the IPE systems analysis to identify components that are important to system functionality and the prevention of core damage. The results were presented in tables listing flood sources and components important to system operation.

In this review, spray and splashing effects on equipment in all areas were identified by determining the separation of unshielded equipment and flood propagation pathways from elevation to elevation or flood sources. While the possibility of submergence was considered in all cases, submergence is usually not a problem above the lowest elevations

Table C3.1.4.1 Component Flooding Effects

Component Type	Effect of Flood		
	Submergence	Spray	Steam
Valves:			
Motor	Fail as is	Fail as is	Fail as is[1]
Air	Fail	OK	OK
Hydraulic	Fail	OK	OK
Solenoid	Fail	Fail	Fail[1]
Manual	OK	OK	OK
Check	OK	OK	OK
Pumps (motor or turbine)	Fail	Fail	Fail[1]
Compressors	Fail	Fail	Fail[1]
Fans	Fail	Fail	Fail[1]
Diesels	Fail	Fail	Fail[2]
Electrical (excluding cables)	Fail	Fail	Fail
Cables	OK	OK	OK
Junction boxes	Fail[3]	OK	OK
Cable splices	Fail	OK	OK
Instrumentation	Fail	Fail	Fail[1]
Strainers/filters	OK	OK	OK
Heat exchangers	OK	OK	OK
Tanks/accumulators	OK[4]	OK	OK
Piping	OK	OK	OK
Duct work	OK	OK	OK
Room air unit coolers (excluding fan)	Fail	OK	OK
Vaporizers/heaters	Fail	Fail	Fail
Steam air ejectors/oil separators	OK	OK	OK

1 Although failure is predicted, equipment qualification testing/analysis may provide a basis for reclassifying the effect as OK.

2 Although this scenario is unlikely, failure was assumed for screening purposes if exposure to steam is possible.

3 Failure was assumed for screening purposes.

4 Tanks and accumulators were assumed to be full.

because stairs, piping penetrations, and air conditioning ducts will drain water away quickly if curbs are lower than critical flood heights and doors are open. In identifying equipment susceptible to floods, particular attention was paid to electrical equipment and especially to MCCs and switchgear.

C3.2 IDENTIFICATION OF FLOODING SCENARIOS

Flooding scenarios that could initiate or contribute to core damage accident sequences were identified. Each core damage accident sequence comprises an initiator and system failures (or possibly system successes) that result in a particular core damage state. The different flood sources and flood propagation pathways were examined to identify the systems that might fail as a result of flooding--in developing accident sequences, particular attention was paid to the possibility of flooding that both causes a reactor trip and fails systems required to help ensure a safe shutdown.

If the flood alone was sufficient to lead to core damage, it was subjected to detailed analysis. Otherwise, it was examined further to determine whether the flood, coupled with one random system failure, could lead to core damage. If more than one random failure has to occur in conjunction with a flood before core damage results, it was not examined further because such combinations of events are unlikely: typically the predicted frequency of flooding in a given flood zone is 10^{-4}/yr or less, and the probability of independent random failures of systems or trains of systems is 10^{-2} for each failure.

In defining the various flood scenarios, additional assumptions based on previous flood analyses [1,2,3] were made to limit the scope of the analysis:

- A flood source flows at full flow until it is isolated or its water supply is exhausted. Flood growth in a zone is halted by termination of the flood source or by outflow from the flood zone matching the flow of flood water into the zone. Isolation requires the operator to detect the flood and take appropriate action to isolate or depressurize the flood source, or otherwise reduce the flow from the system. The time required for isolation therefore depends on indications of flooding, such as fire-pump start indications or observations made by operators in their normal course of duties, and on the ease with which isolation can be accomplished.

- The effects of spraying and splashing from a flood were assumed to be restricted to within 30 ft of the source. Where barriers (walls, equipment, other pipes) are present, the distance will be less. While the actual distance traversed by a jet will depend upon the height and direction of release, the rate at which water escapes, and the aperture size, the dependence on pipe diameter is weak [4,5]. Calculations show that a 30-ft distance is reasonable for the pipe breaks expected here.

- Where the flow of steam is unrestricted, steam effects from a flood are limited to the room area or flood zone in which the steam release occurs. However, subsequent condensation or flood propagation effects were considered.

- Credit was always taken for installed floor drains of 24-in. diameter or greater. Without checks or maintenance of the drains, however, the functioning of smaller drains (typically of 4-in. diameter) cannot be assumed. Therefore, the consequences of flooding were normally calculated for scenarios in which the drains function and scenarios in which they are blocked.

To determine whether a flood (with or without additional random failures) would result in core damage, the impact of the flood on system components in each flood zone was evaluated. The height reached by flood water in the flood zones was calculated by integrating differential equations describing the influx of floodwater, drainage from the flooded area, and the resulting change in water volume and height. The flow rates from ruptured pipes and valves were calculated accounting for frictional resistance in the piping [5] and, where appropriate, pump run out. The rate at which water drains under doors was calculated assuming negligible frictional resistance to flow under the door. Flow through drains was calculated as described in Brater and King [6] assuming that, at low water depths, flow into a drain resembles flow over a broad-crested weir.

If the levels achieved before isolation or other mitigating actions could be taken would not affect equipment of importance in the area of interest, the equipment was considered unaffected by submergence. Spray, splashing, and steam damage could fail the equipment, however.

Finally, the frequency with which the flood might occur was considered. If the anticipated frequency of flooding from a specific source is so low that its contribution to the core damage frequency is negligible (i.e., $<10^{-8}$/year), the scenario was eliminated from further consideration. The rupture frequencies used to determine flood frequencies are presented in Table 3.2.1.1. These data were derived from two sources [7,8]. Eide et al. [7] presented rupture data for piping, valves, pumps, flanges, tanks and heat exchangers, distinguishing between primary coolant system piping and eqipment and other piping and equipment. Jamali [8] presented separate data for sections of piping in service with:

- Reactor coolant system (RCS)

- Safety injection and recirculations systems (SIR)

- Other safety-related systems (OSR)

- Main and auxiliary emergency feedwater and condensate systems (FWC)

- Main, auxiliary and extraction steam and turbine systems (ST).

Table 3.2.1.1

Rupture Frequencies

When the fluid involved is not the primary coolant:

Pipe rupture	
--general	1.2×10^{-10}/hour.ft [7]
--feedwater, condensate, steam and safety-related (<2-in. diameter)	6.3×10^{-10}/hour.section [8]
--feedwater, condensate, and steam (2 to 6-in. diameter)	10^{-9}/hour.section [8]
--safety-related (2 to 6-in. diameter)	6.4×10^{-11}/hour.section [8]
--feedwater, condensate, and steam (>6-in. diameter)	8.1×10^{-10}/hour.section [8]
--safety-related (>6-in. diameter)	1.1×10^{-10}/hour.section [8]
Valve rupture	4×10^{-10}/hour [7]
Pump rupture	1.2×10^{-9}/hour [7]
Flange rupture	10^{-10}/hour [7]
Tank/heat exchanger shell rupture	4×10^{-10}/hour [7]
Heat exchanger tube rupture	4×10^{-9}/hour [7]

When the fluid involved is the primary coolant:

Pipe rupture	3×10^{-11}/hour.ft [7]
Valve rupture	10^{-10}/hour [7]
Pump rupture	3×10^{-10}/hour [7]
Flange rupture	10^{-10}/hour [7]
Tank/heat exchanger shell rupture	10^{-10}/hour [7]
Heat exchanger tube rupture	10^{-9}/hour [7]

Data for other systems (e.g., fire protections sytems) was judged to be incomplete. Analysis of Jamali's data shows significant differences between piping rupture rates for safety injection and recirculation systems and other safety-related systems piping and the rupture rates for FWC/ST piping in pipes of 2-in. diameter of more. Accordingly, the following rupture data were used in this study:

- Piping rupture rates for safety injection and recirculation systems and other safety-related systems derived from the data of Jamali [8].
- Piping rupture rates for feedwater/condensate and steam systems derived from the data of Jamali [8].
- For other piping and all equipment (e.g., fire protection system piping and valves), the rates presented by Eide et al., [7].

Both Eide et al. and Jamali defined ruptures as breaks that result in the release of water at a rate exceeding 50 gpm. While Eide et al. expressed pipe rupture rates in terms of a rate/unit length, Jamali expressed rupture rates as a rate/pipe section, a pipe section being defined as a segment of piping between major discontinuities such as valves, pumps, reducers, etc. However, there would appear to be no basis for asserting that either approach is better.

In determining the consequences of internal flooding, recovery actions were also considered. If their effect is to reduce the frequency of occurrence of the scenarios to insignificant levels, the scenarios were eliminated without performing a detailed quantification.

C3.3 QUANTIFICATION OF POTENTIALLY IMPORTANT FLOOD SCENARIOS

Flooding scenarios that remain after screening were rigorously quantified by making a detailed assessment of the frequency of breaks of the size required to cause flood damage; the probability of isolating the break; the random failure of any unaffected systems that, when coupled with the flood, might cause core damage; and the probability of recovering systems in time to avoid core damage.

This quantification entailed the modification and requantification of event trees and fault trees constructed for the IP3 internal events PRA to obtain flood-induced accident sequence frequencies. Those flooding scenarios in which the bounding contribution to core damage frequency is less than 10^{-8}/yr were not considered further.

Finally, the flood-induced accident sequence frequencies from each flood scenario that meets the core damage frequency criterion were summed to obtain the overall contribution of flooding to the IP3 core damage frequency and plant damage state frequencies. The contribution to core damage frequency, CDF, was calculated by quantifying the following equation:

$$CDF = \sum_i FD_i (\sum_j P_{ij})$$

where P_{ij} is the probability of the core damage state j given flooding scenario i with its frequency FD_i.

Section C4

ANALYSIS OF INTERNAL FLOODING

C4.1 POTENTIAL PLANT FLOODS AND AFFECTED AREAS

Potential flood sources, flood zones, and flood propagation pathways were identified. This information is required to determine how internal flooding could result in core damage.

C4.1.1 FLOOD ZONES

The plant contains five major buildings vulnerable to internal flooding that could subsequently cause or contribute to core damage. These buildings and areas are:

- Primary auxiliary building (PAB)
- Control building (CTL)
- Diesel generator building (DGB)
- Auxiliary feedwater pump building and main steam/feed piping enclosure (AFW)
- Turbine building (TBL).

The fuel storage building and the intake structure (service water building) are not susceptible to, or sources of, internal flooding. The fuel storage building is a separate structure that contains the spent fuel pit and the new fuel storage facility. While the spent fuel pump pit heat exchangers, which are cooled by the component cooling water system, and spent fuel pumps are located on the lowest (55-ft) elevation, no equipment required for safe shutdown is located in the fuel building. Although the fuel building connects to the containment and the PAB fan house, the only potential flood pathway is via door 319, located at the 95-ft elevation. Since there are no large flood sources on or above this elevation in the fuel building and ample drainage is provided within the fuel building via stairway 1, significant flood propagation to the PAB from the fuel building is most unlikely. Therefore the fuel storage building was not considered further in this internal flooding analysis.

The intake structure is located by the river and is separate from other plant buildings. The building contains the six main circulating water pumps and six service water pumps together with associated travelling screens. While most major circulating water and service water piping is below grade, the pump motors themselves are located above grade. Should a pipe break, therefore, water should simply run back to the river and not pose a flooding hazard. One exception to this situation is the rupture of service water piping in the service water valve

pit. While this piping is below grade, flooding of the service water strainer motors located in the valve pit is possible. However, the continued operation of these motors is not required to provide service water for accident mitigation. There is also some small-bore screen wash water piping that is located above grade in the intake structure. While rupture in this piping may spray/splash the circulating water or service water pumps, no damage is expected to result because the pump motor enclosures are designed for outdoor service. Consequently, the only possible impact on plant operation from pipe rupture in the intake structure results from the initiating event itself. Because the loss of service water initiating event is already modeled elsewhere in the IPE and the loss of circulating water is enveloped by the loss of main feedwater initiator that is also modeled elsewhere, no further consideration of intake structure flooding was required.

The layout of the buildings and areas vulnerable to internal flooding is shown in Figure C4.1.1.1. Each of these buildings was examined to determine whether it should be divided into separate flood zones. Drawings depicting the boundaries of these flood zones and doors, stairwells, and other connections between flood zones at various elevations are presented as Figures C4.1.1.2-15.

It will be noted that the diesel generator and diesel generator valve rooms comprise a single zone as does the turbine building. Drains in the diesel generator and diesel generator valve rooms are so large that flood propagation between the rooms is of no consequence and thus the treatment of the rooms as separate zones adds nothing to the analysis. In the turbine building, the floor drains and open structure ensure that floods at higher elevations rapidly propagate to the 15-ft elevation.

It will also be noted that rooms that share a common hallway or access were also lumped together to form a single flood zone provided water does accumulate in the common hallway or access to the rooms. Thus, in the PAB, the 73-ft, 55-ft and 15-ft elevations comprise single flood zones, the pipe tunnel on the 41-ft elevation is placed in the same flood zone as the other rooms, and the pipe tunnel and pipe penetration areas on the 32- and 35-ft elevations are placed in the same flood zone as rooms on the 34-ft elevation.

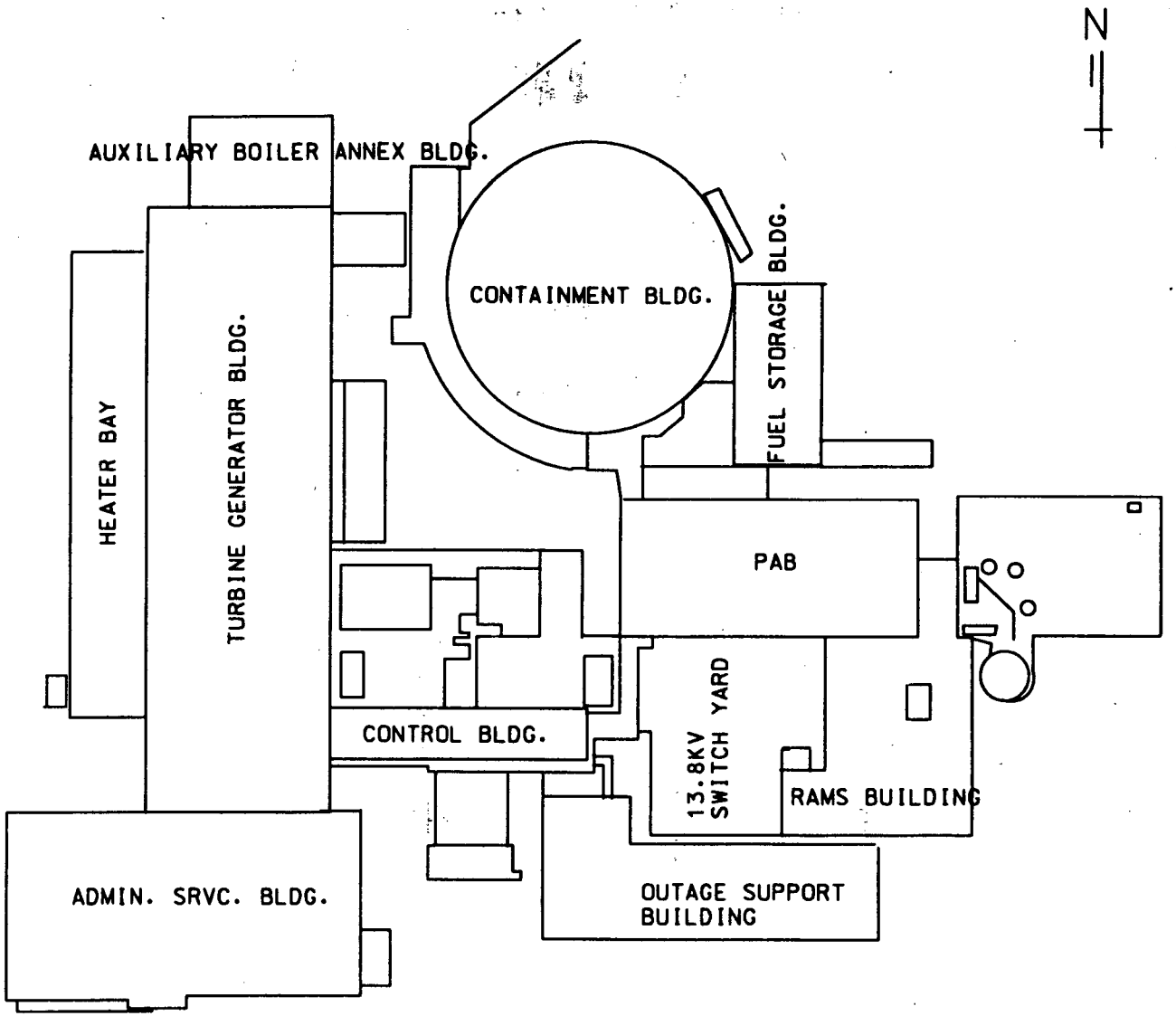


Figure C4.1.1.1

Indian Point 3 Nuclear Power Plant Plot Plan

Reference Drawing Number 9321-F-10023

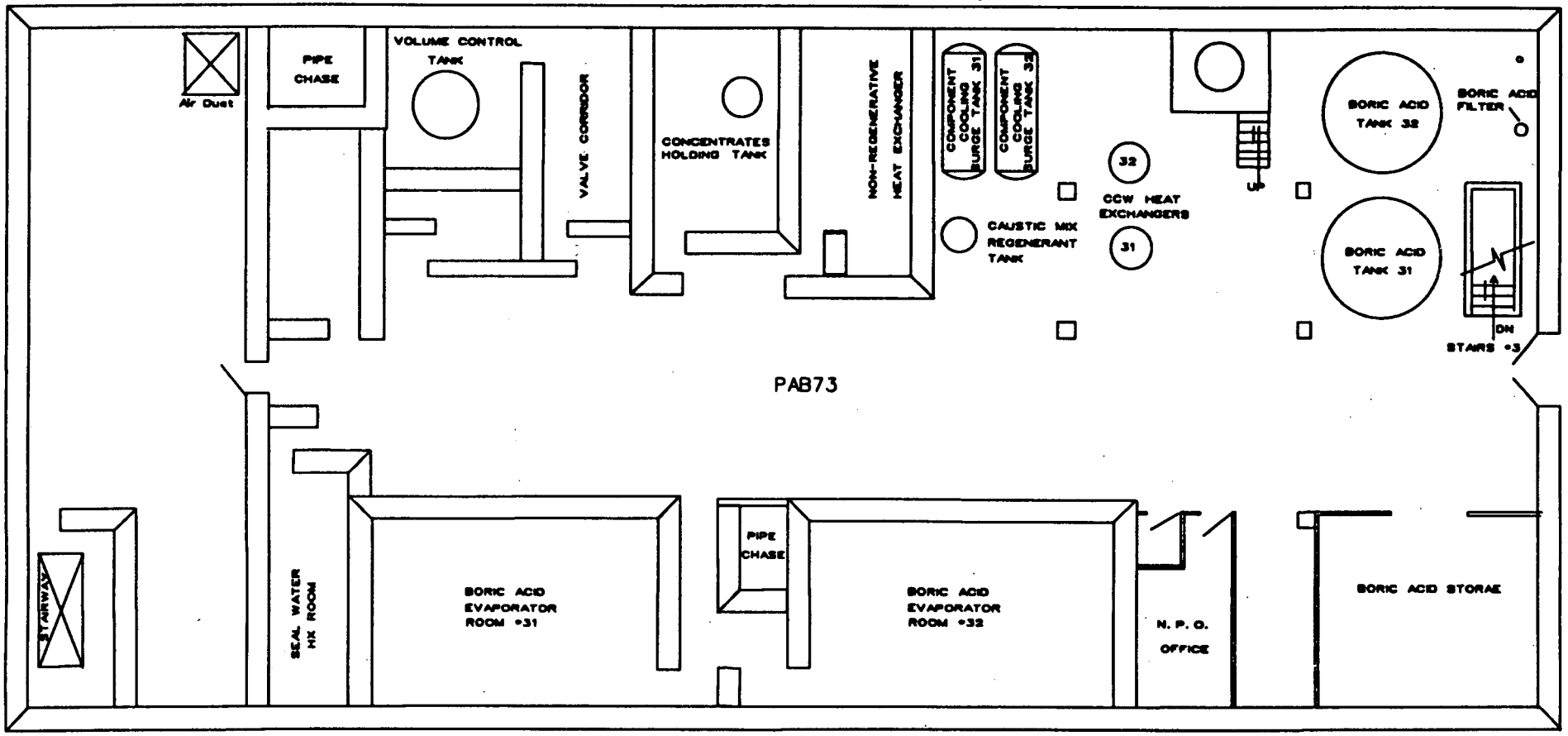


Figure C4.1.1.2

Primary Auxiliary Building Flood Zones at 73ft Elevation

Reference Drawing 9321-F-25153

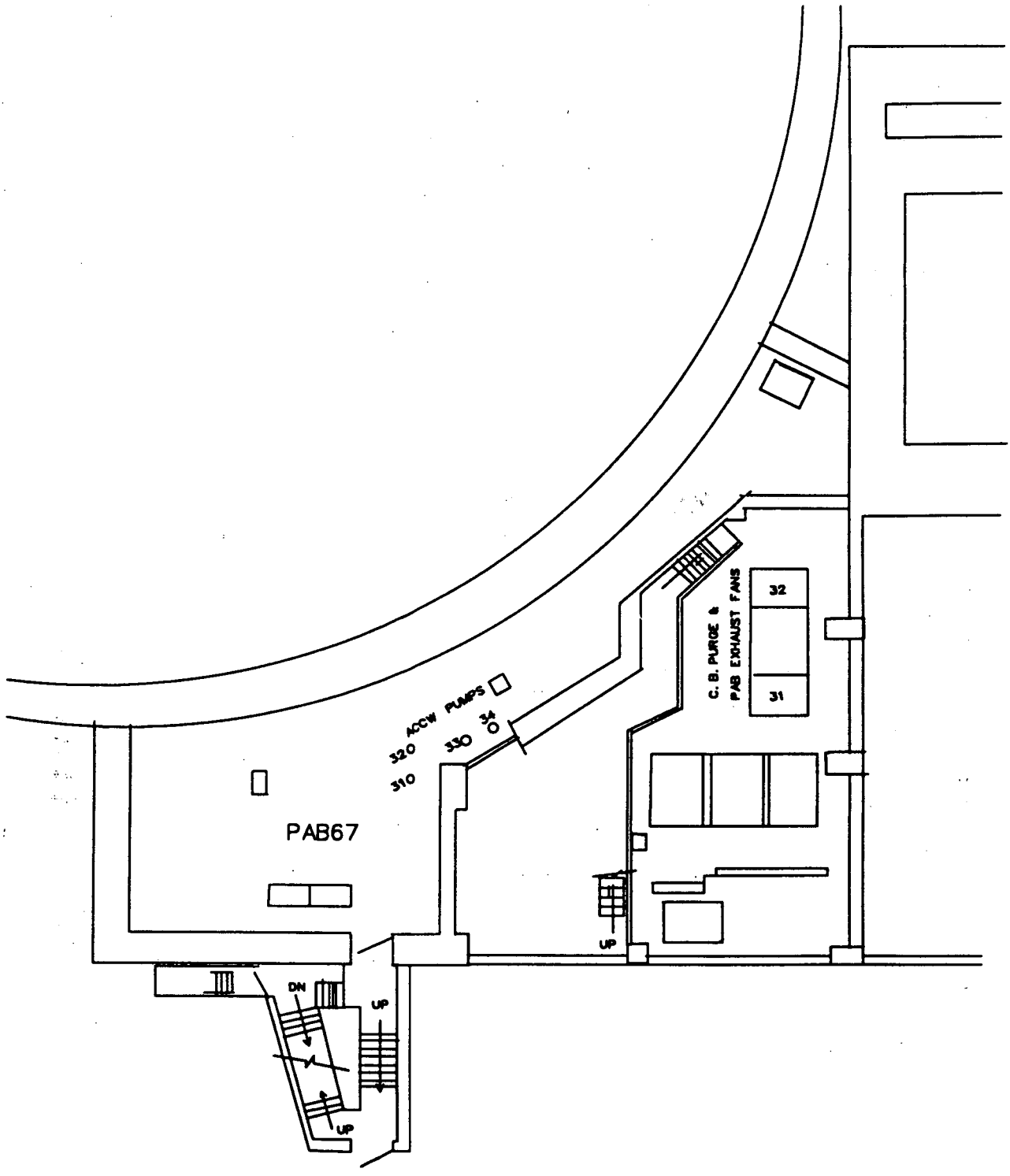


Figure C4.1.1.3

Primary Auxiliary Building Flood Zones at 67-ft Elevation

Reference Drawing Number 9321-F-25183

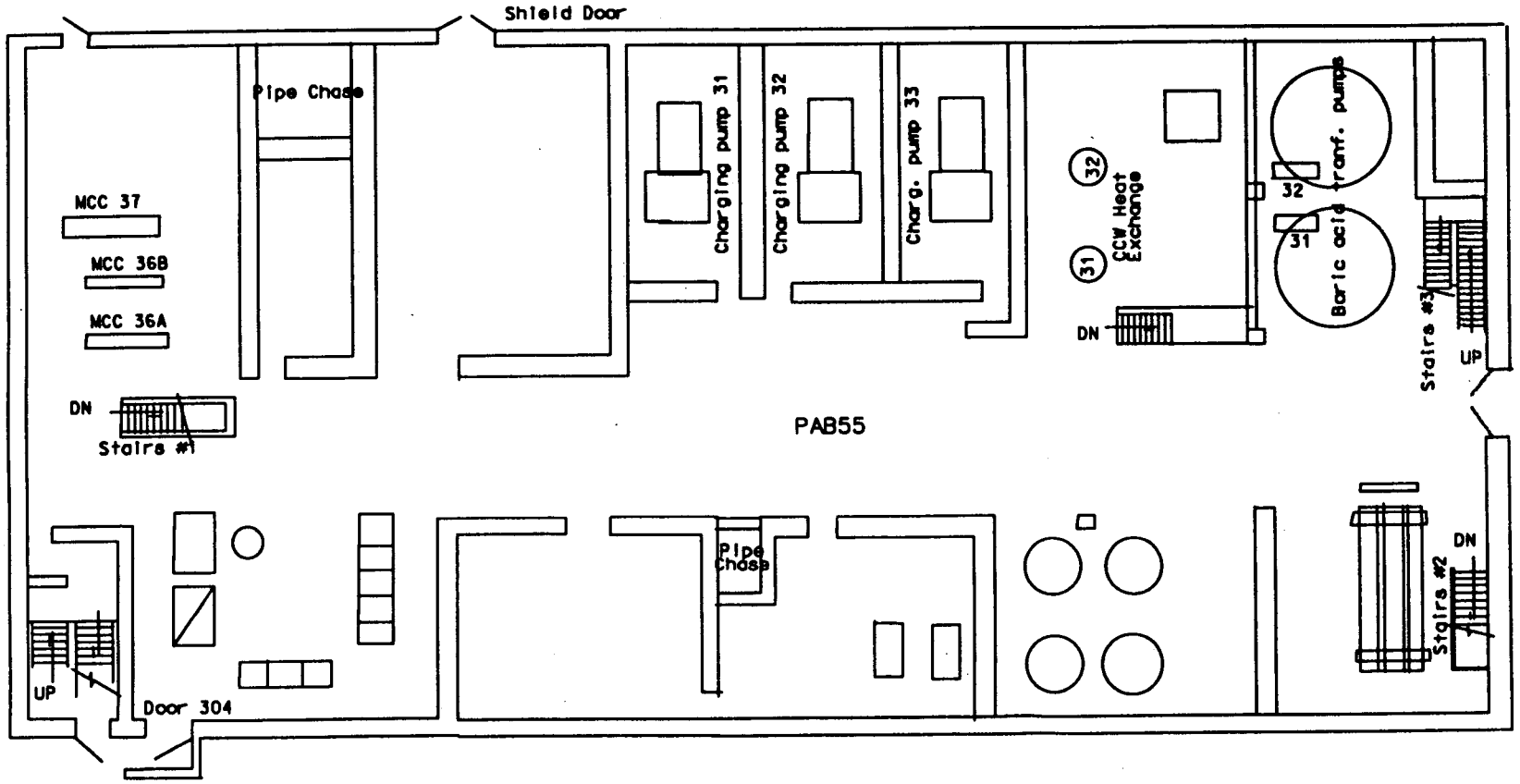


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Figure C4.1.1.4

Primary Auxiliary Building Flood Zone at 55-ft Elevation

Reference Drawing Number 9321-F-25153

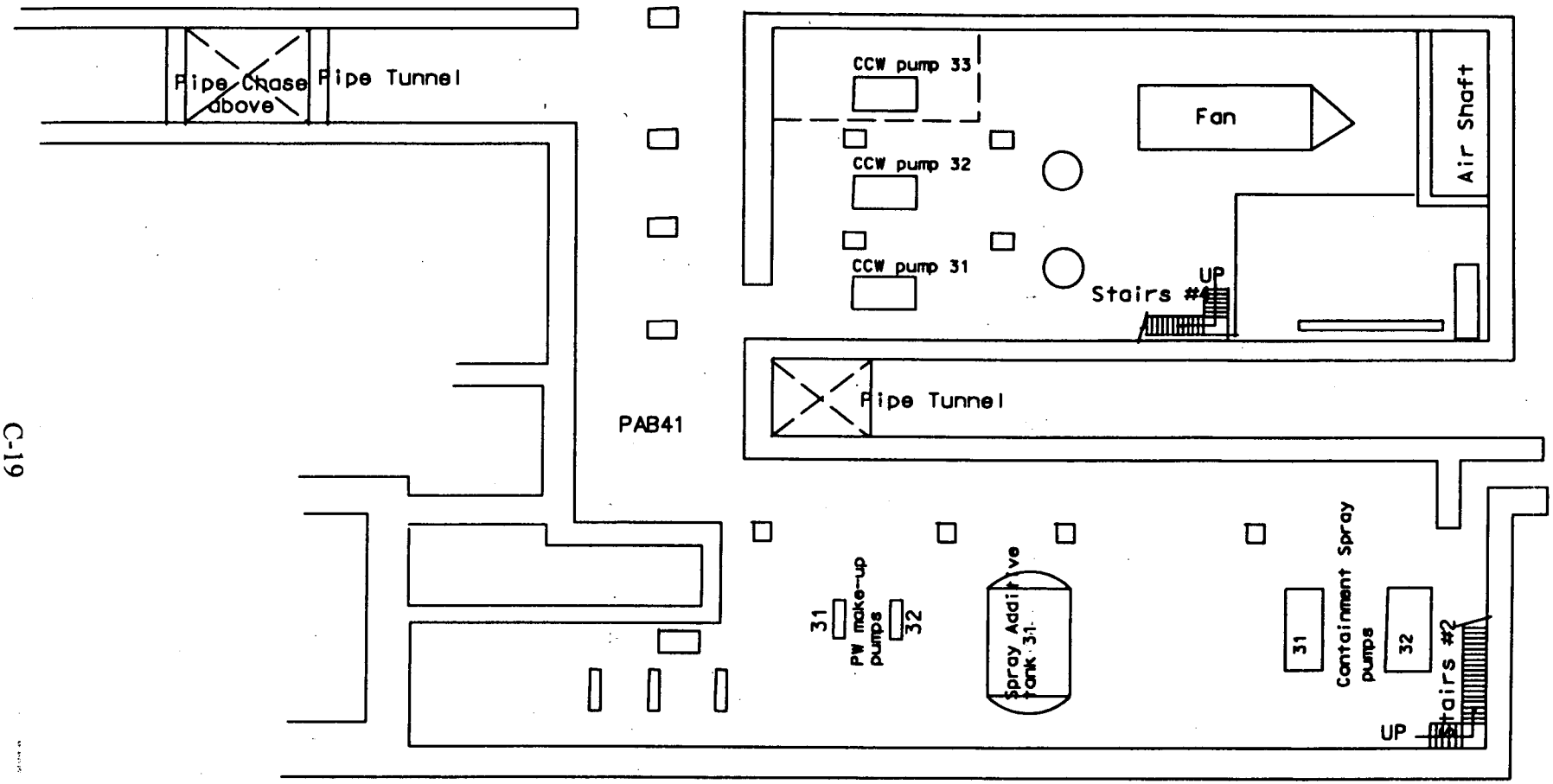


Figure C4.1.1.5

Primary Auxiliary Building Flood Zones at 41-ft Elevation

Reference Drawing Number 9321-F-25103

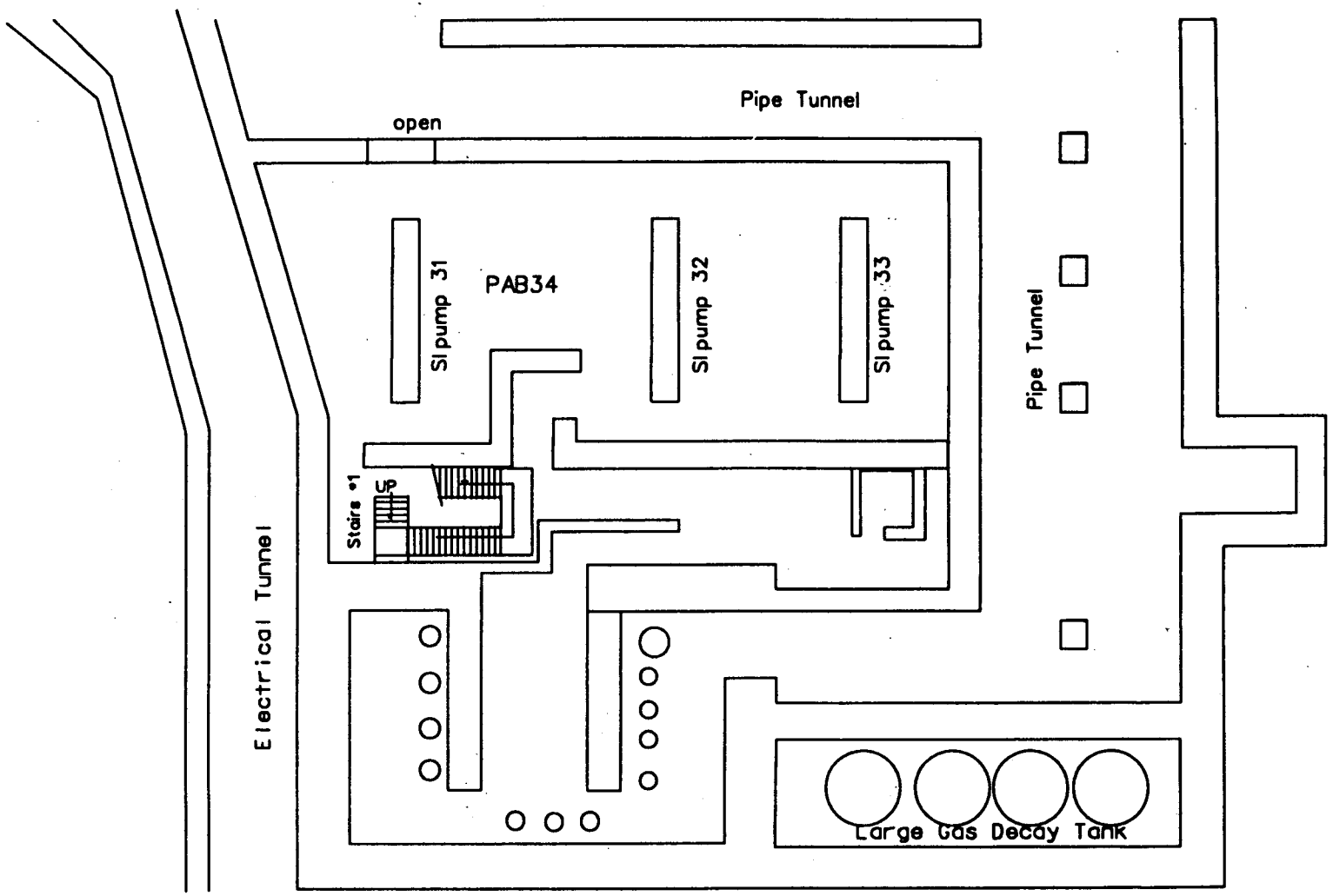


Figure C4.1.1.6

Primary Auxiliary Building Flood Zone at 34ft Elevation

Reference Drawing Number 9321-F-25103

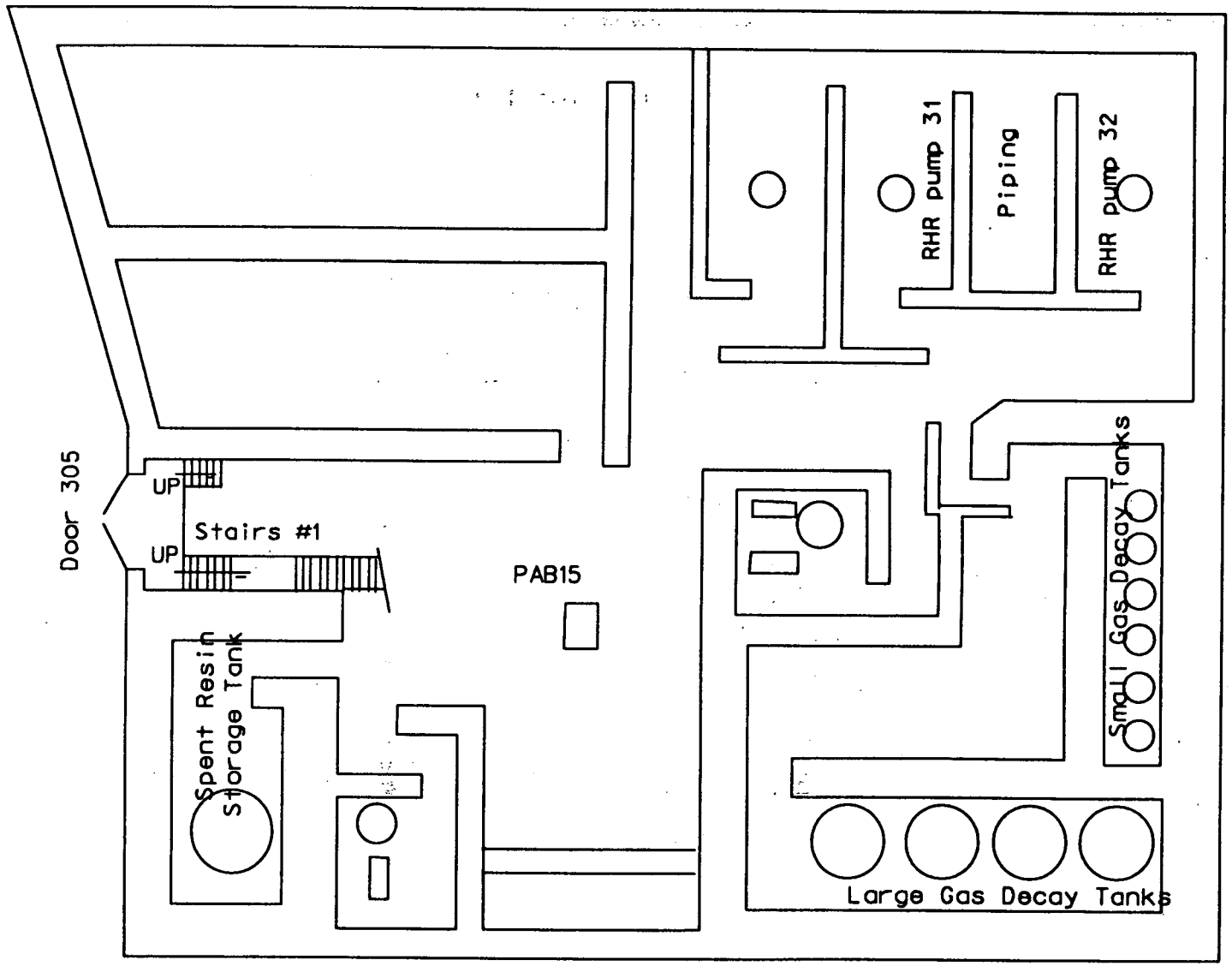


Figure C4.1.1.7

Primary Auxiliary Building Flood Zones at 15-ft Elevation
Reference Drawing Number 9321-F-25103

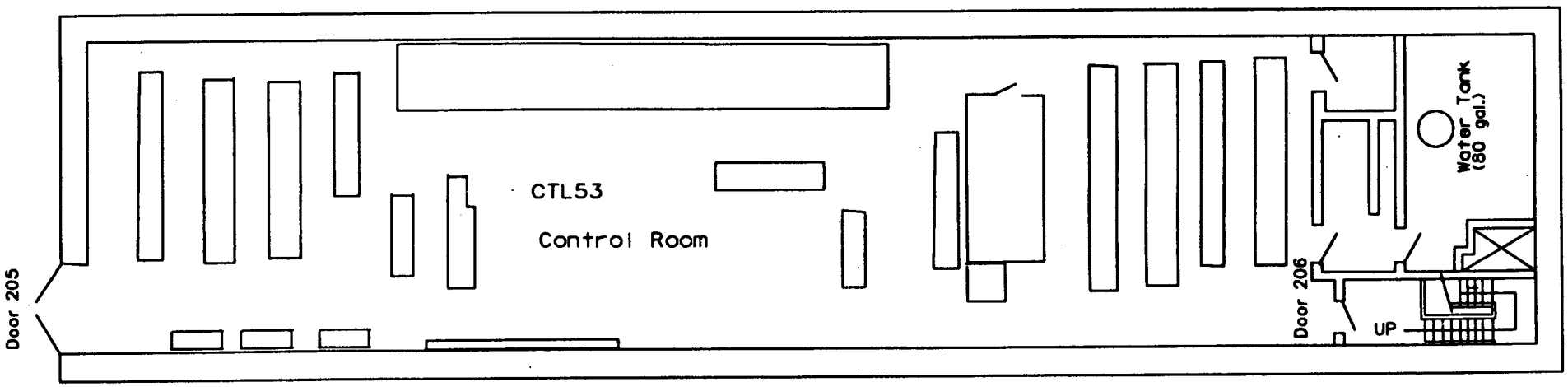


Figure C4.1.1.8

Control Building Flood Zones at 53-ft Elevation

Reference Drawing Number 9321-F-30523

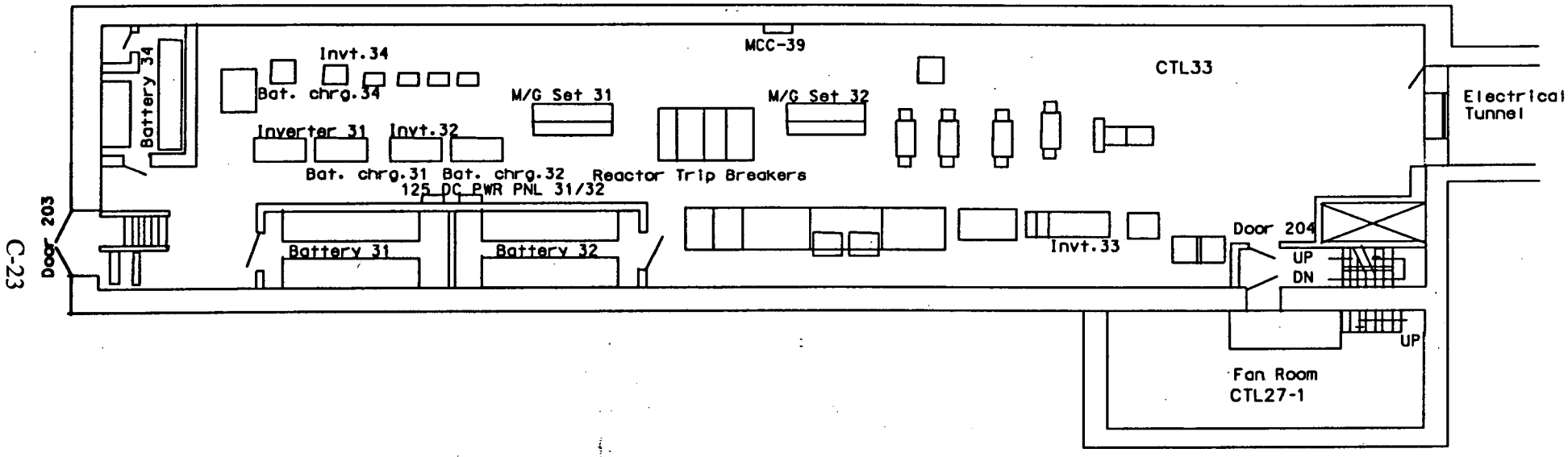


Figure C4.1.1.9

Control Building Flood Zones at 33-ft Elevation

Reference Drawing Number 9321-F-30523

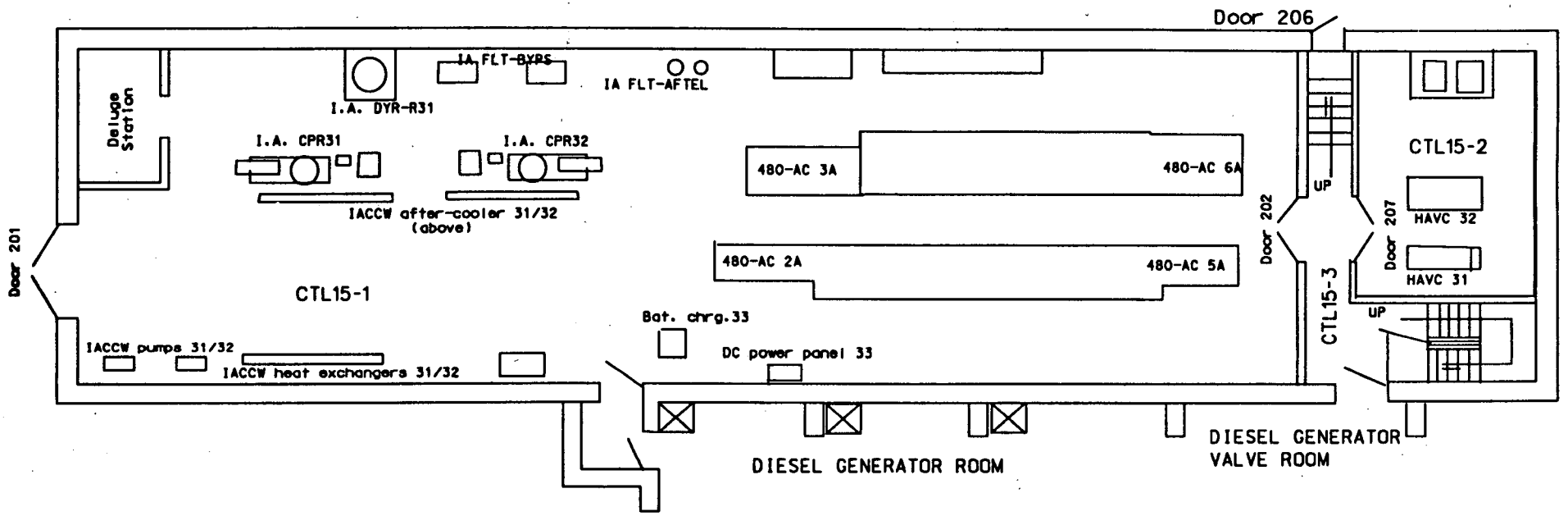


Figure C4.1.1.10

Control Building Flood Zones at 15-ft Elevation

Reference Drawing Number 9321-F-30523

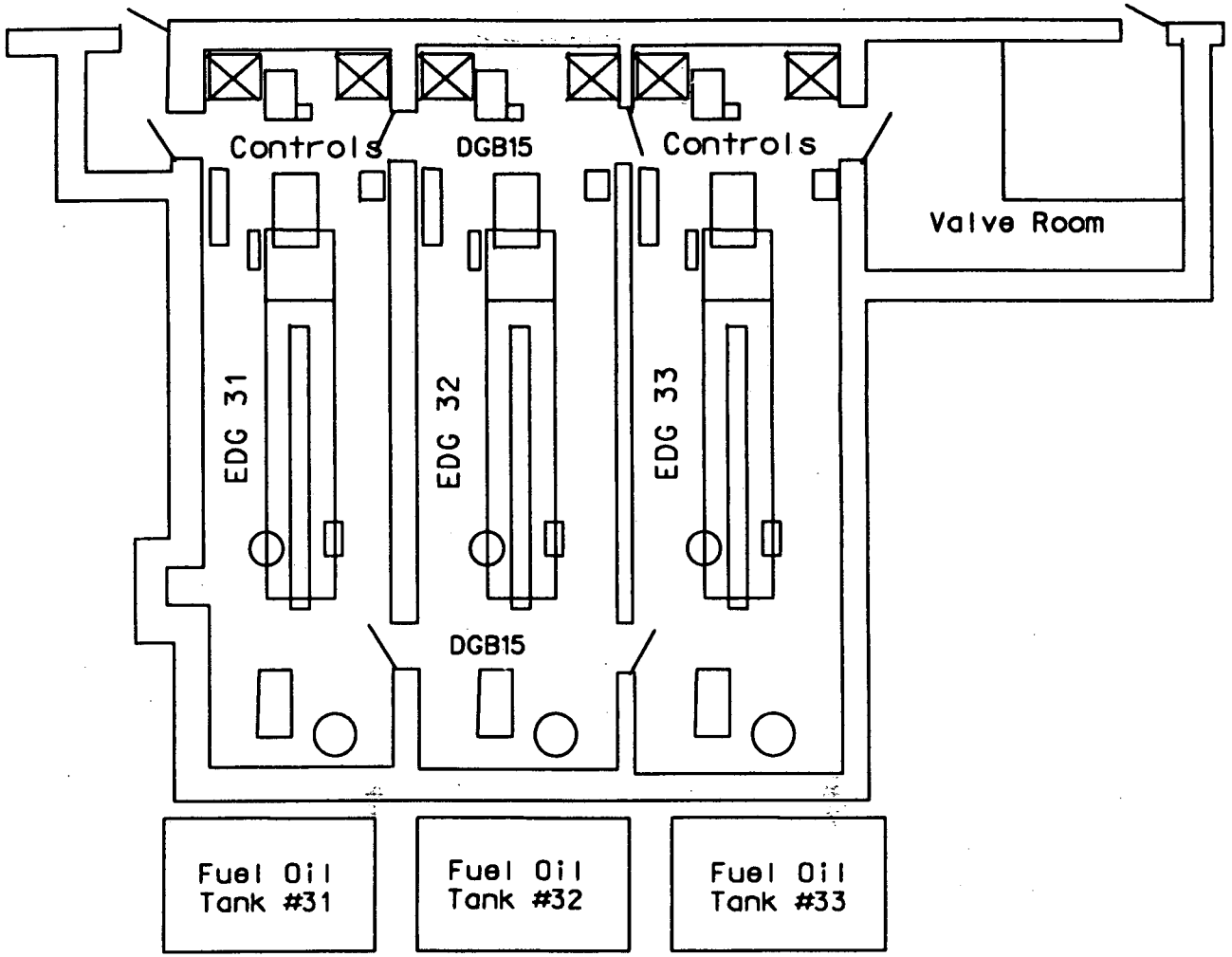


Figure C4.1.1.11

Diesel Generator Room Flood Zones at 15-ft Elevation

Reference Drawing Number 9321-F-30523

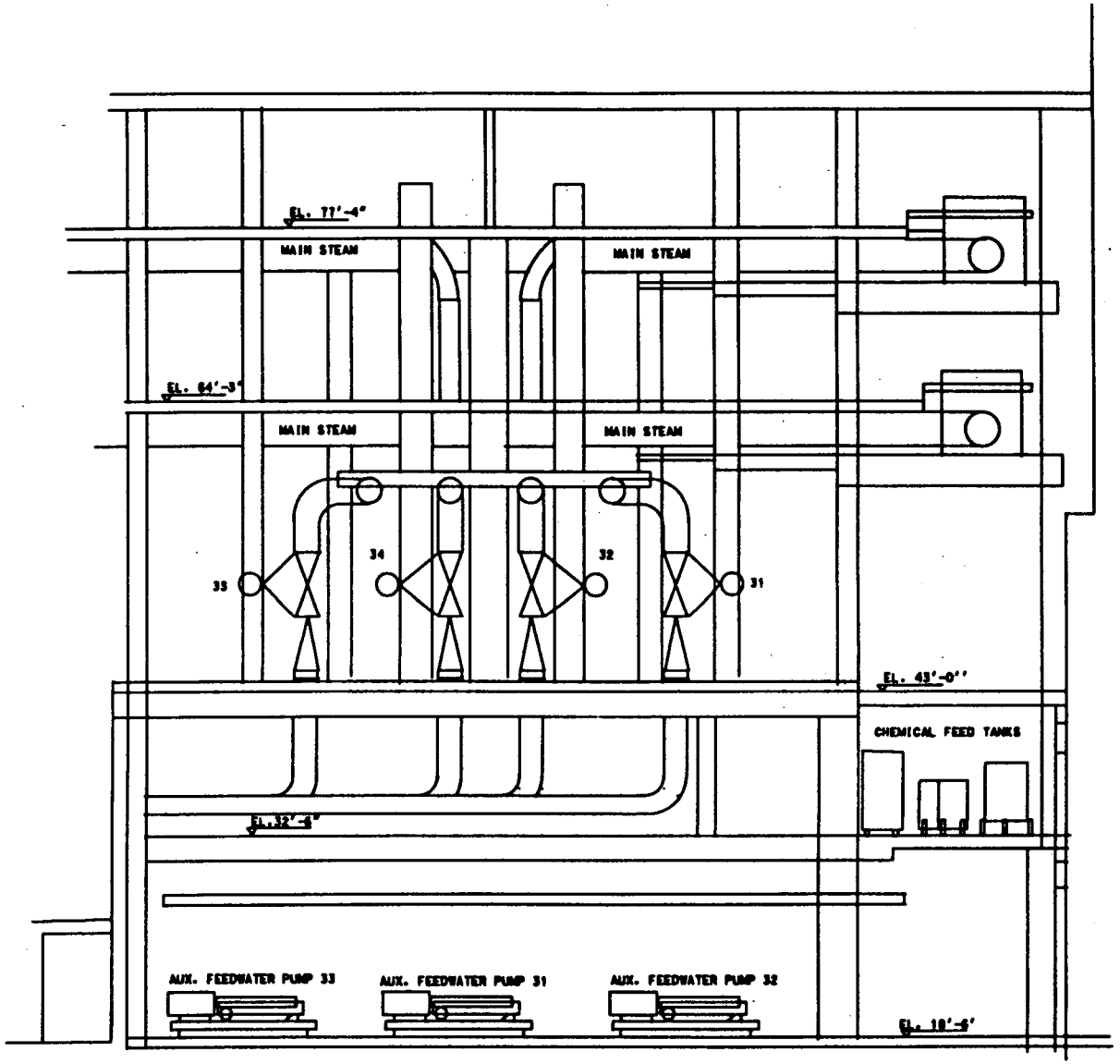


Figure C4.1.1.12

Auxiliary Boiler Feedwater Pump Building Flood Zones at 43-ft Elevation

Reference Drawing Number 9321-F-20153

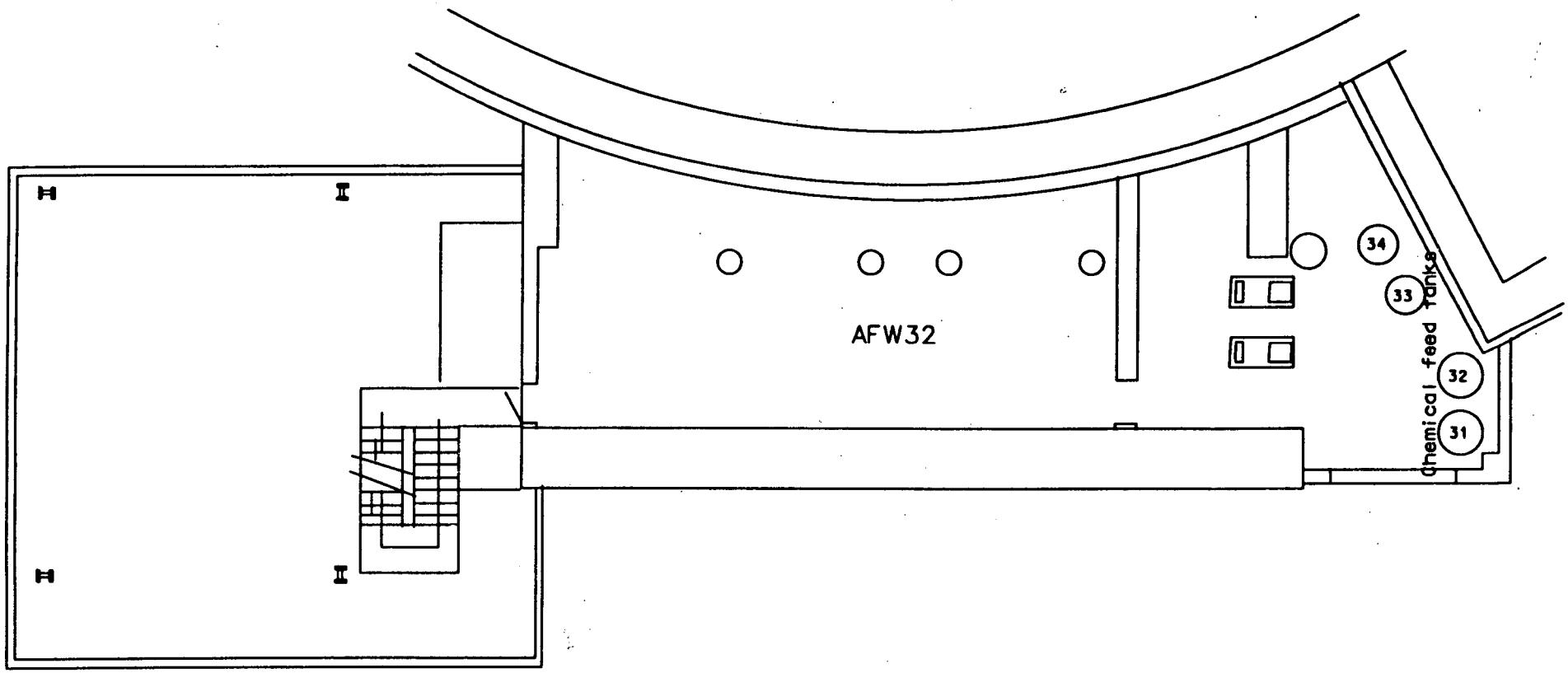


Figure C4.1.1.13

Auxiliary Boiler Feedwater Pump Building Flood Zones at 32-ft Elevation

Reference Drawing Number 9321-F-20143

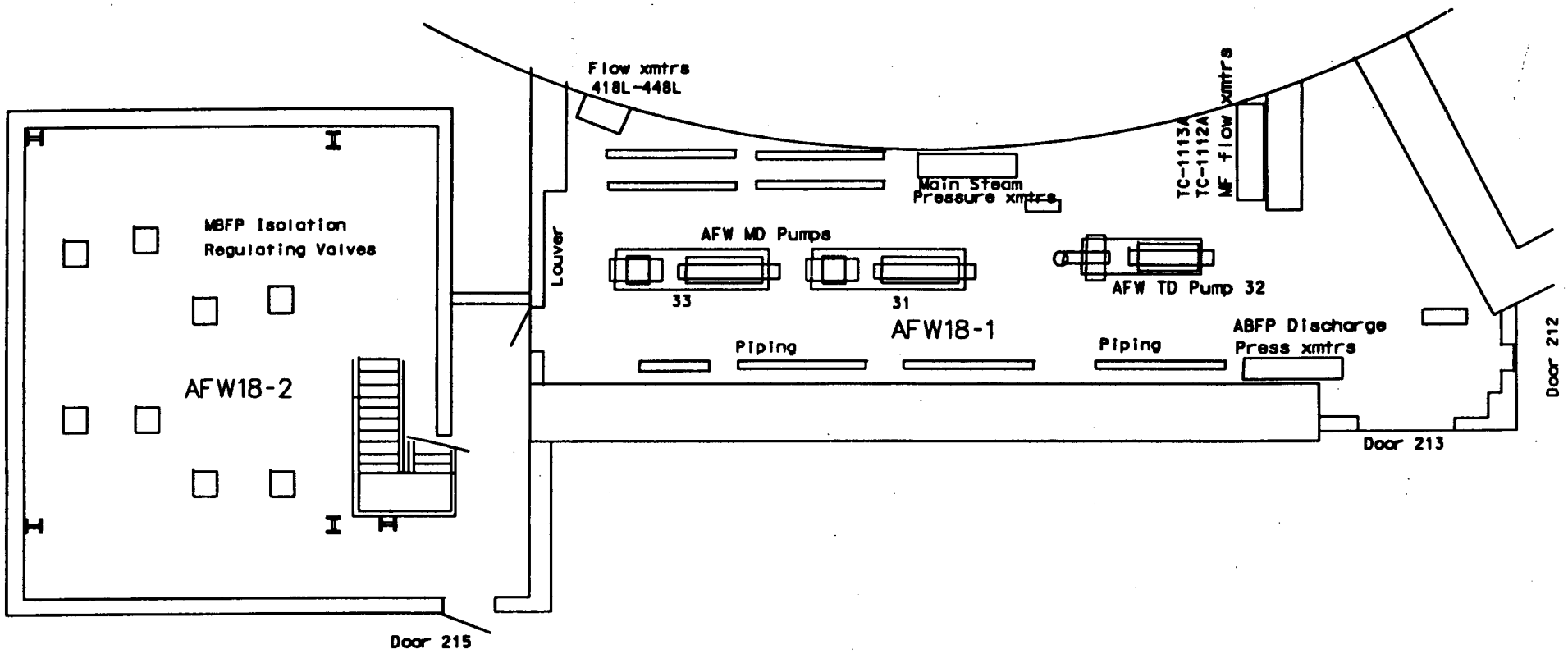


Figure C4.1.1.14

Auxiliary Boiler Feedwater Pump Building Flood Zones at 18-ft Elevation

Reference Drawing Number 9321-F-20143

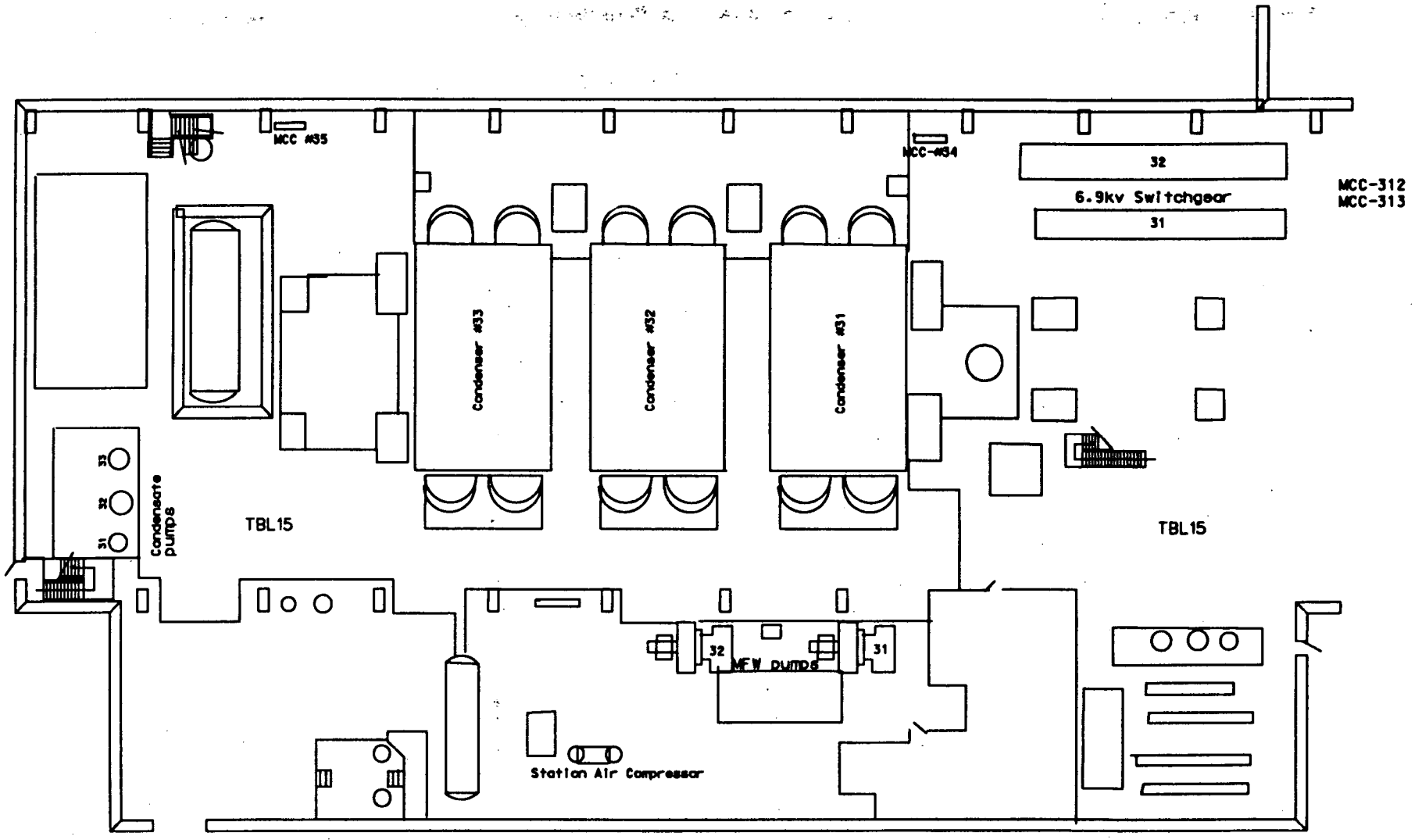


Figure C4.1.1.15

Turbine Building Flood Zones at 15-ft Elevation

Reference Drawing Number 9321-F-20063

C4.1.2 FLOOD PROPAGATION PATHWAYS

This section describes the pathways by which floods can propagate through the buildings of concern. While flood propagation pathways between buildings can be distinguished from pathways within buildings, this distinction is not particularly useful in developing flood scenarios unless floods propagating from one building to another follow a single pathway. As, at IP3, multiple flood propagation pathways exist between many of the buildings, the approach taken was to examine each building in turn, addressing all flood propagation pathways relevant to that building, regardless of their source or destination. The flood propagation pathways are discussed below.

C4.1.2.1 Flood Propagation Through the Primary Auxiliary Building

Flood water may propagate from one elevation to another within the primary auxiliary building (PAB) and between the PAB and the control building. The flood propagation pathways are shown schematically in Figure C4.1.2.1.

The main pathways from elevation to elevation within the PAB are:

- Stairway 3 (from the 73-ft elevation to the 55-ft elevation)
- Stairways 2 and 4 from the 55-ft elevation to the 41-ft elevation
- Stairway 1 from the 55-ft elevation to the 34-ft elevation and from there to the 15-ft elevation
- A stairway from the 67-ft elevation to the 41-ft elevation.

In addition, water will flow from flood zone PAB73 to flood zone PAB55 and from flood zone PAB55 to flood zone PAB41 through open gratings around the CCW heat exchangers. However, at the 73-ft elevation, a 4-in. curb around the grating will preclude floods from all but the CCW lines and fire protection system from propagating down to the 55-ft elevation. Piping penetrations allow flood propagation from flood zone PAB34 to flood zone PAB15; from flood zone PAB41 to flood zone PAB34; and from flood zone PAB34 to flood zone PAB15. No significant propagation will occur from the stairways to flood zones at higher elevations.

Water released at higher elevations within the PAB will flow to the 15-ft elevation impeded by no more than 4-in. curbs between rooms on each level and the hallways and stairways. Water may accumulate at the 15-ft elevation if 4-in. floor drains near the yard door at the

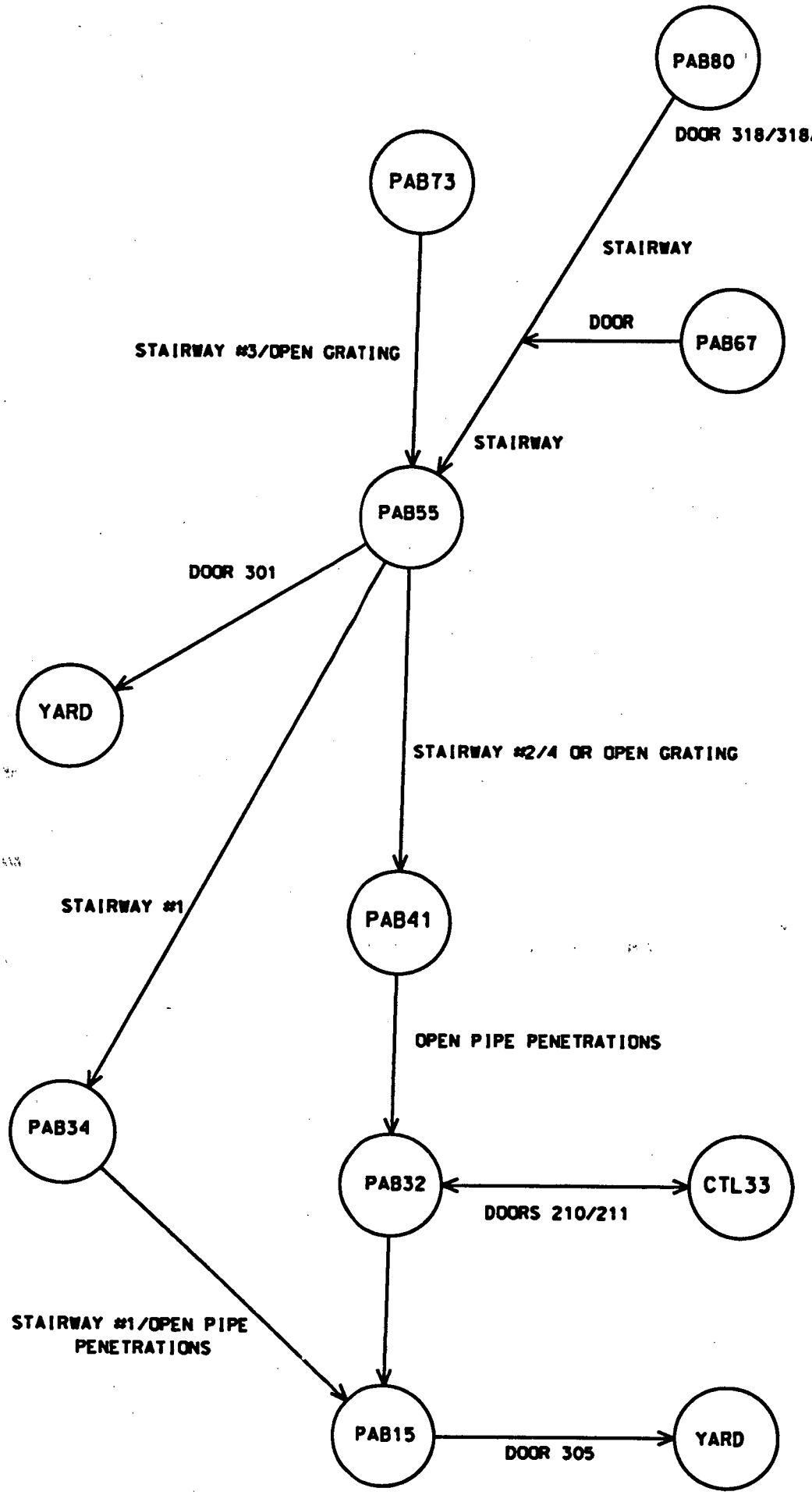


Figure C4.1.2.1 Flood Propagation Pathways in Primary Auxiliary Building

15-ft elevation are inadequate or blocked. Although water will eventually discharge to the outdoors through roll-up door 305 in the east wall of the PAB next to the valve corridor, the base of this door is 43.5 in. above the floor level and thus above the 39-in. critical flood height for the RHR pumps. Furthermore, outflow is restricted to a 0.5-in. gap at the bottom of the door because the original flap in the roll-up door has been welded closed.

The backflow of water through floor drain systems into flood zone PAB15 is a means of flood propagation that was analyzed previously in response to NRC Information Notice No. 83-44 and Supplement 1 to the notice (dated August 1990). However, as this route of flood propagation essentially duplicates other routes, it was examined no further.

Flood propagation between primary auxiliary building flood zone PAB32 and control building flood zone CTL33 could occur through fire doors 210 and 211. However, significant flood propagation between flood zones PAB32 and CTL33 is unlikely because water will not accumulate in either flood zone and propagation would have to occur under closed flood doors.

C4.1.2.2 Flood Propagation Through the Control Building

Flood water may propagate from one flood zone to another within the control building and between the control building and the PAB or the diesel generator building. These flood propagation pathways are shown schematically in Figure C4.1.2.2.

Excepting the 15-ft elevation, each elevation within the control building is designated as a single flood zone. The main pathway from higher elevations to the 15-ft elevation is the east stairway. Water can propagate from flood zones CTL53 and CTL33 to the stairwell at the 15-ft elevation (flood zone CTL15-3) through fire doors 206 and 204, respectively. This flow of water would be unimpeded--there are no curbs between the rooms at higher elevations and the stairway. No significant propagation will occur from the stairways to other flood zones at higher elevations and all piping and other penetrations between the zones are sealed.

Should water be released in flood zone CTL33, most is expected to drain to the yard through a 4-ft x 4-ft HVAC duct in the cable tunnel floor or through seven 4-in. floor drains. A 4-in. floor drain is located close to the IACCW head tank. This drain acts as a potential flood propagation path from flood zone CTL33 to flood zone CTL15-1 should the hub drain in CTL15-1 be blocked.

At the 15-ft elevation, flood water may propagate between the emergency switchgear room (flood zone CTL15-1) and the stairwell (flood zone CTL15-3) by overflowing a 6-in. high curb under interconnecting double fire door 202. Because door 202 opens into the emergency switchgear room from the stairwell, it may fail open should water accumulate in the stairwell,

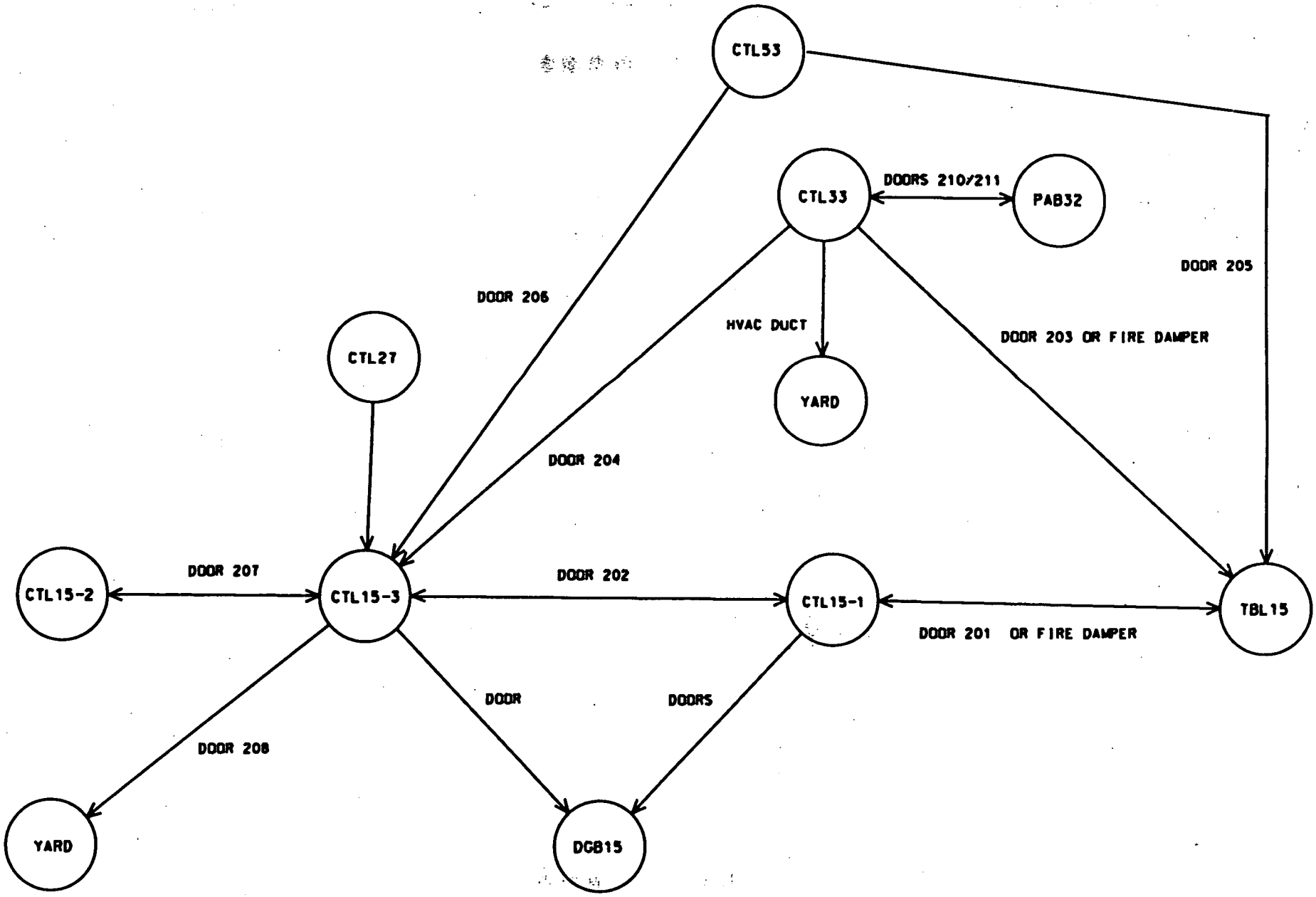


Figure C4.1.2.2 Flood Propagation Pathways in Control Building

causing submergence, spray and splashing within the switchgear room. Flood water may also propagate between the stairwell (CTL15-3) and the AC equipment room (flood zone CTL15-2) by overflowing a 6-in. high curb under door 207. Finally, water may propagate between flood zones CTL15-1 and CTL15-2 through shared drains: the four 4-in. hub drains and one 4-in. floor drain in CTL15-2 and the three 4-in. floor drains and eleven 4-in. hub drains in CTL15-1 discharge through a common line to a common sump. The air intake opening through the exterior wall will not drain CTL15-2. The opening of fire door 208 to the yard will only drain flood zone CTL15-3 when water there is more than 3-ft deep.

At the 15-ft elevation, water will flow from the stairwell (flood zone CTL15-3) into the diesel generator building valve room, flood zone DGB15, through a 0.25-in. gap under the close-fitting interconnecting door. Because the sump pumps and large drainage system in DGB15 can accommodate flows of 20,000 gpm, drainage from CTL15-3 will be limited by the flow rate under the door. Because the door into the diesel generator valve room opens out into the stairwell, it is unlikely to fail open should water accumulate in flood zone CTL15-3. Water will also flow from the switchgear room, flood zone CTL15-1, into flood zone DGB15 through a short hallway and 0.25-in. gaps under double interconnecting doors.

Flood propagation between primary auxiliary building flood zone PAB34 and control building flood zone CTL33 could occur through fire doors 210 and 211. However, as noted in Section C4.1.2.1, propagation through these doors is unlikely to be significant.

Floods can also propagate between the turbine building and the control building at the 53-ft, 33-ft, and 15-ft elevations. At the 53-ft elevation, double fire door 205 opens out from the control room (flood zone CTL53) to the turbine building. Water that accumulates within the control room can be drained off by opening this door. Positive pressures within the control room are, however, expected to prevent the entry of steam through the normally closed fire door into the control room should a high-pressure steam line rupture in the turbine building.

At the 33-ft elevation, fire door 203 opens out from flood zone CTL33 into the turbine building. In addition, a 3-ft x 3-ft HVAC wall duct and a fire damper 52 in. above the floor of flood zone CTL33 will allow steam to enter flood zone CTL33 from the turbine building but provide no drainage of flood water from CTL33-1.

At the 15-ft elevation, double fire door 201 and a normally open 4-ft x 6-ft fire louver above the door connect the switchgear room (flood zone CTL15-1) and the turbine building (flood zone TBL15). A 4-ft high dike protects the fire door on the turbine building side. To overflow this barrier, a discharge of more than 10^6 gal. is required and the only flood source capable of achieving such flooding within 30 minutes, the circulating water system, will itself terminate when the 6.9-kV switchgear in the turbine building is damaged at a flood height of 3 in. Furthermore, two 15-ft wide roll-up doors would probably buckle under a 4-ft head of water, releasing the water from the turbine building into the yard. However, while water is unlikely to overflow the dike, the rupture of 10-in. turbine building fire protection system piping adjacent to and directly above the dike could result in water being sprayed through the louver into the emergency switchgear room.

C4.1.2.3 Flood Propagation Through the Diesel Generator and Valve Rooms (Flood Zone DGB15)

Flood zone DGB15 comprises three diesel generator rooms and a valve room. Fire doors separate the rooms. Each room has a 24-in. drain that discharges to an enclosure at the 10-ft elevation and into the river. Each drain has a capacity of 20,000 gpm. In addition, each room contains a large trench drained through 8-in. lines to the valve room sump. Three sump pumps, one of 50-gpm capacity and two of 500-gpm capacity empty the sump. It can therefore be concluded that little water can accumulate in the diesel generator or valve rooms or flow between the rooms other than through the sumps.

Natural pathways for flood propagation to the diesel generator building valve room (flood zone DGB15) exist from the stairwell of the control building east stairway (flood zone CTL15-3) and from the emergency switchgear room (flood zone CTL15-1). Because drains within DGB15 can accommodate flows of over 20,000 gpm, they offer a means of mitigating the effects of flooding in the 15-ft elevation in the control building if the door is opened. Propagation into the diesel generator valve room will, however, normally be restricted to flow through a narrow gap under the door.

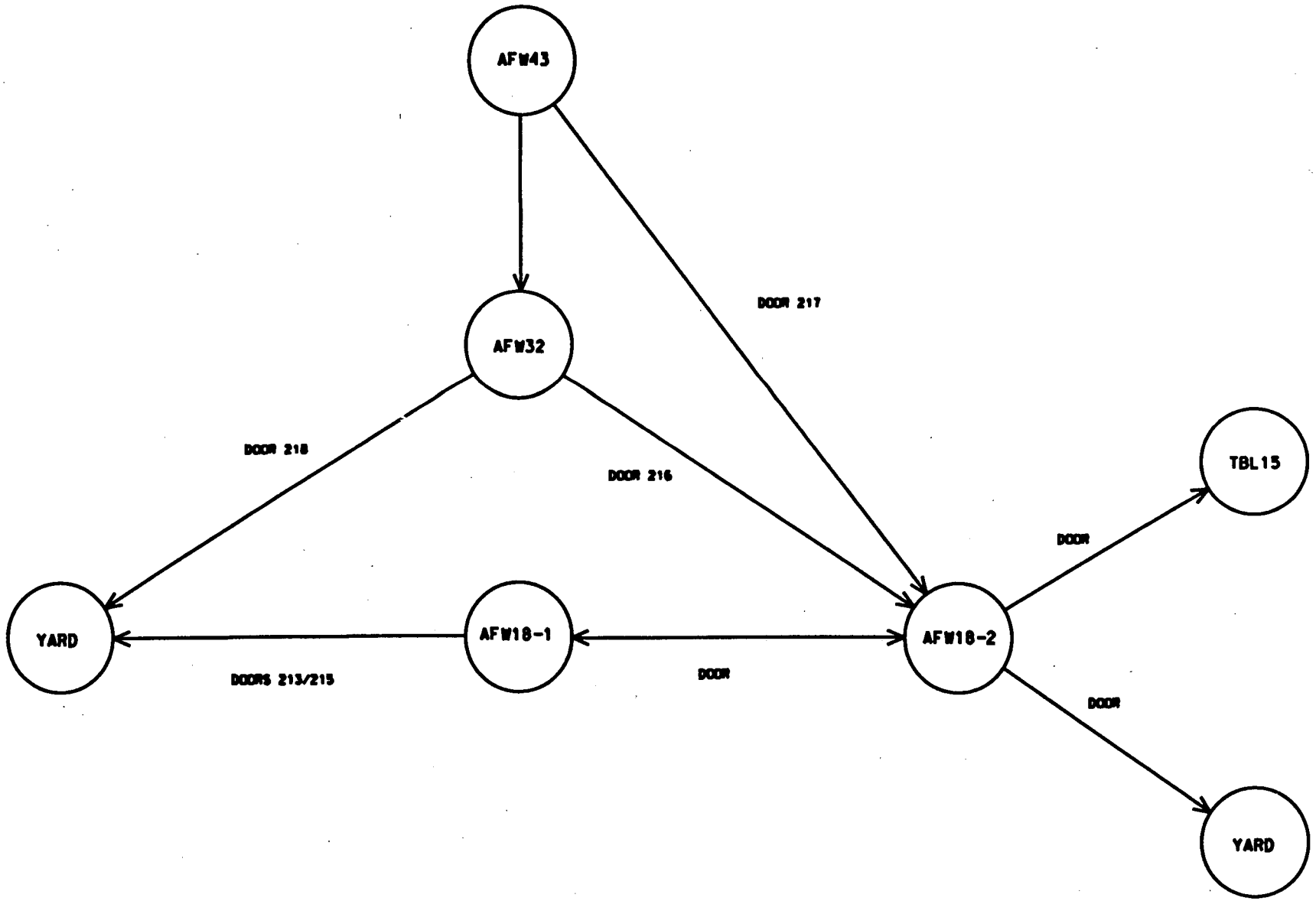
C4.1.2.4 Flood Propagation Through the Auxiliary Boiler Feedwater Pump Building

Flood water may propagate from flood zone AFW43 (the main steam/feedwater piping enclosure and bridge) to flood zone AFW32 through open piping penetrations, and to flood zone AFW18-2, through the open wire fence door 217. From flood zone AFW32, flood water may drain to the yard through 6-ft wide door 218, and to flood zone AFW18-2 through fire door 216. Propagation to flood zone AFW18-1 is unlikely as the accumulation of water in flood zone AFW32 will be insufficient to cause the silicone foam fire sealant in floor penetrations to fail. Water can drain from flood zone AFW18-1 to the yard through doors 213 and 215 and from flood zone AFW18-2 to the yard through a door. Finally, door 215 provides a pathway for flood propagation between flood zones AFW18-1 and AFW18-2.

The flood propagation pathways through the auxiliary boiler feedwater pump building are shown schematically in Figure C4.1.2.3.

Figure C4.1.2.3

Flood Propagation Pathways through Auxiliary Boiler Feedwater Building



C4.1.2.5 Flood Propagation Through the Turbine Building (Flood Zone TBL15)

Flood zone TBL15 comprises the entire turbine building. As noted in Section C4.1.1, the building was treated as a single flood zone because the floor drains and open structure ensure that floods at higher levels rapidly propagate to the 15-ft elevation. Steam releases will also pervade the entire building. Water accumulations at the 15-ft elevation in the turbine building will drain to the condensate pump pits or to the yard through two 15-ft wide roll-up doors.

Floods can propagate between the turbine building and the control building at the 53-ft, 33-ft, and 15-ft elevations. At the 53-ft elevation, double fire door 205 opens out from the control room (flood zone CTL53) to the turbine building. By opening this door, water that accumulates within the control room can be drained off.

At the 33-ft elevation, fire door 203 opens out from flood zone CTL33 onto the turbine building. In addition, a 3-ft x 3-ft HVAC wall duct and a fire damper, 52 in. above the floor of flood zone CTL33, connect CTL33 to the turbine building but will not drain flood water from CTL33-1.

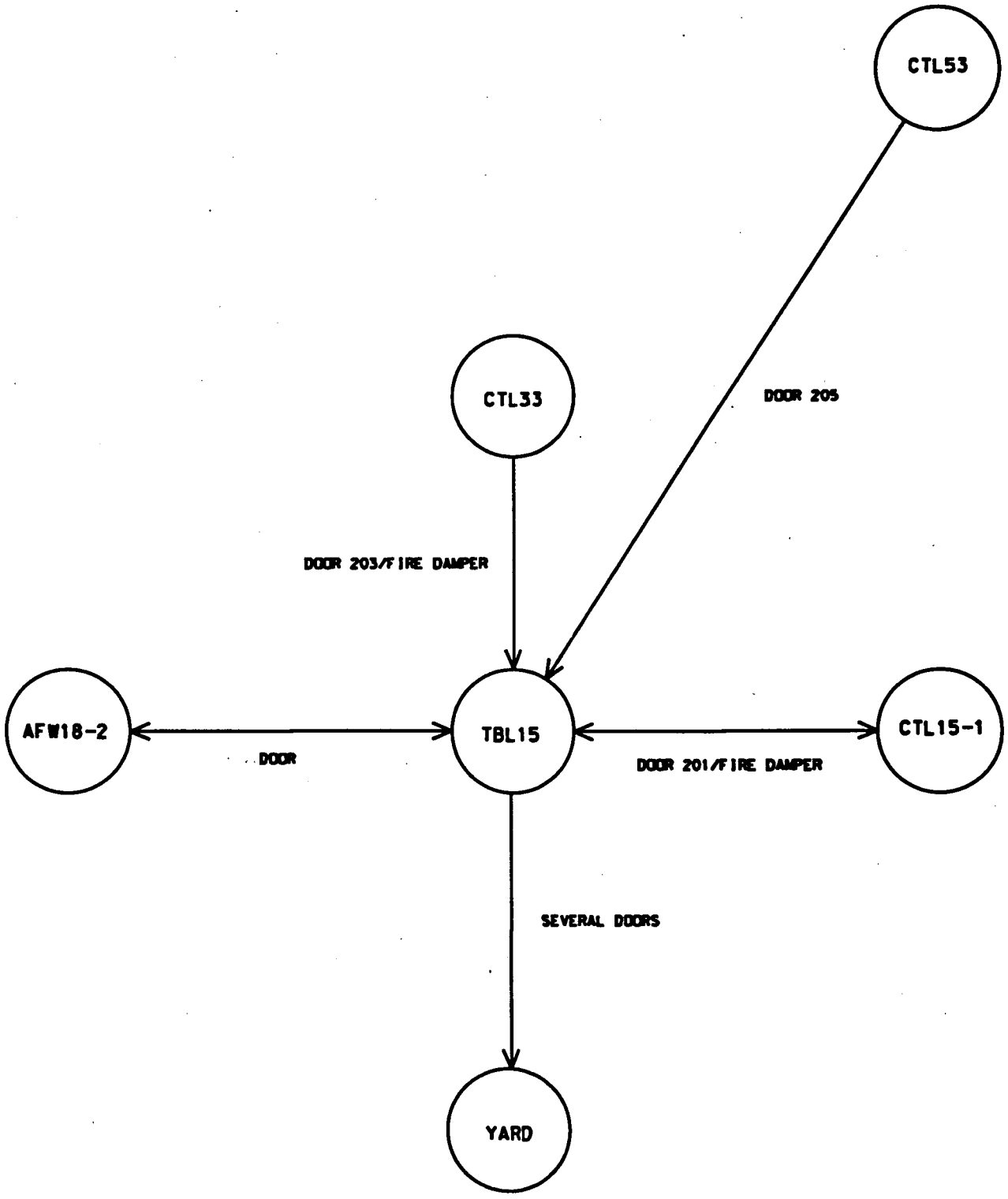
At the 15-ft elevation, double fire door 201 and a normally open 4-ft x 6-ft fire louver above the door connect the switchgear room (flood zone CTL15-1) and the turbine building (flood zone TBL15). A 4-ft high dike protects the fire door on the turbine building side. However, while water is unlikely to overflow the dike, the rupture of 10-in. turbine building fire protection system piping adjacent to and directly above the dike could result in water being sprayed into the emergency switchgear room through the louver.

Floods can also propagate between the auxiliary boiler feedwater pump building, flood zone AFW18-2, and the turbine building through a door.

These flood propagation pathways are shown schematically in Figure C4.1.2.4.

Figure C4.1.2.4

Flood Propagation Pathways through Turbine Building



C4.1.3 FLOOD SOURCES AND VULNERABILITIES

The "contents" of each flood zone--the potential flood sources and the systems and equipment affected by floods--were identified by walkdowns and the examination of drawings. The rationale for identifying flood sources and determining the susceptibility of equipment to internal floods will now be presented for each building.

C4.1.3.1 Primary Auxiliary Building

Potential flood sources exist at all levels of the primary auxiliary building. These sources include piping, valves, and tanks associated with the essential and non-essential service water (SW), component cooling water (CCW), refueling water storage tank (RWST), chemical and volume control system (CVCS), auxiliary steam, fire protection, city water, and waste disposal systems, and steam generator blow down and condensate return lines. Flooding occasioned by the rupture of the waste disposal line was eliminated from further consideration because of its small (1-in.) diameter, and because flow through the line would be intermittent and at low pressure. Similarly, the adverse effects of a rupture of the auxiliary steam line were ignored because a restriction orifice and pressure controls outside the PAB will limit the entry of steam into PAB flood zones should the auxiliary steam line rupture.

The systems in the PAB that are potentially vulnerable to flooding and important in preventing core damage include:

- High-head safety injection systems
- Residual heat removal (RHR) system
- Chemical volume control system (charging pumps)
- Component cooling water system
- Support systems (e.g., MCC-36A).

Table C4.1.3.1 lists the flood sources and equipment susceptible to flooding in the PAB.

Table C4.1.3.1

Systems and Equipment in the Primary Auxiliary Building

Flood Zone	System	Equipment Located in Flood Zone			Critical Flood Height	Vulnerable to Splashing
		Piping	Valve	Other		
PAB73	CVCS	1"- 204 2"- 202	CH-FCV-110A(A) CH-FCV-100B(A) CH-FCV-111A(A)	Boric acid storage tanks 31/32 Boric acid filter Caustic mix regeneration tank Boric acid blender Seal water return heat exchanger		
PAB73	CCW	4"- 142 4"- 180 14"-vent	832A 832B	Surge tanks 31/32		
PAB73	Non-essential SW	24"- 405 18"- 405 18"- 509 14"- 410	SWN-35-2 SWN-35-1			
PAB73	Primary water	2"- 393 2"- 473 2"- 512				
PAB73	Fire protect.	4"- FP-PAB73-4 2.5"- FP-PAB73-2 1.5"- FP-PAB73-1 (150 ft)	FP-385			
PAB73	Auxiliary steam	8"- 557 6"- 558 3"- 728 2"- 560 2"- 727				
PAB73	Cond. return	4"- 475 3"- 676 1.5"-362				
PAB73	City water	2"- 35 2"- 152 1.5" (220 ft)				

Table C4.1.3.1

Systems and Equipment in the Primary Auxiliary Building

Flood Zone	System	Equipment Located in Flood Zone			Critical Flood Height	Vulnerable to Splashing
		Piping	Valve	Other		
PAB67	Essential SW	18"-406 10"-12b 10"-12d 10"-12a 10"-12c 10"-12e	 SWN-44-1 SWN-44-2 SWN-44-3 SWN-44-4 SWN-44-5			
PAB67	CCW			ACCW pumps 31-34		From SW sources
PAB67	Fire protect.	4"-FP-PAB67-4 2.5"- FP-PAB67-2 (150 ft)				
PAB67	CVCS	3" - 19 3" - 19 4" - 17 1" - 44 1" - 44 1" - 42 1" - 42 1" - 43 1" - 43 1" - 44 1" - 44	CH-205(M) CH-226(M) CH-222(M) CH-250A(M) CH-441(M) CH-250B(M) CH-442(M) CH-250C(M) CH-443(M) CH-250D(M) CH-444(M)			From SW sources. Valves fail in correct position for accident mitigation
PAB55	480-Vac			MCC-36A/B MCC-37A	10"	MCC 36A from FPS pipe in stairwell # 1
PAB55	CVCS	 2" - 208 3" - 19 4"- 205	 CH-333(M) CH-HCV-142(A) CH-LCV-112B(A)	Boric acid transfer pumps 31/34 Charging pumps 31-33 Charging pump speed controllers SC-141A/B/C	12" 6' 20" 22"	City Water, CCW & CVCS in CH Pump 32 Room & Chase. City Water, CCW, RWST. Pumps in separate rooms so only one pump can be damaged. Not susceptible--can be overridden from control room control control

Table C4.1.3.1

Systems and Equipment in the Primary Auxiliary Building

Flood Zone	System	Equipment Located in Flood Zone			Critical Flood Height	Vulnerable to Splashing
		Piping	Valve	Other		
PAB55	CCW	16"-53 10"-148 10" 149 3"- 403 3"- 404 2"- 403 2"- 404 2"- 640 2" -641 1"- 403 1"- 404 1"- 638 1"- 639				
PAB55	Non-essential SW	24"- 408 24"- 409				
PAB55	Primary water	2"- 357 2"- 392	PW-28			
PAB55	Fire protect.	4"- FP-PAB55-4 2.5"- FP-PAB55-2	FP-104 FP-384			
PAB55	Auxiliary steam	3"- 730				
PAB55	Condensate return	1"- 677				
PAB55	City water	2"- 35 2"- 152 (20 ft)				
PAB55	Waste disposal	1"-357				
PAB41	CSS	8"- 51 8"- 15	SI-866A (M) SI-866B (M)	Containment spray pumps 31/32 Spray additive tank 31	16"	Spray from rupture CSS will splash all pumps and valves
PAB41	CVCS	3" -128	CH-226(M) CH-205(M)			

Table C4.1.3.1

Systems and Equipment in the Primary Auxiliary Building

Flood Zone	System	Equipment Located in Flood Zone			Critical Flood Height	Vulnerable to Splashing
		Piping	Valve	Other		
PAB41	SW	18"- 408 18"- 409 14"- 408 10"- 11a 10"- 11d 10"- 11b 10" -11c 1'0"-11d	 SWN-43-1 SWN-43-2 SWN-43-3 SWN-43-4 SWN-43-5			
PAB41	CCW	12" -52 12"- 52A 6"- 14 3"- 121 6"- 13 6"- 784 3" - 21	AC-822A (M) AC-822B (M) AC-786 (M) AC-789 (M) AC-797 (M) AC-769 (M) AC-784 (M) AC-625 (M) AC-784 (M) FCV-625(A)	Component cooling pumps 31-33	18"	
PAB41	Primary water	3"- 163 3"- 33 3"- 103 2"- 398 2"- 72	PW-108 PW-109	PW make-up pumps 31/32		Not required for safe shutdown
PAB41	RWST supply	12"-181				
PAB41	Fire protection	4"- FP-PAB41-4 2.5"- FP-PAB41-2	FP-108			
PAB41	Auxiliary steam	4"- 561				
PAB41	Condensate return	2"- 196 1"- 680				
PAB41	S/G blow down	2"- 45 2"- 46 2"- 47 2"- 48				

Table C4.1.3.1

Systems and Equipment in the Primary Auxiliary Building

Flood Zone	System	Equipment Located in Flood Zone			Critical Flood Height	Vulnerable to Splashing
		Piping	Valve	Other		
PAB41	Waste disposal	1"- 338				
PAB41	City water	2"- 35 2"- 152 1" 0.75" (20 ft)	MW-433			
PAB34	Essential SW	18" -406 10" -406	SWN-TCV-1104(A) SWN-TCV-1105(A) SWN-TCV-1103(A) SWN-46			
PAB34	Auxiliary steam	3" - 20				
PAB34	SI	2"- 594 2"- 594 6"- 550 6"- 550 4"- 145 4"- 145 2"- 161 2"- 161 4"- 56 4"- 56 14"-57 14"-57 6"- 277 6"- 277 8"- 60 8"- 60	SI-1851A (A) SI-1851B (A) SI-1852A (M) SI-1852B (M) SI-851A(M) SI-851B(M) SI-842 (M) SI-843 (M) SI-850A(M) SI-850C (M) SI-885A(M) SI-885B(M) SI-887A(M) SI-887B(M) SI-888A(M) SI-888B(M)	Safety injection pumps 31-33	31"	From RWST and CCW
PAB34	CCW	2"- 122 2"- 123 1"- 659 1"- 660 1"- 655 1"- 656 1"- 122 1"- 123				
PAB34	Fire protection	4"- FP-PAB34-4 2.5" FP-PAB34-2				

Table C4.1.3.1

Systems and Equipment in the Primary Auxiliary Building

Flood Zone	System	Equipment Located in Flood Zone			Critical Flood Height	Vulnerable to Splashing
		Piping	Valve	Other		
PAB34	City water	3/4"				
PAB34	SI	8"-190 14"- 57 14"- 57 4"- 16 4"- 16 12"- 9 3" - 377 3" - 37	SI-883(M) SI-885A(M) SI-885B(M) SI-1835A(M) SI-1835B(M) AC-744(M) AC-743(M) AC-1870(M)	Boron injection tank		
	RWST supply	16"-155 12"-155 12"-181 8" -189 8" - 189 8"- 60 (30 ft)	SI-882(M) SI-1810(M)			
PAB15	SI			RHR pumps 31/32	40"or 39"	From RWST and CCW. However pumps are located in separate bays and both pumps are unlikely to be damaged simultaneously
PAB15	CCW	1" -335 1" -336 1" -657 1" -658 (50 ft)				
PAB15	Fire protection	4"- FP-PAB15-4 2.5"- FP-PAB15-2	FP-382 FP-109			
PAB15	RWST supply	12"-10 (200 ft)				
PAB15	Primary water	1.5" (10 ft)				
	City water	3/4"				

The rationale for determining the susceptibility of equipment in the PAB to internal floods will now be presented. Spraying and splashing are the flooding effects of principal concern in flood zones above the 15-ft elevation--these zones have stairways and other pathways to drain away water.

Flood Zone PAB80. No equipment on the 80-ft elevation is susceptible to flooding and there are no flood sources on that level.

Flood Zone PAB73. On the 73-ft elevation, the only equipment susceptible to spray/splashing are the boric acid flow control valves that are used only for emergency boration in ATWS events. As the probability of the simultaneous occurrence of a flood and an ATWS event is negligible, concern over the effects of flooding on the 73-ft level can be dismissed.

Flood Zone PAB67. On the 67-ft elevation both the CVCS containment isolation valves (CH-205, CH-222, CH-226, CH-250A/B/C/D, CH-441, CH-442, CH-443, CH-444) and the auxiliary component cooling water pumps are susceptible to spray/splashing from ruptured essential service water lines.

Flood Zone PAB55. On the 55-ft elevation, SC-141A/B/C, the hydraulic flow controllers for charging pumps 31, 32, and 33, are susceptible to spray damage. However, because they are used only in emergency boration and can be overridden from the control room, and because the probability of the simultaneous occurrence of a flood and an ATWS event is negligible, the effects of flooding on these controllers are of little concern.

The MCCs located on the 55-ft elevation of the primary auxiliary building distribute ac power to safety-system pumps and MOVs. These MCCs are within range of water spraying from a break in the fire protection piping in the stairway leading from the 55-ft elevation to the 34-ft elevation. However, only MCC-36A and the motor starter components located within it will be affected by spray as it will shield the other MCCs. The MCCs are not vulnerable to submergence because their critical flood height is 10 in. and flood waters deeper than 4 in. will drain to lower levels from PAB55 through the open stairways. Because spray-induced damage to MCC-36A is unlikely to be recoverable in a short period of time, a manual plant shutdown is dictated by the technical specifications. While main and auxiliary feedwater will be available for this operation, components supplied by MCC-36A will be unavailable. These components include auxiliary component cooling pumps 31 and 33, boric acid transfer pump 31, hydrogen recombiner 32, and MOV AC-730. In addition, the motor starter compartments for MOVs AC-744 and SI-1810 will be affected by the splashing of MCC-36A.

Boric acid transfer pumps 31 and 32 are susceptible to spray damage but not to submergence effects--their critical flood height is 12 in. but flood heights will not exceed 4 in.

Charging pumps 31, 32, and 33 are also susceptible to spray damage but not to submergence effects--their critical flood height is 20 in. Spray damage will result from the rupture of city

water, component cooling water, and RWST lines, but, because the pumps are in different rooms, only one pump would be damaged in any one incident.

Motor-operated valve CH-333 (at the boric acid filter outlet) charging pump suction level control valve CH-LCV-112B, and flow control valve CH-HCV-142 (in the charging line) are susceptible to spray damage. However, as these valves are used only in emergency boration and the probability of the simultaneous occurrence of a flood and an ATWS event is negligible, concern over the effects of flooding on them can be dismissed.

Flood Zone PAB41. CCW pumps 31 and 32 in flood zone PAB41 are located in an open area 14 ft from the nearest point at which water cascading through the roof grating would strike the floor. Given this separation, CCW pumps 31 and 32 are unlikely to be susceptible to spray damage if floods propagate from the 73-ft, 67-ft or 55-ft elevations through open grating around the CCW heat exchanger. CCW pumps 31 and 32 are, however, susceptible to SWS or CCW piping ruptures in flood zone PAB41. CCW pump 33 is protected from spray damage, other than from spray from the CCW lines feeding it, by an 8-ft high Appendix R wall.

Containment spray pumps 31 and 32 in flood zone PAB41 and their pump outlet motor-operated discharge valves SI-866A/B are susceptible to spray from ruptured primary water, city water, and RWST lines.

Flood Zone PAB34. HHSI system valves SI-842, SI-843, SI-850A/C, SI-851A/B, SI-885A/B, SI-887A/B, SI-888A/B, SI-1851A/B and SI-1852A/B are located in the SI pump room in flood zone PAB34. These valves are susceptible to spray effects resulting from the rupture of SI, RWST and CCW systems. The SI pumps in flood zone PAB34 are distant from flood propagation pathways and are protected in the SI pump room. The SI pumps are not susceptible to submergence caused by flood propagation from other sources because their critical flood height is 31 in. while flood accumulation in flood zone PAB34 is limited to 4 in.

LHSI system valves AC-743, AC-744, SI-882, SI-883, SI-885A/B, SI-1810, AC-1870 and HHSI motor-operated valves SI-1835A/B are located in the pipe penetration area in flood zone PAB34. These valves are susceptible to spray and submergence effects resulting from the rupture of SI or RWST lines in the area.

Flood Zone PAB15. The RHR pumps located on the 15-ft elevation are susceptible to submergence resulting from flood propagation from higher elevations of the PAB or from the rupture of RHR, RWST, CCW, fire protection or city water lines on the 15-ft elevation of the PAB should the floor drains in the flood zone be blocked or be inadequate.

The RHR pumps are also susceptible to spray damage resulting from the rupture of pipes on the 15-ft elevation. It is unlikely, however, that more than one pump would be affected by a single source of spray.

C4.1.3.2 Control Building

Table C4.1.3.2 lists the flood sources and equipment susceptible to flooding in the control building.

The flood sources of principal concern are the 10-in. fire protection headers in the deluge station (flood zone CTL15-1) and cable tunnel (flood zone CTL33); the 4-in. fire protection headers in the east stairway (flood zone CTL15-3); and the 3-in. service water piping in the switchgear room (flood zone CTL15-1) and AC equipment room (flood zone CTL15-2). In addition, instrument air closed cooling water (IACCW), city water lines and tanks and auxiliary steam piping are present in the control building. The fire protection system sprinkler lines were eliminated from consideration as flood sources because the sprinkler system has dry pipes with normally closed sprinklers. Sanitary lines were also eliminated from consideration as a flood source because of their low pressure and intermittent flow.

The systems in the control building that are potentially vulnerable to flooding and important in preventing core damage include:

- The controllers, switches, relays and dc distribution panels in the control room (flood zone CTL53)
- The batteries and associated equipment in the battery rooms (flood zone CTL33)
- The switches, relays, circuit breakers and buses in the switchgear room (flood zone CTL15-1)
- The instrument air compressors (flood zone CTL15-1).

In identifying equipment susceptible to the effects of flooding, spray and splashing effects were considered for equipment in all areas. The determination of the susceptibility of equipment in the control building to internal floods is as follows.

Flood Zone CTL53. Controllers, switches, relays, and dc distribution panels, etc., are located in the control room, flood zone CTL53. However, city water lines on the 53-ft elevation are located in the adjacent locker room and thus will not pose a spraying hazard. While the rupture of the auxiliary steam lines in the same area could cause high temperatures and humidity within the control room, the closure of doors and isolation of the steam line break eliminate this as a source of concern. Because the critical flood height is 4 in., submergence is a potential problem in the control room. In reality, however, damage there is most unlikely--operators in the control room would discover the flood almost immediately and isolate it or drain the water from the control room by opening of doors to the control building east stairway or the turbine building.

Table C4.1.3.2

Systems and Equipment in the Control Building

Flood Zone	System	Equipment Located in Flood Zone			Critical Flood Height	Vulnerable to Splashing
		Piping	Valve	Other		
CTL53	All			Plant controls (process monitoring, controllers, switches, relays etc),	4"	None
CTL53	City water	2"		Water tank (80 gal)		
CTL53	Aux. steam	2"				
CTL33	480-Vac			MCC-39	4"	None
CTL33	118-Vac			Inverters 31-34	4"	None
CTL33	125-Vdc			Battery chargers 31, 32 & 34 125V-dc panels 31,32 & 34 Batteries 31, 32 & 34	4"	None
CTL33	IACCW	2" -1181		Head tank (80 gal.)		
CTL33	Fire protect.	10"- FP-CTL33-10				
CTL33	City water	1"- 1203 0.75"	MW-443 MW-444			
CTL33	Sanitary drain	4"				
CTL27	Control bldg vent.					
CTL15-1	480V-ac			480V-ac buses 2A, 3A, 5A & 6A SS transformers 2, 3, 5 & 6 480-Vac MCC C	4"	Bus 2A & 3A, SS transformers 2 & 3 from limited IACCW (20 ft of line) and SW sources

Table C4.1.3.2

Systems and Equipment in the Control Building

Flood Zone	System	Equipment Located in Flood Zone			Critical Flood Height	Vulnerable to Splashing
		Piping	Valve	Other		
CTL15-1	125V-dc			DC power panel 33 Battery charger 33		From limited IACCW and SW sources in this zone
CTL15-1	IAS			I.A. compressors CPR-31/32 I.A. refrigerant driers DYR-R31/ I.A. refrigerant drier after-cooler FLT-AFTFL I.A. refrigerant dryer bypass FLT-BYPS		From limited IACCW and SW sources in this zone
CTL15-1	IACCW	2"- 193 2"- 181 2"- 1183 1.25"1195 1.25"1194 1.25"1187 1.25"1186 1.25"1183 1.25"1184 1"- 1193 1"- 1194 1"- 1190 1"- 1192 1"- 1191		IACCW pumps 31/32 IACCW heat exchangers 31/32 IACCW after-coolers 31/32		From IACCW sources
CTL15-1	SW	3" - 1197 3" - 12003" - 1200 3" - 1201 2.5"-1199 2.5"-1196 2.5"-1202 2.5"-1202 1.5"-1200 (for pipe rupture frequency assume 140' of 3" pipe)	SWN87- 1SWN87-1 SWN-47 SWN70-1 SWN70-2 SWN27-1 SWN27-2 SWN28-1 SWN28-2 TCV1113 (A)			From limited IACCW and SW sources

Table C4.1.3.2

Systems and Equipment in the Control Building

Flood Zone	System	Equipment Located in Flood Zone			Critical Flood Height	Vulnerable to Splashing
		Piping	Valve	Other		
CTL15-1	Fire protect.	10"	FP231 2-1 FP230 2-2 FP232 3-2 FP237 2-1			
CTL15-1	City water	2"-1203	MW 4-1			
CTL15-2	Control Room HVAC			HVAC units 31/33	38"	From SW, auxiliary steam & SW in this zone. However, equipment not required for safe shutdown
CTL15-2	Auxiliary Steam	2" 1.5"				
CTL15-2	City Water	2"				
CTL15-2	SW	3" - 1224 3" - 1224 3" - 1223	SWN-108-5 SWN-109-2 SWN-108-4 SWN-109-1			
CTL15-3	SW	3" - 1223 3" - 1224 (16 ft)				
TL15-3	Fire protect.	4"- FP-CTL15-3-4 2.5"-FP-CTL15-3-2	FP100 FP179			

Flood Zone CTL33. 480-Vac MCC-39, 118-Vac inverters 31 to 34, battery chargers 31, 32 and 34, dc panels 31, 32 and 34, batteries 31, 32 and 34, and associated instrumentation are located on the 33-ft elevation of the control building. However, these components are either remote, or shielded by walls, from potential flood sources that might create sprays. Furthermore, their 4-in. critical flood height and the presence of the 4-ft x 4-ft HVAC duct at the entrance to the cable spreading rooms preclude the possibility of submergence. The instrumentation in flood zone CTL33 may, however, be susceptible to high temperatures and humidity resulting from steam line breaks within the turbine building. The 2-in. component cooling water line in flood zone CTL33 is sleeved and thus is not a potential source of water spray. Furthermore, the line is located at least 25 ft from equipment susceptible to spraying. The IACCW piping is located in the south west corner of the cable spreading room next to the battery room. The location, however, is such that the battery room wall would shield equipment from any spraying resulting from a breach of IACCW piping.

Flood Zone CTL27. The control building fan room, flood zone CTL27, contains no flood sources and is not subject to flood propagation from other flood zones. Accordingly, this room is not relevant to the internal flooding analysis.

Flood Zone CTL15-1. In flood zone CTL15-1, the 480-V switchgear and dc panels, the instrument air compressors, and the instrumentation associated with them are susceptible to submergence and to spray effects from service water system, fire protection system, and IACCW system rupture.

Flood Zone CTL15-2. The control room air conditioning units and air handling units located in flood zone CTL15-2 are susceptible to flooding and spray damage and to the high temperatures and humidities resulting from a steam line break.

Flood Zone CTL15-3. Flood zone CTL15-3 contains no equipment that is susceptible to flooding effects. It does, however, contain fire protection and service water system lines that are potential flood sources.

C4.1.3.3 Diesel Generator and Valve Rooms

Table C4.1.3.3 lists the flood sources and equipment susceptible to flooding in the diesel generator and valve rooms, flood zone DGB15.

The flood sources of concern in flood zone DGB15 are 10-in. fire protection headers and 3-in. service water piping.

As noted in Section C4.1.2.3, submergence effects pose no problem in the diesel generator rooms. Furthermore, spray and splashing effects are restricted to individual rooms--no one flood source can cause spray or splashing damage to more than one diesel generator or its controls and other associated components.

Table C4.1.3.3

Systems and Equipment in the Diesel Generator Building

Flood Zone	System	Equipment Located in Flood Zone			Critical Flood Height	Vulnerable to Splashing
		Piping	Valve	Other		
DGB15	EDG			EDGs 31-33 and associated controls		Only from SW and fire protection lines in same room
	Essential SW	10"-SWN29 10"-SWN30 3"- 1223 3"- 1224	FCV1176 FCV1176A			
	Fire protection system	4"- FP19-1 4"- FP19-2 4"- FP19-3				

C4.1.3.4 Auxiliary Boiler Feedwater Pump Building

Table C4.1.3.4 lists the flood sources and equipment susceptible to flooding in the auxiliary boiler feedwater pump (ABFP) building.

The flood sources of principal concern in the ABFP building are: the 18-in. boiler feedwater lines in flood zone AFW32; the line from the condensate storage tank and the city water line in the auxiliary boiler feed pump room (flood zone AFW18-1); and the steam line to the AFW steam turbine-driven pump, the 28-in. main steam line, 18-in. feedwater/condensate, and 8-in. fire protection system water lines in the main steam/feedwater piping enclosure (flood zone AFW43).

Equipment in the ABFP building that is potentially vulnerable to flooding and important in preventing core damage includes the two motor-driven and one steam turbine-driven AFW pumps and their associated equipment in flood zone AFW18-1 and a variety of valves and instrumentation. These susceptibilities will now be examined in more detail.

Flood Zone AFW43. Main steam isolation valves MS-1-31/32/33/34, solenoid valves SOV-1230 to 1244, power-operated relief valves PCV-1134/1135/1136/1137, and AFW steam supply isolation valve PCV-1310A are located on the main steam/feedwater line piping enclosure on the 43-ft, 65-ft and 77-ft elevations. These valves will not, however, be submerged and are not susceptible to spray effects or steam as they are qualified for severe environments.

Flood Zone AFW32. The only equipment in flood zone AFW32 that is susceptible to the effects of flooding is PCV-1310B, the second auto-isolation valve that functions in the event of a steam line break in the AFW pump room (flood zone AFW18-1). This valve is susceptible to submergence, should water accumulate in flood zone AFW32, but not to spray or steam effects.

Flood Zone AFW18-1. In flood zone AFW18-1, AFW valves, pumps, instrumentation, and an electrical panel are susceptible to exposure to steam and to submergence and spray effects from the rupture of the fire protection header, city water piping, and condensate and boiler feedwater piping. Of this equipment, the pumps will be affected by submergence first--their critical flood height is 10 in., as opposed to 37 in. for most valves. It is unlikely that a single flood source could cause spray damage to more than two pumps. The feedwater flow and main steam pressure transmitters in flood zone AFW18-1 are susceptible to submergence but not to steam or sprays--the transmitters are qualified for a severe environment.

Table C4.1.3.4

Systems and Equipment in Auxiliary Boiler Feedwater Pump Building

Flood Zone	System	Equipment Located in Flood Zone			Critical Flood Height	Vulnerable to Splashing
		Piping	Valve	Other		
AFW43	MFW	18"- 5 18"- 6 18"- 7 18"- 8 4"- 1516 4"- 1517 4"- 1518 4"- 1519	BFD-7-1 BFD-6-1 BFD-7 BFD-6 BFD-7-2 BFD-6-2 BFD-7-3 BFD-6-3 BFD-79-3 BFD-79-2 BFD-79-1 BFD-79-4			
AFW43	MSS	28"- 1 28"- 2 28"- 3 28"- 4 4" -1026 4" -1027	MS-1-31 (A) MS-2-31 MS-45-1 MS-46-1 MS-47-1 MS-48-1 MS-49-1 MS-55-1 (3") MS-1-32 (A) MS-2-32 MS-45-2 MS-46-2 MS-47-2 MS-48-2 MS-49-2 MS-55-2 (3") MS-1-33 (A) MS-2-33 MS-45-3 MS-46-3 MS-47-3 MS-48-3 MS-49-3 MS-55-3 (3") MS-1-34 (A) MS-2-34 MS-45-4 MS-46-4 MS-47-4 MS-48-4 MS-49-4 MS-55-4 (3")	SOVs MS-SOV-1230 to 1244		MSIVs qualified for severe env. SOVs are qualified for severe environment

Table C4.1.3.4

Systems and Equipment in Auxiliary Boiler Feedwater Pump Building

Flood Zone	System	Equipment Located in Flood Zone			Critical Flood Height	Vulnerable to Splashing
		Piping	Valve	Other		
AFW43	SGA	6"- 1020 6"- 1018 6"- 1022 6"- 1024	PCV-1134 (A) 3-1 PCV-1135 (A) 3-2 PCV-1136 (A) 3-3 PCV-1137 (A) 3-4			PORVs qualified for severe env.
AFW43	AFW	4" -1516 4" -1517 4" -1518 4" -1519 4" -1027	MFW9-3 MFW-79-2 MFW-79-1 MFW-79-4 PCV1310A (A)			PCV-1310A qualified for severe env.
AFW43	Fire protection	8"- FP-AFW43-8 Assume 40' for pipe rupture frequency	FP-245			
AFW32	MFW	18" -5 18" -6 18" -7 18" -8 Assume 56' of 18" BF pipe for pipe rupture frequency	BFD-30-1 BFD-30-2 BFD-30-3 BFD-30-4 (vent valves)			
AFW32	AFW	4" -1027 4" -1516 4" -1517 4" -1518 4" -1519	PCV-1310B(A)	Chemical feed tanks 31-34	3 ft	

Table C4.1.3.4

Systems and Equipment in Auxiliary Boiler Feedwater Pump Building

Flood Zone	System	Equipment Located in Flood Zone			Critical Flood Height	Vulnerable to Splashing
		Piping	Valve	Other		
AFW18-1	AFW	4"- 1027	PCV1139 (A) HCV1118 (A)			
		6"- 1005	BFD-31			
		3"- 1008	BFD-48-4			
			FCV-405C (A)		37"	
			BFD-47-1			
			BFD-48-5			
			BFD-48-6		37"	
		3"- 1007	FCV-405D(A)			
			BFD-47-2			
			BFD-48-7			
			BFD-48-2		37"	
		3"- 1006	FCV405B (A)			
			BFD-47-3			
			BFD-48-3			
			BFD-48-8		37"	
		3"- 1005	FCV405A (A)			
			BFD-47-4			
			BFD-48-1			
			BFD-34			
		4"-1003	BFD-62-2		37"	
		3"- 1002	FCV406C (A)			
			BFD-40			
			BFD-41		37"	
			BFD-62-3			
		3"- 1001	FCV406D (A)			
			BFD-42			
			BFD-43		37"	
			BFD-62-1			
		3"- 1004	FCV406B (A)			
			BFD-35		37"	
			BFD-36			
			BFD62-4			
		3"- 1003	FCV406A (A)		CFH valves > pumps	
			BFD-37			
			BFD-38			
			CD-122			
			CD-125			
		2" -1031	BFD-51			
			BFD-50			
			FCV1123			
			BFD-54			
			BFD-55	MD Pump AFW -31		
			FCV1121			
			BFD-52			
			BFD-53			

Table C4.1.3.4

Systems and Equipment in Auxiliary Boiler Feedwater Pump Building

Flood Zone	System	Equipment Located in Flood Zone			Critical Flood Height	Vulnerable to Splashing
		Piping	Valve	Other		
AFW18-1				MD pump AFW-31/32 TD pump AFW-33 SG flow trans. TC-1112A & TC-1113A	10" 12" 12" 19" 19"	Pumps, from all sources in zone. However loss of more than 2 pumps unlikely. SG FTs and TSs qualified for severe env.
AFW18-1	MSS			SG steam pressure trans.	12"	Qualified for severe env.
AFW18-1	City water	8"- 1074 6"- 1074 6"- 1075 8"- 1076	PCV-1187 CT-31 PCV-1188 CT-29-1 PCV-1189 CT-28		CFH for valves > pumps in all cases	
AFW18-1	Condensate return	8"- 1071 6"- 1072 6"- 1073 8"- 1071 Assume 60' of pipe for pipe rupture frequency	CT-64 CT-32 CT-33 CT-26 CT-27 CT-29-2 CT-30 LCV-1158-2			
AFW18-1	Fire Prot.	3"-FP-AFW18-1-3 2"-FP-AFW18-1-2 1"-FP-AFW18-1-1	FP-295 FP-296			
AFW18-2	MS	28"- 1 28"- 2 28"- 3 28"- 4				

Table C4.1.3.4

Systems and Equipment in Auxiliary Boiler Feedwater Pump Building

Flood Zone	System	Equipment Located in Flood Zone			Critical Flood Height	Vulnerable to Splashing
		Piping	Valve	Other		
AFW18-2	MFW	18"- 7 6"- 7 18"- 6 6"- 6 18"- 5 6"- 5 18"- 6 6"- 6 30" - BFD	FCV437(A) BFD-5-2(M) FCV437L(A) BFD-90-2(M) BFD-91-2 FCV447(A) BFD-5-3(M) FCV447L(A) BFD-90-3(M) BFD-91-3 FCV427(A) BFD-5-1(M) FCV427L(A) BFD-90-1(M) BFD-91-1 FCV417(A) BFD-5(M) FCV417L(A) BFD-90(M) BFD-91 BFD-609 BFD-611 BFD-613 BFD-615		CFH for flow control valves > 36"	Flow control valves susceptible to splashing from all sources
AFW18-2	Fire protection	8"-FP-AFW18-2-8 2.5"-FP-AFW18-2-2	FP-516			

Flood Zone AFW18-2. The main feedwater flow control valves in flood zone AFW18-2 are susceptible to splashing from the fire protection and main feedwater lines.

C4.1.3.5 Turbine Building

Table C4.1.3.5 lists the flood sources and equipment susceptible to flooding in the turbine building.

Most turbine building equipment is located on three floors:

- 53-ft elevation - the turbine generator and reheater/moisture separators
- 36.75-ft elevation - feedwater heaters, steam jet air ejector
- 15-ft elevation - condensate pumps (in pits), heater drain tanks and pumps, main boiler feedwater pumps, and the turbine oil reservoir and storage tank. The 6.9-kV switchgear and non-safety-related MCCs are also located here. The 96-in. circulating water piping is located in the condenser inlet and outlet wells on the 12-ft elevation.

The flood sources of principal concern in the turbine building are the 28-in. main steam line, 96-in. circulating water line, 28-in. feedwater/condensate line, 10-in. fire protection system line, 8-in. auxiliary steam line, 4-in. component cooling water line, 4-in. service water line, 2-in. city water line, and 4-in. primary water line, and the feedwater heaters.

The equipment in the turbine building that is potentially vulnerable to flooding and important in preventing core damage includes:

- 6.9-kV switchgear
- Main boiler feedwater pumps
- Condensate pumps
- 480-V switchgear (buses 312 and 313) for Appendix R, alternative safe shutdown.

The rationale used to determine the susceptibility of equipment to internal floods follows.

Table C4.1.3.5

Systems and Equipment in Turbine Building

Flood Zone	System	Equipment Located in Flood Zone			Critical Flood Height	Vulnerable to Splashing
		Piping	Valve	Other		
TBL15	6.9-kV			Switchgear	3"	
TBL15	MFW/ cond.	Main boiler feedwater pumps: 24" suction 20"- 386 discharge Condensate pumps 30" suction 16" discharge 28" steam		MFW pumps 31/32 Condensate pumps		
TBL15	Alternative safe shutdown			MCC-312 MCC-313		
TBL15	SW	4"				
TBL15	TBCCW	4" 6"				
TBL15	Circulating water	96" - 1/2 84" - 3/4/5/6/7/8				
TBL15	Auxiliary steam	8" -				
TBL15	Fire Prot.	10"- FP-TBL15-10	FP-74 FP-76 FP-155			
TBL15	City Water	2" 1"				
TBL15	Primary water	4"				

Switches and transmitters are assumed to fail should they be submerged, sprayed, splashed, or exposed to high temperatures and humidity as a result of a steam line break. Thus all this equipment is assumed to be vulnerable to spraying or splashing as a result of the failure of the service water, main steam, turbine building component cooling water, circulating water, auxiliary steam, fire protection header, city water piping, and boiler feedwater/condensate piping.

The 6.9-kV switchgear provides offsite power to balance-of-plant and emergency loads. Buses 312 and 313 located on the 15-ft elevation distribute ac power to component cooling water pump 32, service water pump 38 and charging pumps 31 or 32 as part of the Appendix R, alternative safe shut down.

Other equipment in flood zone TBL15 that is susceptible to the effects of flooding includes the main boiler feedwater and condensate pumps. The latter are located in pits at the 11.6-ft elevation.

C4.2 FLOODING SCENARIOS

The development and evaluation of flooding scenarios entailed the examination of flood sources and the system failures or degradation that will ensue should equipment be damaged as a result of flooding. The resulting accident sequences were then defined and the probabilities that they will lead to core damage calculated.

C4.2.1 PRIMARY AUXILIARY BUILDING

Flooding scenarios for the primary auxiliary building generally entail a breach in a water system (e.g., SW, CCW, fire protection, city water, and RWST) that disables equipment, causes flooding, and requires a manual plant trip.

C4.2.1.1 Rupture of the CCW System

The rupture of CCW system piping or tanks will require a manual reactor scram; this is characterized as a TCCW event. TCCW events initiated by the rupture of the CCW system are specifically addressed in Section 3.1.4.4 of the IPE. CCW system ruptures with no other consequences of flooding are therefore addressed in the special initiator event trees. Flooding damage, beyond that caused to the CCW system, that might result from the rupture of the CCW system inside the PAB includes spray damage to one of the three charging pumps in flood zone PAB55. While CCW rupture may also cause spray damage to HHSI motor-operated valves in flood zone PAB34, this does not exacerbate the accident as HHSI pump failure will result from a loss of CCW cooling water. Furthermore, the propagation of CCW-

induced floods to the 15-ft elevation will not result in damage to the RHR pumps because the total capacity of the CCW system is less than the 120,000 gal. required to reach the 39-in. critical flood height at the 15-ft elevation.

Therefore, the rupture of the CCW system within the PAB can be characterized as a TCCW event caused by piping rupture, coupled with the failure of one of three charging pumps should CCW system rupture occur in flood zone PAB55. Should the AFW system then fail, core damage will occur. However, this scenario was modeled explicitly in the TCCW event tree and, therefore, was not addressed further in the internal flooding analysis.

A rupture of the 1-in. CCW line providing pump seal and jacket cooling to RHR pump 32 will result only in the loss of that pump. A rupture of the 1-in. CCW line to RHR pump 31 will result in the loss of that pump if the operator fails to align the city water back-up. As there are no other consequences, this event was pursued no further--the predicted frequency of 1-in. CCW line rupture, 3.6×10^{-5}/yr, is small compared to the 2.14×10^{-4}/yr frequency of other causes of RHR pump failure.

C4.2.1.2 Rupture of Non-Essential Service Water System in Flood Zones PAB55 and PAB73

The rupture of the non-essential service water system piping in flood zones PAB55 and PAB73 will require a manual reactor scram. However, as noted in Section 3.1.4.4 of the IPE, accident sequences initiated by loss of non-essential service water transients are similar to those resulting from a loss of component cooling water (TCCW) initiator.

Floods originating in the 55-ft or 73-ft elevations will propagate to the 15-ft elevation of the PAB. The maximum flow rate from the ruptured non-essential service water line is about 22,500 gpm assuming that 3 pumps are running. This flow rate will cause submergence damage to the RHR pumps within 9 minutes of rupture, even allowing for hold-up on intermediate elevations. While the service water low pressure alarms in the control room can be expected to alert the operators to shut down the pumps on the non-essential header, it is not certain that this action would be taken before the RHR pumps are damaged. Therefore, it can be concluded that the consequences of non-essential service water header rupture in flood zones PAB73 and PAB55 are a TSWS*NON-ESSENTIAL initiating event coupled with a loss of the RHR pumps. Given a predicted 3.3×10^{-5}/year frequency for the rupture of the non-essential service water system in PAB55 or PAB73, and the fact that core damage will occur should the AFW system fail, this scenario was examined further.

Smaller ruptures will have a lesser impact. Consider a rupture equivalent to that of a 3-in. line. The flow rate from this rupture will be $\approx$2000 gpm and will be unlikely to trip the low pressure alarms in the non-essential service water header. However, at this flow rate, 74 min. will elapse before the critical flood height for the RHR pumps in flood zone PAB15 is reached and it is very unlikely that such flooding would not be discovered in that time.

C4.2.1.3 Rupture of Essential Service Water System in Flood Zone PAB34

The rupture of the essential service water system piping in the pipe tunnel in flood zone PAB34 will result in a loss of flow to the containment fan cooler units and propagation of flood water to the pipe penetration area and down to flood zone PAB15. The former will require a manual trip. The 22,500 gpm flow rate from the rupture of 10- or 18-in. service water lines in flood zone PAB34 will also result in service water low pressure alarms and submergence of the RHR pumps. This flooding scenario thus leads to a TSWS*ESSENTIAL event accompanied by loss of the RHR system. The predicted frequency of the rupture of the essential service water system is 1.8×10^{-5}/yr. Given this frequency and the fact that at least two other systems must fail for core damage to occur, this scenario was examined no further.

C4.2.1.4 Rupture of Essential Service Water System in Flood Zone PAB67

The essential service water piping in the pipe tunnel of flood zone PAB67 carries water away from the fan cooler units. The rupture of this piping will thus have no direct impact on plant operation. It will, however, cause spray damage to auxiliary component cooling water (ACCW) pumps 31 to 34 and propagation of flood water down to flood zone PAB15 where it will submerge the RHR pumps. The loss of all four ACCW pumps will require that the plant be shut down. The flow rate from the rupture of a 10- or 18-in. service water line will also result in service water low pressure alarms. This flooding scenario thus leads to a T3 event accompanied by the loss of the RHR system. The predicted frequency of the rupture of the essential service water system in flood zone PAB67 is 1.9×10^{-5}/yr. Given this probability and the fact that both the AFW and MFW systems and long-term core cooling would have to fail for core damage to occur, this scenario was examined no further.

C4.2.1.5 Rupture of RWST Piping Inside Flood Zones PAB15, PAB34 and PAB41

The rupture of RWST piping will require a plant shut down and will render the RHR and HHSI systems unavailable because of the loss of their water source. Conservatively, therefore, RWST piping rupture is assumed to result in a manual trip with main feedwater available (a T3 event) but with RHR and SI systems unavailable. The accident progression resulting from RWST piping rupture in PAB15 will not lead to core damage, however, unless the AFW system fails and the operator fails to restore the MFW or condensate system. Given this and the 4.7×10^{-5}/year predicted frequency of RWST line rupture in flood zones PAB15, PAB34 and PAB41, the predicted frequency of core damage initiated by RWST line rupture in these flood zones is below the 10^{-8}/year screening criterion and thus the scenario was considered no further.

It should be noted that RWST rupture in flood zones PAB15, PAB34 and PAB41 may result in flood damage to the RHR pumps, HHSI and LHSI motor-operated valves, and SI pumps.

However, this damage will not exacerbate the accident as the RHR and HHSI systems were assumed to be unavailable because of the loss of their water supply.

Alternatively, RWST piping rupture could occur in the course of another accident progression. However, as noted in Section 3.1 of the IPE, RWST rupture during LOCAs was eliminated from consideration because the predicted frequency of simultaneous RWST failure and occurrence of a LOCA initiator falls below the 10^{-8}/year screening value. The probability of RWST piping rupture during the course of a transient-initiated accident progression can be calculated. Assuming one transient/year requiring use of the water in the RWST or the systems affected by RWST piping rupture and a 24-hr exposure before stable reactor conditions are achieved, the 4.7×10^{-5}/yr predicted frequency of a breach in RWST system piping results in a 1.3×10^{-7}/yr frequency for this scenario. Furthermore, core damage would still require the failure of the AFW system and a failure to restore the MFW or condensate system. The frequency of scenarios in which core damage is facilitated by RWST piping rupture in the course of another transient-initiated accident progression is therefore below the 10^{-8}/year screening criterion and thus this scenario was considered no further.

C4.2.1.6 Rupture of Primary Water System

The primary water system is present in flood zones PAB73, PAB55, PAB41 and PAB15. The rupture of the primary water system with its 2- and 3-in. lines within the PAB should have no direct impact on normal plant operation. Neither will it cause spray damage to other equipment. However, the propagation of flood water from the ruptured system may cause submergence damage to the RHR pumps and RHR system unavailability. Given the lack of other consequences, this scenario was not examined further.

C4.2.1.7 Rupture of Fire Protection System Piping in Stairway #1 in Flood Zone PAB55

The fire protection system is normally maintained at a pressure of 100-110 psig by two jockey pumps. When the pressure within the system drops, as a result of system demand or rupture, motor- and diesel-driven pumps start automatically and an alarm is given in the control room.

The rupture of fire protection system piping in stairway #1 at the 55-ft elevation could result in spray damage to MCC-36A. Because spray-induced damage to MCC-36A is unlikely to be recoverable in a short time, a manual shutdown is dictated by the technical specifications. While main feedwater will be available, components supplied by MCC-36A will be unavailable. These components include auxiliary component cooling pumps 31 and 33, boric acid transfer pump 31, hydrogen recombiner 32, motive power for MOVs used in high- and low-head safety injection and recirculation, and partial loss of ventilation to the diesel generator rooms. However, this flood is unlikely to damage the RHR pumps in flood zone PAB15--the flood flow rate of 1801 gpm will take 97.5 min. to rise to the critical flood

height, if the drains in the PAB 15-ft elevation function, and 82.5 min., should the drains fail. Given that all automatic fire protection systems alarm in the control room when actuated and that on receipt of the alarm, operators will be despatched to isolate the water by closing manual valves, it is unlikely that flooding will persist.

Assuming the rupture of a 10-ft length of 4-in. pipe or of a 0.5-in. hose connection could cause spray damage to MCC-36A, this event has an estimated initiating frequency of 10^{-5}/yr. Although such a rupture may cause a plant trip and other damage to several systems, core damage requires that the AFW system also fail and that the operator fails to restore the MFW or condensate system. As these systems are independent of the spray-damaged systems (e.g., they include no loads supplied by MCC-36A), the frequency of core damage resulting from this sequence is below the 10^{-8}/year criterion. Accordingly, this scenario was examined no further. Furthermore, it should be noted that this event is bounded by the TAC5A special initiator.

C4.2.1.8 Rupture of Fire Protection System Piping in Flood Zones PAB67, PAB34 or PAB15

The rupture of fire protection system piping in flood zone PAB67 could result in the flood water propagating to flood zone PAB41 through the open grating around the CCW heat exchangers. Spray damage to CCW pumps 31 and 32 is, however, unlikely. Furthermore, as noted in Section C4.2.1.7, subsequent flood damage to the RHR pumps is unlikely given an 1800 gpm flow rate after the guillotine rupture of 4-in. fire protection system piping and the fact that all automatic fire protection systems alarm in the control room when actuated. Thus flooding initiated by the rupture of fire protection system piping in PAB67 will not cause a plant shutdown or have additional consequences. Accordingly, this flooding scenario can be eliminated as a matter of further concern.

Similarly, the rupture of fire protection system piping in flood zones PAB34 and PAB15 would cause no direct damage to safety-related systems. While flood water would propagate to flood zone PAB15, it would be unlikely to submerge the RHR pumps. This flood scenario would therefore result in no additional likelihood of core damage and thus can be eliminated as an item of concern.

C4.2.1.9 Rupture of Fire Protection System Piping in Flood Zone PAB41

Fire protection system piping rupture in flood zone PAB41 may cause spray damage to one CCW pump. More than one pump is unlikely to be affected, however, because of the physical separation of the pumps. Furthermore, as noted above, while flood propagation to flood zone PAB15 will occur, damage to the RHR pumps is unlikely. Given that shutdown is not required and that this rupture has no further consequences, this scenario was considered no further.

C4.2.1.10 Rupture of City Water Piping

The only direct consequence of a loss of the city water system is a loss of a back-up cooling system--a plant trip is not required. While the rupture of primary or city water lines in flood zone PAB55 could also result in spray damage to a single charging pump and charging pump suction level control valve LCV-112B, the propagation of the flood water to flood zone PAB41 through the open grating around the CCW heat exchangers is unlikely to damage CCW pumps 31 and 32. Furthermore, given the maximum flood flow rate of 170 gpm through a ruptured 2-in. city water line, submergence damage to the RHR pumps in flood zone is also most unlikely--even if the drains in PAB15 fail to function, the critical flood height will not be reached within 8 hours. Accordingly, because this flooding scenario requires no plant shutdown, it was eliminated from further examination.

The rupture of city water piping in flood zone PAB41 is also of little consequence as it will cause spray damage to only one CCW pump at most because of the physical separation of the CCW pumps.

The rupture of city water piping in flood zones PAB73, PAB34 and PAB15 will result in water accumulating at the 15-ft elevation. However, damage to the RHR pumps is unlikely as it will take over 8 hours for the critical flood height for these pumps to be reached. Again, therefore, this flood scenario was eliminated as a cause for further concern.

C4.2.1.11 Rupture of CVCS System

The only consequence of a rupture of the CVCS system in flood zone PAB73 is a loss of the boric acid supply, an event that is of importance only should an ATWS occur. While rupture of the CVCS system is assumed to require a manual trip, the flooding scenario devolves into a T3 event in which the predicted frequency of initiation (i.e., the frequency of CVCS rupture in PAB73) is 2.2×10^{-5}/yr. This frequency is significantly less than the 3.6/yr frequency of T3 initiating events resulting from other causes. Therefore this flood scenario was eliminated from further consideration.

The direct consequence of a rupture of the CVCS system in flood zones PAB67 and PAB55 is a loss of flow to the RCP seals. Subsequently, while water may propagate to flood zone PAB41 through the open grating around the CCW heat exchangers, damage to the CCW pumps is unlikely. In these circumstances, the flooding scenario devolves into a TCCW event accompanied by RCP seal degradation and possibly an RCP seal LOCA. The predicted frequency of initiation (the frequency of CVCS rupture in PAB67 and PAB55) is 10^{-4}/yr. Given this frequency and the possible consequences, this scenario was eliminated from further consideration.

C4.2.1.12 Rupture of Containment Spray System

The rupture of the containment spray system in flood zone PAB41 downstream of the normally closed pump outlet motor-operated discharge valves will require a plant shutdown. Flooding effects will be minimal, however. As core damage will require the subsequent failure of both the MFW and AFW systems, this scenario was eliminated as a cause for further concern.

The rupture of the containment spray system in flood zone PAB41 upstream of the normally closed pump outlet motor-operated discharge valves will also require a plant shutdown. In addition, it will result in the same consequences as an RWST piping rupture inside flood zone PAB41--the loss of RHR and HHSI systems. However, as core damage will require the subsequent failure of both the MFW and AFW systems, this scenario was also eliminated from further examination.

C4.2.1.13 Rupture of SI System in Pipe Penetration Area in Flood Zone PAB34

The rupture of an SI valve or line in the pipe penetration area in flood zone PAB34 will result in the submergence of the RHR pumps in PAB15, thus requiring a plant shutdown. In addition, SI valves in PAB34 may also suffer spray damage--the two normally closed motor-operated valves SI-1835A/B at the exit to the BIT would not open should the HHSI system be required. This scenario thus devolves into a T3 event in which the RHR pumps have failed and the HHSI system is degraded. However, as core damage will require the subsequent failure of the AFW system and a failure to restore the MFW or condensate system, this scenario was eliminated from further examination.

C4.2.1.14 Rupture of SI System in SI Pump Room in Flood Zone PAB34

The rupture of an HHSI valve, line, or pump in the SI pump room in flood zone PAB34 will result in damage to the HHSI system and in the submergence of the RHR pumps in PAB15. A plant shutdown will be required. This scenario thus devolves into a T3 event in which the RHR pumps have failed and the HHSI system is unavailable. However, as core damage will require the subsequent failure of the AFW system and a failure to restore the MFW or condensate system, this scenario was eliminated from further examination.

C4.2.2 CONTROL BUILDING

C4.2.2.1 Rupture of City Water System in Flood Zone CTL53

The 2-in. city water line and tank are potential flood sources in flood zone CTL53. The accumulation of water in the stairwell, flood zone CTL15-3, can be calculated: assuming a

guillotine line rupture, a 60-psig city water pressure at the 14-ft elevation, and that the operators having failed to isolate the rupture, allow the water to drain down the control building east stairway, the flood flow rate into CTL15-3 is 170.5 gpm. Allowing for drainage through a 0.25-in. gap at the base of the door to the diesel generator valve room (flood zone DGB15), the water will overflow the 6-in. curbs and into the emergency switchgear and AC equipment rooms time within 6 minutes. However, even after 30 minutes the flood levels reached in flood zones CTL15-1 and CTL15-2 will be just 0.5 and 3.6 in., respectively. These water levels will not damage any equipment within the emergency switchgear or air conditioning equipment rooms.

Given that the operators will be immediately aware of the rupture and can simply open a door into the diesel generator valve room or the turbine building to drain the water away, it was concluded that rupture of the a 2-in. city water line or 80-gal. city water tank in flood zone CTL53 poses a negligible risk to the plant.

C4.2.2.2 Rupture of Instrument Air Closed Cooling Water System in Flood Zones CTL33 or CTL15-1

The rupture of the IACCW system, either within the emergency switchgear room or in the cable spreading room, will result in a loss of cooling to the plant instrument air system and eventually to a plant trip: the loss of instrument air is essentially a T2 event. Other flood-induced damage can also result from submergence and spraying effects. Although the capacity of the IACCW system is only 200 gal., the volume in the IACCW head tank will be made up automatically by flow from a 0.75-in. city water line. Thus the rupture of the IACCW line in flood zones CTL33 and CTL15-1 will result in the continued release of water at a rate determined by make-up to the head tank. Should the drains in CTL15-1 function, the critical flood height for switchgear in CTL15-1 will not be reached. However, should the drains fail, the 3-in. critical flood height in CTL15-1 will be reached in 25 min. and all four emergency buses will be lost. The loss of all emergency buses will require that the Appendix R alternative safe shutdown equipment function. The predicted frequency of this event is 2.4×10^{-4}/yr. Because of this frequency and the associated consequences, this scenario was examined in more detail.

Spray damage to two sets of 480-V switchgear (2A and 3A) and battery charger 33 is also possible as a result of the rupture of IACCW piping serving one instrument air compressor in CTL15-1. This piping is 20-ft from the switchgear. However, as switchgear 5A and 6A would still be available, spray damage will not exacerbate the event.

C4.2.2.3 Rupture of Service Water System in Flood Zone CTL15-1

The 3-in. and 2.5-in. service water lines that traverse the emergency switchgear room are potential flood hazards. While the 480-V switchgear, dc power panel 33, dc battery charger

33, and instrument air com[pressors] are too distant from service water piping to suffer spray damage as a result of ser[vice wa]ter line rupture, submergence of this equipment will assure its failure. Assuming a 86-p[si] service water system pressure, the maximum flow rate from the ruptured 3-in. line was c[alcula]ted to be 1359 gpm. At this flow rate, the critical flood height of 3-in. for damage to t[he emer]gency switchgear would be reached in 3.5 min., even if the drains function. The r[upture] of the 3-in line itself would not affect the service water system supply header pressure [However, isolation of a rupture upstream of the IACCW inlet valves (SWN-27-1/2 or SWN[-27-1/]2) would require tripping of the pumps on the associated header or closure of the appr[opriate] 24-in. service header valve--there are no isolation valves in the 3-in. service water li[ne ou]tside CTL15-1. Local isolation of a break downstream of the IACCW inlet valves [would] probably not be attempted unless the four emergency buses were deenergized.

Subsequent to dar[ge to] the switchgear, instrument air compressors 31 and 32, dc power panel 33, and bat[tery cha]rger 33 will be submerged. However, no further consequences will arise from this da[mage].

Thus, it can be co[ncluded] that the most likely outcome of the rupture of a 3-in. service water line in the emerg[ency] switchgear line is the loss of all four emergency buses; a less likely result is a loss of [service] water event. The loss of all emergency buses will require that the Appendix R alte[rnative] safe shutdown equipment function.

The predicted fr[equency] of a rupture of the 3-in. line carrying service water to the IACCW heat exchangers [is] 7.7×10^{-6}/yr. Because of this frequency and the associated consequences, the scenario was [examined] in more detail.

C4.2.2.4 Rupture of Fire Protection System in the Deluge Station (Flood Zone CTL15-1)

The deluge station is a small room adjacent to the emergency switchgear room. It houses a 10-in. fire protection system supply line that feeds four deluge valves associated with the auxiliary, main, and station transformers. While there is no door or flood barrier between the deluge station and the switchgear room, the intervening wall and physical separation preclude spray damage to the switchgear should the fire protection system piping rupture. In this event, a maximum flow rate of 7,500 gpm is expected. This flow rate is the run out rate for the fire protection system pumps. With such a release, the 3-in. critical height for emergency switchgear will be reached in 0.6 min. even if the drains function. Although operators will be alerted by the "fire pump running" alarm and can isolate the break by tripping the pumps locally in the fire pump house or by closing header isolation valve 75 in the turbine building, it is unlikely that isolation will be achieved before damage is incurred. The result of this flood will therefore be the loss of all four emergency buses and the requirement that the Appendix R alternative safe shutdown equipment function.

The frequency of a rupture of the 10-in. fire protection system supply line and valves was calculated as 3.4×10^{-5}/yr assuming 30-ft of 10-in. line, 20 flanges, and 4 deluge valves--the system is dry above the valves. Because of this frequency and the associated consequences, the scenario was subjected to a more detailed analysis.

C4.2.2.5 Rupture of City Water System in Flood Zone CTL15-2

The rupture of the 2-in. city water line in the air conditioning equipment room will cause the loss of control room air conditioning because of the loss of service water to the air conditioning units. While this damage would not require plant shutdown, the rupture of the city water system will pose a flood hazard to equipment other than the AC equipment in flood zone CTL15-2.

Assuming a 60-psig city water system pressure at the 14-ft elevation, the maximum flow rate from the ruptured line was calculated to be 256 gpm. The frequency of 2-in. city water line rupture in flood zone CTL15-2 is 2.1×10^{-5}/yr.

Three flood scenarios were developed for the rupture of the 2-in. city water line in flood zone CTL15-2. The first scenario assumed that the drains function as designed. In this case, a peak water level of 6.1 in. is reached in flood zone CTL15-2, resulting in water overflowing into the stairwell, flood zone CTL15-3, rising to a height of 0.3 in. after 27 min. No flow to the switchgear room will occur in this time. Therefore with no damage to safety-related equipment, this scenario was eliminated from further consideration.

The second scenario assumed that the drains in flood zone CTL15-2 are completely blocked. After 46 min., a water level of 3 in. is reached in flood zone CTL15-1--water will overflow from flood zone CTL15-2 to flood zone CTL15-3 and from flood zone CTL15-2 to flood zone CTL15-1. Should door 202 between the stairwell and the switchgear room fail open when water starts to overflow the 6-in. curb under the door, a 3-in. critical flood height in flood zone CTL15-1 would be reached in 44 min. When the level of water in flood zone CTL15-1 rises to the 3-in. critical flood height, all four emergency buses will be lost, an event that requires the functioning of the Appendix R alternative safe shutdown equipment. Because of its predicted frequency and consequences, this scenario was examined in more detail.

The third scenario assumed that while the drains shared by flood zones CTL15-1 and CTL15-2 are open, allowing water to flow from one flood zone to the other, drainage to or from the sump does not occur. After 30 min., the 3 in. critical flood height is reached in flood zone CTL15-1 as water enters this flood zone through both the drains and under the door. Once the water level in flood zone CTL15-1 reaches the critical flood height, all four emergency buses will be lost. Again, because of the frequency of city water line rupture and its consequences, this scenario was subjected to further analysis.

C4.2.2.6 Rupture of Service Water System in Flood Zone CTL15-2

The consequences of a rupture of the 3-in. service water line will be similar to those of the rupture of city water piping in flood zone CTL15-2.

A flow rate of 1359 gpm was calculated assuming a 86-psig service water system pressure in the 10-in. service water header and a guillotine break of the service water line upstream of the 1.25-in. restriction orifices. This flow rate will cause flood zones CTL15-2, CTL15-3, and CTL15-1 to flood in turn. Even if the drains function as designed, water will reach the critical flood height of 3 in. in flood zone CTL15-1 in 16 min. At that time the levels of water in flood zones CTL15-2 and CTL15-3 are 59 in. and 11.6 in., respectively. Should door 202 between the stairwell and the switchgear room fail open when water starts to overflow the 6-in. curb under the door, the critical flood height in the switchgear room would be reached in 14 min.

All four emergency buses will be lost when the height of water reaches 3 in. and Appendix R alternative safe shutdown equipment will then be required to function. The probability of this scenario can be calculated assuming no detection or mitigation of the flooding before the critical height of water is reached in flood zone CTL15-1. The frequency is 4.2×10^{-6}/yr.

Because of these probabilities and the consequences associated with the rupture of the service water line in CTL15-2, the scenarios were subjected to a more detailed analysis in which mitigating actions were considered together with the probability that Appendix R alternative safe shutdown equipment function. Mitigating actions include the opening of doors between flood zone CTL15-1 or CTL15-3 and the diesel generator valve room and the isolation of the rupture by closing valves in the diesel generator valve room.

Should the service water line rupture downstream of the 1.25-in. restriction orifices, the flow on line rupture will be reduced to 288 gpm. Water released at this rate will cause damage to the emergency switchgear in flood zone CTL15-1 in 60 min. if the drains do not function and mitigating action is not taken. The probability of this scenario can be calculated assuming no detection or mitigation of the flooding before the critical height of water is reached in flood zone CTL15-1 and that the drains are completely blocked. The frequency is 3.8×10^{-7}/yr, assuming a 0.1 probability that the drains are blocked. Given this frequency and the fact that core damage will require the unavailability or subsequent failure of the AFW steam turbine, this last scenario was examined no further.

C4.2.2.7 Rupture of Auxiliary Steam System in Flood Zone CTL15-2

The rupture of a 2-in. auxiliary steam line in the AC equipment room will result in a hot and wet environment in that room and the failure of control room air conditioning. However, no direct damage to safety-related equipment will occur and large volumes of steam will not escape the room. Furthermore, the predicted steam flow rate will create less than 26 gpm of

condensate, a flow rate that will lead to no accumulation in the switchgear room. Accordingly, it was concluded that the rupture of the steam line in the AC equipment room poses no significant hazard to the plant.

C4.2.2.8 Rupture of Fire Protection System in Flood Zone CTL15-3

Assuming guillotine rupture, the maximum flow rate from a ruptured 4-in. line was calculated to be 2492 gpm. Even if the drains function as designed, the rupture of the 4-in. line in the stairway will result in water overflowing the 6-in. curb into the emergency switchgear room and reaching the critical height for the switchgear in 6 min. A frequency of 8.3×10^{-5}/yr can be calculated for this scenario assuming 100 ft of fire protection system piping in the stairway, and no detection or mitigation of the flooding before the critical height of water is reached in flood zone CTL15-1. Because of this frequency, the consequences associated with the rupture of the line, and the short time interval between line rupture and loss of the emergency switchgear, the scenario was examined in more detail.

The maximum flow rate from a ruptured 1.5-in. valve was calculated to be 350 gpm. If the drains function as designed, the rupture of a valve in the stairway will result in water overflowing the 6-in. curb into the emergency switchgear room. However, water will not reach the critical flood height in that room until an hour as elapsed. As the flood will probably be detected within that time, this scenario was examined no further. Should the drains fail to function, the critical height of water in the switchgear room will be reached in 32 min. Once again, however, it was anticipated that the flood will be detected and isolated before 30 min. has elapsed. Accordingly, this scenario too was examined no further.

C4.2.2.9 Rupture of Fire Protection System in Flood Zone CTL33

Most of the water released as a result of the rupture of the fire protection system piping in CTL33 will drain through the HVAC duct to the yard. Without a dike around the IACCW area 4-in. drain in CTL33, however, water will also propagate directly from CTL33 to the hub drain in CTL15-1. In addition, water will propagate from CTL33 to CTL15-3 down the stairs. However, even if the drains to CTL15-1 fail to function, the critical flood height of water in the switchgear room will not be reached Therefore, this scenario was examined no further.

C4.2.2.10 Rupture of Service Water System in Flood Zone CTL15-3

The rupture of the 3-in. essential service water line in the east stairway room will cause a loss of control room air conditioning. While this loss does not require plant shutdown, other consequences are more severe.

Assuming a 86-psig service water system pressure in the 3-in. service water header, the flow rate from a guillotine break of the line was calculated to be 1359 gpm. This flow rate will rapidly cause flood zones CTL15-3, CTL15-2 and CTL15-1 to flood in turn. Even if the drains function as designed, water will reach the critical flood height of 3 in. in flood zone CTL15-1 in 12 min. Should door 202 between the stairwell and emergency switchgear room fail open, the critical height of water in the emergency switchgear room will be reached in 5.6 min. The frequency of this scenario was calculated as 3.9×10^{-7}/yr assuming no detection or mitigation of the flooding before the critical height of water is reached in flood zone CTL15-1. Given this frequency and the fact that core damage will require the unavailability or subsequent failure of the AFW steam turbine, this scenario was examined no further.

C4.2.3 DIESEL GENERATOR ROOMS

Flooding scenarios for the diesel generator rooms, flood zone DGB15, are initiated by failures in the service water or fire protection system and flow of floodwater from the control building east stairwell.

C4.2.3.1 Rupture of Service Water System in Flood Zone DGB15

The rupture of the 10-in. service water line in a diesel generator room will result in a loss of service water to that diesel generator, possible starvation of the service water lines to other diesel generators, and possible spray damage to the diesel generator in the room served by the ruptured service water line. Should the break be upstream of the inlet isolation valve (SWN-62-2/4/6), isolation of the rupture requires closure of the 24-in. service water header valves or the tripping of the service water pumps. Rupture of the service water line downstream of the inlet isolation valve requires only that the valve be closed, removing the emergency diesel generator from service. Thus the worst-case result of a rupture of the service water line is a manual trip following the loss of the service water system. This event was addressed as a special initiator with a frequency of 2.05×10^{-3}/yr. In contrast, the predicted frequency of a line rupture within a diesel generator room is 7.8×10^{-6}/yr. No further analysis was therefore deemed necessary.

C4.2.3.2 Rupture of Fire Protection System in Flood Zone DGB15

The rupture of the 4-in. fire protection system header in a diesel generator room may result in spray damage to a single diesel generator. Assuming a failure rate of 2.96×10^{-5}/year for the fire protection system header in a single diesel generator room and that the diesel generator is subsequently unavailable for a period of one month, the failure of the fire protection system header in the diesel generator room contributes 0.00025 percent to the unavailability of a single diesel generator. This value can be compared to the 0.013 percent unavailability of a

single diesel generator resulting from other causes. No further analysis was therefore deemed necessary.

C4.2.3.3 Propagation of Floodwater from the Control Building, Flood Zone CTL15-3

Floods that originate in or propagate to the control building east stairway, flood zone CTL15-3, will flow into the diesel generator valve room through a gap under the connecting door. Given the narrowness of this gap, flow from the control building to the diesel generator valve room will be slow. Furthermore, regardless of whether the door to the valve room is open, the flows involved can be readily accommodated by the drains within the valve room. Flood sources in the control building therefore pose no hazard to equipment in flood zone DGB15.

C4.2.4 AUXILIARY BOILER FEEDWATER PUMP BUILDING

Flooding scenarios for the ABFP building comprise failures in main steam, AFW steam, boiler feedwater, condensate, fire protection, and city water lines.

C4.2.4.1 Rupture of the Fire Protection System in Flood Zone AFW43

Because valves in flood zone AFW43 are qualified for severe environmental conditions, they are not susceptible to spray damage resulting from the rupture of 8-in. fire protection system piping in that zone. Instead water will propagate through open wire fence door 217 to flood zone AFW18-2 or flow through open penetrations to flood zone AFW32.

Consider first the flow to flood zone AFW18-2. Water will accumulate in AFW18-2, as outflow is initially restricted to flow under the doors to the yard and flood zones TBL15 and AFW18-1. At a flood level of 28-in., however, water will reach open louvers and its level will not rise further and thus remain below the critical flood height of the feedwater flow control valves in AFW18-2. Critical flood heights will also not be reached in AFW18-1 even if the drains in that flood zone fail. Accordingly, this scenario poses no risk of core damage and was not examined further.

Should the louvers in AFW18-2 be closed, however, submergence of the feedwater flow control valves is possible. Assuming the guillotine rupture of an 8-in. fire protection system at the 55-ft elevation, a flood flow rate of 2116 gpm was calculated. Assuming that all this water flows to flood zone AFW18-2 and that the door to the yard from AFW18-2 does not fail, the main feedwater flow control valves will be submerged within 26 min. Critical flood heights will not be reached in AFW18-1, however. Given that the operators will respond to the actuation of the fire protection system and the fact that, if not interrupted, this event is essentially a T2 event with a frequency of 3.2×10^{-5}/yr, the scenario in which the fire

protection system ruptures in flood zone AFW43 ruptures and flood water propagates directly to flood zone AFW18-2 is an insignificant contributor to core damage frequency.

Should water from the rupture of fire protection system piping in AFW43 propagate through the open pipe penetrations to AFW32, it will accumulate in AFW32 as outflow is restricted to gaps under doors. This accumulation is not, however, sufficient to cause submergence and closure of AFW steam supply isolation valve PCV-1310B. Provided the seals and pipe penetrations between flood zones AFW32 and AFW18-1 remain intact, no further flood damage will result--no significant accumulations in flood zone AFW18-2 and AFW18-1 will result from propagation under doors. Calculations show that sealant should withstand the 18-in. head of water anticipated in AFW32. Furthermore, the seals have been reinforced with elastomer. Accordingly, this scenario was deemed inconsequential.

C4.2.4.2 Rupture of Main Feedwater Piping in Flood Zone AFW43

The direct consequence of the rupture of the 18-in. main feedwater line in AFW43 is a T2 event with automatic isolation of the flood source being initiated by a steam:feed mismatch. Before isolation is complete, up to 3876 gal. of water may be released. This volume, however, is insufficient to accumulate or cause further damage in AFW32 or AFW18-2. The event can therefore be regarded as a T2 event with a 4.9×10^{-6}/year frequency. Given this frequency, this scenario was considered no further.

C4.2.4.3 Rupture of Main Steam System Piping in Flood Zone AFW43

The direct consequence of the rupture of the 28-in. main steam lines in AFW43 is a T5 event with automatic isolation of the flood source being initiated by a steam:feed mismatch. However, because the valves in this flood zone are qualified for operation in a severe environment, there will be no other consequences. Given that the predicted frequency of MSS line rupture in flood zone AFW43 is $2. \times 10^{-5}$/yr and that this frequency is included in the 2×10^{-3}/yr frequency of T5 events, this scenario is inconsequential.

C4.2.4.4 Rupture of the Auxiliary Feedwater Steam Line in Flood Zones AFW43 or AFW32

The rupture of the 4-in. AFW steam line will render the steam-driven AFW pump unavailable. It will not, however, initiate a plant shutdown. Furthermore, the probability of the AFW steam turbine unavailability because of steam line rupture is estimated to be 1.6×10^{-5} percent (assuming a rupture rate of 2×10^{-5}/year and a 72 hour allowed outage before the plant must be shut down). In contrast, the calculated probability of AFW steam turbine unavailability is 0.029. The flood hazards resulting from a rupture of the auxiliary

feedwater steam line in flood zones AFW43 or AFW32 can therefore be characterized as being insignificant.

C4.2.4.5 Rupture of the Main Feedwater Line in Flood Zones AFW32 or AFW18-2

The rupture of the 18-in. main feedwater line in flood zone AFW32 will result in a steam:feed mismatch and closure of a valve in the feedwater line. While 3876 gal of water may be discharged before isolation is complete, only 4 in. of water will accumulate in AFW32 and 0.3 in. in AFW18-2. Such water levels will have no effect on equipment in these flood zones. The rupture of the main feedwater line will therefore result in a T2 event. Given the frequency of a rupture of the main feedwater line in AFW32 of 9×10^{-5}/year, this flooding scenario was examined no further.

The rupture of the 18-in. main feedwater piping in flood zone AFW18-2 can also treated as a T2 initiator with a predicted frequency of 3.2×10^{-5}/year. No additional flooding damage will result as the water level in AFW18-2 will not exceed 4.6 in. Given the 0.85/year predicted frequency of other T2 initiating events, this event can be regarded as being insignificant.

C4.2.4.6 Rupture of the Auxiliary Feedwater Steam Line in AFW18-1

The rupture of the auxiliary feedwater steam line in flood zone AFW18-1 will result in a temperature rise and the subsequent closure of the steam supply isolation valves. This will render the steam-turbine driven AFW pump unavailable. However, the other AFW pumps will not be affected by the steam release as they, and the steam generator level, pressure, and flow instrumentation, are qualified for operation in severe environments. Plant technical specifications allow 72 hours of operation if an AFW pump is unavailable. The failure of the AFW steam line poses no immediate threat to plant operations and was thus examined no further.

C4.2.4.7 Rupture of Condensate Water Line in Flood Zone AFW18-1

The rupture of the 6- and 8-in. lines from the condensate storage tank in flood zone AFW18-1 will result in the complete loss of all AFW pumps because of submergence or, possibly, spray damage. This event will therefore lead to the loss of the AFW system. Submergence damage to steam generator level, main steam pressure, and feedwater flow instrumentation is unlikely as these instruments are watertight and environmentally qualified. However, the rupture of the condensate may also result in a loss of condenser vacuum and thus in a possible loss of the main feedwater system and a plant trip. Should the plant not trip, plant technical specifications require that the plant be maintained in a stable configuration on loss of the AFW system. In these circumstances, therefore, a T2 or T3 event will result only if the operator elects to trip the reactor. Given a 3.4×10^{-4}/year estimated frequency of rupture of

the condensate line in flood zone AFW18-1 and the fact that core damage may occur should the reactor trip or be tripped and one more system fail, this event was examined in more detail.

C4.2.4.8 Rupture of City Water Line in Flood Zone AFW18-1

The consequences of the rupture of 6- or 8-in. city water lines in flood zone AFW18-1 are essentially identical to those of the rupture of the condensate lines but without the possible loss of the MFW system (i.e., a T3 event). Accordingly, this scenario was not developed further in light of its low frequency (5.4×10^{-5}/year) and the fact two additional systems would have to fail for core damage to occur.

C4.2.4.9 Rupture of Fire Protection System in Flood Zone AFW18-1

The rupture of the 3-in. fire protection system piping in flood zone AFW18-1 will result in the complete loss of all AFW pumps as a result of submergence within 10 min. Damage may occur sooner as a result of spray damage. Rupture of the 3-in. fire protection system piping will therefore lead to the loss of the AFW system. Submergence damage to steam generator level, pressure, and flow instrumentation will not occur, however. Plant technical specifications require that the plant be maintained in a stable configuration on loss of the AFW system. Therefore, in the absence of other failures while the AFW system is under repair, there is no need to pursue this scenario further. Should, however, the operator implement a manual shutdown because of the loss of the AFW system, the result will be a manual trip with main feedwater/condensate available (i.e., a T3 event). However, for core damage to occur, two other systems would have to fail also. Given an 5.1×10^{-5}/year estimated frequency of rupture of the fire protection system line in flood zone AFW18-1 and an estimated frequency of two additional systems failing of 10^{-4}/year, the frequency of fire protection system water line rupture leading to core damage is below the 10^{-8}/year cut-off. This event was therefore considered no further.

C4.2.5 TURBINE BUILDING

Flooding scenarios for the turbine building comprise failures in the service water, main steam, turbine building component cooling water, circulating water, fire protection, feedwater/condensate, auxiliary steam, city water, and primary water systems.

C4.2.5.1 Rupture of the Fire Protection System in the Turbine Building (Flood Zone TBL15)

The rupture of the 10-in. fire protection system water lines in the turbine building will result in the release of water at 7,500 gpm, the run out rate for the fire protection system pumps. While the control room staff will be immediately alerted to the problem, it was conservatively assumed that 10 min. will elapse before the rupture is isolated. The 75,000 gal. released in the interim will drain to the outlet pipe tunnel, condensate pump bay, and inlet bay as well as through multiple doors to the yard. In the absence of spray damage, this event can be regarded as a T2 event with a frequency of 1.3×10^{-4}/year. Given the predicted frequency of 0.85/year for other T2 events, this event can be regarded as being inconsequential if there are no other consequences.

However, the rupture of the 60-ft length of fire protection piping within 30 ft of the 6.9 switchgear may also damage switchgear initiating a loss of offsite power (T1) event in which there is no possibility of short term recovery of power. The frequency of such a rupture is 4.4×10^{-5}/year. As this frequency is very much smaller than the frequency of other causes of station blackout accompanied by non-recovery of power, it was eliminated as a source of concern.

Should the rupture of fire protection system piping occur in the section of line above the dike protecting door 201 to the control building, water may enter the switchgear room, flood zone CTL15-1, through the louver above and the gap under the switchgear room door. Given the 50-ft distance between the louver and the 480-V switchgear in flood zone CTL15-1, spray damage to the switchgear is unlikely. However, submergence damage is possible--assuming a 500 gpm flow through the open louvers and additional flow under the door between flood zones TBL15 and CTL15-1, the switchgear will be damaged in 6 min. if the drains in CTL15-1 fail to function. Furthermore, this damage may well be compounded by simultaneous spray damage to the 6.9-kV switchgear and MCC-312A eliminating the supply of offsite power and power from the Appendix R diesel.

Given the consequences of this event and its 1.8×10^{-6}/yr frequency, this scenario was selected for further examination.

C4.2.5.2 Rupture of the Turbine Building Closed Cooling Water System

The TBCCW system comprises a closed loop of 500 gal. capacity. It includes 4-in. piping and a head tank. While make-up to the head tank is provided by a 1-in city water line, make-up is not automatic and thus rupture of the TBCCW system will result in the rapid release of up to 500 gal. but no subsequent continued outflow. This event poses no risk of submergence damage to the equipment in the turbine building. Furthermore, TBCCW system rupture will not cause spray damage to switchgear. Accordingly, this event was considered no further.

C4.2.5.3 Rupture of the Main Feedwater System in Flood Zone TBL15

The rupture of the main feedwater system in the turbine building will result in the release of 3876 gal. of water before the steam:feedwater mismatch results in the isolation of the rupture. This volume of water will cause no flood damage to other equipment in the turbine hall. The result of the rupture of the MFW system is essentially a T2 event with a frequency far less than 0.85 events/year predicted for all causes. Accordingly, this event was examined no further.

C4.2.5.4 Rupture of the Condensate System in Flood Zone TBL15

The rupture of the condensate system in the turbine building will result in a rapid plant trip--a T2 event. As the predicted frequency of rupture is much less than the frequency of other T2 events, this event was considered no further.

C4.2.5.5 Rupture of the Service Water System in Flood Zone TBL15

The rupture of the 4-in. service water piping in the turbine building will result in a TSWS event. It can also cause spray damage to the 6.9-kV switchgear. This possibility, however, was explicitly considered in the development of TWSW event trees and, accordingly, is examined no further here.

C4.2.5.6 Rupture of the City Water System in Flood Zone TBL15

The rupture of the 1-in. city water system in the turbine building will result in a release of 47 gpm. Therefore, this event will result in neither submergence nor spray damage to the 6.9-kV switchgear. Accordingly, the event was eliminated as a source of concern.

C4.2.5.7 Rupture of the Main Steam System in Flood Zone TBL15

The rupture of the main steam system in the turbine building will result in the release of large quantities of steam before the steam:feedwater mismatch results in the isolation of the rupture. This steam may cause a failure of the 6.9-kV switchgear within the turbine building, causing a loss of offsite power. Steam released into the turbine building may also propagate to flood zone CTL33-1, damaging the dc power system. The frequency of this event is 9×10^{-5}/yr. However, as this scenario was modeled as a T5 initiator, it was examined no further here.

C4.2.5.8 Rupture of the Auxiliary Steam System in Flood Zone TBL15

The rupture of the auxiliary steam system in the turbine building will result in the release of significant quantities of steam that may cause a failure of the 6.9-kV switchgear within the turbine building, causing a loss of offsite power. As noted above, steam released into the turbine building may also propagate to flood zone CTL33-1, damaging the dc power system. The frequency of this event is 2.2×10^{-4}/yr. However, because this scenario was modeled in the loss-of-offsite power event and fault trees, it was examined no further in this internal flooding analysis.

C4.3 QUANTITATIVE ANALYSIS

A number of flooding scenarios remain after screening (Table 4.3.1.1). The rigorous quantification of these will now be described.

C4.3.1 DETAILED ASSESSMENT OF BREAK FREQUENCY

In the screening analysis, two conservative assumptions were made:

- All pipe and valve ruptures were assumed to be guillotine ruptures
- Line rupture frequency data included all ruptures that resulted in release rates exceeding 50 gpm [7, 8].

The conservatism in these assumptions results from the facts that the flooding scenarios of concern require flow rates considerably in excess of 50 gpm and that most ruptures result in flow rates lower than those predicted assuming guillotine rupture [3,7,9]. Two approaches can be taken to address the conservatism of the screening analysis: use a lower release rate in conjunction with the line and component rupture data from Eide et al. [7] and Jamali [8]; or use a frequency/rate of release distribution curve.

Table 4.3.1.1

Significant Flooding Scenarios that May Lead to Core Damage

C4.2.1.2	Rupture of non-essential service water system in flood zone PAB55
C4.2.2.2	Rupture of instrument air component cooling water system in flood zones CTL33 or CTL15-1
C4.2.2.3	Rupture of service water system in flood zone CTL15-1
C4.2.2.4	Rupture of fire protection system in the deluge station (flood zone CTL15-1)
C4.2.2.5	Rupture of city water system in flood zone CTL15-2
C4.2.2.6	Rupture of service water system in flood zone CTL15-2
C4.2.2.8	Rupture of fire protection system in flood zone CTL15-3
C4.2.4.7	Rupture of condensate water line in flood zone AFW18-1
C4.2.5.1	Rupture of fire protection system in flood zone TBL15

Justification for selecting a smaller release rate for the low energy piping of concern in internal flooding is provided by NRC Standard Review Plan 3.6.1 and Branch Technical Position ASB 3-1 and its appendices. This plan recomends that discharge be assumed to occur through a through-the-wall crack of much smaller area than that assumed in guillotine rupture. However, limiting maximum release rates to values below the flow rates achieved following guillotine rupture prejudges the mechanism of failure and precludes even the possibility of core damage accident sequences being initiated by internal flooding in scenarios in which guillotine rupture but not through-the-wall cracks initiate the accident sequence. Such an approach is less than conservative because catastrophic failures are more likely to result from operator error or design and construction errors (such as water hammer, the improper handling of dynamic loads, or undetected fabrication errors) than from fatigue or conventional flaw initiation and growth [10]. This approach also ignores the possibility of lesser cracks growing to guillotine ruptures if subjected to dynamic loads. For these reasons it was judged more rigorous to proceed using the empirical leak rate/frequency distribution developed by Prugh [9].

Prugh defined a probability density function for release rate in terms of the release rate resulting from guillotine rupture:

$$f = f_G\left(\frac{w}{2w_G - w}\right)^{-n} \quad (1)$$

where:

f_G = probability density for guillotine rupture,

w is the flow rate,

w_G is the flow rate for guillotine rupture, and

n is an exponent (0.5 for lines, 1.0 for flanges, and 0.9 for valves).

Combining this distribution with the rupture data from Eide et al. [7] or Jamali [8], expressing flow rates in gpm, the probability of rupture can be expressed as:

$$\int_{50}^{w_G} f_G\left(\frac{w}{2w_G - w}\right)^{-n} dw \quad (2)$$

Therefore, the probability of rupture resulting in a flow rate greater than w_*, the minimum flow rate of concern, is:

$$p(w_*) = \frac{\int_{w_*}^{w_G} \left(\frac{w}{2w_G - w}\right)^{-n} dw}{\int_{50}^{w_G} \left(\frac{w}{2w_G - w}\right)^{-n} dw} \quad (3)$$

By determining the minimum flow rate of concern for each of the remaining accident scenarios, the frequencies of the initiating events can be more closely defined.

For releases that trigger an alarm and an immediate operator response, the minimum flow rate of concern is the minimum flow rate that will initiate the accident sequence before the flow can be terminated or mitigated. Such releases include ruptures of fire protection system lines and ruptures of the service water headers. However, for floods that will be detected by plant staff only as they make their rounds (assuming it is detected before accident sequence initiation), the situation is more complicated. Consider the case in which plant staff enter zones with an interval T between inspections. The minimum flow rate of concern will vary according to the time at which the release occurs (i.e., according to the time remaining before plant staff arrive on their rounds). Furthermore, there will be a period immediately prior to the arrival of plant staff in the flood zone during which even flow resulting from guillotine rupture will be insufficient to cause damage before flooding is terminated or mitigated. This situation can be described mathematically as follows:

Probability of accident sequence initiation, given rupture

$$= \frac{1}{T} \int_0^{T_*} p(w_*(T-t)) \, . \, dt \quad (4)$$

where

T_* = latest time in interval T at which flooding (assuming a guillotine rupture) can cause accident initiation

$w_*(T-t)$= the minimum flow rate required over a period T-t to initiate the accident sequence

$p(w_*)$ = probability that the flow rate exceeds the flow rate, w_* [defined in equation (3)].

The resulting revised initiating event frequencies calculated using equations (3) and (4) are presented in Table 4.3.1.2. It should be noted that the use of the -0.5 exponent in equations (3) and (4) will lead to a higher relative frequency of large release rates than was assumed in the Surry IPE.

Table 4.3.1.2
Recalculation of Internal Flooding Event Frequencies

Scenario	Event description	Do drains function ?	Flow rate with guillotine rupture (gpm)	Time to mitigate /inspection interval (sec.)	Rupture frequency (/year)	Probability of accident sequence initiation given rupture	Drain status probability	Initiator frequency (/year)
C4.2.1.2	PAB55--rupture NESW header	No	22500	600	3.3×10^{-5}	0.043	0.1	1.43×10^{-6}
		Yes	22500	600		0.043	0.9	
C4.2.2.2	CTL15-1--IACCW rupture	No	170	28800	2.36×10^{-4}	0.894	0.1	2.11×10^{-5}
C4.2.2.3	CTL15-1--SWS rupture	No	1359	28800	7.7×10^{-6}	0.959	0.1	5.36×10^{-6}
		Yes	1359	28800		0.667	0.9	
C4.2.2.4	CTL15-1--FPS rupture	No	7500	600	3.4×10^{-5}	0.810	0.1	2.62×10^{-5}
		Yes	7500	600		0.762	0.9	
C4.2.2.5	CTL15-2--city water line rupture	No	256	28800	2.1×10^{-5}	0.447	0.1	9.30×10^{-7}
C4.2.2.6	CTL15-2--SWS rupture	No	1359	28800	8×10^{-6}	0.777	0.1	2.91×10^{-6}
		Yes	1359	28800		0.314	0.9	
C4.2.2.8	CTL15-3--fire protection system rupture	No	2492	600	8.3×10^{-5}	0.378	0.1	2.29×10^{-5}
		Yes	2492	600		0.265	0.9	
C4.2.4.7	AFW18-1--condensate line rupture	No	8588	600	9.8×10^{-5}	0.640	0.1	5.57×10^{-5}
		Yes	8588	600		0.558	0.9	
C4.2.5.1	TBL15--fire protection system rupture	No	7500	600	2×10^{-6}	0.322	0.1	3.51×10^{-7}
		Yes	7500	600		0.174	0.9	

C4.3.2 EVENT TREES

The nine potentially significant flooding scenarios identified from the screening analysis were grouped into four sets:

- Rupture of the non-essential service water header on the 55-ft elevation of the primary auxiliary building (C4.2.1.2). This event devolves into a loss-of-component-cooling water event coupled with the failure of the RHR pumps (and thus the ability to sustain long-term core cooling).

- The failure of 480-Vac switchgear in the control building switchgear room resulting in both a reactor trip and a non-recoverable loss of safety-related switchgear. Damage to the 480-Vac switchgear can be caused by:

  - Rupture of the IACCW system in the switchgear room coupled with a failure of the drains (C4.2.2.2)

  - Rupture of the service water system in the switchgear room (C4.2.2.3), the 15-ft elevation HVAC room (C4.2.2.6)

  - Rupture of the fire protection system in the deluge room adjacent to the switchgear room (C4.2.2.4), or the control building east stairwell (C4.2.2.8)

  - Rupture of the city water line in the control building 15-ft elevation HVAC room coupled with a failure of the drains (C4.2.2.5).

  In these scenarios, damage can be prevented by operation of the turbine-driven AFW pump and alignment of alternative safe shutdown equipment to MCC-312A.

- Rupture of fire protection system piping above the entrance to the fire protection system in the turbine building above the entrance to the switchgear room (C4.2.5.1). This rupture might result in water being sprayed into the switchgear room (where it might caused submergence damage) and in spray damage to the 6.9-kV switchgear and MCC-312A, the Appendix R diesel generator switchgear.

- Rupture of the condensate line in the auxiliary feedwater pump room (C4.2.4.7). This event might cause loss of both the auxiliary and main feedwater systems.

Event trees were constructed for the four sets of flood scenarios.

C4.3.2.1 Event Tree for Rupture Non-Essential Service Water System in Flood Zone PAB55

The event tree for rupture of the non-essential service water header coupled with RHR pump failure is shown in Figure 4.3.2.1. The top events shown in the event tree are defined as follows:

Transient Initiator (TP55). Rupture of the non-essential service water header in flood zone PAB55. Subsequently, the RHR pumps suffer flood damage and the operator initiates a manual scram.

RPS Scram (C). Success implies all, or all but one, control rods are inserted into the reactor core. Failure leads to an anticipated transient without scram (ATWS) event.

Offsite ac Power Available (B1). Success implies offsite ac power is available. Failure leads to a demand for onsite ac power.

Pressurizer PORV Recloses After Opening During Transient (P). Success implies reclosure of open PORVs when RCS pressure drops below the closure setpoint. The failure of one or two PORVs to reclose is designated as a "P" event.

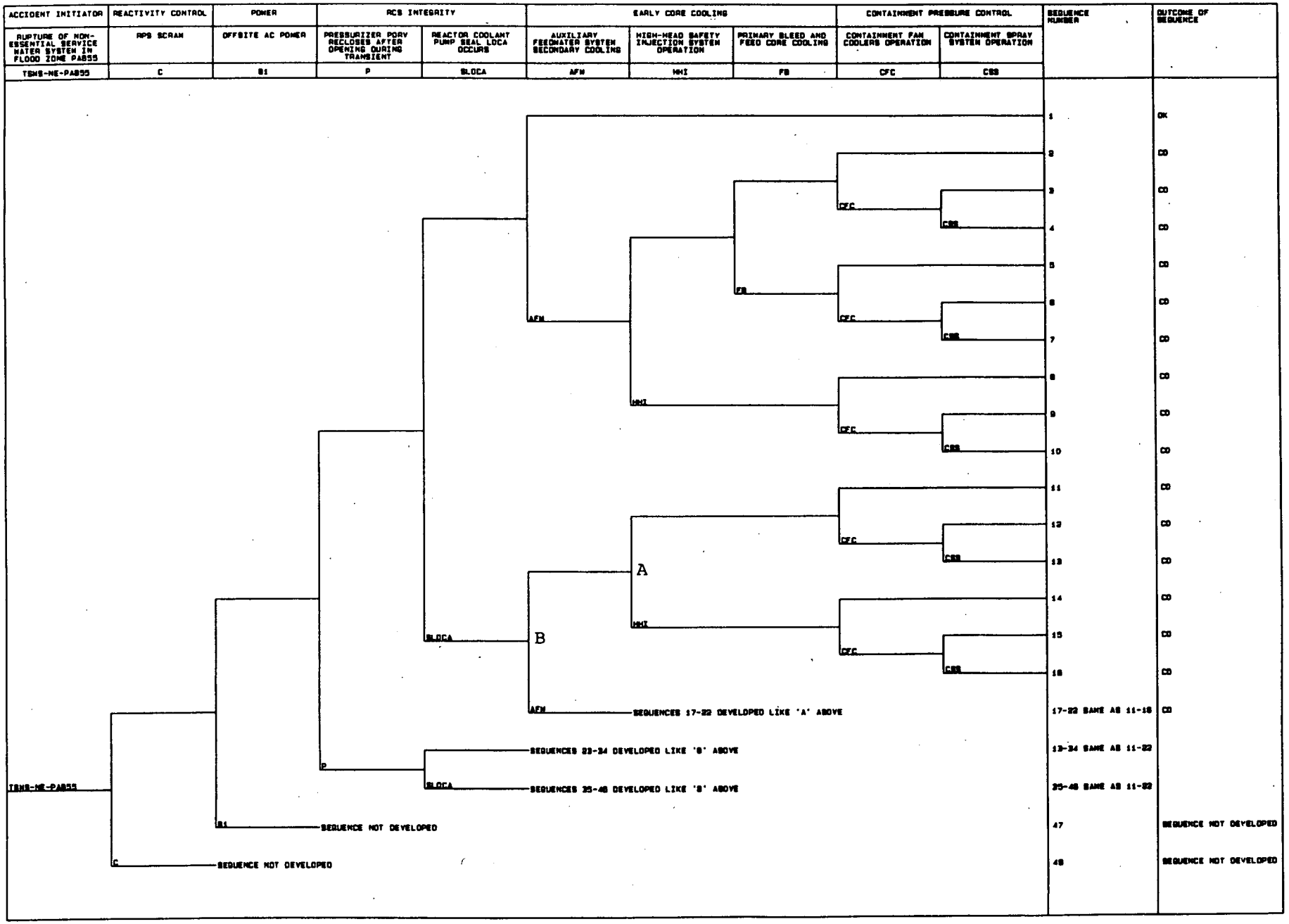
Reactor Coolant Pump Seal LOCA Occurs (SLOCA). Success implies back-up city water flow is aligned within 60 minutes to restore charging pump cooling and maintain charging pump operation for RCP seal injection. Failure leads to RCP seal LOCAs.

Auxiliary Feedwater System Secondary Cooling (AFW). Success of AFW in removing core heat implies that a motor- or steam-driven pump provides feedwater to at least one steam generator.

Primary Cooling Bleed-and-Feed (FB). This event is considered in sequences in which AFW secondary cooling fails. Success implies the manual opening of the PORVs to reduce RCS pressure (bleed) and the injection of water via HHSI pumps for core cooling (feed).

High-Head Safety Injection (HHI). This event is considered for sequences that entail bleed-and-feed operation, a stuck-open PORV, or a RCP seal LOCA. Success implies that at least one pump injects water into at least one 2-in. RCS cold leg. Failure requires that alternative core cooling be established.

Containment Fan Coolers (CFC). Success of the fan coolers in containment decay heat removal implies the operation of at least three fan coolers in their emergency mode and of two essential service water pumps. Failure requires alternative methods for containment decay heat removal. Furthermore, loss of service water precludes long-term decay heat removal by the containment fan coolers.



KEY:

OK - CORE COOLANT IS PROVIDED, CONTAINMENT HEAT REMOVAL IS PROVIDED

CD - CORE DAMAGE

Figure 4.3.2.1 PAB55 Non-Essential Service Water System Rupture Event Tree

Containment Spray System (CSS). Success implies an adequate RWST inventory and the use of at least one containment spray pump to provide early containment decay heat removal. Containment spray operation can continue after RWST depletion if a portion of the long-term recirculation core cooling flow is diverted to the containment spray headers. However, loss of component cooling water and the RHR pumps both preclude long-term decay heat removal by the RHR exchangers and thus the use of containment recirculation spray for containment pressure control.

Transient Sequences. In defining a sequence, a slash (/) preceding an event designator indicates the event is a success. Asterisks (*) separate the event designators.

Sequence TP55-1: TP55*/C*/B1*/P*/SLOCA*/AFW. A rupture of the non-essential service water header in flood zone PAB55 causes a loss of component cooling water transient (TP55). Plant procedures require a manual reactor trip. The reactor scrams (/C). Offsite ac power to the 6.9-kV buses is available (/B1). The pressurizer PORVs reclose, if opened (/P). To prevent RCP seal degradation following the loss of component cooling to the RCP seals and charging pumps, the operator aligns the city water back-up cooling supply to the charging pumps, restoring charging pump seal injection flow to the RCP seals (/SLOCA). The main feedwater system is tripped. The AFW system is initiated and removes core decay heat through the steam generators (/AFW). Continued AFW operation allows eventual hot shutdown. A safe core and containment result.

Sequence TP55-2: TP55*/C*/B1*/P*/SLOCA*AFW*/HHI*/FB*/CFC. Same as sequence TP55-1 except that the AFW system fails to remove core decay heat through the steam generators (AFW). Because RCS pressure remains above the high-head safety injection system pump shut-off head, the operator opens all PORVs, effectively inducing an RCS LOCA. As RCS water inventory decreases, RCS pressure falls enough to allow high-head safety injection system core cooling (/HHI) and RCS bleed-and-feed operation (/FB). Subsequently, with containment pressure increasing because of PORV opening, the fan coolers start in their emergency mode of operation to provide containment overpressure control (/CFC). Because the loss of component cooling water causes the recirculation system pumps to be unavailable for long-term core cooling and both RHR pumps are unavailable, long-term core cooling cannot be maintained. Core damage results.

Sequence TP55-3: TP55*/C*/B1*/P*/SLOCA*AFW*/HHI*/FB*CFC*/CSS. Same as sequence TP55-2 except that the fan coolers fail to start on high containment pressure (CFC). The containment spray system (/CSS) then initiates when containment pressure reaches 22.5 psig. However, upon RWST depletion, no effective means of containment heat removal exists. This sequence results in core damage.

Sequence TP55-4: TP55*/C*/B1*/P*/SLOCA*AFW*/HHI*/FB*CFC*CSS. Same as sequence TP55-3 except that early containment spray operation fails. Core damage results.

Sequence TP55-5: TP55*/C*/B1*/P*/SLOCA*AFW*FB*/CFC. Same as sequence TP55-2 except that the PORVs fail to open when the operator attempts to establish bleed-and-feed operation (FB). This prevents operation of the high-head safety injection system. With low-head safety injection precluded, this sequence results in core damage.

Sequence TP55-6: TP55*/C*/B1*/P*/SLOCA*AFW*FB*CFC*/CSS. Same as sequence TP55-5 except that the fan coolers fail to start (CFC) on high containment pressure. Containment pressure control is then provided by the containment spray system (/CSS). This sequence results in core damage.

Sequence TP55-7: TP55*/C*/B1*/P*/SLOCA*AFW*FB*CFC*CSS. Same as sequence TP55-5 except that both the fan coolers and containment spray system fail to provide early containment pressure control (CFC*CSS). This sequence results in core damage.

Sequences TP55-8 to TP55-10. Same as sequences TP55-5 to TP55-7 except that bleed-and-feed operation is precluded because high-head safety injection fails (HHI). Unable to depressurize the RCS for low-head injection, RCS boil-off occurs at the PORV setpoint. These sequences result in core damage.

Sequences TP55-11 to TP55-16. Same as sequences TP55-2 to TP55-7 except that auxiliary feedwater is available for secondary heat removal (/AFW) but alignment of back-up city water cooling supply to the charging pumps fails. With loss of component cooling water and no charging pump flow to the RCP seals, seal degradation and RCP seal LOCAs occur (SLOCA). Core damage results in all cases.

Sequences TP55-17 to TP55-22. Same as sequences TP55-11 to TP55-16 except that auxiliary feedwater is unavailable for secondary heat removal (AFW). Core damage results in all cases.

Sequences TP55-23 to TP55-34. Same as sequences TP55-11 to TP55-22 except that a single PORV fails to reclose, causing a breach in RCS integrity. No seal LOCA occurs but core damage results.

Sequences TP55-35 to TP55-46. Same as sequences TP55-23 to TP55-34, except that a RCP seal LOCA occurs in addition to the stuck-open PORV. Core damage results.

Sequence TP55-47: TP55*/C*B1. A loss of component cooling water transient (TP55) occurs. A manual reactor trip is required and the reactor scrams (/C). Subsequently, offsite ac power to the 6.9-kV buses is unavailable (B1). At this point the sequence frequency is $<10^{-8}$/year, and additional failures leading to core damage would result in still lower probabilities. Therefore, the sequence was not developed further.

Sequence TP55-48: TP55*C. A loss of component cooling water transient (TP55) occurs, requiring a manual reactor trip. The control rods are not inserted into the core (C). At this

point, the sequence frequency is ~10^{-8}/year, and any additional failures leading to core damage would result in a lower frequency. Therefore, the sequence was not developed further.

C4.3.2.2 Event Tree for Loss of 480-Vac Switchgear in Flood Zone CTL15-1

The event tree for loss of the 480-Vac switchgear is shown in Figure 4.3.2.2. The top events shown in the event tree are defined as follows:

Transient Initiator (TC15). Flooding causes non-recoverable damage to the 480-Vac switchgear in the control building switchgear room.

Pressurizer PORV Recloses After Opening During Transient (PORV). Success implies reclosure of open PORVs when RCS pressure drops below the closure setpoint. The failure of one or two PORVs to reclose is designated as a "PORV" event.

Power is Supplied from MCC-312 (MCC-312A). MCC-312A provides power to CCW pump 32, service water pump 38, and charging pumps 31 or 32. MCC-312A in turn receives power from the 6.9-kV power supply (bus 1).

RCP Seal LOCA (RCP-LOCA). During this incident, insufficient seal cooling exposes the RCP seals to RCS pressure and temperature. Given RCP seal materials, the seals may fail and an RCP seal LOCA will result. Success for this event implies that no RCP seal LOCA occurs; failure implies an RCP seal LOCA occurs and the core is uncovered.

Auxiliary Feedwater System Turbine-Driven Secondary Cooling (AFWT). Core heat removal during this incident implies the use of the steam-turbine-driven AFW pump to provide feedwater to at least one steam generator.

The transient sequences follow. In defining a sequence, a slash (/) preceding an event designator indicates the event is a success. Asterisks (*) separate the event designators.

Sequence TC15-2: TC15*/PORV*/MCC-312A*/RCP-LOCA*/AFWT. Control building switchgear suffers flood damage. The reactor is shut down. Should the pressurizer PORVs open, they reclose (/PORV). Power is supplied from 6.9-kV buses by MCC-312A to alternative safe shutdown equipment (/MCC-312A). RCP seal failures do not occur (/RCP-LOCA). Without main feedwater, operation of the auxiliary feedwater system is required. Although the loss of switchgear renders all motor-driven AFW pumps inoperable, the steam-turbine-driven AFW pump starts and removes core decay heat through the steam generators (/AFWT). No core damage results.

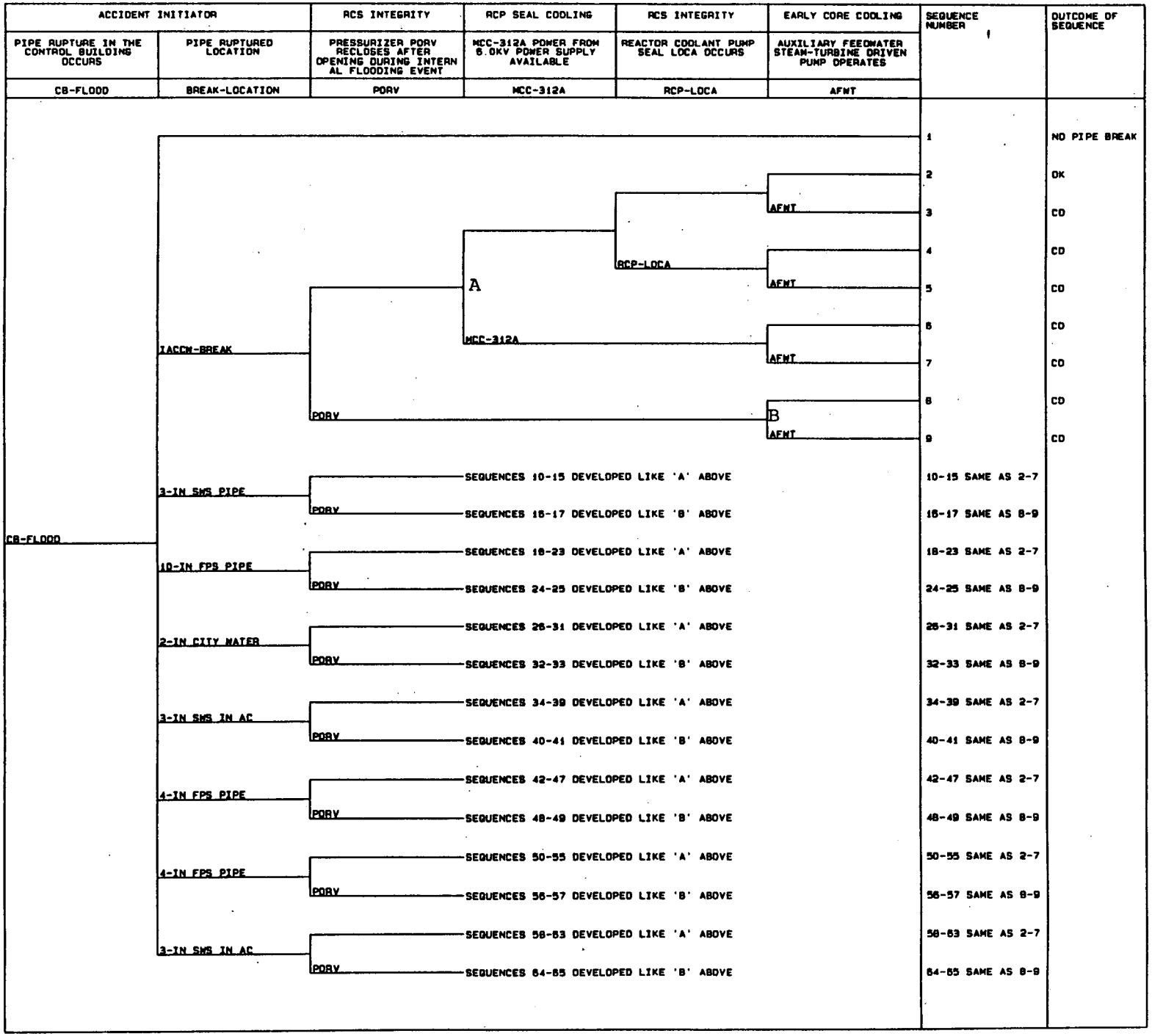


Figure 4.3.2.2 Control Building Switchgear Room Flooding Event Tree

Sequence TC15-3: TC15*/PORV*/MCC-312A*/RCP-LOCA*AFWT. Same as sequence TC15-2 except that the turbine-driven AFW pump fails. Unable to remove core decay heat, core damage results.

Sequences TC15-4 and TC15-5. Same as sequences TC15-2 and TC15-3 except that an RCP seal LOCA occurs. Core damage results.

Sequence TC15-6: TC15*/PORV*MCC-312A*/AFWT. Control building switchgear suffers flood damage. The reactor is shut down. If opened, the PORVs reclose (/PORV). Power is not supplied to MCC-312A (MCC-312A). RCP seal failures occur and the core is uncovered. Core damage results.

Sequence TC15-7: TC15*/PORV*MCC-312A*AFWT. Same as sequence TC15-6, except that the steam-turbine driven AFW pump fails. Core damage results.

Sequence TC15-8: TC15*PORV*/AFWT. Control building switchgear suffers flood damage. The reactor is shut down. A pressurizer PORV opens but fails to reclose (PORV). Core damage results.

Sequence TC15-9: TC15*PORV*AFWT. Same as sequence TC15-8, except that the steam-turbine driven AFW pump fails. Core damage results.

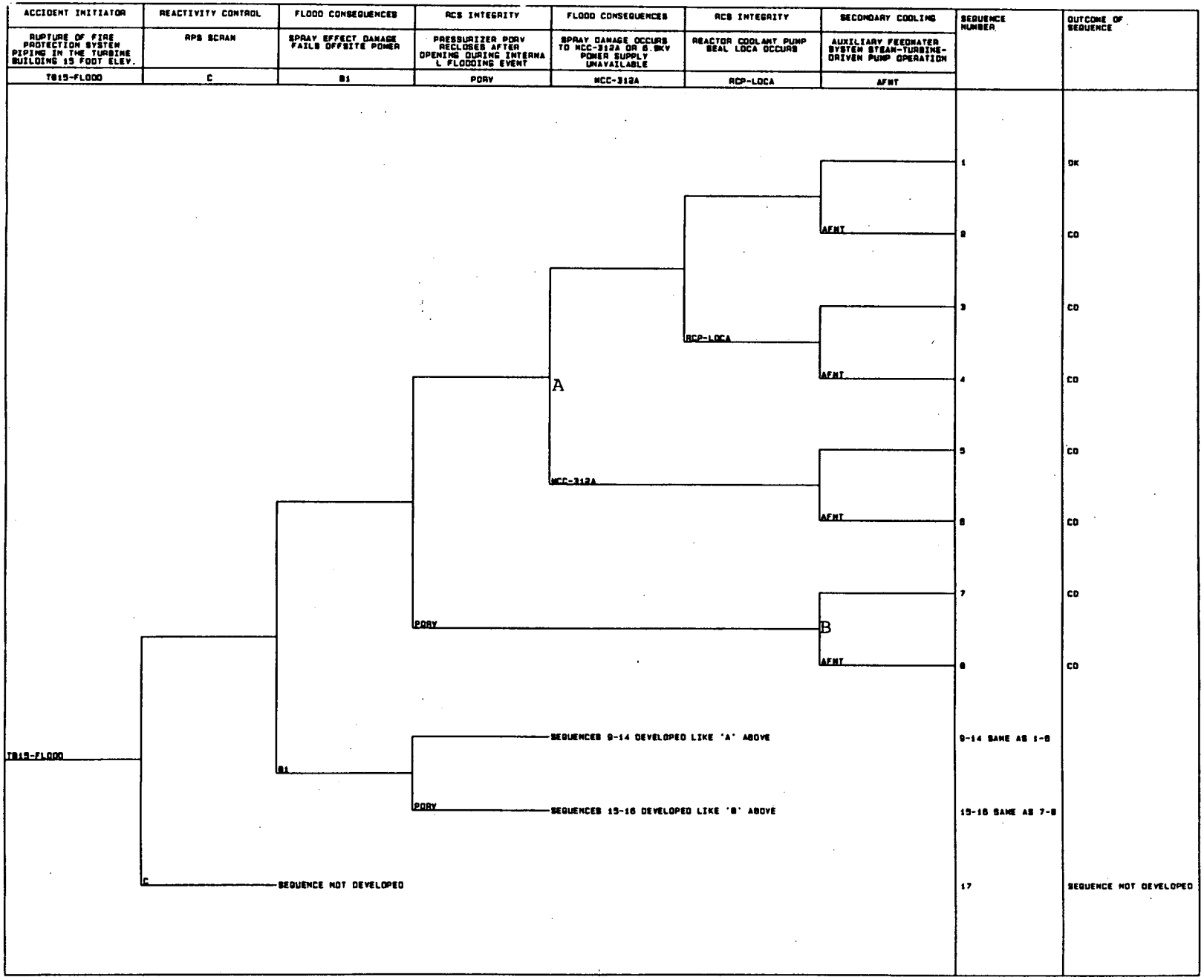
C4.3.2.3 Event Tree for Rupture of the Turbine Building Fire Protection System and Subsequent Loss of 480-Vac Switchgear in Flood Zone CTL15-1

The event tree for rupture of the turbine building fire protection system and loss of the 480-Vac switchgear is shown in Figure 4.3.2.3. The top events shown in the event tree are defined as follows:

Transient Initiator (TT15). Flooding initiated by the rupture of fire protection system piping in the turbine building outside the control building switchgear room causes non-recoverable damage to the 480-Vac switchgear.

RPS Scram (C). Success implies all, or all but one, control rods are inserted into the reactor core. Failure leads to an anticipated transient without scram (ATWS) event.

Offsite ac Power Available (B1). Success implies offsite ac power is available. Failure may be caused by spray damage resulting from the initiating event. Failure required the starting and alignment of the Appendix R diesel generator.



KEY:

OK - CORE COOLANT IS PROVIDED, CONTAINMENT HEAT REMOVAL IS PROVIDED

CD - CORE DAMAGE

Figure 4.3.2.3 Turbine Building Fire Protection System Rupture Event Tree

Pressurizer PORV Recloses After Opening During Transient (PORV). Success implies reclosure of open PORVs when RCS pressure drops below the closure setpoint. The failure of one or two PORVs to reclose is designated as a "PORV" event.

Power from MCC-312A Unavailable (MCC-312A). Spray damage or random failures render MCC-312 unable to provide power to CCW pump 32, service water pump 38, and charging pumps 31 or 32.

RCP Seal LOCA (RCP-LOCA). During this incident, insufficient seal cooling exposes the RCP seals to RCS pressure and temperature. Given RCP seal materials, the seals may fail and an RCP seal LOCA will result. Success for this event implies that no RCP seal LOCA occurs; failure implies an RCP seal LOCA occurs and the core is uncovered.

Auxiliary Feedwater System Turbine-Driven Secondary Cooling (AFWT). Core heat removal during this incident implies the use of the steam-turbine-driven AFW pump to provide feedwater to at least one steam generator.

The transient sequences follow. In defining a sequence, a slash (/) preceding an event designator indicates the event is a success. Asterisks (*) separate the event designators.

Sequence TT15-1: TT15*/C*/B1*/PORV*/MCC-312A*/RCP-LOCA*/AFWT. Control building switchgear suffers flood damage as a result of the rupture of fire protection system piping in the turbine building. The reactor scrams (/C). The 6.9-kV switchgear suffer no spray damage and offsite power continues to be available (/B1). If opened, the pressurizer PORVs reclose (/PORV). The 6.9-kV buses supply power to MCC-312A (/MCC-312A). RCP seal failures do not occur (/RCP-LOCA). The steam-turbine-driven AFW pump starts and removes core decay heat through the steam generators (/AFWT). No core damage results.

Sequence TT15-2: TT15*/C*/B1*/PORV*/MCC-312A*/RCP-LOCA*AFWT. Same as sequence TT15-1 except that the turbine-driven AFW pump fails. Unable to remove core decay heat, core damage results.

Sequences TT15-3 and TT15-4. Same as sequences TT15-1 and TT15-2 except that an RCP seal LOCA occurs. Core damage results.

Sequence TT15-5: TT15*/C*/B1*/PORV*MCC-312A*/AFWT. Control building switchgear suffers flood damage as a result of the rupture of fire protection system piping in the turbine building. The reactor scrams (/C). The 6.9-kV switchgear suffers no spray damage (/B1). If opened, the pressurizer PORVs reclose (/PORV). Power from MCC-312A is unavailable (MCC-312A) and as a result an RCP seal LOCA occurs. The steam-turbine-driven AFW pump starts and removes core decay heat through the steam generators (/AFWT). Core damage results.

Sequence TT15-6: **TT15*/C*B1*/PORV*MCC-312A*AFWT**. Same as sequence TT15-5 except that the turbine-driven AFW pump fails. Core damage results.

Sequence TT15-7: **TT15*/C*/B1*PORV*/AFWT**. Control building switchgear suffers flood damage as a result of the rupture of fire protection system piping in the turbine building. The reactor scrams (/C). The 6.9-kV switchgear does not suffer spray damage (/B1). Pressurizer PORVs open but fail to reclose (PORV). The steam-turbine-driven AFW pump starts and removes core decay heat through the steam generators (/AFWT). Core damage results.

Sequence TT15-8: **TT15*/C*/B1*PORV*AFWT**. Same as sequence TT15-5 except that the turbine-driven AFW pump fails. Core damage results.

Sequence TT15-9 to TT15-16. Same as sequences TT15-1 to TT15-8 except that spray damage renders the 6.9-kV switchgear unavailable.

Sequence TT15-17: TT15*C. Control building switchgear suffers flood damage as a result of the rupture of fire protection system piping in the turbine building. The control rods are not inserted into the core (C). At this point, the sequence frequency is $\sim 10^{-8}$/year, and any additional failures leading to core damage would result in a lower frequency. Therefore, the sequence was not developed further.

C4.3.2.4 Event Tree for Rupture of the Condensate Line in the Auxiliary Feedwater Pump Room, Flood Zone AFW18-1

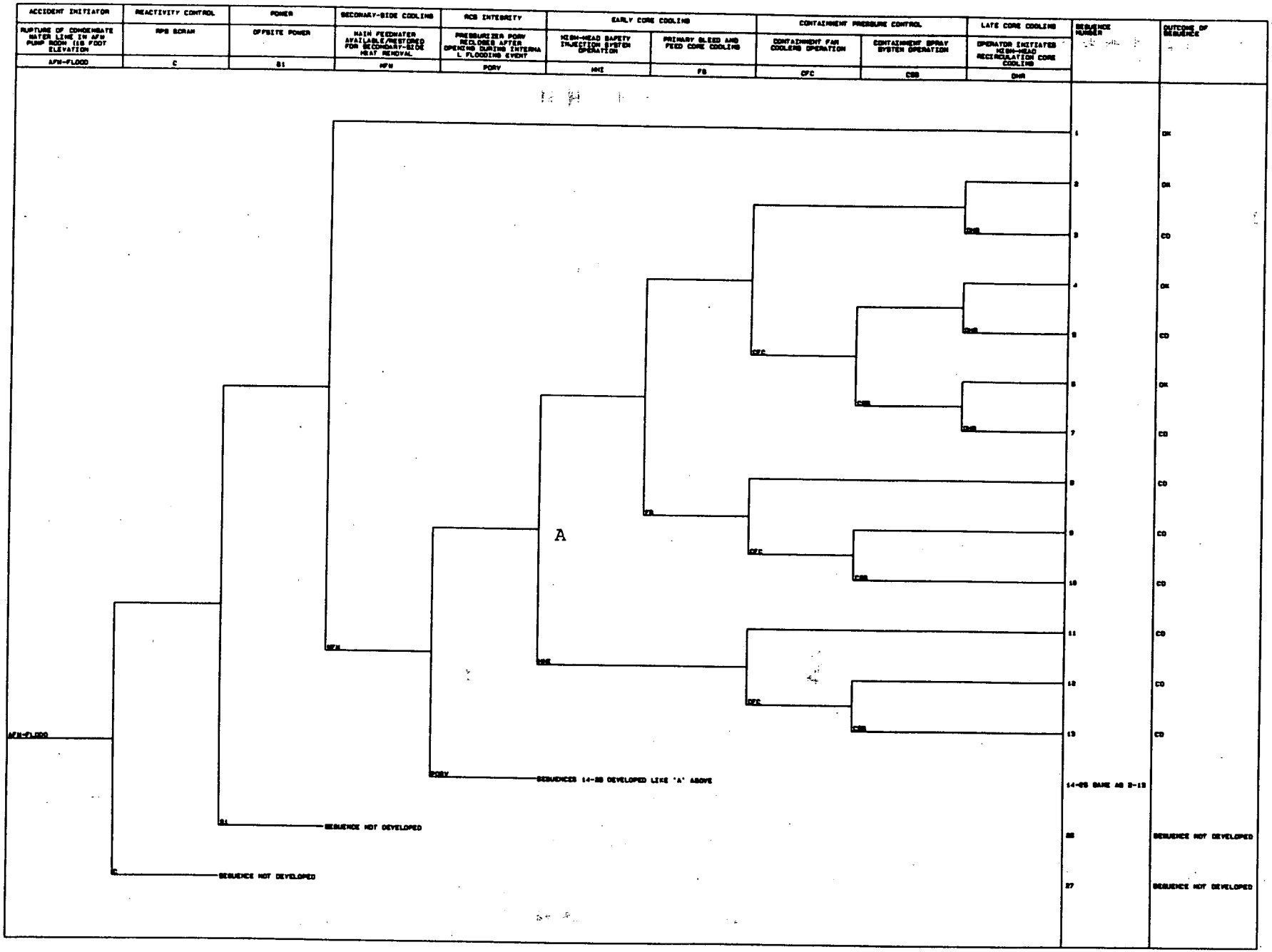
The event tree for rupture of the condensate line in flood zone AFW18-1 is shown in Figure 4.3.2.4. The top events shown in the event tree are defined as follows:

Transient Initiator (TA18). Flooding initiated by the rupture of condensate line in the auxiliary feedwater pump room, AFW18-1. This event causes loss of the AFW system and potential loss of the MFW system.

RPS Scram (C). Success implies all, or all but one, control rods are inserted into the reactor core. Failure leads to an anticipated transient without scram (ATWS) event.

Offsite ac Power Available (B1). Success implies offsite ac power is available. Failure leads to a demand for onsite ac power.

Main Feedwater System (MFW). Success implies that one main feedwater pump provides feedwater to at least one steam generator. Failure requires bleed-and-feed core cooling.



KEY:

OK - CORE COOLANT IS PROVIDED, CONTAINMENT HEAT REMOVAL IS PROVIDED

CD - CORE DAMAGE

Figure 4.3.2.4 Auxiliary Feedwater Pump Room Pipe Rupture Event Tree

Pressurizer PORV Recloses After Opening During Transient (PORV). Success implies reclosure of open PORVs when RCS pressure drops below the closure setpoint. The failure of one or two PORVs to reclose is designated as a "PORV" event.

Primary Cooling Bleed-and-Feed (FB). Success implies the manual opening of the PORVs to reduce RCS pressure (bleed) and the injection of water via HHSI pumps for core cooling (feed).

High-Head Safety Injection (HHI). This event is considered for sequences that entail bleed-and-feed operation, a stuck-open PORV, or a RCP seal LOCA. Success implies that at least one pump injects water into at least one 2-in. RCS cold leg. Failure requires that alternative core cooling be established.

Containment Fan Coolers (CFC). Success of the fan coolers in containment decay heat removal implies the operation of at least three fan coolers in their emergency mode and of two essential service water pumps. Failure requires alternative methods for containment decay heat removal.

Containment Spray System (CSS). Success implies an adequate RWST inventory and the use of at least one containment spray pump to provide early containment decay heat removal. Containment spray operation can continue after RWST depletion if a portion of the long-term recirculation core cooling flow is diverted to the containment spray headers.

High-Head Recirculation Core Cooling (OHR). Success implies that high-head recirculation core cooling is established to remove decay heat. Failure leads to the absence of long-term decay heat removal and core damage.

The transient sequences follow. In defining a sequence, a slash (/) preceding an event designator indicates the event is a success. Asterisks (*) separate the event designators.

Sequence TA18-1: TA18*/C*/B1*/MFW. The condensate return line in AFW18-1 ruptures, causing loss of the AFW system. The operators elect to trip the reactor. The reactor scrams (/C). Offsite ac power to the 6.9-kV buses is available (/B1). Secondary core cooling is maintained using the main feedwater system (/MFW). Hot shutdown and a safe core and containment result.

Sequence TA18-2: TA18*/C*/B1*MFW*/PORV*/HHI*/FB*/CFC*/OHR. Same as sequence TA18-1 except that flood damage or other problems preclude the use of the MFW system to provide secondary cooling. Instead core cooling is established using high-head safety injection system core cooling (/HHI) and RCS bleed-and-feed operation (/FB). If opened, the pressurizer PORVs reclose (/PORV). Subsequently, with containment pressure increasing because of PORV opening, the fan coolers start in their emergency mode of operation to provide containment overpressure control (/CFC). The operators initiate high-head recirculation core cooling (/OHR). A safe core and containment result.

Sequence TA18-3: TA18*/C*/B1*MFW*/PORV*/HHI*/FB*/CFC*OHR. Same as sequence TA18-2 except that the operators fail to initiate high-head recirculation core cooling (OHR). Core damage results.

Sequence TA18-4: TA18*/C*/B1*MFW*/PORV*/HHI*/FB*CFC*/CSS*/OHR. Same as sequence TA18-2 except that the fan coolers fail to start on high containment pressure (CFC). The containment spray system (/CSS) then initiates when containment pressure reaches 22.5 psig. A safe core and containment result.

Sequence TA18-5: TA18*/C*/B1*MFW*/PORV*/HHI*/FB*CFC*/CSS*OHR. Same as sequence TA18-4 except that the operators fail to initiate high-head recirculation core cooling (OHR). Core damage results.

Sequence TA18-6: TA18*/C*/B1*MFW*/PORV*/HHI*/FB*CFC*CSS*/OHR. Same as sequence TA18-4 except that early containment spray operation fails (CSS). A safe core and containment result.

Sequence TA18-7: TA18*/C*/B1*MFW*/PORV*/HHI*/FB*CFC*CSS*OHR. Same as sequence TA18-6 except that the operators fail to initiate high-head recirculation core cooling (OHR). Core damage results.

Sequences TA18-8 to TA18-10: Same as sequences TA18-2 to TA18-7 except that the operator fails to establish bleed-and-feed operation (FB). This prevents operation of the high-head safety injection system and thus recirculation core cooling, regardless as to whether the containment spray and containment fan coolers function. Core damage results.

Sequences TA18-11 to TA18-13. Same as sequences TA18-8 to TA18-10 except that bleed-and-feed operation and recirculation core cooling is precluded because high-head safety injection fails (HHI). Core damage results.

Sequences TA18-14 to TA18-25. Same as sequences TA18-2 to TA18-13 except that the pressurizer PORVs fail to reclose after opening (PORV).

Sequence TA18-26: TA18*/C*B1. The condensate line ruptures in AFW18-1. The reactor scrams (/C). Subsequently, offsite ac power to the 6.9-kV buses is unavailable (B1). At this point the sequence frequency is $<10^{-8}$/year, and additional failures leading to core damage would result in still lower frequencies. Therefore, the sequence was not developed further.

Sequence TA18-27: TA18*C. The condensate line ruptures in flood zone AFW18-1. The operators elect to scram the reactor. The control rods are not inserted into the core (C). At this point, the sequence frequency is $\sim 10^{-8}$/year, and any additional failures leading to core damage would result in a lower frequency. Therefore, the sequence was not developed further.

C4.3.3 QUANTIFICATION

The event trees described in Section C4.3.2 were quantified using the data prepared for the other event trees (Section 3) and sequence probabilities calculated. These probabilities were then combined with the initiating event frequences (Table C4.3.1.2) to determine the contribution of internal flooding to the core damage frequency. The calculations are presented in Table 4.3.3.1. The total contribution of internal flooding to the mean core damage frequency is 6.51 x 10^{-6}/yr. Three internal flooding scenarios are responsible for 84 percent of this contribution and have estimated frequencies greater than 10^{-6}/yr:

- The rupture of the instrument air closed cooling water system in the control building switchgear room (case C4.2.2.2)--1.42 x 10^{-6}/yr
- The rupture of the fire protection system in the control building switchgear room (case C4.2.2.4)--1.76 x 10^{-6}/yr
- The rupture of the fire protection system in the control building east stairwell (case C4.2.2.8)--2.00 x 10^{-6}/yr

Table 4.3.3.1

Internal Flooding Event Tree Quantification

Section	Event description	Initiator frequency (/year)	Contribution to CDF (/year)
C4.2.1.2	PAB55--rupture NESW header	1.43×10^{-6}	3.02×10^{-8}
C4.2.2.2	CTL15-1--IACCW system rupture	2.11×10^{-5}	1.42×10^{-6}
C4.2.2.3	CTL15-1--SWS rupture	5.36×10^{-6}	3.60×10^{-7}
C4.2.2.4	CTL15-1--fire protection system rupture	2.62×10^{-5}	1.76×10^{-6}
C4.2.2.5	CTL15-2--city water line rupture	9.30×10^{-7}	6.15×10^{-8}
C4.2.2.6	CTL15-2--SWS rupture	2.91×10^{-6}	2.12×10^{-7}
C4.2.2.8	CTL15-3--fire protection system rupture	2.29×10^{-5}	2.00×10^{-6}
C4.2.4.7	AFW18-1--condensate system rupture	5.57×10^{-5}	2.50×10^{-7}
C4.2.5.1	TBL15--rupture fire protection system	3.51×10^{-7}	6.48×10^{-8}

Section C5

CONCLUSIONS AND RECOMMENDATIONS

Internal flooding can initiate or exacerbate a core damage accident. A large number of flooding scenarios were evaluated and subjected to deterministic and probabilistic analyses. From these analyses, it was concluded that three flooding scenarios have estimated frequencies exceeding 10^{-6}/yr:

- The rupture of the instrument air closed cooling water system in the control building switchgear room (case C4.2.2.2)
- The rupture of the fire protection system in the control building switchgear room (case C4.2.2.4)
- The rupture of the fire protection system in the control building east stairwell (case C4.2.2.8).

The scenarios can be mitigated by relatively simple measures should cost-benefit analyses and detailed engineering analyses show mitigation to be desirable:

- Replace the automatic make-up to the instrument air closed cooling water system tank with manually controlled make-up or make-up that is restricted to the normally anticipated leak rate. While automatic make-up was presumably installed to compensate for possible leaks, it is clearly counter-productive if large continued leaks lead to the accumulation of water within the control building switchgear room. The elimination of automatic make-up with a high flow rate eliminates case C4.2.2.2, rupture of the IACCW system, as a source of concern.
- Prevent a rupture of the fire protection system in the deluge room from flooding the control building switchgear room. This could be accomplished by closing the open door between the deluge room and switchgear room and establish a means to ensure that water escaping into the deluge room is discharged to the turbine building or outside. This action would eliminate case C4.2.2.4 as a source of concern. Alternatively, the contribution to core damage of accident sequences initiated by rupture of the fire protection system in the deluge room could be reduced significantly by routine non-destructive examination of the valves, welds and pipes in that room and by implementing maintenance isolation procedures for fire protection equipment in that room that require independent verification, with written check-off procedures, of valve closure.
- Replace the present door between the control building switchgear room and the control building east stairwell with a water-tight door. Because the curb below this door is

higher than the critical flood height of the 480-Vac switchgear, drainage through gaps beneath the door will not mitigate flooding initiated within the switchgear room. They will, however, allow floods originating in the control building east stairwell or AC equipment room to propagate into the switchgear room and damage the switchgear. The replacement of the existing door with a water-tight door will therefore eliminate case C4.2.2.8, rupture of the fire protection system in the control building east stairwell, as a source of concern. Alternatively, drainage of flood zone CTL15-3, the control building east stairwell, into the diesel generator valve room could be enhanced to prevent water from flowing into the control building switchgear room from the stairwell.

The susceptability of the plant to internal flooding could also be reduced if a number of other steps are taken:

- Ensure that the floor drains within the control building function properly.
- Enhance drainage of flood zone CTL15-1, the control building switchgear room by installing a trench, with water trap, to allow flow into the diesel generator valve room. A trench may well mitigate the effects of service water and fire protection system rupture in the switchgear room.
- Install shields to prevent the IACCW line from spraying switchgear in flood zone CTL15-1.
- Implement procedures to direct the operators to use SOP-EL-12 to align the alternative safe shutdown equipment to MCC-312A should power from all 480-Vac safeguard buses be lost while offsite power is available. Power to MCC-312A can be supplied via the 6.9-kV switchgear.
- Implement maintenance isolation procedures to require independent verification of water line isolation immediately prior to the start of maintenance should this maintenance require the opening of water lines in the control building.

Section C6

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APPENDIX D

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Table D1 Accumulator System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
SI-894A	MOTOR OPERATED VALVE	VC	46		YES	480 V	MCC36A					SIS
SI-894B	MOTOR OPERATED VALVE	VC	46		YES	480 V	MCC36B					SIS
SI-894C	MOTOR OPERATED VALVE	VC	46		YES	480 V	MCC36A					SIS
SI-894D	MOTOR OPERATED VALVE	VC	46		YES	480 V	MCC36B					SIS
SI-895A	CHECK VALVE	VC	46									
SI-895B	CHECK VALVE	VC	46									
SI-895C	CHECK VALVE	VC	46									
SI-895D	CHECK VALVE	VC	46									
SI-897A	CHECK VALVE	VC	46									
SI-897B	CHECK VALVE	VC	46									
SI-897C	CHECK VALVE	VC	46									
SI-897D	CHECK VALVE	VC	46									

Table D2 Auxiliary Feedwater System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
1/AF1	MDP 31 CONTROL SWITCH	CB	53	SCF								
1/AF3	MDP 33 CONTROL SWITCH	CB	53	SCF								
1/CWMU1	PCV-1187 CONTROL SWITCH	CB	53	SCF								
1/CWMU2	PCV-1188 CONTROL SWITCH	CB	53	SCF								
1/CWMU3	PCV-1189 CONTROL SWITCH	CB	53	SCF								
2-1/AF1	MDP 31 SEQ START TIME DELAY RELAY	CB	15					PWR PNL 33				
2-1/AF3	MDP 33 SEQ START TIME DELAY RELAY	CB	15					PWR PNL 32				
27-3A/X3	480V BUS3A AUX UNDERVOLTAGE RELAY	CB	15					PWR PNL 33				
27-6A/X3	480V BUS6A AUX UNDERVOLTAGE RELAY	CB	15					PWR PNL 32				
52/AF1	CIRCUIT BREAKER	CB	15			480 V	BUS 3A	PWR PNL 33				
52/AF3	CIRCUIT BREAKER	CB	15			480 V	BUS 6A	PWR PNL 32				
71/CST-1	LEVEL SWITCH	ABFB	15									
71/CST-2	LEVEL SWITCH	ABFB	15									
ABFP-31	MOTOR DRIVEN AUX FWR PUMP 31	ABFB	15		YES	480 V	BUS 3A	PWR PNL 33	AFV			RLY BFP
ABFP-32	TURBINE DRIVEN AUX FWR PUMP 32	ABFB	15		YES			PWR PNL 31	AFV			SG LVL
ABFP-33	MOTOR DRIVEN AUX FWR PUMP 33	ABFB	15		YES	480 V	BUS 6A	PWR PNL 32	AFV			RLY BFP
BFD-31	CHECK VALVE	ABFB	15									
BFD-34	CHECK VALVE	ABFB	15									
BFD-35	CHECK VALVE	ABFB	15									
BFD-36	MANUAL OUTLET ISOLATION VLV	ABFB	15									
BFD-37	CHECK VALVE	ABFB	15									
BFD-38	MANUAL OUTLET ISOLATION VLV	ABFB	15									
BFD-39	CHECK VALVE	ABFB	15									
BFD-40	CHECK VALVE	ABFB	15									
BFD-41	MANUAL OUTLET ISOLATION VLV	ABFB	15									
BFD-42	CHECK VALVE	ABFB	15									
BFD-43	MANUAL OUTLET ISOLATION VLV	ABFB	15									
BFD-47-1	CHECK VALVE	ABFB	15									
BFD-47-2	CHECK VALVE	ABFB	15									
BFD-47-3	CHECK VALVE	ABFB	15									
BFD-47-4	CHECK VALVE	ABFB	15									
BFD-48-1	MANUAL OUTLET ISOLATION VLV	ABFB	15									

Table D2 Auxiliary Feedwater System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
BFD-48-2	MANUAL INLET ISOLATION VLV	ABFB	15									
BFD-48-3	MANUAL OUTLET ISOLATION VLV	ABFB	15									
BFD-48-4	MANUAL INLET ISOLATION VLV	ABFB	15									
BFD-48-5	MANUAL OUTLET ISOLATION VLV	ABFB	15									
BFD-48-6	MANUAL INLET ISOLATION VLV	ABFB	15									
BFD-48-7	MANUAL OUTLET ISOLATION VLV	ABFB	15									
BFD-48-8	MANUAL INLET ISOLATION VLV	ABFB	15									
BFD-50	CHECK VALVE	ABFB	15									
BFD-51	MANUAL VALVE	ABFB	15									
BFD-52	CHECK VALVE	ABFB	15									
BFD-53	MANUAL VALVE	ABFB	15									
BFD-54	CHECK VALVE	ABFB	15									
BFD-55	MANUAL VALVE	ABFB	15									
BFD-62-1	MANUAL INLET ISOLATION VLV	ABFB	15									
BFD-62-2	MANUAL INLET ISOLATION VLV	ABFB	15									
BFD-62-3	MANUAL INLET ISOLATION VLV	ABFB	15									
BFD-62-4	MANUAL INLET ISOLATION VLV	ABFB	15									
BFD-67	CHECK VALVE	ABFB	33									
BFD-68	CHECK VALVE	ABFB	33									
BFD-69	CHECK VALVE	ABFB	33									
BFD-70	CHECK VALVE	ABFB	33									
BFP	RELAY, MDP31&33 AUTO START MASTER CONTACTOR	CB	15									
BFP-K	RELAY, MDP31&33 AUTO START REDUNDANT MASTER CONTACTOR	CB	15									
BFP-L	PUMP 32 AUTO START AUX REALY	CB	15					PWR PNL 32				
CT-26	CHECK VALVE	ABFB	15									
CT-27	MANUAL GATE VALVE	ABFB	15									
CT-28	CHECK VALVE	ABFB	15									
CT-29-1	CHECK VALVE	ABFB	15									
CT-29-2	CHECK VALVE	ABFB	15									
CT-30	MANUAL GATE VALVE	ABFB	15									
CT-31	CHECK VALVE	ABFB	15									
CT-32	CHECK VALVE	ABFB	15									
CT-33	MANUAL GATE VALVE	ABFB	15									
CT-49	MANUAL GATE VALVE	UT	9									
CT-6	BUTTERFLY VALVE	YARD	60									

Table D2 Auxiliary Feedwater System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
CT-64	MANUAL GATE VALVE	ABFB	15									
FC-1135S	FLOW SWITCH	ABFB	15									
FC-1136S	FLOW SWITCH	ABFB	15									
FCV-1121	MIN-FLOW RECIRC CONTROL VLV	ABFB	15		YES			PWR PNL 33			IAS	FLOW SW
FCV-1123	MIN-FLOW RECIRC CONTROL VLV	ABFB	15		YES			DIS PNL 32			IAS	FLOW SW
FCV-405A	FLOW CONTROL VALVE	ABFB	15		YES						IAS/NITRO	
FCV-405B	FLOW CONTROL VALVE	ABFB	15		YES						IAS/NITRO	
FCV-405C	FLOW CONTROL VALVE	ABFB	15		YES						IAS/NITRO	
FCV-405D	FLOW CONTROL VALVE	ABFB	15		YES						IAS/NITRO	
FCV-406A	FLOW CONTROL VALVE	ABFB	15		YES						IAS/NITRO	
FCV-406B	FLOW CONTROL VALVE	ABFB	15		YES						IAS/NITRO	
FCV-406C	FLOW CONTROL VALVE	ABFB	15		YES						IAS/NITRO	
FCV-406D	FLOW CONTROL VALVE	ABFB	15		YES						IAS/NITRO	
FT-418L	FEEDWATER FLOW TRANSMITTER	ABFB	15			118V	BUS 33					
FT-428L	FEEDWATER FLOW TRANSMITTER	ABFB	15			118V	BUS 33					
FT-438L	FEEDWATER FLOW TRANSMITTER	ABFB	15			118V	BUS 34					
FT-448L	FEEDWATER FLOW TRANSMITTER	ABFB	15			118V	BUS 34					
HC-405A	FLOW CONTROL VALVE FCV-405A CONTROLLER	CB	53	SCF	YES	118V	BUS 31					
HC-405B	FLOW CONTROL VALVE FCV-405B CONTROLLER	CB	53	SCF	YES	118V	BUS 31					
HC-405C	FLOW CONTROL VALVE FCV-405C CONTROLLER	CB	53	SCF	YES	118V	BUS 31					
HC-405D	FLOW CONTROL VALVE FCV-405D CONTROLLER	CB	53	SCF	YES	118V	BUS 31					
HC-406A	FLOW CONTROL VALVE FCV-406A CONTROLLER	CB	53	SCF	YES	118V	BUS 33					MDP31 DISCH PRS
HC-406B	FLOW CONTROL VALVE FCV-406B CONTROLLER	CB	53	SCF	YES	118V	BUS 33					MDP31 DISCH PRS
HC-406C	FLOW CONTROL VALVE FCV-406C CONTROLLER	CB	53	SCF	YES	118V	BUS 32					MDP33 DISCH PRS

Table D2 Auxiliary Feedwater System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
HC-406D	FLOW CONTROL VALVE FCV-406D CONTROLLER	CB	53	SCF	YES	110V	BUS 32					MDP33 DISCH PRS
HCV-1118	TURBINE SPEED CONTROL VLV	ABFB	15		YES	118 V	BUS 31				IAS/NITRO	
IA-409	MANUAL VALVE	ABFB	15									
IA-410	MANUAL VALVE	ABFB	15									
IA-411	MANUAL VALVE	ABFB	15									
IA-434	CHECK VALVE	ABFB	15									
LCV-1158-1	CST LOW LEVEL CONTROL VLV	ABFB	15		YES			DIS PNL 34			IAS	LEVEL SW
LCV-1158-2	CST LOW LEVEL CONTROL VLV	ABFB	15		YES			DIS PNL 33			IAS	LEVEL SW
MS-41	STOP CHECK VALVE	ABFB	65									
MS-42	STOP CHECK VALVE	ABFB	65									
MS-54	MANUAL VALVE	ABFB	15									
PCV-1139	PRESSURE CONTROL VALVE	ABFB	15		YES			DIS PNL 31			IAS	
PCV-1187	PRESSURE CONTROL VALVE	ABFB	15		YES	118 V	BUS 33				IAS/NITRO	
PCV-1188	PRESSURE CONTROL VALVE	ABFB	15		YES	118 V	BUS 31				IAS	
PCV-1189	PRESSURE CONTROL VALVE	ABFB	15		YES	118 V	BUS 32				IAS/NITRO	
PCV-1273	PRESSURE CONTROL VALVE	ABFP	15									
PCV-1274	PRESSURE CONTROL VALVE	ABFP	15									
PCV-1275	PRESSURE CONTROL VALVE	ABFP	15									
PCV-1276	PRESSURE CONTROL VALVE	ABFP	15									
PCV-1284	RELIEF VALVE	ABFP	15									
PCV-1310A	PRESSURE CONTROL VALVE	ABFB	44		YES			DIS PNL 33			IAS	TEMP SW
PCV-1310B	PRESSURE CONTROL VALVE	ABFB	33		YES			DIS PNL 34			IAS	TEMP SW
PT-406A	MDP 31 PRESSURE TRANSMITTER	ABFP	15			118 V	BUS 33					
PT-406B	MDP 33 PRESSURE TRANSMITTER	ABFP	15			118 V	BUS 33					
PT-412A	TURBINE FIRST STAGE PRESSURE TRANSMITTER	TB	28			118 V	BUS 32					
PT-412B	TURBINE FIRST STAGE PRESSURE TRANSMITTER	TB	28			118 V	BUS 31					
TC-1112A	TEMPERATURE SWITCH	ABFB	15									
TC-1113A	TEMPERATURE SWITCH	ABFB	15									

Table D3 Control Building Ventilation System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
EF33	Control Building Exhaust Fan 33	CB	27			480V	MCC39					Louver L-319
EF34	Control Building Exhaust Fan 34	CB	27			480V	MCC39					TempSW23-4
L-319	Control Building Louver L-319	CB	15			120V	LP-319					Rm.Temp Sw
TR-2-L319	L-319 Fire Protection Relay	CB	15'	Term Rel Bx TR-2		120V	LP-IF1					
LP-319	Lighting Panel 319	CB	33	LP-319		120V	LB32					

Table D4 Component Cooling Water System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
1/822A	MOV 822A CONTROL SWITCH	CB	53									
1/822B	MOV 822B CONTROL SWITCH	CB	53									
1/CCP-31	31 CCW PUMP CONTROL SWITCH	CB	53	SGF	YES							
1/CCP-32	32 CCW PUMP CONTROL SWITCH	CB	53	SGF	YES							
1/CCP-33	33 CCW PUMP CONTROL SWITCH	CB	53	SGF	YES							
1/FCV-625	MOV FCV-625 CONTROL SWITCH	CB	53									
27/2A-X2	UNDERVOLTAGE RELAY	CB	15									
27/5A-X3	UNDERVOLTAGE RELAY	CB	15									
27/6A-X3	UNDERVOLTAGE RELAY	CB	15									
43/CC2	TRANSFER SWITCH	PAB	41		YES							
52/CC1	31 CCW PUMP BREAKER	CB	15		YES							
52/CC2	32 CCW PUMP BREAKER	CB	15		YES							
52/CC3	33 CCW PUMP BREAKER	CB	15		YES							
AC-1871A	MANUAL VALVE	PAB	15									
AC-1871B	MANUAL VALVE	PAB	15									
AC-1871C	MANUAL VALVE	PAB	15									
AC-1871D	MANUAL VALVE	PAB	15									
AC-701A	CITY WTR SUP VLV	PAB	55									
AC-701B	CITY WTR DIS VLV	PAB	55									
AC-736A	MANUAL VALVE	PAB	15									
AC-736B	MANUAL VALVE	PAB	15									
AC-737A	MANUAL VALVE	PAB	15									
AC-737B	MANUAL VALVE	PAB	15									
AC-749A	MANUAL VALVE	PAB	34									
AC-749B	MANUAL VALVE	PAB	34									
AC-749C	MANUAL VALVE	PAB	34									
AC-749D	MANUAL VALVE	PAB	34									
AC-749E	MANUAL VALVE	PAB	34									
AC-749F	MANUAL VALVE	PAB	34									
AC-750A	CHECK VALVE	PAB	34									
AC-750B	CHECK VALVE	PAB	34									
AC-750C	CHECK VALVE	PAB	34									
AC-750D	CHECK VALVE	PAB	15									
AC-750E	CHECK VALVE	PAB	15									
AC-751A	CHECK VALVE											

Table D4 Component Cooling Water System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
AC-751B	CHECK VALVE											
AC-752A	MANUAL VALVE	FH	68									
AC-752B	MANUAL VALVE	FH	68									
AC-752C	MANUAL VALVE	FH	68									
AC-752D	MANUAL VALVE	FH	68									
AC-752E	MANUAL VALVE	FH	68									
AC-752F	MANUAL VALVE	FH	68									
AC-752G	MANUAL VALVE	VC	46									
AC-752H	MANUAL VALVE	VC	46									
AC-752J	MANUAL VALVE	PAB	41									
AC-752K	MANUAL VALVE	PAB	41									
AC-753A	MANUAL VALVE	FH	68									
AC-753B	MANUAL VALVE	FH	68									
AC-753C	MANUAL VALVE	FH	68									
AC-753D	MANUAL VALVE	FH	68									
AC-753E	MANUAL VALVE	FH	68									
AC-753F	MANUAL VALVE	FH	68									
AC-753G	MANUAL VALVE	VC	46									
AC-753H	MANUAL VALVE	VC	46									
AC-753J	MANUAL VALVE	PAB	41									
AC-753K	MANUAL VALVE	PAB	41									
AC-755A	CHECK VALVE	FH	68									
AC-755B	CHECK VALVE	FH	68									
AC-755C	CHECK VALVE	FH	68									
AC-755D	CHECK VALVE	FH	68									
AC-755E	CHECK VALVE	FH	68									
AC-755F	CHECK VALVE	FH	68									
AC-756A	MANUAL VALVE	PAB	55									
AC-756B	MANUAL VALVE	PAB	55									
AC-757A	MANUAL VALVE	PAB	55									
AC-757B	MANUAL VALVE	PAB	55									
AC-757C	MANUAL VALVE	PAB	55									
AC-757D	MANUAL VALVE	PAB	55									
AC-757E	MANUAL VALVE	PAB	55									
AC-757F	MANUAL VALVE	PAB	55									

Table D4 Component Cooling Water System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
AC-759A	MANUAL VALVE	PAB	73									
AC-759B	MANUAL VALVE	PAB	73									
AC-759C	MANUAL VALVE	PAB	73									
AC-759D	MANUAL VALVE	PAB	73									
AC-760A	MANUAL VALVE	PAB	41									
AC-760B	MANUAL VALVE	PAB	41									
AC-760C	MANUAL VALVE	PAB	41									
AC-761A	CHECK VALVE	PAB	41									
AC-761B	CHECK VALVE	PAB	41									
AC-761C	CHECK VALVE	PAB	41									
AC-762A	MANUAL VALVE	PAB	41									
AC-762B	MANUAL VALVE	PAB	41									
AC-762C	MANUAL VALVE	PAB	41									
AC-765A	MANUAL VALVE	PAB	55									
AC-765B	MANUAL VALVE	PAB	55									
AC-766A	MANUAL VALVE	PAB	41									
AC-766B	MANUAL VALVE	PAB	41									
AC-766C	MANUAL VALVE	PAB	41									
AC-766D	MANUAL VALVE	PAB	41									
AC-769	MOTOR OPERATED VALVE	PAB	51		YES	480	MCC36B					PHASE B
AC-770	CHECK VALVE	VC										
AC-771A	MANUAL VALVE	VC	46									
AC-771B	MANUAL VALVE	VC	46									
AC-771C	MANUAL VALVE	VC	46									
AC-771D	MANUAL VALVE	VC	46									
AC-772A	MANUAL VALVE	VC	78									
AC-772B	MANUAL VALVE	VC	78									
AC-772C	MANUAL VALVE	VC	78									
AC-772D	MANUAL VALVE	VC	82									
AC-773A	MANUAL VALVE	VC	78									
AC-773B	MANUAL VALVE	VC										
AC-773C	MANUAL VALVE	VC	76									
AC-773D	MANUAL VALVE	VC	76									
AC-774A	CHECK VALVE	VC	65									
AC-774B	CHECK VALVE	VC										

Table D4 Component Cooling Water System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
AC-774C	CHECK VALVE	VC	68									
AC-774D	CHECK VALVE	VC	69									
AC-775A	MANUAL VALVE	VC										
AC-775B	MANUAL VALVE	VC										
AC-775C	MANUAL VALVE	VC										
AC-775D	MANUAL VALVE	VC	82									
AC-776A	MANUAL VALVE	VC	78									
AC-776B	MANUAL VALVE	VC	78									
AC-776C	MANUAL VALVE	VC	78									
AC-776D	MANUAL VALVE	VC	82									
AC-780A	MANUAL VALVE	VC	46									
AC-780B	MANUAL VALVE	VC	46									
AC-780C	MANUAL VALVE	VC	46									
AC-780D	MANUAL VALVE	VC	46									
AC-781A	MANUAL VALVE	VC	46									
AC-781B	MANUAL VALVE	VC	46									
AC-781C	MANUAL VALVE	VC	46									
AC-781D	MANUAL VALVE	VC	46									
AC-784	MOTOR OPERATED VALVE	PAB	68		YES	480	MCC36A					PHASE B ISOL
AC-786	MOTOR OPERATED VALVE	PAB	68		YES	480	MCC36B					PHASE B
AC-787	MANUAL VALVE	PAB	34									
AC-789	MOTOR OPERATED VALVE	PAB	68		YES	480	MCC36B					PHASE B
AC-797	MOTOR OPERATED VALVE	PAB	51		YES	480	MCC36A					PHASE B
AC-810	NON-REGEN HX ISOLATION VALVE	PAB	73									
AC-818A	MANUAL VALVE	VC	46									
AC-818B	MANUAL VALVE	VC	46									
AC-818C	MANUAL VALVE	VC	46									
AC-818D	MANUAL VALVE	VC	46									
AC-820A	BUTTERFLY VALVE	VC	46									
AC-820B	BUTTERFLY VALVE	VC	46									
AC-822A	MOTOR OPERATED VALVE	PAB	68		YES	480	MCC36A					
AC-822B	MOTOR OPERATED VALVE	PAB	68		YES	480	MCC36B					
AC-832A	MANUAL VALVE	PAB	73									

Table D4 Component Cooling Water System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
AC-832B	MANUAL VALVE	PAB	73									
AC-833A	MANUAL VALVE	PAB	55									
AC-833B	MANUAL VALVE	PAB	55									
AC-833C	MANUAL VALVE	PAB	55									
AC-FCV-625	MOTOR OPERATED VALVE	PAB	55		YES	480	MCC36A					PHASE B
ACCW 31	AUX. CCW PUMP 31	FH	68			480	MCC36A					
ACCW 32	AUX. CCW PUMP 32	FH	68			480	MCC36B					
ACCW 33	AUX. CCW PUMP 33	FH	68			480	MCC36A					
ACCW 34	AUX. CCW PUMP 34	FH	68			480	MCC36B					
CCW HTX-31	HEAT EXCHANGER	PAB	73							SWS		
CCW HTX-32	HEAT EXCHANGER	PAB	73							SWS		
CCW-31	CCW PUMP 31	PAB	41	SBF-1, SGF, SJF	YES	480	5A	PWR PNL 31				SIS, LOSP
CCW-32	CCW PUMP 32	PAB	41	SBF-1, SGF, SJF	YES	480	2A	PWR PNL 33				SIS, LOSP
CCW-33	CCW PUMP 33	PAB	41	SBF-1, SGF, SJF	YES	480	6A	PWR PNL 32				SIS, LOSP
PC-600A-X	LOOP 1 DISCH PRESSURE RELAY	CB	53									
PC-600B-X	LOOP 2 DISCH PRESSURE RELAY	CB	53									
SDP-31	SIS PUMP 31 CWP	PAB	34									
SDP-32	SIS PUMP 32 CWP	PAB	34									
SDP-33	SIS PUMP 33 CWP	PAB	34									
C-B11X	CONT. PHASE B RELAY	CB	53									
C-B21X	CONT. PHASE B RELAY	CB	53									

Table D5 Condensate System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
1/CP-31	COND PMP 31 CONTROL SWITCH	CB	53		YES							
1/CP-32	COND PMP 32 CONTROL SWITCH	CB	53		YES							
1/CP-33	COND PMP 33 CONTROL SWITCH	CB	53		YES							
AEC 31	AIR EJECTOR CONDENSER	TB	33									
AEC 32	AIR EJECTOR CONDENSER	TB	33									
AEC 33	AIR EJECTOR CONDENSER	TB	33									
AOV-518	AOV	TB	15		YES						IAS	
AOV-519	AOV	TB	15		YES						IAS	
CD-1-1	CHECK VALVE	TB	5									
CD-1-2	CHECK VALVE	TB	5									
CD-1-3	CHECK VALVE	TB	5									
CD-10	CHECK VALVE	TB	33									
CD-16-1	MANUAL VALVE	TB	33									
CD-16-2	MANUAL VALVE	TB	33									
CD-16-3	MANUAL VALVE	TB	33									
CD-18-1	MANUAL VALVE	TB	33									
CD-18-2	MANUAL VALVE	TB	33									
CD-18-3	MANUAL VALVE	TB	33									
CD-2-1	MANUAL VALVE	TB	5									
CD-2-2	MANUAL VALVE	TB	5									
CD-2-3	MANUAL VALVE	TB	5									
CD-21-1	MANUAL VALVE	TB	15									
CD-21-2	MANUAL VALVE	TB	15									
CD-25	MANUAL VALVE	TB	33									
CD-26	MANUAL VALVE	TB	33									
CD-45-1	SAFETY RELIEF VALVE	TB	33									
CD-45-2	SAFETY RELIEF VALVE	TB	33									
CD-45-3	SAFETY RELIEF VALVE	TB	33									
CD-46-1	SAFETY RELIEF VALVE	TB	33									
CD-46-2	SAFETY RELIEF VALVE	TB	33									
CD-46-3	SAFETY RELIEF VALVE	TB	33									
CD-7-1	MANUAL VALVE	TB	33									
CD-7-2	MANUAL VALVE	TB	33									
CD-7-3	MANUAL VALVE	TB	33									
CD-8-1	MANUAL VALVE	TB	33									
CD-8-2	MANUAL VALVE	TB	33									
CD-8-3	MANUAL VALVE	TB	33									
CP-31	CONDENSATE MDP 31	TB	5	SCF	YES	6.9K	BUS 1			THCC		
CP-32	CONDENSATE MDP 32	TB	5	SCF	YES	6.9K	BUS 2			THCC		
CP-33	CONDENSATE MDP 33	TB	5	SCF	YES	6.9K	BUS 4			THCC		

Table D5 Condensate System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
CS-1-1	BUTTERFLY VALVE	TB	5									
CS-1-2	BUTTERFLY VALVE	TB	5									
CS-1-3	BUTTERFLY VALVE	TB	5									
CS-1-4	BUTTERFLY VALVE	TB	5									
CS-1-5	BUTTERFLY VALVE	TB	5									
CS-1-6	BUTTERFLY VALVE	TB	5									
CS-2-1	BUTTERFLY VALVE	TB	5									
CS-2-2	BUTTERFLY VALVE	TB	5									
CS-2-3	BUTTERFLY VALVE	TB	5									
CST	CONDENSATE STORAGE TANK	YARD	70		YES							
CT-10	MANUAL VALVE	TB	33									
CT-11	MANUAL VALVE	TB	33									
CT-1128	LEVEL CONTROL VALVE	TB	33	SCF	YES						IAS	
CT-1158-1	LEVEL CONTROL VALVE	ABFP	18	SCF	YES			DIST PNL 34			IAS	
CT-1158-2	LEVEL CONTROL VALVE	ABFP	18	SCF	YES			DIST PNL 33			IAS	
CT-6	BUTTERFLY VALVE	YARD	60	SCF, SKF	YES							
CT-7-1	BUTTERFLY VALVE	TB	33									
CT-7-2	BUTTERFLY VALVE	TB	33									
CT-8	BUTTERFLY VALVE	TB	33									
CT-9	MANUAL VALVE	TB	33									
FCV-1113	FLOW CONTROL VALVE (AOV)	TB	33								IAS	
FCV-1120	FLOW CONTROL VALVE (AOV)	TB	5								IAS	
GSC	GLAND STEAM CONDENSER	TB	33									
LP FWH 31A	LOW PRESSURE FW HEATER	TB	36									
LP FWH 31B	LOW PRESSURE FW HEATER	TB	36									
LP FWH 31C	LOW PRESSURE FW HEATER	TB	36									
LP FWH 32A	LOW PRESSURE FW HEATER	TB	36									
LP FWH 32B	LOW PRESSURE FW HEATER	TB	36									
LP FWH 32C	LOW PRESSURE FW HEATER	TB	36									
LP FWH 33A	LOW PRESSURE FW HEATER	TB	36									
LP FWH 33B	LOW PRESSURE FW HEATER	TB	36									
LP FWH 33C	LOW PRESSURE FW HEATER	TB	36									
LP FWH 34A	LOW PRESSURE FW HEATER	TB	36									
LP FWH 34B	LOW PRESSURE FW HEATER	TB	36									
LP FWH 34C	LOW PRESSURE FW HEATER	TB	36									
LP FWH 35A	LOW PRESSURE FW HEATER	TB	36									
LP FWH 35B	LOW PRESSURE FW HEATER	TB	36									
LP FWH 35C	LOW PRESSURE FW HEATER	TB	36									
TCV-1110	MANUALLY OPERATED TCV	TB	15									

Table D6 Containment Air Recirculation Cooling and Filtration System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
1/CRF1	CONT RECIR FAN 31 CONTROL SWITCH	CB	53	SBF-2								
1/CRF2	CONT RECIR FAN 32 CONTROL SWITCH	CB	53	SBF-2								
1/CRF3	CONT RECIR FAN 33 CONTROL SWITCH	CB	53	SBF-2								
1/CRF4	CONT RECIR FAN 34 CONTROL SWITCH	CB	53	SBF-2								
1/CRF5	CONT RECIR FAN 35 CONTROL SWITCH	CB	53	SBF-2								
52/CRF1	CIRCUIT BREAKER	CB	15			480V	BUS 5A	PWR PNL 31				
52/CRF2	CIRCUIT BREAKER	CB	15			480V	BUS 2A	PWR PNL 33				
52/CRF3	CIRCUIT BREAKER	CB	15			480V	BUS 5A	PWR PNL 31				
52/CRF4	CIRCUIT BREAKER	CB	15			480V	BUS 3A	PWR PNL 33				
52/CRF5	CIRCUIT BREAKER	CB	15			480V	BUS 6A	PWR PNL 32				
C-CRF1	FAN COOLER UNIT 31 DAMPER C	VC	68								IAS	
C-CRF2	FAN COOLER UNIT 32 DAMPER C	VC	68								IAS	
C-CRF3	FAN COOLER UNIT 33 DAMPER C	VC	68								IAS	
C-CRF4	FAN COOLER UNIT 34 DAMPER C	VC	68								IAS	
C-CRF5	FAN COOLER UNIT 35 DAMPER C	VC	68								IAS	
CRF1	CONT RECIRCULATION FAN UNIT 31	VC	68		YES	480V	BUS 5A	PWR PNL 31		SWS		SIS
CRF1 (BLOW-IN DOOR)	FAN COOLER UNIT 31 BLOW-IN DOOR	VC	68									
CRF2	CONT RECIRCULATION FAN UNIT 32	VC	68		YES	480V	BUS 2A	PWR PNL 33		SWS		SIS
CRF2 (BLOW-IN DOOR)	FAN COOLER UNIT 32 BLOW-IN DOOR	VC	68									
CRF3	CONT RECIRCULATION FAN UNIT 33	VC	68		YES	480V	BUS 5A	PWR PNL 31		SWS		SIS
CRF3 (BLOW-IN DOOR)	FAN COOLER UNIT 33 BLOW-IN DOOR	VC	68									
CRF4	CONT RECIRCULATION FAN UNIT 34	VC	68		YES	480V	BUS 3A	PWR PNL 33		SWS		SIS
CRF4 (BLOW-IN DOOR)	FAN COOLER UNIT 34 BLOW-IN DOOR	VC	68									
CRF5	CONT RECIRCULATION FAN UNIT 35	VC	68		YES	480V	BUS 6A	PWR PNL 32		SWS		SIS
CRF5 (BLOW-IN DOOR)	FAN COOLER UNIT 35 BLOW-IN DOOR	VC	68									

Table D6 Containment Air Recirculation Cooling and Filtration System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
D-CRF1	FAN COOLER UNIT 31 DAMPER D	VC	68								IAS	
D-CRF2	FAN COOLER UNIT 32 DAMPER D	VC	68								IAS	
D-CRF3	FAN COOLER UNIT 33 DAMPER D	VC	68								IAS	
D-CRF4	FAN COOLER UNIT 34 DAMPER D	VC	68								IAS	
D-CRF5	FAN COOLER UNIT 35 DAMPER D	VC	68								IAS	
VS-SOV-1294	SOLENOID VALVE OPERATOR FOR FCU 31 DAMPER C	VC	68					DIS PNL 31				SIS
VS-SOV-1297	SOLENOID VALVE OPERATOR FOR FCU 32 DAMPER C	VC	68					PWR PNL 33				SIS
VS-SOV-1298	SOLENOID VALVE OPERATOR FOR FCU 32 DAMPER D & DOOR	VC	68					PWR PNL 33				SIS
VS-SOV-1300	SOLENOID VALVE OPERATOR FOR FCU 33 DAMPER C	VC	68					DIS PNL 33				SIS
VS-SOV-1301	SOLENOID VALVE OPERATOR FOR FCU 33 DAMPER D & DOOR	VC	68					DIS PNL 33				SIS
VS-SOV-1303	SOLENOID VALVE OPERATOR FOR FCU 34 DAMPER C	VC	68					PWR PNL 33				SIS
VS-SOV-1304	SOLENOID VALVE OPERATOR FOR FCU 34 DAMPER D & DOOR	VC	68					PWR PNL 33				SIS
VS-SOV-1306	SOLENOID VALVE OPERATOR FOR FCU 35 DAMPER C	VC	68					DIS PNL 34				SIS
VS-SOV-1307	SOLENOID VALVE OPERATOR FOR FCU 35 DAMPER D & DOOR	VC	68					DIS PNL 34				SIS

Table D7 Containment Spray System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
1/CS1	MDP 31 CONTROL SWITCH	CB	53	SBF-1								
1/CS2	MDP 32 CONTROL SWITCH	CB	53	SBF-1								
2-1/CS1	MDP 31 TIME DELAY RELAY	CB	15					PWR PNL 31				
2-1/CS2	MDP 32 TIME DELAY RELAY	CB	15					PWR PNL 31				
2-2/CS1	MDP 31 TIME DELAY RELAY	CB	15					PWR PNL 32				
2-2/CS2	MDP 32 TIME DELAY RELAY	CB	15					PWR PNL 32				
52/CS1	MDP 31 CIRCUIT BREAKER	CB	15			480 V	BUS 5A	PWR PNL 31				
52/CS2	MDP 32 CIRCUIT BREAKER	CB	15			480 V	BUS 6A	PWR PNL 32				
INTSIAPCS1	CONTAINMENT SPRAY PUMP 31	PAB	41		YES	480 V	BUS 5A	PWR PNL 31				CON PRE/SIS
INTSIAPCS2	CONTAINMENT SPRAY PUMP 32	PAB	41		YES	480 V	BUS 6A	PWR PNL 32				CON PRE/SIS
SI-865A	MANUAL VALVE	PAB	41									
SI-865B	MANUAL VALVE	PAB	41									
SI-866A	MOTOR OPERATED VALVE	PAB	41		YES	480 V	MCC36A					CON PRE/REC SW
SI-866B	MOTOR OPERATED VALVE	PAB	41		YES	480 V	MCC36B					CON PRE/REC SW
SI-867A	CHECK VALVE	PAB	41									
SI-867B	CHECK VALVE	PAB	41									

Table D8 Containment Spray External Recirculation System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
1/1802A	MOV SI-1802A CONTROL SWITCH	CB	53	SBF-1								
1/1802B	MOV SI-1802B CONTROL SWITCH	CB	53	SBF-1								
1/885A	MOV SI-885A CONTROL SWITCH	CB	53	SBF-1								
1/885B	MOV SI-885B CONTROL SWITCH	CB	53	SBF-1								
1/889A	MOV SI-889A CONTROL SWITCH	CB	53	SBF-1								
1/889B	MOV SI-889B CONTROL SWITCH	CB	53	SBF-1								
1/RHR 1	RHR PUMP 31 CONTROL SWITCH	CB	53	SGF								
1/RHR 2	RHR PUMP 32 CONTROL SWITCH	CB	53	SGF								
43/RS-3	RECIRCULATION SWITCH	CB	53	SBF-1								
52/RHR 31	CIRCUIT BREAKER	CB	15			480V	BUS 3A	PWR PNL 33				
52/RHR 32	CIRCUIT BREAKER	CB	15			480V	BUS 6A	PWR PNL 32				
730-33AC-X	RELAY	CB	53			480V	MCC36A					
731-33AC-X	RELAY	CB	53			480V	MCC36B					
AC-1870	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36B					REC SW
AC-735A	MANUAL VALVE	PAB	15									
AC-735B	MANUAL VALVE	PAB	15									
AC-738A	CHECK VALVE	PAB	15									
AC-738B	CHECK VALVE	PAB	15									
AC-739A	MANUAL VALVE	PAB	15									
AC-739B	MANUAL VALVE	PAB	15									
AC-741	CHECK VALVE	VC	66									
AC-742	MANUAL VALVE	VC	66									
AC-743	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36A					REC SW
AC-744	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36A					REC SW
AC-745A	MOTOR OPERATED VALVE	VC	66		YES	480V	MCC36B					
AC-745B	MOTOR OPERATED VALVE	VC	66		YES	480V	MCC36A					
AC-837	CHECK VALVE	PAB	15									
AC-838	CHECK VALVE	PAB	15									
AC-839	MANUAL VALVE	PAB	15									
AC-840	MANUAL VALVE	PAB	15									
AC-841	MANUAL VALVE	PAB	15									
AC-842	MANUAL VALVE	PAB	15									
ACAHRC2	RHR HEAT EXCHANGER 32	VC	66							CCW		
ACAHRS1	RHR HEAT EXCHANGER 31	VC	66							CCW		
ACAPRH1	RHR PUMP 31	PAB	15		YES	480V	BUS 3A	PWR PNL 33	PAB VENT	CCW /CITY WTR		SIS/REC SW

Table D8 Containment Spray External Recirculation System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
ACAPRH2	RHR PUMP 32	PAB	15		YES	480V	BUS 6A	PWR PNL 32	PAB VENT	CCW		SIS/REC SW
LT-920	RWST LEVEL TRANSMITTER	YARD	79			118V	BUS 31					
SI-1802A	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					REC SW
SI-1802B	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					REC SW
SI-1869A	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					
SI-1869B	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					
SI-882	MOTOR OPERATED VALVE	PAB	15		YES	480V	MCC36B					REC SW
SI-883	MOTOR OPERATED VALVE	PAB	15		YES	480V	MCC36B					RLYS 730&731-33ACX
SI-885A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					RLY 730-33ACX
SI-885B	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					RLY 731-33ACX
SI-889A	MOTOR OPERATED VALVE	VC	68		YES	480V	MCC36A					
SI-889B	MOTOR OPERATED VALVE	VC	68		YES	480V	MCC36B					

Table D9 Containment Spray Internal Recirculation System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
1/1802A	MOV SI-1802A CONTROL SWITCH	CB	53	SBF-1								
1/1802B	MOV SI-1802B CONTROL SWITCH	CB	53	SBF-1								
1/889A	MOV SI-889A CONTROL SWITCH	CB	53	SBF-1								
1/889B	MOV SI-889B CONTROL SWITCH	CB	53	SBF-1								
1/R1	REC PUMP 31 CONTROL SWITCH	CB	53	SBF-1								
1/R2	REC PUMP 32 CONTROL SWITCH	CB	53	SBF-1								
36AMCC-4FD	AC-744 MOTOR STARTER COMPARTMENT	PAB	55			480V	MCC36A					
36BMCC-4FD	SI-882 MOTOR STARTER COMPARTMENT	PAB	55			480V	MCC36B					
43/RS-3	RECIRCULATION SWITCH	CB	53	SBF-1								
43/RS-4	RECIRCULATION SWITCH	CB	53	SBF-1								
43/RS-5	RECIRCULATION SWITCH	CB	53	SBF-1								
43/RS-7	RECIRCULATION SWITCH	CB	53	SBF-1								
52-CC1X	RELAY	CB	15					DIS PNL 33				
52-CC2X	RELAY	CB	15					DIS PNL 32				
52-CC3X	RELAY	CB	15					DIS PNL 32				
52/R1	CIRCUIT BREAKER	CB	15			480V	BUS 5A	PWR PNL 31				
52/R2	CIRCUIT BREAKER	CB	15			480V	BUS 6A	PWR PNL 32				
AC-1870	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36B					REC SW
AC-741	CHECK VALVE	VC	66									
AC-742	MANUAL VALVE	VC	66									
AC-743	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36A					REC SW
AC-744	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36A					REC SW
AC-745A	MOTOR OPERATED VALVE	VC	66		YES	480V	MCC36B					
AC-745B	MOTOR OPERATED VALVE	VC	66		YES	480V	MCC36A					
ACAHRC2	RHR HEAT EXCHANGER 32	VC	66							CCW		
ACAHRS1	RHR HEAT EXCHANGER 31	VC	66							CCW		
INTSIAPRE1	RECIRCULATION PUMP 31	VC	46		YES	480V	BUS 5A	PWR PNL 31		CCW		REC SW
INTSIAPRE2	RECIRCULATION PUMP 32	VC	46		YES	480V	BUS 6A	PWR PNL 32		CCW		REC SW
LT-920	RWST LEVEL TRANSMITTER	YARD	79			118V	BUS 31					
SI-1802A	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					REC SW
SI-1802B	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					REC SW
SI-881	CHECK VALVE	PAB	15									
SI-882	MOTOR OPERATED VALVE	PAB	15		YES	480V	MCC36B					REC SW
SI-886A	CHECK VALVE	VC	46									
SI-886B	CHECK VALVE	VC	46									
SI-889A	MOTOR OPERATED VALVE	VC	68		YES	480V	MCC36A					
SI-889B	MOTOR OPERATED VALVE	VC	68		YES	480V	MCC36B					

Table D10 Chemical and Volume Control System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
1/BATP31	BAT PUMP 31 CONTROL SWITCH	CB	53	FCF								
1/BATP32	BAT PUMP 32 CONTROL SWITCH	CB	53	FCF								
1/BCR	MAKEUP CONTROL SWITCH	CB	53	FCF								
1/CSAPCH1	CHARGING PUMP 31 CONTROL SWITCH	CB	53	FBF								
1/CSAPCH2	CHARGING PUMP 32 CONTROL SWITCH	CB	53	FBF								
1/CSAPCH3	CHARGING PUMP 33 CONTROL SWITCH	CB	53	FBF								
1/MOV-333	MOV-333 CONTROL SWITCH	CB	53	SFF								
43/BAB	MAKEUP MODE SELECTOR SWITCH	CB	53	FCF								
43A/BATP31	BAT PUMP 31 SPEED SELECTOR SWITCH	CB	53	FCF								
43A/BATP32	BAT PUMP 32 SPEED SELECTOR SWITCH	CB	53	FCF								
52/C1	CIRCUIT BREAKER	CB	15			480V	BUS 5A	PWR PNL 31				
52/C2	CIRCUIT BREAKER	CB	15			480V	BUS 3A	PWR PNL 33				
52/C3	CIRCUIT BREAKER	CB	15			480V	BUS 6A	PWR PNL 32				
BSX-1	RELAY	CB	53			118V	BUS 31					
BSX-2	RELAY	CB	53			118V	BUS 31					
CH-204A	AIR OPERATED VALVE	VC	46		YES			DIS PNL 31			IAS	
CH-204B	AIR OPERATED VALVE	VC	59		YES			DIS PNL 32			IAS	
CH-205	MOTOR OPERATED VALVE	PAB	68		YES	480V	MCC36B					
CH-218	RELIEF VALVE	VC	46									
CH-222	MOTOR OPERATED VALVE	PAB	68		YES	480V	MCC36A					
CH-223	MANUAL VALVE	PAB	15									
CH-225	MANUAL VALVE	PAB	15									
CH-226	MOTOR OPERATED VALVE	PAB	68		YES	480V	MCC36A					
CH-229	MANUAL VALVE	PAB	55									
CH-230	MANUAL VALVE	PAB	55									
CH-232	MANUAL VALVE	PAB	55									
CH-233	MANUAL VALVE	PAB	55									
CH-235	MANUAL VALVE	PAB	55									
CH-236	MANUAL VALVE	PAB	55									
CH-238	MANUAL VALVE	PAB	55									
CH-239J	MANUAL VALVE	PAB	15									
CH-239K	MANUAL VALVE	PAB	15									
CH-241A	MANUAL VALVE	PAB	41									
CH-241B	MANUAL VALVE	PAB	41									
CH-241C	MANUAL VALVE	PAB	41									
CH-241D	MANUAL VALVE	PAB	41									
CH-244A	MANUAL VALVE	VC	46									
CH-244B	MANUAL VALVE	VC	46									
CH-244C	MANUAL VALVE	VC	46									
CH-244D	MANUAL VALVE	VC	46									
CH-249A	MANUAL VALVE	PAB	15									
CH-249B	MANUAL VALVE	PAB	15									

Table D10 Chemical and Volume Control System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
CH-249C	MANUAL VALVE	PAB	15									
CH-249D	MANUAL VALVE	PAB	15									
CH-250A	MOTOR OPERATED VALVE	PAB	68			480V	MCC36B					
CH-250B	MOTOR OPERATED VALVE	PAB	68			480V	MCC36B					
CH-250C	MOTOR OPERATED VALVE	PAB	68			480V	MCC36B					
CH-250D	MOTOR OPERATED VALVE	PAB	68			480V	MCC36B					
CH-210A	CHECK VALVE	VC	60									
CH-210B	CHECK VALVE	VC	60									
CH-210C	CHECK VALVE	VC	60									
CH-210D	CHECK VALVE	VC	60									
CH-251A	CHECK VALVE	VC	68									
CH-251B	CHECK VALVE	VC	68									
CH-251C	CHECK VALVE	VC	68									
CH-251D	CHECK VALVE	VC	68									
CH-251E	CHECK VALVE	VC	68									
CH-251F	CHECK VALVE	VC	68									
CH-251G	CHECK VALVE	VC	68									
CH-251H	CHECK VALVE	VC	68									
CH-251J	CHECK VALVE	VC	68									
CH-251K	CHECK VALVE	VC	68									
CH-251L	CHECK VALVE	VC	68									
CH-251M	CHECK VALVE	VC	68									
CH-261A	AIR OPERATED VALVE	VC	46		YES			DIS PNL 31			IAS	
CH-261B	AIR OPERATED VALVE	VC	46		YES			DIS PNL 32			IAS	
CH-261C	AIR OPERATED VALVE	VC	46		YES			DIS PNL 31			IAS	
CH-261D	AIR OPERATED VALVE	VC	46		YES			DIS PNL 32			IAS	
CH-262A	MANUAL VALVE	VC	46									
CH-262B	MANUAL VALVE	VC	46									
CH-262C	MANUAL VALVE	VC	46									
CH-262D	MANUAL VALVE	VC	46									
CH-272A	MANUAL VALVE	PAB	73									
CH-272B	MANUAL VALVE	PAB	73									
CH-278	MANUAL VALVE	PAB	55									
CH-283	MANUAL VALVE	PAB	55									
CH-284	MANUAL VALVE	PAB	55									
CH-289	MANUAL VALVE	PAB	55									
CH-290	CHECK VALVE	PAB	55									
CH-292	MANUAL VALVE	PAB	55									
CH-293	MANUAL VALVE	PAB	73									
CH-297	MANUAL VALVE	PAB	73									
CH-328	CHECK VALVE	PAB	73									
CH-329	MANUAL VALVE	PAB	73									
CH-332	CHECK VALVE	PAB	55									
CH-333	MOTOR OPERATED VALVE	PAB	55		YES	480V	MCC36B					

Table D10 Chemical and Volume Control System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
CH-334	MANUAL VALVE	PAB	73									
CH-336	MANUAL VALVE	PAB	73									
CH-337	MANUAL VALVE	PAB	55-73									
CH-360	MANUAL VALVE	PAB	55									
CH-362A	CHECK VALVE	PAB	55									
CH-362B	CHECK VALVE	PAB	55									
CH-364	MANUAL VALVE	PAB	55									
CH-366	MANUAL VALVE	PAB	55									
CH-370	MANUAL VALVE	PAB	55									
CH-373	MANUAL VALVE	PAB	55-73									
CH-374	CHECK VALVE	VC	46									
CH-401	CHECK VALVE	PAB	55									
CH-402	CHECK VALVE	PAB	55									
CH-403	CHECK VALVE	PAB	55									
CH-404	CHECK VALVE	PAB	55									
CH-405	CHECK VALVE	PAB	55									
CH-406	CHECK VALVE	PAB	55									
CH-441	MOTOR OPERATED VALVE	PAB	68			480V	MCC36A					
CH-442	MOTOR OPERATED VALVE	PAB	68			480V	MCC36A					
CH-443	MOTOR OPERATED VALVE	PAB	68			480V	MCC36A					
CH-444	MOTOR OPERATED VALVE	PAB	68			480V	MCC36A					
CH-FCV-110A	FLOW CONTROL VALVE	PAB	73		YES			DIS PNL 31			IAS	RLYS BSX-1,
CH-FCV-110B	FLOW CONTROL VALVE	PAB	73		YES			DIS PNL 31			IAS	RLYS BSX-1,
CH-HCV-142	FLOW CONTROL VALVE	PAB	55		YES	118V	BUS 31					
CH-LCV-112B	LEVEL CONTROL VALVE	PAB	55		YES	480V	MCC36B					RLY LC112C-X
CH-LCV-112C	LEVEL CONTROL VALVE	PAB	55		YES	480V	MCC36A					RLY LC112C-X &LC112B
CSAHSW1	SEAL RETURN WATER HTX 31	PAB	73							CCW		
CSAPBA1	BORIC ACID TRANSFER PUMP 31	PAB	55		YES	480V	MCC36A					RLYS BSX-1,
CSAPBA2	BORIC ACID TRANSFER PUMP 32	PAB	55		YES	480V	MCC36B					RLYS BSX-1,
CSAPCH1	CHARGING PUMP 31	PAB	55		YES	480V	BUS 5A	PWR PNL 31		CCW/CITY WTR		SIAS
CSAPCH2	CHARGING PUMP 32	PAB	55		YES	480V	BUS 3A	PWR PNL 33		CCW/CITY WTR		SIAS
CSAPCH3	CHARGING PUMP 33	PAB	55		YES	480V	BUS 6A	PWR PNL 32		CCW/CITY WTR		SIAS
CSBLBA1	BORIC ACID BLENDER	PAB	73									
CSFLBA1	BORIC ACID FILTER	PAB	73									
CSFLSI1	SEAL INJECTION FILTER	PAB	15									

Table D10 Chemical and Volume Control System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
CSFLSI2	SEAL INJECTION FILTER	PAB	15									
CSFLSW1	SEAL WATER FILTER	PAB	73									
FIC-110	BORIC ACID FLOW CONTROLLER	CB	53	FBF	YES	118V	BUS 31					BORIC ACID FLOW
FIT-156A	RCI PUMP NO.1 SEAL LEAK FLOW INSTRUMENT	VC										
FIT-156B	RCI PUMP NO.1 SEAL LEAK FLOW INSTRUMENT	VC										
FIT-157A	RCI PUMP NO.1 SEAL LEAK FLOW INSTRUMENT	VC										
FIT-157B	RCI PUMP NO.1 SEAL LEAK FLOW INSTRUMENT	VC										
FIT-158A	RCI PUMP NO.1 SEAL LEAK FLOW INSTRUMENT	VC										
FIT-158B	RCI PUMP NO.1 SEAL LEAK FLOW INSTRUMENT	VC										
FIT-159A	RCI PUMP NO.1 SEAL LEAK FLOW INSTRUMENT	VC										
FIT-159B	RCI PUMP NO.1 SEAL LEAK FLOW INSTRUMENT	VC										
LC112C-X	RELAY	CB	53			118V	BUS 31					
SC-141A	CHG PMP 31 SPEED CONTROLLER	CB	53	FBF	YES	118V	BUS 34					
SC-141B	CHG PMP 32 SPEED CONTROLLER	CB	53	FBF	YES	118V	BUS 34					
SC-141C	CHG PMP 33 SPEED CONTROLLER	CB	53	FBF	YES	118V	BUS 34					
SI-846	MANUAL VALVE	YARD	81									
YIC-110	BORIC ACID FLOW TOTALIZER	CB	53	FBF	YES	118V	BUS 31					BORIC ACID FLOW

Table D11.1 Offsite Electric Power System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
BT5-6	138kV Breaker BT5-6	Switchyard			Yes	480V	MCC32 / MCC39					
MOD-BK5	MOD Switch BK5	Switchyard						Pwr Pnl 31/ Pwr Pnl 32				
MOD-BT5-6S	MOD Switch BT5-6S	Switchyard						Pwr Pnl 31/ Pwr Pnl 32				
MOD-F4	MOD Switch F4	Switchyard						Pwr Pnl 31/ Pwr Pnl 32				

Table D11.2 6.9-KVAC Electric Power System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
25-1	SYNCHRONISM-CHECK RELAY	CB	53	CCR PNL FCR			BUS 5 PT					
25-2	SYNCHRONISM-CHECK RELAY	CB	53	CCR PNL FCR			BUS 6 PT					
25/X1	SYNCHRONISM-CHECK AUX. RELAY	CB	53	CCR PNL FCR				DP 32/CKT.3				
25/X2	SYNCHRONISM-CHECK AUX. RELAY	CB	53	CCR PNL FCR				DP 31/CKT.19				
27-2-62	TIME DELAY RELAY(27-2-X1,27-2)	TB	15	6.9KV SWGR 31				PP 31/CKT.15				
27-2-62X	UV AUX RELAY	TB	15	6.9KV SWGR 31				PP 31/CKT.15				
27-3-62	TIME DELAY RELAY(27-3-X1,27-3)	TB	15	6.9KV SWGR 32				PP 32/CKT.7				
27-3-62X	UV AUX RELAY	TB	15	6.9KV SWGR 32				PP 32/CKT.7				
27-5-62	TIME DELAY RELAY(27-5-X1,27-5)	TB	15	6.9KV SWGR 31				DP 31/CKT.20				
27-6-62	TIME DELAY UV AUX RELAY(27-6-X1,27-6)	TB	15	6.9KV SWGR 32				DP 32/CKT.18				
27-6-62X	UV AUX RELAY	TB	15	6.9KV SWGR 32				DP 32/CKT.18				
27-6-62X	UV AUX RELAY	TB	15	6.9KV SWGR 32				DP 31/CKT.20				
31PP	125VDC POWER PANEL 31	CB	33			480V	MCC39/5F	BATT 31				
32DP	125VDC DISTRIBUTION PANEL 32	CB	53					PP 32/CKT.12				
32DP	125VDC DISTRIBUTION PANEL 32	CB	53					PP 32/CKT.12				
32PP	125VDC POWER PANEL 32	CB	33			480V	MCC37/1FL	BATT 32				
51/ST5	BRKR ST5 OVERCURRENT RELAY	TB	15	6.9KV SWGR 31	YES			PP 31/CKT.3				
51/ST6	BRKR ST6 OVERCURRENT RELAY	TB	15	6.9KV SWGR 32				PP 32/CKT.9				
51/UT1	BRKR UT1 OVERCURRENT RELAY	TB	15	6.9KV SWGR 31				PP 31/CKT.3				
51/UT2	BRKR UT2 OVERCURRENT RELAY	TB	15	6.9KV SWGR 32				PP 31/CKT.3				
51/UT3	BRKR UT3 OVERCURRENT RELAY	TB	15	6.9KV SWGR 32				PP 32/CKT.9				
51/UT4	BRKR UT4 OVERCURRENT RELAY	TB	15	6.9KV SWGR 32								
51N/ST5	BRKR ST5 NEUTRAL OVERCURRENT REL	TB	15	6.9KV SWGR 31	YES			PP 31/CKT.3				
51N/ST6	BRKR ST6 NEUTRAL OVERCURRENT REL	TB	15	6.9KV SWGR 32				PP 32/CKT.9				
51N/UT1	BRKR UT1 NEUTRAL OVERCURRENT REL	TB	15	6.9KV SWGR 31				PP 31/CKT.3				
51N/UT2	BRKR UT2 NEUTRAL OVERCURRENT REL	TB	15	6.9KV SWGR 32				PP 31/CKT.3				
51N/UT3	BRKR UT3 NEUTRAL OVERCURRENT REL	TB	15	6.9KV SWGR 32				PP 32/CKT.9				
51N/UT4	BRKR UT4 NEUTRAL OVERCURRENT REL	TB	15	6.9KV SWGR 32								
52/GT5	13.8KV TIE CIRCUIT BREAKER 52/GT5	TB	15	6.9KV SWGR 31		6.9KV		PP31/CKT.3				
52/GT6	13.8KV TIE CIRCUIT BREAKER 52/GT6	TB	15	6.9KV SWGR 32				PP32/CKT.9				

Table D11.2 6.9-KVAC Electric Power System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
52/SS2	6.9KV CIRCUIT BREAKER SS2	TB	15	6.9KV SWGR 31	YES			PP 31/CKT.3				
52/SS3	6.9KV CIRCUIT BREAKER SS3	TB	15	6.9KV SWGR 32	YES			PP 32/CKT.9				
52/SS5	6.9KV CIRCUIT BREAKER SS5	TB	15	6.9KV SWGR 31	YES			PP 31/CKT.3				
52/SS6	6.9KV CIRCUIT BREAKER SS6	TB	15	6.9KV SWGR 32	YES			PP 32/CKT.9				
52/ST5	6.9KV CIRCUIT BREAKER ST5	TB	15	6.9KV SWGR 31	YES			PP 31/CKT.3				
52/ST6	6.9KV CIRCUIT BREAKER ST6	TB	15	6.9KV SWGR 32	YES			PP 32/CKT.9				
52/UT1	6.9KV CIRCUIT BREAKER UT1	TB	15	6.9KV SWGR 31	YES			PP 31/CKT.3				
52/UT1-ST5	6.9KV CIRCUIT BREAKER UT1-ST5	TB	15	6.9KV SWGR 31	YES			PP 31/CKT.3				
52/UT2	6.9KV CIRCUIT BREAKER UT2	TB	15	6.9KV SWGR 31	YES			PP 31/CKT.3				
52/UT3	6.9KV CIRCUIT BREAKER UT3	TB	15	6.9KV SWGR 32	YES			PP 32/CKT.9				
52/UT3-ST6	6.9KV CIRCUIT BREAKER UT3-ST6	TB	15	6.9KV SWGR 32	YES			PP 32/CKT.9				
52/UT4	6.9KV CIRCUIT BREAKER UT4	TB	15	6.9KV SWGR 32	YES			PP 32/CKT.9				
52/UT4-ST6	6.9KV CIRCUIT BREAKER UT4-ST6	TB	15	6.9KV SWGR 32	YES			PP 32/CKT.9				
62/ST5	TIME-DELAY RELAY	TB	15	6.9KV SWGR 31	YES			PP 31/CKT.3				
62/ST6	TIME-DELAY RELAY	TB	15	6.9KV SWGR 32				PP 32/CKT.9				
62/UT1	TIME-DELAY RELAY	TB	15	6.9KV SWGR 31				PP 31/CKT.3				
62/UT2	TIME-DELAY RELAY	TB	15	6.9KV SWGR 32				PP 31/CKT.3				
62/UT3	TIME-DELAY RELAY	TB	15	6.9KV SWGR 32				PP 32/CKT.9				
62/UT4	TIME-DELAY RELAY	TB	15	6.9KV SWGR 32								
85L1/138	138KV PILOT-WIRE RECEIVER RELAY	CB	53	CCR PNL FBR	YES	118V	IB 32(CKT.23)	DP 33(CKT.18)				
85L2/138	138KV PILOT-WIRE RECEIVER RELAY	CB	53	CCR PNL FBR	YES	118V	IB 33(CKT.24)	DP 32(CKT.1)				
86/BU	GENERATOR BACK-UP LOCKOUT RELAY	CB	53	CCR PNL FAR	YES			DP 31/CKT.2				
86/P	GENERATOR PRIMARY LOCKOUT RELAY	CB	53	CCR PNL FAR	YES			DP 32/CKT.17				
86/ST5	BRKR ST5 LOCKOUT RELAY	TB	15	6.9KV SWGR 31	YES			PP 31/CKT.3				
86/ST6	BRKR ST6 LOCKOUT RELAY	TB	15	6.9KV SWGR 32				PP 32/CKT.9				
86/STBU	SAT BACK-UP LOCKOUT RELAY	CB	53	CCR PNL FBR	YES			DP 32 (CKT.3)				
86/STP	SAT PRIMARY LOCKOUT RELAY	CB	53	CCR PNL FBR	YES			DP 31/CKT.19				
86/UT1	BRKR UT1 LOCKOUT RELAY	CB	53	CCR PNL FBR	YES			PP 31/CKT.3				
86/UT3	BRKR UT3 LOCKOUT RELAY	TB	15	6.9KV SWGR 32	YES			PP 32/CKT.9				
86/UT4	BRKR UT4 LOCKOUT RELAY	TB	15	6.9KV SWGR 32	YES			PP 32/CKT.9				
87L1/138	DIFFERENTIAL OV. CURR. RELAY	CB	53	CCR PNL FBR	YES	118V	IB 32(CKT.23)	DP 33(CKT.18)				
87L2/138	DIFFERENTIAL OV. CURR. RELAY	CB	53	CCR PNL FBR	YES	118V	IB 33(CKT.24)	DP 32(CKT.1)				

Table D11.2 6.9-KVAC Electric Power System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
BUS1	6.9KV BUS 1	TB	15	6.9KV SWGR 31	YES	6.9KV						
BUS1-PT	6.9KV BUS1 POTENTIAL TRANSFORMER	TB	15	6.9KV SWGR 31		6.9KV/ 120V	BUS 1					
BUS2	6.9KV BUS 2	TB	15	6.9KV SWGR 32				PP 31/CKT.3				
BUS3	6.9KV BUS 3	TB	15	6.9KV SWGR 32	YES	6.9KV						
BUS4	6.9KV BUS 4	TB	15	6.9KV SWGR 32	YES	6.9KV						
BUS4-PT	6.9KV BUS4 POTENTIAL TRANSFORMER	TB	15	6.9KV SWGR 32		6.9KV/ 120V	BUS 4					
BUS5	6.9KV BUS 5	TB	15	6.9KV SWGR 31	YES	6.9KV						
BUS6	6.9KV BUS 6	TB	15	6.9KV SWGR 32	YES	6.9KV						
FUS-N-6SYN	NEGATIVE FUSE AT 125VDC DP 31/CKT.19	CB	53	125VDC DP 31				DP 31				
FUS-N-U1S5	NEGATIVE FUSE AT 125VDC PP 31/CKT.3	CB	33	125VDC PP 31				PP 31				
FUS-N-U3S6	FUSE NEGITIVE AT PP 32/CKT.9	CB	33	125VDC PP 32				PP 32				
FUS-N1ST5	NEGATIVE FUSE AT 125VDC DP 32/CKT.3	CB	53	125VDC DP 32				DP 32				
FUS-P-6SYN	POSITIVE FUSE AT 125VDC DP 31/CKT.19	CB	53	125VDC DP 31				DP 31				
FUS-P-U1S5	POSITIVE FUSE AT125VDC PP 31/CKT.3	CB	33	125VDC PP 31				PP 31				
FUS-P-U3S6	POSITIVE FUSE AT PP 32/CKT.9	CB	33	125VDC PP 32				PP 32				
FUS-P1ST5	POSITIVE FUSE AT 125VDC DP 32/CKT.3	CB	53	125VDC DP 32				DP 32				
FUS-PT1-BUS1	FUSE FOR BUS 1 PT-1(PRIMARY)	TB	15	6.9KV SWGR 31		6.9KV	BUS 1					
FUS-PT1-BUS2	FUSE FOR BUS 2 PT-1(PRIMARY)	TB	15	6.9KV SWGR 31		6.9KV						
FUS-PT1-BUS3	FUSE FOR BUS 3 PT-1(PRIMARY)	TB	15	6.9KV SWGR 32		6.9KV						
FUS-PT1-BUS4	FUSE FOR BUS 4 PT-1(PRIMAR)	TB	15	6.9KV SWGR 32		6.9KV						
FUS-PT1-BUS5	FUSE FOR BUS 5 PT-1(PRIMARY)	TB	15	6.9KV SWGR 31		6.9KV						
FUS-PT1-BUS6	FUSE FOR BUS 6 PT-1(PRIMARY)	TB	15	6.9KV SWGR 32		6.9KV	BUS 6					
FUS-PT2-BUS1	FUSE FOR BUS 1 PT-2(PRIMARY)	TB	15	6.9KV SWGR 31		6.9KV	BUS 1					
FUS-PT2-BUS2	FUSE FOR BUS 2 PT-2(PRIMARY)	TB	15	6.9KV SWGR 31		6.9KV						
FUS-PT2-BUS3	FUSE FOR BUS 3 PT-2(PRIMARY)	TB	15	6.9KV SWGR 32		6.9KV						

Table D11.2 6.9-KVAC Electric Power System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
FUS-PT2-BUS4	FUSE FOR BUS 4 PT-2(PRIMARY)	TB	15	6.9KV SWGR 32		6.9KV						
FUS-PT2-BUS5	FUSE FOR BUS 5 PT-2(PRIMARY)	TB	15	6.9KV SWGR 31		6.9KV						
FUS-PT2-BUS6	FUSE FOR BUS 6 PT-2(PRIMARY)	TB	15	6.9KV SWGR 32		6.9KV	BUS 6					
FUS-PT3-BUS1	FUSE FOR BUS 1 PT-3(PRIMARY)	TB	15	6.9KV SWGR 31		6.9KV	BUS 1					
FUS-PT3-BUS2	FUSE FOR BUS 2 PT-3(PRIMARY)	TB	15	6.9KV SWGR 31		6.9KV						
FUS-PT3-BUS3	FUSE FOR BUS 3 PT-3(PRIMARY)	TB	15	6.9KV SWGR 32		6.9KV						
FUS-PT3-BUS4	FUSE FOR BUS 4 PT-3(PRIMARY)	TB	15	6.9KV SWGR 32		6.9KV						
FUS-PT3-BUS5	FUSE FOR BUS 5 PT-3(PRIMARY)	TB	15	6.9KV SWGR 31		6.9KV						
FUS-PT3-BUS6	FUSE FOR BUS 6 PT-3(PRIMARY)	TB	15	6.9KV SWGR 32		6.9KV	BUS 6					
FUS-PT7-BUS1	FUSE FOR BUS 1 PT-7(SECONDARY)	TB	15	6.9KV SWGR 31		120V	BUS 1					
FUS-PT7-BUS2	FUSE FOR BUS 2 PT-7(SECONDARY)	TB	15	6.9KV SWGR 31		120V						
FUS-PT7-BUS3	FUSE FOR BUS 3 PT-7(SECONDARY)	TB	15	6.9KV SWGR 32		120V						
FUS-PT7-BUS4	FUSE FOR BUS 4 PT-7(SECONDARY)	TB	15	6.9KV SWGR 32		120V						
FUS-PT7-BUS5	FUSE FOR BUS 5 PT-7(SECONDARY)	TB	15	6.9KV SWGR 31		120V						
FUS-PT7-BUS6	FUSE FOR BUS 6 PT-7(SECONDARY)	TB	15	6.9KV SWGR 32		120V	BUS 6					
FUS-PT9-BUS1	FUSE FOR BUS 1 PT-9(SECONDARY)	TB	15	6.9KV SWGR 31		120V	BUS 1					
FUS-PT9-BUS2	FUSE FOR BUS 2 PT-9(SECONDARY)	TB	15	6.9KV SWGR 31		120V						
FUS-PT9-BUS3	FUSE FOR BUS 3 PT-9(SECONDARY)	TB	15	6.9KV SWGR 32		120V						
FUS-PT9-BUS4	FUSE FOR BUS 4 PT-9(SECONDARY)	TB	15	6.9KV SWGR 32		120V						
FUS-PT9-BUS5	FUSE FOR BUS 5 PT-9(SECONDARY)	TB	15	6.9KV SWGR 31		120V						
FUS-PT9-BUS6	FUSE FOR BUS 6 PT-9(SECONDARY)	TB	15	6.9KV SWGR 32		120V	BUS 6					
OC-50SS2	BRKR SS2 OVERCURRENT RELAY	TB	15	6.9KV SWGR 31		6.9KV						
OC-50SS3	BRKR SS3 OVERCURRENT RELAY	TB	15	6.9KV SWGR 32		6.9KV						

Table D11.2 6.9-KVAC Electric Power System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
OC-50SS5	BRKR SS5 OVERCURRENT RELAY	TB	15	6.9KV SWGR 31		6.9KV						
OC-50SS6	BRKR SS6 OVERCURRENT RELAY	TB	15	6.9KV SWGR 32		6.9KV		PP 32 /CKT.9				
OC-51SS2	BRKR SS2 TIME OVERCURRENT RELAY	TB	15	6.9KV SWGR 31		6.9KV						
OC-51SS3	BRKR SS3 TIME OVERCURRENT RELAY	TB	15	6.9KV SWGR 32		6.9KV						
OC-51SS5	BRKR SS5 TIME OVERCURRENT RELAY	TB	15	6.9KV SWGR 31		6.9KV						
OC-51SS6	BRKR SS6 TIME OVERCURRENT RELAY	TB	15	6.9KV SWGR 32		6.9KV		PP 32 /CKT.9				
PT-BUS2	6.9KV BUS 2 POTENTIAL TRANSFORMER	TB	15	6.9KV SWGR 31		6.9KV/120V						
PT-BUS3	6.9KV BUS 3 POTENTIAL TRANSFORMER	TB	15	6.9KV SWGR 32		6.9KV/120V						
PT-BUS5	6.9KV BUS 5 POTENTIAL TRANSFORMER	TB	15	6.9KV SWGR 31		6.9KV/120V						
PT-BUS6	6.9KV BUS 6 POTENTIAL TRANSFORMER	TB	15	6.9KV SWGR 32		6.9KV/120V	BUS 6					
SAT	STA. AUX. TRANSFORMER	YARD				138/6.9KV						

Table D11.3 480-VAC Electric Power System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
27-1-2A	UNDERVOLTAGE RELAY	CB	15	480V SWGR 31		120V	BUS 2A PT					480V BUS 2A
27-1-3A	UNDERVOLTAGE RELAY	CB	15	480V SWGR 32		120V	BUS 3A PT					480V BUS 3A
27-1-5A	UNDERVOLTAGE RELAY	CB	15	480V SWGR 31		120V	BUS 5A PT					480V BUS 5A
27-1-6A	UNDERVOLTAGE RELAY	CB	15	480V SWGR 32		120V	BUS 6A PT					480V BUS 6A
27-2-2A	UNDERVOLTAGE RELAY	CB	15	480V SWGR 31		120V	BUS 2A PT					480V BUS 2A
27-2-3A	UNDERVOLTAGE RELAY	CB	15	480V SWGR 32		120V	BUS 3A PT					480V BUS 3A
27-2-5A	UNDERVOLTAGE RELAY	CB	15	480V SWGR 31		120V	BUS 5A PT					480V BUS 5A
27-2-6A	UNDERVOLTAGE RELAY	CB	15	480V SWGR 32		120V	BUS 6A PT					480V BUS 6A
27-2A-X1	UNDERVOLTAGE AUX RELAY	CB	15	480V SWGR 31				PP33/CKT.1				27-1-2A
27-2A-X2	UNDERVOLTAGE AUX RELAY	CB	15	480V SWGR 31				PP33/CKT.1				27-2A-X1
27-2A-X4	UNDERVOLTAGE AUX RELAY	CB	15	480V SWGR 31				PP33/CKT.1				27-2-2A
27-3-2A	UNDERVOLTAGE RELAY	CB	15	480V SWGR 31		120V	BUS 2A PT					480V BUS 2A
27-3-3A	UNDERVOLTAGE RELAY	CB	15	480V SWGR 32		120V	BUS 3A PT					480V BUS 3A
27-3-5A	UNDERVOLTAGE RELAY	CB	15	480V SWGR 31		120V	BUS 5A PT					480V BUS 5A
27-3-6A	UNDERVOLTAGE RELAY	CB	15	480V SWGR 32		120V	BUS 6A PT					480V BUS 6A
27-3A-X1	UNDERVOLTAGE AUX RELAY	CB	15	480V SWGR 32				PP33/CKT.1				27-1-3A
27-3A-X2	UNDERVOLTAGE AUX RELAY	CB	15	480V SWGR 32				PP33/CKT.1				27-3A-X1
27-3A-X4	UNDERVOLTAGE AUX RELAY	CB	15	480V SWGR 32				PP33/CKT.1				27-2-3A
27-3X-2A	UNDERVOLTAGE AUX RELAY	CB	15	480V SWGR 31		120V	BUS 2A PT					27-3-2A
27-3X-3A	UNDERVOLTAGE AUX RELAY	CB	15	480V SWGR 32		120V	BUS 3A PT					27-3-3A
27-3X-5A	UNDERVOLTAGE AUX RELAY	CB	15	480V SWGR 31		120V	BUS 5A PT					27-3-5A
27-3X-6A	UNDERVOLTAGE AUX RELAY	CB	15	480V SWGR 32		120V	BUS 6A PT					27-3-6A
27-4-2A	UNDERVOLTAGE RELAY	CB	15	480V SWGR 31		120V	BUS 2A PT					480V BUS 2A
27-4-3A	UNDERVOLTAGE RELAY	CB	15	480V SWGR 32		120V	BUS 3A PT					480V BUS 3A
27-4-5A	UNDERVOLTAGE RELAY	CB	15	480V SWGR 31		120V	BUS 5A PT					480V BUS 5A
27-4-6A	UNDERVOLTAGE RELAY	CB	15	480V SWGR 32		120V	BUS 6A PT					480V BUS 6A
27-4X-2A	UNDERVOLTAGE AUX RELAY	CB	15	480V SWGR 31		120V	BUS 2A PT					27-4-2A
27-4X-3A	UNDERVOLTAGE AUX RELAY	CB	15	480V SWGR 32		120V	BUS 3A PT					27-4-3A
27-4X-5A	UNDERVOLTAGE AUX RELAY	CB	15	480V SWGR 31		120V	BUS 5A PT					27-4-5A
27-4X-6A	UNDERVOLTAGE AUX RELAY	CB	15	480V SWGR 32		120V	BUS 6A PT					27-4-6A
27-5A-X1	UNDERVOLTAGE AUX RELAY	CB	15	480V SWGR 31				PP31/CKT.4				27-1-5A
27-5A-X2	UNDERVOLTAGE AUX RELAY	CB	15	480V SWGR 31				PP31/CKT.4				27-5A-X1
27-5A-X4	UNDERVOLTAGE AUX RELAY	CB	15	480V SWGR 31				PP31/CKT.4				27-2-5A
27-6A-X1	UNDERVOLTAGE AUX RELAY	CB	15	480V SWGR 32				PP32/CKT.8				
27-6A-X2	UNDERVOLTAGE AUX RELAY	CB	15	480V SWGR 32				PP32/CKT.8				
27-6A-X4	UNDERVOLTAGE AUX RELAY	CB	15	480V SWGR 32				PP32/CKT.8				

Table D11.3 480-VAC Electric Power System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
3-3/5A2	SI/LOOP RELAY 3-3/5A2 TYPE BFD80S	CB	15	480V SWGR 31				PP31/CKT.4				SI/5A
33MCC	480V MCC 33	TB	15			480V	BUS 2A					
34MCC	480V MCC 34	TB	15			480V	BUS 2A					
36AMCC	480V MCC 36A	PAB	55			480V	BUS 5A					
36BMCC	480V MCC 36B	PAB	55			480V	BUS 6A					
36CMCC	480V MCC 36C	CB	15			480V	BUS 2A					
37MCC	480V MCC 37	PAB	35			480V	BUS 6A					
39MCC	480V MCC 39	CB	33			480V	BUS 5A					
480V BUS 2A PT	480V BUS 2A POTENTIAL TRANSFORMER	CB	15	480V SWGR 31		480V	2A					480V BUS 2A
480V BUS 3A PT	480V BUS 3A POTENTIAL TRANSFORMER	CB	15	480V SWGR 32		480V	3A					480V BUS 3A
480V BUS 5A PT	480V BUS 5A POTENTIAL TRANSFORMER	CB	15	480V SWGR 31		480V	5A					480V BUS 5A
480V BUS 6A PT	480V BUS 6A POTENTIAL TRANSFORMER	CB	15	480V SWGR 32		480V	6A					480V BUS 6A
52/2A	480V CIRCUIT BREAKER 2A	CB	15	480V SWGR 31	YES			PP33/CKT.1				52/EG1
52/2AT3A	480V CIRCUIT BREAKER 2AT3A	CB	15	480V SWGR 31	YES			PP33/CKT.1				52/3A
52/3A	480V CIRCUIT BREAKER 3A	CB	15	480V SWGR 32	YES			PP33/CKT.1				27-3A-X2
52/3AT6A	480V CIRCUIT BREAKER 3AT6A	CB	15	480V SWGR 31	YES			PP32/CKT.8				
52/5A	480V CIRCUIT BREAKER 5A	CB	15	480V SWGR 31	YES			PP31/CKT.4				52/EG3
52/6A	480V CIRCUIT BREAKER 6A	CB	15	480V SWGR 32	YES			PP32/CKT.8				52/EG2
52/MCC3	CIRCUIT BREAKER 52/MCC3	CB	15	480V SWGR 31				PP31/CKT.4				
52/MCC4	CIRCUIT BREAKER 52/MCC4	CB	15	480V SWGR 31				PP31/CKT.4				
52/MCC6A	CIRCUIT BREAKER 52/MCC6A	CB	15	480V SWGR 32				PP32/CKT.8				
52/MCC6B	CIRCUIT BREAKER 52/MCC6B	CB	15	480V SWGR 31				PP31/CKT.4				
52/MCC6C	CIRCUIT BREAKER 52/MCC6C	CB	15	480V SWGR 31				PP31/CKT.4				
52/MCC7	CIRCUIT BREAKER 52/MCC7	CB	15	480V SWGR 32				PP32/CKT.8				
52/MCC9	CIRCUIT BREAKER 52/MCC9	CB	15	480V SWGR 31				PP31/CKT.4				
62-1-2A	TIME DELAY RELAY	CB	15	480V SWGR 31				PP33/CKT.1				27-3X-2A
62-1-3A	TIME DELAY RELAY	CB	15	480V SWGR 32				PP33/CKT.1				27-3X-3A
62-1-5A	TIME DELAY RELAY	CB	15	480V SWGR 31				PP31/CKT.4				27-3X-5A
62-1-6A	TIME DELAY RELAY	CB	15	480V SWGR 32				PP32/CKT.8				
62-2-2A	TIME DELAY RELAY	CB	15	480V SWGR 31				PP33/CKT.1				SI/2A
62-2-3A	TIME DELAY RELAY	CB	15	480V SWGR 32				PP33/CKT.1				SI/3A
62-2-5A	TIME DELAY RELAY	CB	15	480V SWGR 31				PP31/CKT.4				SI/5A
62-2-6A	TIME DELAY RELAY	CB	15	480V SWGR 32				PP32/CKT.8				
BUS2A	480V BUS 2A	CB	15	480V SWGR 31	YES							
BUS3A	480V BUS 3A	CB	15	480V SWGR 32	YES							

Table D11.3 480-VAC Electric Power System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
BUS5A	480V BUS 5A	CB	15	480V SWGR 31	YES							
BUS6A	480V BUS 6A	CB	15	480V SWGR 32	YES							
FUSE-2A-PT	FUSES ON 480V BUS 2A POT XFRMR	CB	15	480V SWGR 31		480V	2A					
FUSE-3A-PT	FUSES ON 480V BUS 3A POT XFRMR	CB	15	480V SWGR 32		480V	3A					
FUSE-5A-PT	FUSES ON 480V BUS 5A POT XFRMR	CB	15	480V SWGR 31		480V	5A					
FUSE-6A-PT	FUSES ON 480V BUS 6A POT XFRMR	CB	15	480V SWGR 32		480V	6A					
OTS-2A	OVERCURRENT TRIP SWITCH	CB	15	480V SWGR 31		480V	2A					
OTS-3A	OVERCURRENT TRIP SWITCH	CB	15	480V SWGR 32		480V	3A					
OTS-5A	OVERCURRENT TRIP SWITCH	CB	15	480V SWGR 31		480V	5A					
OTS-6A	OVERCURRENT TRIP SWITCH	CB	15	480V SWGR 32		480V	6A					
SS TRANS 2	STATION SERVICE TRANSFORMER 2	CB	15	480V SWGR 31		6.9KV	BUS 2					
SS TRANS 3	STATION SERVICE TRANSFORMER 3	CB	15	480V SWGR 32		6.9KV	BUS 3					
SS TRANS 5	STATION SERVICE TRANSFORMER 5	CB	15	480V SWGR 31		6.9KV	BUS 5					
SS TRANS 6	STATION SERVICE TRANSFORMER 6	CB	15	480V SWGR 32		6.9KV	BUS 6					

Table D11.4 125-VDC Electric Power System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
31-BATT-FUSE	BATTERY 31 FUSES	CB	33									
31DP	DC DISTRIBUTION PANEL 31	CB	53					PP31	CR HVAC			
31PP	DC POWER PANEL 31	CB	33		Yes				CB VENT			
31PP-17	POWER PANEL 31 BATT CKT BRKR	CB	33					PP31				
32-BATT-FUSE	BATTERY 32 FUSES	CB	33									
32DP	DC DISTRIBUTION PANEL 32	CB	53					PP32	CR HVAC			
32PP	DC POWER PANEL 32	CB	33		Yes				CB VENT			
32PP-15	POWER PANEL 32 BATT CKT BRKR	CB	33					PP32				
33-BATT-FUSE	BATTERY 33 FUSES	CB	15									
33DP	DC DISTRIBUTION PANEL 33	CB	53					PP31	CR HVAC			
33PP	DC POWER PANEL 33	CB	15		Yes				CB VENT			
33PP-MAIN	POWER PANEL 33 BATT CKT BRKR	CB	15					PP33				
34DP	DC DISTRIBUTION PANEL 34	CB	53					PP32	CR HVAC			
34PP	DC POWER PANEL 34	CB	33		Yes				CB VENT			
34PP-MAIN	POWER PANEL 34 BATT CKT BRKR	CB	33					PP34				
BATT 31	BATTERY 31	CB	33						BR VENT			
BATT 32	BATTERY 32	CB	33						BR VENT			
BATT 33	BATTERY 33	DGB	15						BR VENT			
BATT 34	BATTERY 34	CB	33						BR VENT			
BATT CHGR 31	BATTERY CHARGER 31	CB	33						CB VENT			
BATT CHGR 32	BATTERY CHARGER 32	CB	33						CB VENT			
BATT CHGR 33	BATTERY CHARGER 33	CB	15						CB VENT			
BATT CHGR 34	BATTERY CHARGER 34	CB	33						CB VENT			
BATT CHGR 35	BATTERY CHARGER 35	CB	33						CB VENT			
PLUG	BATT CHGR 35 MAXGUARD PLUG	CB	33									

Table D11.5 118-VAC Electric Power System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
31 INVERTER	118VAC INSTRUMENT BUS 31 INVERTER	CB	33		YES	480V	MCC34	PP31	CB VENT			
31IB-31	BUS 31 SUPPLY CIRCUIT BREAKER	CB	33			118V	INST BUS 31					
32 INVERTER	118VAC INSTRUMENT BUS 32 INVERTER	CB	33		YES	480V	MCC33	PP32	CB VENT			
32IB-31	BUS 32 SUPPLY CIRCUIT BREAKER	CB	33			118V	INST BUS 32					
33 INVERTER	118VAC INSTRUMENT BUS 33 INVERTER	CB	33		YES	480V	MCC39	PP33	CB VENT			
33IB-31	BUS 33 SUPPLY CIRCUIT BREAKER	CB	33			118V	INST BUS 33					
34 INVERTER	118VAC INSTRUMENT BUS 34 INVERTER	CB	33		YES	480V	MCC36B , MCC36C	PP34	CB VENT			
34IB-31	BUS 34 NORMAL SUPPLY CKT BREAKER	CB	33			118V	INST BUS 34					34IB-32
34IB-32	BUS 34 BACKUP SUPPLY CKT BREAKER	CB	33			118V	INST BUS 34					34IB-31
IB31 BYPASS SW	INVERTER 31 MAINT BYPASS SWITCH	CB	33									
IB32 BYPASS SW	INVERTER 32 MAINT BYPASS SWITCH	CB	33									
IB33 BYPASS SW	INVERTER 33 MAINT BYPASS SWITCH	CB	33									
IB34 BYPASS SW	INVERTER 34 MAINT BYPASS SWITCH	CB	33									

Table D11.6 Emergency Diesel Generator #31 System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
1-1 / EG1	BUS2A EMERG FEED CTL. SWITCH	CB	53									
1-1/2A(AUX)	2A NORMAL FEED BRK CTL SWITCH	CB	53									
1-1/2AT5A	(AUX) 2AT5A TIE BRK CTL SWITCH	CB	53									
1/FB1-31	F.O.PUMP 31 CONTROL SWITCH	DGB	15			120	MCC36C					
2/ISO SW	ISOLATION SWITCH	CB	15	SWGR ISOL. CAB.								
20-1/1207A	LCV-1207A SOLENOID VALVE	DGB	15			120	MCC36C					
27-1	DG 31 UNDERVOLTAGE RELAY	DGB	15	DG31 CNTL BD		480	BUS 2A	PP33				
27-2A-X1	BUS2A AUX UNDERVOLTAGE RELAY	CB	15	480V SWGR 31	YES			PP 33 / 1				
27-2A-X2	BUS2A AUX UNDERVOLTAGE RELAY	CB	15	480V SWGR 31	YES			PP 33 / 1				
27-2A-X4	BUS2A AUX UNDERVOLTAGE RELAY	CB	15	480V SWGR 31	YES			PP 33 / 1				
27X1 / EG1	DG31 UNDERVOLTAGE CVX RELAY	DGB	15	DG31 CNTL BD				PP 33				
3-3/2A1	BFD-80S RELAY	CB	15	480V SWGR 31				PP 33				
31 OPS-1	DG31 OIL PRESS SWITCH 1	DGB	15	DG31 CNTL BD								
31 OPS-2	DG31 OIL PRESS SWITCH 2	DGB	15	DG31 CNTL BD								
31 OPS-3	DG31 OIL PRESS SWITCH 3	DGB	15	DG31 CNTL BD								
31-AR-TANK	DG 31 AIR RECEIVER	DGB	15									
31JWPS-1	JACKET WATER PRESS SWITCH 1	DGB	15									
31JWPS-2	JACKET WATER PRESS SWITCH 2	DGB	15									
31JWPS-3	JACKET WATER PRESS SWITCH 3	DGB	15									
32-1	DG31 REVERSE POWER RELAY	DGB	15	DG31 CNTL BD				PP33				
32X-1	DG31 REVERSE POWER AUX. RELAY	DGB	15	DG31 CNTL BD				PP33				
33PP-1	DC CIRCUIT BREAKER	CB	15					PP 33				
51V-3-1	DG31 METER&RLING. OVERCURR RL	DGB	15	DG31 CNTL BD				PP33				
51VX-1	DG31 OVERCURRENT AUX. RELAY	DGB	15	DG31 CNTL BD				PP33				
52/2A	480V CIRCUIT BREAKER	CB	15									
52/2AT5A	480V TIE CIRCUIT BREAKER	CB	15									
52/EG1	480V CIRCUIT BREAKER	CB	15	BUS 2A/29B,C	YES			PP 33				
86-1	DG 31 LOCKOUT RELAY	DGB	15	DG31 CNTL BD	YES			PP33				
86/2A	BUS2A OVERCURR. LOCKOUT RL.	CB	15					PP33				
86/2A	BUS2A OVERCURR.LOCKOUT RELAY	CB	15	480V SWGR 31				PP 33 / 1				
86X-1	DG 31 LOCKOUT AUX. RELAY	DGB	15	DG31 CNTL BD				PP33				
AUX-SW(2A)	BRKR 2A AUX SWITCH	CB	15	480V SWGR 31	YES							
AUX-SW(2AT5A)	BRKR 2AT5A AUX SWITCH	CB	15	480V SWGR 31	YES							
CPT-29-(P)	FUSE (POS) AT SWGR31 CPT29	CB	15	480V SWGR 31				PP33				
CPT-29-(N)	FUSE (NEG) AT SWGR31 CPT29	CB	15	480V SWGR 31				PP33				
D31-F10	FUSE F10(POS)	DGB	15	DG31 CNTL BD				PP 33				
D31-F11	FUSE F11(NEG)	DGB	15	DG31 CNTL BD				PP 33				
DE-31	ED 31 ENGINE	DGB	15						DGV	SWS		
DG-31	ED 31 GENERATOR	DGB	15		YES							

Table D11.6 Emergency Diesel Generator #31 System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
EDG31-FO-T-P	31 FUEL OIL TRANSFER PUMP	DGB	38			480	MCC36C					
ESS/31	ENGINE STOP SOLENOID	DGB	15	DG31 CNTL BD				PP33				
FUSE 2A (+)	125VDC PP33/1 TO BUS2A&3A RELAY	CB	15	480V SWGR 31				PP 33 / 1				
FUSE 2A (-)	125VDC PP33/1 TO BUS2A&3A RELAY	CB	15	480V SWGR 31				PP 33 / 1				
K1/31	RELAY	DGB	15	DG31 CNTL BD				PP33				
KIX-1	DG31 FIELD SHUTDOWN AUX RELAY	DGB	15	DG31 CNTL BD				PP33				
LC-1204S	F.O.S. TANK31 LEVEL CONTROLLER	DGB	38									
LC-1207S	F.O.D. TANK 31 LEVEL CONTROLLER	DGB	26									
LCV-1207A	F.O.DAY TANK 31 LEVEL CTL.VALVE	DGB	10			120	MCC36C					
LIM-SW(2A)	BRKR 2A LIM SWITCH	CB	15	480V SWGR 31	YES							
LIM-SW(2AT5A)	BRKR 2AT5A LIM SWITCH	CB	15	480V SWGR 31								
NST-1	NORMAL SHUTDOWN TIMER RELAY	DGB	15	DG31 CNTL BD				PP33				
OCT-1-1	DG31 OVERCRANK TIMER RELAY	DGB	15	DG31 CNTL BD				PP33				
OSR-1	DG31 OVERSPEED RELAY	DGB	15	DG31 CNTL BD				PP33				
OTS-A/2A	OVERCURRENT TRIP SWITCH	CB	15	480V SWGR 31								
OTS-A/EG1	OVERCURRENT TRIP SWITCH	CB	15	480V SWGR 31								
PP33-4	DC CIRCUIT BREAKER	CB	15	125V DC PP33				PP 33				
RR-1	DG 31 RUN RELAY	DGB	15	DG31 CNTL BD				PP33				
SDR-1	DG 31 SHUTDOWN RELAY	DGB	15	DG31 CNTL BD				PP33				
ST-SO-A/31	STARTING SOLENOID A	DGB	15					PP 33				
ST-SO-B/31	STARTING SOLENOID B	DGB	15					PP 33				
STOP-PB-31	DG31 EMERG STOP PB	DGB	15	DG31 CNTL BD				PP33				

Table D11.7 Emergency Diesel Generator #32 System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
FUSE 3A (+)	125VDC PP32/8 TO BUS6A RELAY	CB	15	480V SWGR 32				PP32				
FUSE 3A (+)	125VDC PP33/2 TO BUS3A RELAY	CB	15	480V SWGR 32				PP33				
FUSE 3A (-)	125VDC PP32/8 TO BUS6A RELAY	CB	15	480V SWGR 32				PP32				
FUSE 3A (-)	125VDC PP33/2 TO BUS3A RELAY	CB	15	480V SWGR 32				PP33				
LC-1205S	F.O.S. TANK32 LEVEL CONTROLLER	DGB	38									
1-1 / EG2	BUS6A EMERG FEED CTL. SWITCH	CB	53									
1-1/3AT6A	3AT6A TIE BRK CTL SWITCH	CB	53									
1-1/6A(AUX)	6A NORMAL FEED BRK CTL SWITCH	CB	53									
1/FP2	F.O.PUMP 32 CONTROL SWITCH	DGB	15			120	MCC36B					
20-2/1208A	LCV-1208A SOLENOID VALVE	DGB	15			120	MCC36B					
27-2	DG 32 UNDERVOLTAGE RELAY	DGB	15	DG32 CNTL BD		480	BUS 6A	PP32				
27-6A-X1	BUS6A AUX UNDERVOLTAGE RELAY	CB	15	480V SWGR 32				PP32				
27-6A-X2 (SS)	BUS6A AUX UNDERVOLTAGE RELAY	CB	15	480V SWGR 32				PP32				
27-6A-X4	BUS6A AUX UNDERVOLTAGE RELAY	CB	15	480V SWGR 32				PP32				
27X1/EG2	DG32 UNDERVOLTAGE CVX RELAY	DGB	15	DG32 CNTL BD				DP32				
3-3/6A1	BFD-80S RELAY	CB	15	480V SWGR32				PP32				
32-2	DG32 REVERSE POWER RELAY	DGB	15	DG32 CNTL BD				DP32				
32-AR-TANK	DG 32 AIR RECEIVER	DGB	15									
32JWPS-1	JACKET WATER PRESS SWITCH 1	DGB	15									
32JWPS-2	JACKET WATER PRESS SWITCH 2	DGB	15									
32JWPS-3	JACKET WATER PRESS SWITCH 3	DGB	15									
32OPS-1	DG32 OIL PRESS SWITCH 1	DGB	15	DG32 CNTL BD								
32OPS-2	DG32 OIL PRESS SWITCH 2	DGB	15	DG32 CNTL BD								
32OPS-3	DG32 OIL PRESS SWITCH 3	DGB	15	DG32 CNTL BD								
32X-2	DG32 REVERSE POWER AUX. RELAY	DGB	15	DG32 CNTL BD				DP32				
51V-3-2	DG32 METER&RLING. OVERCURR RL	DGB	15	DG32 CNTL BD				DP32				
51VX-2	DG32 OVERCURRENT AUX. RELAY	DGB	15	DG32 CNTL BD				DP32				
52/3AT6A	480V TIE CIRCUIT BREAKER	CB	15	480V SWGR 32				PP32				
52/6A	480V CIRCUIT BREAKER	CB	15	480V SWGR 32				PP32				
52/EG2	480V CIRCUIT BREAKER	CB	15	BUS 6A/15B,C	YES			PP 32				
86-2	DG 32 LOCKOUT RELAY	DGB	15	DG32 CNTL BD				DP32				
86/6A	BUS6A OVERCURR. LOCKOUT RELAY	CB	15					PP32				
86/6A	BUS6A OVERCURR. LOCKOUT RELAY	CB	15	480V SWGR 32				PP32				
86X-2	DG 32 LOCKOUT AUX. RELAY	DGB	15	DG32 CNTL BD				DP32				
AUX-SW(3AT6A)	3AT6A AUX SWITCH	CB	15	480V SWGR 32								
AUX-SW(6A)	6A AUX SWITCH	CB	15	480V SWGR 32								
D32-F10	FUSE F10(POS)	DGB	15	DG32 CNTL BD				DP 32				
D32-F11	FUSE F11(NEG)	DGB	15	DG32 CNTL BD				DP 32				
DE-32	ED 32 ENGINE	DGB	15						DGV	SWS		

Table D11.7 Emergency Diesel Generator #32 System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
DG-32	ED 32 GENERATOR	DGB	15		YES							
DP 32	PANEL	CB	15	125 VDC DP32				PP 32				
EDG32-FO-T-P	32 FUEL OIL TRANSFER PUMP	DGB	38				MCC36B					
ESS	ENGINE STOP SOLENOID	DGB	15	DG32 CNTL BD				DP32				
K1/32	RELAY	DGB	15	DG32 CNTL BD				DP32				
KIX-2	DG 32 FIELD SHUTDOWN AUX RELAY	DGB	15	DG32 CNTL BD				DP32				
LC-1208S	F.O.D. TANK 32 LEVEL CONTROLLER	DGB	26									
LCV-1208A	F.O.DAY TANK 32 LEVEL CTL. VALVE	DGB	10			120	MCC36B					
LIM-SW(3AT6A)	3AT6A LIM SWITCH	CB	15	480V SWGR 32								
LIM-SW(6A)	6A LIM SWITCH	CB	15	480V SWGR 32								
NST-2	NORMAL SHUTDOWN TIMER RELAY	DGB	15	DG32 CNTL BD				DP32				
OCT-1-2	DG32 OVERCRANK TIMER RELAY	DGB	15	DG32 CNTL BD				DP32				
OSR-2	DG32 OVERSPEED RELAY	DGB	15	DG32 CNTL BD				DP32				
OTS-A/6A	OVERCURRENT TRIP SWITCH	CB	15	480V SWGR 32								
OTS-A/EG2	OVERCURRENT TRIP SWITCH	CB	15	480V SWGR 32								
PP32-8(+)	FUSE(+) FOR SWGR32 CPT15(52/EG2)	CB	15	480V SWGR 32				PP32				
PP32-8(-)	FUSE(-) FOR SWGR32 CPT15(52/EG2)	CB	15	480V SWGR 32				PP32				
RR-2	DG 32 RUN RELAY	DGB	15	DG32 CNTL BD				DP32				
SDR-2	DG 32 SHUTDOWN RELAY	DGB	15	DG32 CNTL BD				DP32				
ST-SO-A/32	STARTING SOLENOID A	DGB	15					PP32				
ST-SO-B/32	STARTING SOLENOID B	DGB	15					PP32				
STOP-PB-32	DG32 EMERG STOP PB	DGB	15	DG32 CNTL BD								

Table D11.8 Emergency Diesel Generator #33 System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
FUSE 5A (+)	125VDC PP31/4 TO BUS5A RELAY	CB	15	480V SWGR 31				PP 31 / 4				
FUSE 5A (-)	125VDC PP31/4 TO BUS5A RELAY	CB	15	480V SWGR 31				PP 31 / 4				
LC-1206S	F.O.S. TANK 33 LEVEL CONTROLLER	DGB	38									
1-1 /EG3	BUS5A EMERG FEED CTL. SWITCH	CB	53									
1-1/2AT5A	(AUX) 2AT5A TIE BRK CTL SWITCH	CB	53									
1-1/5A(AUX)	5A NORMAL FEED BRK CTL SWITCH	CB	53									
1/FB3	F.O.PUMP 33 CONTROL SWITCH	DGB	15			120	MCC36A					
20-3/1209A	LCV-1209A SOLENOID VALVE	DGB	15			120	MCC36A					
27-3	DG 33 UNDERVOLTAGE RELAY	DGB	15	DG33 CNTL BD		480	BUS 5A	PP31				
27-5A-X1	BUS5A AUX UNDERVOLTAGE RELAY	CB	15	480V SWGR 31				PP 31 / 4				
27-5A-X2	BUS5A AUX UNDERVOLTAGE RELAY	CB	15	480V SWGR 31				PP 31 / 4				
27-5A-X4	BUS5A AUX UNDERVOLTAGE RELAY	CB	15	480V SWGR 31				PP 31 / 4				
27X1/EG3	DG33 UNDERVOLTAGE CVX RELAY	DGB	15	DG33 CNTL BD				DP31				
3-3/5A1	BFD 80S RELAY	CB	15	480V SWGR 31				PP31				
32-3	DG33 REVERSE POWER RELAY	DGB	15	DG33 CNTL BD				DP31				
32X-3	DG33 REVERSE POWER AUX. RELAY	DGB	15	DG33 CNTL BD				DP31				
33-AR-TANK	DG 33 AIR RECEIVER	DGB	15									
33JWPS-1	JACKET WATER PRESS SWITCH 1	DGB	15									
33JWPS-2	JACKET WATER PRESS SWITCH 2	DGB	15									
33JWPS-3	JACKET WATER PRESS SWITCH 3	DGB	15									
33OPS-1	DG33 OIL PRESS SWITCH 1	DGB	15									
33OPS-2	DG33 OIL PRESS SWITCH 2	DGB	15									
33OPS-3	DG33 OIL PRESS SWITCH 3	DGB	15									
51V-3-3	DG33 METER&RLING. OVERCURR RL.	DGB	15	DG33 CNTL BD				DP31				
51VX-3	DG33 OVERCURRENT AUX. RELAY	DGB	15	DG33 CNTL BD				DP31				
52/2AT5A	480V TIE CIRCUIT BREAKER	CB	15					PP31				
52/5A	480V CIRCUIT BREAKER	CB	15					PP31				
52/EG3	480V CIRCUIT BREAKER	CB	15	BUS 5A/18B,C	YES			PP 31				
86-3	DG 33 LOCKOUT RELAY	DGB	15	DG33 CNTL BD				DP31				
86/5A	BUS5A OVERCURR. LOCKOUT RELAY	CB	15	480V SWGR 31				PP 31 / 4				
86/5A	BUS5A OVERCURR. LOCKOUT RL.	CB	15					PP31				
86X-3	DG 33 LOCKOUT AUX. RELAY	DGB	15	DG33 CNTL BD				DP31				
AUX-SW(2AT5A)	BRKR 2AT5A AUX SWITCH	CB	15	480V SWGR 31								
AUX-SW(5A)	BRKR 5A AUX SWITCH	CB	15	480V SWGR 31								
D33-F10	FUSE F10(POS)	DGB	15	DG33 CNTL BD				DP 31				
D33-F11	FUSE F11(NEG)	DGB	15	DG33 CNTL BD				DP 31				
DE-33	ED33 ENGINE	DGB	15						DGV	SWS		
DG-33	ED33 GENERATOR	DGB	15		YES							
DP 31	PANEL	CB	53	125VDC DP31				PP 31				

Table D11.8 Emergency Diesel Generator #33 System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
DP31-14	DC CIRCUIT BREAKER	CB	53	125VDC DP31				DP 31				
EDG33-FO-T-P	33 FUEL OIL TRANSFER PUMP	DGB	38			480	MCC36A					
ESS/33	ENGINE STOP SOLENOID	DGB	15	DG33 CNTL BD				DP31				
K1/33	RELAY	DGB	15	DG33 CNTL BD				DP31				
KIX-3	DG 33 FIELD SHUTDOWN AUX RELAY	DGB	15	DG33 CNTL BD				DP31				
LC-1209S	F.O.D. TANK33 LEVEL CONTROLLER	DGB	26									
LCV-1209A	F.O.DAY TANK 33 LEVEL CTL.VALVE	DGB	10			120	MCC36A					
LIM-SW(2AT5A)	BRKR 2AT5A LIM SWITCH	CB	15	480V SWGR 31								
LIM-SW(5A)	BRKR 5A LIM SWITCH	CB	15	480V SWGR 31								
NST-2	NORMAL SHUTDOWN TIMER RELAY	DGB	15	DG33 CNTL BD				DP31				
OCT-1-3	DG33 OVERCRANK TIMER RELAY	DGB	15	DG33 CNTL BD				DP31				
OSR-3	DG33 OVERSPEED RELAY	DGB	15	DG33 CNTL BD				DP31				
OTS-A/5A	OVERCURRENT TRIP SWITCH	CB	15	480V SWGR 31								
OTS-A/EG3	OVERCURRENT TRIP SWITCH	CB	15	480V SWGR 31								
PP31-4(P)	POS. FUSE FOR SWGR31 CPT18(52/EG3)	CB	15	480V SWGR 31				PP31				
PP31-4(N)	NEG. FUSE FOR SWGR31 CPT18(52/EG3)	CB	15	480V SWGR 31				PP31				
RR-3	DG 33 RUN RELAY	DGB	15	DG33 CNTL BD				DP31				
SDR-3	DG 33 SHUTDOWN RELAY	DGB	15	DG33 CNTL BD				DP31				
ST-SO-A/33	STARTING SOLENOID A	DGB	15					PP31				
ST-SO-B/33	STARTING SOLENOID B	DGB	15					PP31				
STOP-PB-33	DG33 EMERG STOP PB	DGB	15	DG33 CNTL BD								

Table D12 Emergency Diesel Generator Building Ventilation System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
ED314	DG 31 Exhaust Fan 314 Damper	DGB						DP33			DG Air	EF-314
ED315	DG 31 Exhaust Fan 315 Damper	DGB						DP33			DG Air	EF-315
ED316	DG 32 Exhaust Fan 316 Damper	DGB						DP32			DG Air	EF-316
ED317	DG 32 Exhaust Fan 317 Damper	DGB						DP32			DG Air	EF-317
ED318	DG 33 Exhaust Fan 318 Damper	DGB						DP31			DG Air	EF-318
ED319	DG 33 Exhaust Fan 319 Damper	DGB						DP31			DG Air	EF-319
EF314	DG 31 Exhaust Fan 314	DGB				480V	MCC36A					TS23-4/TR-31
EF315	DG 31 Exhaust Fan 315	DGB				480V	MCC36B					TS23-5/TR-31
EF316	DG 32 Exhaust Fan 316	DGB				480V	MCC36A					TS23-6/TR-32
EF317	DG 32 Exhaust Fan 317	DGB				480V	MCC36B					TS23-7/TR-32
EF318	DG 33 Exhaust Fan 318	DGB				480V	MCC36A					TS23-8/TR-33
EF319	DG 33 Exhaust Fan 319	DGB				480V	MCC36B					TS23-9/TR-33
L-316	DG 31 Room Ventilation Inlet Louver L-316	DGB									DG Air	DG31 Start
L-317	DG 32 Room Ventilation Inlet Louver L-317	DGB									DG Air	DG32 Start
L-318	DG 33 Room Ventilation Inlet Louver L-318	DGB									DG Air	DG33 Start
TR-31	TR-31 Fire Protection Relay	DGB										
TR-32	TR-32 Fire Protection Relay	DGB										
TR-33	TR-33 Fire Protection Relay	DGB										
TS234	DG 31 Room Temperature Switch 23-4	DGB		Pneum. Ctrl Pnl								
TS235	DG 31 Room Temperature Switch 23-5	DGB		Pneum. Ctrl Pnl								
TS236	DG 32 Room Temperature Switch 23-6	DGB		Pneum. Ctrl Pnl								
TS237	DG 32 Room Temperature Switch 23-7	DGB		Pneum. Ctrl Pnl								
TS238	DG 33 Room Temperature Switch 23-8	DGB		Pneum. Ctrl Pnl								
TS239	DG 33 Room Temperature Switch 23-9	DGB		Pneum. Ctrl Pnl								

Table D13 Hot Leg External Recirculation System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
1/1802A	MOV SI-1802A CONTROL SWITCH	CB	53	SBF-1								
1/1802B	MOV SI-1802B CONTROL SWITCH	CB	53	SBF-1								
1/885A	MOV SI-885A CONTROL SWITCH	CB	53	SBF-1								
1/885B	MOV SI-885B CONTROL SWITCH	CB	53	SBF-1								
1/856B	MOV SI-856B CONTROL SWITCH	CB	53	SBF-2								
1/856C	MOV SI-856C CONTROL SWITCH	CB	53	SBF-2								
1/856E	MOV SI-856E CONTROL SWITCH	CB	53	SBF-2								
1/856G	MOV SI-856G CONTROL SWITCH	CB	53	SBF-2								
1/856H	MOV SI-856H CONTROL SWITCH	CB	53	SBF-2								
1/856J	MOV SI-856J CONTROL SWITCH	CB	53	SBF-2								
1/887A	MOV SI-887A CONTROL SWITCH	CB	53	SBF-2								
1/887B	MOV SI-887B CONTROL SWITCH	CB	53	SBF-2								
1/RHR 1	RHR PUMP 31 CONTROL SWITCH	CB	53	SGF								
1/RHR 2	RHR PUMP 32 CONTROL SWITCH	CB	53	SGF								
1/SI1	SI PUMP 31 CONTROL SWITCH	CB	53	SBF-2								
1/SI2	SI PUMP 32 CONTROL SWITCH	CB	53	SBF-2								
1/SI3	SI PUMP 33 CONTROL SWITCH	CB	53	SBF-2								
43/RS-3	RECIRCULATION SWITCH	CB	53	SBF-1								
43/RS-5	RECIRCULATION SWITCH	CB	53	SBF-1								
43/RS-6	RECIRCULATION SWITCH	CB	53	SBF-1								
52/RHR 31	CIRCUIT BREAKER	CB	15			480V	BUS 3A	PWR PNL 33				
52/RHR 32	CIRCUIT BREAKER	CB	15			480V	BUS 6A	PWR PNL 32				
52/SI1	CIRCUIT BREAKER	CB	15			480V	BUS 5A	PWR PNL 31				
52/SI2	CIRCUIT BREAKER	CB	15			480V	BUS 2A	PWR PNL 33				
52/SI3	CIRCUIT BREAKER	CB	15			480V	BUS 6A	PWR PNL 32				
730-33AC-X	RELAY	CB	15			480V	MCC36A					
731-33AC-X	RELAY	CB	15			480V	MCC36B					
856C-VX	RELAY	CB	53			480V	MCC36A					
856E-VX	RELAY	CB	53			480V	MCC36A					
856H-VX	RELAY	CB	53			480V	MCC36B					
856J-VX	RELAY	CB	53			480V	MCC36B					
AC-738A	CHECK VALVE	PAB	15									
AC-738B	CHECK VALVE	PAB	15									
AC-741	CHECK VALVE	VC	66									
AC-743	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36A					REC SW
AC-744	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36A					REC SW

Table D13 Hot Leg External Recirculation System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
AC-745A	MOTOR OPERATED VALVE	VC	66		YES	480V	MCC36B					
AC-745B	MOTOR OPERATED VALVE	VC	66		YES	480V	MCC36A					
AC-837	CHECK VALVE	PAB	15									
AC-838	CHECK VALVE	PAB	15									
AC-1870	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36B					REC SW
ACAHRC2	RHR HEAT EXCHANGER 32	VC	66							CCW		
ACAHRS1	RHR HEAT EXCHANGER 31	VC	66							CCW		
ACAPRH1	RHR PUMP 31	PAB	15		YES	480V	BUS 3A	PWR PNL 33	PAB VEN	/CITY WTR		SIS/REC SW
ACAPRH2	RHR PUMP 32	PAB	15		YES	480V	BUS 6A	PWR PNL 32	PAB VEN	CCW		SIS/REC SW
INTSIAPSI1	SAFETY INJECTION PUMP 31	PAB	34		YES	480V	BUS 5A	PWR PNL 31	PAB VEN	CCW		SIS
INTSIAPSI2	SAFETY INJECTION PUMP 32	PAB	34		YES	480V	BUS 2A	PWR PNL 33	PAB VEN	CCW		SIS
INTSIAPSI3	SAFETY INJECTION PUMP 33	PAB	34		YES	480V	BUS 6A	PWR PNL 32	PAB VEN	CCW		SIS
SI-842	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					REC SW
SI-843	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					REC SW
SI-847	CHECK VALVE	PAB	34									
SI-848A	MANUAL VALVE	PAB	34									
SI-848B	MANUAL VALVE	PAB	34									
SI-849A	CHECK VALVE	PAB	34									
SI-849B	CHECK VALVE	PAB	34									
SI-850A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					
SI-850B	MANUAL VALVE	PAB	34									
SI-850C	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					
SI-851A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					
SI-851B	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					
SI-852A	CHECK VALVE	PAB	34									
SI-852B	CHECK VALVE	PAB	34									
SI-856B	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					RLY 856H&J-VX
SI-856C	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					
SI-856E	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					
SI-856G	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					RLY 856C&E-VX
SI-856H	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					
SI-856J	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					
SI-857B	CHECK VALVE	VC	46									
SI-857H	CHECK VALVE	VC	46									
SI-857N	CHECK VALVE	VC	46									
SI-857P	CHECK VALVE	VC	46									

Table D13 Hot Leg External Recirculation System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
SI-882	MOTOR OPERATED VALVE	PAB	15		YES	480V	MCC36B					REC SW
SI-883	MOTOR OPERATED VALVE	PAB	15		YES	480V	MCC36B					RLYS 730&731-
SI-885A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					RLY 730-33ACX
SI-885B	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					RLY 731-33ACX
SI-887A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					REC SW/SIS
SI-887B	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					REC SW/SIS
SI-888A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					REC SW/SIS
SI-888B	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					REC SW/SIS
SI-1802A	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					REC SW
SI-1802B	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					REC SW
SI-1810	MOTOR OPERATED VALVE	PAB	15		YES	480V	MCC36A					REC SW
SI-1835A	MOTOR OPERATED VALVE	PAB	55		YES	480V	MCC36A					SIS
SI-1835B	MOTOR OPERATED VALVE	PAB	55		YES	480V	MCC36B					SIS
SI-1851A	AIR OPERATED VALVE	PAB	34		YES			DIS PNL 31			IAS	SIS
SI-1851B	AIR OPERATED VALVE	PAB	34		YES			DIS PNL 32			IAS	SIS
SI-1852A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					SIS
SI-1852B	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					SIS
SI-1862	MANUAL VALVE	YARD	81									
SI-1869A	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					
SI-1869B	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					

Table D14 Hot Leg Internal Recirculation System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
1/1802A	MOV SI-1802A CONTROL SWITCH	CB	53	SBF-1								
1/1802B	MOV SI-1802B CONTROL SWITCH	CB	53	SBF-1								
1/856B	MOV SI-856B CONTROL SWITCH	CB	53	SBF-2								
1/856C	MOV SI-856C CONTROL SWITCH	CB	53	SBF-2								
1/856E	MOV SI-856E CONTROL SWITCH	CB	53	SBF-2								
1/856G	MOV SI-856G CONTROL SWITCH	CB	53	SBF-2								
1/856H	MOV SI-856H CONTROL SWITCH	CB	53	SBF-2								
1/856J	MOV SI-856J CONTROL SWITCH	CB	53	SBF-2								
1/887A	MOV SI-887A CONTROL SWITCH	CB	53	SBF-2								
1/887B	MOV SI-887B CONTROL SWITCH	CB	53	SBF-2								
1/R1	REC PUMP 31 CONTROL SWITCH	CB	53	SBF-1								
1/SI1	SI PUMP 31 CONTROL SWITCH	CB	53	SBF-2								
1/SI2	SI PUMP 32 CONTROL SWITCH	CB	53	SBF-2								
1/SI3	SI PUMP 33 CONTROL SWITCH	CB	53	SBF-2								
36AMCC-4FD	AC-744 MOTOR STARTER COMPARTMENT	PAB	55			480V	MCC36A					
36AMCC-8FD	SI-1810 MOTOR STARTER COMPARTMENT	PAB	55			480V	MCC36A					
36BMCC-4FD	SI-882 MOTOR STARTER COMPARTMENT	PAB	55			480V	MCC36B					
43/RS-3	RECIRCULATION SWITCH	CB	53	SBF-1								
43/RS-5	RECIRCULATION SWITCH	CB	53	SBF-1								
43/RS-6	RECIRCULATION SWITCH	CB	53	SBF-1								
43/RS-7	RECIRCULATION SWITCH	CB	53	SBF-1								
43/RS-8	RECIRCULATION SWITCH	CB	53	SBF-1								
52-CC1X	RELAY	CB	15					DIS PNL 33				
52-CC2X	RELAY	CB	15					DIS PNL 32				
52-CC3X	RELAY	CB	15					DIS PNL 32				
52/R1	CIRCUIT BREAKER	CB	15			480V	BUS 5A	PWR PNL 31				
52/R2	CIRCUIT BREAKER	CB	15			480V	BUS 6A	PWR PNL 32				
52/SI1	CIRCUIT BREAKER	CB	15			480V	BUS 5A	PWR PNL 31				
52/SI2	CIRCUIT BREAKER	CB	15			480V	BUS 2A	PWR PNL 33				
52/SI3	CIRCUIT BREAKER	CB	15			480V	BUS 6A	PWR PNL 32				
730-33AC-X	RELAY	CB	15			480V	MCC36A					
731-33AC-X	RELAY	CB	15			480V	MCC36B					
856C-VX	RELAY	CB	53			480V	MCC36A					
856E-VX	RELAY	CB	53			480V	MCC36A					
856H-VX	RELAY	CB	53			480V	MCC36B					
856J-VX	RELAY	CB	53			480V	MCC36B					

Table D14 Hot Leg Internal Recirculation System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
AC-1870	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36B					REC SW
AC-741	CHECK VALVE	VC	66									
AC-742	MANUAL VALVE	VC	66									
AC-743	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36A					REC SW
AC-744	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36A					REC SW
AC-745A	MOTOR OPERATED VALVE	VC	66		YES	480V	MCC36B					
AC-745B	MOTOR OPERATED VALVE	VC	66		YES	480V	MCC36A					
ACAHRC2	RHR HEAT EXCHANGER 32	VC	66							CCW		
ACAHRS1	RHR HEAT EXCHANGER 31	VC	66							CCW		
INTSIAPRE1	RECIRCULATION PUMP 32	VC	46		YES	480V	BUS 5A	PWR PNL 31		CCW		REC SW
INTSIAPRE2	RECIRCULATION PUMP 31	VC	46		YES	480V	BUS 6A	PWR PNL 32	PAB	CCW		REC SW
INTSIAPSI1	SAFETY INJECTION PUMP 31	PAB	34		YES	480V	BUS 5A	PWR PNL 31	VENT	CCW		SIAS
INTSIAPSI2	SAFETY INJECTION PUMP 32	PAB	34		YES	480V	BUS 2A	PWR PNL 33	VENT	CCW		SIS
INTSIAPSI3	SAFETY INJECTION PUMP 33	PAB	34		YES	480V	BUS 6A	PWR PNL 32	VENT	CCW		SIS
SI-1802A	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					REC SW
SI-1802B	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					REC SW
SI-1810	MOTOR OPERATED VALVE	PAB	15		YES	480V	MCC36A					REC SW
SI-1835A	MOTOR OPERATED VALVE	PAB	55		YES	480V	MCC36A					SIS
SI-1835B	MOTOR OPERATED VALVE	PAB	55		YES	480V	MCC36B					SIS
SI-1851A	AIR OPERATED VALVE	PAB	34		YES			DIS PNL 31			IAS	SIS
SI-1851B	AIR OPERATED VALVE	PAB	34		YES			DIS PNL 32			IAS	SIS
SI-1852A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					SIS
SI-1852B	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					SIS
SI-1862	MANUAL VALVE	YARD	81									
SI-1869A	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					
SI-1869B	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					
SI-842	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					REC SW
SI-843	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					REC SW
SI-847	CHECK VALVE	PAB	34									
SI-848A	MANUAL VALVE	PAB	34									
SI-848B	MANUAL VALVE	PAB	34									
SI-849A	CHECK VALVE	PAB	34									
SI-849B	CHECK VALVE	PAB	34									
SI-850A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					
SI-850B	MANUAL VALVE	PAB	34									
SI-850C	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					

Table D14 Hot Leg Internal Recirculation System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
SI-851A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					
SI-851B	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					
SI-852A	CHECK VALVE	PAB	34									
SI-852B	CHECK VALVE	PAB	34									
SI-856B	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					RLY 856H&J-VX
SI-856C	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					
SI-856E	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					RLY 856C&E-VX
SI-856G	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					
SI-856H	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					
SI-856J	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					
SI-857B	CHECK VALVE	VC	46									
SI-857H	CHECK VALVE	VC	46									
SI-857N	CHECK VALVE	VC	46									
SI-857P	CHECK VALVE	VC	46									
SI-881	CHECK VALVE	PAB	15									
SI-882	MOTOR OPERATED VALVE	PAB	15		YES	480V	MCC36B					REC SW
SI-886A	CHECK VALVE	VC	46									
SI-886B	CHECK VALVE	VC	46									
SI-887A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					REC SW/SIS
SI-887B	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					REC SW/SIS
SI-888A	MOTOR OPERATED VALVE	PAB	68		YES	480V	MCC36A					REC SW/SIS
SI-888B	MOTOR OPERATED VALVE	PAB	68		YES	480V	MCC36B					REC SW/SIS

Table D15 High-Head Safety Injection System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
1/SI1	SI PUMP 31 CONTROL SWITCH	CB	53	SBF-2								
1/SI2	SI PUMP 32 CONTROL SWITCH	CB	53	SBF-2								
1/SI3	SI PUMP 33 CONTROL SWITCH	CB	53	SBF-2								
52/SI1	CIRCUIT BREAKER	CB	15			480V	BUS 5A	PWR PNL 31				
52/SI2	CIRCUIT BREAKER	CB	15			480V	BUS 2A	PWR PNL 33				
52/SI3	CIRCUIT BREAKER	CB	15			480V	BUS 6A	PWR PNL 32				
INTSIAPSI1	SAFETY INJECTION PUMP 31	PAB	34		YES	480V	BUS 5A	PWR PNL 31	PAB VENT	CCW		SIS
INTSIAPSI2	SAFETY INJECTION PUMP 32	PAB	34		YES	480V	BUS 2A	PWR PNL 33	PAB VENT	CCW		SIS
INTSIAPSI3	SAFETY INJECTION PUMP 33	PAB	34		YES	480V	BUS 6A	PWR PNL 32	PAB VENT	CCW		SIS
SI-1807A	MANUAL VALVE	PAB	34									
SI-1807B	MANUAL VALVE	PAB	34									
SI-1807C	MANUAL VALVE	PAB	34									
SI-1810	MOTOR OPERATED VALVE	PAB	15		YES	480V	MCC36A					REC SW
SI-1835A	MOTOR OPERATED VALVE	PAB	55		YES	480V	MCC36A					SIS
SI-1835B	MOTOR OPERATED VALVE	PAB	55		YES	480V	MCC36B					SIS
SI-1844	MANUAL VALVE	PAB	34									
SI-1851A	AIR OPERATED VALVE	PAB	34		YES			DIS PNL 31			IAS	SIS
SI-1851B	AIR OPERATED VALVE	PAB	34		YES			DIS PNL 32			IAS	SIS
SI-1852A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					SIS
SI-1852B	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					SIS
SI-1862	MANUAL VALVE	YARD	81									
SI-842	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					REC SW
SI-843	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					REC SW
SI-846	MANUAL VALVE	YARD	81									
SI-847	CHECK VALVE	PAB	34									
SI-848A	MANUAL VALVE	PAB	34									
SI-848B	MANUAL VALVE	PAB	34									
SI-849A	CHECK VALVE	PAB	34									
SI-849B	CHECK VALVE	PAB	34									
SI-850A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					
SI-850B	MANUAL VALVE	PAB	34									
SI-850C	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					
SI-851A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					
SI-851B	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					

Table D15 High-Head Safety Injection System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
SI-852A	CHECK VALVE	PAB	34									
SI-852B	CHECK VALVE	PAB	34									
SI-856A	MOTOR OPERATED VALVE	VC	46									
SI-856C	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					
SI-856D	MOTOR OPERATED VALVE	VC	46									
SI-856E	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					
SI-856F	MOTOR OPERATED VALVE	VC	46									
SI-856H	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					
SI-856J	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					
SI-856K	MOTOR OPERATED VALVE	VC	46									
SI-857A	CHECK VALVE	VC	46									
SI-857C	CHECK VALVE	VC	46									
SI-857D	CHECK VALVE	VC	46									
SI-857E	CHECK VALVE	VC	46									
SI-857F	CHECK VALVE	VC	46									
SI-857G	CHECK VALVE	VC	46									
SI-857J	CHECK VALVE	VC	46									
SI-857K	CHECK VALVE	VC	46									
SI-857L	CHECK VALVE	VC	46									
SI-857M	CHECK VALVE	VC	46									
SI-857Q	CHECK VALVE	VC	46									
SI-857R	CHECK VALVE	VC	46									
SI-857S	CHECK VALVE	VC	46									
SI-857T	CHECK VALVE	VC	46									
SI-857U	CHECK VALVE	VC	46									
SI-857W	CHECK VALVE	VC	46									
SI-884A	CHECK VALVE	PAB	34									
SI-884B	CHECK VALVE	PAB	34									
SI-884C	CHECK VALVE	PAB	34									
SI-887A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					REC SW/SIS
SI-887B	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					REC SW/SIS
SI-897A	CHECK VALVE	VC	46									
SI-897B	CHECK VALVE	VC	46									
SI-897C	CHECK VALVE	VC	46									
SI-897D	CHECK VALVE	VC	46									
SI-898	MANUAL VALVE	PAB	34									

Table D16 High-Head External Recirculation System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
1/1802A	MOV SI-1802A CONTROL SWITCH	CB	53	SBF-1								
1/1802B	MOV SI-1802B CONTROL SWITCH	CB	53	SBF-1								
1/885A	MOV SI-885A CONTROL SWITCH	CB	53	SBF-1								
1/885B	MOV SI-885B CONTROL SWITCH	CB	53	SBF-1								
1/887A	MOV SI-887A CONTROL SWITCH	CB	53	SBF-2								
1/887B	MOV SI-887B CONTROL SWITCH	CB	53	SBF-2								
1/RHR 1	RHR PUMP 31 CONTROL SWITCH	CB	53	SGF								
1/RHR 2	RHR PUMP 32 CONTROL SWITCH	CB	53	SGF								
1/SI1	SI PUMP 31 CONTROL SWITCH	CB	53	SBF-2								
1/SI2	SI PUMP 32 CONTROL SWITCH	CB	53	SBF-2								
1/SI3	SI PUMP 33 CONTROL SWITCH	CB	53	SBF-2								
43/RS-3	RECIRCULATION SWITCH	CB	53	SBF-1								
43/RS-5	RECIRCULATION SWITCH	CB	53	SBF-1								
43/RS-6	RECIRCULATION SWITCH	CB	53	SBF-1								
52/RHR 31	CIRCUIT BREAKER	CB	15			480V	BUS 3A	PWR PNL 33				
52/RHR 32	CIRCUIT BREAKER	CB	15			480V	BUS 6A	PWR PNL 32				
52/SI1	CIRCUIT BREAKER	CB	15			480V	BUS 5A	PWR PNL 31				
52/SI2	CIRCUIT BREAKER	CB	15			480V	BUS 2A	PWR PNL 33				
52/SI3	CIRCUIT BREAKER	CB	15			480V	BUS 6A	PWR PNL 32				
730-33AC-X	RELAY	CB	15			480V	MCC36A					
731-33AC-X	RELAY	CB	15			480V	MCC36B					
AC-1870	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36B					REC SW
AC-735A	MANUAL VALVE	PAB	15									
AC-735B	MANUAL VALVE	PAB	15									
AC-738A	CHECK VALVE	PAB	15									
AC-738B	CHECK VALVE	PAB	15									
AC-739A	MANUAL VALVE	PAB	15									
AC-739B	MANUAL VALVE	PAB	15									
AC-741	CHECK VALVE	VC	66									
AC-742	MANUAL VALVE	VC	66									
AC-743	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36A					REC SW
AC-744	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36A					REC SW
AC-745A	MOTOR OPERATED VALVE	VC	66		YES	480V	MCC36B					
AC-745B	MOTOR OPERATED VALVE	VC	66		YES	480V	MCC36A					
AC-837	CHECK VALVE	PAB	15									
AC-838	CHECK VALVE	PAB	15									

Table D16 High-Head External Recirculation System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
AC-839	MANUAL VALVE	PAB	15									
AC-840	MANUAL VALVE	PAB	15									
AC-841	MANUAL VALVE	PAB	15									
AC-842	MANUAL VALVE	PAB	15									
ACAHRC2	RHR HEAT EXCHANGER 32	VC	66							CCW		
ACAHRS1	RHR HEAT EXCHANGER 31	VC	66							CCW		
ACAPRH1	RHR PUMP 31	PAB	15		YES	480V	BUS 3A	PWR PNL 33	PAB VENT	CCW /CITY WTR		SIS/REC SW
ACAPRH2	RHR PUMP 32	PAB	15		YES	480V	BUS 6A	PWR PNL 32	PAB VENT	CCW		SIS/REC SW
INTSIAPSI1	SAFETY INJECTION PUMP 31	PAB	34		YES	480V	BUS 5A	PWR PNL 31	PAB VENT	CCW		SIS
INTSIAPSI2	SAFETY INJECTION PUMP 32	PAB	34		YES	480V	BUS 2A	PWR PNL 33	PAB VENT	CCW		SIS
INTSIAPSI3	SAFETY INJECTION PUMP 33	PAB	34		YES	480V	BUS 6A	PWR PNL 32	PAB VENT	CCW		SIS
LT-920	RWST LEVEL TRANSMITTER	YARD	79			118V	BUS 31					
SI-1802A	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					REC SW
SI-1802B	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					REC SW
SI-1810	MOTOR OPERATED VALVE	PAB	15		YES	480V	MCC36A					REC SW
SI-1835A	MOTOR OPERATED VALVE	PAB	55		YES	480V	MCC36A					SIS
SI-1835B	MOTOR OPERATED VALVE	PAB	55		YES	480V	MCC36B					SIS
SI-1851A	AIR OPERATED VALVE	PAB	34		YES			DIS PNL 31			IAS	SIS
SI-1851B	AIR OPERATED VALVE	PAB	34		YES			DIS PNL 32			IAS	SIS
SI-1852A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					SIS
SI-1852B	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					SIS
SI-1862	MANUAL VALVE	YARD	81									
SI-1869A	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					
SI-1869B	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					
SI-842	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					REC SW
SI-843	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					REC SW
SI-847	CHECK VALVE	PAB	34									
SI-848A	MANUAL VALVE	PAB	34									
SI-848B	MANUAL VALVE	PAB	34									
SI-849A	CHECK VALVE	PAB	34									
SI-849B	CHECK VALVE	PAB	34									

Table D16 High-Head External Recirculation System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
SI-850A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					
SI-850B	MANUAL VALVE	PAB	34									
SI-850C	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					
SI-851A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					
SI-851B	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					
SI-852A	CHECK VALVE	PAB	34									
SI-852B	CHECK VALVE	PAB	34									
SI-856A	MOTOR OPERATED VALVE	VC	46									
SI-856C	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					
SI-856D	MOTOR OPERATED VALVE	VC	46									
SI-856E	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					
SI-856F	MOTOR OPERATED VALVE	VC	46									
SI-856H	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					
SI-856J	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					
SI-856K	MOTOR OPERATED VALVE	VC	46									
SI-857A	CHECK VALVE	VC	46									
SI-857C	CHECK VALVE	VC	46									
SI-857D	CHECK VALVE	VC	46									
SI-857E	CHECK VALVE	VC	46									
SI-857F	CHECK VALVE	VC	46									
SI-857G	CHECK VALVE	VC	46									
SI-857J	CHECK VALVE	VC	46									
SI-857K	CHECK VALVE	VC	46									
SI-857L	CHECK VALVE	VC	46									
SI-857M	CHECK VALVE	VC	46									
SI-857Q	CHECK VALVE	VC	46									
SI-857R	CHECK VALVE	VC	46									
SI-857S	CHECK VALVE	VC	46									
SI-857T	CHECK VALVE	VC	46									
SI-857U	CHECK VALVE	VC	46									
SI-857W	CHECK VALVE	VC	46									
SI-882	MOTOR OPERATED VALVE	PAB	15		YES	480V	MCC36B					REC SW
SI-883	MOTOR OPERATED VALVE	PAB	15		YES	480V	MCC36B					RLYS 730&731-33ACX
SI-885A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					RLY 730-33ACX

Table D16 High-Head External Recirculation System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
SI-885B	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					RLY 731-33ACX
SI-887A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					REC SW/SIS ..
SI-887B	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					REC SW/SIS
SI-888A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					REC SW/SIS, RLY 730-33ACX
SI-888B	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					REC SW/SIS, RLY 731-33ACX
SI-897A	CHECK VALVE	VC	46									
SI-897B	CHECK VALVE	VC	46									
SI-897C	CHECK VALVE	VC	46									
SI-897D	CHECK VALVE	VC	46									

Table D17 High-Head Internal Recirculation System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
1/1802A	MOV SI-1802A CONTROL SWITCH	CB	53	SBF-1								
1/1802B	MOV SI-1802B CONTROL SWITCH	CB	53	SBF-1								
1/887A	MOV SI-887A CONTROL SWITCH	CB	53	SBF-2								
1/887B	MOV SI-887B CONTROL SWITCH	CB	53	SBF-2								
1/R1	REC PUMP 31 CONTROL SWITCH	CB	53	SBF-1								
1/R2	REC PUMP 32 CONTROL SWITCH	CB	53	SBF-1								
1/SI1	SI PUMP 31 CONTROL SWITCH	CB	53	SBF-2								
1/SI2	SI PUMP 32 CONTROL SWITCH	CB	53	SBF-2								
1/SI3	SI PUMP 33 CONTROL SWITCH	CB	53	SBF-2								
36AMCC-4FD	AC-744 MOTOR STARTER COMPARTMENT	PAB	55			480V	MCC36A					
36AMCC-8FD	SI-1810 MOTOR STARTER COMPARTMENT	PAB	55			480V	MCC36A					
36BMCC-4FD	SI-882 MOTOR STARTER COMPARTMENT	PAB	55			480V	MCC36B					
43/RS-3	RECIRCULATION SWITCH	CB	53	SBF-1								
43/RS-5	RECIRCULATION SWITCH	CB	53	SBF-1								
43/RS-6	RECIRCULATION SWITCH	CB	53	SBF-1								
43/RS-7	RECIRCULATION SWITCH	CB	53	SBF-1								
43/RS-8	RECIRCULATION SWITCH	CB	53	SBF-1								
52-CC1X	RELAY	CB	15					DIS PNL 33				
52-CC2X	RELAY	CB	15					DIS PNL 32				
52-CC3X	RELAY	CB	15					DIS PNL 32				
52/R1	CIRCUIT BREAKER	CB	15			480V	BUS 5A	PWR PNL 31				
52/R2	CIRCUIT BREAKER	CB	15			480V	BUS 6A	PWR PNL 32				
52/SI1	CIRCUIT BREAKER	CB	15			480V	BUS 5A	PWR PNL 31				
52/SI2	CIRCUIT BREAKER	CB	15			480V	BUS 2A	PWR PNL 33				
52/SI3	CIRCUIT BREAKER	CB	15			480V	BUS 6A	PWR PNL 32				
730-33AC-X	RELAY	CB	15			480V	MCC36A					
731-33AC-X	RELAY	CB	15			480V	MCC36B					
AC-1870	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36B					REC SW
AC-741	CHECK VALVE	VC	66									
AC-742	MANUAL VALVE	VC	66									
AC-743	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36A					REC SW
AC-744	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36A					REC SW
AC-745A	MOTOR OPERATED VALVE	VC	66		YES	480V	MCC36B					
AC-745B	MOTOR OPERATED VALVE	VC	66		YES	480V	MCC36A					
ACAHRC2	RHR HEAT EXCHANGER 32	VC	66							CCW		
ACAHRS1	RHR HEAT EXCHANGER 31	VC	66							CCW		

Table D17 High-Head Internal Recirculation System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
INTSIAPRE1	RECIRCULATION PUMP 32	VC	46		YES	480V	BUS 5A	PWR PNL 31		CCW		REC SW
INTSIAPRE2	RECIRCULATION PUMP 31	VC	46		YES	480V	BUS 6A	PWR PNL 32		CCW		REC SW
INTSIAPSI1	SAFETY INJECTION PUMP 31	PAB	34		YES	480V	BUS 5A	PWR PNL 31	PAB VENT	CCW		SIS
INTSIAPSI2	SAFETY INJECTION PUMP 32	PAB	34		YES	480V	BUS 2A	PWR PNL 33	PAB VENT	CCW		SIS
INTSIAPSI3	SAFETY INJECTION PUMP 33	PAB	34		YES	480V	BUS 6A	PWR PNL 32	PAB VENT	CCW		SIS
LT-920	RWST LEVEL TRANSMITTER	YARD	79			118V	BUS 31					
SI-1802A	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					REC SW
SI-1802B	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					REC SW
SI-1810	MOTOR OPERATED VALVE	PAB	15		YES	480V	MCC36A					REC SW
SI-1835A	MOTOR OPERATED VALVE	PAB	55		YES	480V	MCC36A					SIS
SI-1835B	MOTOR OPERATED VALVE	PAB	55		YES	480V	MCC36B					SIS
SI-1851A	AIR OPERATED VALVE	PAB	34		YES			DIS PNL 31			IAS	SIS
SI-1851B	AIR OPERATED VALVE	PAB	34		YES			DIS PNL 32			IAS	SIS
SI-1852A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					SIS
SI-1852B	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					SIS
SI-1862	MANUAL VALVE	YARD	81									
SI-1869A	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					
SI-1869B	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					
SI-842	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					REC SW
SI-843	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					REC SW
SI-847	CHECK VALVE	PAB	34									
SI-848A	MANUAL VALVE	PAB	34									
SI-848B	MANUAL VALVE	PAB	34									
SI-849A	CHECK VALVE	PAB	34									
SI-849B	CHECK VALVE	PAB	34									
SI-850A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					
SI-850B	MANUAL VALVE	PAB	34									
SI-850C	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					
SI-851A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					
SI-851B	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					
SI-852A	CHECK VALVE	PAB	34									
SI-852B	CHECK VALVE	PAB	34									
SI-856A	MOTOR OPERATED VALVE	VC	46									
SI-856C	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					
SI-856D	MOTOR OPERATED VALVE	VC	46									
SI-856E	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					

Table D17 High-Head Internal Recirculation System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
SI-856F	MOTOR OPERATED VALVE	VC	46									
SI-856H	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					
SI-856J	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					
SI-856K	MOTOR OPERATED VALVE	VC	46									
SI-857A	CHECK VALVE	VC	46									
SI-857C	CHECK VALVE	VC	46									
SI-857D	CHECK VALVE	VC	46									
SI-857E	CHECK VALVE	VC	46									
SI-857F	CHECK VALVE	VC	46									
SI-857G	CHECK VALVE	VC	46									
SI-857J	CHECK VALVE	VC	46									
SI-857K	CHECK VALVE	VC	46									
SI-857L	CHECK VALVE	VC	46									
SI-857M	CHECK VALVE	VC	46									
SI-857Q	CHECK VALVE	VC	46									
SI-857R	CHECK VALVE	VC	46									
SI-857S	CHECK VALVE	VC	46									
SI-857T	CHECK VALVE	VC	46									
SI-857U	CHECK VALVE	VC	46									
SI-857W	CHECK VALVE	VC	46									
SI-881	CHECK VALVE	PAB	15									
SI-882	MOTOR OPERATED VALVE	PAB	15		YES	480V	MCC36B					REC SW
SI-886A	CHECK VALVE	VC	46									
SI-886B	CHECK VALVE	VC	46									
SI-887A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					REC SW/SIS
SI-887B	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					REC SW/SIS
SI-888A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					REC SW/SIS, RLY 730-33ACX
SI-888B	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					REC SW/SIS, RLY 731-33ACX
SI-897A	CHECK VALVE	VC	46									
SI-897B	CHECK VALVE	VC	46									
SI-897C	CHECK VALVE	VC	46									
SI-897D	CHECK VALVE	VC	46									

Table D18 Instrument Air System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
3-1 / 5A NE	SAS RELAY											
3-2 / 5A NE	SAS RELAY											
CPR-31	IA COMPRESSOR	CB	15			480	MCC39	PWR PNL 31		SWS		
CPR-32	IA COMPRESSOR	CB	15			480	MCC34			SWS		
DYR-R31	REFRIGERANT DRYER	CB	15			480	MCC39					
DYR-R32	REFRIGERANT DRYER	CB	15			480	MCC34					
DYR-SDYR	STANDBY DESC AIR DRYER											
FLT-BYPS	REFRIG DRY BYPASS AFTCOOL											
IA 1/SW1	SWITCH											
IA-1-1	SAFETY RELIEF VALVE	CB	15									
IA-1-2	SAFETY RELIEF VALVE	CB	15									
IA-10	MANUAL VALVE	CB	15									
IA-11-1	MANUAL VALVE	CB	15									
IA-11-2	MANUAL VALVE	CB	15									
IA-12-1	MANUAL VALVE	CB	15									
IA-12-2	MANUAL VALVE	CB	15									
IA-174	MANUAL VALVE	CB	15									
IA-175	MANUAL VALVE	CB	15									
IA-2-1	CHECK VALVE	CB	15									
IA-2-2	CHECK VALVE	CB	26'6"									
IA-3-1	MANUAL VALVE	CB	15									
IA-3-2	MANUAL VALVE	CB	15									
IA-31-FLT	INLET AIR FILTER	CB	15									
IA-32-FLT	INLET AIR FILTER	CB	15									
IA-49	SAFETY RELIEF VALVE	CB	15									
IA-52	MANUAL VALVE	CB	15									
IA-53	MANUAL VALVE	ABFP	15									
IA-6	MANUAL VALVE	CB	15									
IA-7	MANUAL VALVE	CB	15									
IA-70	MANUAL VALVE	CB	15									
IA-71	MANUAL VALVE	CB	15									
IA-8	MANUAL VALVE	CB	15									
IA-80	CHECK VALVE	CB	15									
IA-81	CHECK VALVE	CB	15									
IA-83	CHECK VALVE	CB	15									
IA-84	CHECK VALVE	CB	15									
IA-87	SAFETY RELIEF VALVE	CB	15									
IA-88	SAFETY RELIEF VALVE	CB	15									
IA-89	SAFETY RELIEF VALVE	CB	15									

Table D18 Instrument Air System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
IA-9	MANUALVALVE	CB	15									
IAS-ACM-31	IA RECEIVER 31											
IAS-HTX-31	IA COMP 31 AFTERCOOLER	CB	15									
IAS-HTX-32	IA COMP 32 AFTERCOOLER	CB	15									
PCV-1143	PRESSURE CONTROL VALVE	CB	15			118	DIST PNL 32					
PCV-1542	PRESSURE CONTROL VALVE	CB	15									

Table D19 Low-Head Safety Injection System Dependiencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
1/RHR 1	RHR PUMP 31 CONTROL SWITCH	CB	53	SGF								
1/RHR 2	RHR PUMP 32 CONTROL SWITCH	CB	53	SGF								
52/RHR 31	CIRCUIT BREAKER	CB	15			480V	BUS 3A	PWR PNL 33				
52/RHR 32	CIRCUIT BREAKER	CB	15			480V	BUS 6A	PWR PNL 33				
AC-1870	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36B					REC SW
AC-735A	MANUAL VALVE	PAB	15									
AC-735B	MANUAL VALVE	PAB	15									
AC-738A	CHECK VALVE	PAB	15									
AC-738B	CHECK VALVE	PAB	15									
AC-739A	MANUAL VALVE	PAB	15									
AC-739B	MANUAL VALVE	PAB	15									
AC-741	CHECK VALVE	VC	66									
AC-742	MANUAL VALVE	VC	66									
AC-743	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36A					REC SW
AC-744	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36A					REC SW
AC-745A	MOTOR OPERATED VALVE	VC	66		YES	480V	MCC36B					
AC-745B	MOTOR OPERATED VALVE	VC	66		YES	480V	MCC36A					
AC-839	MANUAL VALVE	PAB	15									
AC-840	MANUAL VALVE	PAB	15									
AC-841	MANUAL VALVE	PAB	15									
AC-842	MANUAL VALVE	PAB	15									
ACAHRC2	RHR HEAT EXCHANGER 32	VC	66							CCW		
ACAHRS1	RHR HEAT EXCHANGER 31	VC	66							CCW		
ACAPRH1	RHR PUMP 31	PAB	15		YES	480V	BUS 3A	PWR PNL 33		CCW		SIS/REC SW
ACAPRH2	RHR PUMP 32	PAB	15		YES	480V	BUS 6A	PWR PNL 32		CCW		SIS/REC SW
SI-1802A	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					REC SW
SI-1802B	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					REC SW
SI-1869A	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					
SI-1869B	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					
SI-638	HAND CONTROL VALVE	VC	68		YES	480V	MCC36B					
SI-640	HAND CONTROL VALVE	VC	68		YES	480V	MCC36A					
SI-746	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					SIS/REC SW
SI-747	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					SIS/REC SW
SI-838A	CHECK VALVE	VC	46									
SI-838B	CHECK VALVE	VC	46									
SI-838C	CHECK VALVE	VC	46									

Table D19 Low-Head Safety Injection System Dependiencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
SI-838D	CHECK VALVE	VC	46									
SI-846	MANUAL VALVE	YARD	81									
SI-881	CHECK VALVE	PAB	15									
SI-882	MOTOR OPERATED VALVE	PAB	15		YES	480V	MCC36B					REC SW
SI-883	MOTOR OPERATED VALVE	PAB	15		YES	480V	MCC36B					RLYS 730&731-33ACX
SI-885A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					RLY 730-33ACX
SI-885B	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					RLY 731-33ACX
SI-897A	CHECK VALVE	VC	46									
SI-897B	CHECK VALVE	VC	46									
SI-897C	CHECK VALVE	VC	46									
SI-897D	CHECK VALVE	VC	46									
SI-899A	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					SIS/REC SW
SI-899B	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					SIS/REC SW

Table D20 Low-Head External Recirculation System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
1/1802A	MOV SI-1802A CONTROL SWITCH	CB	53	SBF-1								
1/1802B	MOV SI-1802B CONTROL SWITCH	CB	53	SBF-1								
1/885A	MOV SI-885A CONTROL SWITCH	CB	53	SBF-1								
1/885B	MOV SI-885B CONTROL SWITCH	CB	53	SBF-1								
1/RHR 1	RHR PUMP 31 CONTROL SWITCH	CB	53	SGF								
1/RHR 2	RHR PUMP 32 CONTROL SWITCH	CB	53	SGF								
43/RS-3	RECIRCULATION SWITCH	CB	53	SBF-1								
52/RHR 31	CIRCUIT BREAKER	CB	15			480V	BUS 3A	PWR PNL 33				
52/RHR 32	CIRCUIT BREAKER	CB	15			480V	BUS 6A	PWR PNL 32				
730-33AC-X	RELAY	CB	53			480V	MCC36A					
731-33AC-X	RELAY	CB	53			480V	MCC36B					
AC-1870	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36B					REC SW
AC-735A	MANUAL VALVE	PAB	15									
AC-735B	MANUAL VALVE	PAB	15									
AC-738A	CHECK VALVE	PAB	15									
AC-738B	CHECK VALVE	PAB	15									
AC-739A	MANUAL VALVE	PAB	15									
AC-739B	MANUAL VALVE	PAB	15									
AC-741	CHECK VALVE	VC	66									
AC-742	MANUAL VALVE	VC	66									
AC-743	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36A					REC SW
AC-744	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36A					REC SW
AC-745A	MOTOR OPERATED VALVE	VC	66		YES	480V	MCC36B					
AC-745B	MOTOR OPERATED VALVE	VC	66		YES	480V	MCC36A					
AC-837	CHECK VALVE	PAB	15									
AC-838	CHECK VALVE	PAB	15									
AC-839	MANUAL VALVE	PAB	15									
AC-840	MANUAL VALVE	PAB	15									
AC-841	MANUAL VALVE	PAB	15									
AC-842	MANUAL VALVE	PAB	15									
ACAHRC2	RHR HEAT EXCHANGER 32	VC	66							CCW		
ACAHRS1	RHR HEAT EXCHANGER 31	VC	66							CCW		
ACAPRH1	RHR PUMP 31	PAB	15		YES	480V	BUS 3A	PWR PNL 33	PAB VENT	CCW /CITY WTR		SIS/REC SW
ACAPRH2	RHR PUMP 32	PAB	15		YES	480V	BUS 6A	PWR PNL 32	PAB VENT	CCW		SIS/REC SW
LT-920	RWST LEVEL TRANSMITTER	YARD	79			118V	BUS 31					

Table D20 Low-Head External Recirculation System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
SI-1802A	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					REC SW
SI-1802B	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					REC SW
SI-1869A	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					
SI-1869B	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					
SI-638	HAND CONTROL VALVE	VC	68		YES	480V	MCC36B					
SI-640	HAND CONTROL VALVE	VC	68		YES	480V	MCC36A					
SI-746	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					SIS/REC SW
SI-747	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					SIS/REC SW
SI-838A	CHECK VALVE	VC	46									
SI-838B	CHECK VALVE	VC	46									
SI-838C	CHECK VALVE	VC	46									
SI-838D	CHECK VALVE	VC	46									
SI-882	MOTOR OPERATED VALVE	PAB	15		YES	480V	MCC36B					REC SW
SI-883	MOTOR OPERATED VALVE	PAB	15		YES	480V	MCC36B					RLYS 730&731-33ACX
SI-885A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					RLY 730-33ACX
SI-885B	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					RLY 731-33ACX
SI-897A	CHECK VALVE	VC	46									
SI-897B	CHECK VALVE	VC	46									
SI-897C	CHECK VALVE	VC	46									
SI-897D	CHECK VALVE	VC	46									
SI-899A	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					SIS/REC SW
SI-899B	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					SIS/REC SW

Table D21 Low-Head Internal Recirculation System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
1/1802A	MOV SI-1802A CONTROL SWITCH	CB	53	SBF-1								
1/1802B	MOV SI-1802B CONTROL SWITCH	CB	53	SBF-1								
1/R1	REC PUMP 31 CONTROL SWITCH	CB	53	SBF-1								
1/R2	REC PUMP 32 CONTROL SWITCH	CB	53	SBF-1								
36AMCC-4FD	AC-744 MOTOR STARTER COMPARTMENT	PAB	55			480V	MCC36A					
36BMCC-4FD	SI-882 MOTOR STARTER COMPARTMENT	PAB	55			480V	MCC36B					
43/RS-3	RECIRCULATION SWITCH	CB	53	SBF-1								
43/RS-5	RECIRCULATION SWITCH	CB	53	SBF-1								
43/RS-7	RECIRCULATION SWITCH	CB	53	SBF-1								
52-CC1X	RELAY	CB	15					DIS PNL 33				
52-CC2X	RELAY	CB	15					DIS PNL 32				
52-CC3X	RELAY	CB	15					DIS PNL 32				
52/R1	CIRCUIT BREAKER	CB	15			480V	BUS 5A	PWR PNL 31				
52/R2	CIRCUIT BREAKER	CB	15			480V	BUS 6A	PWR PNL 32				
AC-1870	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36B					REC SW
AC-741	CHECK VALVE	VC	66									
AC-742	MANUAL VALVE	VC	66									
AC-743	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36A					REC SW
AC-744	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36A					REC SW
AC-745A	MOTOR OPERATED VALVE	VC	66		YES	480V	MCC36B					
AC-745B	MOTOR OPERATED VALVE	VC	66		YES	480V	MCC36A					
ACAHRC2	RHR HEAT EXCHANGER 32	VC	66							CCW		
ACAHRS1	RHR HEAT EXCHANGER 31	VC	66							CCW		
INTSIAPRE1	RECIRCULATION PUMP 31	VC	46		YES	480V	BUS 5A	PWR PNL 31		CCW		REC SW
INTSIAPRE2	RECIRCULATION PUMP 32	VC	46		YES	480V	BUS 6A	PWR PNL 32		CCW		REC SW
LT-920	RWST LEVEL TRANSMITTER	YARD	79			118V	BUS 31					
SI-1802A	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					REC SW
SI-1802B	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					REC SW
SI-638	HAND CONTROL VALVE	VC	68		YES	480V	MCC36B					
SI-640	HAND CONTROL VALVE	VC	68		YES	480V	MCC36A					
SI-746	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					SIS/REC SW
SI-747	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					SIS/REC SW
SI-838A	CHECK VALVE	VC	46									
SI-838B	CHECK VALVE	VC	46									
SI-838C	CHECK VALVE	VC	46									
SI-838D	CHECK VALVE	VC	46									

Table D21 Low-Head Internal Recirculation System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
SI-881	CHECK VALVE	PAB	15									
SI-882	MOTOR OPERATED VALVE	PAB	15		YES	480V	MCC36B					REC SW
SI-886A	CHECK VALVE	VC	46									
SI-886B	CHECK VALVE	VC	46									
SI-897A	CHECK VALVE	VC	46									
SI-897B	CHECK VALVE	VC	46									
SI-897C	CHECK VALVE	VC	46									
SI-897D	CHECK VALVE	VC	46									
SI-899A	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					SIS/REC SW
SI-899B	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					SIS/REC SW

Table D22 Main Boiler Feedwater System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
BFD-1-1	CHECK VALVE	TB	15									
BFD-1-2	CHECK VALVE	TB	15									
BFD-2-31	MOTOR OPERATED VALVE	TB	15		YES	480	MCC36A					
BFD-2-32	MOTOR OPERATED VALVE	TB	15		YES	480	MCC36B					
BFD-3-1	MANUAL VALVE	TB	37									
BFD-3-2	MANUAL VALVE	TB	37									
BFD-3-3	MANUAL VALVE	TB	37									
BFD-4-1	MANUAL VALVE	TB	37									
BFD-4-2	MANUAL VALVE	TB	37									
BFD-4-3	MANUAL VALVE	TB	37									
BFD-5-1	MOTOR OPERATED VALVE	ABFP	15		YES	480	MCC311					
BFD-5-2	MOTOR OPERATED VALVE	ABFP	15		YES	480	MCC311					
BFD-5-3	MOTOR OPERATED VALVE	ABFP	15		YES	480	MCC311					
BFD-5-4	MOTOR OPERATED VALVE	ABFP	15		YES	480	MCC311					
BFD-6-1	CHECK VALVE	ABFP	44									
BFD-6-2	CHECK VALVE	ABFP	44									
BFD-6-3	CHECK VALVE	ABFP	44									
BFD-6-4	CHECK VALVE	ABFP	44									
BFD-7-1	MANUAL VALVE	ABFP	44									
BFD-7-2	MANUAL VALVE	ABFP	44									
BFD-7-3	MANUAL VALVE	ABFP	44									
BFD-7-4	MANUAL VALVE	ABFP	44									
BFD-8	MANUAL VALVE	TB	15									
BFD-9	MANUAL VALVE	TB	15									
BFD-90-1	MOTOR OPERATED VALVE	ABFP	44			480	MCC311					
BFD-90-2	MOTOR OPERATED VALVE	ABFP	44			480	MCC311					
BFD-90-3	MOTOR OPERATED VALVE	ABFP	44			480	MCC311					
BFD-90-4	MOTOR OPERATED VALVE	ABFP	44			480	MCC311					
FCV-417	FLOW CONTROL VALVE	ABFP	15	FBF							IAS	
FCV-417L	FLOW CONTROL VALVE	ABFP	44	FBF							IAS	
FCV-427	FLOW CONTROL VALVE	ABFP	15	FBF							IAS	
FCV-427L	FLOW CONTROL VALVE	ABFP	44	FBF							IAS	
FCV-437	FLOW CONTROL VALVE	ABFP	15	FBF							IAS	
FCV-437L	FLOW CONTROL VALVE	ABFP	44	FBF							IAS	
FCV-447	FLOW CONTROL VALVE	ABFP	15	FBF							IAS	
FCV-447L	FLOW CONTROL VALVE	ABFP	44	FBF								
HTR-36A	HEATER	TB	36									
HTR-36B	HEATER	TB	36									
HTR-36C	HEATER	TB	36									
TDP-31	TURBINE DRIVEN MFW PUMP 31	TB	15	FAF	YES	118	INST BUS 31A					
TDP-32	TURBINE DRIVEN MFW PUMP 32	TB	15	FAF	YES	118	INST BUS 32A					

Table D23 Main Steam System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
FCV-405A	AFW FLOW CONTROL VALVE	ABFP	15		YES	118	32 INST BUS				IAS, N2	
FCV-405B	AFW FLOW CONTROL VALVE	ABFP	15		YES	118	32 INST BUS				IAS, N2	
FCV-405C	AFW FLOW CONTROL VALVE	ABFP	15		YES	118	32 INST BUS				IAS, N2	
FCV-405D	AFW FLOW CONTROL VALVE	ABFP	15		YES	118	32 INST BUS				IAS, N2	
FCV-406A	AFW FLOW CONTROL VALVE	ABFP	15		YES	118	33 INST BUS				IAS, N2	
FCV-406B	AFW FLOW CONTROL VALVE	ABFP	15		YES	118	33 INST BUS				IAS, N2	
FCV-406C	AFW FLOW CONTROL VALVE	ABFP	15		YES	118	33 INST BUS				IAS, N2	
FCV-406D	AFW FLOW CONTROL VALVE	ABFP	15		YES	118	33 INST BUS				IAS, N2	
HC-405A	HAND CONTROLLER	CB	53	SCF	YES	118	31 INST BUS					
HC-405B	HAND CONTROLLER	CB	53	SCF	YES	118	31 INST BUS					
HC-405C	HAND CONTROLLER	CB	53	SCF	YES	118	31 INST BUS					
HC-405D	HAND CONTROLLER	CB	53	SCF	YES	118	31 INST BUS					
HC-406A	HAND CONTROLLER	CB	53	SCF	YES	118	33 INST BUS					
HC-406B	HAND CONTROLLER	CB	53	SCF	YES	118	33 INST BUS					
HC-406C	HAND CONTROLLER	CB	53	SCF	YES	118	32 INST BUS					
HC-406D	HAND CONTROLLER	CB	53	SCF	YES	118	32 INST BUS					
MS 2-31	NON-RETURN CHECK VALVE	ABFP	77									
MS 2-32	NON-RETURN CHECK VALVE	ABFP	77									
MS 2-33	NON-RETURN CHECK VALVE	ABFP	77									
MS 2-34	NON-RETURN CHECK VALVE	ABFP	77									
MS 41	STOP CHECK VALVE	ABFP	65									
MS 42	STOP CHECK VALVE	ABFP	65									
MS 45-1	SAFETY RELIEF VALVE	ABFP	77									
MS 45-2	SAFETY RELIEF VALVE	ABFP	77									
MS 45-3	SAFETY RELIEF VALVE	ABFP	77									
MS 45-4	SAFETY RELIEF VALVE	ABFP	77									
MS 46-1	SAFETY RELIEF VALVE	ABFP	77									
MS 46-2	SAFETY RELIEF VALVE	ABFP	77									
MS 46-3	SAFETY RELIEF VALVE	ABFP	77									
MS 46-4	SAFETY RELIEF VALVE	ABFP	77									
MS 47-1	SAFETY RELIEF VALVE	ABFP	77									
MS 47-2	SAFETY RELIEF VALVE	ABFP	77									
MS 47-3	SAFETY RELIEF VALVE	ABFP	77									
MS 47-4	SAFETY RELIEF VALVE	ABFP	77									
MS 48-1	SAFETY RELIEF VALVE	ABFP	77									
MS 48-2	SAFETY RELIEF VALVE	ABFP	77									
MS 48-3	SAFETY RELIEF VALVE	ABFP	77									
MS 48-4	SAFETY RELIEF VALVE	ABFP	77									
MS 49-1	SAFETY RELIEF VALVE	ABFP	77									
MS 49-2	SAFETY RELIEF VALVE	ABFP	77									
MS 49-3	SAFETY RELIEF VALVE	ABFP	77									

Table D23 Main Steam System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
MS 49-4	SAFETY RELIEF VALVE	ABFP	77									
MS 55-1	MANUAL VALVE	ABFP	77									
MS 55-2	MANUAL VALVE	ABFP	77									
MS 55-3	MANUAL VALVE	ABFP	77									
MS 55-4	MANUAL VALVE	ABFP	77									
MS 58-1	MANUAL VALVE	ABFP	64									
MS 58-2	MANUAL VALVE	ABFP	64									
MS 58-3	MANUAL VALVE	ABFP	64									
MS 58-4	MANUAL VALVE	ABFP	64									
MS 58-5	MANUAL VALVE	ABFP	64									
MS 58-6	MANUAL VALVE	ABFP	64									
MS 58-7	MANUAL VALVE	ABFP	64									
MS 58-8	MANUAL VALVE	ABFP	64									
MS 91-1	MANUAL VALVE	ABFP	64									
MS 91-2	MANUAL VALVE	ABFP	64									
MS 91-3	MANUAL VALVE	ABFP	64									
MS 91-4	MANUAL VALVE	ABFP	64									
MSIV 1-31	MAIN STEAM ISO VALVE	ABFP	77	SBF-1				DIST PNL 34 (CH I) DIST PNL 33 (CH II)			IAS, N2	ESFAS**
MSIV 1-32	MAIN STEAM ISO VALVE	ABFP	77	SBF-1				DIST PNL 34 (CH I) DIST PNL 33 (CH II)			IAS, N2	ESFAS
MSIV 1-33	MAIN STEAM ISO VALVE	ABFP	77	SBF-1				DIST PNL 34 (CH I) DIST PNL 33 (CH II)			IAS, N2	ESFAS
MSIV 1-34	MAIN STEAM ISO VALVE	ABFP	77	SBF-1				DIST PNL 34 (CH I) DIST PNL 33 (CH II)			IAS, N2	ESFAS
PC-419	PRESSURE CONTROLLER	CB	53			118	33 INST BUS					
PC-429	PRESSURE CONTROLLER	CB	53			118	34 INST BUS					
PC-439	PRESSURE CONTROLLER	CB	53			118	34 INST BUS					
PC-449	PRESSURE CONTROLLER	CB	53			118	33 INST BUS					
PCV-1134	AIR OPERATED VALVE	ABFP	77	FBF	YES	118	33 INST BUS	DIST PNL 33			IAS, N2	HI STEAM PRESS
PCV-1135	AIR OPERATED VALVE	ABFP	65	FBF	YES	118	34 INST BUS	DIST PNL 34			IAS, N2	HI STEAM PRESS
PCV-1136	AIR OPERATED VALVE	ABFP	77	FBF	YES	118	34 INST BUS	DIST PNL 34			IAS, N2	HI STEAM PRESS
PCV-1137	AIR OPERATED VALVE	ABFP	65	FBF	YES	118	33 INST BUS	DIST PNL 33			IAS, N2	HI STEAM PRESS
PCV-1214	AIR OPERATED VALVE	PAB	55								IAS	
PCV-1214A	AIR OPERATED VALVE	PAB	55								IAS	
PCV-1215	AIR OPERATED VALVE	PAB	55								IAS	
PCV-1215A	AIR OPERATED VALVE	PAB	55								IAS	
PCV-1216	AIR OPERATED VALVE	PAB	55								IAS	

Table D23 Main Steam System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
PCV-1216A	AIR OPERATED VALVE	PAB	55								IAS	
PCV-1217	AIR OPERATED VALVE	PAB	55								IAS	
PCV-1217A	AIR OPERATED VALVE	PAB	55								IAS	
S/G 31	STEAM GENERATOR 31	VC	95									
S/G 32	STEAM GENERATOR 32	VC	95									
S/G 33	STEAM GENERATOR 33	VC	95									
S/G 34	STEAM GENERATOR 34	VC	95									
SOV-1230	SOLENOID OPERATED VALVE	ABFP	77					DIST PNL 33				
SOV-1231	SOLENOID OPERATED VALVE	ABFP	77					DIST PNL 34				
SOV-1232	SOLENOID OPERATED VALVE	ABFP	77					DIST PNL 33				
SOV-1233	SOLENOID OPERATED VALVE	ABFP	77					DIST PNL 34				
SOV-1234	SOLENOID OPERATED VALVE	ABFP	77					DIST PNL 33				
SOV-1235	SOLENOID OPERATED VALVE	ABFP	77					DIST PNL 34				
SOV-1236	SOLENOID OPERATED VALVE	ABFP	77					DIST PNL 33				
SOV-1237	SOLENOID OPERATED VALVE	ABFP	77					DIST PNL 34				
SOV-1238	SOLENOID OPERATED VALVE	ABFP	77					DIST PNL 33				
SOV-1239	SOLENOID OPERATED VALVE	ABFP	77					DIST PNL 34				
SOV-1240	SOLENOID OPERATED VALVE	ABFP	77					DIST PNL 33				
SOV-1241	SOLENOID OPERATED VALVE	ABFP	77					DIST PNL 34				
SOV-1242	SOLENOID OPERATED VALVE	ABFP	77					DIST PNL 33				
SOV-1243	SOLENOID OPERATED VALVE	ABFP	77					DIST PNL 34				
SOV-1244	SOLENOID OPERATED VALVE	ABFP	77					DIST PNL 33				
SOV-1245	SOLENOID OPERATED VALVE	ABFP	77					DIST PNL 34				
N2-1-1134	MANUAL VALVE	ABFP	77									
N2-2-1134	MANUAL VALVE	ABFP	77									
N2-3-1134	MANUAL VALVE	ABFP	77									
N2-4-1134	MANUAL VALVE	ABFP	77									
N2-5-1134	MANUAL VALVE	ABFP	77									
N2-6-1134	MANUAL VALVE	ABFP	77									
N2-PRV-1134	MANUAL VALVE	ABFP	77									
N2-1-1135	MANUAL VALVE	ABFP	65									
N2-2-1135	MANUAL VALVE	ABFP	65									
N2-3-1135	MANUAL VALVE	ABFP	65									
N2-4-1135	MANUAL VALVE	ABFP	65									
N2-5-1135	MANUAL VALVE	ABFP	65									
N2-6-1135	MANUAL VALVE	ABFP	65									
N2-PRV-1135	MANUAL VALVE	ABFP	65									
N2-1-1136	MANUAL VALVE	ABFP	77									
N2-2-1136	MANUAL VALVE	ABFP	77									
N2-3-1136	MANUAL VALVE	ABFP	77									
N2-4-1136	MANUAL VALVE	ABFP	77									

Table D23 Main Steam System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
N2-5-1136	MANUAL VALVE	ABFP	77									
N2-6-1136	MANUAL VALVE	ABFP	77									
N2-PRV-1136	MANUAL VALVE	ABFP	77									
N2-1-1137	MANUAL VALVE	ABFP	65									
N2-2-1137	MANUAL VALVE	ABFP	65									
N2-3-1137	MANUAL VALVE	ABFP	65									
N2-4-1137	MANUAL VALVE	ABFP	65									
N2-5-1137	MANUAL VALVE	ABFP	65									
N2-6-1137	MANUAL VALVE	ABFP	65									
N2-PRV-1137	MANUAL VALVE	ABFP	65									
SOV-1314	SOLENOID OPERATED VALVE	PAB	55									
SOV-1314A	SOLENOID OPERATED VALVE	PAB	55									
SOV-1315	SOLENOID OPERATED VALVE	PAB	55									
SOV-1315A	SOLENOID OPERATED VALVE	PAB	55									
SOV-1316	SOLENOID OPERATED VALVE	PAB	55									
SOV-1316A	SOLENOID OPERATED VALVE	PAB	55									
SOV-1317	SOLENOID OPERATED VALVE	PAB	55									
SOV-1317A	SOLENOID OPERATED VALVE	PAB	55									

Table D24 Primary Pressure Relief System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
1/455C	PORV PCV-455C CONTROL SWITCH	CB	53	FCF								
1/456	PORV PCV-456 CONTROL SWITCH	CB	53	FCF								
1245	N2 ACCUMULATOR FOR PCV-455C	VC	95									
1246	N2 ACCUMULATOR FOR PCV-456	VC	95									
8304(NNE-18)	RELIEF VALVE	VC	95									
8305(NNE-15)	RELIEF VALVE	VC	95									
8313(NNE-23)	MANUAL VALVE	VC	95									
8321(NNE-31)	MANUAL VALVE	VC	95									
PC-455G	SPRAY VALVE PCV-455A CONTROLLER	CB	53	FBF	YES	118V	BUS 33					
PC-455H	SPRAY VALVE PCV-455B CONTROLLER	CB	53	FBF	YES	118V	BUS 34					
PC-455K	MASTER PRESSURE CONTROLLER	CB	53	FBF	YES	118V	BUS 34					
PCV-455A	AIR OPERATED SPRAY VALVE	VC	70		YES	118V	BUS 33				IAS	PZR PRES
PCV-455B	AIR OPERATED SPRAY VALVE	VC	66		YES	118V	BUS 34				IAS	PZR PRES
PCV-455C	AIR OPERATED PORV	VC	130		YES			DIS PNL 32			NITRO	PZR PRES
PCV-456	AIR OPERATED PORV	VC	130		YES			DIS PNL 31			NITRO	PZR PRES
PCV-464	CODE SAFETY RELIEF VALVE	VC	130									
PCV-466	CODE SAFETY RELIEF VALVE	VC	130									
PCV-468	CODE SAFETY RELIEF VALVE	VC	130									
PRV-6300	PRESSURE REGULATING VALVE	VC	95									
PRV-6301	PRESSURE REGULATING VALVE	VC	95									
RC-535	MOTOR OPERATED VALVE	VC	130		YES	480V	MCC36B					
RC-536	MOTOR OPERATED VALVE	VC	130		YES	480V	MCC36A					
RC-591	MANUAL VALVE	VC	65									
RC-592	MANUAL VALVE	VC	65									
RC-594	MANUAL VALVE	VC	65									
RC-595	MANUAL VALVE	VC	65									
RCPCPC3	REACTOR COOLANT PUMP 33	VC	70		YES	6.9KV	BUS 3	PWR PNL 32		CCW/CV CS		
RCPCPC4	REACTOR COOLANT PUMP 34	VC	70		YES	6.9KV	BUS 2	PWR PNL 31		CCW/CV CS		

Table D25 Primary Water Make-up System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
1/BCR	MAKEUP CONTROL SWITCH	CB	53	FCF								
1/PWMP31	PRIMARY WATER MAKEUP PUMP 31 CONTROL SWITCH	CB	53	FCF								
1/PWMP32	PRIMARY WATER MAKEUP PUMP 32 CONTROL SWITCH	CB	53	FCF								
43/BAB	MAKEUP MODE SELECTOR SWITCH	CB	53	FCF								
BSX-1	INTERLOCK BORIC ACID BLEND SYSTEM	CB	53			118V	BUS 31					
BSX-3	INTERLOCK BORIC ACID BLEND SYSTEM	CB	53			118V	BUS 31					
CH--FCV-111A	FLOW CONTROL VALVE	PAB	73		YES			DIS PNL 31			IAS	RLY BSX-1,
CH-294	CHECK VALVE	PAB	73									
CH-295	MANUAL VALVE	PAB	73									
CH-297	MANUAL VALVE	PAB	73									
CH-326	MANUAL VALVE	PAB	73									
CH-327	CHECK VALVE	PAB	73									
CH-339	MANUAL VALVE	PAB	73									
CH-350	MANUAL VALVE	PAB	73									
CSBLBA1	BORIC ACID BLENDER	PAB	73									
FIC-111	PRIMARY WATER FLOW CONTROLLER	CB	53	FBF	YES	118V	BUS 31					PRI WTR FLOW
PM-PUMP 31	PRIMARY WATER MAKEUP PUMP 31	PAB	41		YES	480V	MCC37					
PM-PUMP 32	PRIMARY WATER MAKEUP PUMP 32	PAB	41		YES	480V	MCC37					
PW-11	MANUAL VALVE	PAB	41									
PW-12	MANUAL VALVE	PAB	41									
PW-13	CHECK VALVE	PAB	41									
PW-14	CHECK VALVE	PAB	41									
PW-15	MANUAL VALVE	PAB	41									
PW-16	MANUAL VALVE	PAB	41									
PW-2	MANUAL VALVE	YARD	55									
PW-98	MANUAL VALVE	PAB	41									
SI-1862	MANUAL VALVE	YARD	81									
YIC-111	DEMINERALIZED WATER FLOW TOTALIZER	CB	53	FBF	YES	118V	BUS 31					PRI WTR FLOW

Table D26 Residual Heat Removal System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
1/730	VALVE AC-730 CONTROL SWITCH	CB	53	SGF								
1/731	VALVE AC-731 CONTROL SWITCH	CB	53	SGF								
1/RHR 1	RHR PUMP 31 CONTROL SWITCH	CB	53	SGF								
1/RHR 2	RHR PUMP 32 CONTROL SWITCH	CB	53	SGF								
43/RS-3	RECIRCULATION SWITCH	CB	53	SBF-1								
52/RHR 31	CIRCUIT BREAKER	CB	15			480V	BUS 3A	PWR PNL 33				
52/RHR 32	CIRCUIT BREAKER	CB	15			480V	BUS 6A	PWR PNL 32				
AC-1870	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36B					REC SW
AC-730	MOTOR OPERATED VALVE	VC	56		YES	480V	MCC36A					PC-402A-X
AC-731	MOTOR OPERATED VALVE	VC	61		YES	480V	MCC36B					PC-403A-X
AC-732	MANUAL VALVE	PAB	54									
AC-735A	MANUAL VALVE	PAB	15									
AC-735B	MANUAL VALVE	PAB	15									
AC-738A	CHECK VALVE	PAB	15									
AC-738B	CHECK VALVE	PAB	15									
AC-739A	MANUAL VALVE	PAB	15									
AC-739B	MANUAL VALVE	PAB	15									
AC-741	CHECK VALVE	VC	66									
AC-742	MANUAL VALVE	VC	66									
AC-743	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36A					REC SW
AC-744	MOTOR OPERATED VALVE	PAB	54		YES	480V	MCC36A					REC SW
AC-745A	MOTOR OPERATED VALVE	VC	66		YES	480V	MCC36B					
AC-745B	MOTOR OPERATED VALVE	VC	66		YES	480V	MCC36A					
AC-837	CHECK VALVE	PAB	15									
AC-838	CHECK VALVE	PAB	15									
AC-839	MANUAL VALVE	PAB	15									
AC-840	MANUAL VALVE	PAB	15									
AC-841	MANUAL VALVE	PAB	15									
AC-842	MANUAL VALVE	PAB	15									
ACAHRC2	RHR HEAT EXCHANGER 32	VC	66							CCW		
ACAHRS1	RHR HEAT EXCHANGER 31	VC	66							CCW		
ACAPRH1	RHR PUMP 31	PAB	15		YES	480V	BUS 3A	PWR PNL 33	PAB VENT	CCW /CITY WTR		SIS/REC SW
ACAPRH2	RHR PUMP 32	PAB	15		YES	480V	BUS 6A	PWR PNL 32	PAB VENT	CCW		SIS/REC SW
PC-402A-X	RELAY	CB	53	RLY RACK G2		118V	BUS 31					

Table D26 Residual Heat Removal System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
PC-403A-X	RELAY	CB	53	RLY RACK G1		118V	BUS 32					
PT-402	PRESSURE TRANSMITTER	VC		RACK C-9		118V	BUS 31					
PT-403	PRESSURE TRANSMITTER	VC		RACK A-6		118V	BUS 32					
SI-1802A	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					REC SW
SI-1802B	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					REC SW
SI-1869A	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					
SI-1869B	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					
SI-638	HAND CONTROL VALVE	VC	68		YES	480V	MCC36B					
SI-640	HAND CONTROL VALVE	VC	68		YES	480V	MCC36A					
SI-746	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					SIS/REC SW
SI-747	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36A					SIS/REC SW
SI-838A	CHECK VALVE	VC	46									
SI-838B	CHECK VALVE	VC	46									
SI-838C	CHECK VALVE	VC	46									
SI-838D	CHECK VALVE	VC	46									
SI-883	MOTOR OPERATED VALVE	PAB	15		YES	480V	MCC36B					RLYS730&731-33ACX
SI-888A	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36A					REC SW/SIS, RLY730-33ACX
SI-888B	MOTOR OPERATED VALVE	PAB	34		YES	480V	MCC36B					REC SW/SIS, RLY731-33ACX
SI-897A	CHECK VALVE	VC	46									
SI-897B	CHECK VALVE	VC	46									
SI-897C	CHECK VALVE	VC	46									
SI-897D	CHECK VALVE	VC	46									
SI-899A	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					SIS/REC SW
SI-899B	MOTOR OPERATED VALVE	VC	46		YES	480V	MCC36B					SIS/REC SW

Table D27 Safeguards Actuation System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
62	TIME DELAY RELAY	CB	53	G3				DIST PNL 31	CR VENT			MSIV CLOSURE
2SID1	TIME-DELAY RELAY	CB	53	G3				DIST PNL 31	CR VENT			
2SID1	TIME-DELAY RELAY	CB	53	G5				DIST PNL 34	CR VENT			
3-1/2A	AUXILIARY RELAY	CB	15	480V SWGR 31	YES			PWR PNL 33	CB VENT			SI
3-1/5A	AUXILIARY RELAY	CB	15	480V SWGR 31	YES			PWR PNL 31	CB VENT			SI
3-1/6A	AUXILIARY RELAY	CB	15	480V SWGR 32	YES			PWR PNL 32	CB VENT			SI
3-3/2A1	AUXILIARY RELAY	CB	15	480V SWGR 31	YES			PWR PNL 33	CB VENT			SI
3-3/2A2	AUXILIARY RELAY	CB	15	480V SWGR 31	YES			PWR PNL 33	CB VENT			SI
3-3/3A	AUXILIARY RELAY	CB	15	480V SWGR 31	YES			PWR PNL 33	CB VENT			SI
3-3/5A1	AUXILIARY RELAY	CB	15	480V SWGR 31	YES			PWR PNL 31	CB VENT			SI
3-3/5A2	AUXILIARY RELAY	CB	15	480V SWGR 31	YES			PWR PNL 31	CB VENT			SI
3-3/6A1	AUXILIARY RELAY	CB	15	480V SWGR 32	YES			PWR PNL 32	CB VENT			SI
3-3/6A2	AUXILIARY RELAY	CB	15	480V SWGR 32	YES			PWR PNL 32	CB VENT			SI
62-1	TIME DELAY RELAY	CB	53	G5				DIST PNL 34	CR VENT			MSIV CLOSURE
62-2/2A	AUXILIARY RELAY	CB	15	480V SWGR 31	YES			PWR PNL 33	CB VENT			SI
62-2/3A	AUXILIARY RELAY	CB	15	480V SWGR 31	YES			PWR PNL 33	CB VENT			SI
71/SG1-X	AUXILIARY RELAY	CB	53	G2		118VAC	IB 32					SG 31 LEVEL
71/SG2-X	AUXILIARY RELAY	CB	53	G2		118VAC	IB 32					SG 32 LEVEL
71/SG3-X	AUXILIARY RELAY	CB	53	G2		118VAC	IB 32					SG 33 LEVEL
71/SG4-X	AUXILIARY RELAY	CB	53	G2		118VAC	IB 32					SG 34 LEVEL
AS-1	AUXILIARY RELAY	CB	53	G3	YES			DIST PNL 31	CR VENT			CNTMT SPRAY
AS-2	AUXILIARY RELAY	CB	53	G5	YES			DIST PNL 34	CR VENT			CNTMT SPRAY
CS-1R	AUXILIARY RELAY	CB	53	G3	YES			DIST PNL 31	CR VENT			CNTMT SPRAY
CS-2R	AUXILIARY RELAY	CB	53	G5	YES			DIST PNL 34	CR VENT			CNTMT SPRAY
FU-1-G3	POS DC FUSE	CB	53	G3	YES			DIST PNL 31	CR VENT			
FU-1-G5	POS DC FUSE	CB	53	G5	YES			DIST PNL 34	CR VENT			
FU-2-G3	NEG DC FUSE	CB	53	G3	YES			DIST PNL 31	CR VENT			
FU-2-G5	NEG DC FUSE	CB	53	G5	YES			DIST PNL 34	CR VENT			
MAN DEF A	SWITCH	CB	53	SBF								SI-A MAN DEF
MAN DEF B	SWITCH	CB	53	SBF								SI-B MAN DEF
MS1	AUXILIARY RELAY	CB	53	G3	YES			DIST PNL 31	CR VENT			MSIV CLOSURE
MS11	AUXILIARY RELAY	CB	53	G5	YES			DIST PNL 34	CR VENT			MSIV CLOSURE
MS12	AUXILIARY RELAY	CB	53	G5	YES			DIST PNL 34	CR VENT			MSIV CLOSURE
MS13	AUXILIARY RELAY	CB	53	G5	YES			DIST PNL 34	CR VENT			MSIV CLOSURE
MS14	AUXILIARY RELAY	CB	53	G5	YES			DIST PNL 34	CR VENT			MSIV CLOSURE
MS2	AUXILIARY RELAY	CB	53	G3	YES			DIST PNL 31	CR VENT			MSIV CLOSURE
MS3	AUXILIARY RELAY	CB	53	G3	YES			DIST PNL 31	CR VENT			MSIV CLOSURE

Table D27 Safeguards Actuation System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Coolin	Air Supply	Actuation/ Interlock
MS4	AUXILIARY RELAY	CB	53	G3	YES			DIST PNL 31	CR VENT			MSIV CLOSURE
PB/RS-B1	PUSH BUTTON	CB	53	SBF								CS-A RESET
PB/RS-B2	PUSH BUTTON	CB	53	SBF								CS-B RESET
PB/RSI-1	RESET PUSHBUTTON	CB	53	SBF								SI-A RESET
PB/RSI-1	RESET PUSHBUTTON	CB	53	SBF								SI-B RESET
PB/TR1	PUSH BUTTON	CB	53	G3								TRAIN A TEST
PB/TR2	PUSH BUTTON	CB	53	G5								TRAIN B TEST
S1	MG-6 LATCHING RELAY	CB	53	G3	YES			DIST PNL 31	CR VENT			CNTMT SPRAY
S2	MG-6 LATCHING RELAY	CB	53	G5	YES			DIST PNL 34	CR VENT			CNTMT SPRAY
SI/2A	AUXILIARY RELAY	CB	15	480V SWGR 31	YES			PWR PNL 33	CB VENT			SI
SI/2A1	AUXILIARY RELAY	CB	15	480V SWGR 31	YES			PWR PNL 33	CB VENT			SI
SI/5A	AUXILIARY RELAY	CB	15	480V SWGR 31	YES			PWR PNL 31	CB VENT			SI
SI/5A1	AUXILIARY RELAY	CB	15	480V SWGR 31	YES			PWR PNL 31	CB VENT			SI
SI/6A	AUXILIARY RELAY	CB	15	480V SWGR 32	YES			PWR PNL 32	CB VENT			SI
SI/6A1	AUXILIARY RELAY	CB	15	480V SWGR 32	YES			PWR PNL 32	CB VENT			SI
SI1	MG-6 LATCHING RELAY	CB	53	G3	YES			DIST PNL 31	CR VENT			SI
SI10X	AUXILIARY RELAY	CB	53	G3	YES			DIST PNL 31	CR VENT			SI
SI11	MG-6 LATCHING RELAY	CB	53	G3	YES			DIST PNL 31	CR VENT			SI
SI11X	AUXILIARY RELAY	CB	53	G3	YES			DIST PNL 31	CR VENT			SI
SI12	MG-6 LATCHING RELAY	CB	53	G5	YES			DIST PNL 34	CR VENT			SI
SI12X	AUXILIARY RELAY	CB	53	G3	YES			DIST PNL 31	CR VENT			SI
SI13X	AUXILIARY RELAY	CB	53	G3	YES			DIST PNL 31	CR VENT			SI
SI2	MG-6 LATCHING RELAY	CB	53	G5	YES			DIST PNL 34	CR VENT			SI
SI20X	AUXILIARY RELAY	CB	53	G5	YES			DIST PNL 34	CR VENT			SI
SI21X	AUXILIARY RELAY	CB	53	G5	YES			DIST PNL 34	CR VENT			SI
SI22X	AUXILIARY RELAY	CB	53	G5	YES			DIST PNL 34	CR VENT			SI
SI23X	AUXILIARY RELAY	CB	53	G5	YES			DIST PNL 34	CR VENT			SI
SIB1	AUXILIARY RELAY	CB	53	G3	YES			DIST PNL 31	CR VENT			PZR PRESS
SIB2	AUXILIARY RELAY	CB	53	G5	YES			DIST PNL 34	CR VENT			PZR PRESS
SIR1	AUXILIARY RELAY	CB	53	G3	YES			DIST PNL 31	CR VENT			
SIR2	AUXILIARY RELAY	CB	53	G5	YES			DIST PNL 34	CR VENT			CS & MSIV
SL1	AUXILIARY RELAY	CB	53	G3	YES			DIST PNL 31	CR VENT			CLS & MSIV
SL2	AUXILIARY RELAY	CB	53	G5	YES			DIST PNL 34	CR VENT			CLS
TR1-1	AUXILIARY RELAY	CB	53	G3	YES			DIST PNL 31	CR VENT			
TR1-2	AUXILIARY RELAY	CB	53	G5	YES			DIST PNL 34	CR VENT			
TR2-1	AUXILIARY RELAY	CB	53	G3	YES			DIST PNL 31	CR VENT			
TR2-2	AUXILIARY RELAY	CB	53	G5	YES			DIST PNL 34	CR VENT			

Table D28 Service Water System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
1/DGCW1	SWITCH	DG	15									
1/DGCW2	SWITCH	DG	15									
1/SW1	SWITCH	CB	53									
1/SW2	SWITCH	CB	53									
1/SW3	SWITCH	CB	53									
1/SW4	SWITCH	CB	53									
1/SW5	SWITCH	CB	53									
1/SW6	SWITCH	CB	53									
1/SW7	SWITCH	CB	53									
1/SW8	SWITCH	TB	15									
1/SW9	SWITCH	CB	53									
2/SW1	RELAY	CB	15									
2/SW2	RELAY	CB	15									
2/SW2-1	RELAY											
2/SW3	RELAY	CB	15									
2/SW3-1	RELAY											
2/SW3-2	RELAY											
2/SW4	RELAY	CB	15									
2/SW5	RELAY	CB	15									
2/SW5-1	RELAY											
2/SW6	RELAY	CB	15									
2/SW6-1	RELAY											
2/SW6-2	RELAY											
27-2A/X2	UNDERVOLTAGE RELAY											
27-3A/X2	UNDERVOLTAGE RELAY											
27-5A/X3	UNDERVOLTAGE RELAY											
27-6A/X2	UNDERVOLTAGE RELAY											
3-1/2A NE	SAFETY ACTUATION RELAY											
3-1/5A NE	SAFETY ACTUATION RELAY											
3-1/6A NE	SAFETY ACTUATION RELAY											
3-2/2A NE	SAFETY ACTUATION RELAY											
3-2/5A NE	SAFETY ACTUATION RELAY											
3-2/6A NE	SAFETY ACTUATION RELAY											
3-3/6A2	SAFETY ACTUATION RELAY											
3-4/5A	SAFETY ACTUATION RELAY	CB	15									
3-4/6A	SAFETY ACTUATION RELAY	CB	15									
43/SW	SWITCH	CB	51									
52 EGX	RELAY											
52-SW1X	RELAY	CB	15									

Table D28 Service Water System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
52-SW2X	RELAY	CB	15									
52-SW4X	RELAY	CB	15									
52-SW5X	RELAY	CB	15									
52/SW1	CIRCUIT BREAKER											
52/SW2	CIRCUIT BREAKER											
52/SW3	CIRCUIT BREAKER											
52/SW4	CIRCUIT BREAKER											
52/SW5	CIRCUIT BREAKER											
52/SW6	CIRCUIT BREAKER											
52/SW7	CIRCUIT BREAKER											
52/SW8	CIRCUIT BREAKER											
52/SW9	CIRCUIT BREAKER											
CCW HTX 31	HEAT EXCHANGER											
CCW HTX 32	HEAT EXCHANGER											
CRAC UNIT 31	CCR AIR CONDITIONING UNIT					480	MCC36A					
CRAC UNIT 32	CCR AIR CONDITIONING UNIT					480	MCC36B					
FCU 31	FAN COOLER UNIT 31											
FCU 32	FAN COOLER UNIT 32											
FCU 33	FAN COOLER UNIT 33											
FCU 34	FAN COOLER UNIT 34											
FCU 35	FAN COOLER UNIT 35											
IACC HTX	HEAT EXCHANGER											
RS-2	RECIRC. SWITCH			SBF-1								
RS-7	RECIRC. SWITCH			SBF-1								
SI-2A	RELAY											
SI-6A	RELAY											
SI/22X	RELAY											
SI/2X	RELAY											
SI/5A	RELAY											
SI/6A	RELAY											
SWN-1-1	CHECK VALVE	IS	5'9"									
SWN-1-2	CHECK VALVE	IS	5'9"									
SWN-1-3	CHECK VALVE	IS	5'9"									
SWN-1-4	CHECK VALVE	IS	5'9"									
SWN-1-5	CHECK VALVE	IS	5'9"									
SWN-1-6	CHECK VALVE	IS	5'9"									
SWN-100-1	CHECK VALVE	TB	15									
SWN-100-2	CHECK VALVE	TB	15									
SWN-100-3	CHECK VALVE	TB	15									

Table D28 Service Water System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
SWN-108-1	MANUAL VALVE											
SWN-108-2	MANUAL VALVE	CB	15									
SWN-108-3	MANUAL VALVE	CB	15									
SWN-108-4	MANUAL VALVE	CB	15									
SWN-108-5	MANUAL VALVE	CB	15									
SWN-109-1	MANUAL VALVE	CB	15									
SWN-109-2	MANUAL VALVE	CB	15									
SWN-1276	SOLENOID OPERATED VALVE											~~SIS, HI EDG~~ JKT TEMP, EDG START
SWN-1276A	SOLENOID OPERATED VALVE											~~SIS, HI EDG~~ JKT TEMP, EDG START
SWN-1297	PRESSURE CONTROL VALVE	CB	15									
SWN-2-1	BUTTERFLY VALVE	IS	5'9"									
SWN-2-2	BUTTERFLY VALVE	IS	5'9"									
SWN-2-3	BUTTERFLY VALVE	IS	5'9"									
SWN-2-4	BUTTERFLY VALVE	IS	5'9"									
SWN-2-5	BUTTERFLY VALVE	IS	5'9"									
SWN-2-6	BUTTERFLY VALVE	IS	5'9"									
SWN-28-1	BUTTERFLY VALVE	CB	15									
SWN-28-2	BUTTERFLY VALVE	CB	15									
SWN-29	BUTTERFLY VALVE	DGB	15									
SWN-31	BUTTERFLY VALVE	PAB	41									
SWN-33-1	BUTTERFLY VALVE	PAB	41									
SWN-33-2	BUTTERFLY VALVE	PAB	41									
SWN-34-1	BUTTERFLY VALVE	PAB	55									
SWN-34-2	BUTTERFLY VALVE	PAB	55									
SWN-35-1	BUTTERFLY VALVE	PAB	73									
SWN-35-2	BUTTERFLY VALVE	PAB	73									
SWN-38	BUTTERFLY VALVE	PAB	35									
SWN-40-1	BUTTERFLY VALVE	FH	54									
SWN-40-2	BUTTERFLY VALVE	FH	54									
SWN-41-1	BUTTERFLY VALVE	FH	54									
SWN-41-2	BUTTERFLY VALVE	FH	54									
SWN-41-3	BUTTERFLY VALVE	FH	54									
SWN-41-4	BUTTERFLY VALVE	FH	54									
SWN-41-5	BUTTERFLY VALVE	FH	54									
SWN-44-1	BUTTERFLY VALVE	FH	72									

Table D28 Service Water System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
SWN-44-2	BUTTERFLY VALVE	FH	72									
SWN-44-3	BUTTERFLY VALVE	FH	72									
SWN-44-4	BUTTERFLY VALVE	FH	72									
SWN-44-5	BUTTERFLY VALVE	FH	72									
SWN-520	MANUAL VALVE	VC	68									
SWN-521	MANUAL VALVE	VC	68									
SWN-522	MANUAL VALVE	VC	68									
SWN-523	MANUAL VALVE	VC	68									
SWN-524	MANUAL VALVE	VC	68									
SWN-525	MANUAL VALVE	VC	68									
SWN-526	MANUAL VALVE	VC	68									
SWN-527	MANUAL VALVE	VC	68									
SWN-528	MANUAL VALVE	VC	68									
SWN-529	MANUAL VALVE	VC	68									
SWN-55	BUTTERFLY VALVE											
SWN-62-2	BUTTERFLY VALVE	DG	15									
SWN-62-4	BUTTERFLY VALVE	DG	15									
SWN-62-6	BUTTERFLY VALVE	DG	15									
SWN-66-1	BUTTERFLY VALVE	DG	19									
SWN-66-3	BUTTERFLY VALVE	DG	19									
SWN-66-5	BUTTERFLY VALVE	DG	19									
SWN-67-1	MANUAL VALVE											
SWN-67-2	MANUAL VALVE											
SWN-67-3	MANUAL VALVE											
SWN-70-1	BUTTERFLY VALVE	CB	15									
SWN-70-2	BUTTERFLY VALVE	CB	15									
SWN-71-1	MANUAL VALVE	FH	54									
SWN-71-2	MANUAL VALVE	FH	54									
SWN-71-3	MANUAL VALVE	FH	54									
SWN-71-4	MANUAL VALVE	FH	54									
SWN-71-5	MANUAL VALVE	FH	54									
SWN-87-1	MANUAL VALVE	CB	15									
SWN-87-2	MANUAL VALVE	CB	15									
SWN-90-1	CHECK VALVE	DISH	18									
SWN-90-2	CHECK VALVE	DISH	18									
SWN-90-3	CHECK VALVE	DISH	18									
SWN-91	BUTTERFLY VALVE	DISH	18									
SWN-92	BUTTERFLY VALVE	DISH	18									
SWN-93	BUTTERFLY VALVE	DISH	18									

Table D28 Service Water System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
SWN-94-1	MANUAL VALVE	CB	15									
SWN-94-2	MANUAL VALVE	CB	15									
SWN-95	MANUAL VALVE	CB	15									
SWN-97	BUTTERFLY VALVE	IS	6									
SWN-98	BUTTERFLY VALVE	IS	6									
SWN-99	BUTTERFLY VALVE	IS	6									
1112	FLOW CONTROL VALVE	SW Vlv Pit										
SWN-FCV-1176	FLOW CONTROL VALVE	DGB	15									SIS, HI EDG JKT TEMP, EDG START
SWN-FCV-1176A	FLOW CONTROL VALVE	DGB	15									SIS, HI EDG JKT TEMP, EDG START
1104	AIR OPERATED VALVE											
1105	AIR OPERATED VALVE											
1113	TEMPERATURE CONTROL											
SWP 31	SERVICE WATER MDP 31	IS	15	SBF-1, SJF	YES	480	BUS 5A	PWR PNL 31				SIS, RS 2 & 7
SWP 32	SERVICE WATER MDP 32	IS	15	SBF-1, SJF	YES	480	BUS 2A	PWR PNL 33				SIS, RS 2 & 7
SWP 33	SERVICE WATER MDP 33	IS	15	SBF-1, SJF	YES	480	BUS 3A	PWR PNL 32				SIS, RS 2 & 7
SWP 34	SERVICE WATER MDP 34	IS	15	SBF-1, SJF	YES	480	BUS 5A	PWR PNL 31				SIS, RS 2 & 7
SWP 35	SERVICE WATER MDP 35	IS	15	SBF-1, SJF	YES	480	BUS 6A	PWR PNL 33				SIS, RS 2 & 7
SWP 36	SERVICE WATER MDP 36	IS	15	SBF-1, SJF	YES	480	BUS 6A	PWR PNL 32				SIS, RS 2 & 7
SWP 37	BACKUP SERVICE WATER MDP 37	DISH	18	SJF	YES	480	BUS 5A	PWR PNL 31				SIS, RS 2 & 7
SWP 38	BACKUP SERVICE WATER MDP 38	DISH	18	SJF	YES	480	MCC312					SIS, RS 2 & 7
SWP 39	BACKUP SERVICE WATER MDP 39	DISH	18	SJF	YES	480	BUS 6A	PWR PNL 32				SIS, RS 2 & 7
TSW-DG1JW	TEMPERATURE SWITCH											
TSW-DG1LO	TEMPERATURE SWITCH											
TSW-DG2JW	TEMPERATURE SWITCH											
TSW-DG2LO	TEMPERATURE SWITCH											
TSW-DG3JW	TEMPERATURE SWITCH											
TSW-DG3LO	TEMPERATURE SWITCH											
ZURN 31	ZURN STRAINER FOR SWP 31	IS	6				MCC36A					
ZURN 32	ZURN STRAINER FOR SWP 32	IS	6				MCC36B					
ZURN 33	ZURN STRAINER FOR SWP 33	IS	6				MCC36A					
ZURN 34	ZURN STRAINER FOR SWP 34	IS	6				MCC36B					
ZURN 35	ZURN STRAINER FOR SWP 35	IS	6				MCC36A					
ZURN 36	ZURN STRAINER FOR SWP 36	IS	6				MCC36B					
ZURN 37	ZURN STRAINER FOR SWP 37	DISH	18				MCC36A/B					
ZURN 38	ZURN STRAINER FOR SWP 38	DISH	18				MCC36A/B					

Table D28 Service Water System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev.	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
ZURN 39	ZURN STRAINER FOR SWP 39	DISH	18				MCC36A/B					

Table D29 Auxiliary Boiler Feedpump Building Ventilation System Dependencies

BASIC COMPONENT DESCRIPTION		COMPONENT LOCATION				COMPONENT POWER SUPPLY [1]			COMPONENT SUPPORT SYSTEM			
COMP ID	COMPONENT TYPE	Building Location	Elev	Panel/Rack No.	CR Ind.	AC Volt	AC Bus/Panel	125VDC Bus/Panel	Room Cooling	Comp Cooling	Air Supply	Actuation/ Interlock
EF311	WALL EXHAUST FAN	ABFPB			NO	120	LP324					DAMPER
EF312	WALL EXHAUST FAN	ABFPB			NO	120	LP324					DAMPER
L-314	INLET LOUVER L-314	ABFPB			NO	120	LP324					WALL EF START
TS-EF311	THERMOSTAT EF311	ABFPB			NO							WALL EF START
TS-EF311	THERMOSTAT EF312	ABFPB			NO							WALL EF START

APPENDIX E

DATA ASSUMPTIONS

AND COMPONENT BOUNDARIES

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Section E1

COMPILING COMPONENT FAILURE RECORDS

1. The component boundaries are those defined in Section E5 of this appendix.

2. Only components and failure modes that are modeled in the system fault trees were included in the plant-specific failure data collection.

3. The primary source of failure information used in this study was the maintenance work request (MWR) packages. Additional plant information sources were used as necessary, but only as secondary sources. If the sources give inconsistent information, information derived from the MWR packages was used unless it was clearly wrong.

4. MWR packages on which the equipment ID is illegible or not specified were disregarded unless other plant sources provided the necessary information.

5. MWRs sometimes provide very little information on the problem and corrective action taken. This lack of information makes it difficult to distinguish component failures separate from other maintenance activities. Unless component failure is clearly indicated, it was assumed that the package addresses corrective maintenance.

6. An MWR which does not result in actual maintenance activity was set aside. An example of such an MWR is a request for equipment trouble shooting which failed to duplicate the reported equipment problem and therefore did not lead to maintenance.

7. A canceled work request was not analyzed.

8. Component failure severity classifications used in this study are similar to those used in the INPO NPRDS. In the NPRDS, three levels of failure severity are defined: immediate/catastrophic, degraded and incipient. The only failures of concern in this study, however, were immediate/catastrophic failures and some degraded failures which have critical effects on system from the plant risk perspective.

9. The failure start time was defined to be the time at which MWR was issued unless a specific failure time is specified in the MWR or other plant document source. The failure end time was defined to be the time at which control room shift supervisor signs off the clearance of MWR. If the failure start or end times are unavailable, they were assumed to be 12:00 (noon).

10. Some MWRs describe component failures which do not fit into failure criteria used in this study. Such failures include: failures of components outside the scope of this study; failures with component failure modes outside the scope of the study; and failures not

critical to the failed component but critical to other components modeled (e.g., reverse leakage through check valves). Failure records of the last type were scrutinized to determine if they should be retained. However, special care was exercised when including these failures in failure rate and demand probability calculations, since their inclusion changes the component population. If exposure data corresponding to these failures was unavailable, the failures were omitted from the failure rate and demand probability calculations.

11. MWRs are often issued for components which manifest the effect of other component failures. In this study, such failures were counted against the component that actually failed, and not against the component for which the MWR was issued.

12. Some components consist of many sub-components (e.g., turbine-driven pumps and emergency diesel generators). Failures of such components were tracked at the sub-component level to facilitate documentation but were later aggregated for failure rate and demand probability calculations.

13. Often, maintenance on one component leads to subsequent maintenance on the same component or other components. In general, subsequent maintenance on the same component was treated as part of the initial maintenance unless there was a clear reason for doing otherwise. Subsequent maintenance on other components was normally treated separately though it was evaluated as a potential common-cause event.

14 If an MWR package addressed multiple component failures, failure records were created for each component. The failures were then reviewed further to ascertain if they are common-cause failures.

15. Component/piece part replacements or component repairs initiated by plant design changes/modifications were categorized as scheduled maintenance (SM).

16. If functional degradation of a component is monitored by such means as vibration monitoring and lube oil analysis, and its degraded condition is corrected before failure (either by adjustment or replacement of parts), the corresponding maintenance event was categorized as an incipient failure.

17. Component/system misconfiguration (e.g., reversed wiring on a transmitter), induced, discovered and corrected during testing, was not considered a failure.

18. Failures of piping, pipe support, and steam traps were not analyzed except when the failure could initiate an accident sequence that leads to core damage (e.g., piping failures that cause internal flooding). The basis for this omission is that their probability of occurrence and contribution to core damage accident sequences is minimal.

19. Minor external leakage from a pump assembly, such as leak through flange, was considered to be an incipient failure.

20. If the operating status of component at the time of failure could not be determined from the MWR, the assumed failure modes for failure of standby and alternating pumps will be failure to start (FS) unless it is clear that the pump failure is failure to run (FR). For normally running pumps, the reverse was assumed.

21. In general, valve leakage was considered to be an incipient failure unless it seriously degraded system operation or performance or had to be fixed immediately. Valve leakage problems are usually assigned a "fail to remain closed" (CO) failure mode, although a "fail to close (OO) failure mode is assigned if the valve has to close during an accident.

22. Failures associated with integrated leak rate tests (ILRT) on valves were disregarded. ILRT acceptance criteria are much more stringent than the failure criteria used in this study and seldom represent the functional failures of interest here.

23. Valve repacking performed before a valve test was categorized as preventive maintenance (PM) unless the valve leaked severely before repacking.

24. A minor internal valve leakage through a valve seat was considered to be an incipient failure. This assumption does not apply to a major internal leakage and external leakage. Critical internal leakage through a valve (e.g., internal leakage from AFW system to a steam generator) was considered to be degraded/catastrophic failure and the failure was counted against the valve.

25. Internal (reverse) leakage in a check valve was assigned a "fails to remain closed" (CO) failure mode. However, if the reverse leakage failure mode for a check valve was specifically modeled in a fault tree, then the preferred failure mode was reverse leakage.

26. MWR packages which deal with motor-operated valve actuation (MOVATS) testing were reviewed. MOVATS testing indicates whether there are problems with a valve. If a problem was detected through MOVATS testing, it generated other plant documentation such as an SOR and other MWR which was then reviewed for further information.

27. Pilot valve failures were counted against the master valve unless the pilot valve was specifically modeled in the system fault trees.

28. Only instrumentation directly associated with major components (such as pumps, valves, compressors, etc.) was analyzed in this study. This is consistent with the component population scope used in the system fault tree development.

29. A transmitter failure (e.g., transmitter wire burn out) was ignored if the failed transmitter does not provide a control signal to other components such as valves or pumps.

30. If several MWRs address similar problems for separate components during relatively short period of time (i.e., weeks), they were further reviewed to ascertain if the failures represent a common-cause failure.

Section E2

EXPOSURE DATA FROM PERFORMANCE AND SURVEILLANCE TESTING

1. Only components located in a major flow path or included in system logic models were examined.

2. An RHR heat exchanger was considered to be tested in a performance test (PT) or surveillance test (ST) if the flow path through the heat exchanger was tested. Should the heat exchanger fail, the applicable failure mode is "failure of the heat exchanger from miscellaneous faults (such as plugging, rupture, leakage, etc.)" (VF).

3. The exposure time relevant to the valve plugging failure mode was calculated as being one-half the test interval assuming that the valve operated successfully during the previous PT/ST if the valve is in the major flow path. This assumption applies only to normally open valves, in which plugging may be caused by internal valve parts coming loose.

4. During a PT/ST, component operability may be tested repeatedly. Even so, only one verification of component operability was assumed for component failure modes that are related to exposure time.

5. Only those components in a direct flow path tested in a given PT/ST were analyzed for exposure-hour-related failure modes. Valves subject to ILRTs were not included unless specifically addressed by the PT/ST.

6. If the test procedure states that 'M' out of 'N' components can be used for testing, then 'M/N' demands were assigned to each of the N components.

7. Manual valve failure modes "manual valve fails to remain open" (OC) and "manual valve fails closed" (PG) were treated as PG failure modes in this study.

8. Cycling a normally-open or normally closed valve results in one demand that the valve open and one demand that it close.

9. Opening a normally closed valve and throttling it collects one open demand if the valve is throttled immediately after opening: problems that occur during initial valve throttling were assumed to represent a failure of the valve to open--a CC failure mode. If, however, the valve was left open--even partially--for some time before throttling, a "valve does not throttle properly" (DN) failure mode was assumed.

10. If a PCV was challenged during a given test, then the operability of the PCV and the flow path through it were tested. Therefore, exposure was accumulated for two PCV failure modes: "does not operate on demand" (DN), and "fails closed, plugged" (PG).

11. Attempts to close a valve that was already closed or to open a valve that was already open are not valid demands on the valve.

12. Partial opening or closing of a valve was counted as full actuation.

13. Gross reverse leakage through check valves represents a failure to close on demand. This failure mode is especially important for multiple-pump trains that are normally in standby. It can occur in any system where pumps with discharge check valves feed a common header (e.g., in the RHR, SWS and CCW systems).

Section E3

EXPOSURE DATA FROM SYSTEM OPERATION

1. Only components in a major flow path or included in system logic models were examined. Thus drain, vent, and manual isolation valves away from the main flow path were not examined.

2. Attempts to close a valve that was already closed or to open a valve that was already open are not valid demands on the valve.

3. When a pump, compressor or fan cooling unit is actuated, it is assumed that the associated manual switch (MSW-DN) and power breaker (CRB-DN) are also actuated.

4. Whenever a pump is started, the associated discharge check valve collects a demand (CKV-CC). However, this demand is collected only for the minimum flow path that is required to operate the pump.

5. If a valve is required to change its position (e.g., to open) when a pump starts or during pump operation, the valve collects a demand.

Section E4

UNAVAILABILITY CALCULATIONS

1. Events were treated as occurring on the date given in the senior reactor operator (SRO) logs or daily summary report (DSR) unless reported differently in the shift supervisor (SS) logs.

2. If only the event start date was found in the SRO logs and no entry was found in the SS log or DSR to identify the event end date, the event end date was taken as the "estimated return to service date" provided in the DSR.

3. SRO and SS logs and DSRs contain data on component, train, and system outages occasioned by scheduled and unscheduled maintenance and tests. Unavailability calculations ignored tests unless they rendered components inoperable.

4. If a plant shut down was commenced in response to a technical specification limiting condition of operation (LCO), it was assumed that the safety systems were no longer required. Unavailability calculations reflect this assumption.

5. Only events with start dates (or estimated time of occurrence) during power operations were included in unavailability calculations. Events that occurred during an outage were excluded.

Section E5

COMPONENT BOUNDARIES

Three major physical interfaces were considered when specifying component boundaries: the mechanical interface (which includes interfaces with lubricating or cooling systems if applicable); the power supply interface; and the command/control interface. For most components, the distinctions between the component and the rest of the system are clear. For some components, however, the interfaces between the component and the rest of the system are not clear and need detailed specification. These components include the batteries, battery chargers, inverters and diesel generators; pumps; motor-, air-, and solenoid-operated valves; cooling units; fans; air compressors; dampers; and gas turbines. The mechanical, power supply, and command/control interface to these components are defined as follows.

Batteries. A battery boundary includes each battery cell, its internal parts (including plates and electrolyte); terminal connections (including cables with lugs or connectors); and any switches or meters required for normal battery operation.

Battery Chargers. The static battery charger boundary includes all components within the charger enclosure and the associated instrumentation, control, and protective devices, including meters, relays, fuses, switches and internal circuit breakers.

Inverters. The inverter boundary includes all components within the inverter unit, the static transfer switch and associated instrumentation, control, and protective devices (including meters, relays, fuses, switches, and circuit breakers).

Diesel Generators. The mechanical boundary of the emergency diesel generator (EDG) encloses the diesel engine and its subsystems. It includes the combustion air path from the intake to the outlet, engine-driven lubrication and fuel oil supplies, and the jacket water cooling system except for the piping and the source of cooling water. The generator and output circuit breaker were excluded from the boundary, because their failures were modeled separately. The control/command boundary includes the entire air-starting system (its accumulators, compressors and the signal input contacts through the starting-air system). The command signals to the signal input contacts lie outside the boundary but local control systems (e.g., governors) and instrumentation are included within it.

Pumps. A pump consists of a pumping unit, driver, and coupling. The mechanical boundary is taken to extend from the pump side of the inlet isolation valve to the pump side of the outlet isolation valve but excludes the valves. The lubrication and cooling boundaries are taken to include local elements of these systems up to the pump but excluding the driving system for cooling water, if it is common to several pumps. The power supply boundary is essentially the same for all electrically driven pumps and is taken to extend from where cables exit the circuit breaker. The circuit breaker and bus in the motor control centers (MCCs) for the pumps were modeled separately. For steam turbine-driven pumps, the power boundary was taken to be the outlet of the steam shutoff valve. Local control systems like the governors are taken to be part of the pump, since a failure of the governor is usually reported as a failure of the pump. The command/control boundaries (including all controls, switches, circuitry, and local instrumentation) for the pump were excluded, since they are modeled as separate basic events in the fault tree model. This boundary definition is consistent with plant maintenance procedures. Each pump was classified as operating in a running or standby mode, or as alternating between running and standby modes.

Air-Operated Valves. The physical boundary of air-operated valves (AOVs) encompasses the valve body, excluding the pilot valve operator, and all fittings, flanges, and seals. The air supply boundary for AOVs is at the point where the air enters inlet to the pilot operator. The command/control boundaries such as solenoid valves, if they exist, are defined as separate components and modeled as such.

Motor-Operated Valves. The physical boundary of motor-operated valves (MOVs) encompasses the valve body, valve operator, the motor, and all fittings, flanges, and seals. The power supply boundary for MOVs is at the point where the power cable exits the circuit breaker. The MCC motor starter contacts were modeled separately. All limit switches or torque switches on the valve also lie outside of valve boundary.

Solenoid-Operated Valves. The physical boundary of solenoid-operated valves (SOVs) encompasses the valve body, valve operator, air actuator (solenoid), and all fittings, flanges, and seals. For solenoid-operated valves, the power supply and control/command boundaries are at the input contacts of the solenoid coil.

Cooling Units. The physical boundary of the cooling unit includes the filters, the cooling coils, and the fan with its driver. The power supply and command/control boundaries are the same as those for the motor-driven pump. If local controls exist (such as hydraulic coupling), they are also defined as falling within the command/control boundary.

Fans. The driving motor, coupling, belt, and blades were defined as falling within the physical boundary of a fan. The power supply and command/control boundaries were assumed to be the same as those for the cooling units.

Air Compressors. The physical boundary of the air compressor includes the compressing unit, driver, and moisture separator. The boundary lies at the intake air filter and the outlet of the moisture separator. The power supply and command/control boundaries were assumed to be the same as those for the cooling units.

APPENDIX F

PLANT DATA SOURCES AND THEIR USE

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PLANT DATA SOURCES

Plant-specific failure data can come from:

- **Maintenance Work Requests (MWRs)**

  MWRs, as described on the maintenance work request cover sheet and work sheets, are the major source of component failure data. A MWR usually identifies the component being maintained and briefly describes the problem, the corrective action taken, and the duration of maintenance. The time of failure can often be extracted as well, but MWRs seldom describe the circumstances under which components fail.

  The MWRs were reviewed in detail to prepare component failure records that were then used directly to calculate the component failure rate or demand probability. Data extracted from MWRs were cross-referenced with two other plant information sources--the licensee event report (LER) database and INPO NPRDS failure reports--to verify the timing of events. Missing or illegible information was verified by cross-checking the shift supervisor (SS) and senior reactor operator (NCO) logs, the daily summary reports (DSRs), monthly reports (MRs), significant occurrence reports (SORs), and SCRAM reports. This cross-checking ensured the completeness of the data and resolved some uncertainties.

  The review process for a MWR is outlined in Figure F1. The failure information was recorded on a plant-specific failure data form (Figure F2) and then compiled into a database (Table F1). It is important to note that subjective judgments were made when the failure mode and severity (i.e., catastrophic, degraded, or incipient) were assigned.

  While reviewing the MWRs, the data analysts consulted with the system analysts to clarify unusual cases. This consultation provided three benefits:

  - The data analysts gained an understanding of how components were modeled
  - The system analysts benefited by understanding how modeled components have failed and been repaired at the plant and adjust the models accordingly
  - The model and component failure data are made consistent.

  The review of MWRs begins by separating them into system and major component categories (i.e., mechanical, electrical, instrumentation and control, and miscellaneous) to help in their handling and tracking. The MWRs were then analyzed in a series of steps:

  [1] Each MWR was screened to determine whether it applies to work performed within the distinct time period selected. Only MWRs within this window were analyzed. MWRs generated within a month of the window were reviewed to find the actual component failure date, since the date of concern in this analysis is the component failure date--not

the work order request date (the "done date").

[2] The failed component addressed in the MWR is identified. MWRs that are not component-specific (e.g., cleaning the turbine room floor) were set aside for later review to determine whether MWRs dealing with system- or plant-level problems should be addressed in the analysis.

[3] MWRs relating to scheduled maintenance or testing were not used to determine failure rates or demand probabilities unless a failed component was repaired under the same work order. These MWRs were to be used, however, to determine the unavailability of components due to maintenance.

[4] The MWRs were reviewed to determine whether the components addressed were modeled in the system fault trees. Particular care was taken to ensure that the component ID shown on the MWR is indeed that of the failed component: frequently this ID is that of the component that manifests the symptoms of failure and not of the component where the failure originated. This is especially true of indicators and alarms, where the actual failure may be of the monitored component.

Delineation of component boundaries is a key issue for data analysts inasmuch as several components are sometimes lumped together for representation in the fault tree model (e.g., a turbine-driven pump containing a turbine, pump, governor, and steam-control and stop valves, is modeled as a single component). However, the maintenance department usually treats such equipment as separate components. The component boundaries assumed are defined in Appendix E.

[5] A failure-severity code--catastrophic, degraded, or incipient--was assigned to the component failure addressed in each MWR. In a catastrophic failure, the component fails so that it cannot function as required. A degraded failure leaves the component functional, but not meeting one or more of its specified operating parameters. An incipient failure occurs when a component remains fully functional within its operational criteria, but shows symptoms of problems that could lead to degraded or catastrophic failure if not repaired.

As only catastrophic failures and some degraded failures--such as valve internal leakage that provides a significant flow path diversion--are modeled, only these failures are relevant to the data analysis.

[6] If a component and its failure severity are found relevant, the actual component failure was compared with the failure modes modeled to determine whether this type of component failure was modeled in the fault tree. Where subjective judgments are made to match modeled failure modes to actual component failures, these judgments were documented on the failure data report form so they can be reviewed later with the system analysts. Consequently, the logic model was sometimes modified to account for

the failure modes identified from the review of MWRs.

[7] Where data are illegible or missing, other plant data sources such as SRO and SS logs were examined. Once the failure report form is completed, selected data are entered into a computer database for final checking to eliminate duplicate component failures and match the failures identified from MWRs with those identified from other plant data sources.

The MWRs were also used to calculate the component demands incurred in post-maintenance testing--it was assumed that if a component is removed from service for scheduled or unscheduled maintenance, it will be tested before being returned to service. Finally, a maintenance database was created. The work orders addressing catastrophic component failures modeled in the system fault trees are compiled with the other MWRs addressing incipient-failures and scheduled-maintenance. The database is used to help determine unavailability as a result of maintenance. This database is shown in Table F2.

- **Licensee Event Reports (LERs)**

  LERs deal with significant events related to the licensee, including organizational and procedural problems. An LER provides, for example, a very detailed description of a given component failure, its effect on the system and plant, the failure date, the corrective action taken, and the failure cause. Since not all failures are reported as LERs, however, they were used only to supplement and cross-check the MWR database.

- **NPRDS Failure Reports**

  INPO can provide detailed failure reports over the period analyzed. Because many failure reports concern degraded or incipient failures that are not within the scope of this study, and because NPRDS failure reports are usually generated from, and are subjective interpretations of, plant MWRs, they were used only to supplement the MWR database.

- **SCRAM Reports**

  These reports provide detailed accounts of all automatic and manual reactor scrams. They were therefore used to identify initiating events. The reports were also helpful in developing a plant operating mode histogram; they contain clues about when certain components or systems malfunctioned.

- **Significant Occurrence Reports (SORs)**

  These reports delineate unusual events that occur at the plant, including some caused by component failures. Because they are not exhaustive, they were used only to supplement the MWR database.

- **Monthly Report (MR)**

  This report summarizes all significant events that occurred during the month and provides such data as the time the plant operated at full power, time spent in shutdown, and number of scrams. Again, it was used to supplement other documentation.

- **Daily Summary Report (DSR)**

  This report describes events significant in the day-to-day plant operation. Out-of-service equipment is often listed, along with its return to service, particularly if this equipment is within the ECCS or if its inoperability represents a LCO. This report is a primary source of data for estimating system unavailability for the ECCS. It also gives daily reactor power levels that can be used to help develop a comprehensive plant operating mode histogram. Care was taken, however, in using the DSR to identify failures because successive periods of system or component unavailability may be occasioned by single failures,.

- **Senior Reactor Operator (SRO) Log or Central Control Room (CCR) Log**

  The SRO log is kept by field operators at the plant. It contains detailed descriptions of events during which equipment is turned on and off, valve line-ups are changed, and components are tagged out for maintenance. Significant equipment failures, system inoperability, plant shutdowns, refueling outages, surveillance testing, and major maintenance activities are logged into the document as one-line entries with time stamps. Data on component demands and operating hours was therefore basically derived from the SRO log making use of the assumptions delineated in Appendix E. The SOR log was also thoroughly reviewed to obtain detailed surveillance testing (ST) data and to help create the system operation logs used to compile performance logs.

  A system operation history table (Table F3) was generated for the modeled systems from the SOR log using the SS logs and other reports to verify and amplify the data. Composites of the total operating procedure demands and operating hours are summarized for each system, as shown in Table F4. This table is then combined with the ST component demand matrix, Table F7, to obtain the total number of demands or operating hours for each component type modeled and its associated failure mode.

- **Shift Supervisor Log (SS Log)**

  This document is a source of plant and system operating history and was used to support and cross-check the SRO log. The SS log was also used to provide information on the time of component failures if this information was missing or illegible in the MWRs. Other information to be extracted during the SS log review included the reactor mode changes and the times of reactor scrams.

- **Surveillance Testing (ST) Procedures**

ST procedures are based on the plant technical specifications. They list the components to be tested and the components utilized during the performance of a given ST. Although each ST procedure specifies a scheduled frequency, the schedules do not accurately represent actual ST performance. To collect more accurate ST performance data, the SRO logs were reviewed and a complete history of the ST performance generated for the period of time studied. The detailed ST log and a summary are presented in Tables F5 and F6, respectively.

The ST procedures were then used to generate a demand matrix for ST procedures and affected components. The ST-demand matrix is shown in Table F7. This table is completed by identifying the normal state for each component and the operation requested by the ST procedure. The corresponding potential failure mode description, failure mode, and demand are listed. The assumptions for compiling the ST-demand matrix and estimating component exposure and operating hours are documented in Appendix E.

- **System Operating Procedures (OPs)**

  These procedures contain instructions for all modes of system operation, including those rarely performed. The procedures were used as a source of background information on component/system operation.

- **Maintenance Procedures**

  Maintenance procedures detail how maintenance is performed. This information was combined with the MWR database to estimate component demands from maintenance activities. Maintenance procedures also provided insight into how certain components are maintained and identify the components associated with each maintenance procedure.

- **Discussions with Plant Staff**

  Discussions with maintenance and operations staff were particularly useful in ensuring that the data compiled reflect the actual component actuation and failure history and in resolving uncertainties in defining component functions or failure modes.

- **Piping and Instrumentation Diagrams (P&IDs), and other plant drawings**

  Plant drawings were used to identify components modeled in the system fault trees, and to understand how components interface with each other.

- **Other Documentation**

  Other plant documentation (such as the FSAR, technical specifications, system descriptions, and vendor documentation) or summaries of the information prepared in the systems analysis were consulted when necessary.

Figure F1 Flow Chart to Determine Component Failures From MWR Packages

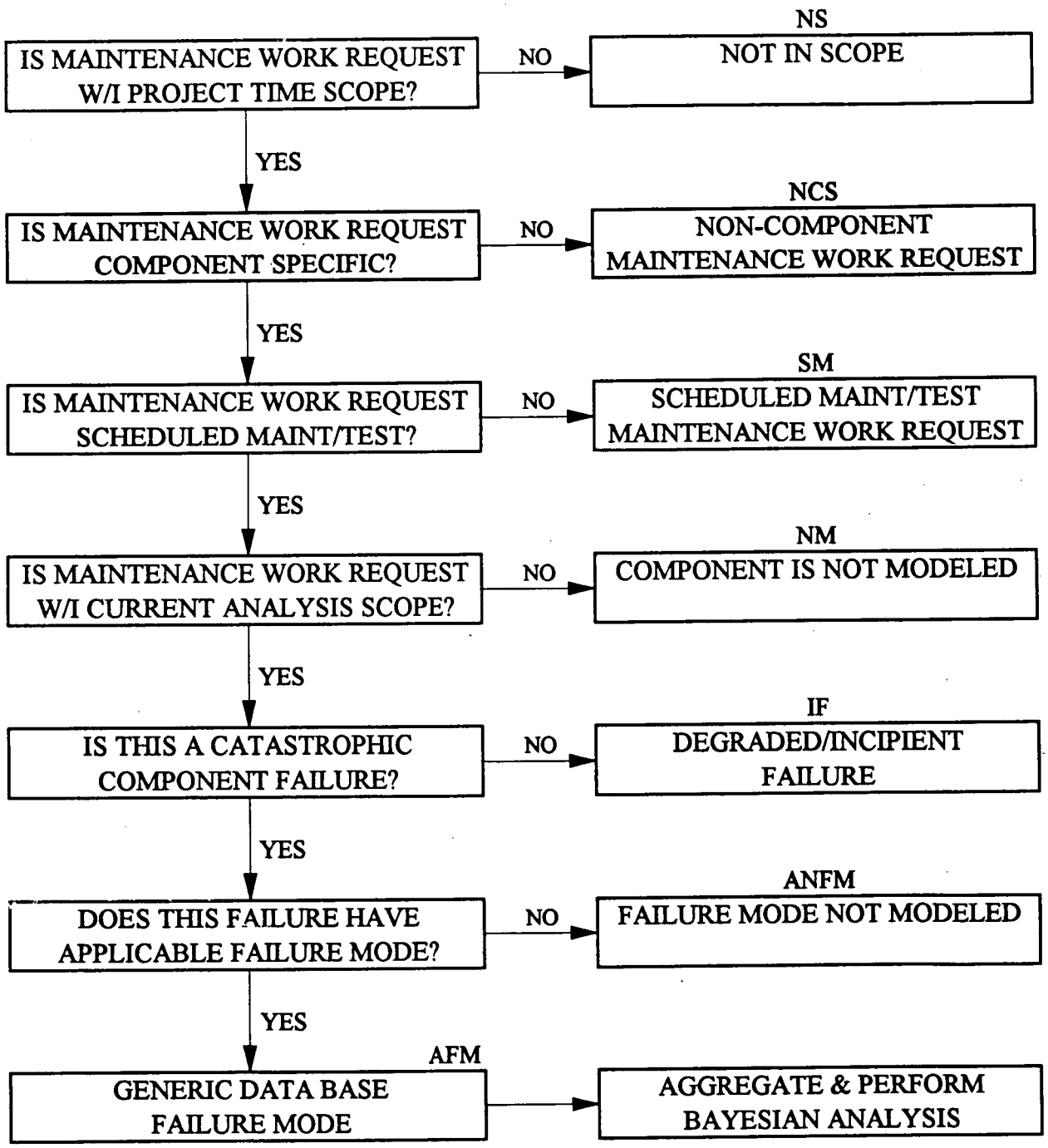

Figure F2 Plant Specific Failure Data Report Form

INDIAN POINT 3 NUCLEAR POWER PLANT
COMPONENT FAILURE DATA REPORT FORM

Failure Record #:	Sheet:
Disposition:	INIT:

System:	CompType:
CompID:	FailMode:
SubComp:	FailCause:
Component Description:	FailDetect:
	Severity:
RxMode:	MWR#:
StartDate:	Source1:
EndDate:	Source2:
Duration:	Source3:
RepairTime:	Source4:

Failure Description:

Failure Cause Description:

Corrective Description:

Miscellaneous Notes:

☐ RCHK ☐ CCF ☐ HRA

Table F1 Failure Record Index

SYSTEM	COMP TYPE	FM	COMPONENT ID	COMPONENT DESCRIPTION	FAILED DATA	MWR #
AC4	CRB	OO	52/EG1	31 EDG Output Breaker	01/25/88	12776
AC4	CRB	OO	52/EG3	33 EDG Output Breaker	04/19/90	21651
AFW	AOV	CC	LCV-1158-1	LEVEL CONTROL VALVE	10/25/88	15083
AFW	AOV	OO	FCV-406C		05/10/86	08322
AFW	AOV	OO	FCV-406B		09/15/90	24370
AFW	MDP	FS	31 ABFP	31 AUXILIARY BOILER FEEDWATER PUMP	11/14/86	09338
AFW	MDP	FS	33 ABFP	33 AUXILIARY BOILER FEEDWATER PUMP	11/14/90	25642
AFW	TDP	FS	32 ABFP	32 AUXILIARY BOILER FEEDWATER PUMP	04/04/90	21518
CCW	MDP	FR	32 CCWP	32 COMPONENT COOLING WATER PUMP	05/10/88	13484
CCW	MDP	FR	33 CCWP	33 COMPONENT COOLING WATER PUMP	09/01/89	19103
CCW	MDP	FS	32 AUX CCWP	32 AUXILIARY CCW PUMP	08/17/87	11668
CCW	MOV	CC	MOV-786	RCP BEARING DISCHARGE RETURN VALVE	08/10/87	11492
CCW	MOV	CC	MOV-786	RCP BEARING DISCHARGE RETURN VALVE	05/02/89	17911
CDS	MDP	FR	32 CD PUMP	PUMP CASING VENT VALVE	01/27/81	01780
CDS	MDP	FR	32 CD PUMP	32 CONDENSATE PUMP	02/22/84	04209
CVCS	HCV	OC	HCV-142	CHARGING LINE HAND CONTROL VAVLE	09/15/90	24340
CVCS	MDP	FR	CSAPBA1	31 BORIC ACID TRANSFER PUMP	04/08/85	06287
CVCS	MDP	FR	31 BATP	31 BORIC ACID TRANSFER PUMP	04/13/87	10228
CVCS	MDP	FS	32 BATP	32 BORIC ACID TRANSFER PUMP	05/22/88	13682
CVCS	PDP	FR	31 CHG PMP	31 CHARGING PUMP	03/02/86	07902
CVCS	PDP	FR	33 CHG PMP	33 CHARGING PUMP	09/22/89	19270
CVCS	PDP	FR	31 CHG PMP	31 CHARGING PUMP	12/03/89	22455

Table F1 Failure Record Index

SYSTEM	COMP TYPE	FM	COMPONENT ID	COMPONENT DESCRIPTION	FAILED DATA	MWR #
CVCS	PDP	FS	32 CHG PMP	32 CHARGING PUMP	07/25/90	23237
CVCS	SPC	DN	32 CHG PMP	32 CHARGING PUMP	06/12/89	18407
CVCS	SPC	DN	CSAPCH2	32 CHARGING PUMP	12/14/90	26418
CVCS	SPC	DN	31 CHG PMP	31 CHARGING PUMP	09/02/91	31234
EDG	ASV	FE	AOV-32	32 EDG WEST AIR START VALVE	10/07/87	12102
EDG	ASV	FE	31 EDG	31 EDG AIR START MOTOR	07/31/89	18916
EDG	ASV	FE	ST-S0-A	31 EDG DA-SOV-18-1	12/16/91	33686
EDG	ASW	OC	33 EDG DPI	JACKET WATER PRESSURE SWITCH	12/12/88	15668
EDG	GEN	HW	32 EDG	32 EMERGENCY DIESEL GENERATOR	08/17/88	14500
IAS	CMP	FR	32 IAC	32 INSTRUMENT AIR COMPRESSOR	03/03/82	02725
IAS	CMP	FR	31 IAC	31 INSTRUMENT AIR COMPRESSOR	06/29/84	04754
IAS	CMP	FR	33 IAC	33 INSTRUMENT AIR COMPRESSOR	07/25/89	18868
IAS	DYR	DN	31 IA DRYER	31 INSTRUMENT AIR DRYER	11/18/87	12393
IAS	RCK	NO	32 IA DRYER	32 INSTRUMENT AIR REFRIGERANT DRYER	08/30/84	05080
IAS	XVM	OC	IA-70	31 REFRIGERANT DRYER INLET ISOLATION VALVE	12/07/91	33559
MFW	MOV	OC	BFD-5-1	31 SG MFW ISOLATION VALVE	12/23/90	26697
MS	AOV	CC	PCV-1216A	33 SG BLOWDOWN ISOLATION VALVE	02/16/84	04228
MS	AOV	CC	PCV-1215	32 SG BLOWDOWN ISOLATION VALVE	08/30/84	05077
MS	AOV	CC	PCV-1134	31 SG ATMOSPHERE RELIEF VALVE	11/19/88	15369
MS	AOV	CC	PCV-1136	33 SG ATMOSPHERE RELIEF VALVE	11/19/88	15371
MS	SOV	HW	SOV-1316		07/05/84	04765

Table F1 Failure Record Index

SYSTEM	COMP TYPE	FM	COMPONENT ID	COMPONENT DESCRIPTION	FAILED DATA	MWR #
MS	SOV	HW	SOV-1241		12/18/87	12551
PPR	AOV	CC	PCV-455C		05/23/88	13693
SI	CRB	DN	32 SIP	480V BREAKER FOR 32 SI PUMP	08/04/88	14412
SI	MOV	CC	MOV-1852A	BIT INLET ISOLATION VALVE	07/17/87	11092
SI	MOV	CC	MOV-888B	LOW HEAD TO HIGH HEAD SI RECIRCULATION	07/13/90	23400
SI	MOV	CC	MOV-1802A	RECIRCULATION PUMP DISCHARGE ISOLATION VALVE	07/13/90	23409
SI	SDP	DN	33 SI Pump	33 SAFETY INJECTION PUMP	08/06/91	30885
SWS	CKV	OO	SWN-1-3	33 SWP CHECK VALVE	10/05/88	14855
SWS	CRB	DN	52/SWP5	480V BREAKER FOR SWS PUMP 35(BUS 3A/3D)	06/04/90	22297
SWS	MDP	FR	31 SWP	31 SERVICE WATER PUMP	04/30/84	04507
SWS	MDP	FR	35 SWP	35 SERVICE WATER PUMP	05/29/84	04633
SWS	MDP	FR	35 SWP	35 SERVICE WATER PUMP	10/05/84	05375
SWS	MDP	FR	35 SWP	35 SERVICE WATER PUMP	02/24/86	07875
SWS	MDP	FS	33 SWP	33 SERVICE WATER PUMP	11/01/82	03184
SWS	MDP	FS	34 SWP	34 SERVICE WATER PUMP	08/22/83	03841
SWS	MDP	FS	32 SWP	32 SERVICE WATER PUMP	06/04/84	04653
SWS	STR	PG	31 ZURN ST	31 ZURN STRAINER	12/31/86	09556
SWS	STR	PG	31 ZURN ST	31 ZURN STRAINER	01/13/87	09659

Table F2 Component/System Out Of Service Records

DATE	SYSTEM	COMPONENT	HOURS UNAVAILABLE
Jan-85	CVCS	31 BORIC ACID TRANSFER PUMP	12.95
Jan-85	CVCS	32 CHARGING PUMP	48.00
Jan-85	CVCS	32 CHARGING PUMP	48.00
Jan-85	CVCS	33 CHARGING PUMP	8.75
Jan-85	CVCS	33 CHARGING PUMP	58.78
Jan-85	EDG	31 EMERGENCY DIESEL GENERATOR	70.25
Jan-85	EDG	32 EMERGENCY DIESEL GENERATOR	58.37
Feb-85	CVCS	31 CHARGING PUMP	93.83
Feb-85	CVCS	32 CHARGING PUMP	33.18
Feb-85	EDG	33 EMERGENCY DIESEL GENERATOR	63.50
Mar-85	EDG	33 EMERGENCY DIESEL GENERATOR	8.05
Mar-85	PWS	32 PRIMARY WATER PUMP	168.00
Mar-85	SWS	36 SERVICE WATER PUMP	24.00
Apr-85	AC0	138 KV LINE 95332	22.05
Apr-85	CVCS	31 BORIC ACID TRANSFER PUMP	8.75
Apr-85	EDG	31 EMERGENCY DIESEL GENERATOR	8.97
Apr-85	EDG	33 EMERGENCY DIESEL GENERATOR	6.60
May-85	CFC	32 FAN COOLER UNIT	24.00
May-85	CVCS	32 BORIC ACID TRANSFER PUMP	11.83
Oct-85	DC1	33 BATTERY CHARGER	24.00
Oct-85	EDG	31 EMERGENCY DIESEL GENERATOR	10.15
Oct-85	EDG	32 EMERGENCY DIESEL GENERATOR	3.78
Oct-85	EDG	33 EMERGENCY DIESEL GENERATOR	3.25
Oct-85	IAS	32 INSTRUMENT AIR COMPRESSOR	96.00
Oct-85	PWS	32 PRIMARY WATER PUMP	168.00
Nov-85	CVCS	32 CHARGING PUMP	329.20
Nov-85	EDG	31 EMERGENCY DIESEL GENERATOR	16.25
Nov-85	EDG	32 EMERGENCY DIESEL GENERATOR	15.25
Nov-85	EDG	33 EMERGENCY DIESEL GENERATOR	11.93
Nov-85	SWS	33 SERVICE WATER PUMP	22.50
Dec-85	CVCS	31 CHARGING PUMP	6.72
Dec-85	CVCS	32 BORIC ACID TRANSFER PUMP	8.25
Dec-85	CVCS	32 CHARGING PUMP	29.72
Dec-85	CVCS	32 CHARGING PUMP	192.00
Jan-86	AFW	32 AUXILIARY FEEDWATER PUMP	5.25
Jan-86	AFW	32 AUXILIARY FEEDWATER PUMP	6.00
Jan-86	CVCS	31 CHARGING PUMP	15.83
Jan-86	CVCS	32 BORIC ACID TRANSFER PUMP	11.08
Jan-86	CVCS	33 CHARGING PUMP	16.50
Feb-86	AC0	138 KV LINE 95331	0.35
Feb-86	AC0	138 KV LINE 95332	18.85
Feb-86	AC0	138 KV LINE 95332	0.42
Feb-86	CVCS	32 CHARGING PUMP	121.08
Feb-86	EDG	31 EMERGENCY DIESEL GENERATOR	16.67
Feb-86	EDG	31 EMERGENCY DIESEL GENERATOR	5.23
Feb-86	EDG	32 EMERGENCY DIESEL GENERATOR	59.00
Feb-86	EDG	32 EMERGENCY DIESEL GENERATOR	6.50

Table F2 Component/System Out Of Service Records

DATE	SYSTEM	COMPONENT	HOURS UNAVAILABLE
Mar-86	CFC	31 FAN COOLER UNIT	286.00
Mar-86	CVCS	31 BORIC ACID TRANSFER PUMP	9.75
Mar-86	CVCS	31 CHARGING PUMP	48.00
Mar-86	CVCS	32 CHARGING PUMP	34.60
Mar-86	EDG	32 EMERGENCY DIESEL GENERATOR	14.83
Mar-86	EDG	32 EMERGENCY DIESEL GENERATOR	48.00
Mar-86	EDG	33 EMERGENCY DIESEL GENERATOR	19.05
Mar-86	EDG	33 EMERGENCY DIESEL GENERATOR	3.17
Apr-86	AC0	138 KV LINE 95332	15.68
Apr-86	AC0	138 KV LINE 95332	11.65
Apr-86	EDG	31 EMERGENCY DIESEL GENERATOR	4.50
Apr-86	EDG	32 EMERGENCY DIESEL GENERATOR	2.70
May-86	CVCS	32 CHARGING PUMP	38.25
Jun-86	CVCS	31 CHARGING PUMP	243.25
Jun-86	CVCS	32 CHARGING PUMP	21.92
Jun-86	EDG	31 EMERGENCY DIESEL GENERATOR	16.67
Jun-86	EDG	32 EMERGENCY DIESEL GENERATOR	17.97
Jun-86	EDG	33 EMERGENCY DIESEL GENERATOR	14.62
Sep-86	CVCS	31 CHARGING PUMP	58.75
Sep-86	EDG	31 EMERGENCY DIESEL GENERATOR	12.92
Sep-86	EDG	33 EMERGENCY DIESEL GENERATOR	3.25
Oct-86	AC0	138 KV LINE 95332	6.07
Oct-86	CVCS	32 BORIC ACID TRANSFER PUMP	12.15
Oct-86	CVCS	32 CHARGING PUMP	294.00
Oct-86	EDG	31 EMERGENCY DIESEL GENERATOR	8.92
Nov-86	CVCS	32 CHARGING PUMP	195.50
Nov-86	CVCS	32 CHARGING PUMP	21.00
Nov-86	EDG	31 EMERGENCY DIESEL GENERATOR	16.75
Nov-86	EDG	32 EMERGENCY DIESEL GENERATOR	12.45
Nov-86	EDG	33 EMERGENCY DIESEL GENERATOR	11.67
Dec-86	CVCS	31 CHARGING PUMP	82.50
Dec-86	CVCS	33 CHARGING PUMP	125.30
Dec-86	CVCS	33 CHARGING PUMP	44.17
Dec-86	CVCS	33 CHARGING PUMP	74.50
Dec-86	DC1	33 BATTERY CHARGER	51.75
Dec-86	EDG	31 EMERGENCY DIESEL GENERATOR	20.50
Jan-87	CFC	32 FAN COOLER UNIT	24.00
Jan-87	CVCS	33 CHARGING PUMP	21.25
Jan-87	CVCS	33 CHARGING PUMP	0.87
Jan-87	CVCS	33 CHARGING PUMP	25.67
Jan-87	CVCS	33 CHARGING PUMP	40.25
Jan-87	CVCS	33 CHARGING PUMP	28.58
Jan-87	CVCS	33 CHARGING PUMP	22.25
Jan-87	SWS	33 SERVICE WATER PUMP	111.00
Jan-87	SWS	33 SERVICE WATER PUMP	45.00
Jan-87	SWS	36 SERVICE WATER PUMP	10.25
Feb-87	CFC	34 FAN COOLER UNIT	1.50

Table F2 Component/System Out Of Service Records

DATE	SYSTEM	COMPONENT	HOURS UNAVAILABLE
Feb-87	CVCS	33 CHARGING PUMP	118.42
Mar-87	CVCS	31 BORIC ACID TRANSFER PUMP	15.35
Mar-87	CVCS	32 BORIC ACID TRANSFER PUMP	8.75
Mar-87	CVCS	33 CHARGING PUMP	8.00
Mar-87	EDG	31 EMERGENCY DIESEL GENERATOR	39.08
Mar-87	EDG	31 EMERGENCY DIESEL GENERATOR	0.98
Mar-87	EDG	32 EMERGENCY DIESEL GENERATOR	25.17
Mar-87	EDG	33 EMERGENCY DIESEL GENERATOR	36.58
Mar-87	SWS	36 SERVICE WATER PUMP	20.00
Mar-87	SWS	36 SERVICE WATER PUMP	16.00
Apr-87	AFW	31 AUX. FEEDWATER AUTO START CIRCUITRY	30.32
Apr-87	AFW	32 AUX. FEEDWATER AUTO START CIRCUITRY	30.32
Apr-87	AFW	33 AUX. FEEDWATER AUTO START CIRCUITRY	30.32
Apr-87	CVCS	31 BORIC ACID TRANSFER PUMP	28.25
Apr-87	CVCS	31 BORIC ACID TRANSFER PUMP	5.67
Apr-87	CVCS	33 CHARGING PUMP	47.75
Sep-87	CVCS	31 BORIC ACID TRANSFER PUMP	12.00
Sep-87	CVCS	31 CHARGING PUMP	24.00
Sep-87	CVCS	31 CHARGING PUMP	26.97
Sep-87	CVCS	31 CHARGING PUMP	32.00
Oct-87	AFW	33 AUXILIARY FEEDWATER PUMP	5.67
Oct-87	EDG	31 EMERGENCY DIESEL GENERATOR	61.62
Oct-87	EDG	31 EMERGENCY DIESEL GENERATOR	14.08
Oct-87	EDG	31 EMERGENCY DIESEL GENERATOR	9.25
Oct-87	EDG	32 EMERGENCY DIESEL GENERATOR	1.67
Oct-87	EDG	32 EMERGENCY DIESEL GENERATOR	13.83
Oct-87	EDG	32 EMERGENCY DIESEL GENERATOR	29.50
Oct-87	EDG	33 EMERGENCY DIESEL GENERATOR	14.67
Oct-87	EDG	33 EMERGENCY DIESEL GENERATOR	16.50
Oct-87	EDG	33 EMERGENCY DIESEL GENERATOR	12.98
Oct-87	RHR	31 RESIDUAL HEAT REMOVAL PUMP	21.25
Oct-87	RHR	31 RESIDUAL HEAT REMOVAL PUMP	168.00
Oct-87	SIS	31 SAFETY INJECTION PUMP	9.75
Oct-87	SIS	32 SAFETY INJECTION PUMP	12.65
Nov-87	AFW	31 AUXILIARY FEEDWATER PUMP	9.03
Nov-87	CCW	31 COMPONENT COOLING WATER PUMP	6.45
Nov-87	CCW	33 COMPONENT COOLING WATER PUMP	5.65
Nov-87	CSS	32 CONTAINMENT SPRAY PUMP	3.18
Nov-87	CVCS	31 BORIC ACID TRANSFER PUMP	5.92
Nov-87	CVCS	31 BORIC ACID TRANSFER PUMP	13.50
Nov-87	CVCS	32 CHARGING PUMP	5.50
Nov-87	CVCS	32 CHARGING PUMP	21.25
Nov-87	CVCS	33 CHARGING PUMP	47.50
Nov-87	DC1	32 BATTERY CHARGER	128.42
Nov-87	SIS	33 SAFETY INJECTION PUMP	6.07
Dec-87	AC0	138 KV LINE 95331	15.85
Dec-87	AC0	138 KV LINE 95332	24.90

Table F2 Component/System Out Of Service Records

DATE	SYSTEM	COMPONENT	HOURS UNAVAILABLE
Dec-87	AC0	138 KV LINE 95332	18.90
Dec-87	CCW	32 AUXILIARY COMPONENT COOLING WATER PUMP	2.50
Dec-87	CCW	33 AUXILIARY COMPONENT COOLING WATER PUMP	24.00
Dec-87	CCW	33 COMPONENT COOLING WATER PUMP	8.50
Dec-87	CCW	33 COMPONENT COOLING WATER PUMP	88.00
Dec-87	CVCS	31 CHARGING PUMP	42.42
Dec-87	CVCS	31 CHARGING PUMP	18.92
Dec-87	CVCS	32 BORIC ACID TRANSFER PUMP	1.37
Dec-87	CVCS	32 BORIC ACID TRANSFER PUMP	48.00
Dec-87	CVCS	32 CHARGING PUMP	15.00
Dec-87	EDG	31 EMERGENCY DIESEL GENERATOR	22.50
Dec-87	EDG	31 EMERGENCY DIESEL GENERATOR	19.50
Dec-87	EDG	32 EMERGENCY DIESEL GENERATOR	23.25
Dec-87	EDG	32 EMERGENCY DIESEL GENERATOR	19.67
Dec-87	EDG	33 EMERGENCY DIESEL GENERATOR	39.58
Dec-87	EDG	33 EMERGENCY DIESEL GENERATOR	21.42
Dec-87	SWS	33 SERVICE WATER PUMP	20.00
Jan-88	CCW	32 COMPONENT COOLING WATER PUMP	27.27
Jan-88	CCW	33 AUXILIARY COMPONENT COOLING WATER PUMP	14.58
Jan-88	CCW	34 AUXILIARY COMPONENT COOLING WATER PUMP	39.50
Jan-88	CVCS	31 CHARGING PUMP	3.25
Jan-88	EDG	31 EMERGENCY DIESEL GENERATOR	34.00
Jan-88	EDG	32 EMERGENCY DIESEL GENERATOR	14.92
Jan-88	EDG	33 EMERGENCY DIESEL GENERATOR	23.37
Jan-88	SWS	33 SERVICE WATER PUMP	10.50
Feb-88	CCW	31 COMPONENT COOLING WATER PUMP	285.83
Feb-88	CVCS	32 BORIC ACID TRANSFER PUMP	37.58
Feb-88	EDG	31 EMERGENCY DIESEL GENERATOR	14.75
Feb-88	EDG	33 EMERGENCY DIESEL GENERATOR	20.67
Feb-88	SWS	33 SERVICE WATER PUMP	8.08
Feb-88	SWS	36 SERVICE WATER PUMP	8.08
Mar-88	CFC	34 FAN COOLER UNIT	72.00
Mar-88	CVCS	31 CHARGING PUMP	425.08
Apr-88	AFW	31 AUXILIARY FEEDWATER PUMP	32.00
Apr-88	AFW	31 AUXILIARY FEEDWATER PUMP	2.00
Apr-88	AFW	33 AUXILIARY FEEDWATER PUMP	8.25
Apr-88	AFW	33 AUXILIARY FEEDWATER PUMP	2.00
Apr-88	CCW	32 AUXILIARY COMPONENT COOLING WATER PUMP	83.75
Apr-88	CSS	31 CONTAINMENT SPRAY PUMP	8.00
Apr-88	CVCS	31 CHARGING PUMP	33.00
Apr-88	EDG	31 EMERGENCY DIESEL GENERATOR	32.00
Apr-88	EDG	31 EMERGENCY DIESEL GENERATOR	4.00
Apr-88	EDG	32 EMERGENCY DIESEL GENERATOR	29.75
Apr-88	EDG	33 EMERGENCY DIESEL GENERATOR	22.08
Apr-88	EDG	33 EMERGENCY DIESEL GENERATOR	0.97
Apr-88	EDG	33 EMERGENCY DIESEL GENERATOR	8.00
Apr-88	SWS	33 SERVICE WATER PUMP	12.25

Table F2 Component/System Out Of Service Records

DATE	SYSTEM	COMPONENT	HOURS UNAVAILABLE
Apr-88	SWS	36 SERVICE WATER PUMP	16.17
Apr-88	SWS	36 SERVICE WATER PUMP	2.25
May-88	AFW	33 AUXILIARY FEEDWATER PUMP	24.00
May-88	CCW	32 COMPONENT COOLING WATER PUMP	244.75
May-88	CSS	31 CONTAINMENT SPRAY PUMP	7.50
May-88	CSS	32 CONTAINMENT SPRAY PUMP	5.83
May-88	CSS	32 CONTAINMENT SPRAY PUMP	8.00
May-88	RHR	31 RESIDUAL HEAT REMOVAL PUMP	12.25
May-88	RHR	31 RESIDUAL HEAT REMOVAL PUMP	2.00
May-88	RHR	31 RESIDUAL HEAT REMOVAL PUMP	8.00
May-88	RHR	32 RESIDUAL HEAT REMOVAL PUMP	11.42
May-88	RHR	32 RESIDUAL HEAT REMOVAL PUMP	8.00
May-88	RHR	32 RESIDUAL HEAT REMOVAL PUMP	8.00
May-88	SWS	33 SERVICE WATER PUMP	22.17
Jun-88	AC0	138 KV LINE 95332	180.70
Jun-88	AFW	31 AUXILIARY FEEDWATER PUMP	14.33
Jun-88	AFW	31 AUXILIARY FEEDWATER PUMP	16.00
Jun-88	AFW	33 AUXILIARY FEEDWATER PUMP	8.00
Jun-88	CCW	31 COMPONENT COOLING WATER PUMP	8.00
Jun-88	CCW	32 COMPONENT COOLING WATER PUMP	48.00
Jun-88	CCW	33 COMPONENT COOLING WATER PUMP	3.95
Jun-88	CCW	33 COMPONENT COOLING WATER PUMP	11.00
Jun-88	CCW	33 COMPONENT COOLING WATER PUMP	112.25
Jun-88	CFC	31 FAN COOLER UNIT	4.00
Jun-88	CFC	32 FAN COOLER UNIT	8.00
Jun-88	CFC	33 FAN COOLER UNIT	4.00
Jun-88	CFC	34 FAN COOLER UNIT	8.00
Jun-88	CFC	35 FAN COOLER UNIT	8.00
Jun-88	CVCS	32 CHARGING PUMP	43.20
Jun-88	EDG	31 EMERGENCY DIESEL GENERATOR	8.00
Jun-88	EDG	31 EMERGENCY DIESEL GENERATOR	8.00
Jun-88	EDG	31 EMERGENCY DIESEL GENERATOR	72.00
Jun-88	EDG	31 EMERGENCY DIESEL GENERATOR	8.00
Jun-88	EDG	32 EMERGENCY DIESEL GENERATOR	72.00
Jun-88	EDG	33 EMERGENCY DIESEL GENERATOR	8.00
Jun-88	EDG	33 EMERGENCY DIESEL GENERATOR	8.00
Jun-88	EDG	33 EMERGENCY DIESEL GENERATOR	8.00
Jun-88	EDG	33 EMERGENCY DIESEL GENERATOR	4.00
Jun-88	SIS	33 SAFETY INJECTION PUMP	8.00
Jul-88	AC0	138 KV LINE 95332	9.57
Jul-88	AFW	31 AUXILIARY FEEDWATER PUMP	2.25
Jul-88	AFW	33 AUXILIARY FEEDWATER PUMP	10.13
Jul-88	CCW	32 COMPONENT COOLING WATER PUMP	21.50
Jul-88	CFC	31 FAN COOLER UNIT	2.88
Jul-88	CFC	32 FAN COOLER UNIT	3.00
Jul-88	CFC	33 FAN COOLER UNIT	2.88
Jul-88	CFC	34 FAN COOLER UNIT	2.48

Table F2 Component/System Out Of Service Records

DATE	SYSTEM	COMPONENT	HOURS UNAVAILABLE
Jul-88	CFC	35 FAN COOLER UNIT	5.23
Jul-88	CVCS	33 CHARGING PUMP	112.83
Jul-88	EDG	32 EMERGENCY DIESEL GENERATOR	7.42
Jul-88	EDG	32 EMERGENCY DIESEL GENERATOR	4.00
Jul-88	EDG	33 EMERGENCY DIESEL GENERATOR	22.83
Jul-88	IAS	32 INSTRUMENT AIR COMPRESSOR	216.00
Jul-88	IAS	32 INSTRUMENT AIR COMPRESSOR	48.00
Jul-88	SIS	31 SAFETY INJECTION PUMP	4.45
Jul-88	SIS	32 SAFETY INJECTION PUMP	3.52
Jul-88	SIS	33 SAFETY INJECTION PUMP	3.37
Jul-88	SWS	36 SERVICE WATER PUMP	0.25
Jul-88	SWS	36 SERVICE WATER PUMP	0.12
Aug-88	AFW	31 AUXILIARY FEEDWATER PUMP	24.00
Aug-88	AFW	33 AUXILIARY FEEDWATER PUMP	32.00
Aug-88	CCW	31 COMPONENT COOLING WATER PUMP	0.50
Aug-88	CCW	33 COMPONENT COOLING WATER PUMP	4.00
Aug-88	CFC	31 FAN COOLER UNIT	4.00
Aug-88	CFC	32 FAN COOLER UNIT	24.00
Aug-88	CFC	33 FAN COOLER UNIT	4.00
Aug-88	CFC	34 FAN COOLER UNIT	32.00
Aug-88	CFC	35 FAN COOLER UNIT	24.00
Aug-88	CVCS	31 BORIC ACID TRANSFER PUMP	12.75
Aug-88	CVCS	32 CHARGING PUMP	8.00
Aug-88	CVCS	33 CHARGING PUMP	24.00
Aug-88	EDG	31 EMERGENCY DIESEL GENERATOR	16.50
Aug-88	EDG	31 EMERGENCY DIESEL GENERATOR	48.00
Aug-88	EDG	32 EMERGENCY DIESEL GENERATOR	88.35
Aug-88	EDG	32 EMERGENCY DIESEL GENERATOR	4.00
Aug-88	EDG	32 EMERGENCY DIESEL GENERATOR	0.50
Aug-88	EDG	33 EMERGENCY DIESEL GENERATOR	8.20
Aug-88	EDG	33 EMERGENCY DIESEL GENERATOR	23.50
Aug-88	SIS	32 SAFETY INJECTION PUMP	4.42
Aug-88	SIS	32 SAFETY INJECTION PUMP	8.00
Aug-88	SIS	33 SAFETY INJECTION PUMP	0.50
Sep-88	CFC	35 FAN COOLER UNIT	48.00
Sep-88	CVCS	31 CHARGING PUMP	45.00
Sep-88	CVCS	32 CHARGING PUMP	27.83
Sep-88	CVCS	33 CHARGING PUMP	48.00
Sep-88	EDG	32 EMERGENCY DIESEL GENERATOR	9.37
Oct-88	CCW	32 AUXILIARY COMPONENT COOLING WATER PUMP	139.75
Oct-88	EDG	31 EMERGENCY DIESEL GENERATOR	32.00
Oct-88	EDG	32 EMERGENCY DIESEL GENERATOR	32.00
Oct-88	EDG	33 EMERGENCY DIESEL GENERATOR	32.00
Oct-88	SWS	33 SERVICE WATER PUMP	105.68
Nov-88	CVCS	33 CHARGING PUMP	100.33
Nov-88	DC1	31 BATTERY CHARGER	2.00
Nov-88	DC1	32 BATTERY CHARGER	2.00

Table F2 Component/System Out Of Service Records

DATE	SYSTEM	COMPONENT	HOURS UNAVAILABLE
Nov-88	SWS	36 SERVICE WATER PUMP	82.08
Dec-88	CVCS	31 CHARGING PUMP	23.28
Dec-88	CVCS	32 CHARGING PUMP	59.42
Dec-88	EDG	32 EMERGENCY DIESEL GENERATOR	71.50
Dec-88	EDG	32 EMERGENCY DIESEL GENERATOR	16.00
Dec-88	EDG	33 EMERGENCY DIESEL GENERATOR	8.50
Dec-88	EDG	33 EMERGENCY DIESEL GENERATOR	41.17
Dec-88	EDG	33 EMERGENCY DIESEL GENERATOR	48.00
Jan-89	CCW	33 COMPONENT COOLING WATER PUMP	10.00
Jan-89	CFC	33 FAN COOLER UNIT	9.75
Jan-89	CSS	31 CONTAINMENT SPRAY PUMP	8.00
Jan-89	CVCS	32 CHARGING PUMP	8.00
Jan-89	EDG	31 EMERGENCY DIESEL GENERATOR	44.25
Jan-89	SWS	36 SERVICE WATER PUMP	12.17
Feb-89	AFW	32 AUXILIARY FEEDWATER PUMP	4.00
Feb-89	CVCS	31 CHARGING PUMP	8.00
Feb-89	CVCS	32 CHARGING PUMP	4.00
Feb-89	CVCS	33 CHARGING PUMP	2.00
Apr-89	AFW	31 AUXILIARY FEEDWATER PUMP VALVE PATH	4.00
Apr-89	AFW	33 AUXILIARY FEEDWATER PUMP VALVE PATH	1.00
Apr-89	AFW	33 AUXILIARY FEEDWATER PUMP VALVE PATH	1.00
Apr-89	AFW	33 AUXILIARY FEEDWATER PUMP VALVE PATH	8.00
Jun-89	AFW	31 AUXILIARY FEEDWATER PUMP	9.92
Jun-89	AFW	32 AUXILIARY FEEDWATER PUMP	27.22
Jun-89	AFW	32 AUXILIARY FEEDWATER PUMP	36.00
Jun-89	AFW	33 AUXILIARY FEEDWATER PUMP	0.62
Jun-89	AFW	33 AUXILIARY FEEDWATER PUMP	4.00
Jul-89	AC0	138 KV LINE 95331	1.38
Jul-89	CCW	31 COMPONENT COOLING WATER PUMP	8.97
Jul-89	CCW	32 COMPONENT COOLING WATER PUMP	17.00
Jul-89	CCW	32 COMPONENT COOLING WATER PUMP	16.58
Jul-89	CCW	33 COMPONENT COOLING WATER PUMP	13.25
Jul-89	CVCS	31 BORIC ACID TRANSFER PUMP	13.92
Jul-89	EDG	31 EMERGENCY DIESEL GENERATOR	31.50
Jul-89	EDG	31 EMERGENCY DIESEL GENERATOR	61.42
Jul-89	EDG	31 EMERGENCY DIESEL GENERATOR	7.42
Jul-89	EDG	32 EMERGENCY DIESEL GENERATOR	6.00
Jul-89	EDG	33 EMERGENCY DIESEL GENERATOR	4.25
Aug-89	CCW	33 COMPONENT COOLING WATER PUMP	281.50
Aug-89	CVCS	32 CHARGING PUMP	50.00
Aug-89	EDG	31 EMERGENCY DIESEL GENERATOR	34.00
Aug-89	EDG	31 EMERGENCY DIESEL GENERATOR	12.67
Aug-89	EDG	31 EMERGENCY DIESEL GENERATOR	8.50
Aug-89	EDG	31 EMERGENCY DIESEL GENERATOR	11.75
Aug-89	EDG	32 EMERGENCY DIESEL GENERATOR	43.25
Aug-89	EDG	33 EMERGENCY DIESEL GENERATOR	32.83
Sep-89	CFC	31 FAN COOLER UNIT	0.50

Table F2 Component/System Out Of Service Records

DATE	SYSTEM	COMPONENT	HOURS UNAVAILABLE
Sep-89	CFC	33 FAN COOLER UNIT	0.53
Sep-89	CFC	35 FAN COOLER UNIT	0.50
Sep-89	CVCS	31 CHARGING PUMP	112.92
Sep-89	CVCS	33 CHARGING PUMP	168.52
Sep-89	EDG	31 EMERGENCY DIESEL GENERATOR	3.00
Sep-89	IAS	32 INSTRUMENT AIR COMPRESSOR	183.92
Sep-89	SIS	31 SAFETY INJECTION PUMP	10.00
Sep-89	SIS	32 SAFETY INJECTION PUMP	10.00
Oct-89	AC0	138 KV LINE 95332	246.12
Oct-89	CVCS	31 CHARGING PUMP	32.00
Oct-89	CVCS	32 CHARGING PUMP	49.67
Oct-89	CVCS	33 CHARGING PUMP	32.17
Oct-89	EDG	31 EMERGENCY DIESEL GENERATOR	13.55
Oct-89	EDG	32 EMERGENCY DIESEL GENERATOR	87.67
Oct-89	EDG	33 EMERGENCY DIESEL GENERATOR	15.68
Nov-89	CCW	31 COMPONENT COOLING WATER PUMP	124.88
Nov-89	EDG	31 EMERGENCY DIESEL GENERATOR	10.00
Dec-89	CFC	32 FAN COOLER UNIT	4.00
Dec-89	CVCS	33 CHARGING PUMP	81.50
Dec-89	SWS	33 SERVICE WATER PUMP	5.50
Jan-90	CVCS	32 BORIC ACID TRANSFER PUMP	29.40
Jan-90	CVCS	32 CHARGING PUMP	13.95
Jan-90	CVCS	33 CHARGING PUMP	15.83
Jan-90	EDG	31 EMERGENCY DIESEL GENERATOR	56.33
Jan-90	EDG	32 EMERGENCY DIESEL GENERATOR	60.17
Jan-90	EDG	33 EMERGENCY DIESEL GENERATOR	47.00
Jan-90	EDG	33 EMERGENCY DIESEL GENERATOR	9.25
Jan-90	SWS	33 SERVICE WATER PUMP	221.08
Feb-90	CVCS	31 CHARGING PUMP	41.00
Feb-90	EDG	32 EMERGENCY DIESEL GENERATOR	17.00
Feb-90	EDG	32 EMERGENCY DIESEL GENERATOR	6.83
Mar-90	RHR	32 RESIDUAL HEAT REMOVAL PUMP	6.08
Apr-90	AC0	138 KV LINE 95331	0.42
Apr-90	AC0	138 KV LINE 95331	0.32
Apr-90	CVCS	32 BORIC ACID TRANSFER PUMP	22.50
Apr-90	CVCS	32 CHARGING PUMP	106.50
Apr-90	CVCS	32 CHARGING PUMP	48.33
Apr-90	CVCS	33 CHARGING PUMP	30.50
Apr-90	CVCS	33 CHARGING PUMP	22.50
Apr-90	EDG	31 EMERGENCY DIESEL GENERATOR	33.00
Apr-90	EDG	32 EMERGENCY DIESEL GENERATOR	30.25
Apr-90	EDG	33 EMERGENCY DIESEL GENERATOR	41.25
Apr-90	RHR	31 RESIDUAL HEAT REMOVAL PUMP	16.00
Apr-90	RHR	32 RESIDUAL HEAT REMOVAL PUMP	2.00
May-90	CCW	31 COMPONENT COOLING WATER PUMP	61.67
May-90	CSS	31 CONTAINMENT SPRAY PUMP	16.00
May-90	CVCS	32 CHARGING PUMP	150.25

Table F2 Component/System Out Of Service Records

DATE	SYSTEM	COMPONENT	HOURS UNAVAILABLE
May-90	CVCS	33 CHARGING PUMP	181.42
May-90	CVCS	33 CHARGING PUMP	40.25
May-90	EDG	31 EMERGENCY DIESEL GENERATOR	15.92
May-90	EDG	32 EMERGENCY DIESEL GENERATOR	15.67
May-90	EDG	33 EMERGENCY DIESEL GENERATOR	21.67
Jun-90	AFW	31 AUXILIARY FEEDWATER PUMP	8.00
Jun-90	AFW	31 AUXILIARY FEEDWATER PUMP	40.00
Jun-90	AFW	33 AUXILIARY FEEDWATER PUMP	16.00
Jun-90	AFW	33 AUXILIARY FEEDWATER PUMP	48.00
Jun-90	CCW	31 COMPONENT COOLING WATER PUMP	12.00
Jun-90	CFC	31 FAN COOLER UNIT	56.00
Jun-90	CFC	32 FAN COOLER UNIT	5.00
Jun-90	CFC	32 FAN COOLER UNIT	8.00
Jun-90	CFC	33 FAN COOLER UNIT	56.00
Jun-90	CFC	33 FAN COOLER UNIT	8.00
Jun-90	CFC	34 FAN COOLER UNIT	8.00
Jun-90	CVCS	31 CHARGING PUMP	24.92
Jun-90	CVCS	32 CHARGING PUMP	20.50
Jun-90	CVCS	32 CHARGING PUMP	55.75
Jun-90	CVCS	33 CHARGING PUMP	36.00
Jun-90	CVCS	33 CHARGING PUMP	108.00
Jun-90	EDG	31 EMERGENCY DIESEL GENERATOR	4.00
Jun-90	EDG	31 EMERGENCY DIESEL GENERATOR	24.00
Jun-90	EDG	32 EMERGENCY DIESEL GENERATOR	24.00
Jun-90	EDG	33 EMERGENCY DIESEL GENERATOR	16.00
Jun-90	SWS	33 SERVICE WATER PUMP	4.17
Jul-90	AFW	32 AUXILIARY FEEDWATER PUMP	8.00
Jul-90	CFC	32 FAN COOLER UNIT	0.23
Jul-90	CFC	32 FAN COOLER UNIT	6.00
Jul-90	CSS	31 CONTAINMENT SPRAY PUMP	28.00
Jul-90	CSS	32 CONTAINMENT SPRAY PUMP	8.00
Jul-90	CVCS	31 CHARGING PUMP	19.75
Jul-90	CVCS	31 CHARGING PUMP	50.95
Jul-90	CVCS	32 CHARGING PUMP	153.67
Jul-90	CVCS	33 CHARGING PUMP	137.42
Jul-90	CVCS	33 CHARGING PUMP	23.08
Jul-90	EDG	31 EMERGENCY DIESEL GENERATOR	53.68
Jul-90	EDG	32 EMERGENCY DIESEL GENERATOR	33.97
Jul-90	EDG	33 EMERGENCY DIESEL GENERATOR	30.10
Aug-90	CFC	32 FAN COOLER UNIT	36.00
Aug-90	CVCS	32 BORIC ACID TRANSFER PUMP	19.50
Aug-90	CVCS	32 BORIC ACID TRANSFER PUMP	30.33
Aug-90	CVCS	32 CHARGING PUMP	25.83
Aug-90	CVCS	32 CHARGING PUMP	2.00
Aug-90	CVCS	33 CHARGING PUMP	84.58
Aug-90	CVCS	33 CHARGING PUMP	180.08
Aug-90	CVCS	33 CHARGING PUMP	30.83

Table F2 Component/System Out Of Service Records

DATE	SYSTEM	COMPONENT	HOURS UNAVAILABLE
Aug-90	DC1	31 BATTERY CHARGER	417.42
Aug-90	EDG	31 EMERGENCY DIESEL GENERATOR	34.75
Aug-90	EDG	32 EMERGENCY DIESEL GENERATOR	35.75
Aug-90	EDG	33 EMERGENCY DIESEL GENERATOR	32.25
Sep-90	AFW	31 AUXILIARY FEEDWATER PUMP	4.00
Sep-90	CFC	31 FAN COOLER UNIT	0.45
Sep-90	CFC	32 FAN COOLER UNIT	30.00
Sep-90	CFC	35 FAN COOLER UNIT	0.33
Sep-90	CFC	35 FAN COOLER UNIT	30.00
Sep-90	CVCS	33 CHARGING PUMP	15.50
Sep-90	CVCS	33 CHARGING PUMP	96.00
Dec-90	CVCS	32 CHARGING PUMP	1.92
Dec-90	EDG	32 EMERGENCY DIESEL GENERATOR	2.67
Dec-90	EDG	33 EMERGENCY DIESEL GENERATOR	15.58
Jan-91	CVCS	31 BORIC ACID TRANSFER PUMP	15.67
Jan-91	EDG	31 EMERGENCY DIESEL GENERATOR	32.55
Jan-91	EDG	31 EMERGENCY DIESEL GENERATOR	31.00
Jan-91	IAS	32 INSTRUMENT AIR COMPRESSOR	10.83
Feb-91	AC0	138 KV LINE 95332	10.85
Feb-91	AC0	138 KV LINE 95332	3.00
Feb-91	CVCS	33 CHARGING PUMP	10.00
Feb-91	EDG	32 EMERGENCY DIESEL GENERATOR	71.50
Feb-91	EDG	32 EMERGENCY DIESEL GENERATOR	5.92
Feb-91	EDG	33 EMERGENCY DIESEL GENERATOR	54.83
Mar-91	AC0	138 KV LINE 95331	30.00
Mar-91	EDG	31 EMERGENCY DIESEL GENERATOR	11.50
Mar-91	SWS	36 SERVICE WATER PUMP	21.75
Mar-91	SWS	36 SERVICE WATER PUMP	9.87
Apr-91	CVCS	31 CHARGING PUMP	97.50
Apr-91	CVCS	33 CHARGING PUMP	25.75
Apr-91	EDG	31 EMERGENCY DIESEL GENERATOR	41.07
Apr-91	IAS	32 INSTRUMENT AIR COMPRESSOR	216.00
Apr-91	SIS	32 SAFETY INJECTION PUMP	2.48
Apr-91	SIS	32 SAFETY INJECTION PUMP	4.00
Apr-91	SIS	32 SAFETY INJECTION PUMP	3.00
Apr-91	SWS	36 SERVICE WATER PUMP	18.75
May-91	CCW	32 COMPONENT COOLING WATER PUMP	12.75
Jun-91	AC0	138 KV LINE 95331	1.25
Jun-91	CVCS	32 BORIC ACID TRANSFER PUMP	37.83
Jun-91	CVCS	33 CHARGING PUMP	17.50
Jun-91	EDG	32 EMERGENCY DIESEL GENERATOR	40.75
Jun-91	EDG	32 EMERGENCY DIESEL GENERATOR	18.75
Jun-91	EDG	33 EMERGENCY DIESEL GENERATOR	16.42
Jun-91	EDG	33 EMERGENCY DIESEL GENERATOR	12.00
Jun-91	SWS	33 SERVICE WATER PUMP	14.75
Jun-91	SWS	36 SERVICE WATER PUMP	22.00
Jul-91	AC0	138 KV LINE 95331	10.08

Table F2 Component/System Out Of Service Records

DATE	SYSTEM	COMPONENT	HOURS UNAVAILABLE
Jul-91	CSS	31 CONTAINMENT SPRAY PUMP	16.75
Jul-91	CVCS	31 CHARGING PUMP	41.00
Jul-91	CVCS	32 CHARGING PUMP	4.75
Jul-91	EDG	31 EMERGENCY DIESEL GENERATOR	7.25
Jul-91	EDG	31 EMERGENCY DIESEL GENERATOR	35.83
Aug-91	CCW	31 AUXILIARY COMPONENT COOLING WATER PUMP	48.00
Aug-91	CVCS	32 BORIC ACID TRANSFER PUMP	15.92
Aug-91	CVCS	33 CHARGING PUMP	51.00
Aug-91	CVCS	33 CHARGING PUMP	19.42
Aug-91	EDG	32 EMERGENCY DIESEL GENERATOR	45.17
Sep-91	CVCS	31 CHARGING PUMP	210.42
Sep-91	EDG	33 EMERGENCY DIESEL GENERATOR	56.67
Oct-91	CVCS	31 BORIC ACID TRANSFER PUMP	16.42
Oct-91	IAS	32 INSTRUMENT AIR COMPRESSOR	24.00
Oct-91	SIS	31 SAFETY INJECTION PUMP	8.00
Oct-91	SIS	31 SAFETY INJECTION PUMP	4.00
Oct-91	SIS	32 SAFETY INJECTION PUMP	6.50
Oct-91	SIS	33 SAFETY INJECTION PUMP	6.42
Oct-91	SIS	33 SAFETY INJECTION PUMP	0.43
Nov-91	AFW	31 AUXILIARY FEEDWATER PUMP	0.05
Nov-91	AFW	33 AUXILIARY FEEDWATER PUMP	10.58
Nov-91	AFW	33 AUXILIARY FEEDWATER PUMP	0.08
Nov-91	CVCS	31 BORIC ACID TRANSFER PUMP	45.25
Nov-91	CVCS	31 CHARGING PUMP	77.42
Nov-91	EDG	33 EMERGENCY DIESEL GENERATOR	8.00
Nov-91	SWS	33 SERVICE WATER PUMP	219.00
Dec-91	CFC	34 FAN COOLER UNIT	0.57
Dec-91	CVCS	31 CHARGING PUMP	74.67
Dec-91	CVCS	32 BORIC ACID TRANSFER PUMP	4.25
Dec-91	CVCS	32 CHARGING PUMP	63.50
Dec-91	CVCS	33 CHARGING PUMP	125.33
Dec-91	EDG	31 EMERGENCY DIESEL GENERATOR	8.75
Dec-91	EDG	31 EMERGENCY DIESEL GENERATOR	4.78
Dec-91	EDG	31 EMERGENCY DIESEL GENERATOR	24.00
Dec-91	EDG	31 EMERGENCY DIESEL GENERATOR	6.00
Dec-91	EDG	32 EMERGENCY DIESEL GENERATOR	22.17
Dec-91	EDG	32 EMERGENCY DIESEL GENERATOR	2.75
Dec-91	EDG	33 EMERGENCY DIESEL GENERATOR	16.83
Dec-91	SIS	31 SAFETY INJECTION PUMP	13.42

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC0	FDR	01/27/85 00:46	01/27/85 07:37	6.85	FDR 96951 OOS/IS		SRO
AC0	FDR	01/27/85 08:33	01/28/85 05:23	20.83	FDR 95891 OOS/IS		SRO
AC0	FDR	01/30/85 12:25	02/02/85 09:59	69.57	FDR 96952 OOS/IS		SRO
AC0	FDR	02/02/85 10:14	02/02/85 17:29	7.25	FDR 95891 OOS/IS		SRO
AC0	FDR	02/08/85 19:22	02/10/85 01:22	30.00	FDR 96952 OOS/IS	ASSUMED OOS TIME	SRO
AC0	FDR	02/10/85 08:10	02/10/85 21:39	13.48	FDR 33332 OOS/IS		SRO
AC0	BKR	02/10/85 09:02	02/10/85 21:32	12.50	OPENED/CLOSED BT 5-6		SRO
AC0	BKR	02/10/85 09:02	02/10/85 16:56	7.90	OPENED/CLOSED BT 5-6S		SRO
AC0	FDR	02/17/85 00:08	02/17/85 18:50	18.70	FDR 95891 OOS/IS	ASSUMED OOS TIME	SRO
AC0	BKR	03/10/85 17:15	03/10/85 17:30	0.25	OPENED/CLOSED BT 2-6		SRO
AC0	FDR	03/16/85 04:25	03/16/85 22:40	18.25	FDR 95891 OOS/IS		SRO
AC0	FDR	04/03/85 02:49	04/04/85 00:52	22.05	FDR 95332 OOS/IS		SRO
AC0	BKR	04/14/85 02:20	04/14/85 19:50	17.50	CLOSED/OPENED BKR GT-BT		SRO
AC0	BKR GT	04/14/85 02:20	04/14/85 19:50	17.50	OPENED/CLOSED GT-2F		SRO
AC0	FDR	04/15/85 03:47	04/15/85 17:51	14.07	FDR 96951 OOS/IS		SRO
AC0	FDR	05/28/85 07:48	05/28/85 11:00	3.20	FDR 95891 OOS/IS		SRO
AC0	FDR	06/09/85 05:18	06/10/85 14:26	33.13	FDR 96952 OOS/IS		SRO
AC0	FDR	06/10/85 00:41	06/10/85 05:30	4.82	FDR 96951 OOS/IS		SRO
AC0	FDR	07/11/85 01:02	07/11/85 06:02	5.00	FDR 96951 OOS/IS		SRO
AC0	BKR GT	07/18/85 03:33	07/18/85 18:35	15.03	CLOSED/OPENED GT-36		SRO
AC0	BKR GT	07/18/85 19:27	07/19/85 19:50	24.38	OPENED/CLOSED GT-2F		SRO
AC0	BKR GT	07/28/85 21:15	08/04/85 00:18	147.05	CLOSED/OPENED GT-BT		SRO
AC0	BKR GT	07/28/85 21:15	08/04/85 00:18	147.05	OPENED/CLOSED GT-2F		SRO
AC0	BKR GT	08/05/85 18:25	08/13/85 05:04	178.65	CLOSED/OPENED GT-36		SRO
AC0	BKR GT	08/05/85 18:50	08/13/85 04:48	177.97	CLOSED/OPENED GT-35		SRO
AC0	FDR	08/05/85 20:09	08/06/85 01:03	4.90	FDR 95331 DEENERGIZED/ENERGIZED		SRO
AC0	BKR MOD	08/05/85 20:12	08/12/85 22:05	169.88	OPENED/CLOSED MO BK5		SRO
AC0	XFR	08/05/85 20:12	08/12/85 22:22	170.17	TOOK/RESTORED STA AUX		SRO
AC0	BKR	08/05/85 20:43	08/05/85 22:50	2.12	OPENED/CLOSED BT 5-6 (DID NOT CLOSE/MANUALLY CLOSED)		SRO
AC0	BKR	08/05/85 20:50	08/05/85 21:00	0.17	OPENED/CLOSED BT 5-6S		SRO
AC0	BKR	08/05/85 22:50	08/05/85 22:50	0.00	CLOSED/OPENED BT 5-6 (FAILED TO CLOSE AUTO)		SRO
AC0	BKR	08/06/85 10:47	09/17/85 10:24	1007.62	CLOSED/OPENED BT 5-6		SRO
AC0	BKR GT	08/19/85 04:07	08/20/85 10:07	30.00	CLOSED/OPENED GT-35	ASSUMED CLOSED TIME	SRO
AC0	BKR GT	08/19/85 04:07	08/20/85 10:07	30.00	CLOSED/OPENED GT-36	ASSUMED CLOSED TIME	SRO
AC0	BKR GT	08/20/85 10:07	08/24/85 21:10	107.05	OPENED/CLOSED GT-2F		SRO
AC0	BKR GT	08/26/85 08:41	09/04/85 21:10	228.48	OPENED/CLOSED GT-2F		SRO
AC0	FDR	09/10/85 11:25	09/11/85 17:25	30.00	FDR 95891 OOS/IS	ASSUMED I/S TIME	SRO
AC0	BKR GT	09/17/85 10:06	09/17/85 21:35	11.48	CLOSED/OPENED GT-35		SRO
AC0	BKR GT	09/17/85 10:06	09/17/85 21:35	11.48	CLOSED/OPENED GT-36		SRO
AC0	BKR	09/17/85 10:24	09/18/85 01:05	14.68	OPENED/CLOSED BKR BT 2-6	ASSUMED CLOSED WHEN 95331 IS	SRO
AC0	BKR	09/17/85 10:24	09/18/85 01:05	14.68	OPENED/CLOSED BT 4-5		SRO
AC0	BKR	09/17/85 10:24	09/17/85 20:45	10.35	OPENED/CLOSED BT 5-6		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC0	BKR	09/17/85 10:24	09/17/85 20:45	10.35	OPENED/CLOSED BT 5-6S		SRO
AC0	FDR	09/17/85 10:24	09/17/85 20:45	10.35	DEENERGIZED FEEDER 33332		SRO
AC0	FDR	09/17/85 10:24	09/18/85 01:05	14.68	DEENERGIZED FEEDER 95331		SRO
AC0	BKR	09/17/85 20:10	09/17/85 20:45	0.58	OPENED/CLOSED BT 5-6S		SRO
AC0	BKR	09/17/85 22:05	09/18/85 01:05	3.00	OPENED/CLOSED BT 5-6		SRO
AC0	BKR	09/17/85 22:05	09/17/85 22:05	0.00	OPENED/CLOSED BT 5-6S		SRO
AC0	FDR	09/20/85 21:32	09/20/85 22:04	0.53	FDR 95891 OOS/IS		SRO
AC0	FDR	09/26/85 12:10	10/27/85 05:35	737.42	TAKING OUT 95891/RETURNED TO SERVICE		SRO
AC0	BKR GT	10/03/85 12:26	10/03/85 15:30	3.07	OPENED/CLOSED GT-2F FOR POSITION BKR TESTING		SRO
AC0	FDR	10/03/85 20:35	10/08/85 02:29	101.90	FDR 13W92 OOS/IS	SEE 10/9/85 20:00	SRO
AC0	FDR	10/12/85 05:43	10/12/85 18:45	13.03	FDR 96951 OOS/IS		SRO
AC0	FDR	10/16/85 14:27	10/20/85 17:02	98.58	FDR 96951 OOS/IS		SRO
AC0	FDR	10/27/85 05:35	10/27/85 11:32	5.95	FDR 96951 OOS/IS		SRO
AC0	FDR	11/02/85 21:28	11/03/85 15:06	17.63	FDR 95891 OOS/IS		SRO
AC0	FDR	12/08/85 07:09	12/08/85 19:07	11.97	FDR 96952 OOS/IS		SRO
AC0	BKR	12/14/85 23:41	12/16/85 22:42	47.02	BKR F-7 OOS/IS		SRO
AC0	FDR	12/14/85 23:41	12/16/85 22:42	47.02	FDR 95891 OOS/IS		SRO
AC0	FDR	01/27/86 00:00	01/27/86 00:00	0.00	Feeder 95332 out of service by ConEd for switching operations.		DSRP
AC0	FDR	01/31/86 13:00	01/31/86 15:19	2.32	FDR 96951 OOS/IS		SRO
AC0	BKR	02/01/86 00:33	02/01/86 00:45	0.20	OPENED/CLOSED BT 4-5		SRO
AC0	FDR	02/01/86 00:33	02/01/86 00:45	0.20	FDR 33332 OOS/IS		SRO
AC0	FDR	02/01/86 03:37	02/02/86 22:20	42.72	FDR 95891 OOS/IS		SRO
AC0	FDR	02/16/86 05:30	02/18/86 06:22	48.87	FDR 33332 OOS/IS FOR TRIP CHECK.	ASSUMED I/S TIME	SRO
AC0	FDR	02/16/86 05:30	02/17/86 00:21	18.85	FDR 95332 OOS/IS FOR TRIP CHECK.		SRO
AC0	FDR	02/16/86 05:30	02/17/86 00:21	18.85	FDR 96952 OOS/IS FOR TRIP CHECK.	ASSUMED I/S TIME	SRO
AC0	FDR	02/17/86 02:20	02/17/86 02:41	0.35	FDR 95331 OOS/IS		SRO
AC0	FDR	02/17/86 02:20	02/17/86 02:41	0.35	FDR 96951 OOS/IS		SRO
AC0	FDR	02/18/86 05:57	02/18/86 06:22	0.42	FDR 95331 OOS/IS		SRO
AC0	FDR	02/18/86 05:57	02/18/86 06:22	0.42	FDR 96951 OOS/IS		SRO
AC0	BKR GT	02/22/86 05:04	02/22/86 20:09	15.08	CLOSED/OPENED GT-BT		SRO
AC0	BKR GT	02/22/86 05:04	02/22/86 20:09	15.08	OPENED/CLOSED GT-2F		SRO
AC0	FDR	02/22/86 05:31	02/22/86 19:15	13.73	FDR 13W93 OOS/IS		SRO
AC0	BKR	03/01/86 02:55	03/01/86 18:55	16.00	CLOSED/OPENED BREAKER GT/BT.		SRO
AC0	BKR GT	03/01/86 02:55	03/01/86 19:10	16.25	OPENED/CLOSED GT-2F		SRO
AC0	FDR	03/01/86 02:55	03/01/86 18:11	15.27	FDR 13W92 OOS/IS		SRO
AC0	FDR	03/01/86 02:55	03/01/86 18:11	15.27	FDR 13W93 OOS/IS		SRO
AC0	FDR	03/09/86 04:08	03/10/86 02:21	22.22	FDR 95891 OOS/IS		SRO
AC0	FDR	03/15/86 00:15	03/15/86 00:35	0.33	FDR 95891 OOS/IS		SRO
AC0	FDR	03/16/86 07:14	03/16/86 14:33	7.32	FDR 96951 OOS/IS		SRO
AC0	FDR	03/22/86 05:25	03/22/86 20:40	15.25	FDR 95891 OOS/IS		SRO
AC0	FDR	04/09/86 06:55	04/09/86 14:46	7.85	FDR 95891 OOS/IS		SRO
AC0	FDR	04/11/86 06:40	04/11/86 12:55	6.25	FDR 95891 OOS/IS		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC0	BKR GT	04/14/86 19:45	04/14/86 20:10	0.42	OPENED/CLOSED GT-2F		SRO
AC0	FDR	04/15/86 05:16	04/15/86 20:57	15.68	FDR 95332 OOS/IS		SRO
AC0	FDR	04/15/86 15:42	04/15/86 18:03	2.35	FDR 95891 OOS/IS		SRO
AC0	FDR	04/18/86 04:25	04/18/86 13:26	9.02	FDR 95332 OOS/IS		SRO
AC0	FDR	04/24/86 07:05	04/24/86 20:33	13.47	FDR 95891 OOS/IS		SRO
AC0	FDR	04/25/86 07:15	04/25/86 18:57	11.70	FDR 95891 OOS/IS		SRO
AC0	FDR	04/26/86 07:13	04/26/86 08:04	0.85	FDR 95891 OOS/IS		SRO
AC0	BKR	05/04/86 01:56	05/08/86 01:35	95.65	OPENED/CLOSED BT 5-6S		SRO
AC0	BKR	05/04/86 03:25	05/07/86 22:22	90.95	APPLIED/REMOVED GD 33		SRO
AC0	BKR	05/04/86 03:25	05/07/86 22:22	90.95	APPLIED/REMOVED GD 49		SRO
AC0	BKR GT	05/04/86 12:30	05/11/86 10:35	166.08	CLOSED/OPENED GT-35 (TRANSFERED 6.9KV TO 13.8KV VIA GT35, GT36. PLACED ST5, ST6 IN T.P.O.		SRO
AC0	BKR GT	05/04/86 12:30	05/11/86 10:35	166.08	CLOSED/OPENED GT-36 (TRANSFERED 6.9KV TO 13.8KV VIA GT35, GT36. PLACED ST5, ST6 IN T.P.O.		SRO
AC0	BKR MOD	05/05/86 17:15	05/11/86 09:10	135.92	OPENED/CLOSED MO BK5	ASSUMED OPENED BEFORE 95331+33332 OOS	SRO
AC0	FDR	05/05/86 17:15	05/05/86 17:45	0.50	FDR 33332 OOS/IS		SRO
AC0	FDR	05/05/86 17:15	05/05/86 17:45	0.50	FDR 95331 OOS/IS		SRO
AC0	BKR	05/11/86 08:50	05/11/86 09:16	0.43	OPENED/CLOSED BT 2-6		SRO
AC0	BKR	05/11/86 08:50	05/11/86 09:12	0.37	OPENED/CLOSED BT 5-6		SRO
AC0	BKR GT	05/12/86 08:05	05/13/86 14:05	30.00	RELEASE 6.9 BREAKER GT-35 TO MAINT. FOR PM.	ASSUMED END TIME	SRO
AC0	BKR	05/12/86 08:29	05/13/86 18:02	33.55	APPLIED/REMOVED GD 11 FOR BKR3 MOD 3B,3A	ASSUMED REMOVED WHEN 3B CLOSED	SRO
AC0	BKR	05/12/86 08:29	05/13/86 18:02	33.55	APPLIED/REMOVED GD 9 FOR BKR3 MOD 3B,3A	ASSUMED REMOVED WHEN 3B CLOSED	SRO
AC0	BKR GT	05/19/86 16:40	07/21/86 00:55	1496.25	TRIPPED/CLOSED GT-2F		SRO
AC0	BKR GT	05/19/86 17:05	07/21/86 00:35	1495.50	CLOSED/OPENED GT-BT		SRO
AC0	FDR	06/04/86 11:00	06/06/86 03:45	40.75	FDR 95891 OOS/IS		SRO
AC0	BKR	06/07/86 03:36	06/07/86 19:11	15.58	APPLIED/REMOVED GD 49		SRO
AC0	BKR	06/14/86 02:30	06/14/86 22:05	19.58	APPLIED/REMOVED GD49 FOR UT 1-4		SRO
AC0	FDR	06/21/86 00:08	06/22/86 03:43	27.58	FDR 96952 OOS/IS		SRO
AC0	FDR	07/12/86 00:05	07/12/86 14:50	14.75	FDR 95891 OOS/IS		SRO
AC0	FDR	07/19/86 11:58	07/20/86 15:30	27.53	FDR 13W93 OOS/IS		SRO
AC0	FDR	08/06/86 03:29	08/06/86 09:00	5.52	FDR 96952 OOS/IS		SRO
AC0	BKR MOD	08/19/86 12:14	08/20/86 14:44	26.50	OPENED/CLOSED MO BK5		SRO
AC0		08/19/86 13:20	08/20/86 15:02	25.70	138KV HOLD OFF/BACK		SRO
AC0	FDR	08/24/86 01:24	08/25/86 00:03	22.65	FDR 95332 OOS/IS		SRO
AC0	FDR	10/12/86 08:25	10/12/86 14:29	6.07	FDR 95332 OOS/IS		SRO
AC0	FDR	10/12/86 08:25	10/12/86 14:29	6.07	FDR 96952 OOS/IS		SRO
AC0	FDR	11/17/86 03:16	11/18/86 09:16	30.00	FDR 96951 OOS/IS	ASSUMED I/S TIME	SRO
AC0	FDR	11/23/86 23:09	11/25/86 16:22	41.22	FDR 95891 OOS/IS		SRO
AC0	FDR	12/01/86 06:16	12/04/86 18:38	84.37	FDR 96951 OOS/IS		SRO
AC0	FDR	12/14/86 04:09	12/14/86 19:13	15.07	FDR 96952 OOS/IS		SRO
AC0	FDR	12/19/86 21:22	12/22/86 01:37	52.25	FDR 96952 OOS/IS		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC0	FDR	01/08/87 06:01	01/08/87 18:00	11.98	FDR 96951 OOS/IS		SRO
AC0	FDR	01/17/87 03:50	01/18/87 18:24	38.57	FDR 96952 OOS/IS		SRO
AC0	BKR GT	01/24/87 00:30	01/29/87 17:53	137.38	TRIPPED/CLOSED GT-2F		SRO
AC0	BKR GT	01/24/87 05:02	01/29/87 17:17	132.25	CLOSED/OPENED GT-BT		SRO
AC0	BKR GT	01/24/87 05:02	01/25/87 11:02	30.00	CLOSED GT-CP	ASSUMED END TIME	SRO
AC0	FDR	01/28/87 14:30	01/28/87 16:48	2.30	FDR 13W93 OOS/IS		SRO
AC0	FDR	01/31/87 05:54	02/04/87 01:10	91.27	FDR 96951 OOS/IS		SRO
AC0	FDR	02/21/87 05:28	02/23/87 03:21	45.88	FDR 96952 OOS/IS		SRO
AC0	FDR	02/24/87 04:30	02/24/87 04:48	0.30	FDR 95891 OOS/IS		SRO
AC0	FDR	03/03/87 23:25	03/04/87 07:11	7.77	FDR 96952 OOS/IS		SRO
AC0	FDR	03/04/87 17:10	03/04/87 23:21	6.18	FDR 96952 OOS/IS		SRO
AC0	FDR	03/29/87 09:48	03/29/87 09:52	0.07	FDR 96952 OOS/IS		SRO
AC0	FDR	04/04/87 08:59	04/06/87 09:06	48.12	FDR 96952 OOS/IS		SRO
AC0	FDR	04/11/87 05:14	04/12/87 23:59	42.75	FDR 96952 OOS/IS (USE SCHEDULED END DATE)		SRO
AC0	FDR	04/18/87 03:46	04/18/87 22:22	18.60	FDR 96952 OOS/IS		SRO
AC0	FDR	05/01/87 17:02	05/02/87 11:39	18.62	FDR 96952 OOS/IS		SRO
AC0	FDR	05/02/87 11:39	05/03/87 17:39	30.00	FDR 96922 OOS/IS	ASSUMED I/S TIME	SRO
AC0	FDR	05/04/87 11:57	05/04/87 12:48	0.85	FDR 96951 LOST/ENERGIZED BY 95891		SRO
AC0	FDR	05/04/87 11:57	05/04/87 12:48	0.85	FDR 96952 LOST/ENERGIZED BY 95891		SRO
AC0	BKR GT	05/04/87 23:45	05/05/87 11:46	12.02	CLOSED/OPENED GT-BT		SRO
AC0	BKR GT	05/04/87 23:45	05/05/87 11:46	12.02	OPENED/CLOSED GT-2F		SRO
AC0	FDR	05/04/87 23:45	05/05/87 03:35	3.83	FDR 13W93 OOS/IS		SRO
AC0	FDR	05/05/87 22:21	05/06/87 07:30	9.15	FDR 96952 OOS/IS		SRO
AC0	BKR GT	05/10/87 17:47	05/15/87 17:30	119.72	CLOSED/TRIPPED GT-35		SRO
AC0	BKR GT	05/10/87 17:50	05/23/88 04:45	9082.92	CLOSED/OPENED GT-36	ASSUMED CLOSED WHEN BT5-6 CLOSED	SRO
AC0	BKR	05/11/87 00:39	05/11/87 01:09	0.50	OPENED/CLOSED BT 2-6		SRO
AC0	BKR	05/11/87 00:39	05/11/87 01:09	0.50	OPENED/CLOSED BT 5-6		SRO
AC0	FDR	05/11/87 15:33	05/11/87 15:53	0.33	FDR 95331 OOS/IS		SRO
AC0	FDR	05/13/87 03:11	05/16/87 01:50	70.65	FDR 95332 OOS/IS		SRO
AC0	BKR GT	05/15/87 17:40	05/23/88 04:35	8962.92	CLOSED/OPENED GT-35		SRO
AC0	FDR	05/18/87 08:02	05/18/87 14:33	6.52	FDR 95331 OOS/IS		SRO
AC0	FDR	05/28/87 22:55	05/29/87 05:05	6.17	FDR 95331 OOS/IS		SRO
AC0	FDR	06/07/87 15:00	06/07/87 15:08	0.13	FDR 95331 OOS/IS		SRO
AC0	FDR	06/25/87 05:14	06/25/87 19:11	13.95	FDR 95331 OOS/IS		SRO
AC0	FDR	06/30/87 19:46	07/01/87 06:41	10.92	FDR 96952 OOS/IS		SRO
AC0	BKR	07/01/87 08:25	07/11/87 21:24	252.98	OPENED/CLOSED BT 2-6	ASSUMED CLOSED WHEN BT5-6 CLOSED	SRO
AC0	BKR	07/01/87 08:25	07/12/87 02:25	258.00	OPENED/CLOSED BT 4-5		SRO
AC0	BKR	07/01/87 08:25	07/12/87 02:15	257.83	OPENED/CLOSED BT 5-6		SRO
AC0	FDR	07/01/87 08:45	07/11/87 21:24	252.65	DE-ENERGIZED SAT VIA 95331	ASSUMED MO F4 OPENED/CLOSED	SRO
AC0	BKR GT	07/28/87 18:36	07/28/87 21:39	3.05	TRIPPED/RECLOSED GT-2F		SRO
AC0	FDR	08/23/87 06:00	08/23/87 18:37	12.62	FDR 96952 OOS/IS		SRO
AC0	FDR	08/24/87 14:40	08/25/87 17:00	26.33	FDR 13W92 OOS/IS		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC0	FDR	08/24/87 22:00	08/25/87 01:30	3.50	FDR 95891 OOS/IS		SRO
AC0	FDR	09/01/87 07:32	09/01/87 18:05	10.55	FDR 96951 OOS/IS		SRO
AC0	FDR	09/01/87 07:32	09/01/87 18:05	10.55	FDR 96951 OOS/IS		SRO
AC0	BKR MOD	09/05/87 10:37	09/05/87 11:35	0.97	OPENED/CLOSED MO BK5		SRO
AC0	FDR	09/30/87 21:03	10/20/87 21:12	480.15	FDR 96951 OOS/IS		SRO
AC0	BKR GT	10/25/87 00:57	10/25/87 01:27	0.50	OPENED/CLOSED GT-2F		SRO
AC0	FDR	11/05/87 04:00	11/05/87 17:45	13.75	FDR 96951 OOS/IS		SRO
AC0	FDR	11/07/87 05:11	11/18/87 02:20	261.15	FDR 96952 OOS/IS		SRO
AC0	FDR	11/19/87 14:20	11/20/87 09:58	19.63	FDR 96951 OOS/IS		SRO
AC0	FDR	11/21/87 06:11	11/26/87 11:18	125.12	FDR 95891 OOS/IS		SRO
AC0	FDR	11/30/87 21:01	12/11/87 03:30	246.48	FDR 95891 OOS/IS		SRO
AC0	FDR	12/11/87 20:59	12/12/87 19:54	22.92	FDR 95332 OOS/IS		SRO
AC0	FDR	12/13/87 05:43	12/13/87 21:33	15.83	FDR 95331 OOS/IS		SRO
AC0	FDR	12/13/87 22:50	12/17/87 14:58	88.13	FDR 95891 OOS/IS		SRO
AC0	FDR	12/29/87 03:41	12/29/87 22:35	18.90	FDR 95332 OOS/IS		SRO
AC0	FDR	01/09/88 00:20	01/11/88 18:45	66.42	FDR 96952 OOS/IS		SRO
AC0	FDR	01/20/88 06:43	01/20/88 18:57	12.23	FDR 96951 OOS/IS		SRO
AC0	FDR	02/06/88 07:35	03/04/88 20:47	661.20	FDR 13W87 DE-ENERGIZED/ ENERGIZED		SRO
AC0	FDR	02/06/88 07:35	03/03/88 04:04	620.48	FDR 13W88 DE-ENERGIZED/ ENERGIZED		SRO
AC0	FDR	02/12/88 20:20	02/13/88 22:35	26.25	FDR 95891 OOS/IS		SRO
AC0	FDR	02/15/88 17:14	02/16/88 23:14	30.00	FDR 13W94 OOS/IS	ASSUMED OOS TIME	SRO
AC0	FDR	02/19/88 22:35	02/20/88 08:36	10.02	FDR 96951 OOS/IS		SRO
AC0	BKR	03/01/88 04:43	03/01/88 23:17	18.57	OPENED/CLOSED BT 1-2		SRO
AC0	BKR	03/01/88 04:43	03/01/88 23:17	18.57	OPENED/CLOSED BT 2-3	ASSUMED CLOSED TIME	SRO
AC0	BKR	03/01/88 04:43	03/01/88 23:17	18.57	OPENED/CLOSED BT 3-4	ASSUMED CLOSED TIME	SRO
AC0	FDR	03/01/88 04:43	03/01/88 23:17	18.57	FDR 95891 OOS/IS		SRO
AC0	FDR	03/01/88 04:43	03/02/88 10:43	30.00	FDR 95951 OOS/IS	ASSUMED I/S TIME	SRO
AC0	BKR	03/08/88 08:55	03/08/88 11:42	2.78	CLOSED/OPENED BKR 101		SRO
AC0	BKR	03/08/88 08:55	03/08/88 11:42	2.78	CLOSED/OPENED BKR 102		SRO
AC0	BKR	03/08/88 11:42	03/08/88 12:30	0.80	OPENED/CLOSED BKR 101		SRO
AC0	BKR	03/08/88 11:42	03/08/88 12:30	0.80	OPENED/CLOSED BKR 102		SRO
AC0	FDR	03/09/88 00:21	03/09/88 17:48	17.45	FDR 13W88 OOS/IS		SRO
AC0	FDR	03/16/88 03:08	03/17/88 08:57	29.82	FDR 13W94 OOS/IS		SRO
AC0	FDR	03/16/88 03:08	03/16/88 03:35	0.45	FDR 95891 OOS/IS		SRO
AC0	FDR	03/26/88 13:49	03/26/88 15:43	1.90	FDR 96951 OOS/IS		SRO
AC0	FDR	04/01/88 05:11	04/01/88 20:11	15.00	FDR 96951 OOS/IS	ASSUMED I/S TIME	SRO
AC0	FDR	04/05/88 01:10	04/05/88 17:46	16.60	FDR 96951 OOS/IS		SRO
AC0	FDR	04/11/88 06:40	04/14/88 14:05	79.42	RECEIVED ELECTRICAL DISTURBANCE DUE TO LOSS OF FDR	ASSUMED END TIME	SRO
AC0	BKR GT	04/11/88 07:04	05/05/88 07:54	576.83	OPENED/CLOSED GT-2F		SRO
AC0	BKR GT	04/11/88 07:50	05/05/88 06:55	575.08	CLOSED/OPENED GT-BT		SRO
AC0	FDR	04/15/88 11:59	04/15/88 13:56	1.95	FDR 13W93 OOS/IS		SRO
AC0	FDR	05/05/88 06:55	05/06/88 20:18	37.38	FDR 13W92 OOS/IS		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC0	BKR GT	05/06/88 21:05	05/06/88 21:39	0.57	OPENED/RECLOSED BKR GT-1		SRO
AC0	BKR	05/18/88 08:20	05/18/88 11:00	2.67	OPENED/CLOSED BT 2-6		SRO
AC0	BKR	05/18/88 08:20	05/18/88 11:00	2.67	OPENED/CLOSED BT 5-6		SRO
AC0	BKR MOD	05/18/88 09:11	05/23/88 04:45	115.57	OPENED/CLOSED MO BK5	ASSUMED CLOSED WHEN 95331 IS	SRO
AC0	BKR	05/21/88 15:46	10/28/88 16:59	3841.22	OPENED/CLOSED BT 5-6		SRO
AC0	BKR	05/21/88 15:48	05/23/88 03:05	35.28	OPENED/CLOSED BT 2-6		SRO
AC0	BKR	05/21/88 15:51	10/28/88 16:59	3841.13	OPENED/CLOSED BT 4-5	ASSUMED CLOSED WHEN BT5-6 CLOSED	SRO
AC0	BKR	05/21/88 15:51	10/28/88 16:44	3840.88	OPENED/CLOSED BT 5-6S		SRO
AC0	BKR MOD	05/21/88 15:51	05/23/88 04:45	36.90	OPENED/CLOSED MO F4	ASSUMED CLOSED WHEN 95331 IS	SRO
AC0	FDR	05/21/88 16:43	05/22/88 22:57	30.23	FDR 95331 GND 49 & 47 APPLIED		SRO
AC0	FDR	05/21/88 16:48	05/23/88 04:45	35.95	FDR 33332 GND 31 APPLIED		SRO
AC0	FDR	05/21/88 17:27	05/22/88 22:57	29.50	FDR 33332 GND 33 & 35 APPLIED		SRO
AC0	FDR	05/21/88 17:37	05/23/88 02:25	32.80	FDR 33332 OOS/IS		SRO
AC0	FDR	05/21/88 17:37	05/23/88 04:45	35.13	FDR 95331 OOS/IS		SRO
AC0	FDR	06/06/88 04:35	06/13/88 17:17	180.70	FDR 95332 OOS/IS		SRO
AC0	FDR	06/22/88 08:08	06/22/88 15:03	6.92	FDR 13W88 LOST/RESTORED		SRO
AC0	BKR	06/22/88 11:11	07/01/88 20:10	224.98	CLOSED/OPENED BKR 101		SRO
AC0	BKR	06/22/88 11:11	07/01/88 20:10	224.98	CLOSED/OPENED BKR 103		SRO
AC0	BKR	06/22/88 11:11	07/01/88 20:10	224.98	OPENED/CLOSED BKR 101		SRO
AC0	BKR	07/01/88 20:10	07/03/88 02:10	30.00	OPENED/CLOSED BKR 102	ASSUMED CLOSED TIME	SRO
AC0	FDR	07/16/88 05:28	07/16/88 16:23	10.92	FDR 95891 OOS/IS		SRO
AC0	FDR	07/30/88 05:02	07/30/88 14:36	9.57	FDR 95332 OOS/IS		SRO
AC0	FDR	07/30/88 05:02	07/30/88 14:36	9.57	FDR 96952 OOS/IS		SRO
AC0	BKR GT	07/30/88 17:44	07/31/88 00:30	6.77	TRIPPED/CLOSED GT-2F		SRO
AC0	FDR	08/09/88 15:46	08/10/88 17:08	25.37	FDR 95891 OOS/IS		SRO
AC0	FDR	08/14/88 00:13	08/15/88 13:44	37.52	FDR 95891 OOS/IS		SRO
AC0	FDR	08/19/88 01:05	08/19/88 05:23	4.30	FDR 95891 OOS/IS		SRO
AC0	FDR	09/01/88 02:10	09/02/88 02:35	24.42	FDR 95891 OOS/IS		SRO
AC0	FDR	09/02/88 23:39	09/03/88 18:25	18.77	FDR 96951 OOS/IS		SRO
AC0	FDR	09/03/88 10:21	09/05/88 23:50	61.48	FDR 96952 OOS/IS		SRO
AC0	FDR	09/13/88 03:28	09/13/88 21:22	17.90	FDR 96951 OOS/IS		SRO
AC0	FDR	09/18/88 04:49	09/18/88 18:00	13.18	FDR 96952 OOS/IS		SRO
AC0	FDR	09/30/88 13:32	09/30/88 13:32	0.00	FDR 96951 OOS/IS		SRO
AC0	FDR	10/05/88 04:56	10/05/88 18:03	13.12	FDR 96951 OOS/IS		SRO
AC0	FDR	10/23/88 16:14	10/29/88 14:10	141.93	FDR 33332 OOS/IS		SRO
AC0	BKR	10/29/88 01:16	10/29/88 13:40	12.40	OPENED/CLOSED BT 5-6		SRO
AC0	BKR	10/29/88 01:16	10/29/88 12:10	10.90	OPENED/CLOSED BT 5-6 S		SRO
AC0	BKR	11/28/88 19:40	11/29/88 06:46	11.10	CLOSED/OPENED BKR 103	ASSUMED OPENED WHEN 13W88 I/S	SRO
AC0	BKR	11/28/88 19:40	11/29/88 06:46	11.10	OPENED/CLOSED BKR 101	ASSUMED CLOSED WHEN 13W88 I/S	SRO
AC0	FDR	11/28/88 19:40	11/29/88 06:46	11.10	FDR 13W88 OOS/IS		SRO
AC0	BKR GT	12/10/88 21:05	12/11/88 23:56	26.85	CLOSED/OPENED GT-BT		SRO
AC0	BKR GT	12/10/88 21:05	12/11/88 23:56	26.85	OPENED/CLOSED GT-2F		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC0	FDR	12/11/88 07:02	12/11/88 22:48	15.77	FDR 13W93 OOS/IS		SRO
AC0	BKR GT	01/10/89 21:43	02/04/89 10:30	588.78	TRIPPED/CLOSED GT-2F		SRO
AC0	FDR	01/10/89 21:43	01/31/89 20:40	502.95	TRIPPED/RETURN FDR 13W93		SRO
AC0	BKR GT	01/10/89 22:12	01/12/89 09:45	35.55	CLOSED/OPENED GT-BT	ASSUMED OPENED WHEN 13W92 OOS	SRO
AC0	FDR	01/10/89 22:12	01/12/89 09:45	35.55	FDR 13W92 IS/OOS		SRO
AC0	FDR	01/11/89 00:08	01/11/89 22:58	22.83	FDR 95891 OOS/IS		SRO
AC0	BKR GT	01/12/89 14:00	02/04/89 10:16	548.27	CLOSED/OPENED GT-BT		SRO
AC0	FDR	01/12/89 14:00	01/17/89 18:20	124.33	FDR 13W92 IS/OOS	ASSUMED OOS TIME	SRO
AC0	FDR	01/21/89 05:46	01/21/89 09:35	3.82	FDR 13W88 OOS/IN SERVICE.		SRO
AC0	BKR	01/21/89 07:20	01/21/89 09:35	2.25	CLOSED/OPENED BKR 103		SRO
AC0	BKR	01/21/89 07:20	01/21/89 09:35	2.25	OPENED/CLOSED BKR 101		SRO
AC0	BKR	02/07/89 18:05	02/08/89 08:52	14.78	CLOSED/OPENED BKR 103		SRO
AC0	BKR	02/07/89 18:05	03/25/89 16:15	1102.17	OPENED/CLOSED BKR 101		SRO
AC0	BKR GT	03/06/89 17:08	04/08/89 11:30	786.37	TRIPPED/CLOSED GT-2F		SRO
AC0	FDR	03/06/89 17:08	04/08/89 11:30	786.37	FDR 13W93 OOS/IS		SRO
AC0	BKR GT	03/06/89 17:52	04/08/89 11:30	785.63	CLOSED/OPENED GT-BT		SRO
AC0	FDR	03/06/89 17:52	03/11/89 00:00	102.13	FDR 13W92 IS/OOS	ASSUMED OOS TIME	SRO
AC0	BKR	03/25/89 16:25	03/26/89 22:25	30.00	CLOSED/OPENED BKR 102B	ASSUMED OPENED TIME	SRO
AC0	FDR	04/04/89 02:40	04/07/89 20:30	89.83	FDR 13W92 OOS/IS		SRO
AC0	FDR	04/04/89 05:24	04/05/89 21:46	40.37	FDR 95332 OOS/IS		SRO
AC0	BKR	04/12/89 00:25	04/16/89 14:27	110.03	OPENED/CLOSED BKR5-6 (FAILED TO CLOSED AT 14:15)		SRO
AC0	BKR	04/12/89 00:25	04/16/89 14:15	109.83	OPENED/CLOSED BKR5-6S		SRO
AC0	FDR	04/19/89 03:21	04/19/89 04:06	0.75	FDR 95332 OOS/IS		SRO
AC0	FDR	04/19/89 03:21	04/19/89 04:06	0.75	FDR 96952 OOS/IS		SRO
AC0	BKR MOD	04/22/89 01:10	04/22/89 01:45	0.58	F-4 FAILED TO OPEN DUE TO EXCESSIVE ARCING		SRO
AC0	BKR	04/22/89 01:10	04/22/89 20:47	19.62	OPENED/CLOSED BT 2-6	ASSUMED CLOSED WHEN 95331 IS	SRO
AC0	FDR	04/22/89 01:10	04/22/89 20:47	19.62	FDR 95331 OOS/IS		SRO
AC0	FDR	04/27/89 00:00	04/27/89 16:21	16.35	FDR 13W92 OOS/IS		SRO
AC0	BKR GT	04/27/89 07:25	04/27/89 16:21	8.93	OPENED/CLOSED GT-2		SRO
AC0	BKR GT	04/27/89 07:45	04/27/89 16:15	8.50	CLOSED/OPENED GT-BT		SRO
AC0	BKR GT	04/28/89 08:43	04/28/89 18:03	9.33	CLOSED/OPENED GT-BT		SRO
AC0	FDR	04/29/89 09:51	04/29/89 19:14	9.38	FDR 95891 OOS/IS		SRO
AC0	BKR	05/07/89 21:35	05/29/89 01:31	507.93	OPENED/CLOSED BT5-6		SRO
AC0	BKR	05/07/89 21:35	05/29/89 00:32	506.95	OPENED/CLOSED BT5-6S		SRO
AC0	FDR	05/07/89 21:44	05/29/89 01:31	507.78	FDR 33332 OOS/IS		SRO
AC0	BKR GT	05/08/89 03:38	05/15/89 01:39	166.02	CLOSED/OPENED GT-35		SRO
AC0	BKR GT	05/08/89 04:03	05/15/89 01:39	165.60	CLOSED/OPENED GT-36		SRO
AC0	BKR	05/08/89 05:03	05/09/89 07:30	26.45	OPENED/CLOSED BT 2-6		SRO
AC0	FDR	05/08/89 05:03	05/09/89 07:30	26.45	FDR 95331 OOS/IS		SRO
AC0	BKR MOD	05/08/89 05:18	05/15/89 01:03	163.75	OPENED/CLOSED MO BK5		SRO
AC0	FDR	05/15/89 00:57	05/15/89 01:08	0.18	DEENERGIZED/ENERGIZED FDR 95331		SRO
AC0	BKR	05/30/89 00:50	05/30/89 06:01	5.18	OPENED/CLOSED BT 2-6		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC0	FDR	05/30/89 00:50	05/30/89 06:01	5.18	FDR 95331 OOS/IS		SRO
AC0	FDR	05/31/89 23:05	06/01/89 03:14	4.15	FDR 95331 OOS/IS		SRO
AC0	FDR	06/03/89 06:09	06/04/89 12:09	30.00	FDR 13W89 LOST/IS	ASSUMED I/S TIME	SRO
AC0	BKR	06/06/89 00:25	06/09/89 08:45	80.33	OPENED/CLOSED BT 5-6 (FAILED TO CLOSE, REPAIRED)		SRO
AC0	FDR	06/06/89 03:11	06/09/89 08:45	77.57	FDR 95332 OOS/IS	ASSUMED I/S WHEN BT5-6 CLOSED	SRO
AC0	FDR	06/13/89 09:35	06/13/89 16:45	7.17	FDR 95891 OOS/IS		SRO
AC0	FDR	06/13/89 09:35	06/13/89 16:45	7.17	FDR TA-5 OOS/IS		SRO
AC0	FDR	06/14/89 08:38	06/14/89 17:17	8.65	FDR 95891 OOS/IS		SRO
AC0	FDR	06/14/89 08:38	06/14/89 17:17	8.65	FDR TA-5 OOS/IS		SRO
AC0	FDR	06/15/89 05:03	06/16/89 00:46	19.72	FDR 95891 OOS/IS		SRO
AC0	FDR	06/19/89 02:06	06/19/89 16:36	14.50	FDR 96951 OOS/IS		SRO
AC0	FDR	06/20/89 06:13	06/20/89 17:44	11.52	FDR 96951 OOS/IS		SRO
AC0	FDR	06/21/89 04:53	06/21/89 10:01	5.13	FDR 96951 OOS/IS		SRO
AC0	FDR	06/22/89 05:12	06/22/89 13:38	8.43	FDR 96951 OOS/IS		SRO
AC0	BKR	07/01/89 22:16	07/03/89 04:16	30.00	OPENED/CLOSED BT 2-3	ASSUMED OPENED TIME	SRO
AC0	FDR	07/01/89 23:55	07/03/89 03:53	27.97	FDR 13W94 OOS/IS		SRO
AC0	FDR	07/02/89 22:05	07/02/89 23:28	1.38	FDR 95331 OOS/IS (DUE TO BT 2-6 ARCING)		SRO
AC0	BKR	07/13/89 08:38	07/13/89 13:12	4.57	TRIPPED/CLOSED CP-1 (480V BKR FOR POL).		SRO
AC0	BKR	07/13/89 08:38	07/13/89 13:06	4.47	TRIPPED/CLOSED CT-CP (6.9KV BKR FOR POL).		SRO
AC0	BKR GT	07/13/89 08:38	07/13/89 13:03	4.42	TRIPPED/CLOSED GT-2F		SRO
AC0	BKR	07/18/89 02:30	07/18/89 18:45	16.25	CLOSED/OPENED BKR 102		SRO
AC0	BKR	07/18/89 02:30	07/18/89 18:45	16.25	CLOSED/OPENED BKR 103		SRO
AC0	BKR	07/18/89 02:30	07/18/89 18:45	16.25	OPENED/CLOSED BKR 101		SRO
AC0	FDR	07/18/89 02:30	07/18/89 18:45	16.25	FDR 13W88 OOS/IS		SRO
AC0	FDR	07/20/89 06:07	07/20/89 15:31	9.40	FDR 13W92 OOS/IS		SRO
AC0	FDR	08/05/89 05:34	08/05/89 13:57	8.38	FDR 96952 OOS/IS		SRO
AC0	BKR	08/10/89 17:12	08/11/89 18:18	25.10	CLOSED/OPENED BKR 103		SRO
AC0	BKR	08/10/89 17:12	08/11/89 18:18	25.10	OPENED/CLOSED BKR 101		SRO
AC0	FDR	08/10/89 21:47	08/11/89 19:07	21.33	FDR 13W88 OOS/IS		SRO
AC0	FDR	08/19/89 05:30	08/19/89 23:26	17.93	FDR 96952 OOS/IS		SRO
AC0	BKR	08/27/89 05:58	08/27/89 18:23	12.42	CLOSED/OPENED BKR 103		SRO
AC0	BKR	08/27/89 05:58	08/27/89 18:23	12.42	OPENED/CLOSED BKR 101		SRO
AC0	FDR	08/27/89 05:58	08/27/89 18:23	12.42	FDR 13W88 OOS/IN SERVICE.		SRO
AC0	BKR	08/28/89 10:42	08/28/89 13:45	3.05	CLOSED/OPENED BKR 103		SRO
AC0	BKR	08/28/89 13:25	08/29/89 19:25	30.00	CLOSED/OPENED BKR 102	ASSUMED THE OPENED TIME	SRO
AC0	FDR	08/28/89 17:45	08/29/89 10:17	16.53	FDR 13W84 OOS/IS		SRO
AC0	FDR	09/03/89 00:07	09/03/89 00:22	0.25	FDR 96951 OOS/IS		SRO
AC0	BKR GT	09/27/89 12:16	10/19/89 21:52	537.60	TRIPPED/CLOSED GT-2F		SRO
AC0	FDR	09/27/89 12:16	10/11/89 10:45	334.48	TRIPPED/CLOSED FDR 13W93		SRO
AC0	FDR	09/28/89 01:35	09/28/89 01:53	0.30	FDR 96951 OOS/IS		SRO
AC0	FDR	09/29/89 05:05	10/11/89 10:45	293.67	FDR 13W93 OOS/IS		SRO
AC0	FDR	10/09/89 07:20	10/09/89 11:09	3.82	FDR 96952 OOS/IS		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC0	FDR	10/09/89 10:15	10/21/89 16:42	294.45	FDR 33332 TRIPPED/IS		SRO
AC0	FDR	10/09/89 10:15	10/19/89 16:22	246.12	FDR 95332 (33332 L&M) OOS DUE TO FAULT		
AC0	BKR	10/09/89 11:20	10/21/89 16:25	293.08	OPENED/CLOSED BT 5-6		SRO
AC0	BKR	10/09/89 11:20	10/21/89 16:08	292.80	OPENED/CLOSED BT 5-6S		SRO
AC0	BKR GT	10/18/89 15:52	10/19/89 21:52	30.00	CLOSED/OPENED GT-BT	ASSUMED CLOSED TIME	SRO
AC0	FDR	10/20/89 00:00	10/20/89 12:21	12.35	FDR 13W88 OOS/IS		SRO
AC0	FDR	10/21/89 11:55	10/21/89 12:21	0.43	TRIPPED/IS FDR 13W88		SRO
AC0	FDR	12/11/89 00:37	12/15/89 15:20	110.72	FDR 95891 OOS/IS		SRO
AC0	BKR GT	01/21/90 19:30	01/21/90 22:02	2.53	LOST/CLOSED BKR GT-2F		SRO
AC0	FDR	01/21/90 19:30	01/22/90 21:12	25.70	FDR 13W87 LOST/ IS		SRO
AC0	BKR	01/21/90 21:37	01/22/90 21:12	23.58	CLOSED/OPENED BKR 103		SRO
AC0	BKR	01/21/90 21:37	01/22/90 21:12	23.58	OPENED/CLOSED BKR 102		SRO
AC0	BKR GT	02/01/90 13:15	02/01/90 13:32	0.28	TRIPPED/CLOSED GT-2F		SRO
AC0	FDR	02/01/90 13:15	02/01/90 13:37	0.37	FDR 13W88 TRIPPED/IS		SRO
AC0	BKR	03/09/90 14:59	03/09/90 16:02	1.05	OPENED/CLOSED BT 5-6		SRO
AC0	FDR	03/15/90 00:20	03/16/90 23:23	47.05	FDR 95332 OOS/IS		SRO
AC0	BKR GT	03/19/90 11:40	03/20/90 04:25	16.75	CLOSED/OPENED GT-35	ASSUMED OPENED WHEN ST5 CLOSED	SRO
AC0	BKR GT	03/19/90 11:40	03/20/90 04:25	16.75	CLOSED/OPENED GT-36	ASSUMED OPENED WHEN ST6 CLOSED	SRO
AC0	BKR	03/19/90 12:39	03/20/90 02:48	14.15	OPENED/CLOSED BT 2-6	ASSUMED CLOSED WHEN 95331 IS	SRO
AC0	BKR	03/19/90 12:39	03/20/90 02:49	14.17	OPENED/CLOSED BT 4-5	ASSUMED CLOSED WHEN 33332 IS	SRO
AC0	BKR	03/19/90 12:39	03/20/90 02:30	13.85	OPENED/CLOSED BT 5-6		SRO
AC0	BKR MOD	03/19/90 12:39	03/20/90 02:00	13.35	OPENED/CLOSED MO BK5	ASSUMED OPENED WHEN F4 & BT5-6S OPENED	SRO
AC0	BKR	03/19/90 12:50	03/20/90 02:05	13.25	OPENED/CLOSED BT 5-6S		SRO
AC0	BKR	03/31/90 09:05	04/01/90 09:30	24.42	CLOSED/OPENED BKR 102	ASSUMED OPENED WHEN BKR 103	SRO
AC0	BKR	03/31/90 09:05	04/01/90 09:30	24.42	CLOSED/OPENED BKR 103		SRO
AC0	BKR	03/31/90 09:05	04/01/90 09:30	24.42	OPENED/CLOSED BKR 101		SRO
AC0	FDR	03/31/90 21:16	04/01/90 09:30	12.23	FDR 13W88 OOS/IS	ASSUMED I/S WHEN BKR 101 CLOSED	SRO
AC0	FDR	04/01/90 17:40	04/01/90 17:46	0.10	FDR 95331 OOS/IS		SRO
AC0	FDR	04/14/90 01:32	04/14/90 01:57	0.42	FDR 95331 OOS/IS		SRO
AC0	FDR	04/14/90 01:32	04/14/90 01:57	0.42	FDR 96951 OOS/IS		SRO
AC0	FDR	04/16/90 02:49	04/16/90 03:08	0.32	FDR 95331 OOS/IS		SRO
AC0	FDR	04/16/90 02:49	04/16/90 03:08	0.32	FDR 96951 OOS/IS		SRO
AC0	BKR	05/10/90 00:44	05/10/90 01:15	0.52	OPENED/CLOSED CP-1		SRO
AC0	BKR GT	05/10/90 00:44	05/12/90 03:42	50.97	OPENED/CLOSED GT-2F.		SRO
AC0	BKR	05/10/90 01:15	05/12/90 03:32	50.28	CLOSED/OPENED BKR GT-BT (FAILED TO CLOSE AT 5/10/90		SRO
AC0	FDR	05/10/90 03:08	05/12/90 03:55	48.78	FDR 13W93 OOS/IS		SRO
AC0	BKR	05/12/90 03:32	05/12/90 03:42	0.17	OPENED/CLOSED CP-1		SRO
AC0	BKR GT	05/29/90 20:40	05/31/90 18:18	45.63	OPENED/CLOSED GT-2F		SRO
AC0	FDR	05/31/90 02:28	05/31/90 18:18	15.83	FDR 13W93 OOS/IS		SRO
AC0	FDR	06/10/90 12:00	06/11/90 13:10	25.17	FDR 13W84 OOS/IS		SRO
AC0	BKR	06/12/90 12:33	06/12/90 13:45	1.20	CLOSED/OPENED BKR 102	ASSUMED OPENED WHEN BKR 103	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC0	BKR	06/12/90 12:33	06/12/90 13:45	1.20	CLOSED/OPENED BKR 103		SRO
AC0	BKR	06/12/90 12:33	06/12/90 13:45	1.20	OPENED/CLOSED BKR 101		SRO
AC0	FDR	06/16/90 00:00	06/16/90 11:21	11.35	FDR 13W82 OOS/IS		SRO
AC0	FDR	06/16/90 00:19	06/16/90 11:24	11.08	FDR 13W92 IS/OOS		SRO
AC0	FDR	07/22/90 22:45	07/23/90 20:57	22.20	FDR 96951 OOS/IS		SRO
AC0	BKR	07/23/90 00:29	07/23/90 18:24	17.92	CLOSED/OPENED BKR 103		SRO
AC0	BKR	07/23/90 00:29	07/23/90 18:24	17.92	OPENED/CLOSED BKR 102		SRO
AC0	BKR	07/30/90 12:49	08/01/90 05:55	41.10	CLOSED/OPENED BKR 103	ASSUMED CLOSED WHEN 13W88 OOS	SRO
AC0	BKR	07/30/90 12:49	08/01/90 05:55	41.10	OPENED/CLOSED BKR 101	ASSUMED OPENED WHEN 13W88 OOS	SRO
AC0	FDR	07/30/90 12:49	08/01/90 05:55	41.10	FDR 13W88 OOS/IS		SRO
AC0	BKR	08/10/90 12:30	08/10/90 19:05	6.58	CLOSED/OPENED BKR 103		SRO
AC0	BKR	08/10/90 12:30	08/10/90 19:05	6.58	OPENED/CLOSED BKR 102		SRO
AC0	FDR	09/08/90 04:35	09/08/90 20:10	15.58	FDR 96952 OOS/IS		SRO
AC0	FDR	09/09/90 04:36	09/09/90 18:30	13.90	FDR 96952 OOS/IS		SRO
AC0	BKR	09/22/90 02:13	09/22/90 18:32	16.32	CLOSED/OPENED BKR 103		SRO
AC0	BKR	09/22/90 02:13	09/22/90 18:32	16.32	OPENED/CLOSED BKR 101		SRO
AC0	FDR	09/22/90 05:00	09/23/90 04:30	23.50	FDR 13W88 OOS/IS		SRO
AC0	BKR	09/28/90 19:52	09/29/90 17:36	21.73	CLOSED/OPENED BKR GT-BT		SRO
AC0	BKR GT	09/28/90 19:52	09/29/90 16:17	20.42	OPENED/CLOSED GT-2F	ASSUMED CLOSED WHEN 13w93 IS	SRO
AC0	FDR	09/28/90 19:52	09/29/90 16:17	20.42	FDR 13W93 OOS/IS		SRO
AC0	BKR BT	10/03/90 13:25	10/03/90 13:56	0.52	TRIPPPED/CLOSED BT 5-6 (PERSONNEL IN 138KV YARD		SRO
AC0	BKR BT	10/03/90 13:25	10/03/90 13:52	0.45	TRIPPPED/CLOSED BT 5-6S (PERSONNEL IN 138KV YARD		SRO
AC0	BKR	10/24/90 16:55	10/25/90 09:40	16.75	CLOSED/OPENED BKR 103		SRO
AC0	BKR	10/24/90 16:55	10/25/90 09:40	16.75	OPENED/CLOSED BKR 102		SRO
AC0	FDR	10/24/90 21:55	10/25/90 09:40	11.75	FDR 13W87 OOS/IS		SRO
AC0	FDR	10/24/90 23:38	10/25/90 20:30	20.87	FDR 13W84 OOS/IS		SRO
AC0	BKR	10/29/90 03:20	10/30/90 02:00	22.67	CLOSED/OPENED BKR GT-BT		SRO
AC0	BKR GT	10/29/90 03:20	10/30/90 02:10	22.83	OPENED/CLOSED GT-2F		SRO
AC0	FDR	10/29/90 03:20	10/30/90 02:00	22.67	FDR 13W92 IS/OOS		SRO
AC0	FDR	10/30/90 04:26	10/30/90 16:36	12.17	FDR 95332 OOS/IS		SRO
AC0	BKR GT	11/02/90 09:32	11/16/90 04:10	330.63	CLOSED/OPENED GT-35		SRO
AC0	BKR GT	11/02/90 09:32	11/16/90 04:10	330.63	CLOSED/OPENED GT-36		SRO
AC0	BKR	11/02/90 10:42	11/15/90 22:05	323.38	OPENED/CLOSED BKR BT 4-5	ASSUMED CLOSED TIME	SRO
AC0	BKR	11/02/90 10:42	11/15/90 22:05	323.38	OPENED/CLOSED BKR BT 5-6		SRO
AC0	BKR	11/02/90 11:13	11/20/90 14:17	435.07	OPENED/CLOSED BKR BT 2-6	ASSUMED CLOSED WHEN 95331 IS	SRO
AC0	FDR	11/02/90 11:13	11/20/90 14:17	435.07	FDR 95331 OOS/IS		SRO
AC0	BKR MOD	11/02/90 11:45	11/14/90 14:25	290.67	OPENED/CLOSED MO BK6		SRO
AC0	FDR	11/23/90 20:49	11/24/90 10:07	13.30	FDR 95891 OOS/IS		SRO
AC0	BKR	11/25/90 23:25	11/30/90 23:25	120.00	OPENED/CLOSED BKR BT 1-2	ASSUMED CLOSED TIME	SRO
AC0	BKR	11/25/90 23:25	11/30/90 23:25	120.00	OPENED/CLOSED BKR BT 3-4	ASSUMED CLOSED TIME	SRO
AC0	FDR	12/03/90 00:50	12/04/90 07:50	31.00	FDR 33332 OOS/IS (HIT ON BKR)		SRO
AC0	BKR	12/03/90 00:55	12/04/90 07:50	30.92	OPENED/CLOSED BKR BT 3-4	ASSUMED CLOSED TIME	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC0	BKR	12/04/90 07:50	12/05/90 13:50	30.00	BKR 3-4 OOS/IS	ASSUMED BT3-4'S I/S TIME	SRO
AC0	BKR	12/05/90 09:10	12/06/90 15:10	30.00	OPENED GT-CP	ASSUMED END TIME	SRO
AC0	BKR	01/26/91 14:45	01/28/91 11:30	44.75	OPEN/CLOSE BKR 102 (BKR DAMAGED)		SRO
AC0		01/26/91 14:45	01/27/91 12:27	21.70	13W87 OOS/IS		SRO
AC0	BKR	01/26/91 17:48	01/28/91 11:30	41.70	CLOSE/OPEN BKR 103		SRO
AC0	BKR	02/02/91 05:45	02/04/91 18:59	61.23	OPEN/CLOSE BKR BT2-3		SRO
AC0	BKR	02/02/91 05:45	02/04/91 18:59	61.23	OPEN/CLOSE BKR BT3-4		SRO
AC0	BKR	02/02/91 05:45	02/04/91 18:59	61.23	OPEN/CLOSE BKR F3		SRO
AC0	FDR	02/05/91 00:17	02/15/91 20:54	260.62	FEEDER 95891 OOS/IS		SRO
AC0	BKR	02/09/91 10:42	02/11/91 06:25	43.72	CLOSED/OPENED BKR CE-103		SRO
AC0	BKR	02/09/91 10:42	02/11/91 06:25	43.72	OPENED/CLOSED BKR CE-101		SRO
AC0	FDR	02/09/91 10:42	02/10/91 19:45	33.05	FEEDER 13W88 OOS/IS	ASSUMED OOS WHWN BKR CE 101 OPEN	SRO
AC0	BKR	02/15/91 21:00	02/15/91 21:12	0.20	OPEN/CLOSE BKR BT2-3	ASSUMED OPENED TIME	SRO
AC0	BKR	02/16/91 06:05	02/16/91 20:05	14.00	OPEN/CLOSE BKR BT1-2	ASSUMED OPENED WHEN 95891 OOS	SRO
AC0	BKR	02/16/91 06:05	02/16/91 20:05	14.00	OPEN/CLOSE BKR F7	ASSUMED OPENED WHEN 95891 OOS	SRO
AC0	FDR	02/16/91 06:05	02/16/91 20:05	14.00	FEEDER 95891 OOS/IS (FOR REMOVE TR.1)		SRO
AC0	BKR	02/18/91 05:13	02/18/91 17:50	12.62	OPEN/CLOSE BKR BT2-3	ASSUMED CLOSE TIME	SRO
AC0	BKR	02/18/91 05:13	02/18/91 17:50	12.62	OPEN/CLOSE BKR F7	ASSUMED CLOSE TIME	SRO
AC0	FDR	02/18/91 05:13	02/18/91 17:50	12.62	FEEDER 95891 OOS/IS (FOR PROTECTION ON BK 11)		SRO
AC0	FDR	02/18/91 05:13	02/18/91 17:50	12.62	FEEDER 96951 IS/OOS (FOR PROTECTION ON BK 11)	ASSUMED OOS TIME	SRO
AC0	FDR	02/18/91 05:13	02/18/91 17:50	12.62	FEEDER 96952 IS/OOS (FOR PROTECTION ON BK 11)	ASSUMED OOS TIME	SRO
AC0	FDR	02/19/91 07:04	02/19/91 17:55	10.85	FEEDER 95332 DOING CHECKS		SRO
AC0	FDR	02/19/91 08:00	02/23/91 16:02	104.03	FEEDER Y-88 ON WORKING/IN SERVICE		SRO
AC0	FDR	02/19/91 08:06	02/19/91 11:06	3.00	FEEDER W-93 RELAY CALIB. CHECKS	ASSUMED END TIME	SRO
AC0	FDR	02/20/91 09:20	02/20/91 12:20	3.00	FEEDER 95332 RELAY CALIB. CHECKS	ASSUMED END TIME	SRO
AC0	FDR	03/08/91 10:30	03/08/91 16:30	6.00	FEEDER 95891 DOING RELAY CHECK		SRO
AC0	FDR	03/08/91 16:30	03/08/91 16:30	0.00	FEEDER 95951 DOING RELAY CHECK		SRO
AC0	FDR	03/08/91 16:30	03/08/91 16:30	0.00	FEEDER 95952 DOING RELAY CHECK		SRO
AC0	FDR	03/11/91 07:16	03/11/91 17:25	10.15	FEEDER 95891 PERFORMING RELAY CHECK		SRO
AC0	FDR	03/11/91 07:16	03/11/91 17:25	10.15	FEEDER 95951 PERFORMING RELAY CHECK		SRO
AC0	FDR	03/11/91 07:16	03/11/91 17:25	10.15	FEEDER 95952 PERFORMING RELAY CHECK		SRO
AC0	FDR	03/12/91 05:31	03/12/91 16:54	11.38	FEEDER 95951 OOS/IS		SRO
AC0	FDR	03/13/91 01:00	03/13/91 05:08	4.13	FEEDER 95952 OOS/IS		SRO
AC0	FDR	03/13/91 05:21	03/13/91 20:00	14.65	FEEDER 95951 OOS/IS		SRO
AC0	FDR	03/18/91 10:00	03/18/91 13:03	3.05	FEEDER 96951 RELAY CALIB. CHECKS		SRO
AC0	FDR	03/18/91 13:03	03/18/91 16:03	3.00	FEEDER 96952 RELAY CALIB. CHECKS	ASSUMED END TIME	SRO
AC0	FDR	03/20/91 17:45	03/20/91 23:45	6.00	FEEDER 95331 OOS/ IS		SRO
AC0	BKR	03/20/91 23:45	03/22/91 05:45	30.00	CLOSED/OPENED BKR BT 4-5	ASSUMED OPENED TIME	SRO
AC0	BKR	03/20/91 23:45	03/22/91 05:45	30.00	CLOSED/OPENED BKR BT 5-6	ASSUMED OPENED TIME	SRO
AC0	FDR	03/20/91 23:45	03/22/91 05:45	30.00	FEEDER 95332 OOS/IS	ASSUMED I/S TIME	SRO
AC0	FDR	03/27/91 04:02	03/27/91 17:43	13.68	FEEDER 95331 OOS/IS		SRO
AC0	FDR	03/27/91 04:02	03/27/91 17:43	13.68	FEEDER 96951 OOS/IS	ASSUMED I/S WHEN 95331 I/S	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC0	FDR	04/03/91 13:18	04/04/91 13:18	24.00	FEEDER 95952 RELAY CALIBRATION	ASSUMED END TIME	SRO
AC0	BKR	04/04/91 20:15	04/12/91 10:38	182.38	CLOSED/OPENED BKR CE-103 (TIE)		SRO
AC0	BKR	04/04/91 20:15	04/12/91 10:38	182.38	OPENED/CLOSED BKR CE-102		SRO
AC0	FDR	04/04/91 20:15	04/06/91 02:53	30.63	FEEDER 13W87 OOS/IS	ASSUMED OOS WHEN BKR CE-102 OPEN	SRO
AC0	FDR	04/09/91 04:47	04/10/91 04:30	23.72	FEEDER 95891 OOS/IS	ASSUMED I/S TIME BEFORE OOS AGAIN	SRO
AC0	FDR	04/10/91 04:30	04/10/91 20:49	16.32	FEEDER 95891 OOS/IS		SRO
AC0	FDR	04/11/91 05:16	04/11/91 20:13	14.95	FEEDER 95891 OOS/IS		SRO
AC0	FDR	04/12/91 05:55	04/12/91 18:37	12.70	FEEDER 95891 OOS/IS		SRO
AC0	BKR	04/12/91 21:15	04/16/91 06:20	81.08	CLOSED/OPENED BKR CE-103 (TIE)		SRO
AC0	BKR	04/12/91 21:15	04/16/91 06:20	81.08	OPENED/CLOSED BKR CE-101		SRO
AC0	FDR	04/12/91 23:20	04/14/91 04:10	28.83	FEEDER 13W88 OOS/IS		SRO
AC0	FDR	04/13/91 16:45	04/13/91 17:45	1.00	FEEDER 95891 OOS/IS		SRO
AC0	FDR	04/29/91 08:38	04/29/91 11:38	3.00	FEEDER 95952 RELAY CALIBRATION	ASSUMED END TIME	SRO
AC0	BUS	05/04/91 08:34	05/04/91 16:25	7.85	SYN. BUS OOS/IS		SRO
AC0	FDR	05/21/91 03:01	05/22/91 09:01	30.00	FEEDER 33331 OOS/IS	ASSUMED I/S TIME	SRO
AC0	FDR	05/21/91 03:01	05/24/91 04:33	73.53	FEEDER 33332 OOS/IS		SRO
AC0	FDR	05/21/91 03:01	05/22/91 09:01	30.00	FEEDER 95331 IS/OOS	ASSUMED OOS TIME	SRO
AC0	FDR	05/21/91 03:01	05/23/91 17:33	62.53	FEEDER 95332 OOS/IS		SRO
AC0	FDR	05/21/91 03:01	05/23/91 17:33	62.53	FEEDER 95952 OOS/IS		SRO
AC0	BKR MOD	05/22/91 00:05	05/23/91 16:16	40.18	OPENED/CLOSED MOD BT5-6N		SRO
AC0	BKR MOD	05/22/91 11:25	05/23/91 16:16	28.85	OPENED/CLOSED MOD BT5-6		SRO
AC0	BKR MOD	05/22/91 11:25	05/23/91 16:16	28.85	OPENED/CLOSED MOD BT5-6S		SRO
AC0	FDR	05/23/91 16:50	05/24/91 00:00	7.17	Feeder 95332 out of service.		DSRP
AC0	BKR MOD	05/23/91 18:26	05/24/91 04:33	10.12	OPENED/CLOSED MOD BT5-6		SRO
AC0	FDR	05/23/91 18:26	05/24/91 04:33	10.12	FEEDER 95332 OOS/IS		SRO
AC0	BKR MOD	05/23/91 18:47	05/24/91 04:10	9.38	OPENED/CLOSED MOD BT5-6S		SRO
AC0	BKR MOD	05/23/91 20:50	05/24/91 04:33	7.72	BURST STAB. MOD BT5-6N	ASSUMED END WHEN 33332 I/S	SRO
AC0	FDR	05/24/91 04:34	06/01/91 21:53	209.32	FEEDER 96951 OOS/IS		SRO
AC0	FDR	05/25/91 02:17	05/25/91 05:00	2.72	SWITCHING ON 96951+95332		SRO
AC0	BKR	06/01/91 01:10	06/01/91 02:25	1.25	OPENED/CLOSED BKR BT 2-6		SRO
AC0	FDR	06/01/91 01:10	06/01/91 02:25	1.25	FEEDER 95331 OOS/IS		SRO
AC0	FDR	06/01/91 20:53	06/01/91 21:53	1.00	FEEDER 96952 OOS/IS	ASSUMED OOS TIME	SRO
AC0	FDR	06/01/91 23:52	06/02/91 21:53	22.02	FEEDER 96891 OOS/IS		SRO
AC0	FDR	06/03/91 08:25	06/03/91 19:22	10.95	FEEDER 96952 RELAY CHECK		SRO
AC0	FDR	06/19/91 00:15	06/19/91 02:21	2.10	FEEDER 95331 OOS/IS	ASSUMED I/S WHEN BT2-6 I/S	SRO
AC0	BKR	06/19/91 00:25	06/19/91 02:21	1.93	BREAKER MOD BT2-6 OOS/IS		SRO
AC0	FDR	06/19/91 05:27	06/20/91 11:27	30.00	FEEDER 95891 OOS/IS	ASSUMED I/S TIME	SRO
AC0	BKR	06/23/91 05:30	06/23/91 18:41	13.18	BREAKER BT1-2 OOS/IS	ASSUMED OOS WHEN 96952 OOS	SRO
AC0	FDR	06/23/91 05:30	06/23/91 18:41	13.18	FEEDER 96952 OOS/IS		SRO
AC0	BKR	06/29/91 08:35	06/30/91 00:41	16.10	OPENED/CLOSED BKR BT2-3		SRO
AC0	BKR	07/02/91 08:30	07/02/91 18:35	10.08	OPENED/CLOSED BKR BT2-3		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC0	FDR	07/02/91 08:30	07/02/91 18:35	10.08	Feeder 95331 removed from service by Con Ed on a Cat 1 emergency due to problems at breaker BT2-6		DSRP
AC0	BKR MOD	07/02/91 11:36	07/02/91 18:30	6.90	OPENED/CLOSED MOD F4		SRO
AC0	FDR	07/06/91 05:33	07/06/91 20:22	14.82	FEEDER 95891 OOS/IS (ALL 138KV BKRS I/S AT 22:15)		SRO
AC0	FDR	07/10/91 04:53	07/10/91 23:05	18.20	FEEDER 95891 OOS/IS		SRO
AC0	BUS	07/12/91 05:10	07/12/91 23:55	18.75	MILLWOOD WEST BUS "B" OOS/IS		SRO
AC0	BKR	07/19/91 19:37	07/23/91 00:49	77.20	OPENED/CLOSED BKR BT2-3	ASSUMED OPENED WHEN 138KV PRI. GND FAULT DET.	SRO
AC0	BUS	07/19/91 19:37	07/21/91 01:37	30.00	BUS SECT. 6 PRIMARY GROUND FAULT DET.	ASSUMED END TIME	SRO
AC0		07/19/91 19:37	07/21/91 01:37	30.00	138KV PRIMARY GROUND OR CURRENT	ASSUMED END TIME	SRO
AC0	BUS	07/23/91 15:55	07/24/91 21:55	30.00	BUS SECT. 6 PRIMARY GROUND FAULT DET.	ASSUMED END TIME	SRO
AC0	BUS	07/23/91 15:55	07/24/91 21:55	30.00	BUS SECT. 6 PRIMARY PHASE FAULT DET.	ASSUMED END TIME	SRO
AC0		07/23/91 15:55	07/24/91 21:55	30.00	138KV BACKUP PHASE FAULT DET S-6	ASSUMED END TIME	SRO
AC0	BUS	07/27/91 14:41	07/28/91 20:41	30.00	MILLWOOD WEST BUS "B" OOS/IS	ASSUMED OOS TIME	SRO
AC0	BKR	07/29/91 14:22	07/30/91 20:22	30.00	OPENED/CLOSED BKR BT2-3	ASSUMED OPENED TIME	SRO
AC0	BKR	07/31/91 05:30	08/17/91 02:25	404.92	OPENED/CLOSED BKR BT 2-3		SRO
AC0	BKR BT	08/06/91 09:45	08/06/91 10:15	0.50	TROUBLE ALARM ON BT 5-6(STA.AUX.VOITAGE LOW)		SRO
AC0	BKR	08/09/91 13:05	08/09/91 13:46	0.68	OPENED/CLOSED BKR F3		SRO
AC0	BKR BT	08/20/91 21:00	08/20/91 21:02	0.03	TROUBLE ALARM ON BT 2-3(COMP. RUN TIME RELAY 95/1)		SRO
AC0	FDR	08/25/91 04:47	08/25/91 18:40	13.88	FEEDER 95952 OOS/IS		SRO
AC0	FDR	09/07/91 17:45	09/08/91 23:45	30.00	FEEDER 95891 OOS/IS	ASSUMED I/S TIME	SRO
AC0	FDR	09/07/91 17:45	09/08/91 23:45	30.00	FEEDER 95952 OOS/IS	ASSUMED I/S TIME	SRO
AC0	BKR	09/10/91 05:21	09/10/91 23:24	18.05	OPENED/CLOSED BKR BT 2-3		SRO
AC0	FDR	09/30/91 05:00	09/30/91 14:03	9.05	FEEDER 95952 OOS/IS		SRO
AC0	FDR	10/03/91 15:20	10/03/91 15:26	0.10	DBA LINE TO CEDO OOS/IS		SRO
AC0	FDR	10/27/91 09:10	10/28/91 23:27	38.28	FEEDER 13W84 OOS/IS	ASSUMED OOS TIME	SRO
AC0	FDR	11/14/91 01:44	11/14/91 16:10	14.43	FEEDER 13W82 OOS/IS		SRO
AC0	FDR	12/10/91 05:55	12/10/91 18:14	12.32	FEEDER 95951 OOS/IS		SRO
AC0	FDR	12/14/91 09:32	12/15/91 15:32	30.00	FEEDER 95891 OOS/IS	ASSUMED OOS TIME	SRO
AC0	FDR	12/17/91 07:48	12/17/91 10:53	3.08	FEEDER 96952 OOS/IS (138KV SWITCH FROM 4:24?)		SRO
AC1	INST BUS 32	01/21/85 23:48	01/21/85 23:49	0.02	32 IB BUS LOST/RESET (REACTOR TRIP)		SRO
AC1	INST BUS 31	01/21/85 23:49	01/21/85 23:49	0.00	31 IB INADVERTENTLY SWITCH TO BACK UP CAUSING MOMENTARY LOSS OF POWER		SRO
AC1	INST BUS 33	01/22/85 22:35	01/22/85 22:36	0.02	33 IB ON BACKUP/NORMAL (DUE TO WORK ON 33 BC)		SRO
AC1	INST BUS 33	07/08/85 11:25	07/09/85 17:25	30.00	33 IB ON BACKUP/NORMAL	ON BACKUP TIME	SRO
AC1	INST BUS 33	07/08/85 11:25	07/09/85 17:25	30.00	33A IB ON BACKUP/NORMAL	ON BACKUP TIME	SRO
AC1	INST BUS 34	07/10/85 09:05	07/11/85 09:08	24.05	34 IB ON BACKUP/NORMAL		SRO
AC1	INST BUS 34	07/10/85 09:05	07/11/85 09:08	24.05	34A IB ON BACKUP/NORMAL		SRO
AC1	INST BUS 31	07/15/85 08:34	07/16/85 14:34	30.00	31 IB ON BACKUP/NORMAL	ON NORMAL TIME	SRO
AC1	INST BUS 31	07/15/85 08:34	07/16/85 14:34	30.00	31A IB ON BACKUP/NORMAL	ON NORMAL TIME	SRO
AC1	INST BUS 34	07/16/85 08:38	07/16/85 08:38	0.00	34 IB BUS LOST/RESET		SRO
AC1	INST BUS 31	07/19/85 10:45	07/22/85 15:05	76.33	31 IB ON BACKUP/NORMAL		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC1	INST BUS 32	07/22/85 15:05	08/13/85 12:30	525.42	32 IB ON BACKUP/NORMAL		SRO
AC1	INST BUS 34	08/01/85 13:20	08/01/85 13:36	0.27	34 IB BUS LOST/RESET (DUE TO 34 INV TRIPPING ON		SRO
AC1	INST BUS 31	08/13/85 12:35	08/14/85 18:35	30.00	31 IB ON BACKUP/NORMAL	ON NORMAL TIME	SRO
AC1	INST BUS 31	08/13/85 12:35	08/14/85 18:35	30.00	31A IB ON BACKUP/NORMAL	ON NORMAL TIME	SRO
AC1	INST BUS 33	10/09/85 22:23	10/10/85 14:41	16.30	33 IB ON BACKUP/NORMAL		SRO
AC1	STAT INVERT	11/11/85 07:30	11/11/85 07:58	0.47	32 INV. SWAPPED TO ALT/NORMAL		SRO
AC1	STAT INVERT	11/11/85 10:04	11/11/85 14:02	3.97	32 INV. SWAPPED TO ALT/NORMAL		SRO
AC1	STAT INVERT	12/16/85 18:17	12/18/85 16:05	45.80	32 INV. ON BACKUP/NORMAL		SRO
AC1	INST BUS 32	12/19/85 05:15	12/19/85 10:10	4.92	32 IB ON BACKUP/NORMAL		SRO
AC1	INST BUS 33	05/12/86 04:20	05/16/86 01:30	93.17	33 IB ON BACKUP/NORMAL		SRO
AC1	INST BUS 33	05/12/86 04:20	05/16/86 01:30	93.17	33A IB ON BACKUP/NORMAL		SRO
AC1	STAT INVERT	05/12/86 04:20	05/16/86 01:30	93.17	33 INV. OOS/IS		SRO
AC1	STAT INVERT	06/08/86 07:00	06/09/86 21:34	38.57	32 INV. ON BACKUP/NORMAL	START TIME	SRO
AC1	INST BUS 33	12/23/86 14:45	12/23/86 22:23	7.63	33A IB ON BACKUP/NORMAL		SRO
AC1	INST BUS 33	12/23/86 14:48	12/23/86 22:25	7.62	33 IB ON BACKUP/NORMAL		SRO
AC1	INST BUS 33	12/29/86 09:05	12/29/86 14:10	5.08	33A IB ON BACKUP/NORMAL		SRO
AC1	INST BUS 33	12/29/86 09:12	12/29/86 14:15	5.05	33 IB ON BACKUP/NORMAL		SRO
AC1	STAT INVERT	01/26/87 21:55	01/30/87 13:40	87.75	32 INV. ON BACKUP/NORMAL		SRO
AC1	STAT INVERT	02/03/87 18:57	02/04/87 19:50	24.88	32 INV. ON BACKUP/NORMAL		SRO
AC1	INST BUS 33	02/11/87 17:17	02/11/87 20:37	3.33	33 IB ON BACKUP/NORMAL		SRO
AC1	INST BUS 33	02/11/87 17:17	02/12/87 22:08	28.85	33A IB ON BACKUP/NORMAL		SRO
AC1	INST BUS 34	02/11/87 17:17	02/12/87 22:36	29.32	34 IB ON NORMAL/BACKUP		SRO
AC1	INST BUS 34	02/11/87 17:17	02/12/87 22:36	29.32	34A IB ON NORMAL/BACKUP		SRO
AC1	INST BUS 33	02/11/87 23:15	02/12/87 22:08	22.88	33 IB ON BACKUP/NORMAL		SRO
AC1	INST BUS 34	02/12/87 22:36	02/12/87 23:15	0.65	34 IB ON NORMAL/BACKUP		SRO
AC1	INST BUS 34	02/12/87 22:36	02/12/87 23:15	0.65	34A IB ON NORMAL/BACKUP		SRO
AC1	INST BUS 31	05/04/87 12:43	05/05/87 13:20	24.62	31 IB ON BACKUP/NORMAL		SRO
AC1	STAT INVERT	05/04/87 12:43	05/05/87 13:20	24.62	31 INV. OOS/IS		SRO
AC1	STAT INVERT	06/07/87 01:50	06/07/87 15:30	13.67	33 INV. OOS/IS		SRO
AC1	STAT INVERT	06/07/87 01:50	06/07/87 13:45	11.92	33 INV. OOS/IS (33 DC BUS LOST)		SRO
AC1	INST BUS 33	06/07/87 02:04	06/07/87 15:50	13.77	33 IB ON BACKUP/NORMAL		SRO
AC1	INST BUS 33	06/07/87 02:04	06/07/87 15:55	13.85	33 IB ON BACKUP/NORMAL (33 I.B. LOST)		SRO
AC1	INST BUS 33	06/10/87 08:40	06/10/87 16:15	7.58	33 IB ON BACKUP/NORMAL		SRO
AC1	INST BUS 33	06/10/87 08:40	06/10/87 16:15	7.58	33A IB ON BACKUP/NORMAL		SRO
AC1	STAT INVERT	06/10/87 08:40	06/10/87 16:05	7.42	33 INV. OOS/IS		SRO
AC1	INST BUS 34	06/10/87 16:18	06/11/87 21:52	29.57	34 IB ON BACKUP/NORMAL		SRO
AC1	INST BUS 34	06/10/87 16:18	06/11/87 21:52	29.57	34A IB ON BACKUP/NORMAL		SRO
AC1	STAT INVERT	06/10/87 16:20	06/11/87 21:52	29.53	34 INV. OOS/IS		SRO
AC1	INST BUS 31	06/11/87 21:57	06/13/87 09:55	35.97	31 IB ON BACKUP/NORMAL		SRO
AC1	STAT INVERT	06/11/87 21:59	06/13/87 09:55	35.93	31 INV. OOS/IS		SRO
AC1	INST BUS 31	06/12/87 06:00	06/13/87 09:55	27.92	31A IB ON BACKUP/NORMAL		SRO
AC1	INST BUS 32	06/13/87 10:25	06/13/87 22:04	11.65	32 IB ON BACKUP/NORMAL		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC1	STAT INVERT	06/13/87 10:25	06/13/87 18:07	7.70	32 INV. OOS/IS		SRO
AC1	STAT INVERT	06/15/87 08:15	06/15/87 10:15	2.00	31 INV. OOS/IS		SRO
AC1	STAT INVERT	06/25/87 11:10	06/25/87 11:15	0.08	31 INV. OOS/IS		SRO
AC1	STAT INVERT	07/11/87 17:35	07/13/87 19:58	50.38	32 INV. ON BACKUP/NORMAL		SRO
AC1	INST BUS 31	07/24/87 21:30	07/28/87 20:50	95.33	31 IB ON BACKUP/NORMAL		SRO
AC1	STAT INVERT	07/24/87 21:30	07/25/87 21:30	24.00	31 INV. OOS/IS	I/S TIME	SRO
AC1	INST BUS 32	10/23/87 11:50	10/24/87 11:45	23.92	32 IB ON BACKUP/NORMAL		SRO
AC1	STAT INVERT	10/24/87 12:15	10/25/87 18:15	30.00	31 INV. ON BACKUP/NORMAL	ON NORMAL TIME	SRO
AC1	INST BUS 31	11/10/87 21:15	11/11/87 21:15	24.00	31 IB ON BACKUP/NORMAL, 31 S.I. SEC./ FOR EQUALIZE	ON NORMAL TIME	SRO
AC1	INST BUS 31	02/10/88 13:05	02/11/88 17:24	28.32	31 IB ON BACKUP/NORMAL		SRO
AC1	INST BUS 32	02/11/88 17:25	02/12/88 18:30	25.08	32 IB ON BACKUP/NORMAL		SRO
AC1	STAT INVERT	03/01/88 11:30	03/03/88 16:30	53.00	31 INV. ON BACKUP/NORMAL		SRO
AC1	STAT INVERT	03/17/88 08:40	03/17/88 12:55	4.25	31 INV. ON BACKUP/NORMAL		SRO
AC1	STAT INVERT	03/17/88 13:05	03/17/88 13:20	0.25	32 INV. ON BYPASS/IS		SRO
AC1	INST BUS 31	05/06/88 17:30	05/07/88 18:00	24.50	31 IB ON BACKUP/NORMAL		SRO
AC1	STAT INVERT	05/06/88 17:30	05/07/88 18:00	24.50	31 INV. OOS/IS		SRO
AC1	INST BUS 32	05/07/88 18:40	05/08/88 18:52	24.20	32 IB ON BACKUP/NORMAL		SRO
AC1	STAT INVERT	05/07/88 18:40	05/08/88 18:52	24.20	32 INV. OOS/IS		SRO
AC1	INST BUS 32	05/10/88 08:30	05/11/88 14:30	30.00	32 IB ON BACKUP/NORMAL	ON NORMAL TIME	SRO
AC1	STAT INVERT	05/10/88 08:30	05/11/88 14:30	30.00	32 INV. OOS/IS	I/S TIME	SRO
AC1	STAT INVERT	05/13/88 09:00	05/13/88 18:49	9.82	31 INV. ON BACKUP/NORMAL		SRO
AC1	STAT INVERT	05/13/88 18:16	05/14/88 17:40	23.40	32 INV. SPIKE OF INST BUS 31/NORMAL (CAUSE I & C.)		SRO
AC1	INST BUS 31	05/14/88 02:20	05/14/88 17:40	15.33	31 IB ON BACKUP/NORMAL		SRO
AC1	STAT INVERT	05/14/88 02:20	05/17/88 19:05	88.75	31 INV. ON BACKUP/NORMAL		SRO
AC1	STAT INVERT	05/14/88 02:20	05/14/88 17:40	15.33	31 INV. OOS/IS		SRO
AC1	STAT INVERT	05/19/88 04:50	05/20/88 10:50	30.00	32 INV. OOS/IS	OOS TIME	SRO
AC1	INST BUS 31	05/19/88 16:27	05/20/88 22:27	30.00	31 IB ON BACKUP/NORMAL	ON NORMAL TIME	SRO
AC1	STAT INVERT	05/19/88 16:27	05/20/88 18:30	26.05	31 INV. OOS/IS		SRO
AC1	INST BUS 31	08/03/88 12:13	08/04/88 18:13	30.00	31 IB ON BACKUP/NORMAL	ON NORMAL TIME	SRO
AC1	STAT INVERT	08/03/88 12:13	08/04/88 12:48	24.58	31 INV. OOS/IS		SRO
AC1	STAT INVERT	08/04/88 12:50	08/05/88 14:20	25.50	32 INV. OOS/IS		SRO
AC1	STAT INVERT	08/29/88 16:45	08/31/88 09:15	40.50	32 INV. OOS/IS		SRO
AC1	STAT INVERT	11/10/88 11:29	11/12/88 11:53	48.40	31 INV. ON BACKUP/NORMAL		SRO
AC1	STAT INVERT	11/12/88 13:00	11/14/88 13:25	48.42	32 INV. ON BACKUP/NORMAL		SRO
AC1	INST BUS 34	02/06/89 21:28	02/07/89 13:20	15.87	34 IB ON BACKUP/NORMAL		SRO
AC1	STAT INVERT	02/06/89 21:28	02/07/89 13:20	15.87	34 INV. OOS/IS		SRO
AC1	STAT INVERT	02/08/89 08:05	02/08/89 16:09	8.07	31 INV. OOS/IS		SRO
AC1	STAT INVERT	02/09/89 08:20	02/09/89 13:50	5.50	32 INV. OOS/IS		SRO
AC1	STAT INVERT	02/14/89 10:00	02/14/89 11:20	1.33	31 INV. OOS/IS		SRO
AC1	STAT INVERT	02/15/89 08:52	02/15/89 10:40	1.80	32 INV. OOS/IS		SRO
AC1	STAT INVERT	03/20/89 16:00	03/21/89 18:30	26.50	31 INV. ON BACKUP/NORMAL		SRO
AC1	STAT INVERT	03/22/89 14:40	03/23/89 17:50	27.17	32 INV. ON BACKUP/NORMAL		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC1	STAT INVERT	04/04/89 04:30	04/05/89 10:30	30.00	31 INV. ON BACKUP/NORMAL	ON NORMAL TIME	SRO
AC1	INST BUS 33	04/11/89 13:28	04/14/89 21:30	80.03	33 IB ON BACKUP/NORMAL		SRO
AC1	STAT INVERT	04/22/89 05:00	04/25/89 08:50	75.83	32 INV. ON BACKUP/NORMAL		SRO
AC1	INST BUS 31	05/10/89 08:54	05/11/89 14:54	30.00	31 IB ON BACKUP/NORMAL	ON NORMAL TIME	SRO
AC1	STAT INVERT	05/16/89 10:45	05/22/89 09:30	142.75	33 INV. OOS/IS	OOS WHEN 33 BATTERY 35 CHARGER	SRO
AC1	STAT INVERT	05/17/89 12:57	05/18/89 18:57	30.00	31 INV. ON BACKUP/NORMAL	ON NORMAL TIME	SRO
AC1	INST BUS 36	05/22/89 09:30	05/22/89 09:30	0.00	36A IB OOS/IS	WRONG IB NUMBER	SRO
AC1	STAT INVERT	05/25/89 13:16	05/26/89 19:16	30.00	33 INV. ON BACKUP/NORMAL	ON NORMAL TIME	SRO
AC1	INST BUS 32	09/20/89 20:45	09/20/89 20:45	0.00	32 IB LOST/RESTORED (MANUALLY)		SRO
AC1	STAT INVERT	09/20/89 23:30	09/23/89 14:12	62.70	32 INV. ON BACKUP/NORMAL		SRO
AC1	STAT INVERT	09/21/89 17:15	09/22/89 05:00	11.75	32 INV. ON LOAD TEST.	TEST	SRO
AC1	STAT INVERT	09/22/89 15:30	09/23/89 14:12	22.70	32 INV. ON LOAD TEST.	TEST	SRO
AC1	INST BUS 33	12/19/89 09:58	12/19/89 14:35	4.62	33 IB ON/OFF MAINT BYPASS.		SRO
AC1	STAT INVERT	03/03/90 14:35	03/07/90 16:35	98.00	31 INV. OOS/IS		SRO
AC1	STAT INVERT	03/07/90 16:40	03/08/90 22:40	30.00	32 INV. HELD OFF	END TIME	SRO
AC1	INST BUS 34	03/15/90 19:41	03/15/90 21:15	1.57	34 IB ON BACKUP/NORMAL.		SRO
AC1	INST BUS 34	03/15/90 19:41	03/15/90 21:15	1.57	34A IB ON BACKUP/NORMAL		SRO
AC1	STAT INVERT	03/15/90 19:41	03/15/90 21:15	1.57	34 INV. SECURED		SRO
AC1	INST BUS 31	10/02/90 20:00	10/02/90 20:01	0.02	31 IB TRIP/IS	I/S TIME	SRO
AC1	INST BUS 32	10/04/90 04:10	10/05/90 10:10	30.00	32 IB ON BACKUP/NORMAL	ON NORMAL TIME	SRO
AC1	STAT INVERT	10/22/90 07:35	10/25/90 17:00	81.42	33 INV. ON MBS/IS		SRO
AC1	STAT INVERT	11/15/90 08:50	11/16/90 14:50	30.00	32 INV. ON BACKUP/NORMAL	ON NORMAL TIME	SRO
AC1	INST BUS 31	04/06/91 18:40	04/08/91 00:40	30.00	31 IB BKR 23 FAILED TO CLOSE	END TIME	SRO
AC1	STAT INVERT	04/06/91 18:40	04/08/91 00:40	30.00	31 INV. TO AUTO TRANSFORMER	END TIME	SRO
AC1	INST BUS 33	04/21/91 01:50	04/22/91 03:25	25.58	33 IB BKR 13 DE-ENERGIZED/ENERGIZED	START TIME WHEN ALARM	SRO
AC1	STAT INVERT	06/05/91 13:49	06/05/91 14:10	0.35	32 INV. TO REV. XFR /NORMAL FOR I&C		SRO
AC1	STAT INVERT	06/06/91 09:04	06/06/91 12:15	3.18	32 INV. TO BACKUP POWER/IS		SRO
AC1	STAT INVERT	09/25/91 13:54	09/25/91 13:55	0.02	31 INV. OOS/IS	OOS TIME	SRO
AC4	BKR EXT	06/07/85 15:00	10/04/85 16:34	2857.57	OPENED/CLOSED EXCITER BKR	ASSUME OPENED WHEN PLANT	SRO
AC4	BKR TIE	06/26/85 14:28	06/26/85 16:25	1.95	CLOSED/TRIPPED 2AT3A		SRO
AC4	BKR	06/26/85 14:28	06/26/85 16:25	1.95	OPENED/CLOSED 52-2A		SRO
AC4	BKR TIE	06/27/85 13:06	06/28/85 09:50	20.73	CLOSED/OPENED 2AT3A		SRO
AC4	BKR	06/27/85 13:06	06/28/85 08:51	19.75	OPENED/CLOSED 52-3A		SRO
AC4	BKR	06/28/85 08:51	06/28/85 09:50	0.98	OPENED/CLOSED 52-2A		SRO
AC4	BKR TIE	06/28/85 09:58	06/28/85 14:05	4.12	CLOSED/OPENED 3AT6A		SRO
AC4	BKR TIE	06/28/85 09:58	06/28/85 14:05	4.12	OPENED/CLOSED 3AT6A		SRO
AC4	BKR TIE	06/28/85 14:10	06/28/85 16:35	2.42	CLOSED/OPENED 2AT5A		SRO
AC4	BKR	06/28/85 14:10	06/28/85 16:35	2.42	OPENED/CLOSED 52-5A		SRO
AC4	BKR TIE	07/12/85 03:00	07/15/85 01:10	70.17	CLOSED/OPENED 312T313		SRO
AC4	BKR SS	07/12/85 03:00	07/15/85 01:10	70.17	OPENED/CLOSED SS312		SRO
AC4	BKR TIE	07/13/85 02:58	07/16/85 12:59	82.02	CLOSED/OPENED 312T313		SRO
AC4	BKR SS	07/13/85 02:58	07/16/85 12:59	82.02	OPENED/CLOSED SS313		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC4	BKR TIE	07/13/85 03:02	07/15/85 01:00	45.97	CLOSED/OPENED 2AT3A		SRO
AC4	BKR	07/13/85 03:02	07/15/85 01:00	45.97	OPENED/CLOSED 52-3A		SRO
AC4	BKR TIE	07/16/85 07:46	07/16/85 12:59	5.22	CLOSED/OPENED 312T313		SRO
AC4	BKR TIE	07/16/85 07:50	07/16/85 12:58	5.13	CLOSED/OPENED 2AT3A		SRO
AC4	BKR	07/16/85 07:50	07/16/85 12:58	5.13	OPENED/CLOSED 52-3A		SRO
AC4	BKR TIE	07/16/85 18:20	07/17/85 19:40	25.33	CLOSED/OPENED 2AT3A		SRO
AC4	BKR	07/16/85 18:20	07/17/85 19:40	25.33	OPENED/CLOSED 52-2A		SRO
AC4	BKR SS	07/16/85 18:20	07/17/85 19:40	25.33	OPENED/CLOSED SS2		SRO
AC4	BKR TIE	07/18/85 01:58	07/19/85 19:52	41.90	CLOSED/OPENED 312T313		SRO
AC4	BKR SS	07/18/85 01:58	07/19/85 19:52	41.90	OPENED/CLOSED SS313		SRO
AC4	BKR TIE	07/18/85 03:16	07/19/85 19:28	40.20	CLOSED/OPENED 3AT6A		SRO
AC4	BKR	07/18/85 03:17	07/18/85 03:40	0.38	OPENED/CLOSED 52-3A		SRO
AC4	BKR	07/18/85 03:32	07/18/85 03:35	0.05	OPENED/CLOSED 52-6A		SRO
AC4	BKR	07/18/85 03:40	07/19/85 19:28	39.80	OPENED/CLOSED 52-6A		SRO
AC4	BKR SS	07/18/85 03:50	07/19/85 19:28	39.63	OPENED/CLOSED SS6		SRO
AC4	BKR TIE	07/18/85 18:30	07/19/85 19:28	24.97	CLOSED/OPENED 2AT3A (BUS 2A FEEDING 3A & 6A)		SRO
AC4	BKR TIE	07/20/85 15:50	07/22/85 17:23	49.55	CLOSED/OPENED 2AT3A		SRO
AC4	BKR TIE	07/20/85 15:50	07/22/85 17:18	49.47	CLOSED/OPENED 2AT5A		SRO
AC4	BKR	07/20/85 15:50	07/22/85 17:23	49.55	OPENED/CLOSED 52-2A		SRO
AC4	BKR	07/20/85 15:50	07/22/85 17:18	49.47	OPENED/CLOSED 52-5A		SRO
AC4	BKR TIE	07/20/85 16:10	07/22/85 17:38	49.47	CLOSED/OPENED 312T313		SRO
AC4	BKR SS	07/20/85 16:10	07/22/85 17:38	49.47	OPENED/CLOSED SS312		SRO
AC4	BKR TIE	08/05/85 18:25	08/05/85 18:52	0.45	CLOSED/OPENED 2AT3A		SRO
AC4	BKR TIE	08/05/85 18:25	08/05/85 18:52	0.45	CLOSED/OPENED 2AT5A		SRO
AC4	BKR TIE	08/05/85 18:25	08/05/85 18:55	0.50	CLOSED/OPENED 312T313		SRO
AC4	BKR TIE	08/05/85 18:25	08/05/85 18:52	0.45	CLOSED/OPENED 3AT6A		SRO
AC4	BKR TIE	08/13/85 04:00	08/13/85 05:10	1.17	CLOSED/OPENED 2AT3A		SRO
AC4	BKR TIE	08/13/85 04:00	08/13/85 04:51	0.85	CLOSED/OPENED 2AT5A		SRO
AC4	BKR	08/13/85 04:35	08/13/85 05:10	0.58	OPENED/CLOSED 52-3A		SRO
AC4	BKR	08/13/85 04:35	08/13/85 04:50	0.25	OPENED/CLOSED 52-5A		SRO
AC4	BKR	08/13/85 04:45	08/13/85 04:50	0.08	OPENED/CLOSED 52-2A		SRO
AC4	BKR	08/13/85 05:03	08/13/85 05:05	0.03	OPENED/CLOSED 52-6A		SRO
AC4	BKR TIE	08/19/85 16:24	08/24/85 01:10	104.77	CLOSED/OPENED 312T313	ASSUME OPENED WHEN BUS3	SRO
AC4	BKR SS	08/19/85 16:24	08/24/85 01:10	104.77	OPENED/CLOSED SS313	ASSUME CLOSED WHEN BUS3	SRO
AC4	BKR TIE	08/20/85 09:43	08/24/85 01:10	87.45	CLOSED/OPENED 2AT3A		SRO
AC4	BKR	08/20/85 09:51	08/24/85 01:10	87.32	OPENED/CLOSED 52-3A		SRO
AC4	BKR	08/20/85 09:51	08/24/85 01:10	87.32	OPENED/CLOSED 52-6A		SRO
AC4	BKR SS	08/20/85 10:01	08/24/85 01:10	87.15	OPENED/CLOSED SS3		SRO
AC4	BKR SS	08/20/85 10:01	08/24/85 01:10	87.15	OPENED/CLOSED SS6		SRO
AC4	BKR TIE	08/20/85 14:10	08/24/85 01:10	83.00	CLOSED/OPENED 2AT5A		SRO
AC4	BKR TIE	08/24/85 15:30	08/26/85 08:26	40.93	OPENED/CLOSED 3AT6A		SRO
AC4	BKR TIE	08/28/85 09:39	09/03/85 08:00	142.35	CLOSED/OPENED 2AT5A	ASSUME OPENED WHEN PULLED FUSES	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC4	BKR TIE	05/03/86 17:35	05/03/86 20:15	2.67	CLOSED/OPENED 312T313		SRO
AC4	BKR SS	05/03/86 18:13	05/03/86 18:53	0.67	OPENED/CLOSED SS313		SRO
AC4	BKR TIE	05/03/86 18:23	05/03/86 19:15	0.87	CLOSED/OPENED 2AT3A	ASSUME CLOSED WHEN 52-3A CLOSED	SRO
AC4	BKR	05/03/86 18:23	05/03/86 18:53	0.50	OPENED/CLOSED 52-3A	ASSUME CLOSED WHEN UT3-ST6	SRO
AC4	BKR TIE	05/06/86 09:40	05/07/86 09:35	23.92	CLOSED/OPENED 2AT3A	ASSUME OPENED WHEN UT2-ST5	SRO
AC4	BKR SS	05/06/86 09:40	05/07/86 09:35	23.92	CLOSED/OPENED SS2		SRO
AC4	BKR	05/06/86 09:40	05/07/86 09:35	23.92	OPENED/CLOSED 52-2A		SRO
AC4	BKR	05/07/86 10:00	05/08/86 07:55	21.92	OPENED/CLOSED 52-3A	ASSUME CLOSED WHEN 3AT6A CLOSED	SRO
AC4	BKR SS	05/07/86 10:00	05/08/86 07:55	21.92	OPENED/CLOSED SS3	ASSUME CLOSED WHEN 3AT6A CLOSED	SRO
AC4	BKR TIE	05/08/86 07:55	05/09/86 13:55	30.00	CLOSED/OPENED 2AT5A	ASSUME OPENED TIME	SRO
AC4	BKR TIE	05/08/86 07:55	05/09/86 13:55	30.00	CLOSED/OPENED 3AT6A	ASSUME OPENED TIME	SRO
AC4	BKR SS	05/08/86 07:55	05/11/86 10:35	74.67	OPENED/CLOSED SS5	ASSUME CLOSED WHEN GT35 OPENED	SRO
AC4	BKR TIE	05/12/86 08:50	05/13/86 14:50	30.00	CLOSED/OPENED 312T313	ASSUME CLOSED TIME	SRO
AC4	BKR SS	05/12/86 08:50	05/13/86 14:50	30.00	OPENED/CLOSED SS312	ASSUME OPENED TIME	SRO
AC4	BKR TIE	05/27/86 13:05	05/27/86 18:25	5.33	CLOSED/OPENED 2AT3A		SRO
AC4	BKR	05/27/86 13:05	05/27/86 18:25	5.33	OPENED/CLOSED 52-2A		SRO
AC4	BKR SS	05/27/86 13:05	05/27/86 18:25	5.33	OPENED/CLOSED SS2		SRO
AC4	BKR EXT	07/05/86 09:58	09/04/86 16:26	1470.47	OPENED/CLOSED EXCITER BREAKER	ASSUME OPENED TIME WHEN REACTOR SHUTDOWN	SRO
AC4	BKR TIE	08/08/86 10:40	08/08/86 13:03	2.38	CLOSED/OPENED 312T313		SRO
AC4	BKR SS	08/08/86 10:40	08/08/86 13:03	2.38	OPENED/CLOSED SS312		SRO
AC4	BKR TIE	08/19/86 09:25	08/19/86 10:30	1.08	CLOSED/OPENED 2AT5A		SRO
AC4	BKR TIE	08/19/86 09:30	08/19/86 10:30	1.00	CLOSED/OPENED 3AT6A		SRO
AC4	BKR TIE	08/19/86 09:50	08/19/86 10:30	0.67	CLOSED/OPENED 2AT3A		SRO
AC4	BKR	10/06/86 11:20	10/07/86 17:20	30.00	OPENED SUPPLY BREAKER FOR LIGHTING PANEL 317 & 318.	ASSUME END TIME	SRO
AC4	BKR EXT	02/11/87 08:28	02/13/87 06:55	46.45	OPENED/CLOSED EXCITER FIELD BREAKER	ASSUME OPENED TIME WHEN REACTOR SHUTDOWN	SRO
AC4	BKR TIE	05/11/87 03:45	05/13/87 08:45	53.00	CLOSED/OPENED 2AT3A		SRO
AC4	BKR	05/11/87 03:45	05/12/87 18:47	39.03	OPENED/CLOSED 52-3A	ASSUME CLOSED WHEN SS3 CLOSED	SRO
AC4	BKR SS	05/11/87 03:45	05/12/87 18:47	39.03	OPENED/CLOSED SS3		SRO
AC4	BKR TIE	05/11/87 04:00	05/12/87 18:47	38.78	CLOSED/OPENED 312T313	ASSUME OPENED WHEN UT3-ST6	SRO
AC4	BKR SS	05/11/87 04:00	05/12/87 18:47	38.78	OPENED/CLOSED SS313	ASSUME CLOSED WHEN SS3 CLOSED	SRO
AC4	BKR TIE	05/13/87 08:45	05/14/87 14:45	30.00	CLOSED/OPENED 2AT5A	ASSUME OPENED TIME	SRO
AC4	BKR TIE	05/13/87 08:45	05/14/87 14:45	30.00	CLOSED/OPENED 3AT6A	ASSUME OPENED TIME	SRO
AC4	BKR	05/13/87 08:45	05/14/87 14:45	30.00	OPENED/CLOSED 52-2A	ASSUME CLOSED TIME	SRO
AC4	BKR SS	05/13/87 08:45	05/14/87 14:45	30.00	OPENED/CLOSED SS2	ASSUME CLOSED TIME	SRO
AC4	BKR	05/15/87 12:15	05/16/87 18:15	30.00	OPENED/CLOSED 52-5A	ASSUME OPENED TIME	SRO
AC4	BKR SS	05/15/87 12:15	05/16/87 18:15	30.00	OPENED/CLOSED SS5	ASSUME OPENED TIME	SRO
AC4	BKR	05/16/87 18:15	05/18/87 00:15	30.00	OPENED/CLOSED 52-2A	ASSUME CLOSED TIME	SRO
AC4	BKR TIE	05/27/87 14:14	05/28/87 20:14	30.00	CLOSED/OPENED 3AT6A	ASSUME OPENED TIME	SRO
AC4	BKR	05/27/87 14:14	05/28/87 20:14	30.00	OPENED/CLOSED 52-6A	ASSUME CLOSED TIME	SRO
AC4	BKR SS	05/27/87 14:14	05/28/87 20:14	30.00	OPENED/CLOSED SS6	ASSUME CLOSED TIME	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC4	BKR TIE	07/10/87 09:45	07/10/87 09:52	0.12	CLOSED/TRIPPED 2AT5A		SRO
AC4	BKR	07/10/87 09:45	07/10/87 10:35	0.83	OPENED/CLOSED 52-5A		SRO
AC4	BKR TIE	05/23/88 04:00	05/23/88 04:55	0.92	CLOSED/OPENED 3AT6A		SRO
AC4	BKR	05/30/88 17:35	05/30/88 17:55	0.33	32 CWP 6.9 BKR TRIP/CLOSED		SRO
AC4	BKR	10/09/88 18:53	10/09/88 19:25	0.53	TRIPPED/CLOSED 52-5A		SRO
AC4	BKR	10/09/88 19:36	10/10/88 00:58	5.37	TRIPPED/CLOSED 52-5A		SRO
AC4	BKR	10/10/88 10:20	10/10/88 11:15	0.92	OPENED/CLOSED 52-5A		SRO
AC4	BKR	10/12/88 09:30	10/12/88 10:10	0.67	OPENED/CLOSED 52-5A		SRO
AC4	BKR SS	10/12/88 09:30	10/12/88 10:10	0.67	OPENED/CLOSED SS5		SRO
AC4	BKR TIE	03/24/89 09:00	03/27/89 18:25	81.42	CLOSED/OPENED 312T313	ASSUME OPENED WHEN SS312 CLOSED	SRO
AC4	BKR SS	03/24/89 09:00	03/24/89 13:15	4.25	OPENED/CLOSED SS313		SRO
AC4	BKR SS	03/24/89 13:50	03/27/89 18:25	76.58	OPENED/CLOSED SS312		SRO
AC4	BKR TIE	04/20/89 11:52	04/20/89 11:59	0.12	CLOSED/OPENED 2AT3A		SRO
AC4	BKR	04/20/89 11:52	04/20/89 11:58	0.10	OPENED/CLOSED 52-2A		SRO
AC4	BKR TIE	04/24/89 07:45	04/24/89 07:48	0.05	CLOSED/TRIPPED 2AT3A		SRO
AC4	BKR	04/24/89 07:45	04/24/89 08:25	0.67	OPENED/CLOSED 52-3A		SRO
AC4	BKR TIE	04/24/89 07:55	04/24/89 08:25	0.50	CLOSED/OPENED 2AT3A		SRO
AC4	BKR TIE	04/24/89 09:00	04/24/89 15:15	6.25	CLOSED/OPENED 2AT3A		SRO
AC4	BKR	04/24/89 09:00	04/24/89 14:30	5.50	OPENED/CLOSED 52-2A		SRO
AC4	BKR	04/24/89 14:30	04/24/89 15:15	0.75	OPENED/CLOSED 52-3A		SRO
AC4	BKR	04/27/89 08:48	04/27/89 09:10	0.37	OPENED/CLOSED 52-6A		SRO
AC4	BKR TIE	05/15/89 00:50	05/15/89 02:05	1.25	CLOSED/OPENED 2AT5A		SRO
AC4	BKR TIE	05/15/89 01:10	05/15/89 02:06	0.93	CLOSED/OPENED 2AT3A		SRO
AC4	BKR	05/15/89 01:10	05/15/89 02:06	0.93	OPENED/CLOSED 52-3A		SRO
AC4	BKR	05/15/89 01:25	05/15/89 01:48	0.38	OPENED/CLOSED 52-2A		SRO
AC4	BKR	05/15/89 01:28	05/15/89 02:05	0.62	OPENED/CLOSED 52-5A		SRO
AC4	BKR	05/15/89 01:35	05/15/89 01:58	0.38	OPENED/CLOSED 52-6A		SRO
AC4	BKR TIE	06/02/89 03:45	06/03/89 14:53	35.13	CLOSED/OPENED 2AT3A		SRO
AC4	BKR	06/02/89 03:45	06/03/89 14:53	35.13	OPENED/CLOSED 52-3A		SRO
AC4	BKR SS	06/02/89 03:45	06/03/89 14:53	35.13	OPENED/CLOSED SS3		SRO
AC4	BKR TIE	03/13/90 18:54	03/14/90 19:50	24.93	CLOSED/OPENED 2AT3A		SRO
AC4	BKR	03/13/90 18:54	03/14/90 09:15	14.35	OPENED/CLOSED 52-2A		SRO
AC4	BKR SS	03/13/90 18:54	03/14/90 06:09	11.25	OPENED/CLOSED SS2		SRO
AC4	BKR	03/14/90 09:15	03/14/90 19:50	10.58	OPENED/CLOSED 52-3A		SRO
AC4	BKR TIE	03/14/90 09:45	03/14/90 19:50	10.08	CLOSED/OPENED 312T313	ASSUME OPENED WHEN UT3-ST6	SRO
AC4	BKR SS	03/14/90 09:45	03/14/90 19:50	10.08	OPENED/CLOSED SS3		SRO
AC4	BKR SS	03/14/90 09:45	03/14/90 19:50	10.08	OPENED/CLOSED SS313	ASSUME CLOSED WHEN UT3-ST6	SRO
AC4	BKR TIE	03/20/90 00:48	03/20/90 04:25	3.62	CLOSED/OPENED 3AT6A	ASSUME OPENED WHEN ST5,ST6	SRO
AC4	BKR TIE	03/27/90 09:05	03/27/90 14:53	5.80	CLOSED/OPENED 3AT6A		SRO
AC4	BKR	03/27/90 09:30	03/27/90 14:53	5.38	OPENED/CLOSED 52-6A		SRO
AC4	BKR TIE	09/29/90 04:53	10/01/90 13:35	56.70	CLOSED/OPENED 2AT3A		SRO
AC4	BKR TIE	09/29/90 04:53	10/01/90 13:35	56.70	CLOSED/OPENED 312T313		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC4	BKR SS	09/29/90 04:53	10/03/90 22:50	113.95	OPENED/CLOSED SS313	ASSUME OPENED WHEN UT3-ST6 TRIP	SRO
AC4	BKR	09/29/90 04:53	10/01/90 13:35	56.70	TRIPPED/CLOSED 52-3A		SRO
AC4	BKR SS	09/29/90 04:53	10/01/90 13:35	56.70	TRIPPED/CLOSED SS3		SRO
AC4	BKR TIE	10/17/90 17:28	10/26/90 23:55	222.45	CLOSED/OPENED 312T313	ASSUME OPENED WHEN SHIFTED BUSES	SRO
AC4	BKR	10/17/90 17:28	10/26/90 23:55	222.45	OPENED/CLOSED BKR 312 FOR MAINTENANCE		SRO
AC4	BKR SS	10/17/90 17:28	10/26/90 23:20	221.87	OPENED/CLOSED SS312	ASSUME OPENED WHEN SS312 OPENED	SRO
AC4	BKR TIE	10/27/90 03:25	10/28/90 09:25	30.00	CLOSED/OPENED 2AT3A	ASSUME OPENED TIME	SRO
AC4	BKR	10/27/90 03:25	10/28/90 09:25	30.00	OPENED/CLOSED 52-3A	ASSUME CLOSED TIME	SRO
AC4	BKR TIE	11/01/90 13:43	11/02/90 10:00	20.28	CLOSED/OPENED 2AT5A		SRO
AC4	BKR TIE	11/01/90 13:50	11/02/90 10:00	20.17	CLOSED/OPENED 3AT6A		SRO
AC4	BKR	11/02/90 09:17	11/02/90 10:00	0.72	OPENED/CLOSED 52-6A		SRO
AC4	BKR	11/02/90 09:30	11/02/90 10:00	0.50	OPENED/CLOSED 52-5A		SRO
AC4	BKR TIE	11/02/90 09:32	11/16/90 04:10	330.63	CLOSED/OPENED 312T313	ASSUME OPENED WHEN GT 35, 36	SRO
AC4	BKR TIE	11/06/90 00:15	11/13/90 21:35	189.33	CLOSED/OPENED 2AT5A	ASSUME OPENED WHEN SS2 CLOSED	SRO
AC4	BKR	11/06/90 00:15	11/08/90 20:05	67.83	OPENED/CLOSED 52-5A	ASSUME CLOSED WHEN SST5	SRO
AC4	BKR SS	11/06/90 00:15	11/08/90 20:05	67.83	OPENED/CLOSED SS5		SRO
AC4	BKR	11/08/90 20:05	11/13/90 21:35	121.50	OPENED/CLOSED 52-2A	ASSUME CLOSED WHEN SST2	SRO
AC4	BKR SS	11/08/90 23:45	11/13/90 21:35	117.83	OPENED/CLOSED SS2		SRO
AC4	BKR SS	11/09/90 23:45	11/13/90 21:35	93.83	OPENED/CLOSED SS2		SRO
AC4	BKR TIE	11/14/90 00:10	11/28/90 13:03	348.88	CLOSED/OPENED 3AT6A		SRO
AC4	BKR	11/14/90 00:10	11/19/90 21:05	140.92	OPENED/CLOSED 52-3A		SRO
AC4	BKR SS	11/14/90 00:10	11/19/90 21:05	140.92	OPENED/CLOSED SS3		SRO
AC4	BKR	11/16/90 04:05	11/16/90 04:15	0.17	OPENED/CLOSED 52-5A		SRO
AC4	BKR	11/16/90 04:05	11/16/90 04:15	0.17	OPENED/CLOSED 52-6A		SRO
AC4	BKR	11/19/90 21:08	11/28/90 13:03	207.92	OPENED/CLOSED 52-6A		SRO
AC4	BKR SS	11/19/90 21:08	11/28/90 12:55	207.78	OPENED/CLOSED SS6		SRO
AC4	BKR TIE	11/30/90 10:20	12/03/90 21:20	83.00	CLOSED/OPENED 312T313		SRO
AC4	BKR SS	11/30/90 10:20	12/03/90 21:20	83.00	OPENED/CLOSED SS312		SRO
AC4	BKR TIE	12/05/90 00:20	12/06/90 01:30	25.17	CLOSED/OPENED 2AT3A		SRO
AC4	BKR	12/05/90 00:20	12/06/90 01:30	25.17	OPENED/CLOSED 52-2A		SRO
AC4	BKR SS	12/05/90 00:25	12/06/90 01:30	25.08	OPENED/CLOSED SS2		SRO
AC4	BKR TIE	12/10/90 03:19	12/11/90 13:28	34.15	CLOSED/OPENED 3AT6A		SRO
AC4	BKR	12/10/90 03:21	12/10/90 16:00	12.65	OPENED/CLOSED 52-6A	ASSUME CLOSED WHEN ENERGIZED	SRO
AC4	BKR	12/10/90 15:20	12/10/90 16:00	0.67	DE-ENERGIZED 480V BUS 6A FOR I & C		SRO
AC4	BKR TIE	12/11/90 03:53	12/20/90 03:05	215.20	CLOSED/OPENED 312T313	ASSUME OPENED WHEN Rx STARTUP	SRO
AC4	BKR SS	12/11/90 03:53	12/27/90 22:40	402.78	OPENED/CLOSED BKR 313		SRO
AC4	BKR	12/11/90 10:15	12/11/90 10:46	0.52	OPENED/CLOSED 52-6A		SRO
AC4	BKR	12/11/90 10:15	12/11/90 10:46	0.52	OPENED/CLOSED 52-6A		SRO
AC4	BKR TIE	12/11/90 14:42	12/12/90 14:04	23.37	CLOSED/OPENED 3AT6A		SRO
AC4	BKR	12/11/90 14:42	12/12/90 14:04	23.37	OPENED/CLOSED 52-6A		SRO
AC4	BKR SS	12/12/90 14:00	12/12/90 14:02	0.03	OPENED/CLOSED SS6		SRO
AC4	BKR TIE	12/20/90 05:40	12/21/90 05:00	23.33	BKR 52-2AT3A OOS/IS (RELPACED)		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC4	BKR TIE	12/22/90 08:07	12/22/90 08:10	0.05	CLOSED/OPENED 2AT3A	ASSUME THE OPENED TIME	SRO
AC4	BKR SS	02/05/91 00:10	02/05/91 10:10	10.00	OPENED/CLOSED SS312	ASSUME CLOSED TIME	SRO
AC4	BKR TIE	02/06/91 00:32	02/06/91 10:32	10.00	CLOSED/OPENED 312T313	ASSUME OPENED TIME	SRO
AC4	BKR SS	02/06/91 00:32	02/06/91 10:32	10.00	OPENED/CLOSED SS312	ASSUME CLOSED TIME	SRO
AC4	BKR TIE	03/29/91 02:55	03/31/91 00:35	45.67	CLOSED/OPENED 2AT3A		SRO
AC4	BKR TIE	03/29/91 02:55	03/31/91 00:27	45.53	CLOSED/OPENED 312T313		SRO
AC4	BKR	03/29/91 02:55	03/31/91 00:35	45.67	OPENED/CLOSED 480V 52/3A	ASSUME OPENED WHEN 6.9KV BUS3 DE-ENERGIZED	SRO
AC4	BKR TIE	03/29/91 02:55	03/30/91 21:23	42.47	OPENED/CLOSED SS3	ASSUME OPENED WHEN 6.9KV BUS3 DE-ENERGIZED	SRO
AC4	BKR	05/15/91 04:37	05/15/91 05:01	0.40	OPENED/CLOSED 480V BUS 6A NORMAL FEED BKR 52/6A		SRO
AC4	BKR SS	05/15/91 04:45	05/15/91 04:55	0.17	OPENED/CLOSED SS6 (6.9KV)		SRO
AC4	BKR SS	05/21/91 12:25	05/21/91 12:32	0.12	OPENED/CLOSED SS6 (6.9KV) REPLACEMENT		SRO
AC4	BKR	06/08/91 15:10	06/08/91 15:10	0.01	480V BUS 6A VOLTAGE MONITOR LIGHT OUT	ASSUME END TIME	SRO
AC4	BKR	06/08/91 15:10	06/08/91 15:10	0.01	480V SAFEGUARD BUS UV. ALARM ON SBF-2	ASSUME END TIME	SRO
AC4	BKR	06/17/91 20:00	06/17/91 20:10	0.17	TRIPED/RESET 480V MCC-33 BKR(LOSS OF DIST.PNL.PCE-B)		SRO
AC6	BKR ST	03/02/85 01:58	03/02/85 06:50	4.87	PLACED STA AUX T/C IN MANUAL DUE TO HIGH SYSTEM VOLTAGE/RETURNED TO AUTO		SRO
AC6	BKR ST	03/08/85 15:50	03/08/85 22:10	6.33	PLACED STA AUX T/C IN AUTO		SRO
AC6	BKR ST	03/08/85 22:10	03/08/85 23:10	1.00	STATION AUXILIARY T/C IN MANUAL DUE TO HIGH SYSTEM	ASSUMED END TIME	SRO
AC6	BKR UT	06/07/85 19:30	10/04/85 17:05	2853.58	OPENED/CLOSED UT1	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	06/07/85 19:30	10/04/85 17:05	2853.58	OPENED/CLOSED UT2	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	06/07/85 19:30	10/04/85 17:05	2853.58	OPENED/CLOSED UT3	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	06/07/85 19:30	10/04/85 17:05	2853.58	OPENED/CLOSED UT4	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	06/07/85 19:30	07/12/85 13:10	833.67	CLOSED/OPENED UT1-ST5	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	06/07/85 19:30	07/16/85 18:20	934.83	CLOSED/OPENED UT2-ST5	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	06/07/85 19:30	07/13/85 03:02	847.53	CLOSED/OPENED UT3-ST6	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	06/07/85 19:30	07/10/85 09:43	782.22	CLOSED/OPENED UT4-ST6	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	07/12/85 13:10	07/18/85 18:35	149.42	CLOSED/OPENED UT4-ST6		SRO
AC6	BKR UT-ST	07/13/85 02:50	10/04/85 17:05	2006.25	CLOSED/OPENED UT1-ST5		SRO
AC6	BKR UT-ST	07/15/85 00:30	07/16/85 07:50	31.33	CLOSED/OPENED UT3-ST6		SRO
AC6	BKR UT-ST	07/16/85 12:45	07/18/85 18:35	53.83	CLOSED/OPENED UT3-ST6		SRO
AC6	BKR UT-ST	07/17/85 19:40	10/04/85 17:05	1893.42	CLOSED/OPENED UT2-ST5		SRO
AC6	BKR ST	07/18/85 03:33	07/19/85 17:52	38.32	OPENED/CLOSEED ST6		SRO
AC6	BKR UT-ST	07/19/85 17:52	08/20/85 10:07	760.25	CLOSED/OPENED UT3-ST6		SRO
AC6	BKR UT-ST	07/19/85 17:52	08/20/85 10:07	760.25	CLOSED/OPENED UT4-ST6		SRO
AC6	BKR ST	07/20/85 16:15	07/22/85 16:50	48.58	DEENERGIZED 6.9 BUSES 5 FOR PM	ASSUMED ENERGIZED AFTER ST5 RACKED IN	SRO
AC6	BKR UT-ST	07/20/85 16:15	07/22/85 16:50	48.58	DEENERGIZED 6.9 BUSES 1 FOR PM	ASSUMED ENERGIZED AFTER ST5 RACKED IN	SRO
AC6	BKR UT-ST	07/20/85 16:15	07/22/85 16:50	48.58	DEENERGIZED 6.9 BUSES 2 FOR PM	ASSUMED ENERGIZED AFTER ST5 RACKED IN	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC6	BKR ST	08/05/85 18:25	08/13/85 05:04	178.65	OPENED/CLOSED ST6		SRO
AC6	BKR ST	08/05/85 18:50	08/13/85 04:48	177.97	OPENED/CLOSED ST5		SRO
AC6	BKR ST	08/13/85 05:04	08/20/85 10:07	173.05	CLOSED/OPENED ST6		SRO
AC6	BKR UT-ST	08/24/85 01:10	10/04/85 17:05	999.92	CLOSED/OPENED UT3-ST6		SRO
AC6	BKR UT-ST	08/24/85 01:10	10/04/85 17:05	999.92	CLOSED/OPENED UT4-ST6		SRO
AC6	BKR UT-ST	09/15/85 12:37	09/15/85 17:30	4.88	DEENERGIZED 6.9KV BUS SEC 3 TO PERFORM MEGGAR CHECK ON 33 RCP MOTOTR		SRO
AC6	BKR ST	09/17/85 10:06	09/17/85 21:35	11.48	OPENED/CLOSED ST5		SRO
AC6	BKR ST	09/17/85 10:06	09/17/85 21:35	11.48	OPENED/CLOSED ST6		SRO
AC6	BKR UT	10/04/85 22:40	10/04/85 23:50	1.17	OPENED/CLOSED UT1	ASSUMED OPENED WHEN TURBINE TRIP	SRO
AC6	BKR UT	10/04/85 22:40	10/04/85 23:50	1.17	OPENED/CLOSED UT2	ASSUMED OPENED WHEN TURBINE TRIP	SRO
AC6	BKR UT	10/04/85 22:40	10/04/85 23:50	1.17	OPENED/CLOSED UT3	ASSUMED OPENED WHEN TURBINE TRIP	SRO
AC6	BKR UT	10/04/85 22:40	10/04/85 23:50	1.17	OPENED/CLOSED UT4	ASSUMED OPENED WHEN TURBINE TRIP	SRO
AC6	BKR UT-ST	10/04/85 22:40	10/04/85 23:50	1.17	CLOSED/OPENED UT1-ST5	ASSUMED CLOSED WHEN TURBINE TRIP	SRO
AC6	BKR UT-ST	10/04/85 22:40	10/04/85 23:50	1.17	CLOSED/OPENED UT2-ST5	ASSUMED CLOSED WHEN TURBINE TRIP	SRO
AC6	BKR UT-ST	10/04/85 22:40	10/04/85 23:50	1.17	CLOSED/OPENED UT3-ST6	ASSUMED CLOSED WHEN TURBINE TRIP	SRO
AC6	BKR UT-ST	10/04/85 22:40	10/04/85 23:50	1.17	CLOSED/OPENED UT4-ST6	ASSUMED CLOSED WHEN TURBINE TRIP	SRO
AC6	BKR UT	10/15/85 15:16	10/16/85 01:35	10.32	OPENED/CLOSED UT1	ASSUMED OPENED WHEN TURBINE TRIP	SRO
AC6	BKR UT	10/15/85 15:16	10/16/85 01:35	10.32	OPENED/CLOSED UT2	ASSUMED OPENED WHEN TURBINE TRIP	SRO
AC6	BKR UT	10/15/85 15:16	10/16/85 01:35	10.32	OPENED/CLOSED UT3	ASSUMED OPENED WHEN TURBINE TRIP	SRO
AC6	BKR UT	10/15/85 15:16	10/16/85 01:35	10.32	OPENED/CLOSED UT4	ASSUMED OPENED WHEN TURBINE TRIP	SRO
AC6	BKR UT-ST	10/15/85 15:16	10/16/85 01:35	10.32	CLOSED/OPENED UT1-ST5	ASSUMED CLOSED WHEN TURBINE TRIP	SRO
AC6	BKR UT-ST	10/15/85 15:16	10/16/85 01:35	10.32	CLOSED/OPENED UT2-ST5	ASSUMED CLOSED WHEN TURBINE TRIP	SRO
AC6	BKR UT-ST	10/15/85 15:16	10/16/85 01:35	10.32	CLOSED/OPENED UT3-ST6	ASSUMED CLOSED WHEN TURBINE TRIP	SRO
AC6	BKR UT-ST	10/15/85 15:16	10/16/85 01:35	10.32	CLOSED/OPENED UT4-ST6	ASSUMED CLOSED WHEN TURBINE TRIP	SRO
AC6	BKR UT	11/29/85 08:17	11/30/85 09:35	25.30	OPENED/CLOSED UT1	ASSUMED OPENED WHEN Rx TRIP	SRO
AC6	BKR UT	11/29/85 08:17	11/30/85 09:35	25.30	OPENED/CLOSED UT2	ASSUMED OPENED WHEN Rx TRIP	SRO
AC6	BKR UT	11/29/85 08:17	11/30/85 09:35	25.30	OPENED/CLOSED UT3	ASSUMED OPENED WHEN Rx TRIP	SRO
AC6	BKR UT	11/29/85 08:17	11/30/85 09:35	25.30	OPENED/CLOSED UT4	ASSUMED OPENED WHEN Rx TRIP	SRO
AC6	BKR UT-ST	11/29/85 08:17	11/30/85 09:35	25.30	CLOSED/OPENED UT1-ST5	ASSUMED CLOSED WHEN Rx TRIP	SRO
AC6	BKR UT-ST	11/29/85 08:17	11/30/85 09:35	25.30	CLOSED/OPENED UT2-ST5	ASSUMED CLOSED WHEN Rx TRIP	SRO
AC6	BKR UT-ST	11/29/85 08:17	11/30/85 09:35	25.30	CLOSED/OPENED UT3-ST6	ASSUMED CLOSED WHEN Rx TRIP	SRO
AC6	BKR UT-ST	11/29/85 08:17	11/30/85 09:35	25.30	CLOSED/OPENED UT4-ST6	ASSUMED CLOSED WHEN Rx TRIP	SRO
AC6	BKR UT	02/28/86 08:55	03/01/86 03:55	19.00	OPENED/CLOSED UT1	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	02/28/86 08:55	03/01/86 03:55	19.00	OPENED/CLOSED UT2	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	02/28/86 08:55	03/01/86 03:55	19.00	OPENED/CLOSED UT3	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	02/28/86 08:55	03/01/86 03:55	19.00	OPENED/CLOSED UT4	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	02/28/86 08:55	03/01/86 03:55	19.00	CLOSED/OPENED UT1-ST5	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	02/28/86 08:55	03/01/86 03:55	19.00	CLOSED/OPENED UT2-ST5	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	02/28/86 08:55	03/01/86 03:55	19.00	CLOSED/OPENED UT3-ST6	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	02/28/86 08:55	03/01/86 03:55	19.00	CLOSED/OPENED UT4-ST6	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT	04/26/86 00:10	05/19/86 05:07	556.95	OPENED/CLOSED UT1		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC6	BKR UT	04/26/86 00:10	05/19/86 05:07	556.95	OPENED/CLOSED UT2		SRO
AC6	BKR UT	04/26/86 00:10	05/19/86 05:07	556.95	OPENED/CLOSED UT3		SRO
AC6	BKR UT	04/26/86 00:10	05/19/86 05:07	556.95	OPENED/CLOSED UT4		SRO
AC6	BKR UT-ST	04/26/86 00:10	05/03/86 17:35	185.42	CLOSED/OPENED UT1-ST5		SRO
AC6	BKR UT-ST	04/26/86 00:10	05/06/86 09:40	249.50	CLOSED/OPENED UT2-ST5		SRO
AC6	BKR UT-ST	04/26/86 00:10	05/03/86 18:45	186.58	CLOSED/OPENED UT3-ST6		SRO
AC6	BKR UT-ST	04/26/86 00:10	05/03/86 18:45	186.58	CLOSED/OPENED UT3-ST6		SRO
AC6	BKR UT-ST	04/26/86 00:10	05/07/86 09:00	272.83	CLOSED/OPENED UT4-ST6	ASSUMED OPENED TIME	SRO
AC6	BKR UT-ST	05/03/86 18:13	05/19/86 05:07	370.90	CLOSED/OPENED UT1-ST5		SRO
AC6	BKR UT-ST	05/03/86 18:53	05/07/86 10:00	87.12	CLOSED/OPENED UT3-ST6		SRO
AC6	BKR UT-ST	05/03/86 18:53	05/19/86 05:07	370.23	CLOSED/OPENED UT3-ST6		SRO
AC6	BKR ST	05/04/86 12:30	05/11/86 09:10	164.67	OPENED/CLOSED ST5 (TRANSFERED 6.9KV TO 13.8KV VIA GT35, GT36. PLACED ST5, ST6 IN T.P.O.		SRO
AC6	BKR ST	05/04/86 12:30	05/11/86 09:10	164.67	OPENED/CLOSED ST6 (TRANSFERED 6.9KV TO 13.8KV VIA GT35, GT36. PLACED ST5, ST6 IN T.P.O.		SRO
AC6	BKR UT-ST	05/05/86 08:50	05/07/86 09:45	48.92	6.9KV BT4-6 OOS/IS	BT4-6(UT4-ST6?)?	SRO
AC6	BKR UT-ST	05/07/86 09:35	05/19/86 05:07	283.53	CLOSED/OPENED UT2-ST5		SRO
AC6	BKR UT-ST	05/07/86 09:45	05/19/86 05:07	283.37	CLOSED/OPENED UT4-ST6		SRO
AC6	BKR UT	05/23/86 08:40	05/25/86 01:30	40.83	OPENED/CLOSED UT1	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	05/23/86 08:40	05/25/86 01:30	40.83	OPENED/CLOSED UT2	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	05/23/86 08:40	05/25/86 01:30	40.83	OPENED/CLOSED UT3	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	05/23/86 08:40	05/25/86 01:30	40.83	OPENED/CLOSED UT4	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	05/23/86 08:40	05/25/86 01:30	40.83	CLOSED/OPENED UT1-ST5	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	05/23/86 08:40	05/25/86 01:30	40.83	CLOSED/OPENED UT2-ST5	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	05/23/86 08:40	05/25/86 01:30	40.83	CLOSED/OPENED UT3-ST6	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	05/23/86 08:40	05/25/86 01:30	40.83	CLOSED/OPENED UT4-ST6	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT	05/26/86 19:20	05/28/86 03:32	32.20	OPENED/CLOSED UT2	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	05/26/86 19:20	05/28/86 03:32	32.20	OPENED/CLOSED UT3	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	05/26/86 19:20	05/28/86 03:32	32.20	OPENED/CLOSED UT4	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	05/26/86 19:20	05/28/86 03:32	32.20	CLOSED/OPENED UT1-ST5	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	05/26/86 19:20	05/27/86 13:05	17.75	CLOSED/OPENED UT2-ST5	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	05/26/86 19:20	05/28/86 03:32	32.20	CLOSED/OPENED UT3-ST6	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	05/26/86 19:20	05/28/86 03:32	32.20	CLOSED/OPENED UT4-ST6	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT	05/26/86 19:21	05/28/86 03:32	32.18	OPENED/CLOSED UT1	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	05/27/86 18:24	05/28/86 03:32	9.13	CLOSED/OPENED UT2-ST5		SRO
AC6	BKR UT	06/07/86 03:20	06/08/86 01:37	22.28	OPENED/CLOSED UT1	ASSUMED OPENED WHEN TURBINE TRIP	SRO
AC6	BKR UT	06/07/86 03:20	06/08/86 01:37	22.28	OPENED/CLOSED UT2	ASSUMED OPENED WHEN TURBINE TRIP	SRO
AC6	BKR UT	06/07/86 03:20	06/08/86 01:37	22.28	OPENED/CLOSED UT3	ASSUMED OPENED WHEN TURBINE TRIP	SRO
AC6	BKR UT	06/07/86 03:20	06/08/86 01:37	22.28	OPENED/CLOSED UT4	ASSUMED OPENED WHEN TURBINE TRIP	SRO
AC6	BKR UT-ST	06/07/86 03:20	06/08/86 01:37	22.28	CLOSED/OPENED UT1-ST5	ASSUMED CLOSED WHEN TURBINE TRIP	SRO
AC6	BKR UT-ST	06/07/86 03:20	06/08/86 01:37	22.28	CLOSED/OPENED UT2-ST5	ASSUMED CLOSED WHEN TURBINE TRIP	SRO
AC6	BKR UT-ST	06/07/86 03:20	06/08/86 01:37	22.28	CLOSED/OPENED UT3-ST6	ASSUMED CLOSED WHEN TURBINE TRIP	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC6	BKR UT-ST	06/07/86 03:20	06/08/86 01:37	22.28	CLOSED/OPENED UT4-ST6	ASSUMED CLOSED WHEN TURBINE TRIP	SRO
AC6	BKR UT	06/14/86 01:00	06/15/86 06:05	29.08	OPENED/CLOSED UT1	ASSUMED OPENED WHEN TURBINE TRIP	SRO
AC6	BKR UT	06/14/86 01:00	06/15/86 06:05	29.08	OPENED/CLOSED UT2	ASSUMED OPENED WHEN TURBINE TRIP	SRO
AC6	BKR UT	06/14/86 01:00	06/15/86 06:05	29.08	OPENED/CLOSED UT3	ASSUMED OPENED WHEN TURBINE TRIP	SRO
AC6	BKR UT	06/14/86 01:00	06/15/86 06:05	29.08	OPENED/CLOSED UT4	ASSUMED CLOSED WHEN TURBINE TRIP	SRO
AC6	BKR UT-ST	06/14/86 01:00	06/15/86 06:05	29.08	CLOSED/OPENED UT1-ST5	ASSUMED CLOSED WHEN TURBINE TRIP	SRO
AC6	BKR UT-ST	06/14/86 01:00	06/15/86 06:05	29.08	CLOSED/OPENED UT2-ST5	ASSUMED CLOSED WHEN TURBINE TRIP	SRO
AC6	BKR UT-ST	06/14/86 01:00	06/15/86 06:05	29.08	CLOSED/OPENED UT3-ST6	ASSUMED CLOSED WHEN TURBINE TRIP	SRO
AC6	BKR UT-ST	06/14/86 01:00	06/15/86 06:05	29.08	CLOSED/OPENED UT4-ST6	ASSUMED OPENED WHEN TURBINE OFF	SRO
AC6	BKR UT	07/05/86 09:58	09/04/86 16:57	1470.98	OPENED/CLOSED UT1	ASSUMED OPENED WHEN TURBINE OFF	SRO
AC6	BKR UT	07/05/86 09:58	09/04/86 16:57	1470.98	OPENED/CLOSED UT2	ASSUMED OPENED WHEN TURBINE OFF	SRO
AC6	BKR UT	07/05/86 09:58	09/04/86 16:57	1470.98	OPENED/CLOSED UT3	ASSUMED OPENED WHEN TURBINE OFF	SRO
AC6	BKR UT	07/05/86 09:58	09/04/86 16:57	1470.98	OPENED/CLOSED UT4	ASSUMED CLOSED WHEN TURBINE OFF	SRO
AC6	BKR UT-ST	07/05/86 09:58	09/04/86 16:57	1470.98	CLOSED/OPENED UT1-ST5	ASSUMED CLOSED WHEN TURBINE OFF	SRO
AC6	BKR UT-ST	07/05/86 09:58	09/04/86 16:57	1470.98	CLOSED/OPENED UT2-ST5	ASSUMED CLOSED WHEN TURBINE OFF	SRO
AC6	BKR UT-ST	07/05/86 09:58	09/04/86 16:57	1470.98	CLOSED/OPENED UT3-ST6	ASSUMED CLOSED WHEN TURBINE OFF	SRO
AC6	BKR UT-ST	07/05/86 09:58	09/04/86 16:57	1470.98	CLOSED/OPENED UT4-ST6	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	09/05/86 15:58	09/08/86 01:13	57.25	OPENED/CLOSED UT1	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	09/05/86 15:58	09/08/86 01:13	57.25	OPENED/CLOSED UT2	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	09/05/86 15:58	09/08/86 01:13	57.25	OPENED/CLOSED UT3	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	09/05/86 15:58	09/08/86 01:13	57.25	OPENED/CLOSED UT4	ASSUMED CLOSED WHEN UNIT TRIPED	SRO
AC6	BKR UT-ST	09/05/86 15:58	09/08/86 01:13	57.25	CLOSED/OPENED UT1-ST5	ASSUMED CLOSED WHEN UNIT TRIPED	SRO
AC6	BKR UT-ST	09/05/86 15:58	09/08/86 01:13	57.25	CLOSED/OPENED UT2-ST5	ASSUMED CLOSED WHEN UNIT TRIPED	SRO
AC6	BKR UT-ST	09/05/86 15:58	09/08/86 01:13	57.25	CLOSED/OPENED UT3-ST6	ASSUMED CLOSED WHEN UNIT TRIPED	SRO
AC6	BKR UT-ST	09/05/86 15:58	09/08/86 01:13	57.25	CLOSED/OPENED UT4-ST6	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	09/09/86 10:00	09/10/86 12:05	26.08	OPENED/CLOSED UT1		SRO
AC6	BKR UT	09/09/86 10:00	09/10/86 12:05	26.08	OPENED/CLOSED UT2		SRO
AC6	BKR UT	09/09/86 10:00	09/10/86 12:05	26.08	OPENED/CLOSED UT3		SRO
AC6	BKR UT	09/09/86 10:00	09/10/86 12:05	26.08	OPENED/CLOSED UT4	ASSUMED CLOSED WHEN UNIT TRIPED	SRO
AC6	BKR UT-ST	09/09/86 10:00	09/10/86 12:05	26.08	CLOSED/OPENED UT1-ST5	ASSUMED CLOSED WHEN UNIT TRIPED	SRO
AC6	BKR UT-ST	09/09/86 10:00	09/10/86 12:05	26.08	CLOSED/OPENED UT2-ST5	ASSUMED CLOSED WHEN UNIT TRIPED	SRO
AC6	BKR UT-ST	09/09/86 10:00	09/10/86 12:05	26.08	CLOSED/OPENED UT3-ST6	ASSUMED CLOSED WHEN UNIT TRIPED	SRO
AC6	BKR UT-ST	09/09/86 10:00	09/10/86 12:05	26.08	CLOSED/OPENED UT4-ST6	ASSUMED END TIME	SRO
AC6	BKR GT	01/24/87 05:02	01/25/87 11:02	30.00	CLOSED GT-CP	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	01/31/87 14:05	02/02/87 09:42	43.62	OPENED/CLOSED UT1	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	01/31/87 14:05	02/02/87 09:42	43.62	OPENED/CLOSED UT2	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	01/31/87 14:05	02/02/87 09:42	43.62	OPENED/CLOSED UT3	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	01/31/87 14:05	02/02/87 09:42	43.62	OPENED/CLOSED UT4	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	01/31/87 14:05	02/02/87 09:42	43.62	CLOSED/OPENED UT1-ST5	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	01/31/87 14:05	02/02/87 09:42	43.62	CLOSED/OPENED UT2-ST5	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	01/31/87 14:05	02/02/87 09:42	43.62	CLOSED/OPENED UT3-ST6	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	01/31/87 14:05	02/02/87 09:42	43.62	CLOSED/OPENED UT4-ST6	ASSUMED CLOSED WHEN UNIT TRIP	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC6	BKR UT	02/11/87 08:28	02/13/87 07:15	46.78	OPENED/CLOSED UT1	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	02/11/87 08:28	02/13/87 07:15	46.78	OPENED/CLOSED UT2	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	02/11/87 08:28	02/13/87 07:15	46.78	OPENED/CLOSED UT3	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	02/11/87 08:28	02/13/87 07:15	46.78	OPENED/CLOSED UT4	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	02/11/87 08:28	02/13/87 07:15	46.78	CLOSED/OPENED UT1-ST5	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	02/11/87 08:28	02/13/87 07:15	46.78	CLOSED/OPENED UT2-ST5	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	02/11/87 08:28	02/13/87 07:15	46.78	CLOSED/OPENED UT3-ST6	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	02/11/87 08:28	02/13/87 07:15	46.78	CLOSED/OPENED UT4-ST6	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT	05/02/87 00:47	09/05/87 11:43	3034.93	OPENED/CLOSED UT1	ASSUMED OPENED WHEN TURBINE	SRO
AC6	BKR UT	05/02/87 00:47	09/05/87 11:43	3034.93	OPENED/CLOSED UT2	ASSUMED OPENED WHEN TURBINE	SRO
AC6	BKR UT	05/02/87 00:47	09/05/87 11:43	3034.93	OPENED/CLOSED UT3	ASSUMED OPENED WHEN TURBINE	SRO
AC6	BKR UT	05/02/87 00:47	09/05/87 11:43	3034.93	OPENED/CLOSED UT4	ASSUMED OPENED WHEN TURBINE	SRO
AC6	BKR UT-ST	05/02/87 00:47	09/05/87 11:47	3035.00	CLOSED/OPENED UT1-ST5	ASSUMED CLOSED WHEN TURBINE	SRO
AC6	BKR UT-ST	05/02/87 00:47	05/13/87 08:45	271.97	CLOSED/OPENED UT2-ST5	ASSUMED CLOSED WHEN TURBINE	SRO
AC6	BKR UT-ST	05/02/87 00:47	05/06/87 15:50	111.05	CLOSED/OPENED UT3-ST6	ASSUMED CLOSED WHEN TURBINE	SRO
AC6	BKR UT-ST	05/02/87 00:47	05/31/87 15:52	711.08	CLOSED/OPENED UT4-ST6	ASSUMED CLOSED WHEN TURBINE	SRO
AC6	BKR UT-ST	05/09/87 22:00	05/11/87 04:00	30.00	CLOSED/OPENED UT3-ST6	ASSUMED CLOSED TIME	SRO
AC6	BKR ST	05/10/87 17:47	05/23/88 04:35	9082.80	OPENED/CLOSED ST5		SRO
AC6	BKR ST	05/10/87 17:50	05/23/88 04:45	9082.92	OPENED/CLOSED ST6		SRO
AC6	BKR UT-ST	05/12/87 18:47	09/05/87 11:43	2776.93	CLOSED/OPENED UT3-ST6		SRO
AC6	BKR UT-ST	06/02/87 19:45	09/05/87 11:43	2271.97	CLOSED/OPENED UT4-ST6		SRO
AC6	BKR UT	12/22/87 16:30	12/24/87 02:48	34.30	OPENED/CLOSED UT1	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	12/22/87 16:30	12/24/87 02:48	34.30	OPENED/CLOSED UT2	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	12/22/87 16:30	12/24/87 02:48	34.30	OPENED/CLOSED UT3	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	12/22/87 16:30	12/24/87 02:48	34.30	OPENED/CLOSED UT4	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	12/22/87 16:30	12/24/87 02:48	34.30	CLOSED/OPENED UT1-ST5	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	12/22/87 16:30	12/24/87 02:48	34.30	CLOSED/OPENED UT2-ST5	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	12/22/87 16:30	12/24/87 02:48	34.30	CLOSED/OPENED UT3-ST6	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	12/22/87 16:30	12/24/87 02:48	34.30	CLOSED/OPENED UT4-ST6	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT	02/02/88 21:22	02/03/88 19:15	21.88	OPENED/CLOSED UT1	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	02/02/88 21:22	02/03/88 19:15	21.88	OPENED/CLOSED UT2	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	02/02/88 21:22	02/03/88 19:15	21.88	OPENED/CLOSED UT3	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	02/02/88 21:22	02/03/88 19:15	21.88	OPENED/CLOSED UT4	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	02/02/88 21:22	02/03/88 19:15	21.88	CLOSED/OPENED UT1-ST5	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	02/02/88 21:22	02/03/88 19:15	21.88	CLOSED/OPENED UT2-ST5	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	02/02/88 21:22	02/03/88 19:15	21.88	CLOSED/OPENED UT3-ST6	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	02/02/88 21:22	02/03/88 19:15	21.88	CLOSED/OPENED UT4-ST6	ASSUMED CLOSED WHEN UNIT TRIP	SRO
AC6	BKR UT	05/11/88 02:50	05/29/88 12:51	442.02	OPENED/CLOSED UT1		SRO
AC6	BKR UT	05/11/88 02:50	05/29/88 12:51	442.02	OPENED/CLOSED UT2		SRO
AC6	BKR UT	05/11/88 02:50	05/29/88 12:51	442.02	OPENED/CLOSED UT3		SRO
AC6	BKR UT	05/11/88 02:50	05/29/88 12:51	442.02	OPENED/CLOSED UT4		SRO
AC6	BKR UT-ST	05/11/88 02:50	05/29/88 12:51	442.02	CLOSED/OPENED UT1-ST5		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC6	BKR UT-ST	05/11/88 02:50	05/29/88 12:51	442.02	CLOSED/OPENED UT2-ST5		SRO
AC6	BKR UT-ST	05/11/88 02:50	05/29/88 12:51	442.02	CLOSED/OPENED UT3-ST6		SRO
AC6	BKR UT-ST	05/11/88 02:50	05/29/88 12:51	442.02	CLOSED/OPENED UT4-ST6		SRO
AC6	BKR UT	10/09/88 18:52	10/15/88 12:23	137.52	OPENED/CLOSED UT1	ASSUMED OPENED WHEN TURBINE	SRO
AC6	BKR UT	10/09/88 18:52	10/15/88 12:23	137.52	OPENED/CLOSED UT2	ASSUMED OPENED WHEN TURBINE	SRO
AC6	BKR UT	10/09/88 18:52	10/15/88 12:23	137.52	OPENED/CLOSED UT3	ASSUMED OPENED WHEN TURBINE	SRO
AC6	BKR UT	10/09/88 18:52	10/15/88 12:23	137.52	OPENED/CLOSED UT4	ASSUMED OPENED WHEN TURBINE	SRO
AC6	BKR UT-ST	10/09/88 18:52	10/15/88 12:23	137.52	CLOSED/OPENED UT1-ST5	ASSUMED CLOSED WHEN TURBINE TRIP	SRO
AC6	BKR UT-ST	10/09/88 18:52	10/15/88 12:23	137.52	CLOSED/OPENED UT2-ST5	ASSUMED CLOSED WHEN TURBINE TRIP	SRO
AC6	BKR UT-ST	10/09/88 18:52	10/15/88 12:23	137.52	CLOSED/OPENED UT3-ST6	ASSUMED CLOSED WHEN TURBINE TRIP	SRO
AC6	BKR UT-ST	10/09/88 18:52	10/15/88 12:23	137.52	CLOSED/OPENED UT4-ST6	ASSUMED CLOSED WHEN TURBINE TRIP	SRO
AC6	BKR UT	10/15/88 21:20	10/16/88 16:25	19.08	OPENED/CLOSED UT1		SRO
AC6	BKR UT	10/15/88 21:20	10/16/88 16:25	19.08	OPENED/CLOSED UT2		SRO
AC6	BKR UT	10/15/88 21:20	10/16/88 16:25	19.08	OPENED/CLOSED UT3		SRO
AC6	BKR UT	10/15/88 21:20	10/16/88 16:25	19.08	OPENED/CLOSED UT4		SRO
AC6	BKR UT-ST	10/15/88 21:20	10/16/88 16:25	19.08	CLOSED/OPENED UT1-ST5		SRO
AC6	BKR UT-ST	10/15/88 21:20	10/16/88 16:25	19.08	CLOSED/OPENED UT2-ST5		SRO
AC6	BKR UT-ST	10/15/88 21:20	10/16/88 16:25	19.08	CLOSED/OPENED UT3-ST6		SRO
AC6	BKR UT-ST	10/15/88 21:20	10/16/88 16:25	19.08	CLOSED/OPENED UT4-ST6		SRO
AC6	BKR UT	10/20/88 01:25	11/22/88 19:30	810.08	OPENED/CLOSED UT1		SRO
AC6	BKR UT	10/20/88 01:25	11/22/88 19:30	810.08	OPENED/CLOSED UT2		SRO
AC6	BKR UT	10/20/88 01:25	11/22/88 19:30	810.08	OPENED/CLOSED UT3		SRO
AC6	BKR UT	10/20/88 01:25	11/22/88 19:30	810.08	OPENED/CLOSED UT4		SRO
AC6	BKR UT-ST	10/20/88 01:25	11/22/88 19:30	810.08	CLOSED/OPENED UT1-ST5		SRO
AC6	BKR UT-ST	10/20/88 01:25	11/22/88 19:30	810.08	CLOSED/OPENED UT2-ST5		SRO
AC6	BKR UT-ST	10/20/88 01:25	11/22/88 19:30	810.08	CLOSED/OPENED UT3-ST6		SRO
AC6	BKR UT-ST	10/20/88 01:25	11/22/88 19:30	810.08	CLOSED/OPENED UT4-ST6		SRO
AC6	BKR UT	02/04/89 00:18	06/23/89 21:52	3357.57	OPENED/CLOSED UT1	ASSUMED OPENED WHEN TURBINE	SRO
AC6	BKR UT	02/04/89 00:18	06/23/89 21:52	3357.57	OPENED/CLOSED UT2	ASSUMED OPENED WHEN TURBINE	SRO
AC6	BKR UT	02/04/89 00:18	06/23/89 21:52	3357.57	OPENED/CLOSED UT3	ASSUMED OPENED WHEN TURBINE	SRO
AC6	BKR UT	02/04/89 00:18	06/23/89 21:52	3357.57	OPENED/CLOSED UT4	ASSUMED OPENED WHEN TURBINE	SRO
AC6	BKR UT-ST	02/04/89 00:18	06/23/89 21:52	3357.57	CLOSED/OPENED UT1-ST5	ASSUMED CLOSED WHEN TURBINE TRIP	SRO
AC6	BKR UT-ST	02/04/89 00:18	06/23/89 21:52	3357.57	CLOSED/OPENED UT2-ST5	ASSUMED CLOSED WHEN TURBINE TRIP	SRO
AC6	BKR UT-ST	02/04/89 00:18	06/23/89 21:52	3357.57	CLOSED/OPENED UT3-ST6	ASSUMED CLOSED WHEN TURBINE TRIP	SRO
AC6	BKR UT-ST	02/04/89 00:18	03/25/89 20:27	1196.15	CLOSED/OPENED UT4-ST6	ASSUMED CLOSED WHEN TURBINE TRIP/OPENED TIME	SRO
AC6	BKR UT-ST	03/25/89 21:27	06/23/89 21:52	2160.42	CLOSED/OPENED UT4-ST6		SRO
AC6	BKR ST	05/08/89 03:38	05/15/89 01:39	166.02	OPENED/CLOSED ST5		SRO
AC6	BKR ST	05/08/89 04:03	05/15/89 01:39	165.60	OPENED/CLOSED ST6		SRO
AC6	BKR UT-ST	06/23/89 22:30	06/25/89 01:14	26.73	CLOSED/OPENED UT1-ST5		SRO
AC6	BKR UT-ST	06/23/89 22:30	06/25/89 01:14	26.73	CLOSED/OPENED UT2-ST5		SRO
AC6	BKR UT-ST	06/23/89 22:30	06/25/89 01:14	26.73	CLOSED/OPENED UT3-ST6		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC6	BKR UT-ST	06/23/89 22:30	06/25/89 01:14	26.73	CLOSED/OPENED UT4-ST6		SRO
AC6	BKR UT-ST	10/18/89 15:52	10/19/89 21:52	30.00	CLOSED/OPENED GT-BT	ASSUMED CLOSED TIME	SRO
AC6	BKR UT	03/03/90 00:36	04/08/90 20:38	884.03	OPENED/CLOSED UT1	ASSUMED OPENED WHEN Rx SHUTDOWN	SRO
AC6	BKR UT	03/03/90 00:36	04/08/90 20:38	884.03	OPENED/CLOSED UT2	ASSUMED OPENED WHEN Rx SHUTDOWN	SRO
AC6	BKR UT	03/03/90 00:36	04/08/90 20:38	884.03	OPENED/CLOSED UT3	ASSUMED OPENED WHEN Rx SHUTDOWN	SRO
AC6	BKR UT	03/03/90 00:36	04/08/90 20:38	884.03	OPENED/CLOSED UT4	ASSUMED OPENED WHEN Rx SHUTDOWN	SRO
AC6	BKR UT-ST	03/03/90 00:36	04/08/90 20:38	884.03	CLOSED/OPENED UT1-ST5	ASSUMED CLOSED WHEN Rx SHUTDOWN	SRO
AC6	BKR UT-ST	03/03/90 00:36	03/13/90 18:54	258.30	CLOSED/OPENED UT2-ST5	ASSUMED CLOSED WHEN Rx SHUTDOWN	SRO
AC6	BKR UT-ST	03/03/90 00:36	03/14/90 09:45	273.15	CLOSED/OPENED UT3-ST6	ASSUMED CLOSED WHEN Rx SHUTDOWN	SRO
AC6	BKR UT-ST	03/03/90 00:36	04/08/90 20:38	884.03	CLOSED/OPENED UT4-ST6	ASSUMED CLOSED WHEN Rx SHUTDOWN	SRO
AC6	BKR UT-ST	03/14/90 06:09	04/08/90 20:38	614.48	CLOSED/OPENED UT2-ST5		SRO
AC6	BKR UT-ST	03/14/90 19:50	04/08/90 20:38	600.80	CLOSED/OPENED UT3-ST6		SRO
AC6	BKR ST	03/19/90 11:40	03/20/90 04:25	16.75	OPENED/CLOSED ST5		SRO
AC6	BKR ST	03/19/90 11:40	03/20/90 04:25	16.75	OPENED/CLOSED ST6		SRO
AC6	BKR ST	08/30/90 13:47	08/30/90 14:15	0.47	STATION AUX TRANSFORMER IN MANUAL/ AUTO		SRO
AC6	BKR UT-ST	09/16/90 12:30	11/30/90 10:00	1797.50	CLCSED/OPENED UT1-ST5	ASSUMED CLOSED WHEN UNIT CSD	SRO
AC6	BKR UT-ST	09/16/90 12:30	11/09/90 23:45	1307.25	CLOSED/OPENED UT2-ST5	ASSUMED CLOSED/OPENED WHEN UNIT CSD/BKR SS2 OPENED	SRO
AC6	BKR UT-ST	09/16/90 12:30	12/23/90 19:59	2359.48	CLOSED/OPENED UT3-ST6	ASSUMED CLOSED/OPENED WHEN UNIT CSD/ONLINE	SRO
AC6	BKR UT-ST	09/16/90 12:30	12/23/90 19:59	2359.48	CLOSED/OPENED UT4-ST6	ASSUMED CLOSED/OPENED WHEN UNIT CSD/ONLINE	SRO
AC6	BKR UT-ST	09/29/90 04:53	10/01/90 13:35	56.70	TRIPPED/CLOSED UT3-ST6 (DURING REMOVAL OF 6.9 KV BKR		SRO
AC6	BUS	10/27/90 03:25	10/28/90 09:25	30.00	6.9KV BUS 3 DE-ENERGIZED	ASSUMED END TIME	SRO
AC6	BKR ST	11/02/90 08:50	11/16/90 04:10	331.33	OPENED/CLOSED ST5		SRO
AC6	BKR ST	11/02/90 08:50	11/16/90 04:10	331.33	OPENED/CLOSED ST6		SRO
AC6	BKR UT-ST	11/13/90 21:35	12/05/90 00:25	506.83	CLOSED/OPENED UT2-ST5		SRO
AC6	BKR UT-ST	12/03/90 21:20	12/23/90 19:59	478.65	CLOSED/OPENED UT1-ST5	ASSUMED OPENED WHEN UNIT ONLINE	SRO
AC6	BKR UT-ST	12/06/90 01:30	12/23/90 19:59	426.48	CLOSED/OPENED UT2-ST5	ASSUMED OPENED WHEN UNIT ONLINE	SRO
AC6	BKR UT	12/26/90 12:37	12/28/90 11:48	47.18	OPENED/CLOSED UT1		SRO
AC6	BKR UT	12/26/90 12:37	12/28/90 11:48	47.18	OPENED/CLOSED UT2		SRO
AC6	BKR UT	12/26/90 12:37	12/28/90 11:48	47.18	OPENED/CLOSED UT3		SRO
AC6	BKR UT	12/26/90 12:37	12/28/90 11:48	47.18	OPENED/CLOSED UT4		SRO
AC6	BKR UT-ST	12/26/90 12:37	12/28/90 11:48	47.18	CLOSED/OPENED UT1-ST5		SRO
AC6	BKR UT-ST	12/26/90 12:37	12/28/90 11:48	47.18	CLOSED/OPENED UT2-ST5		SRO
AC6	BKR UT-ST	12/26/90 12:37	12/28/90 11:48	47.18	CLOSED/OPENED UT3-ST6		SRO
AC6	BKR UT-ST	12/26/90 12:37	12/28/90 11:48	47.18	CLOSED/OPENED UT4-ST6		SRO
AC6	BKR UT	03/20/91 19:15	03/22/91 05:20	34.08	OPENED/CLOSED UT1	ASSUMED OPENED WHEN RxTRIP	SRO
AC6	BKR UT	03/20/91 19:15	03/22/91 05:30	34.25	OPENED/CLOSED UT2(FAULT TO CLOSE AT 5:20)	ASSUMED OPENED WHEN RxTRIP	SRO
AC6	BKR UT	03/20/91 19:15	03/22/91 05:20	34.08	OPENED/CLOSED UT3	ASSUMED OPENED WHEN RxTRIP	SRO
AC6	BKR UT	03/20/91 19:15	03/22/91 05:20	34.08	OPENED/CLOSED UT4	ASSUMED OPENED WHEN RxTRIP	SRO
AC6	BKR UT-ST	03/20/91 19:15	03/22/91 05:20	34.08	CLOSED/OPENED ST5-UT1	ASSUMED CLOSED WHEN RxTRIP	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC6	BKR UT-ST	03/20/91 19:15	03/22/91 05:30	34.25	CLOSED/OPENED ST5-UT2	ASSUMED CLOSED WHEN RxTRIP	SRO
AC6	BKR UT-ST	03/20/91 19:15	03/22/91 05:20	34.08	CLOSED/OPENED ST6-UT3	ASSUMED CLOSED WHEN RxTRIP	SRO
AC6	BKR UT-ST	03/20/91 19:15	03/22/91 05:20	34.08	CLOSED/OPENED ST6-UT4	ASSUMED CLOSED WHEN RxTRIP	SRO
AC6	BKR UT	03/22/91 08:14	04/09/91 20:35	444.35	OPENED/CLOSED UT1	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	03/22/91 08:14	04/09/91 20:35	444.35	OPENED/CLOSED UT2	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	03/22/91 08:14	04/09/91 20:35	444.35	OPENED/CLOSED UT3	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	03/22/91 08:14	04/09/91 20:35	444.35	OPENED/CLOSED UT4	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	03/22/91 08:14	04/09/91 20:35	444.35	CLOSED/OPENED ST5-UT1	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	03/22/91 08:14	04/09/91 20:35	444.35	CLOSED/OPENED ST5-UT2	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	03/22/91 08:14	03/29/91 02:55	162.68	CLOSED/OPENED ST6-UT3	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	03/22/91 08:14	04/09/91 20:35	444.35	CLOSED/OPENED ST6-UT4	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	03/30/91 21:18	04/09/91 20:35	239.28	CLOSED/OPENED ST6-UT3	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	04/10/91 09:36	04/11/91 03:15	17.65	OPENED/CLOSED UT1	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	04/10/91 09:36	04/11/91 03:15	17.65	OPENED/CLOSED UT2	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	04/10/91 09:36	04/11/91 03:15	17.65	OPENED/CLOSED UT3	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	04/10/91 09:36	04/11/91 03:15	17.65	OPENED/CLOSED UT4	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	04/10/91 09:36	04/11/91 03:15	17.65	CLOSED/OPENED ST5-UT1	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	04/10/91 09:36	04/11/91 03:15	17.65	CLOSED/OPENED ST5-UT2	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	04/10/91 09:36	04/11/91 03:15	17.65	CLOSED/OPENED ST6-UT3	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	04/10/91 09:36	04/11/91 03:15	17.65	CLOSED/OPENED ST6-UT4	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	05/12/91 00:10	05/24/91 00:23	288.22	OPENED/CLOSED UT1	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	05/12/91 00:10	05/24/91 00:23	288.22	OPENED/CLOSED UT2	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	05/12/91 00:10	05/24/91 00:23	288.22	OPENED/CLOSED UT3	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	05/12/91 00:10	05/24/91 00:23	288.22	OPENED/CLOSED UT4	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	05/12/91 00:10	05/24/91 00:23	288.22	CLOSED/OPENED ST5-UT1	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	05/12/91 00:10	05/24/91 00:23	288.22	CLOSED/OPENED ST5-UT2	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	05/12/91 00:10	05/24/91 00:23	288.22	CLOSED/OPENED ST6-UT3	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT-ST	05/12/91 00:10	05/24/91 00:23	288.22	CLOSED/OPENED ST6-UT4	ASSUMED OPENED WHEN UNIT TRIP	SRO
AC6	BKR UT	08/24/91 10:29	08/24/91 18:58	8.48	OPENED/CLOSED UT1		SRO
AC6	BKR UT	08/24/91 10:29	08/24/91 18:58	8.48	OPENED/CLOSED UT2		SRO
AC6	BKR UT	08/24/91 10:29	08/24/91 18:58	8.48	OPENED/CLOSED UT3		SRO
AC6	BKR UT	08/24/91 10:29	08/24/91 18:58	8.48	OPENED/CLOSED UT4		SRO
AC6	BKR UT-ST	08/24/91 10:29	08/24/91 18:58	8.48	CLOSED/OPENED ST5-UT1		SRO
AC6	BKR UT-ST	08/24/91 10:29	08/24/91 18:58	8.48	CLOSED/OPENED ST5-UT2		SRO
AC6	BKR UT-ST	08/24/91 10:29	08/24/91 18:58	8.48	CLOSED/OPENED ST6-UT3		SRO
AC6	BKR UT-ST	08/24/91 10:29	08/24/91 18:58	8.48	CLOSED/OPENED ST6-UT4		SRO
AC6	BKR UT	10/18/91 06:05	11/04/91 11:40	413.58	OPENED/CLOSED UT1		SRO
AC6	BKR UT	10/18/91 06:05	11/04/91 11:40	413.58	OPENED/CLOSED UT2		SRO
AC6	BKR UT	10/18/91 06:05	11/04/91 11:40	413.58	OPENED/CLOSED UT3		SRO
AC6	BKR UT	10/18/91 06:05	11/04/91 11:40	413.58	OPENED/CLOSED UT4		SRO
AC6	BKR UT-ST	10/18/91 06:05	11/04/91 11:40	413.58	CLOSED/OPENED ST5-UT1		SRO
AC6	BKR UT-ST	10/18/91 06:05	11/04/91 11:40	413.58	CLOSED/OPENED ST5-UT2		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AC6	BKR UT-ST	10/18/91 06:05	11/04/91 11:40	413.58	CLOSED/OPENED ST6-UT3		SRO
AC6	BKR UT-ST	10/18/91 06:05	11/04/91 11:40	413.58	CLOSED/OPENED ST6-UT4		SRO
AFW	MDP	01/09/85 00:05	01/09/85 06:47	6.70	STARTED/SECURED 31 ABFP FOR CST WARM UP	ABFP-31	SRO
AFW	MDP	01/23/85 22:02	01/23/85 22:32	0.50	STARTED/SECURED 31 ABFP	ABFP-31 STNG, 30 MIN	SRO
AFW	MDP	01/23/85 22:02	01/23/85 22:32	0.50	STARTED/SECURED 33 ABFP	ABFP-33 STNG, 30 MIN	SRO
AFW	MDP	06/08/85 11:35	06/08/85 12:05	0.50	STARTED/SECURED 31 ABFP	ABFP-31 STNG, 30 MIN	SRO
AFW	MDP	06/08/85 20:57	06/08/85 22:30	1.55	STARTED/SECURED 31 ABFP TO ADD CHEMICAL TO 31 & 32	ABFP-31	SRO
AFW	MDP	06/09/85 12:13	06/09/85 13:13	1.00	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	06/09/85 16:36	06/09/85 17:20	0.73	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	06/09/85 19:20	06/09/85 19:40	0.33	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	06/09/85 21:50	06/09/85 22:30	0.67	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	06/15/85 22:03	06/15/85 22:26	0.38	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	06/16/85 00:20	06/16/85 01:00	0.67	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	06/16/85 02:35	06/16/85 03:10	0.58	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	06/17/85 02:20	06/17/85 02:45	0.42	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	06/17/85 03:50	06/17/85 04:25	0.58	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	06/18/85 17:31	06/18/85 17:58	0.45	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	06/18/85 19:26	06/18/85 20:03	0.62	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	06/19/85 19:21	06/19/85 19:59	0.63	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	06/19/85 19:22	06/19/85 20:02	0.67	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	06/19/85 22:37	06/19/85 23:12	0.58	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	06/19/85 22:38	06/19/85 23:12	0.57	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	06/21/85 17:05	06/21/85 17:25	0.33	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	06/21/85 19:40	06/21/85 20:45	1.08	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	06/24/85 23:11	06/25/85 00:36	1.42	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	06/25/85 02:32	06/25/85 04:00	1.47	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	06/25/85 19:30	06/25/85 20:05	0.58	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	06/27/85 01:38	06/27/85 01:58	0.33	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	06/27/85 02:40	06/27/85 08:40	6.00	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	06/27/85 13:54	06/27/85 14:23	0.48	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	07/01/85 11:15	07/01/85 11:25	0.17	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	07/01/85 14:40	07/01/85 15:25	0.75	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	07/03/85 05:14	07/03/85 05:19	0.08	STARTED/SECURED 33 ABFP TO FILL 34 S/G FOR HP	ABFP-33	SRO
AFW	MDP	07/03/85 05:40	07/03/85 05:55	0.25	STARTED/SECURED 33 ABFP TO FILL 34 S/G FOR HP	ABFP-33	SRO
AFW	MDP	07/03/85 08:15	07/03/85 08:35	0.33	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	07/04/85 01:45	07/04/85 02:03	0.30	STARTED/SECURED 31 ABFP TO ADD CHEMICALS TO 32 S/G	ABFP-31	SRO
AFW	MDP	07/04/85 01:45	07/04/85 02:03	0.30	STARTED/SECURED 33 ABFP TO ADD CHEMICALS TO 33 S/G	ABFP-33	SRO
AFW	MDP	07/04/85 04:08	07/04/85 05:03	0.92	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	07/04/85 04:50	07/04/85 04:55	0.08	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	07/04/85 06:45	07/04/85 07:05	0.33	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	07/04/85 17:08	07/04/85 17:20	0.20	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	07/04/85 18:05	07/04/85 18:18	0.22	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AFW	MDP	07/05/85 03:30	07/05/85 03:45	0.25	STARTED/SECURED 31 ABFP TO ADD CHEMICALS TO 31 S/G	ABFP-31	SRO
AFW	MDP	07/10/85 22:39	07/10/85 23:22	0.72	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	07/11/85 00:39	07/11/85 02:30	1.85	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	07/11/85 05:15	07/11/85 05:55	0.67	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	07/15/85 22:23	07/15/85 22:43	0.33	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	07/16/85 07:27	07/16/85 08:40	1.22	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	07/16/85 13:35	07/16/85 14:56	1.35	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	07/17/85 13:35	07/17/85 14:00	0.42	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	07/19/85 21:45	07/19/85 22:15	0.50	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	07/22/85 19:20	07/22/85 19:40	0.33	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	07/22/85 21:30	07/22/85 22:30	1.00	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	07/23/85 04:45	07/23/85 05:05	0.33	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	07/23/85 18:48	07/23/85 19:03	0.25	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	07/23/85 20:50	07/23/85 21:50	1.00	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	07/24/85 01:40	07/24/85 02:05	0.42	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	07/24/85 03:35	07/24/85 03:45	0.17	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	07/24/85 09:40	07/24/85 11:31	1.85	STARTED/SECURED 33 ABFP TO 3 FOR HYDRO	ABFP-33	SRO
AFW	MDP	07/24/85 18:00	07/24/85 18:01	0.02	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	07/24/85 18:07	07/24/85 18:09	0.03	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	07/24/85 18:36	07/24/85 18:53	0.28	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	07/25/85 00:50	07/25/85 07:15	6.42	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	07/26/85 17:35	07/26/85 18:40	1.08	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	07/27/85 15:42	07/27/85 17:57	2.25	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	07/27/85 19:05	07/27/85 19:17	0.20	STARTED/SECURED 31 ABFP FOR HYDRO	ABFP-31	SRO
AFW	MDP	07/27/85 21:20	07/27/85 22:21	1.02	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	07/28/85 13:50	07/28/85 16:09	2.32	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	07/28/85 16:26	07/28/85 16:29	0.05	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	07/30/85 00:08	07/30/85 00:33	0.42	STARTED/SECURED 31 ABFP FOR 32 S/G HYDRO	ABFP-31	SRO
AFW	MDP	07/30/85 03:45	07/30/85 07:10	3.42	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	07/30/85 07:27	07/30/85 09:40	2.22	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	07/30/85 10:50	07/30/85 11:08	0.30	STARTED/SECURED 33 ABFP FOR 34 S/G HYDRO	ABFP-33	SRO
AFW	MDP	07/30/85 11:35	07/30/85 11:40	0.08	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	07/30/85 16:14	07/30/85 16:48	0.57	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	07/30/85 21:34	07/30/85 21:57	0.38	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	08/01/85 08:55	08/01/85 11:59	3.07	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	08/01/85 12:25	08/01/85 12:26	0.02	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	08/01/85 12:36	08/01/85 12:45	0.15	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	08/01/85 22:25	08/01/85 22:40	0.25	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	08/06/85 23:48	08/07/85 00:06	0.30	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	08/07/85 03:03	08/07/85 03:42	0.65	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	08/07/85 11:06	08/07/85 11:31	0.42	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	08/07/85 14:31	08/07/85 14:37	0.10	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AFW	MDP	09/01/85 05:44	09/01/85 05:48	0.07	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	09/04/85 14:15	09/04/85 14:18	0.05	STARTED/SECURED 31 ABFP FOR TEST	ABFP-31	SRO
AFW	MDP	09/04/85 15:55	09/04/85 19:00	3.08	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	09/05/85 13:35	09/05/85 14:00	0.42	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	09/05/85 16:44	09/05/85 17:54	1.17	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	09/05/85 20:10	09/05/85 20:35	0.42	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	09/05/85 21:00	09/05/85 21:25	0.42	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	09/06/85 00:35	09/06/85 01:25	0.83	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	09/14/85 08:04	09/14/85 09:25	1.35	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	09/22/85 22:08	09/22/85 22:38	0.50	STARTED/SECURED 31 ABFP	ABFP-31 STNG, 30 MIN	SRO
AFW	MDP	09/22/85 22:08	09/22/85 22:38	0.50	STARTED/SECURED 33 ABFP	ABFP-33 ETNG, 30 MIN	SRO
AFW	MDP	09/25/85 09:05	09/25/85 13:20	4.25	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	09/25/85 09:05	09/25/85 12:20	3.25	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	09/26/85 20:10	09/26/85 20:29	0.32	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	09/26/85 20:10	09/26/85 20:29	0.32	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	09/26/85 22:29	09/26/85 22:30	0.02	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	09/26/85 22:29	09/26/85 22:30	0.02	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	09/27/85 04:15	09/27/85 04:45	0.50	STARTED/SECURED 31 ABFP	ABFP-31 STNG, 30 MIN	SRO
AFW	TDP	09/27/85 04:15	09/27/85 04:45	0.50	STARTED/SECURED 32 ABFP	ABFP-32 ETNG, 30 MIN	SRO
AFW	MDP	03/01/86 01:58	03/01/86 02:28	0.50	STARTED/SECURED 31 ABFP	ABFP-31 STNG, 30 MIN	SRO
AFW	MDP	03/01/86 02:00	03/01/86 02:30	0.50	STARTED/SECURED 33 ABFP	ABFP-33 STNG, 30 MIN	SRO
AFW	MDP	04/27/86 08:06	04/27/86 08:29	0.38	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	04/27/86 09:06	04/27/86 09:21	0.25	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	04/27/86 10:42	04/27/86 10:57	0.25	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	04/27/86 11:05	04/27/86 11:40	0.58	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	04/27/86 13:18	04/27/86 13:42	0.40	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	04/27/86 13:35	04/27/86 13:48	0.22	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	04/27/86 15:55	04/27/86 17:00	1.08	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	04/27/86 18:35	04/27/86 19:05	0.50	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	04/27/86 20:15	04/27/86 20:55	0.67	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	04/27/86 20:30	04/27/86 22:00	1.50	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	05/04/86 12:50	05/04/86 13:20	0.50	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33 ETNG, 30 MIN	SRO
AFW	MDP	05/05/86 12:05	05/05/86 12:50	0.75	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	05/08/86 00:35	05/08/86 00:53	0.30	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	05/08/86 00:35	05/08/86 00:56	0.35	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	05/08/86 03:30	05/08/86 04:18	0.80	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	05/08/86 03:50	05/08/86 04:35	0.75	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	05/08/86 10:25	05/08/86 10:55	0.50	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	05/08/86 12:10	05/08/86 12:40	0.50	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	05/09/86 00:30	05/09/86 00:50	0.33	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	05/09/86 04:40	05/09/86 05:48	1.13	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	05/10/86 12:37	05/10/86 13:09	0.53	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AFW	MDP	05/10/86 20:55	05/10/86 21:05	0.17	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	05/10/86 22:18	05/10/86 22:55	0.62	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	05/11/86 00:35	05/11/86 02:15	1.67	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	05/11/86 03:10	05/11/86 04:15	1.08	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	05/11/86 05:00	05/11/86 05:30	0.50	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/12/86 05:20	05/12/86 05:35	0.25	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	05/12/86 06:23	05/12/86 07:10	0.78	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	05/12/86 11:10	05/12/86 11:40	0.50	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	05/12/86 18:29	05/12/86 18:40	0.18	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	05/12/86 20:07	05/12/86 21:53	1.77	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	05/12/86 20:08	05/12/86 20:20	0.20	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	05/12/86 21:25	05/12/86 22:00	0.58	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	05/13/86 01:05	05/13/86 01:37	0.53	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	05/13/86 02:21	05/13/86 02:38	0.28	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	05/13/86 03:43	05/13/86 04:35	0.87	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	05/13/86 06:27	05/13/86 07:05	0.63	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	05/16/86 18:05	05/16/86 18:35	0.50	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	05/16/86 20:00	05/16/86 20:30	0.50	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	05/16/86 21:15	05/16/86 21:45	0.50	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	05/17/86 00:04	05/17/86 01:49	1.75	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	05/17/86 01:55	05/17/86 02:38	0.72	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	05/17/86 05:02	05/17/86 06:05	1.05	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	05/17/86 06:13	05/17/86 07:04	0.85	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	05/17/86 11:00	05/17/86 11:44	0.73	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/17/86 13:15	05/17/86 13:45	0.50	STARTED/SECURED 31 ABFP	ABFP-31 STNG, 30 MIN	SRO
AFW	MDP	05/17/86 13:15	05/18/86 11:18	22.05	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/18/86 13:07	05/18/86 14:07	1.00	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/18/86 23:57	05/19/86 03:15	3.30	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/19/86 00:02	05/19/86 03:15	3.22	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/20/86 06:58	05/20/86 07:28	0.50	STARTED/SECURED 31 ABFP	ABFP-31 STNG, 30 MIN	SRO
AFW	MDP	05/20/86 06:58	05/20/86 07:28	0.50	STARTED/SECURED 33 ABFP	ABFP-33 STNG, 30 MIN	SRO
AFW	MDP	05/20/86 09:19	05/20/86 09:57	0.63	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/20/86 09:19	05/20/86 09:57	0.63	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/20/86 12:18	05/20/86 12:48	0.50	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/20/86 12:18	05/20/86 12:48	0.50	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/20/86 14:50	05/20/86 15:20	0.50	STARTED/SECURED 31 ABFP	ABFP-31 STNG, 30 MIN	SRO
AFW	MDP	05/20/86 14:50	05/20/86 15:20	0.50	STARTED/SECURED 33 ABFP	ABFP-33 ETNG, 30 MIN	SRO
AFW	MDP	05/20/86 16:45	05/20/86 18:10	1.42	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	05/20/86 16:45	05/20/86 18:10	1.42	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	05/20/86 20:25	05/20/86 21:20	0.92	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	05/20/86 20:25	05/20/86 21:20	0.92	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	05/24/86 20:55	05/24/86 21:25	0.50	STARTED/SECURED 31 ABFP	ABFP-31 STNG, 30 MIN	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AFW	MDP	05/24/86 20:55	05/24/86 21:25	0.50	STARTED/SECURED 33 ABFP	ABFP-33 STNG, 30 MIN	SRO
AFW	MDP	05/26/86 19:16	05/27/86 01:55	6.65	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/26/86 19:16	05/27/86 01:55	6.65	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/27/86 02:51	05/27/86 04:15	1.40	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/27/86 02:51	05/27/86 04:15	1.40	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/27/86 05:30	05/27/86 06:45	1.25	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/27/86 05:30	05/27/86 06:30	1.00	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/27/86 08:05	05/27/86 08:40	0.58	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/27/86 08:05	05/27/86 08:40	0.58	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/27/86 11:45	05/27/86 13:05	1.33	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/27/86 13:05	05/27/86 13:40	0.58	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/27/86 13:40	05/27/86 16:04	2.40	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/27/86 15:19	05/27/86 15:38	0.32	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/27/86 16:02	05/27/86 17:10	1.13	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/27/86 17:16	05/27/86 18:27	1.18	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/27/86 18:37	05/27/86 19:33	0.93	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/27/86 20:16	05/28/86 02:30	6.23	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/28/86 01:34	05/28/86 02:04	0.50	STARTED/SECURED 33 ABFP	ABFP-33 STNG, 30 MIN	SRO
AFW	MDP	06/07/86 03:22	06/07/86 20:55	17.55	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/07/86 03:22	06/07/86 20:55	17.55	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	06/07/86 20:57	06/08/86 00:21	3.40	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/07/86 20:57	06/08/86 00:21	3.40	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	06/14/86 01:25	06/15/86 01:43	24.30	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/14/86 01:25	06/15/86 01:53	24.47	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	07/05/86 10:00	07/05/86 23:50	13.83	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	07/05/86 10:00	07/05/86 23:50	13.83	STARTED/SECURED 32 ABFP	ABFP-32	SRO
AFW	TDP	07/06/86 00:48	07/07/86 13:15	36.45	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	07/06/86 00:48	07/07/86 05:35	28.78	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	07/07/86 06:23	07/07/86 06:58	0.58	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	07/07/86 08:16	07/07/86 10:10	1.90	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	07/07/86 11:00	07/07/86 12:15	1.25	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	07/07/86 13:25	07/07/86 13:55	0.50	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	07/07/86 13:50	07/07/86 14:23	0.55	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	07/07/86 15:35	07/07/86 17:40	2.08	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	07/07/86 15:35	07/07/86 17:40	2.08	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	07/07/86 18:59	07/08/86 23:15	28.27	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	07/07/86 19:00	07/08/86 23:36	28.60	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	07/08/86 01:18	07/09/86 15:04	37.77	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	07/09/86 01:19	07/09/86 15:09	13.83	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	07/09/86 15:26	07/10/86 13:10	21.73	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	07/09/86 15:26	07/10/86 13:02	21.60	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	07/10/86 13:11	07/10/86 13:12	0.02	STARTED/SECURED 33 ABFP	ABFP-33	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AFW	MDP	07/10/86 13:12	07/10/86 20:22	7.17	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	07/10/86 21:18	07/10/86 22:02	0.73	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	07/11/86 06:29	07/11/86 07:10	0.68	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	07/11/86 10:50	07/11/86 13:08	2.30	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	07/11/86 16:51	07/11/86 17:07	0.27	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	07/11/86 19:39	07/11/86 22:27	2.80	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	07/12/86 08:30	07/12/86 17:56	9.43	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	07/26/86 23:17	07/26/86 23:45	0.47	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	07/27/86 01:56	07/27/86 03:58	2.03	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	07/27/86 06:10	07/27/86 07:05	0.92	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	07/28/86 04:39	07/28/86 05:22	0.72	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	07/28/86 06:13	07/28/86 08:10	1.95	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	07/28/86 12:54	07/28/86 13:49	0.92	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	08/06/86 15:55	08/06/86 16:21	0.43	STARTED/SECURED 33 ABFP FOR MTC	ABFP-33	SRO
AFW	MDP	08/07/86 10:50	08/07/86 11:13	0.38	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	08/07/86 14:33	08/07/86 15:45	1.20	STARTED/SECURED 33 ABFP TO ADD CHEMICAL TO 33 & 34	ABFP-33	SRO
AFW	MDP	08/07/86 18:28	08/07/86 19:48	1.33	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	08/22/86 01:30	08/22/86 02:00	0.50	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	08/22/86 04:15	08/22/86 05:30	1.25	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	08/22/86 09:15	08/22/86 09:44	0.48	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	08/22/86 10:10	08/22/86 11:05	0.92	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	08/22/86 13:02	08/22/86 14:28	1.43	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	08/22/86 19:00	08/22/86 19:31	0.52	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	TDP	08/22/86 19:03	08/22/86 19:18	0.25	STARTED/SECURED 32 ABFP TO FILL 33 & 34 S/G	ABFP-32	SRO
AFW	MDP	09/02/86 08:01	09/02/86 10:05	2.07	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	09/02/86 08:01	09/02/86 09:20	1.32	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	TDP	09/02/86 08:45	09/02/86 09:05	0.33	STARTED/SECURED 32 ABFP	ABFP-32	SRO
AFW	MDP	09/02/86 11:05	09/02/86 12:33	1.47	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	09/02/86 11:05	09/02/86 11:35	0.50	STARTED/SECURED 33 ABFP	ABFP-33 ETNG, 30 MIN	SRO
AFW	MDP	09/02/86 13:39	09/02/86 14:09	0.50	STARTED/SECURED 31 ABFP	ABFP-31 ETNG, 30 MIN	SRO
AFW	MDP	09/02/86 20:45	09/02/86 21:15	0.50	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	09/02/86 21:15	09/02/86 21:55	0.67	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	09/02/86 22:40	09/04/86 11:23	36.72	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	09/02/86 23:40	09/04/86 11:22	35.70	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	09/07/86 02:10	09/07/86 02:40	0.50	STARTED/SECURED 31 ABFP	ABFP-31 ETNG, 30 MIN	SRO
AFW	MDP	09/07/86 02:10	09/07/86 02:40	0.50	STARTED/SECURED 33 ABFP	ABFP-33 STNG, 30 MIN	SRO
AFW	MDP	09/11/86 18:18	09/11/86 18:22	0.07	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	09/11/86 20:16	09/11/86 20:19	0.05	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	TDP	10/30/86 02:40	10/30/86 03:10	0.50	STARTED/SECURED 32 ABFP	ABFP-32	SRO
AFW	MDP	11/14/86 13:48	11/14/86 14:18	0.50	STARTED/SECURED 31 ABFP	ABFP-31 STNG, 30 MIN	SRO
AFW	TDP	11/14/86 14:18	11/14/86 21:25	7.12	STARTED/SECURED 32 ABFP	ABFP-32	SRO
AFW	MDP	11/14/86 19:25	11/14/86 19:45	0.33	STARTED/SECURED 31 ABFP FOR PT RETEST	ABFP-31	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AFW	MDP	11/14/86 21:20	11/15/86 03:30	6.17	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	11/22/86 17:20	11/22/86 17:25	0.08	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	01/31/87 19:01	01/31/87 19:31	0.50	STARTED/SECURED 31 ABFP	ABFP-31 STNG, 30 MIN	SRO
AFW	MDP	01/31/87 19:06	01/31/87 19:36	0.50	STARTED/SECURED 33 ABFP	ABFP-33 STNG, 30 MIN	SRO
AFW	MDP	01/31/87 19:44	01/31/87 21:12	1.47	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	01/31/87 19:44	01/31/87 21:22	1.63	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	01/31/87 21:22	02/01/87 15:58	18.60	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	01/31/87 21:30	01/31/87 23:22	1.87	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	01/31/87 23:48	02/01/87 19:55	20.12	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	02/01/87 16:04	02/01/87 20:00	3.93	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	02/01/87 20:00	02/01/87 21:50	1.83	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	02/01/87 20:04	02/01/87 21:30	1.43	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	02/01/87 21:31	02/02/87 04:32	7.02	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	02/01/87 21:51	02/02/87 08:05	10.23	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	02/02/87 04:36	02/02/87 07:58	3.37	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	02/11/87 09:15	02/11/87 09:45	0.50	STARTED/SECURED 33 ABFP	ABFP-33 STNG, 30 MIN	SRO
AFW	MDP	02/11/87 09:50	02/11/87 10:20	0.50	STARTED/SECURED 31 ABFP	ABFP-31 STNG, 30 MIN	SRO
AFW	MDP	02/11/87 10:38	02/11/87 19:00	8.37	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	02/11/87 10:38	02/12/87 05:25	18.78	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	02/11/87 19:02	02/12/87 05:30	10.47	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	02/12/87 05:35	02/12/87 15:37	10.03	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	02/12/87 15:40	02/13/87 22:12	30.53	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	02/12/87 22:16	02/13/87 05:20	7.07	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	02/13/87 04:50	02/13/87 05:20	0.50	STARTED/SECURED 33 ABFP	ABFP-33 STNG, 30 MIN	SRO
AFW	MDP	03/27/87 19:35	03/28/87 06:31	10.93	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	03/27/87 19:36	03/28/87 16:15	20.65	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	03/28/87 15:30	03/28/87 16:00	0.50	STARTED/SECURED 31 ABFP	ABFP-31 STNG, 30 MIN	SRO
AFW	MDP	03/28/87 17:19	03/28/87 18:19	1.00	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	03/30/87 20:50	03/30/87 21:10	0.33	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	03/30/87 21:50	03/30/87 22:42	0.87	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	03/31/87 02:01	03/31/87 02:38	0.62	STARTED/SECURED 33 ABFP FOR PT AND FILL 34 S/G	ABFP-33	SRO
AFW	MDP	03/31/87 02:08	03/31/87 02:38	0.50	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	03/31/87 03:46	03/31/87 15:03	11.28	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	04/01/87 01:32	04/01/87 01:50	0.30	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	04/01/87 02:15	04/01/87 02:30	0.25	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	04/01/87 03:16	04/01/87 03:54	0.63	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	04/01/87 04:05	04/01/87 04:43	0.63	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	04/01/87 11:38	04/01/87 12:48	1.17	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	04/01/87 11:40	04/01/87 12:48	1.13	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	04/03/87 07:10	04/03/87 21:15	14.08	STARTED/SECURED 31 ABFP AND SET FOR AT POWER OPS	ABFP-31	SRO
AFW	TDP	04/03/87 09:15	04/03/87 21:15	12.00	STARTED/SECURED 32 ABFP AND SET FOR AT POWER OPS	ABFP-32	SRO
AFW	MDP	04/03/87 22:16	04/03/87 22:43	0.45	STARTED/SECURED 31 ABFP	ABFP-31	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AFW	MDP	04/03/87 22:16	04/03/87 22:43	0.45	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	TDP	04/03/87 22:16	04/03/87 22:21	0.08	STARTED/SECURED 32 ABFP	ABFP-32	SRO
AFW	MDP	04/04/87 02:17	04/04/87 02:47	0.50	STARTED/SECURED 31 ABFP	ABFP-31 STNG, 30 MIN	SRO
AFW	MDP	04/04/87 02:17	04/04/87 02:47	0.50	STARTED/SECURED 33 ABFP	ABFP-33 STNG, 30 MIN	SRO
AFW	TDP	04/30/87 13:08	04/30/87 13:31	0.38	STARTED/SECURED 32 ABFP	ABFP-32	SRO
AFW	MDP	05/02/87 00:45	05/02/87 22:30	21.75	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/02/87 00:46	05/03/87 00:10	23.40	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/03/87 00:05	05/03/87 00:10	0.08	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/03/87 01:15	05/03/87 03:44	2.48	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	05/03/87 01:15	05/03/87 01:30	0.25	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	05/03/87 22:05	05/04/87 00:00	1.92	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	05/04/87 01:05	05/04/87 01:27	0.37	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	05/04/87 02:43	05/04/87 03:35	0.87	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	05/04/87 04:00	05/04/87 06:10	2.17	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	05/04/87 13:33	05/04/87 13:52	0.32	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/04/87 13:53	05/04/87 14:16	0.38	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/04/87 19:35	05/04/87 20:33	0.97	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	05/05/87 02:50	05/05/87 03:15	0.42	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	05/05/87 12:53	05/05/87 13:20	0.45	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	05/13/87 20:52	05/13/87 22:18	1.43	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	05/14/87 02:53	05/14/87 03:32	0.65	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	05/14/87 05:05	05/14/87 06:10	1.08	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	05/14/87 10:23	05/14/87 12:33	2.17	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	05/14/87 20:35	05/14/87 21:25	0.83	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	05/15/87 19:25	05/15/87 19:45	0.33	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	05/15/87 20:50	05/15/87 21:40	0.83	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	05/15/87 23:55	05/16/87 00:58	1.05	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	05/16/87 20:25	05/16/87 20:40	0.25	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	05/16/87 22:25	05/16/87 23:15	0.83	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	05/17/87 04:08	05/17/87 04:35	0.45	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	05/17/87 18:35	05/17/87 18:55	0.33	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	05/17/87 20:15	05/17/87 21:05	0.83	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	05/18/87 00:30	05/18/87 01:05	0.58	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	05/21/87 05:26	05/21/87 08:10	2.73	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G FOR HYDRO	ABFP-31	SRO
AFW	MDP	05/21/87 08:25	05/21/87 09:40	1.25	STARTED/SECURED 31 ABFP FOR HYDRO (CONTINUED)	ABFP-31	SRO
AFW	MDP	05/23/87 02:00	05/23/87 02:35	0.58	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	05/23/87 04:08	05/23/87 05:00	0.87	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	05/23/87 08:14	05/23/87 10:30	2.27	STARTED/SECURED 33 ABFP TO HYDRO 33 S/G	ABFP-33	SRO
AFW	MDP	05/23/87 18:25	05/23/87 19:05	0.67	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	05/23/87 19:15	05/23/87 19:45	0.50	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	05/23/87 23:35	05/24/87 00:31	0.93	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	05/24/87 02:08	05/24/87 02:29	0.35	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AFW	MDP	05/24/87 05:03	05/24/87 05:47	0.73	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	05/24/87 06:23	05/24/87 09:00	2.62	STARTED/SECURED 33 ABFP TO HYDRO 34 S/G	ABFP-33	SRO
AFW	MDP	05/24/87 14:15	05/24/87 15:00	0.75	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	05/24/87 21:15	05/24/87 21:40	0.42	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	05/25/87 01:13	05/25/87 02:00	0.78	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	05/25/87 04:33	05/25/87 05:11	0.63	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	05/25/87 10:05	05/25/87 10:25	0.33	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	05/25/87 10:35	05/25/87 10:45	0.17	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	06/14/87 05:00	06/14/87 05:02	0.03	BUMPED 31 ABFP	ABFP-31 2 MIN	SRO
AFW	MDP	06/23/87 21:05	06/23/87 21:06	0.02	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/23/87 21:13	06/23/87 21:15	0.03	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/23/87 21:27	06/23/87 21:27	0.00	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/23/87 22:00	06/23/87 22:04	0.07	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	07/15/87 21:20	07/15/87 21:23	0.05	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	07/16/87 09:01	07/16/87 09:11	0.17	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-33	SRO
AFW	MDP	07/16/87 09:18	07/16/87 09:31	0.22	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-31	SRO
AFW	MDP	07/16/87 10:40	07/16/87 11:50	1.17	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-33	SRO
AFW	MDP	07/16/87 10:42	07/16/87 11:50	1.13	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	07/17/87 10:24	07/17/87 10:48	0.40	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	07/17/87 11:52	07/17/87 12:41	0.82	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	07/17/87 13:10	07/17/87 13:57	0.78	STARTED/SECURED 33 ABFP	ABFP-31	SRO
AFW	MDP	07/18/87 01:30	07/18/87 01:52	0.37	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	07/18/87 05:42	07/18/87 06:49	1.12	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-33	SRO
AFW	MDP	07/30/87 15:35	07/30/87 15:36	0.02	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	07/30/87 15:37	07/30/87 16:00	0.38	STARTED/SECURED 33 ABFP	ABFP-31	SRO
AFW	MDP	08/17/87 21:02	08/17/87 21:05	0.05	STARTED/SECURED 31 ABFP	ABFP-33	SRO
AFW	MDP	08/17/87 21:02	08/17/87 21:05	0.05	STARTED/SECURED 33 ABFP	ABFP-31	SRO
AFW	MDP	08/18/87 21:38	08/19/87 10:08	12.50	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	08/19/87 00:00	08/19/87 01:40	1.67	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	08/19/87 05:27	08/19/87 05:50	0.38	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-33	SRO
AFW	MDP	08/19/87 10:42	08/19/87 11:06	0.40	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	08/19/87 12:56	08/19/87 13:48	0.87	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	08/20/87 18:14	08/20/87 18:25	0.18	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	08/20/87 19:17	08/20/87 21:08	1.85	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-31	SRO
AFW	MDP	08/21/87 15:53	08/21/87 16:14	0.35	STARTED/SECURED 31 ABFP	ABFP-33	SRO
AFW	MDP	08/21/87 16:19	08/21/87 16:37	0.30	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	08/23/87 12:12	08/23/87 13:35	1.38	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	08/23/87 19:47	08/23/87 20:39	0.87	STARTED/SECURED 33 ABFP	ABFP-31 ETNG, 30 MIN	SRO
AFW	MDP	08/23/87 21:47	08/23/87 22:17	0.50	STARTED/SECURED 31 ABFP	ABFP-33	SRO
AFW	MDP	08/23/87 23:28	08/24/87 01:09	1.68	STARTED/SECURED 33 ABFP	ABFP-31	SRO
AFW	MDP	08/24/87 03:00	08/24/87 03:40	0.67	STARTED/SECURED 31 ABFP	ABFP-33 ETNG, 30 MIN	SRO
AFW	MDP	08/24/87 03:41	08/24/87 04:11	0.50	STARTED/SECURED 33 ABFP		

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AFW	MDP	08/24/87 06:00	08/24/87 06:30	0.50	STARTED/SECURED 31 ABFP	ABFP-31 ETNG, 30 MIN	SRO
AFW	MDP	08/24/87 06:10	08/24/87 06:40	0.50	STARTED/SECURED 33 ABFP	ABFP-33 ETNG, 30 MIN	SRO
AFW	MDP	08/24/87 09:28	08/24/87 10:10	0.70	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	08/24/87 09:28	08/24/87 10:10	0.70	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	08/24/87 12:50	08/24/87 13:48	0.97	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	08/24/87 12:50	08/24/87 13:48	0.97	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	08/25/87 15:26	08/27/87 09:36	42.17	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	08/27/87 11:55	08/27/87 12:25	0.50	STARTED/SECURED 31 ABFP	ABFP-31 STNG, 30 MIN	SRO
AFW	MDP	08/27/87 12:20	08/27/87 16:27	4.12	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	08/27/87 13:20	08/30/87 21:25	80.08	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	08/27/87 18:22	08/30/87 22:35	76.22	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	08/30/87 22:00	08/30/87 22:35	0.58	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	08/30/87 23:12	08/30/87 23:55	0.72	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	08/30/87 23:12	08/31/87 12:18	13.10	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	09/01/87 08:35	09/01/87 08:55	0.33	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	09/01/87 08:35	09/01/87 08:55	0.33	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	09/01/87 14:08	09/01/87 14:45	0.62	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	09/01/87 15:42	09/01/87 16:34	0.87	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	09/01/87 17:00	09/01/87 17:45	0.75	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	09/03/87 06:23	09/03/87 06:52	0.48	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	09/03/87 06:45	09/03/87 06:58	0.22	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	09/03/87 11:50	09/03/87 20:15	8.42	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	09/03/87 11:50	09/03/87 20:15	8.42	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	09/03/87 22:28	09/03/87 23:53	1.42	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	09/03/87 22:28	09/03/87 23:53	1.42	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	09/04/87 00:35	09/05/87 06:47	30.20	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	09/04/87 01:35	09/05/87 06:47	29.20	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	09/05/87 07:07	09/05/87 09:40	2.55	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	09/05/87 07:07	09/05/87 09:40	2.55	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	TDP	09/05/87 09:25	09/05/87 09:55	0.50	STARTED/SECURED 32 ABFP	ABFP-32 ETNG, 30 MIN	SRO
AFW	MDP	11/10/87 16:27	11/10/87 16:29	0.03	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	11/12/87 16:50	11/12/87 16:55	0.08	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	02/03/88 17:15	02/03/88 17:45	0.50	STARTED/SECURED 31 ABFP	ABFP-31 STNG, 30 MIN	SRO
AFW	MDP	02/03/88 17:15	02/03/88 17:45	0.50	STARTED/SECURED 33 ABFP	ABFP-33 STNG, 30 MIN	SRO
AFW	MDP	03/31/88 20:45	03/31/88 21:15	0.50	STARTED/SECURED 33 ABFP	ABFP-33 ETNG, 30 MIN	SRO
AFW	MDP	04/01/88 00:10	04/01/88 00:34	0.40	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	04/01/88 01:22	04/01/88 02:55	1.55	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	04/01/88 02:25	04/01/88 10:10	7.75	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	04/01/88 03:08	04/01/88 10:10	7.03	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	TDP	04/01/88 10:05	04/01/88 19:55	9.83	STARTED/SECURED 32 ABFP	ABFP-32	SRO
AFW	MDP	04/01/88 11:20	04/01/88 12:05	0.75	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	04/01/88 12:45	04/01/88 13:08	0.38	STARTED/SECURED 33 ABFP	ABFP-33	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AFW	MDP	04/01/88 19:55	04/02/88 15:40	19.75	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	04/01/88 19:55	04/02/88 15:40	19.75	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	04/29/88 10:01	04/29/88 10:01	0.00	STARTED/TRIPPED 33 ABFP MOTER (PUMP DIS-CONNECTED)	ABFP-33	SRO
AFW	MDP	04/29/88 13:40	04/29/88 13:55	0.25	STARTED/SECURED 33 ABFP FOR OPERABILITY	ABFP-33	SRO
AFW	MDP	05/11/88 05:10	05/11/88 13:15	8.08	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/11/88 05:10	05/11/88 17:05	11.92	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/11/88 15:00	05/11/88 16:00	1.00	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/11/88 17:47	05/11/88 18:58	1.18	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/11/88 18:58	05/11/88 19:38	0.67	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/11/88 22:10	05/11/88 22:40	0.50	STARTED/SECURED 31 ABFP	ABFP-31 ETNG, 30 MIN	SRO
AFW	MDP	05/11/88 22:10	05/11/88 22:40	0.50	STARTED/SECURED 33 ABFP	ABFP-33 ETNG, 30 MIN	SRO
AFW	MDP	05/12/88 16:16	05/12/88 18:25	2.15	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	05/12/88 16:16	05/12/88 18:25	2.15	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	05/13/88 00:00	05/13/88 00:45	0.75	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/13/88 09:20	05/13/88 09:52	0.53	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	05/13/88 14:10	05/13/88 15:18	1.13	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	05/13/88 19:37	05/13/88 20:00	0.38	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	05/14/88 22:36	05/14/88 23:39	1.05	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	05/15/88 03:35	05/15/88 04:10	0.58	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/21/88 14:34	05/21/88 14:41	0.12	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/21/88 14:47	05/21/88 15:12	0.42	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/23/88 01:42	05/23/88 02:00	0.30	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	05/23/88 05:05	05/23/88 05:15	0.17	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/23/88 06:15	05/23/88 07:23	1.13	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/23/88 10:58	05/23/88 11:20	0.37	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	05/23/88 20:41	05/23/88 20:44	0.05	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/24/88 06:41	05/24/88 07:04	0.38	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	05/24/88 09:25	05/24/88 10:21	0.93	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	05/24/88 16:58	05/24/88 17:31	0.55	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	05/27/88 22:40	05/27/88 22:50	0.17	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	05/27/88 22:40	05/27/88 22:50	0.17	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	06/14/88 22:50	06/14/88 23:20	0.50	STARTED/SECURED 31 ABFP	ABFP-31 STNG, 30 MIN	SRO
AFW	MDP	06/14/88 22:50	06/14/88 23:20	0.50	STARTED/SECURED 33 ABFP	ABFP-33 STNG, 30 MIN	SRO
AFW	MDP	06/15/88 00:50	06/15/88 07:35	6.75	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/15/88 01:05	06/15/88 07:30	6.42	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	06/15/88 08:28	06/15/88 19:12	10.73	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/15/88 08:28	06/15/88 19:13	10.75	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	06/29/88 22:24	06/29/88 22:39	0.25	STARTED/SECURED 31 ABFP FOR OPERABILITY	ABFP-31 ETNG, 15 MIN	SRO
AFW	MDP	07/01/88 17:50	07/01/88 17:51	0.02	STARTED/SECURED 33 ABFP FOR OPERABILITY	ABFP-33	SRO
AFW	MDP	07/22/88 10:54	07/22/88 10:54	0.00	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	07/22/88 10:56	07/22/88 10:56	0.00	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	08/29/88 00:55	08/29/88 01:13	0.30	STARTED/SECURED 31 ABFP	ABFP-31	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AFW	MDP	08/29/88 01:19	08/29/88 01:34	0.25	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	TDP	08/29/88 01:43	08/29/88 02:05	0.37	ROLLED/SECURES 32 ABFP	ABFP-32	SRO
AFW	MDP	10/11/88 13:15	10/11/88 13:45	0.50	STARTED/SECURED 31 ABFP	ABFP-31 STNG, 30 MIN	SRO
AFW	MDP	10/11/88 16:15	10/11/88 18:33	2.30	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	10/11/88 16:28	10/11/88 16:58	0.50	STARTED/SECURED 33 ABFP	ABFP-33 STNG, 30 MIN	SRO
AFW	MDP	10/11/88 20:38	10/11/88 21:15	0.62	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	10/11/88 21:50	10/11/88 22:40	0.83	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	10/12/88 19:19	10/12/88 21:04	1.75	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	10/12/88 19:19	10/12/88 21:37	2.30	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	10/13/88 05:00	10/13/88 06:30	1.50	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	10/13/88 05:00	10/13/88 07:00	2.00	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	10/13/88 09:55	10/13/88 11:15	1.33	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	10/13/88 09:55	10/13/88 11:15	1.33	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	10/13/88 11:35	10/15/88 09:25	45.83	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	10/13/88 11:35	10/15/88 09:25	45.83	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	10/16/88 07:05	10/16/88 07:35	0.50	STARTED/SECURED 31 ABFP	ABFP-31 STNG, 30 MIN	SRO
AFW	MDP	10/16/88 07:05	10/16/88 07:35	0.50	STARTED/SECURED 33 ABFP	ABFP-33 STNG, 30 MIN	SRO
AFW	MDP	10/16/88 11:21	10/16/88 12:35	1.23	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	10/16/88 11:21	10/16/88 12:35	1.23	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	10/20/88 15:36	10/20/88 16:06	0.50	STARTED/SECURED 31 ABFP	ABFP-31 STNG, 30 MIN	SRO
AFW	MDP	10/20/88 18:23	10/20/88 18:53	0.50	STARTED/SECURED 33 ABFP	ABFP-33 STNG, 30 MIN	SRO
AFW	MDP	10/20/88 21:21	10/20/88 22:05	0.73	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	10/20/88 22:23	10/20/88 23:02	0.65	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	10/21/88 01:47	10/21/88 02:23	0.60	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	10/21/88 04:54	10/21/88 05:17	0.38	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	10/21/88 05:57	10/21/88 06:28	0.52	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	10/24/88 09:45	10/24/88 10:50	1.08	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	10/24/88 10:53	10/24/88 11:28	0.58	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	10/27/88 03:01	10/27/88 03:30	0.48	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	10/27/88 03:01	10/27/88 03:30	0.48	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	10/27/88 04:45	10/27/88 05:15	0.50	STARTED/SECURED 31 ABFP	ABFP-31 STNG, 30 MIN	SRO
AFW	MDP	10/27/88 04:47	10/27/88 05:17	0.50	STARTED/SECURED 33 ABFP	ABFP-33 STNG, 30 MIN	SRO
AFW	MDP	10/27/88 11:07	10/27/88 11:36	0.48	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	10/27/88 11:07	10/27/88 11:36	0.48	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	11/05/88 12:47	11/05/88 13:17	0.50	STARTED/SECURED 33 ABFP TO FILL 33 S/G	ABFP-33	SRO
AFW	MDP	11/15/88 04:37	11/15/88 05:50	1.22	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	11/15/88 08:20	11/15/88 09:05	0.75	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	11/15/88 09:15	11/15/88 09:25	0.17	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	11/15/88 09:30	11/15/88 09:35	0.08	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	11/15/88 09:40	11/15/88 09:45	0.08	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	11/15/88 10:15	11/15/88 10:20	0.08	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	11/15/88 10:25	11/15/88 10:30	0.08	STARTED/SECURED 31 ABFP	ABFP-31	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AFW	MDP	11/17/88 05:40	11/17/88 05:54	0.23	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	11/17/88 06:38	11/17/88 10:55	4.28	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	11/18/88 10:48	11/18/88 12:00	1.20	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	11/18/88 15:48	11/18/88 16:25	0.62	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	11/19/88 02:42	11/19/88 03:25	0.72	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	11/19/88 17:20	11/19/88 18:30	1.17	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	11/19/88 22:20	11/19/88 22:50	0.50	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	11/21/88 09:38	11/22/88 07:22	21.73	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	11/21/88 10:43	11/21/88 11:15	0.53	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	11/21/88 11:46	11/22/88 17:25	29.65	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	11/22/88 08:03	11/22/88 17:20	9.28	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	TDP	11/22/88 08:30	11/22/88 08:53	0.38	STARTED/SECURED 32 ABFP	ABFP-32	SRO
AFW	MDP	02/04/89 00:10	02/04/89 06:44	6.57	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	02/04/89 00:10	02/04/89 16:45	16.58	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	02/04/89 07:23	02/04/89 07:53	0.50	STARTED/SECURED 31 ABFP	ABFP-31 ETNG, 30 MIN	SRO
AFW	MDP	05/01/89 18:33	05/01/89 19:10	0.62	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/01/89 19:31	05/01/89 20:17	0.77	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/10/89 12:45	05/10/89 14:11	1.43	STARTED/SECURED 33 ABFP TO HYDRO 33 S/G	ABFP-33	SRO
AFW	MDP	05/13/89 14:12	05/13/89 15:00	0.80	STARTED/SECURED 33 ABFP FOR S/G HYDRO	ABFP-33	SRO
AFW	MDP	05/17/89 11:00	05/17/89 11:20	0.33	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/17/89 13:15	05/17/89 14:08	0.88	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/18/89 14:08	05/18/89 14:28	0.33	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	05/28/89 02:50	05/28/89 03:13	0.38	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	05/28/89 08:38	05/28/89 10:32	1.90	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	05/29/89 02:31	05/29/89 02:54	0.38	STARTED/SECURED 31 ABFP FOR HYDRO ON 34 S/G	ABFP-31	SRO
AFW	MDP	05/29/89 03:53	05/29/89 05:15	1.37	STARTED/SECURED 33 ABFP TO HYDRO 34 S/G	ABFP-33	SRO
AFW	MDP	05/29/89 05:10	05/29/89 06:20	1.17	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	05/29/89 12:05	05/29/89 12:10	0.08	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	05/29/89 19:39	05/29/89 19:53	0.23	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/30/89 05:03	05/30/89 07:05	2.03	STARTED/SECURED 31 ABFP TO HYDRO 32 S/G	ABFP-31	SRO
AFW	MDP	05/30/89 22:00	05/30/89 22:30	0.50	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/31/89 03:45	05/31/89 04:35	0.83	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	05/31/89 06:10	05/31/89 06:55	0.75	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	05/31/89 13:00	05/31/89 13:50	0.83	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	06/01/89 12:42	06/01/89 13:12	0.50	STARTED/SECURED 31 ABFP FOR 32 S/G HYDRO	ABFP-31 ETNG, 30 MIN	SRO
AFW	MDP	06/01/89 16:35	06/01/89 17:25	0.83	STARTED/SECURED 31 ABFP FOR 31 S/G HYDRO	ABFP-31	SRO
AFW	MDP	06/11/89 18:20	06/11/89 19:05	0.75	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/11/89 19:12	06/11/89 19:14	0.03	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/11/89 20:40	06/11/89 20:42	0.03	BUMPED 31 ABFP	ABFP-31 2 MIN	SRO
AFW	MDP	06/11/89 21:00	06/11/89 21:42	0.70	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	06/11/89 21:45	06/11/89 21:47	0.03	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	06/13/89 11:51	06/13/89 12:01	0.17	STARTED/SECURED 31 ABFP	ABFP-31	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AFW	MDP	06/13/89 13:25	06/13/89 13:31	0.10	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/13/89 19:09	06/13/89 19:12	0.05	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/13/89 19:13	06/13/89 19:15	0.03	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/13/89 20:30	06/13/89 20:45	0.25	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/13/89 21:25	06/13/89 21:48	0.38	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/13/89 22:55	06/13/89 23:07	0.20	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	06/13/89 23:20	06/13/89 23:25	0.08	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	06/13/89 23:30	06/13/89 23:32	0.03	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	06/14/89 03:10	06/14/89 05:40	2.50	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/14/89 03:13	06/14/89 03:50	0.62	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	06/14/89 10:23	06/14/89 11:15	0.87	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	TDP	06/14/89 10:23	06/14/89 11:15	0.87	STARTED/SECURED 32 ABFP	ABFP-32	SRO
AFW	MDP	06/14/89 14:45	06/14/89 14:55	0.17	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/14/89 15:52	06/14/89 16:41	0.82	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/14/89 15:52	06/14/89 16:38	0.77	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	06/14/89 18:02	06/14/89 18:50	0.80	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/14/89 18:02	06/14/89 18:43	0.68	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	06/15/89 01:00	06/15/89 02:42	1.70	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/15/89 01:00	06/15/89 02:20	1.33	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	06/15/89 07:04	06/15/89 08:22	1.30	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/15/89 07:04	06/15/89 08:22	1.30	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	06/15/89 09:50	06/15/89 10:50	1.00	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/15/89 09:50	06/15/89 11:15	1.42	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	06/15/89 12:35	06/15/89 14:23	1.80	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/15/89 12:35	06/15/89 14:23	1.80	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	06/15/89 15:40	06/15/89 17:25	1.75	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/15/89 15:40	06/15/89 17:25	1.75	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	06/15/89 21:00	06/16/89 04:30	7.50	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	06/15/89 21:02	06/16/89 04:30	7.47	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/16/89 05:10	06/16/89 06:42	1.53	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/16/89 05:10	06/16/89 06:42	1.53	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	06/16/89 07:23	06/16/89 08:15	0.87	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/16/89 07:23	06/16/89 19:07	11.73	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	06/16/89 08:35	06/16/89 19:07	10.53	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/16/89 20:20	06/20/89 19:05	94.75	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/16/89 20:24	06/20/89 19:05	94.68	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	06/20/89 19:40	06/20/89 20:49	1.15	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	06/20/89 19:45	06/20/89 20:21	0.60	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	06/20/89 20:25	06/20/89 20:55	0.50	STARTED/SECURED 31 ABFP	ABFP-31 ETNG, 30 MIN	SRO
AFW	MDP	06/20/89 20:55	06/20/89 21:33	0.63	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	06/20/89 22:21	06/20/89 22:31	0.17	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	06/20/89 22:38	06/23/89 15:27	64.82	STARTED/SECURED 33 ABFP	ABFP-33	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AFW	MDP	06/23/89 14:28	06/23/89 15:27	0.98	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	08/30/89 09:16	08/30/89 09:33	0.28	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	08/30/89 10:00	08/30/89 10:17	0.28	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	TDP	08/30/89 13:10	08/30/89 13:29	0.32	STARTED/SECURED 32 ABFP	ABFP-32	SRO
AFW	MDP	10/20/89 10:40	10/20/89 11:10	0.50	STARTED/SECURED 31 ABFP	ABFP-31 ETNG, 30 MIN	SRO
AFW	MDP	10/20/89 10:40	10/20/89 11:10	0.50	STARTED/SECURED 33 ABFP	ABFP-33 ETNG, 30 MIN	SRO
AFW	MDP	10/21/89 12:55	10/21/89 13:55	1.00	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	10/21/89 16:26	10/21/89 16:57	0.52	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	10/22/89 21:55	10/22/89 22:13	0.30	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	10/22/89 21:55	10/22/89 22:13	0.30	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	10/22/89 22:30	10/22/89 23:00	0.50	STARTED/SECURED 31 ABFP	ABFP-31 ETNG, 30 MIN	SRO
AFW	MDP	10/22/89 22:30	10/22/89 23:00	0.50	STARTED/SECURED 33 ABFP	ABFP-33 ETNG, 30 MIN	SRO
AFW	MDP	10/23/89 09:30	10/23/89 10:50	1.33	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	10/23/89 09:30	10/23/89 10:42	1.20	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	10/23/89 13:00	10/23/89 15:01	2.02	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	10/23/89 15:55	10/23/89 17:40	1.75	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	10/23/89 15:55	10/23/89 16:00	0.08	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	10/23/89 18:10	10/23/89 19:08	0.97	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	10/23/89 19:41	10/23/89 20:59	1.30	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	10/23/89 20:21	10/24/89 01:15	4.90	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	10/23/89 21:55	10/24/89 01:14	3.32	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	03/03/90 12:00	03/03/90 12:07	0.12	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	03/03/90 12:00	03/03/90 12:07	0.12	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	03/03/90 20:10	03/03/90 21:00	0.83	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	03/03/90 20:10	03/03/90 21:00	0.83	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	03/05/90 06:10	03/05/90 06:45	0.58	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	03/05/90 09:37	03/05/90 09:54	0.28	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	03/06/90 00:04	03/06/90 01:50	1.77	STARTED/SECURED 31 ABFP ADDING CHEM TO 32 S/G	ABFP-31	SRO
AFW	MDP	03/15/90 15:26	03/15/90 16:28	1.03	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	03/15/90 17:10	03/15/90 18:50	1.67	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	03/15/90 22:16	03/15/90 23:30	1.23	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	03/16/90 03:27	03/16/90 03:48	0.35	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	03/16/90 21:30	03/16/90 22:06	0.60	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	03/17/90 00:43	03/17/90 02:11	1.47	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	03/17/90 05:37	03/17/90 06:13	0.60	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	03/17/90 19:03	03/17/90 19:43	0.67	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	03/18/90 03:56	03/18/90 04:10	0.23	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	03/18/90 03:56	03/18/90 04:10	0.23	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	03/18/90 10:20	03/18/90 10:37	0.28	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	03/18/90 10:23	03/18/90 10:37	0.23	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	03/18/90 16:42	03/18/90 17:07	0.42	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	03/18/90 16:42	03/18/90 17:07	0.42	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AFW	MDP	03/18/90 19:28	03/18/90 19:46	0.30	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	03/18/90 19:28	03/18/90 19:46	0.30	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	03/18/90 20:38	03/18/90 20:59	0.35	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	03/18/90 20:38	03/18/90 20:59	0.35	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	03/18/90 21:55	03/18/90 22:07	0.20	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	03/18/90 21:55	03/18/90 22:07	0.20	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	03/19/90 05:20	03/19/90 05:43	0.38	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	03/19/90 05:20	03/19/90 05:34	0.23	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	03/20/90 07:14	03/20/90 07:44	0.50	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	03/20/90 07:14	03/20/90 07:44	0.50	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	03/20/90 21:39	03/20/90 22:01	0.37	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	03/20/90 21:39	03/20/90 22:01	0.37	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	03/21/90 02:53	03/21/90 03:12	0.32	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	03/21/90 02:53	03/21/90 03:12	0.32	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	03/21/90 20:06	03/21/90 20:45	0.65	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	03/21/90 20:06	03/21/90 20:45	0.65	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	03/22/90 21:49	03/22/90 22:51	1.03	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	03/22/90 21:49	03/22/90 22:49	1.00	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	03/28/90 17:54	03/28/90 18:18	0.40	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	03/28/90 17:54	03/28/90 18:18	0.40	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	04/02/90 05:10	04/02/90 05:20	0.17	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	04/02/90 05:10	04/02/90 05:20	0.17	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	04/02/90 16:53	04/02/90 18:18	1.42	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	04/02/90 16:55	04/02/90 18:14	1.32	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	04/02/90 19:42	04/02/90 19:59	0.28	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	04/02/90 19:42	04/02/90 19:59	0.28	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	04/03/90 09:05	04/03/90 09:10	0.08	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	04/03/90 09:05	04/03/90 09:10	0.08	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	04/04/90 12:50	04/04/90 13:20	0.50	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	04/04/90 13:35	04/04/90 14:05	0.50	STARTED/SECURED 31 ABFP	ABFP-31 ETNG, 30 MIN	SRO
AFW	MDP	04/04/90 15:30	04/04/90 16:00	0.50	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31 ETNG, 30 MIN	SRO
AFW	MDP	04/04/90 16:50	04/04/90 17:25	0.58	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	04/04/90 17:37	04/05/90 02:40	9.05	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	04/04/90 17:55	04/04/90 20:15	2.33	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	04/05/90 04:00	04/05/90 08:50	4.83	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	04/05/90 08:50	04/05/90 12:30	3.67	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	04/05/90 12:30	04/05/90 16:30	4.00	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	04/05/90 16:41	04/06/90 01:20	8.65	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	04/06/90 01:20	04/06/90 01:50	0.50	STARTED/SECURED 33 ABFP	ABFP-33 ETNG, 30 MIN	SRO
AFW	MDP	04/06/90 08:30	04/06/90 21:00	12.50	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	TDP	04/06/90 19:10	04/06/90 19:40	0.50	STARTED/SECURED 32 ABFP	ABFP-32	SRO
AFW	MDP	04/06/90 21:11	04/06/90 22:00	0.82	STARTED/SECURED 33 ABFP	ABFP-33	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AFW	MDP	04/07/90 03:01	04/07/90 03:32	0.52	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	04/07/90 03:03	04/07/90 04:22	1.32	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	04/07/90 05:12	04/08/90 15:25	34.22	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	04/07/90 05:12	04/08/90 15:25	34.22	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	04/08/90 15:31	04/08/90 15:38	0.12	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	TDP	04/08/90 15:31	04/08/90 15:38	0.12	STARTED/SECURED 32 ABFP	ABFP-32	SRO
AFW	MDP	04/25/90 11:00	04/25/90 11:30	0.50	STARTED/SECURED 31 ABFP	ABFP-31 ETNG, 30 MIN	SRO
AFW	MDP	04/25/90 11:00	04/25/90 11:30	0.50	STARTED/SECURED 33 ABFP	ABFP-33 ETNG, 30 MIN	SRO
AFW	TDP	06/25/90 00:45	06/25/90 01:00	0.25	STARTED/SECURED 32 ABFP	ABFP-32	SRO
AFW	MDP	07/01/90 00:10	07/01/90 00:40	0.50	STARTED/SECURED 31 ABFP & LINED UP FOR AUTO	ABFP-31 STNG, 30 MIN	SRO
AFW	MDP	07/01/90 00:10	07/01/90 00:40	0.50	STARTED/SECURED 33 ABFP & LINED UP FOR AUTO	ABFP-33 STNG, 30 MIN	SRO
AFW	MDP	09/15/90 00:26	09/15/90 20:56	20.50	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	09/15/90 00:26	09/15/90 20:56	20.50	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	09/15/90 23:17	09/16/90 01:38	2.35	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	09/16/90 01:19	09/16/90 01:38	0.32	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	09/16/90 10:25	09/16/90 12:15	1.83	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	09/16/90 12:00	09/16/90 13:54	1.90	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	10/01/90 08:12	10/01/90 08:13	0.02	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	11/14/90 09:25	11/14/90 09:27	0.03	BUMPED 33 ABFP FOR ROTATION	ABFP-33 2 MIN	SRO
AFW	MDP	11/14/90 09:35	11/14/90 09:37	0.03	BUMPED 33 ABFP FOR ROTATION	ABFP-33 2 MIN	SRO
AFW	MDP	11/14/90 09:59	11/14/90 10:01	0.03	BUMPED 33 ABFP FOR ROTATION	ABFP-33 2 MIN	SRO
AFW	MDP	11/14/90 15:00	11/14/90 15:02	0.03	BUMPED 33 ABFP FOR MAINT. DEPT.	ABFP-33 2 MIN	SRO
AFW	MDP	11/14/90 20:58	11/14/90 21:00	0.03	STARTED/SECURED 33 ABFP TO FILL 34 S/G	ABFP-33	SRO
AFW	MDP	11/15/90 13:05	11/15/90 13:22	0.28	STARTED/TRIPPED 33 ABFP	ABFP-33	SRO
AFW	MDP	11/15/90 14:30	11/15/90 14:32	0.03	STARTED/TRIPPED ON LOW FLOW 33 ABFP	ABFP-33	SRO
AFW	MDP	11/15/90 15:18	11/15/90 17:56	2.63	STARTED/SECURED 33 ABFP FOR 34 S/G HYDRO	ABFP-33	SRO
AFW	MDP	11/16/90 10:23	11/16/90 10:25	0.03	BUMPED 31 ABFP FOR MAINTENANCE	ABFP-31 2 MIN	SRO
AFW	MDP	11/16/90 10:24	11/16/90 10:50	0.43	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	11/16/90 19:00	11/16/90 19:22	0.37	STARTED/SECURED 31 ABFP FOR TEST GROUP	ABFP-31	SRO
AFW	MDP	11/18/90 17:47	11/18/90 18:28	0.68	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	11/18/90 20:04	11/18/90 21:10	1.10	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	11/19/90 01:20	11/19/90 01:55	0.58	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	11/20/90 10:17	11/20/90 10:30	0.22	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	11/20/90 11:30	11/20/90 11:50	0.33	STARTED/TRIPPED 31 ABFP	ABFP-33	SRO
AFW	MDP	11/20/90 12:30	11/20/90 13:50	1.33	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	11/21/90 00:38	11/21/90 01:07	0.48	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	11/21/90 17:20	11/21/90 18:30	1.17	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	11/21/90 21:20	11/21/90 22:11	0.85	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	11/22/90 03:02	11/22/90 03:18	0.27	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	11/23/90 14:35	11/23/90 15:30	0.92	STARTED/SECURED 31 ABFP FOR 31 S/G HYDRO	ABFP-31	SRO
AFW	MDP	11/24/90 09:22	11/24/90 10:40	1.30	STARTED/SECURED 31 ABFP FOR 32 S/G HYDRO	ABFP-31	SRO
AFW	MDP	11/24/90 11:00	11/24/90 11:30	0.50	STARTED/SECURED 31 ABFP FOR 32 S/G HYDRO	ABFP-31	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AFW	MDP	11/26/90 17:35	11/26/90 18:25	0.83	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	11/26/90 19:00	11/26/90 20:30	1.50	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	12/05/90 17:56	12/05/90 18:16	0.33	STARTED/SECURED 31 ABFP FOR TEST GROUP	ABFP-31	SRO
AFW	MDP	12/05/90 18:39	12/05/90 19:10	0.52	STARTED/SECURED 33 ABFP FOR TEST GROUP	ABFP-33	SRO
AFW	MDP	12/05/90 19:05	12/05/90 19:15	0.17	STARTED/SECURED 31 ABFP TO CLEAR S/G LOW LEVEL	ABFP-31	SRO
AFW	MDP	12/06/90 11:50	12/06/90 11:57	0.12	STARTED/SECURED 33 ABFP FOR TEST	ABFP-33	SRO
AFW	MDP	12/06/90 12:03	12/06/90 12:08	0.08	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	12/06/90 15:30	12/06/90 15:31	0.02	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	12/06/90 15:35	12/06/90 16:30	0.92	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	12/06/90 21:08	12/06/90 21:21	0.22	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	12/06/90 21:09	12/06/90 21:21	0.20	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	12/07/90 18:28	12/07/90 18:46	0.30	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	12/07/90 18:28	12/07/90 18:40	0.20	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	12/07/90 21:42	12/07/90 22:12	0.50	STARTED/SECURED 31 ABFP	ABFP-31 ETNG, 30 MIN	SRO
AFW	MDP	12/07/90 21:42	12/07/90 22:12	0.50	STARTED/SECURED 33 ABFP	ABFP-33 ETNG, 30 MIN	SRO
AFW	MDP	12/08/90 15:52	12/08/90 15:55	0.05	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	12/09/90 09:21	12/09/90 09:49	0.47	STARTED/SECURED 31 ABFP FOR TEST GROUP	ABFP-31	SRO
AFW	MDP	12/09/90 09:50	12/09/90 09:54	0.07	STARTED/SECURED 33 ABFP FOR TEST GROUP	ABFP-33	SRO
AFW	MDP	12/09/90 09:54	12/09/90 10:23	0.48	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	12/09/90 18:47	12/09/90 19:23	0.60	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	12/12/90 17:49	12/12/90 18:28	0.65	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	12/12/90 17:50	12/12/90 18:33	0.72	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	12/14/90 00:05	12/14/90 02:15	2.17	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	TDP	12/14/90 00:16	12/14/90 02:15	1.98	STARTED/SECURED 32 ABFP	ABFP-32	SRO
AFW	TDP	12/14/90 11:19	12/14/90 11:49	0.50	STARTED/SECURED 32 ABFP	ABFP-32	SRO
AFW	MDP	12/14/90 12:36	12/14/90 13:00	0.40	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	12/14/90 15:10	12/14/90 15:34	0.40	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	12/14/90 19:09	12/14/90 19:43	0.57	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	12/14/90 22:45	12/15/90 23:34	24.82	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	12/15/90 00:30	12/15/90 01:20	0.83	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	12/15/90 03:08	12/15/90 04:25	1.28	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	12/15/90 03:08	12/15/90 04:25	1.28	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	12/15/90 07:30	12/15/90 10:35	3.08	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	12/15/90 07:31	12/15/90 10:35	3.07	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	12/15/90 13:55	12/15/90 14:30	0.58	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	12/15/90 18:30	12/15/90 18:40	0.17	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	12/15/90 22:20	12/15/90 22:30	0.17	STARTED/TRIPPED 32 ABFP ON OVERSPEED	ABFP-33	SRO
AFW	TDP	12/15/90 22:50	12/15/90 22:54	0.07	STARTED/SECURED 32 ABFP FOR OVERSPEED	ABFP-32	SRO
AFW	MDP	12/16/90 00:30	12/16/90 02:00	1.50	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	12/16/90 00:30	12/16/90 02:00	1.50	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	TDP	12/16/90 04:00	12/16/90 05:10	1.17	STARTED/SECURED 32 ABFP	ABFP-32	SRO
AFW	MDP	12/16/90 06:55	12/16/90 07:25	0.50	STARTED/SECURED 31 ABFP	ABFP-31 ETNG, 30 MIN	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AFW	MDP	12/16/90 06:55	12/16/90 07:25	0.50	STARTED/SECURED 33 ABFP	ABFP-33 ETNG, 30 MIN	SRO
AFW	MDP	12/23/90 10:24	12/23/90 11:15	0.85	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	12/23/90 10:24	12/23/90 11:15	0.85	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	12/23/90 12:38	12/27/90 19:13	102.58	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	12/23/90 12:38	12/27/90 19:13	102.58	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	TDP	12/27/90 19:10	12/28/90 01:40	6.50	STARTED/SECURED 32 ABFP	ABFP-32	SRO
AFW	MDP	12/28/90 01:40	12/28/90 02:10	0.50	STARTED/SECURED 31 ABFP	ABFP-31 ETNG, 30 MIN	SRO
AFW	MDP	12/28/90 01:40	12/28/90 02:10	0.50	STARTED/SECURED 33 ABFP	ABFP-33 ETNG, 30 MIN	SRO
AFW	MDP	03/22/91 01:10	03/22/91 01:40	0.50	STARTED/SECURED 31 ABFP	ABFP-31 STNG, 30 MIN	SRO
AFW	MDP	03/22/91 01:10	03/22/91 01:40	0.50	STARTED/SECURED 33 ABFP	ABFP-33 STNG, 30 MIN	SRO
AFW	MDP	03/22/91 08:12	03/23/91 01:55	17.72	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	03/22/91 08:12	03/23/91 01:55	17.72	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	03/23/91 06:14	03/23/91 09:35	3.35	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	03/23/91 06:14	03/23/91 09:35	3.35	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	TDP	03/23/91 09:32	03/23/91 20:20	10.80	STARTED/SECURED 32 ABFP	ABFP-32	SRO
AFW	MDP	03/23/91 20:20	03/23/91 23:37	3.28	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	03/23/91 20:20	03/23/91 23:37	3.28	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	03/24/91 01:43	03/24/91 09:00	7.28	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	03/24/91 01:43	03/24/91 09:00	7.28	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	TDP	03/24/91 09:00	03/24/91 10:27	1.45	STARTED/SECURED 32 ABFP	ABFP-32	SRO
AFW	MDP	03/24/91 10:27	03/25/91 00:48	14.35	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	03/24/91 10:27	03/25/91 00:39	14.20	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	TDP	03/25/91 01:45	03/25/91 09:57	8.20	STARTED/SECURED 32 ABFP	ABFP-32	SRO
AFW	MDP	03/25/91 09:57	03/25/91 20:00	10.05	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	03/25/91 09:57	03/25/91 22:05	12.13	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	03/26/91 19:37	03/26/91 20:27	0.83	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	03/26/91 19:37	03/26/91 20:27	0.83	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	03/26/91 21:27	03/27/91 00:00	2.55	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	03/26/91 22:00	03/26/91 23:40	1.67	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	03/29/91 04:58	03/29/91 06:25	1.45	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	03/30/91 09:12	03/30/91 09:17	0.08	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	04/05/91 06:15	04/05/91 08:45	2.50	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	04/05/91 06:15	04/05/91 07:39	1.40	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	04/05/91 08:50	04/05/91 09:45	0.92	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	04/05/91 12:23	04/05/91 12:45	0.37	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	04/05/91 13:00	04/05/91 13:18	0.30	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	04/07/91 14:00	04/07/91 14:30	0.50	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31 ETNG, 30 MIN	SRO
AFW	MDP	04/07/91 14:00	04/07/91 14:30	0.50	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33 ETNG, 30 MIN	SRO
AFW	MDP	04/08/91 07:00	04/09/91 18:02	35.03	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	04/08/91 07:00	04/09/91 18:02	35.03	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	04/10/91 12:15	04/11/91 00:59	12.73	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	04/10/91 12:15	04/11/91 00:59	12.73	STARTED/SECURED 33 ABFP	ABFP-33	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AFW	MDP	05/12/91 00:11	05/12/91 20:10	19.98	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/12/91 00:11	05/12/91 20:10	19.98	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/13/91 16:05	05/13/91 17:35	1.50	STARTED/SECURED 33 ABFP TO FILL 33 & 34 SG	ABFP-33	SRO
AFW	MDP	05/13/91 17:38	05/13/91 18:15	0.62	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	05/13/91 20:30	05/13/91 21:20	0.83	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	TDP	05/14/91 04:32	05/14/91 05:20	0.80	STARTED/SECURED 32 ABFP TO FILL 32 S/G	ABFP-32	SRO
AFW	MDP	05/15/91 00:39	05/15/91 01:40	1.02	STARTED/SECURED 31 ABFP TO FILL 32 S/G	ABFP-31	SRO
AFW	MDP	05/19/91 21:52	05/19/91 22:13	0.35	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	05/19/91 22:00	05/19/91 22:13	0.22	STARTED/SECURED 33 ABFP TO FILL 33 & 34 SG	ABFP-33	SRO
AFW	MDP	05/20/91 04:16	05/20/91 04:27	0.18	STARTED/SECURED 31 ABFP TO FILL 31 S/G	ABFP-31	SRO
AFW	MDP	05/20/91 10:58	05/20/91 11:13	0.25	STARTED/SECURED 31 ABFP TO FILL 31 & 32 S/G	ABFP-31	SRO
AFW	MDP	05/20/91 10:58	05/20/91 11:13	0.25	STARTED/SECURED 33 ABFP TO FILL 33 & 34 S/G	ABFP-33	SRO
AFW	MDP	05/20/91 14:05	05/20/91 14:27	0.37	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/20/91 14:05	05/20/91 14:27	0.37	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/20/91 17:52	05/20/91 18:16	0.40	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/20/91 17:52	05/20/91 18:16	0.40	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/20/91 19:57	05/20/91 20:07	0.17	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/20/91 19:57	05/20/91 20:07	0.17	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/20/91 21:26	05/20/91 21:41	0.25	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/20/91 21:26	05/20/91 21:41	0.25	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/21/91 05:30	05/21/91 05:59	0.48	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/21/91 05:30	05/21/91 05:59	0.48	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/22/91 13:55	05/22/91 14:25	0.50	STARTED/SECURED 33 ABFP	ABFP-33 ETNG, 30 MIN	SRO
AFW	MDP	05/22/91 14:00	05/22/91 14:30	0.50	STARTED/SECURED 31 ABFP	ABFP-31 ETNG, 30 MIN	SRO
AFW	MDP	05/22/91 22:14	05/22/91 22:58	0.73	STARTED/SECURED 31 ABFP TO FILL 31 & 32 SG	ABFP-31	SRO
AFW	MDP	05/23/91 00:45	05/23/91 22:00	21.25	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	05/23/91 00:45	05/23/91 05:42	4.95	STARTED/SECURED 31 ABFP	ABFP-33	SRO
AFW	MDP	05/23/91 01:12	05/23/91 22:30	21.30	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	05/23/91 01:12	05/23/91 05:42	4.50	STARTED/SECURED 33 ABFP	ABFP-32	SRO
AFW	TDP	05/23/91 05:38	05/23/91 12:00	6.37	STARTED/SECURED 32 ABFP	ABFP-31	SRO
AFW	MDP	08/24/91 11:00	08/24/91 17:45	6.75	STARTED/SECURED 31 ABFP	ABFP-33	SRO
AFW	MDP	08/24/91 11:00	08/24/91 17:45	6.75	STARTED/SECURED 33 ABFP	ABFP-31	SRO
AFW	MDP	10/19/91 06:18	10/19/91 17:42	11.40	STARTED/SECURED 31 ABFP	ABFP-33	SRO
AFW	MDP	10/19/91 06:18	10/19/91 21:39	15.35	STARTED/SECURED 33 ABFP	ABFP-31	SRO
AFW	MDP	10/19/91 19:30	10/19/91 19:55	0.42	STARTED/SECURED 31 ABFP	ABFP-33	SRO
AFW	MDP	10/19/91 22:00	10/20/91 02:45	4.75	STARTED/SECURED 33 ABFP	ABFP-31	SRO
AFW	MDP	10/19/91 22:55	10/20/91 02:35	3.67	STARTED/SECURED 31 ABFP	ABFP-32	SRO
AFW	TDP	10/20/91 03:00	10/20/91 14:55	11.92	STARTED/SECURED 32 ABFP	ABFP-31	SRO
AFW	MDP	10/20/91 14:55	10/20/91 17:14	2.32	STARTED/SECURED 31 ABFP	ABFP-33	SRO
AFW	MDP	10/20/91 14:55	10/20/91 17:18	2.38	STARTED/SECURED 33 ABFP	ABFP-32	SRO
AFW	TDP	10/20/91 17:30	10/20/91 18:30	1.00	STARTED/SECURED 32 ABFP	ABFP-32	SRO
AFW	TDP	10/20/91 19:00	10/22/91 03:30	32.50	STARTED/SECURED 32 ABFP		

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
AFW	MDP	10/20/91 22:09	10/20/91 22:39	0.50	STARTED/SECURED 31 ABFP	ABFP-31 ETNG, 30 MIN	SRO
AFW	MDP	10/20/91 22:50	10/20/91 23:20	0.50	STARTED/SECURED 33 ABFP	ABFP-33 ETNG, 30 MIN	SRO
AFW	MDP	10/22/91 03:36	10/22/91 14:30	10.90	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	10/22/91 03:36	10/22/91 14:18	10.70	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	TDP	10/22/91 14:30	10/23/91 11:34	21.07	STARTED/SECURED 32 ABFP	ABFP-32 ST (31OFF)	SRO
AFW	MDP	10/23/91 11:34	10/24/91 10:59	23.42	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	10/23/91 11:34	10/24/91 11:31	23.95	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	10/24/91 11:08	10/24/91 11:23	0.25	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	10/24/91 11:47	10/24/91 12:02	0.25	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	MDP	10/24/91 12:07	11/04/91 09:15	261.13	STARTED/SECURED 31 ABFP	ABFP-31	SRO
AFW	MDP	10/24/91 12:07	11/04/91 09:15	261.13	STARTED/SECURED 33 ABFP	ABFP-33	SRO
AFW	TDP	10/24/91 13:08	10/24/91 13:30	0.37	STARTED/SECURED 32 ABFP	ABFP-32	SRO
AFW	MDP	11/06/91 16:36	11/06/91 16:38	0.03	STARTED/SECURED 33 ABFP	ABFP-33	SRO
CFC	FCU	06/12/85 12:50	06/13/85 15:34	26.73	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	06/13/85 17:32	06/15/85 10:15	40.72	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	06/15/85 00:00	06/15/85 03:35		STARTED/SECURED 31 FCU	CRF1 STNG	SRO
CFC	FCU	06/15/85 00:00	06/15/85 10:28		STARTED/SECURED 34 FCU FOR PT	CRF4 STNG	SRO
CFC	FCU	06/15/85 10:15	06/17/85 13:41	51.43	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	06/15/85 10:28	06/17/85 10:25	47.95	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	06/15/85 10:39	06/17/85 13:15	50.60	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	06/17/85 10:42	06/18/85 07:56	21.23	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	06/17/85 13:41	06/18/85 12:59	23.30	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	06/17/85 14:00	06/18/85 15:59	25.98	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	06/18/85 07:56	06/19/85 07:37	23.68	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	06/18/85 12:59	07/03/85 18:50	365.85	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	06/18/85 15:55	07/03/85 18:50	362.92	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	06/19/85 07:37	06/24/85 02:55	115.30	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	07/03/85 18:50	07/30/85 15:16	644.43	STARTED/SECURED 31 FCU	CRF1 ETNG, USE NEXT START TIME	SRO
CFC	FCU	07/03/85 18:50	07/15/85 10:02	279.20	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	07/15/85 10:05	07/25/85 08:35	238.50	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	07/26/85 16:42	07/30/85 04:15	83.55	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	07/29/85 16:20	07/29/85 16:22	0.03	BUMPED 32 FCU FOR ROTATION	CRF2 2 MIN	SRO
CFC	FCU	07/30/85 15:16	07/30/85 15:18	0.03	BUMPED 31 FCU FOR ROTATION CHECK	CRF1 2 MIN	SRO
CFC	FCU	07/31/85 16:14	07/31/85 16:16	0.03	BUMPED 34 FCU FOR ROTATION CHECK	CRF4 2 MIN	SRO
CFC	FCU	08/05/85 00:30	08/13/85 10:00	201.50	STARTED/SECURED 32 FCU	CRF2 ETNG, USE NEXT START TIME	SRO
CFC	FCU	08/06/85 12:57	08/06/85 13:00	0.05	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	08/06/85 13:05	08/06/85 13:42	0.62	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	08/07/85 14:15	08/07/85 16:00	1.75	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	08/09/85 15:52	08/13/85 10:00	90.13	STARTED/SECURED 31 FCU	CRF1 ETNG, USE NEXT START TIME	SRO
CFC	FCU	08/27/85 20:50	08/30/85 08:00	59.17	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	08/27/85 20:50	08/29/85 07:35	34.75	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	08/30/85 09:08	09/06/85 13:35	172.45	STARTED/SECURED 32 FCU	CRF2 ETNG, USE NEXT START TIME	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	08/31/85 08:55	08/31/85 09:05	0.17	STARTED/SECURED 33 FCU FOR PERFORMANCE	CRF3	SRO
CFC	FCU	09/03/85 14:52	09/05/85 08:00	41.13	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	09/04/85 13:45	09/04/85 13:52	0.12	STARTED/SECURED 34 FCU FOR PERFORMANCE	CRF4	SRO
CFC	FCU	09/05/85 10:17	09/05/85 10:23	0.10	STARTED/SECURED 31 FCU FOR PERFORMANCE	CRF1	SRO
CFC	FCU	09/05/85 11:45	09/05/85 15:00	3.25	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	09/05/85 12:45	09/05/85 13:05	0.33	STARTED/SECURED 31 FCU FOR PERFORMANCE	CRF1	SRO
CFC	FCU	09/05/85 13:05	09/13/85 20:20	199.25	STARTED/SECURED 34 FCU FOR MAINT	CRF4 STNG, USE PREVIOUS END TIME	SRO
CFC	FCU	09/06/85 13:35	09/06/85 13:53	0.30	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	09/07/85 07:20	09/07/85 07:45	0.42	STARTED/SECURED 32 FCU FOR PERFORMANCE	CRF2	SRO
CFC	FCU	09/07/85 10:20	09/07/85 10:50	0.50	STARTED/SECURED 33 FCU FOR PERFORMANCE	CRF3	SRO
CFC	FCU	09/13/85 22:45	09/21/85 11:05	180.33	STARTED/SECURED 34 FCU	CRF4 ETNG, USE NEXT START TIME	SRO
CFC	FCU	09/19/85 13:29	09/19/85 13:50	0.35	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	09/22/85 14:45	09/26/85 09:40	90.92	STARTED/SECURED 31 FCU	CRF1 ETNG, USE NEXT START TIME	SRO
CFC	FCU	09/22/85 14:45	09/22/85 14:50	0.08	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	09/22/85 14:50	04/30/86 12:51	5278.02	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	09/22/85 17:50	04/30/86 09:42	5271.87	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	09/22/85 17:50	04/30/86 09:41	5271.85	STARTED/SECURED 35 FCU	CRF5 ETNG, USE NEXT START TIME	SRO
CFC	FCU	09/26/85 09:40	09/26/85 13:29	3.82	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	09/26/85 14:35	10/17/85 08:40	498.08	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	10/17/85 09:25	03/24/86 19:00	3801.58	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	03/20/86 09:50	03/20/86 10:15	0.42	STARTED/SECURED 33 FCU FOR PERFORMANCE	CRF3	SRO
CFC	FCU	03/24/86 17:45	03/24/86 19:35	1.83	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	03/24/86 19:35	03/24/86 19:55	0.33	STARTED/SECURED 31 FCU FOR INSPECTION	CRF1	SRO
CFC	FCU	03/24/86 19:55	03/26/86 21:20	49.42	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	03/26/86 21:20	03/26/86 22:00	0.67	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/30/86 09:41	05/02/86 10:23	48.70	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	04/30/86 12:50	05/12/86 09:15	284.42	STARTED/SECURED 32 FCU	CRF2 ETNG, USE NEXT START TIME	SRO
CFC	FCU	05/02/86 15:43	05/06/86 16:28	96.75	STARTED/SECURED 35 FCU	CRF5 ETNG, USE NEXT START TIME	SRO
CFC	FCU	05/03/86 13:48	05/03/86 13:50	0.03	BUMPED 31 FCU FOR ROTATION CHECK	CRF1 2 MIN	SRO
CFC	FCU	05/03/86 13:50	05/03/86 14:10	0.33	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/06/86 08:44	05/06/86 08:46	0.03	BUMPED 33 FCU FOR ROTATION CHECK	CRF3 2 MIN	SRO
CFC	FCU	05/06/86 12:30	05/06/86 12:42	0.20	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/06/86 12:45	05/06/86 12:50	0.08	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/06/86 13:25	05/06/86 13:42	0.28	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/06/86 14:01	05/06/86 14:08	0.12	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/06/86 14:12	05/06/86 14:18	0.10	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/06/86 14:21	05/06/86 14:25	0.07	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/06/86 16:20	05/06/86 16:25	0.08	STARTED/SECURED 31 FCU FOR MTC	CRF5	SRO
CFC	FCU	05/06/86 16:28	05/07/86 07:55	15.45	STARTED/SECURED 35 FCU	CRF1	SRO
CFC	FCU	05/07/86 08:35	05/07/86 09:35	1.00	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/07/86 11:05	05/07/86 11:20	0.25	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/07/86 11:40	05/07/86 11:45	0.08	STARTED/SECURED 31 FCU	CRF1	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	05/07/86 11:46	05/07/86 11:48	0.03	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/07/86 12:00	05/07/86 12:05	0.08	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/07/86 12:25	05/07/86 12:30	0.08	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/07/86 12:35	05/07/86 12:40	0.08	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/07/86 12:42	05/07/86 15:55	3.22	STARTED/SECURED 35 FCU	CRF5 ETNG, USE NEXT START TIME	SRO
CFC	FCU	05/07/86 14:48	05/07/86 14:52	0.07	STARTED/SECURED 33 FCU FOR MTC	CRF3	SRO
CFC	FCU	05/07/86 15:20	05/07/86 15:22	0.03	STARTED/SECURED 33 FCU FOR MTC	CRF3	SRO
CFC	FCU	05/07/86 15:55	05/13/86 08:00	136.08	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	05/13/86 08:00	05/13/86 13:50	5.83	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/13/86 13:50	05/16/86 22:22	80.53	STARTED/SECURED 31 FCU	CRF1 ETNG, USE NEXT START TIME	SRO
CFC	FCU	05/16/86 00:05	05/16/86 22:22	22.28	STARTED/SECURED 32 FCU	CRF2 ETNG, USE NEXT START TIME	SRO
CFC	FCU	05/16/86 02:10	07/31/86 11:04	1832.90	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/16/86 22:22	06/16/86 12:08	733.77	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/16/86 22:22	05/27/86 18:41	260.32	STARTED/SECURED 32 FCU	CRF2 ETNG, USE NEXT START TIME	SRO
CFC	FCU	05/16/86 22:22	05/17/86 08:12	9.83	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	05/17/86 09:55	08/19/86 13:35	2259.67	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	05/27/86 18:41	06/16/86 08:30	469.82	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	06/16/86 08:30	06/23/86 11:43	171.22	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	06/16/86 12:08	07/15/86 15:45	699.62	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	06/16/86 14:16	07/15/86 17:18	699.03	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	06/25/86 11:47	07/05/86 21:50	250.05	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	07/15/86 15:45	08/19/86 13:25	837.67	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	07/15/86 17:18	08/12/86 16:00	670.70	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	07/18/86 09:03	08/12/86 17:15	608.20	STARTED/SECURED 31 FCU FOR PERFORMANCE	CRF1	SRO
CFC	FCU	08/12/86 17:40	08/19/86 13:45	164.08	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	08/12/86 17:50	08/30/86 13:17	427.45	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	08/30/86 13:17	09/11/86 10:30	285.22	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	09/01/86 19:10	09/11/86 08:30	229.33	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	09/01/86 19:10	03/03/87 12:00	4384.83	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	09/01/86 19:10	03/19/87 12:20	4769.17	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	09/11/86 08:30	10/20/86 10:55	938.42	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	09/11/86 10:30	10/11/86 11:05	720.58	STARTED/SECURED 32 FCU	CRF2 ETNG, USE NEXT START TIME	SRO
CFC	FCU	09/11/86 11:30	10/11/86 11:05	719.58	STARTED/SECURED 31 FCU	CRF1 STNG, USE PREVIOUS END TIME	SRO
CFC	FCU	10/11/86 11:45	10/14/86 08:25	68.67	STARTED/SECURED 31 FCU	CRF1 ETNG, USE NEXT START TIME	SRO
CFC	FCU	10/14/86 08:25	10/14/86 10:10	1.75	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	10/14/86 10:10	11/12/86 15:30	701.33	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	10/18/86 00:36	11/12/86 17:30	616.90	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	11/12/86 15:30	01/16/87 18:55	1563.42	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	11/12/86 17:30	12/03/86 17:53	504.38	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	12/03/86 17:53	12/10/86 17:15	167.37	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	12/10/86 17:15	12/29/86 12:15	451.00	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	12/29/86 12:15	12/30/86 08:37	20.37	STARTED/SECURED 31 FCU	CRF1	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	12/30/86 10:22	01/06/87 12:40	170.30	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	01/06/87 12:40	01/06/87 14:44	2.07	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	01/06/87 14:44	01/09/87 18:48	76.07	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	01/09/87 18:48	01/10/87 15:40	20.87	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	01/10/87 15:40	02/03/87 17:11	577.52	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	01/16/87 18:55	02/03/87 15:48	428.88	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/03/87 15:48	02/04/87 01:42	9.90	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	02/03/87 17:11	03/03/87 12:00	666.82	STARTED/SECURED 32 FCU	CRF2 ETNG, USE NEXT START TIME	SRO
CFC	FCU	02/04/87 01:42	03/03/87 09:00	655.30	STARTED/SECURED 31 FCU	CRF1 ETNG, USE NEXT START TIME	SRO
CFC	FCU	02/04/87 01:42	02/11/87 09:15	175.55	STARTED/SECURED 33 FCU	CRF3 STNG, USE PREVIOUS END TIME	SRO
CFC	FCU	02/11/87 09:15	03/18/87 07:55	838.67	STARTED/SECURED 33 FCU	CRF3 STNG, USE PREVIOUS END TIME	SRO
CFC	FCU	03/03/87 09:00	03/03/87 12:00	3.00	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	03/03/87 12:00	03/05/87 12:30	48.50	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	03/03/87 12:00	03/19/87 09:20	381.33	STARTED/SECURED 34 FCU	CRF4 STNG, USE PREVIOUS END TIME	SRO
CFC	FCU	03/05/87 12:30	03/19/87 12:53	336.38	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	03/18/87 07:55	03/19/87 06:40	22.75	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	03/19/87 06:40	03/19/87 08:07	1.45	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	03/19/87 08:07	03/30/87 10:07	266.00	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	03/19/87 09:20	03/19/87 13:23	4.05	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	03/19/87 12:20	03/19/87 14:25	2.08	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/19/87 12:53	03/30/87 10:07	261.23	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/19/87 13:23	03/30/87 10:07	260.73	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	03/19/87 14:25	03/30/87 10:07	259.70	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	03/30/87 10:15	03/30/87 12:45	2.50	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	03/30/87 10:15	03/30/87 12:45	2.50	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	03/30/87 10:15	03/30/87 12:45	2.50	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	03/30/87 10:15	03/30/87 12:45	2.50	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/30/87 13:18	04/14/87 10:26	357.13	STARTED/SECURED 31 FCU	CRF1 ETNG, USE NEXT START TIME	SRO
CFC	FCU	03/30/87 13:18	04/02/87 16:32	75.23	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	03/30/87 13:18	05/05/87 08:41	859.38	STARTED/SECURED 33 FCU	CRF3 ETNG, USE NEXT START TIME	SRO
CFC	FCU	03/30/87 13:18	05/07/87 10:05	908.78	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	04/02/87 16:32	04/14/87 10:26	281.90	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	04/14/87 10:26	05/05/87 08:41	502.25	STARTED/SECURED 31 FCU	CRF1 ETNG, USE NEXT START TIME	SRO
CFC	FCU	05/02/87 13:07	05/05/87 08:41	67.57	STARTED/SECURED 32 FCU	CRF2 ETNG, USE NEXT START TIME	SRO
CFC	FCU	05/06/87 18:40	05/08/87 11:10	40.50	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/08/87 11:10	05/10/87 02:10	39.00	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/08/87 11:10	05/10/87 02:10	39.00	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/08/87 11:10	05/10/87 02:10	39.00	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/08/87 11:10	05/10/87 02:10	39.00	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/10/87 05:00	05/10/87 09:20	4.33	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/10/87 05:00	05/10/87 09:20	4.33	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/10/87 05:00	05/10/87 09:20	4.33	STARTED/SECURED 33 FCU	CRF3	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	05/10/87 05:00	05/10/87 09:20	4.33	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/10/87 12:40	05/11/87 02:00	13.33	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/10/87 12:40	05/11/87 02:00	13.33	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/10/87 12:40	05/11/87 02:00	13.33	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/10/87 12:40	05/11/87 02:00	13.33	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/11/87 03:40	05/12/87 00:55	21.25	STARTED/SECURED 31 FCU FOR DECON	CRF1	SRO
CFC	FCU	05/11/87 03:40	05/12/87 00:55	21.25	STARTED/SECURED 32 FCU FOR DECON	CRF2	SRO
CFC	FCU	05/11/87 03:40	05/12/87 00:55	21.25	STARTED/SECURED 33 FCU FOR DECON	CRF3	SRO
CFC	FCU	05/11/87 03:40	05/12/87 00:55	21.25	STARTED/SECURED 34 FCU FOR DECON	CRF4	SRO
CFC	FCU	05/12/87 04:44	05/12/87 08:55	4.18	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/12/87 04:44	05/13/87 00:30	19.77	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/12/87 04:44	05/13/87 00:30	19.77	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/12/87 04:44	05/13/87 00:30	19.77	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/13/87 03:10	05/13/87 23:35	20.42	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/13/87 03:10	05/13/87 23:35	20.42	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/13/87 03:10	05/13/87 23:35	20.42	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/21/87 01:07	05/21/87 01:07	0.00	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/21/87 01:07	05/21/87 01:07	0.00	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/21/87 02:49	05/22/87 13:04	34.25	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/21/87 02:49	05/22/87 13:18	34.48	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/22/87 13:18	05/24/87 02:09	36.85	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/22/87 13:37	05/24/87 02:09	36.53	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/24/87 05:58	05/31/87 06:55	168.95	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/24/87 05:58	05/31/87 07:53	169.92	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/31/87 07:53	06/03/87 22:21	86.47	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/31/87 09:20	06/03/87 22:21	85.02	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	06/01/87 12:15	06/01/87 13:25	1.17	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	06/01/87 17:00	06/01/87 17:33	0.55	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	06/03/87 17:35	06/03/87 22:21	4.77	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	06/04/87 00:24	06/04/87 17:50	17.43	STARTED/SECURED 31 FCU	CRF1 ETNG, USE NEXT START TIME	SRO
CFC	FCU	06/04/87 00:24	06/10/87 09:20	152.93	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	06/04/87 00:24	06/07/87 14:50	86.43	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	06/04/87 17:50	06/06/87 05:40	35.83	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	06/05/87 20:45	06/06/87 08:42	11.95	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	06/06/87 08:46	07/12/87 14:10	869.40	STARTED/SECURED 32 FCU	CRF2 ETNG, USE NEXT START TIME	SRO
CFC	FCU	06/21/87 13:22	06/27/87 11:55	142.55	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	06/21/87 13:22	07/16/87 04:46	591.40	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	07/12/87 14:10	07/16/87 00:46	82.60	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	07/16/87 04:46	07/16/87 08:05	3.32	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	07/16/87 08:05	07/16/87 13:18	5.22	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	07/19/87 05:49	07/19/87 06:27	0.63	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	07/19/87 05:52	07/19/87 06:27	0.58	STARTED/SECURED 32 FCU	CRF2	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	07/19/87 19:55	07/21/87 14:55	43.00	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	07/19/87 19:57	07/21/87 14:55	42.97	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	07/21/87 15:04	07/28/87 10:58	163.90	STARTED/SECURED 35 FCU	CRF5 ETNG, USE NEXT START TIME	SRO
CFC	FCU	07/21/87 15:05	07/21/87 20:30	5.42	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	07/21/87 20:58	07/23/87 06:15	33.28	STARTED/SECURED 32 FCU	CRF2 ETNG, USE NEXT START TIME	SRO
CFC	FCU	07/23/87 06:15	07/24/87 14:49	32.57	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	07/28/87 10:58	07/28/87 18:51	7.88	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	07/28/87 10:58	07/28/87 18:51	7.88	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	08/04/87 16:30	08/04/87 16:33	0.05	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	08/06/87 22:20	08/06/87 22:21	0.02	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	08/06/87 22:20	08/07/87 03:05	4.75	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	08/06/87 22:28	08/07/87 03:05	4.62	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	08/15/87 10:36	08/15/87 10:45	0.15	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	08/15/87 13:10	08/15/87 13:35	0.42	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	08/16/87 10:34	08/16/87 10:38	0.07	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	08/16/87 10:42	08/16/87 10:43	0.02	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	08/16/87 10:48	08/16/87 10:49	0.02	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	08/16/87 11:00	08/16/87 11:02	0.03	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	08/16/87 11:04	08/16/87 11:06	0.03	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	08/17/87 20:53	08/21/87 10:58	86.08	STARTED/SECURED 31 FCU	CRF1 ETNG, USE NEXT START TIME	SRO
CFC	FCU	08/17/87 20:53	08/19/87 14:25	41.53	STARTED/SECURED 32 FCU	CRF2 ETNG, USE NEXT START TIME	SRO
CFC	FCU	08/17/87 20:53	08/19/87 09:20	36.45	STARTED/SECURED 33 FCU	CRF3 ETNG, USE NEXT START TIME	SRO
CFC	FCU	08/17/87 20:53	08/19/87 10:07	37.23	STARTED/SECURED 34 FCU	CRF4 ETNG, USE NEXT START TIME	SRO
CFC	FCU	08/19/87 09:20	08/19/87 09:39	0.32	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	08/19/87 10:07	08/19/87 10:51	0.73	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	08/19/87 13:10	08/19/87 13:54	0.73	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	08/19/87 14:25	08/19/87 14:27	0.03	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	08/20/87 10:09	08/20/87 10:23	0.23	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	08/20/87 10:34	08/20/87 10:47	0.22	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	08/21/87 10:58	08/22/87 10:18	23.33	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	08/21/87 10:58	08/22/87 05:02	18.07	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	08/21/87 10:58	08/22/87 10:18	23.33	STARTED/SECURED 33 FCU	CRF3 ETNG, USE NEXT START TIME	SRO
CFC	FCU	08/21/87 11:37	08/21/87 16:40	5.05	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	08/21/87 11:37	08/22/87 10:18	22.68	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	08/22/87 10:12	08/22/87 10:18	0.10	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	08/22/87 10:18	08/22/87 13:04	2.77	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	08/22/87 10:18	05/15/88 08:22	6406.07	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	08/22/87 10:18	08/25/87 11:45	73.45	STARTED/SECURED 34 FCU	CRF4 STNG, USE PREVIOUS END TIME	SRO
CFC	FCU	08/22/87 13:04	09/08/87 12:00	406.93	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	08/22/87 13:04	05/15/88 08:22	6403.30	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	08/25/87 11:45	09/08/87 08:40	332.92	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	09/08/87 11:59	10/15/87 14:07	890.13	STARTED/SECURED 32 FCU	CRF2 ETNG, USE NEXT START TIME	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	09/08/87 12:00	10/13/87 08:10	836.17	STARTED/SECURED 31 FCU	CRF1 STNG, USE PREVIOUS END TIME	SRO
CFC	FCU	10/13/87 08:10	10/14/87 08:20	24.17	STARTED/SECURED 31 FCU	CRF1 STNG, USE PREVIOUS END TIME	SRO
CFC	FCU	10/14/87 08:40	10/15/87 14:05	29.42	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	10/15/87 14:05	11/12/87 12:17	670.20	STARTED/SECURED 31 FCU	CRF1 STNG, USE PREVIOUS END TIME	SRO
CFC	FCU	10/15/87 14:07	11/12/87 08:13	666.10	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	11/12/87 08:13	11/12/87 14:04	5.85	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	11/12/87 12:17	11/12/87 14:13	1.93	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	11/12/87 14:04	11/13/87 08:16	18.20	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	11/12/87 14:40	12/12/87 09:30	714.83	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	11/13/87 08:16	11/13/87 08:53	0.62	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	11/13/87 08:53	12/12/87 10:40	697.78	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	12/12/87 09:30	12/12/87 22:45	13.25	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	12/12/87 10:40	01/05/88 08:17	573.62	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	12/12/87 22:45	01/05/88 11:00	564.25	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	01/05/88 10:44	02/05/88 01:48	735.07	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	01/05/88 13:55	02/05/88 03:54	733.98	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	02/05/88 01:48	02/05/88 05:22	3.57	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/05/88 03:54	02/28/88 23:30	571.60	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/05/88 05:22	02/29/88 03:30	574.13	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	02/29/88 01:35	03/30/88 00:55	719.33	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/29/88 03:30	03/30/88 02:56	719.43	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	03/30/88 00:55	03/30/88 04:52	3.95	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/30/88 02:56	04/30/88 02:50	743.90	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	03/30/88 04:52	04/30/88 00:50	739.97	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/01/88 10:00	04/01/88 10:16	0.27	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/30/88 00:50	04/30/88 04:50	4.00	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/30/88 02:50	06/22/88 02:30	1271.67	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/30/88 04:50	05/17/88 20:26	423.60	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/18/88 00:35	06/12/88 09:53	609.30	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/21/88 13:55	05/21/88 13:55	0.00	STARTED/SECURED 34 FCU FOR RETEST	CRF4	SRO
CFC	FCU	05/22/88 09:48	05/25/88 10:10	72.37	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/27/88 19:01	07/12/88 10:55	1095.90	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/27/88 19:02	07/11/88 13:47	1074.75	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	06/12/88 13:20	06/22/88 00:25	227.08	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	06/12/88 13:20	06/22/88 00:25	227.08	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	06/22/88 00:25	06/22/88 05:10	4.75	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	06/22/88 02:30	07/11/88 08:07	461.62	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	06/22/88 05:10	07/12/88 07:54	482.73	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	07/11/88 08:07	07/11/88 11:15	3.13	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	07/11/88 11:15	07/16/88 19:05	127.83	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	07/11/88 13:47	07/11/88 19:03	5.27	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	07/11/88 19:02	07/11/88 19:02	0.00	STARTED/SECURED 35 FCU FOR OPERABILITY	CRF5	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	07/11/88 19:03	10/23/88 04:05	2481.03	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	07/12/88 10:47	07/12/88 10:51	0.07	STARTED/SECURED 31 FCU	CRF1 ETNG, USE NEXT START TIME	SRO
CFC	FCU	07/12/88 10:51	07/17/88 15:00	124.15	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	07/12/88 13:48	07/12/88 13:48	0.00	STARTED/SECURED 33 FCU FOR OPERABILITY	CRF3	SRO
CFC	FCU	07/12/88 13:49	10/09/88 18:53	2141.07	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	07/16/88 21:55	08/11/88 13:17	615.37	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	07/17/88 15:00	07/17/88 15:35	0.58	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	07/17/88 15:35	08/11/88 13:26	597.85	STARTED/SECURED 31 FCU FOR	CRF1	SRO
CFC	FCU	07/25/88 08:10	07/25/88 15:40	7.50	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	07/26/88 06:20	07/26/88 12:12	5.87	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	08/11/88 13:17	08/11/88 14:08	0.85	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	08/11/88 13:26	09/06/88 10:00	620.57	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	08/11/88 14:08	08/24/88 08:55	306.78	STARTED/SECURED 31 FCU	CRF1.	SRO
CFC	FCU	08/24/88 13:45	09/06/88 12:54	311.15	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	09/06/83 10:00	09/06/88 14:38	4.63	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	09/06/88 12:54	09/15/88 09:50	212.93	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	09/06/88 14:38	10/07/88 13:40	743.03	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	09/15/88 09:50	09/15/88 10:38	0.80	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	09/15/88 10:38	09/19/88 08:29	93.85	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	09/19/88 08:29	09/19/88 08:48	0.32	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	09/19/88 08:48	10/03/88 08:40	335.87	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	10/03/88 08:40	10/03/88 21:05	12.42	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/03/88 21:05	10/07/88 08:12	83.12	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	10/07/88 08:12	10/07/88 13:10	4.97	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/07/88 13:10	11/03/88 12:30	647.33	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	10/07/88 13:40	10/07/88 14:35	0.92	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/07/88 14:35	10/09/88 18:53	52.30	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	10/09/88 18:53	10/09/88 19:36	0.72	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	10/09/88 19:36	10/15/88 08:35	132.98	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	10/10/88 00:00	10/10/88 05:07	5.12	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/10/88 05:07	11/03/88 08:05	578.97	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	10/15/88 08:35	10/15/88 13:20	4.75	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/15/88 13:20	11/03/88 08:05	450.75	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	11/03/88 08:05	11/03/88 12:35	4.50	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	11/03/88 12:30	11/05/88 12:56	48.43	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	11/03/88 12:35	11/07/88 10:25	93.83	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	11/05/88 10:25	11/14/88 13:05	218.67	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	11/05/88 13:02	11/29/88 13:40	576.63	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	11/07/88 10:25	11/21/88 06:36	332.18	STARTED/SECURED 32 FCU	CRF2 ETNG, USE NEXT START TIME	SRO
CFC	FCU	11/21/88 06:36	11/29/88 09:20	194.73	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	11/21/88 06:36	01/11/89 09:44	1227.13	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	11/21/88 06:36	02/06/89 10:08	1851.53	STARTED/SECURED 35 FCU	CRF5	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	11/29/88 09:20	11/29/88 14:30	5.17	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	11/29/88 14:30	11/30/88 08:07	17.62	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	11/30/88 08:07	11/30/88 16:44	8.62	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	11/30/88 16:44	12/21/88 09:00	496.27	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	12/14/88 09:15	12/14/88 10:08	0.88	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	12/21/88 09:00	02/06/89 10:08	1129.13	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	12/29/88 08:48	02/06/89 12:47	939.98	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	01/11/89 09:44	02/06/89 10:08	624.40	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	01/11/89 19:30	02/04/89 17:19	573.82	STARTED/SECURED 33 FCU	CRF3 STNG, USE OPERABLE TIME	SRO
CFC	FCU	02/06/89 12:47	02/06/89 15:47	3.00	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/06/89 15:47	02/06/89 17:37	1.83	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/06/89 17:37	02/06/89 22:30	4.88	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/06/89 22:30	02/07/89 02:55	4.42	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/07/89 02:55	02/07/89 06:35	3.67	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/07/89 06:35	02/07/89 08:10	1.58	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/07/89 13:52	02/07/89 17:45	3.88	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/07/89 17:45	02/07/89 22:00	4.25	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/07/89 22:00	02/08/89 02:30	4.50	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/08/89 02:30	02/08/89 08:20	5.83	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/08/89 09:55	02/08/89 15:35	5.67	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/08/89 15:35	02/08/89 19:10	3.58	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/08/89 19:10	02/08/89 22:56	3.77	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/08/89 22:56	02/09/89 05:00	6.07	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/09/89 05:00	02/09/89 09:50	4.83	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/09/89 09:50	02/09/89 14:00	4.17	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/09/89 14:00	02/09/89 18:00	4.00	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/09/89 18:00	02/09/89 22:10	4.17	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/09/89 22:10	02/10/89 02:30	4.33	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/10/89 02:30	02/10/89 06:30	4.00	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/10/89 06:30	02/10/89 10:45	4.25	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/10/89 10:45	02/10/89 15:21	4.60	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/10/89 15:21	02/10/89 19:45	4.40	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/10/89 19:45	02/11/89 01:20	5.58	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/11/89 01:20	02/11/89 05:20	4.00	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/11/89 05:20	02/11/89 09:38	4.30	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/11/89 09:38	02/11/89 13:31	3.88	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/11/89 13:31	02/11/89 17:32	4.02	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/11/89 17:32	02/11/89 22:45	5.22	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/11/89 22:45	02/12/89 03:00	4.25	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/12/89 03:00	02/12/89 07:45	4.75	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/12/89 07:45	02/12/89 11:45	4.00	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/12/89 11:45	02/12/89 15:59	4.23	STARTED/SECURED 32 FCU	CRF2	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	02/12/89 15:59	02/12/89 20:10	4.18	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/12/89 20:10	02/12/89 22:45	2.58	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/12/89 22:45	02/12/89 23:53	1.13	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/12/89 23:53	02/13/89 07:52	7.98	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/13/89 07:52	02/13/89 11:30	3.63	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/13/89 11:30	02/13/89 15:30	4.00	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/13/89 15:30	02/13/89 19:30	4.00	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/13/89 19:30	02/14/89 00:30	5.00	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/14/89 00:30	02/14/89 04:30	4.00	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/14/89 04:30	02/14/89 08:10	3.67	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/14/89 08:10	02/14/89 11:15	3.08	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/14/89 11:15	02/14/89 15:32	4.28	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/14/89 15:32	02/14/89 19:55	4.38	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/14/89 19:55	02/14/89 23:50	3.92	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/14/89 23:50	02/15/89 04:00	4.17	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/15/89 04:00	02/15/89 07:53	3.88	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/15/89 07:53	02/15/89 10:58	3.08	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/15/89 10:58	02/15/89 15:42	4.73	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/15/89 15:42	02/15/89 22:00	6.30	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/15/89 22:00	02/16/89 02:40	4.67	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/16/89 02:40	02/16/89 06:30	3.83	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/16/89 06:30	02/16/89 10:24	3.90	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/16/89 10:24	02/16/89 14:23	3.98	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/16/89 14:23	02/16/89 21:00	6.62	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/16/89 21:00	02/17/89 02:30	5.50	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/17/89 02:30	02/17/89 06:30	4.00	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/17/89 06:30	02/17/89 15:20	8.83	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/17/89 15:20	02/17/89 19:15	3.92	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/17/89 19:15	02/18/89 00:00	4.75	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/18/89 00:00	02/18/89 04:30	4.50	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/18/89 04:30	02/18/89 13:45	9.25	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/18/89 13:45	02/18/89 17:20	3.58	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/18/89 17:20	02/18/89 21:50	4.50	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/18/89 21:50	02/19/89 02:00	4.17	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/19/89 02:00	02/19/89 05:50	3.83	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/19/89 05:50	02/19/89 10:03	4.22	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/19/89 10:03	02/19/89 13:55	3.87	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/19/89 13:55	02/19/89 18:40	4.75	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/19/89 18:40	02/19/89 22:15	3.58	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/19/89 22:15	02/20/89 02:15	4.00	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/20/89 02:15	02/20/89 06:15	4.00	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/20/89 06:15	02/20/89 09:42	3.45	STARTED/SECURED 32 FCU	CRF2	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	02/20/89 09:42	02/20/89 13:32	3.83	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/20/89 13:32	02/20/89 21:40	8.13	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/20/89 17:05	02/20/89 21:40	4.58	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/20/89 21:40	02/21/89 02:02	4.37	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/21/89 02:02	02/21/89 07:54	5.87	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/21/89 07:54	02/21/89 12:05	4.18	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/21/89 12:05	02/21/89 15:45	3.67	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/21/89 15:45	02/21/89 19:00	3.25	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/21/89 19:00	02/21/89 22:45	3.75	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/21/89 22:45	02/22/89 02:25	3.67	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/22/89 02:25	02/22/89 06:30	4.08	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/22/89 06:30	02/22/89 10:52	4.37	STARTED/SECURED 32 FCU	CRF2 IN LOG IT WAS CRF3	SRO
CFC	FCU	02/22/89 10:52	02/22/89 13:26	2.57	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/22/89 13:26	02/22/89 17:36	4.17	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/22/89 17:36	02/22/89 21:20	3.73	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/22/89 21:20	02/23/89 01:54	4.57	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/23/89 01:54	02/23/89 05:50	3.93	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/23/89 05:50	02/23/89 09:52	4.03	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/23/89 09:52	02/23/89 13:34	3.70	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/23/89 13:34	02/23/89 18:05	4.52	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/23/89 18:05	02/23/89 22:08	4.05	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/23/89 22:08	02/24/89 00:35	2.45	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/24/89 00:35	02/24/89 06:30	5.92	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/24/89 06:30	02/24/89 10:30	4.00	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/24/89 10:30	02/24/89 14:00	3.50	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/24/89 14:00	02/24/89 18:05	4.08	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/24/89 18:05	02/24/89 20:05	2.00	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/24/89 20:05	02/25/89 00:20	4.25	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/25/89 00:20	02/25/89 05:10	4.83	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/25/89 05:10	02/25/89 12:25	7.25	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/25/89 10:20	02/25/89 16:35	6.25	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/25/89 16:35	02/25/89 21:00	4.42	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/25/89 21:00	02/26/89 01:10	4.17	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/26/89 01:10	02/26/89 04:50	3.67	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/26/89 04:50	02/26/89 10:45	5.92	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/26/89 10:45	02/26/89 14:30	3.75	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/26/89 14:30	02/26/89 20:45	6.25	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/26/89 20:45	02/27/89 00:45	4.00	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/27/89 00:45	02/27/89 06:17	5.53	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/27/89 06:17	02/27/89 10:55	4.63	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/27/89 10:55	02/27/89 15:45	4.83	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/27/89 15:45	02/27/89 22:15	6.50	STARTED/SECURED 34 FCU	CRF4	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	02/27/89 22:15	02/28/89 00:17	2.03	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/28/89 00:17	02/28/89 04:30	4.22	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/28/89 04:30	02/28/89 08:45	4.25	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	02/28/89 08:45	02/28/89 13:00	4.25	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/28/89 13:00	02/28/89 18:50	5.83	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	02/28/89 18:50	03/01/89 00:23	5.55	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/01/89 00:23	03/01/89 04:22	3.98	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	03/01/89 04:22	03/01/89 06:30	2.13	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/14/89 12:35	03/14/89 17:50	5.25	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/14/89 17:50	03/14/89 21:50	4.00	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/14/89 21:50	03/15/89 01:56	4.10	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/15/89 01:56	03/15/89 05:55	3.98	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/15/89 05:55	03/15/89 12:00	6.08	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/15/89 12:00	03/15/89 21:15	9.25	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/15/89 21:15	03/16/89 01:22	4.12	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/16/89 01:22	03/16/89 05:10	3.80	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/16/89 05:10	03/16/89 09:20	4.17	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/16/89 09:20	03/16/89 13:05	3.75	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/16/89 13:05	03/17/89 23:17	34.20	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/16/89 23:17	03/17/89 03:15	3.97	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/17/89 03:15	03/17/89 06:15	3.00	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/17/89 06:15	03/17/89 10:13	3.97	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/17/89 10:13	03/17/89 16:35	6.37	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/17/89 16:35	03/18/89 01:05	8.50	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/18/89 01:05	03/18/89 05:13	4.13	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/18/89 05:13	03/18/89 09:20	4.12	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/18/89 09:20	03/18/89 13:45	4.42	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/18/89 13:45	03/18/89 16:10	2.42	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/18/89 16:10	03/18/89 20:35	4.42	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/18/89 20:35	03/19/89 00:19	3.73	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/19/89 00:00	03/19/89 05:04	5.07	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/19/89 00:19	03/19/89 04:15	3.93	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/19/89 04:15	03/19/89 08:14	3.98	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/19/89 08:14	03/19/89 14:20	6.10	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/19/89 14:20	03/20/89 00:00	9.67	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/20/89 05:04	03/20/89 08:52	3.80	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/20/89 08:52	03/20/89 13:11	4.32	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/20/89 13:11	03/20/89 18:35	5.40	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/20/89 18:35	03/20/89 23:16	4.68	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/21/89 02:50	03/21/89 08:00	5.17	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/21/89 08:00	03/21/89 12:15	4.25	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/21/89 12:15	03/21/89 17:45	5.50	STARTED/SECURED 35 FCU	CRF5	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	03/21/89 17:45	03/22/89 02:04	8.32	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/22/89 02:04	03/22/89 07:50	5.77	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/22/89 07:50	03/22/89 12:10	4.33	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/22/89 12:10	03/22/89 19:30	7.33	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/22/89 19:30	03/23/89 00:52	5.37	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/23/89 00:52	03/23/89 07:15	6.38	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/23/89 07:15	03/23/89 11:35	4.33	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/23/89 16:17	03/23/89 20:24	4.12	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/23/89 20:24	03/24/89 01:25	5.02	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/24/89 01:25	03/24/89 06:00	4.58	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/24/89 06:00	03/24/89 09:45	3.75	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/24/89 09:45	03/24/89 13:25	3.67	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/24/89 13:25	03/24/89 18:09	4.73	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/24/89 18:09	03/24/89 22:00	3.85	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/24/89 22:00	03/25/89 04:07	6.12	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/25/89 04:07	03/25/89 11:45	7.63	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/25/89 13:38	03/25/89 16:08	2.50	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/25/89 13:50	03/25/89 13:52	0.03	BUMPED 33 FCU FOR ROTATION CHECK	CRF3 2 MIN	SRO
CFC	FCU	03/25/89 13:53	03/25/89 13:55	0.03	BUMPED 31 FCU FOR ROTATION CHECK	CRF1 2 MIN	SRO
CFC	FCU	03/25/89 16:08	03/25/89 20:10	4.03	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/25/89 20:10	03/26/89 02:15	6.08	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/26/89 02:15	03/26/89 06:12	3.95	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/26/89 06:12	03/26/89 10:25	4.22	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/26/89 10:25	03/26/89 15:50	5.42	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/26/89 15:50	03/26/89 19:52	4.03	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/26/89 19:52	03/27/89 00:05	4.22	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/27/89 00:05	03/27/89 08:35	8.50	STARTED/SECURED 34 FCU	CRF4 STNG, USE PREVIOUS END TIME	SRO
CFC	FCU	03/27/89 00:05	03/27/89 08:35	8.50	STARTED/SECURED 35 FCU	CRF5 ETNG, USE NEXT START TIME	SRO
CFC	FCU	03/27/89 08:35	03/27/89 14:33	5.97	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/27/89 14:33	03/27/89 19:13	4.67	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/27/89 19:13	03/27/89 23:06	3.88	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/27/89 23:06	03/28/89 02:52	3.77	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/28/89 02:52	03/28/89 07:55	5.05	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/28/89 07:55	03/28/89 11:50	3.92	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/28/89 11:50	03/28/89 16:06	4.27	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/28/89 16:06	03/28/89 19:58	3.87	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/28/89 19:58	03/28/89 23:57	3.98	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/28/89 23:57	03/29/89 03:58	4.02	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/29/89 03:58	03/29/89 10:15	6.28	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/29/89 10:15	03/29/89 14:10	3.92	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/29/89 14:10	03/29/89 18:12	4.03	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/29/89 18:12	03/29/89 22:10	3.97	STARTED/SECURED 34 FCU	CRF4	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	03/29/89 22:10	03/30/89 01:45	3.58	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/30/89 01:45	03/30/89 05:45	4.00	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/30/89 05:45	03/30/89 07:55	2.17	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/30/89 07:55	03/30/89 13:10	5.25	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/30/89 13:10	03/30/89 19:03	5.88	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/30/89 19:03	03/31/89 01:45	6.70	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/31/89 01:45	03/31/89 08:00	6.25	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/31/89 08:00	03/31/89 15:27	7.45	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/31/89 15:27	03/31/89 19:55	4.47	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	03/31/89 19:55	03/31/89 23:50	3.92	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/31/89 23:50	04/01/89 04:05	4.25	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	04/01/89 04:05	04/01/89 08:05	4.00	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/01/89 08:05	04/01/89 12:03	3.97	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	04/01/89 12:03	04/01/89 18:00	5.95	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/01/89 18:00	04/01/89 22:30	4.50	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	04/01/89 22:30	04/02/89 03:30	5.00	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/02/89 03:30	04/02/89 08:08	4.63	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	04/02/89 08:08	04/02/89 12:06	3.97	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/02/89 12:06	04/02/89 16:25	4.32	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	04/02/89 16:25	04/02/89 20:10	3.75	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/02/89 20:10	04/03/89 00:03	3.88	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	04/03/89 00:03	04/03/89 03:41	3.63	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/03/89 03:41	04/03/89 07:50	4.15	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	04/03/89 07:50	04/03/89 12:17	4.45	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/03/89 12:17	04/03/89 16:37	4.33	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	04/03/89 16:00	04/03/89 17:25	1.42	STARTED/SECURED 33 FCU FOR ENG-249	CRF3	SRO
CFC	FCU	04/03/89 16:37	04/03/89 20:10	3.55	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/03/89 20:10	04/03/89 21:34	1.40	STARTED/SECURED 35 FCU FOR CLEAN-UP	CRF5	SRO
CFC	FCU	04/03/89 21:34	04/04/89 03:38	6.07	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/04/89 03:55	04/04/89 07:54	3.98	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	04/04/89 07:54	04/04/89 11:51	3.95	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/04/89 09:39	04/04/89 09:41	0.03	BUMPED 32 FCU FOR ROTATION	CRF2 2 MIN	SRO
CFC	FCU	04/04/89 10:11	04/04/89 11:32	1.35	STARTED/SECURED 32 FCU FOR TEST GROUP	CRF2	SRO
CFC	FCU	04/04/89 11:51	04/04/89 16:15	4.40	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	04/04/89 16:15	04/04/89 20:17	4.03	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/04/89 16:37	04/04/89 16:47	0.17	STARTED/SECURED 33 FCU FOR TEST	CRF3	SRO
CFC	FCU	04/04/89 16:50	04/04/89 17:33	0.72	STARTED/SECURED 31 FCU FOR TEST	CRF1	SRO
CFC	FCU	04/04/89 17:42	04/04/89 17:44	0.03	STARTED/SECURED 32 FCU FOR TEST	CRF2	SRO
CFC	FCU	04/04/89 20:17	04/05/89 00:20	4.05	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	04/05/89 00:20	04/05/89 05:10	4.83	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	04/05/89 05:10	04/05/89 09:14	4.07	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/05/89 09:14	04/05/89 13:33	4.32	STARTED/SECURED 33 FCU	CRF3	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	04/05/89 13:33	04/05/89 16:44	3.18	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	04/05/89 16:44	04/05/89 20:05	3.35	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/05/89 20:05	04/06/89 00:20	4.25	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/06/89 00:20	04/06/89 05:00	4.67	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	04/06/89 03:04	04/06/89 09:03	5.98	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/06/89 05:00	04/06/89 08:55	3.92	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/06/89 08:55	04/06/89 13:18	4.38	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	04/06/89 13:18	04/06/89 15:30	2.20	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/06/89 15:30	04/06/89 19:30	4.00	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	04/06/89 19:30	04/06/89 23:15	3.75	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/06/89 23:15	04/07/89 03:40	4.42	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/07/89 14:35	04/07/89 19:15	4.67	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/07/89 19:15	04/08/89 00:20	5.08	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/08/89 00:20	04/08/89 08:00	7.67	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/08/89 08:00	04/08/89 12:18	4.30	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/08/89 12:18	04/08/89 20:35	8.28	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/08/89 20:35	04/09/89 00:53	4.30	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/09/89 00:53	04/09/89 05:05	4.20	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/09/89 05:05	04/09/89 08:28	3.38	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/09/89 08:28	04/09/89 12:55	4.45	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/09/89 12:55	04/09/89 19:07	6.20	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/09/89 19:07	04/10/89 00:55	5.80	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/10/89 00:55	04/10/89 04:55	4.00	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/10/89 04:55	04/10/89 07:56	3.02	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/10/89 07:56	04/10/89 14:02	6.10	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/10/89 14:02	04/10/89 18:10	4.13	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/10/89 18:10	04/10/89 22:01	3.85	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/10/89 22:01	04/11/89 01:57	3.93	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/11/89 01:57	04/11/89 06:06	4.15	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/11/89 06:06	04/11/89 09:03	2.95	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/11/89 09:03	04/11/89 13:39	4.60	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/11/89 13:39	04/11/89 17:40	4.02	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/11/89 17:40	04/11/89 21:30	3.83	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/11/89 21:30	04/12/89 01:40	4.17	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/12/89 01:40	04/12/89 05:45	4.08	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/12/89 05:45	04/12/89 09:36	3.85	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/12/89 09:36	04/12/89 12:32	2.93	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/12/89 12:32	04/12/89 17:35	5.05	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/12/89 17:35	04/12/89 21:30	3.92	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/12/89 21:30	04/13/89 01:30	4.00	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/13/89 01:30	04/13/89 05:45	4.25	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/13/89 05:45	04/13/89 10:30	4.75	STARTED/SECURED 31 FCU	CRF1	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	04/13/89 10:30	04/13/89 18:10	7.67	STARTED/SECURED 33 FCU	CRF3 ETNG, USE NEXT START TIME	SRO
CFC	FCU	04/13/89 18:10	04/13/89 22:05	3.92	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/13/89 22:05	04/14/89 02:00	3.92	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/14/89 02:00	04/14/89 06:05	4.08	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/14/89 02:08	04/14/89 05:58	3.83	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/14/89 06:05	04/14/89 10:01	3.93	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/14/89 10:01	04/14/89 14:03	4.03	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/14/89 14:03	04/14/89 18:00	3.95	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/14/89 18:00	04/14/89 22:00	4.00	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/14/89 22:00	04/15/89 02:08	4.13	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/15/89 05:58	04/15/89 10:42	4.73	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/15/89 10:42	04/15/89 14:26	3.73	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/15/89 14:18	04/15/89 14:20	0.03	BUMPED 34 FCU FOR ROTATION	CRF4 2 MIN	SRO
CFC	FCU	04/15/89 14:21	04/15/89 14:23	0.03	BUMPED 35 FCU FOR ROTATION	CRF5 2 MIN	SRO
CFC	FCU	04/15/89 14:26	04/15/89 18:20	3.90	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/15/89 18:20	04/16/89 00:30	6.17	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/16/89 00:30	04/16/89 05:20	4.83	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/16/89 05:20	04/16/89 09:12	3.87	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/16/89 09:12	04/16/89 13:07	3.92	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/16/89 13:07	04/16/89 17:35	4.47	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/16/89 17:35	04/16/89 22:30	4.92	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/16/89 22:30	04/17/89 05:15	6.75	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/17/89 05:15	04/17/89 09:00	3.75	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/17/89 09:00	04/17/89 12:54	3.90	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/17/89 12:54	04/17/89 17:15	4.35	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/17/89 17:15	04/17/89 21:30	4.25	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/17/89 21:30	04/18/89 00:24	2.90	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/18/89 00:24	04/18/89 04:27	4.05	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/18/89 04:27	04/18/89 08:36	4.15	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/18/89 08:36	04/18/89 12:15	3.65	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/18/89 12:15	04/18/89 16:45	4.50	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/18/89 16:45	04/18/89 20:55	4.17	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/18/89 20:55	04/19/89 00:29	3.57	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/19/89 00:29	04/19/89 04:17	3.80	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/19/89 04:17	04/19/89 08:15	3.97	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/19/89 08:15	04/19/89 12:50	4.58	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/19/89 12:50	04/19/89 16:50	4.00	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/19/89 14:05	04/19/89 14:06	0.02	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/19/89 16:50	04/19/89 22:10	5.33	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/19/89 22:10	04/20/89 02:06	3.93	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/20/89 02:06	04/20/89 05:56	3.83	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/20/89 05:56	04/20/89 11:40	5.73	STARTED/SECURED 34 FCU	CRF4	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	04/20/89 11:40	04/20/89 17:15	5.58	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/20/89 17:15	04/20/89 22:10	4.92	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/20/89 22:10	04/21/89 02:15	4.08	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/21/89 02:15	04/21/89 06:03	3.80	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/21/89 06:03	04/21/89 10:00	3.95	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/21/89 10:00	04/21/89 16:20	6.33	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/21/89 16:20	04/21/89 20:40	4.33	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/21/89 20:40	04/22/89 01:07	4.45	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/22/89 01:07	04/22/89 05:15	4.13	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/22/89 05:15	04/22/89 09:45	4.50	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/22/89 09:45	04/22/89 14:30	4.75	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/22/89 14:30	04/22/89 19:25	4.92	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/22/89 19:25	04/23/89 00:18	4.88	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/23/89 00:18	04/23/89 04:15	3.95	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/23/89 04:15	04/23/89 08:30	4.25	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/23/89 08:30	04/23/89 13:15	4.75	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/23/89 13:15	04/23/89 17:15	4.00	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/23/89 17:15	04/23/89 21:00	3.75	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/23/89 21:00	04/24/89 01:37	4.62	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/24/89 01:37	04/24/89 06:26	4.82	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/24/89 08:20	04/24/89 12:40	4.33	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/24/89 12:40	04/24/89 16:50	4.17	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/24/89 16:50	04/24/89 20:50	4.00	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/24/89 20:50	04/25/89 01:15	4.42	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/25/89 01:15	04/25/89 05:05	3.83	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/25/89 05:05	04/25/89 09:30	4.42	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/25/89 09:30	04/25/89 12:55	3.42	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/25/89 12:55	04/25/89 14:30	1.58	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/25/89 17:25	04/25/89 21:15	3.83	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/25/89 21:15	04/26/89 02:38	5.38	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/26/89 02:38	04/26/89 06:03	3.42	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/26/89 06:03	04/26/89 10:20	4.28	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/26/89 10:20	04/26/89 14:15	3.92	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/26/89 14:15	04/26/89 22:15	8.00	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/26/89 22:15	04/27/89 02:15	4.00	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/27/89 02:15	04/27/89 06:15	4.00	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/27/89 06:15	04/27/89 10:25	4.17	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/27/89 10:25	04/27/89 14:25	4.00	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/27/89 14:25	04/27/89 18:15	3.83	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/27/89 18:15	04/27/89 21:56	3.68	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/27/89 21:56	04/28/89 01:50	3.90	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/28/89 01:50	04/28/89 06:00	4.17	STARTED/SECURED 33 FCU	CRF3	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	04/28/89 06:00	04/28/89 09:55	3.92	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/28/89 09:55	04/28/89 14:04	4.15	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/28/89 14:04	04/28/89 18:00	3.93	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/28/89 18:00	04/28/89 22:09	4.15	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/28/89 22:09	04/29/89 02:05	3.93	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/29/89 02:05	04/29/89 09:05	7.00	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/29/89 09:05	04/29/89 13:00	3.92	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/29/89 13:00	04/29/89 16:56	3.93	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/29/89 18:57	04/29/89 21:53	2.93	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/29/89 21:53	04/30/89 03:50	5.95	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/30/89 03:50	04/30/89 08:15	4.42	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/30/89 08:15	04/30/89 12:05	3.83	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/30/89 12:05	04/30/89 16:00	3.92	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/30/89 16:00	04/30/89 20:25	4.42	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/30/89 20:25	05/01/89 02:40	6.25	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/01/89 02:40	05/01/89 05:50	3.17	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/01/89 05:50	05/01/89 09:55	4.08	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/01/89 09:55	05/01/89 14:00	4.08	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/01/89 14:00	05/01/89 18:10	4.17	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/01/89 18:10	05/01/89 22:05	3.92	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/01/89 22:05	05/02/89 02:02	3.95	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/02/89 02:02	05/02/89 05:59	3.95	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/02/89 05:59	05/02/89 10:00	4.02	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/02/89 10:00	05/02/89 14:10	4.17	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/02/89 14:10	05/02/89 18:11	4.02	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/02/89 18:11	05/02/89 22:00	3.82	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/02/89 22:00	05/03/89 02:15	4.25	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/03/89 02:15	05/03/89 06:07	3.87	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/03/89 06:07	05/03/89 10:15	4.13	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/03/89 10:15	05/03/89 14:05	3.83	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/03/89 14:05	05/03/89 14:15	0.17	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/03/89 14:15	05/03/89 18:00	3.75	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/03/89 18:00	05/03/89 22:00	4.00	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/03/89 22:00	05/04/89 02:05	4.08	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/04/89 02:05	05/04/89 06:05	4.00	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/04/89 06:05	05/04/89 10:00	3.92	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/04/89 10:00	05/04/89 14:15	4.25	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/04/89 14:15	05/04/89 23:00	8.75	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/04/89 23:00	05/05/89 02:58	3.97	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/05/89 02:58	05/05/89 06:21	3.38	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/05/89 06:21	05/05/89 09:59	3.63	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/05/89 09:59	05/05/89 13:48	3.82	STARTED/SECURED 32 FCU	CRF2	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	05/05/89 13:48	05/05/89 17:50	4.03	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/05/89 17:50	05/05/89 21:49	3.98	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/05/89 21:49	05/06/89 01:55	4.10	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/06/89 01:55	05/06/89 06:11	4.27	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/06/89 06:11	05/06/89 10:04	3.88	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/06/89 10:04	05/06/89 14:14	4.17	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/06/89 11:18	05/06/89 12:15	0.95	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/06/89 11:18	05/06/89 13:30	2.20	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/06/89 14:14	05/06/89 18:00	3.77	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/06/89 18:00	05/06/89 20:50	2.83	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/06/89 21:48	05/07/89 03:30	5.70	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/07/89 03:30	05/07/89 06:15	2.75	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/07/89 06:15	05/07/89 08:50	2.58	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/07/89 08:50	05/07/89 13:30	4.67	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/07/89 13:30	05/07/89 17:30	4.00	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/07/89 13:30	05/08/89 00:07	10.62	STARTED/SECURED 34 FCU	CRF4 STNG, USE PREVIOUS END TIME	SRO
CFC	FCU	05/07/89 17:30	05/07/89 19:55	2.42	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/07/89 19:55	05/08/89 11:39	15.73	STARTED/SECURED 32 FCU	CRF2 STNG, USE PREVIOUS END TIME	SRO
CFC	FCU	05/07/89 19:55	05/08/89 07:36	11.68	STARTED/SECURED 33 FCU	CRF3 ETNG, USE NEXT START TIME	SRO
CFC	FCU	05/08/89 00:07	05/08/89 04:25	4.30	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/08/89 04:25	05/08/89 07:36	3.18	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/08/89 07:36	05/08/89 19:45	12.15	STARTED/SECURED 33 FCU	CRF3 ETNG, USE NEXT START TIME	SRO
CFC	FCU	05/08/89 11:39	05/08/89 16:05	4.43	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/08/89 16:05	05/08/89 19:40	3.58	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/08/89 19:40	05/08/89 19:45	0.08	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/08/89 19:45	05/09/89 00:00	4.25	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/09/89 00:00	05/09/89 05:05	5.08	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/09/89 05:05	05/09/89 09:00	3.92	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/09/89 09:00	05/09/89 13:00	4.00	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/09/89 13:00	05/09/89 20:05	7.08	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/09/89 20:05	05/10/89 00:25	4.33	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/10/89 00:25	05/10/89 04:25	4.00	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/10/89 04:25	05/10/89 08:00	3.58	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/10/89 08:00	05/10/89 12:00	4.00	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/10/89 12:00	05/10/89 16:00	4.00	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/10/89 16:00	05/10/89 20:35	4.58	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/10/89 20:35	05/11/89 00:50	4.25	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/11/89 00:50	05/11/89 05:40	4.83	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/11/89 05:40	05/11/89 08:20	2.67	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/11/89 08:20	05/11/89 12:00	3.67	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/11/89 12:00	05/11/89 16:27	4.45	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/11/89 16:27	05/11/89 20:17	3.83	STARTED/SECURED 33 FCU	CRF3	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	05/11/89 20:17	05/12/89 02:05	5.80	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/12/89 02:05	05/12/89 06:05	4.00	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/12/89 06:05	05/12/89 10:15	4.17	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/12/89 10:15	05/12/89 13:44	3.48	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	05/12/89 13:44	05/12/89 16:24	2.67	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/12/89 20:18	05/13/89 01:25	5.12	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/13/89 01:25	05/13/89 05:50	4.42	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/13/89 05:50	05/13/89 09:40	3.83	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/13/89 09:50	05/13/89 13:57	4.12	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/13/89 13:57	05/13/89 18:44	4.78	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/13/89 18:44	05/14/89 01:30	6.77	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/14/89 01:30	05/14/89 05:00	3.50	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/14/89 05:00	05/14/89 09:00	4.00	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/14/89 09:00	05/14/89 12:50	3.83	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/14/89 12:50	05/14/89 16:54	4.07	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/14/89 16:54	05/14/89 20:50	3.93	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/14/89 20:50	05/15/89 00:55	4.08	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/15/89 00:55	05/15/89 05:15	4.33	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/15/89 05:15	05/15/89 09:03	3.80	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/15/89 09:03	05/15/89 12:30	3.45	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	05/15/89 12:30	05/15/89 17:05	4.58	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/15/89 17:05	05/15/89 21:17	4.20	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/15/89 21:17	05/16/89 00:57	3.67	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/16/89 00:57	05/16/89 05:45	4.80	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/16/89 05:45	05/16/89 11:35	5.83	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	05/16/89 11:35	05/16/89 12:30	0.92	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/16/89 13:55	05/16/89 17:53	3.97	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/16/89 17:53	05/16/89 21:19	3.43	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/16/89 21:19	05/17/89 01:35	4.27	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/17/89 01:35	05/17/89 05:20	3.75	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	05/17/89 05:20	05/17/89 09:55	4.58	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/17/89 10:12	05/17/89 13:50	3.63	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/17/89 13:50	05/17/89 20:12	6.37	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/17/89 20:12	05/18/89 00:25	4.22	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/18/89 00:25	05/18/89 15:00	14.58	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	05/18/89 16:36	05/18/89 20:15	3.65	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/18/89 20:15	05/19/89 00:30	4.25	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/19/89 00:30	05/19/89 04:10	3.67	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	05/19/89 04:10	05/19/89 08:25	4.25	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/19/89 08:25	05/19/89 13:47	5.37	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/19/89 13:47	05/19/89 17:55	4.13	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/19/89 17:55	05/19/89 21:55	4.00	STARTED/SECURED 32 FCU	CRF2	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	05/19/89 21:55	05/19/89 23:19	1.40	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/19/89 23:15	05/20/89 03:15	4.00	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/20/89 03:15	05/20/89 08:16	5.02	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/20/89 13:42	05/20/89 17:25	3.72	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/20/89 17:25	05/20/89 22:20	4.92	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/20/89 22:20	05/24/89 10:44	84.40	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/24/89 10:44	05/27/89 08:50	70.10	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	05/27/89 08:50	05/29/89 14:51	54.02	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/27/89 13:03	05/27/89 14:40	1.62	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	05/28/89 02:20	05/28/89 21:30	19.17	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/29/89 09:10	05/29/89 14:51	5.68	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/29/89 09:10	05/29/89 14:53	5.72	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/29/89 09:20	05/29/89 09:45	0.42	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/29/89 14:53	05/29/89 21:38	6.75	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/29/89 21:38	05/30/89 00:55	3.28	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/30/89 02:25	05/30/89 07:10	4.75	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/30/89 04:45	05/30/89 07:10	2.42	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/30/89 04:45	05/30/89 13:00	8.25	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/30/89 13:00	05/30/89 13:30	0.50	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/30/89 13:30	05/30/89 13:59	0.48	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	05/30/89 13:59	05/31/89 13:05	23.10	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/31/89 09:28	05/31/89 10:15	0.78	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/31/89 09:28	05/31/89 13:05	3.62	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	05/31/89 10:40	05/31/89 13:55	3.25	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/31/89 13:05	06/01/89 12:35	23.50	STARTED/SECURED 31 FCU	CRF1 STNG, USE PREVIOUS END TIME	SRO
CFC	FCU	05/31/89 13:55	06/08/89 21:25	199.50	STARTED/SECURED 33 FCU	CRF3 ETNG, USE NEXT START TIME	SRO
CFC	FCU	06/01/89 12:35	06/02/89 14:07	25.53	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	06/02/89 14:07	06/03/89 16:00	25.88	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	06/03/89 16:00	06/04/89 11:43	19.72	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	06/04/89 11:43	06/04/89 14:02	2.32	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	06/04/89 14:02	06/05/89 15:44	25.70	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	06/04/89 14:02	06/05/89 21:30	31.47	STARTED/SECURED 35 FCU	CRF5 STNG, USE PREVIOUS END TIME	SRO
CFC	FCU	06/05/89 15:44	06/05/89 19:09	3.42	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	06/05/89 20:04	06/05/89 21:30	1.43	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	06/05/89 20:04	06/06/89 08:17	12.22	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	06/05/89 20:04	06/05/89 21:30	1.43	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	06/05/89 20:04	06/05/89 21:30	1.43	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	06/06/89 08:17	06/07/89 12:39	28.37	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	06/07/89 12:39	06/09/89 13:30	48.85	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	06/08/89 12:04	06/09/89 13:15	25.18	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	06/08/89 12:04	06/09/89 09:35	21.52	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	06/08/89 21:25	06/08/89 21:30	0.08	STARTED/SECURED 33 FCU	CRF3	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	06/09/89 15:45	06/10/89 19:35	27.83	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	06/09/89 15:45	06/10/89 22:00	30.25	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	06/09/89 15:45	09/21/89 10:41	2490.93	STARTED/SECURED 35 FCU FOR MAINT	CRF5	SRO
CFC	FCU	06/10/89 22:00	06/12/89 13:40	39.67	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	06/11/89 11:55	09/21/89 11:43	2447.80	STARTED/SECURED 33 FCU FOR HOSE REPAIR	CRF3	SRO
CFC	FCU	06/12/89 21:46	07/07/89 12:05	590.32	STARTED/SECURED 31 FCU FOR	CRF1	SRO
CFC	FCU	06/12/89 21:47	06/13/89 08:47	11.00	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	06/13/89 08:47	07/22/89 12:28	939.68	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	06/13/89 13:35	07/07/89 12:05	574.50	STARTED/SECURED 32 FCU	CRF2 ETNG, USE NEXT START TIME	SRO
CFC	FCU	07/07/89 12:05	07/07/89 15:04	2.98	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	07/07/89 15:04	07/11/89 08:30	89.43	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	07/11/89 08:30	07/11/89 19:40	11.17	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	07/11/89 19:40	07/12/89 08:51	13.18	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	07/12/89 08:51	07/19/89 11:05	170.23	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	07/19/89 11:05	07/22/89 12:30	73.42	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	07/22/89 12:30	03/05/90 12:56	5424.43	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	08/15/89 09:48	09/21/89 11:12	889.40	STARTED/SECURED 31 FCU FOR HOSE REPAIR.	CRF1	SRO
CFC	FCU	09/21/89 09:53	10/04/89 20:28	322.58	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	09/21/89 11:11	03/05/90 12:56	3961.75	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	09/21/89 11:42	10/02/89 08:18	260.60	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	10/02/89 08:18	11/16/89 16:44	1088.43	STARTED/SECURED 33 FCU	CRF3 ETNG, USE NEXT START TIME	SRO
CFC	FCU	10/04/89 20:28	10/20/89 12:20	375.87	STARTED/SECURED 31 FCU	CRF1 ETNG, USE NEXT START TIME	SRO
CFC	FCU	10/04/89 20:28	10/27/89 16:29	548.02	STARTED/SECURED 32 FCU	CRF2 STNG, USE PREVIOUS END TIME	SRO
CFC	FCU	10/20/89 12:20	11/16/89 16:44	652.40	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	10/27/89 19:02	11/20/89 09:04	566.03	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	11/16/89 16:44	03/05/90 12:56	2612.20	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	11/20/89 09:04	12/18/89 16:54	679.83	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	12/18/89 16:54	01/06/90 09:52	448.97	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	01/06/90 09:52	01/13/90 09:10	167.30	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	01/13/90 09:10	01/27/90 09:25	336.25	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	01/27/90 09:25	02/07/90 09:00	263.58	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	02/07/90 09:00	02/21/90 16:00	343.00	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/21/90 16:00	03/06/90 15:40	311.67	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	03/16/90 15:55	03/16/90 16:04	0.15	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	03/17/90 12:15	03/17/90 15:58	3.72	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/04/90 06:16	04/04/90 06:23	0.12	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/04/90 06:20	04/10/90 10:17	147.95	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/04/90 06:20	04/10/90 10:22	148.03	STARTED/SECURED 34 FCU	CRF4 ETNG, USE NEXT START TIME	SRO
CFC	FCU	04/04/90 06:23	04/10/90 10:12	147.82	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	04/04/90 06:23	04/10/90 10:22	147.98	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	04/10/90 10:12	04/16/90 12:40	146.47	STARTED/SECURED 31 FCU	CRF1 ETNG, USE NEXT START TIME	SRO
CFC	FCU	04/10/90 10:17	04/16/90 12:40	146.38	STARTED/SECURED 32 FCU	CRF2	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	04/10/90 10:22	05/11/90 08:55	742.55	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/16/90 12:40	04/18/90 20:47	56.12	STARTED/SECURED 31 FCU	CRF1 ETNG, USE NEXT START TIME	SRO
CFC	FCU	04/17/90 12:40	04/18/90 20:47	32.12	STARTED/SECURED 32 FCU	CRF2 STNG, USE PREVIOUS END TIME	SRO
CFC	FCU	04/18/90 20:47	04/25/90 16:40	163.88	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/21/90 09:35	04/22/90 05:55	20.33	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	04/25/90 16:40	04/26/90 19:19	26.65	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	04/26/90 19:19	04/26/90 19:30	0.18	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	04/26/90 19:30	05/07/90 08:35	253.08	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	04/27/90 15:41	04/27/90 20:44	5.05	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/01/90 13:54	05/02/90 09:34	19.67	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/07/90 08:35	05/25/90 15:10	438.58	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/11/90 15:20	08/10/90 10:29	2179.15	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/25/90 15:10	05/29/90 12:18	93.13	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/29/90 12:18	06/22/90 17:55	581.62	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	06/22/90 17:55	07/03/90 08:50	254.92	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	07/03/90 08:50	09/18/90 17:23	1856.55	STARTED/SECURED 31 FCU	CRF1 ETNG, USE NEXT START TIME	SRO
CFC	FCU	07/20/90 00:00	07/20/90 14:45	14.75	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	07/20/90 11:57	08/04/90 08:57	357.00	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	07/23/90 07:54	07/26/90 16:30	80.60	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	07/26/90 19:56	08/20/90 08:42	588.77	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	08/04/90 11:47	09/18/90 16:22	1084.58	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	08/20/90 17:24	09/19/90 08:53	711.48	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	09/08/90 00:00	09/08/90 12:10	12.17	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	09/08/90 12:35	09/18/90 17:40	245.08	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	09/15/90 00:00	09/15/90 08:45	8.75	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	09/15/90 08:50	09/18/90 16:22	79.53	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	09/18/90 00:00	09/18/90 16:22	16.37	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	09/18/90 17:23	09/21/90 22:45	77.37	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	09/18/90 17:23	09/19/90 17:00	23.62	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	09/18/90 18:25	09/19/90 21:10	26.75	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	09/19/90 10:00	09/21/90 22:45	60.75	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	09/19/90 21:10	09/20/90 10:10	13.00	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	09/20/90 10:10	09/20/90 20:02	9.87	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	09/20/90 20:02	10/22/90 16:45	764.72	STARTED/SECURED 32 FCU	CRF2 ETNG, USE NEXT START TIME	SRO
CFC	FCU	09/22/90 01:28	09/23/90 09:35	32.12	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	09/22/90 01:29	09/24/90 03:07	49.63	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	09/24/90 05:03	09/25/90 02:34	21.52	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	09/25/90 03:52	09/25/90 09:08	5.27	STARTED/SECURED 34 FCU FOR HP'S	CRF4	SRO
CFC	FCU	09/25/90 11:05	09/26/90 02:40	15.58	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	09/26/90 03:40	09/26/90 08:55	5.25	STARTED/SECURED 34 FCU FOR HP'S	CRF4	SRO
CFC	FCU	09/26/90 11:10	09/26/90 13:30	2.33	STARTED/SECURED 34 FCU FOR HP'S	CRF4	SRO
CFC	FCU	09/26/90 17:15	09/27/90 08:40	15.42	STARTED/SECURED 34 FCU FOR HP'S	CRF4	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	09/27/90 11:00	09/27/90 12:20	1.33	STARTED/SECURED 34 FCU FOR HP'S	CRF4	SRO
CFC	FCU	09/27/90 18:08	09/28/90 08:24	14.27	STARTED/SECURED 34 FCU FOR HP'S	CRF4	SRO
CFC	FCU	09/28/90 10:35	09/28/90 12:20	1.75	STARTED/SECURED 34 FCU FOR HP'S	CRF4	SRO
CFC	FCU	09/29/90 02:20	10/03/90 12:30	106.17	STARTED/SECURED 34 FCU	CRF4 ETNG, USE NEXT START TIME	SRO
CFC	FCU	10/01/90 17:33	10/01/90 17:35	0.03	BUMPED 31 FCU FOR ROTATION	CRF1 2 MIN	SRO
CFC	FCU	10/02/90 18:05	10/02/90 18:07	0.03	BUMPED 33 FCU FOR ROTATION	CRF3 2 MIN	SRO
CFC	FCU	10/03/90 12:30	10/06/90 04:55	64.42	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/03/90 13:06	10/06/90 00:25	59.32	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/06/90 04:50	10/06/90 13:48	8.97	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/06/90 13:48	10/06/90 22:41	8.88	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/06/90 14:12	10/06/90 14:14	0.03	BUMPED 31 FCU	CRF1 2 MIN	SRO
CFC	FCU	10/06/90 14:12	10/06/90 14:14	0.03	BUMPED 33 FCU	CRF3 2 MIN	SRO
CFC	FCU	10/06/90 22:30	10/06/90 22:40	0.17	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	10/06/90 22:40	10/07/90 05:10	6.50	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/07/90 05:10	10/07/90 09:35	4.42	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/07/90 09:35	10/07/90 20:25	10.83	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/07/90 20:25	10/08/90 04:50	8.42	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/08/90 04:50	10/08/90 12:00	7.17	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/08/90 12:00	10/08/90 20:41	8.68	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/08/90 20:41	10/09/90 00:38	3.95	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/09/90 00:38	10/09/90 04:45	4.12	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/09/90 04:45	10/09/90 10:58	6.22	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/09/90 10:58	10/09/90 16:31	5.55	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/09/90 16:31	10/10/90 00:24	7.88	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/10/90 00:24	10/10/90 08:59	8.58	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/10/90 08:59	10/10/90 16:15	7.27	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/10/90 16:15	10/10/90 20:15	4.00	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/10/90 20:15	10/11/90 04:09	7.90	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/11/90 04:09	10/11/90 08:15	4.10	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/11/90 08:15	10/11/90 12:50	4.58	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/11/90 12:50	10/11/90 16:30	3.67	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/11/90 16:30	10/11/90 20:25	3.92	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/11/90 20:25	10/12/90 03:43	7.30	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/12/90 03:43	10/12/90 16:50	13.12	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/12/90 16:50	10/12/90 20:20	3.50	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/12/90 20:20	10/13/90 04:14	7.90	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/13/90 04:14	10/13/90 08:50	4.60	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/13/90 08:50	10/13/90 16:30	7.67	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/13/90 16:30	10/13/90 20:16	3.77	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/13/90 20:16	10/14/90 04:32	8.27	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/14/90 04:32	10/14/90 08:54	4.37	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/14/90 08:54	10/14/90 20:35	11.68	STARTED/SECURED 35 FCU	CRF5	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	10/14/90 20:35	10/15/90 04:06	7.52	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/15/90 04:06	10/15/90 12:38	8.53	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/15/90 12:38	10/15/90 21:05	8.45	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/15/90 21:05	10/16/90 01:13	4.13	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/16/90 01:13	10/16/90 06:15	5.03	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/16/90 06:15	10/16/90 23:22	17.12	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/16/90 17:40	10/17/90 04:50	11.17	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/16/90 17:58	10/16/90 19:10	1.20	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	10/17/90 04:50	10/17/90 08:29	3.65	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/17/90 08:29	10/17/90 21:35	13.10	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/17/90 11:48	10/18/90 03:10	15.37	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/18/90 03:10	10/18/90 21:35	18.42	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/18/90 11:10	10/19/90 00:40	13.50	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/19/90 00:40	10/19/90 05:40	5.00	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/19/90 05:40	10/19/90 12:35	6.92	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/19/90 12:35	10/19/90 19:53	7.30	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/19/90 19:53	10/20/90 01:15	5.37	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/20/90 01:15	10/20/90 08:45	7.50	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/20/90 08:45	10/20/90 12:55	4.17	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/20/90 12:55	10/20/90 21:30	8.58	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/20/90 21:30	10/21/90 02:21	4.85	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/21/90 02:21	10/21/90 14:20	11.98	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/21/90 14:20	10/21/90 19:25	5.08	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/21/90 19:25	10/22/90 02:05	6.67	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/22/90 02:05	10/22/90 22:07	20.03	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/22/90 16:45	10/22/90 16:47	0.03	BUMPED 32 FCU FOR ROTATION	CRF2 2 MIN	SRO
CFC	FCU	10/22/90 22:07	10/23/90 03:12	5.08	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/23/90 05:01	10/23/90 13:35	8.57	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/23/90 13:35	10/23/90 21:15	7.67	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/23/90 21:15	10/24/90 02:28	5.22	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/24/90 02:28	10/24/90 13:40	11.20	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/24/90 13:40	10/24/90 22:08	8.47	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/24/90 22:08	10/25/90 08:35	10.45	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/25/90 08:35	10/25/90 23:55	15.33	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/25/90 09:28	10/25/90 09:37	0.15	STARTED/SECURED 32 FCU - TPO.	CRF2	SRO
CFC	FCU	10/25/90 13:20	10/25/90 13:30	0.17	STARTED/SECURED 32 FCU - TPO.	CRF2	SRO
CFC	FCU	10/25/90 23:55	10/26/90 12:55	13.00	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/26/90 12:55	10/27/90 01:30	12.58	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/27/90 01:30	10/27/90 17:52	16.37	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/27/90 17:52	10/28/90 01:30	7.63	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/28/90 01:30	10/28/90 11:08	9.63	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/28/90 11:08	10/29/90 23:00	35.87	STARTED/SECURED 35 FCU	CRF5	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	10/28/90 23:00	10/29/90 11:33	12.55	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/29/90 11:33	10/29/90 19:50	8.28	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/29/90 11:33	10/29/90 19:50	8.28	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/29/90 19:50	10/30/90 02:40	6.83	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/29/90 19:50	10/30/90 02:40	6.83	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/30/90 02:40	10/30/90 15:43	13.05	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/30/90 15:43	10/31/90 05:05	13.37	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	10/31/90 05:05	10/31/90 11:45	6.67	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/31/90 11:45	11/01/90 01:00	13.25	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	11/01/90 01:00	11/01/90 08:20	7.33	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	11/01/90 08:20	11/02/90 01:23	17.05	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	11/02/90 01:23	11/03/90 01:05	23.70	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	11/03/90 01:05	11/03/90 20:20	19.25	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	11/03/90 20:20	11/04/90 21:30	25.17	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	11/04/90 21:30	11/05/90 04:30	7.00	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	11/05/90 04:30	11/05/90 16:20	11.83	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	11/05/90 16:20	11/06/90 04:20	12.00	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	11/05/90 16:35	11/05/90 17:00	0.42	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	11/06/90 04:20	11/06/90 09:24	5.07	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	11/06/90 09:24	11/06/90 20:38	11.23	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	11/06/90 20:38	11/07/90 01:55	5.28	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	11/07/90 01:55	11/07/90 10:15	8.33	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	11/07/90 10:15	11/08/90 04:00	17.75	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	11/08/90 04:00	11/08/90 11:28	7.47	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	11/08/90 11:28	11/08/90 20:00	8.53	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	11/08/90 20:00	11/09/90 02:10	6.17	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	11/09/90 02:10	11/09/90 17:37	15.45	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	11/09/90 17:37	11/10/90 02:40	9.05	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	11/10/90 02:40	11/10/90 03:00	0.33	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	11/10/90 03:00	11/10/90 11:55	8.92	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	11/10/90 11:55	11/10/90 15:08	3.22	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	11/10/90 11:55	11/10/90 15:08	3.22	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	11/10/90 15:51	11/11/90 02:35	10.73	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	11/11/90 02:35	11/12/90 02:30	23.92	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	11/11/90 03:15	11/11/90 07:36	4.35	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	11/11/90 03:15	11/11/90 07:36	4.35	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	11/12/90 02:30	11/13/90 07:57	29.45	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	11/14/90 01:50	11/14/90 07:43	5.88	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	11/15/90 01:45	11/17/90 10:15	56.50	STARTED/SECURED 33 FCU FOR PERFORMANCE.	CRF3	SRO
CFC	FCU	11/17/90 10:15	11/17/90 13:15	3.00	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	11/17/90 13:15	11/17/90 13:43	0.47	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	11/17/90 13:43	11/18/90 00:10	10.45	STARTED/SECURED 32 FCU	CRF2	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	11/18/90 00:10	11/19/90 04:00	27.83	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	11/19/90 04:00	11/26/90 11:05	175.08	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	11/26/90 11:05	11/26/90 11:15	0.17	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	11/26/90 11:15	11/26/90 13:20	2.08	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	11/26/90 13:20	11/27/90 00:47	11.45	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	11/27/90 00:47	12/03/90 08:00	151.22	STARTED/SECURED 31 FCU	CRF1 ETNG, USE NEXT START TIME	SRO
CFC	FCU	11/28/90 20:30	11/29/90 12:00	15.50	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	11/28/90 20:30	12/03/90 17:44	117.23	STARTED/SECURED 34 FCU	CRF4 ETNG, USE NEXT START TIME	SRO
CFC	FCU	11/29/90 12:00	11/29/90 17:40	5.67	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	12/03/90 08:00	12/03/90 17:44	9.73	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	12/03/90 17:44	12/03/90 22:39	4.92	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	12/03/90 22:39	12/04/90 16:34	17.92	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	12/05/90 21:18	12/06/90 04:17	6.98	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	12/05/90 21:18	12/10/90 20:40	119.37	STARTED/SECURED 34 FCU	CRF4 ETNG, USE NEXT START TIME	SRO
CFC	FCU	12/06/90 04:17	12/06/90 17:11	12.90	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	12/06/90 17:11	12/07/90 18:03	24.87	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	12/07/90 18:03	12/08/90 08:54	14.85	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	12/09/90 13:56	12/11/90 09:48	43.87	STARTED/SECURED 31 FCU	CRF1 ETNG, USE NEXT START TIME	SRO
CFC	FCU	12/10/90 10:36	12/10/90 20:40	10.07	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	12/10/90 20:40	12/10/90 22:03	1.38	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	12/10/90 21:15	12/10/90 22:03	0.80	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	12/10/90 22:03	12/11/90 01:04	3.02	STARTED/SECURED 32 FCU	CRF2 ETNG, USE NEXT START TIME	SRO
CFC	FCU	12/11/90 00:28	12/11/90 18:20	17.87	STARTED/SECURED 33 FCU TO TEST DAMPERS	CRF3 ETNG, USE NEXT START TIME	SRO
CFC	FCU	12/11/90 01:04	12/11/90 01:42	0.63	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	12/11/90 09:48	12/11/90 18:20	8.53	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	12/11/90 09:48	12/13/90 09:43	47.92	STARTED/SECURED 35 FCU	CRF5 ETNG, USE NEXT START TIME	SRO
CFC	FCU	12/11/90 12:30	12/11/90 13:55	1.42	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	12/11/90 18:20	12/11/90 21:21	3.02	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	12/11/90 21:21	12/11/90 22:30	1.15	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	12/11/90 22:30	01/11/91 09:05	730.58	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	12/13/90 09:34	03/25/91 16:40	2455.10	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	12/13/90 09:34	03/25/91 17:00	2455.43	STARTED/SECURED 35 FCU	CRF5 ETNG, USE NEXT START TIME	SRO
CFC	FCU	12/14/90 12:47	12/15/90 20:36	31.82	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	12/14/90 12:47	03/25/91 16:40	2427.88	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	01/11/91 12:56	02/14/91 08:35	811.65	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	02/14/91 08:35	02/28/91 09:17	336.70	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	02/28/91 09:17	03/13/91 08:59	311.70	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	03/13/91 08:59	03/25/91 16:40	295.68	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	03/25/91 16:40	04/08/91 09:00	328.33	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	03/25/91 17:00	03/27/91 13:30	44.50	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	03/25/91 17:00	03/29/91 16:05	95.08	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	03/25/91 17:00	03/27/91 13:30	44.50	STARTED/SECURED 34 FCU	CRF4	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	04/07/91 21:00	04/24/91 09:06	396.10	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	04/07/91 21:00	05/19/91 20:57	1007.95	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	04/07/91 21:00	05/13/91 07:10	850.17	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	04/08/91 09:00	05/15/91 15:00	894.00	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	04/24/91 09:06	05/06/91 09:01	287.92	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/06/91 09:01	05/19/91 20:57	323.93	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/16/91 00:45	05/16/91 01:10	0.42	STARTED/SECURED 31 FCU FOR PERFORMANCE	CRF1	SRO
CFC	FCU	05/16/91 00:45	05/16/91 01:10	0.42	STARTED/SECURED 35 FCU FOR PERFORMANCE	CRF5	SRO
CFC	FCU	05/16/91 09:10	05/19/91 20:57	83.78	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	05/18/91 10:05	05/18/91 10:07	0.03	BUMPED 34 FCU FOR ROTATION CHECK	CRF4 2 MIN	SRO
CFC	FCU	05/19/91 16:25	05/19/91 16:28	0.05	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/20/91 23:13	05/20/91 23:15	0.03	BUMPED 34 FCU FOR ROTATION	CRF4 2 MIN	SRO
CFC	FCU	05/21/91 02:52	09/17/91 09:05	2862.22	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	05/22/91 03:30	05/22/91 22:30	19.00	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	05/22/91 03:30	06/21/91 08:35	725.08	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	05/22/91 03:30	09/17/91 09:13	2837.72	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	05/22/91 22:30	09/17/91 09:21	2818.85	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	06/21/91 08:35	07/02/91 09:00	264.42	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	07/02/91 09:00	07/18/91 09:02	384.03	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	07/18/91 09:02	07/29/91 08:55	263.88	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	07/29/91 08:55	08/13/91 08:42	359.78	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	08/13/91 08:42	08/21/91 16:45	200.05	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	08/21/91 16:45	08/30/91 11:08	210.38	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	08/30/91 10:25	09/16/91 10:20	407.92	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	09/16/91 10:20	09/17/91 09:32	23.20	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	09/17/91 09:05	10/23/91 00:40	855.58	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	09/17/91 09:13	11/12/91 07:07	1341.90	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	09/17/91 09:21	12/02/91 23:37	1838.27	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	09/17/91 09:32	10/20/91 10:15	792.72	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/15/91 07:08	10/15/91 15:44	8.60	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	10/20/91 10:15	10/20/91 14:15	4.00	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	10/20/91 14:15	10/22/91 08:30	42.25	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/22/91 08:30	10/22/91 12:55	4.42	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	10/22/91 12:55	11/18/91 17:20	652.42	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	10/23/91 02:01	11/26/91 13:09	827.13	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	11/12/91 07:07	11/13/91 14:36	31.48	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	11/13/91 14:36	12/02/91 23:30	464.90	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	11/18/91 19:34	11/22/91 19:36	96.03	STARTED/SECURED 35 FCU	CRF5	SRO
CFC	FCU	11/21/91 10:00	11/21/91 10:25	0.42	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	11/22/91 19:36	12/03/91 02:44	247.13	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	11/26/91 15:00	12/03/91 02:50	155.83	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	12/02/91 23:30	12/03/91 02:58	3.47	STARTED/SECURED 35 FCU	CRF5	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CFC	FCU	12/02/91 23:37	12/12/91 13:16	229.65	STARTED/SECURED 34 FCU	CRF4	SRO
CFC	FCU	12/03/91 02:44	12/11/91 14:25	203.68	STARTED/SECURED 33 FCU	CRF3	SRO
CFC	FCU	12/03/91 02:50	12/13/91 12:52	250.03	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	12/03/91 02:58	12/18/91 08:50	365.87	STARTED/SECURED 31 FCU	CRF1	SRO
CFC	FCU	12/11/91 14:25	12/11/91 00:00		STARTED/SECURED 35 FCU	CRF5 ETNG	SRO
CFC	FCU	12/12/91 12:30	12/12/91 00:00		STARTED/SECURED 33 FCU	CRF3 ETNG	SRO
CFC	FCU	12/13/91 12:15	12/13/91 00:00		STARTED/SECURED 34 FCU	CRF4 ETNG	SRO
CFC	FCU	12/18/91 08:50	12/18/91 12:12	3.37	STARTED/SECURED 32 FCU	CRF2	SRO
CFC	FCU	12/18/91 12:12	12/18/91 00:00		STARTED/SECURED 31 FCU	CRF1 ETNG	SRO
DC1	BATTERY	02/04/85 14:45	02/06/85 14:45	48.00	31 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	02/04/85 14:45	02/06/85 14:45	48.00	32 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	05/04/85 14:35	05/05/85 00:50	10.25	31 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	05/04/85 14:35	05/05/85 05:25	14.83	32 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	05/04/85 14:35	05/05/85 05:25	14.83	33 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	05/04/85 14:35	05/05/85 00:50	10.25	34 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	06/12/85 13:35	06/13/85 19:35	30.00	33 BATTERY ON/OFF CHARGE	ASSUME OFF CHARGE TIME	SRO
DC1	BATTERY	07/20/85 14:00	07/22/85 14:00	48.00	32 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	07/31/85 11:35	08/02/85 11:35	48.00	33 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	07/31/85 11:35	08/02/85 11:35	48.00	34 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	08/14/85 23:30	08/16/85 05:30	30.00	31 BATTERY ON/OFF CHARGE	ASSUME OFF CHARGE TIME	SRO
DC1	BATTERY	09/01/85 09:30	09/03/85 09:30	48.00	32 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	11/11/85 12:55	11/12/85 13:20	24.42	31 BATTERY ON/OFF EQUALIZE CHARGE		SRO
DC1	BATTERY	01/28/86 08:00	01/29/86 08:00	24.00	31 BATTERY ON/OFF EQUALIZE CHARGE	START/END TIME	SRO
DC1	BATTERY	01/28/86 08:00	01/29/86 08:00	24.00	32 BATTERY ON/OFF EQUALIZE CHARGE	START/END TIME	SRO
DC1	BATTERY	01/28/86 08:00	01/29/86 08:00	24.00	34 BATTERY ON/OFF EQUALIZE CHARGE	START/END TIME	SRO
DC1	BATTERY	06/30/86 07:00	07/01/86 07:00	24.00	33 BATTERY ON/OFF EQUALIZE CHARGE	START/END TIME	SRO
DC1	BATTERY	07/28/86 16:00	07/29/86 20:10	28.17	31 BATTERY ON/OFF EQUALIZE CHARGE	START TIME	SRO
DC1	BATTERY	07/28/86 16:00	07/29/86 20:10	28.17	32 BATTERY ON/OFF EQUALIZE CHARGE	START TIME	SRO
DC1	BATTERY	07/28/86 16:00	07/29/86 20:10	28.17	34 BATTERY ON/OFF EQUALIZE CHARGE	START TIME	SRO
DC1	BATTERY	07/28/86 19:40	07/29/86 20:10	24.50	33 BATTERY ON/OFF EQUALIZE CHARGE		SRO
DC1	BATTERY	09/25/86 22:25	09/27/86 04:25	30.00	33 BATTERY ON/OFF CHARGE	ASSUME OFF CHARGE TIME	SRO
DC1	BATTERY	10/24/86 10:20	10/26/86 02:25	40.08	34 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	10/24/86 13:30	10/26/86 02:20	36.83	31 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	10/25/86 02:20	10/26/86 02:20	24.00	32 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	10/25/86 04:20	10/26/86 06:00	25.67	33 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	12/31/86 18:20	01/02/87 22:05	51.75	33 BATTERY ON/OFF CHARGE (ON 35 BC)		SRO
DC1	BATTERY	01/26/87 13:45	01/27/87 19:45	30.00	31 BATTERY ON/OFF CHARGE	ASSUME OFF CHARGE TIME	SRO
DC1	BATTERY	01/26/87 13:45	01/26/87 21:55	8.17	32 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	04/26/87 16:24	04/28/87 16:46	48.37	33 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	04/26/87 16:24	04/28/87 16:46	48.37	34 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	05/04/87 12:43	05/05/87 13:20	24.62	31 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	05/05/87 14:35	05/06/87 15:00	24.42	32 BATTERY ON/OFF CHARGE		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
DC1	BATTERY	07/04/87 02:00	07/05/87 08:00	30.00	33 BATTERY ON/OFF CHARGE	ASSUME OFF CHARGE TIME	SRO
DC1	BATTERY	07/08/87 21:00	07/10/87 21:00	48.00	31 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	07/10/87 20:55	07/12/87 02:55	30.00	34 BATTERY ON/OFF CHARGE	ASSUME OFF CHARGE TIME	SRO
DC1	BATTERY	07/14/87 19:00	07/16/87 01:00	30.00	31 BATTERY ON/OFF CHARGE (ON 35 BC)	ASSUME OFF CHARGE TIME	SRO
DC1	BATTERY	07/24/87 21:30	07/26/87 03:30	30.00	31 BATTERY ON/OFF CHARGE	ASSUME OFF CHARGE TIME	SRO
DC1	BATTERY	08/20/87 17:45	08/21/87 19:41	25.93	33 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	09/21/87 16:30	09/23/87 16:45	48.25	33 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	10/19/87 16:00	10/20/87 14:15	22.25	34 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	10/20/87 14:15	10/21/87 20:15	30.00	33 BATTERY ON/OFF CHARGE	ASSUME OFF CHARGE TIME	SRO
DC1	BATTERY	10/23/87 11:50	10/24/87 11:45	23.92	32 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	10/24/87 12:15	10/26/87 10:50	46.58	31 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	02/10/88 13:05	02/11/88 19:05	30.00	31 BATTERY ON/OFF CHARGE	ASSUME OFF CHARGE TIME	SRO
DC1	BATTERY	02/17/88 13:50	02/18/88 19:50	30.00	33 BATTERY ON/OFF CHARGE	ASSUME OFF CHARGE TIME	SRO
DC1	BATTERY	03/29/88 16:42	03/30/88 16:50	24.13	33 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	05/06/88 17:35	05/07/88 17:45	24.17	31 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	05/12/88 21:30	05/13/88 21:48	24.30	33 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	05/19/88 16:27	05/20/88 18:30	26.05	31 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	08/03/88 12:13	08/04/88 12:48	24.58	31 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	08/04/88 12:50	08/05/88 14:20	25.50	32 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	08/05/88 14:40	08/06/88 16:00	25.33	34 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	11/10/88 11:29	11/12/88 11:53	48.40	31 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	11/12/88 13:00	11/14/88 13:25	48.42	32 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	11/14/88 13:25	11/15/88 13:50	24.42	34 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	11/15/88 13:50	11/17/88 13:50	48.00	33 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	01/31/89 12:10	02/01/89 13:46	25.60	31 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	02/01/89 13:50	02/02/89 14:30	24.67	32 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	02/02/89 14:40	02/03/89 20:40	30.00	33 BATTERY ON/OFF CHARGE	ASSUME OFF CHARGE TIME	SRO
DC1	BATTERY	03/20/89 16:00	03/21/89 18:30	26.50	31 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	03/22/89 14:40	03/23/89 17:50	27.17	32 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	04/14/89 21:30	04/16/89 21:00	47.50	33 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	04/19/89 12:15	04/21/89 12:20	48.08	31 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	04/20/89 17:20	04/21/89 15:00	21.67	33 BATTERY ON/OFF CHARGE (ON 35 BC)		SRO
DC1	BATTERY	04/22/89 09:00	04/23/89 03:25	18.42	33 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	04/25/89 17:30	04/26/89 23:30	30.00	32 BATTERY ON/OFF CHARGE	ASSUME OFF CHARGE TIME	SRO
DC1	BATTERY	04/27/89 09:30	04/29/89 18:28	56.97	31 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	05/02/89 13:30	05/04/89 20:15	54.75	32 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	05/03/89 08:35	05/05/89 09:15	48.67	34 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	05/06/89 12:30	05/08/89 12:35	48.08	31 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	05/08/89 10:05	05/08/89 19:30	9.42	34 BATTERY ON/OFF DISCHARGE TEST		SRO
DC1	BATTERY	05/08/89 19:30	05/10/89 20:00	48.50	34 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	05/15/89 14:00	05/17/89 16:11	50.18	31 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	05/29/89 09:30	05/30/89 15:30	30.00	31 BATTERY ON/OFF CHARGE	ASSUME OFF CHARGE TIME	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
DC1	BATTERY	08/07/89 13:10	08/09/89 08:51	43.68	31 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	08/09/89 08:55	08/10/89 12:00	27.08	34 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	08/10/89 12:00	08/11/89 12:40	24.67	32 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	08/11/89 12:40	08/12/89 14:40	26.00	33 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	10/26/89 18:45	10/27/89 19:10	24.42	32 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	10/31/89 14:30	11/02/89 14:55	48.42	34 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	02/02/90 08:45	02/03/90 08:50	24.08	31 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	02/03/90 08:50	02/04/90 09:30	24.67	32 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	02/05/90 20:25	02/06/90 20:25	24.00	34 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	02/07/90 11:50	02/08/90 10:00	22.17	33 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	03/16/90 13:00	03/17/90 18:42	29.70	32 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	05/04/90 14:45	05/06/90 14:45	48.00	31 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	05/07/90 11:45	05/08/90 12:00	24.25	32 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	05/08/90 13:55	05/09/90 14:05	24.17	33 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	05/09/90 14:05	05/10/90 14:52	24.78	34 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	07/26/90 22:30	07/27/90 22:07	23.62	34 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	07/30/90 16:05	07/31/90 16:15	24.17	32 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	10/03/90 19:20	10/06/90 18:00	70.67	34 BATTERY ON/OFF CHARGE (ON 35 BC)		SRO
DC1	BATTERY	10/06/90 20:40	10/08/90 21:00	48.33	32 BATTERY ON/OFF CHARGE (ON 35 BC)		SRO
DC1	BATTERY	10/13/90 13:30	10/15/90 14:10	48.67	32 BATTERY ON/OFF CHARGE (ON 35 BC)		SRO
DC1	BATTERY	10/18/90 16:55	10/20/90 16:55	48.00	31 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	10/31/90 14:25	11/01/90 15:30	25.08	34 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	11/01/90 16:00	11/03/90 16:05	48.08	33 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	11/05/90 14:00	11/08/90 10:40	68.67	31 BATTERY ON/OFF CHARGE		SRO
DC1	BATTERY	01/30/91 12:11	01/31/91 12:28	24.28	34 BATTERY ON EQUALIZE/FLOAT CHARGE		SRO
DC1	BATTERY	01/31/91 12:28	02/01/91 13:50	25.37	31 BATTERY ON EQUALIZE CHARGE		SRO
DC1	BATTERY	02/05/91 14:15	04/05/91 15:25	1417.17	32 BATTERY ON FLOAT/EQUALIZE CHARGE		SRO
DC1	BATTERY	02/05/91 14:15	02/06/91 20:15	30.00	33 BATTERY ON EQUALIZE/FLOAT CHARGE	ASSUME ON FLOAT CHARGE TIME	SRO
DC1	BATTERY	04/09/91 06:30	04/10/91 12:30	30.00	31 BATTERY ON EQUALIZE CHARGE	ASSUME START TIME	SRO
DC1	BATTERY	04/29/91 17:25	04/30/91 23:25	30.00	31 BATTERY ON EQUALIZE CHARGE	ASSUME START/END TIME	SRO
DC1	BATTERY	05/02/91 00:10	05/03/91 14:30	38.33	32 BATTERY ON EQUALIZE/FLOAT CHARGE	ASSUME START TIME	SRO
DC1	BATTERY	05/03/91 15:20	05/05/91 16:00	48.67	34 BATTERY ON EQUALIZE/FLOAT CHARGE		SRO
DC1	BATTERY	05/07/91 14:00	05/08/91 14:30	24.50	33 BATTERY ON EQUALIZE/FLOAT CHARGE		SRO
DC1	BATTERY	07/11/91 14:15	07/12/91 14:10	23.92	31 BATTERY ON EQUALIZE/FLOAT CHARGE	ASSUME END TIME	SRO
DC1	BATTERY	07/12/91 14:15	07/13/91 14:15	24.00	32 BATTERY ON EQUALIZE/FLOAT CHARGE		SRO
DC1	BATTERY	07/31/91 10:55	08/01/91 12:50	25.92	31 BATTERY ON EQUALIZE/FLOAT CHARGE		SRO
DC1	BATTERY	08/01/91 14:30	08/02/91 14:45	24.25	32 BATTERY ON EQUALIZE/FLOAT CHARGE		SRO
DC1	BATTERY	08/02/91 14:45	08/03/91 16:05	25.33	34 BATTERY ON EQUALIZE/FLOAT CHARGE		SRO
DC1	BATTERY	08/06/91 13:35	08/07/91 13:30	23.92	33 BATTERY ON EQUALIZE/FLOAT CHARGE		SRO
DC1	BATTERY	11/01/91 13:30	11/02/91 14:15	24.75	32 BATTERY ON EQUALIZE CHARGE		SRO
DC1	BATTERY	11/04/91 14:05	11/05/91 20:05	30.00	31 BATTERY ON EQUALIZE CHARGE	ASSUME END TIME	SRO
DC1	BATTERY	11/07/91 13:00	11/08/91 14:20	25.33	34 BATTERY ON EQUALIZE/FLOAT CHARGE		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
DC1	BATTERY	11/08/91 14:20	11/09/91 20:20	30.00	31 BATTERY ON EQUALIZE CHARGE	ASSUME END TIME	SRO
DC1	BATTERY	11/09/91 14:20	11/10/91 20:20	30.00	33 BATTERY ON FLOAT CHARGE	ASSUME END TIME	SRO
EDG	32 EDG	02/03/85 01:50	02/03/85 02:53	1.05	RAN 32 EDG		SRO
EDG	33 EDG	02/07/85 20:06	02/07/85 21:26	1.33	STARTED/SECURED 33 EDG		SRO
EDG	31 EDG	07/04/85 08:10	07/04/85 09:10	1.00	STARTED/SECURED 31 EDG (FOR SERVICE WATER MOD)	ASSUMED START TIME	SRO
EDG	32 EDG	07/22/85 16:00	07/22/85 17:05	1.08	RAN 32 EDG		SRO
EDG	32 EDG	07/22/85 18:06	07/22/85 19:24	1.30	RAN 32 EDG		SRO
EDG	31 EDG	09/04/85 23:30	09/05/85 00:30	1.00	STARTED/SECURED 31 EDG		SRO
EDG	32 EDG	09/05/85 00:30	09/05/85 01:30	1.00	STARTED/SECURED 32 EDG		SRO
EDG	33 EDG	09/05/85 01:30	09/05/85 02:30	1.00	STARTED/SECURED 33 EDG		SRO
EDG		09/14/85 10:30	09/14/85 10:45	0.25	SYNCH THE BLACK-OUT DIESEL TO THE BUS/TRIPPED DUE TO HIGH VIBRATION		SRO
EDG		09/14/85 11:20	09/14/85 12:20	1.00	SYNCH THE BLACK-OUT DIESEL TO THE BUS	ASSUMED END TIME	SRO
EDG	31 EDG	10/01/85 00:18	10/01/85 01:20	1.03	RAN 31 EDG AT IDEL TO MIX COOLING H O CHEMICALS		SRO
EDG	32 EDG	10/01/85 01:38	10/01/85 01:39	0.02	RAN 32 EDG FOR CHEMICAL MIXING		SRO
EDG	31 EDG	10/22/85 10:15	10/22/85 11:15	1.00	RAN 31 EDG FOR CHEMICAL MIXING OF COOLING WATER		SRO
EDG	32 EDG	10/28/85 08:03	10/28/85 09:08	1.08	RAN 32 EDG		SRO
EDG	32 EDG	10/28/85 09:29	10/28/85 10:35	1.10	RAN 32 EDG		SRO
EDG	32 EDG	12/13/85 11:47	12/13/85 12:50	1.05	32 EDG IN SERVICE FOR CHEMISTRY/SECURED 32 EDG & RETURNED TO AUTO		SRO
EDG	32 EDG	12/16/85 13:45	12/16/85 14:45	1.00	STARTED/SECURED 32 EDG IN AUTO OPERABLE		SRO
EDG	31 EDG	02/13/86 12:05	02/13/86 12:30	0.42	31 EDG IN SERVICE FOR MTC.		SRO
EDG	32 EDG	03/18/86 21:30	03/18/86 22:33	1.05	RAN 32 EDG		SRO
EDG	33 EDG	03/19/86 11:50	03/19/86 12:15	0.42	33 EDG IN SERVICE FOR COMPRESSION TEST.		SRO
EDG	33 EDG	03/19/86 15:45	03/19/86 16:10	0.42	RAN 33 EDG FOR MTC(MAINTANENCE COMP. CHECK TEST)		SRO
EDG	31 EDG	04/08/86 16:52	04/08/86 17:57	1.08	31 EDG ON/OFF BUS		SRO
EDG	31 EDG	06/03/86 00:50	06/03/86 01:56	1.10	31 EDG ON/OFF BUS		SRO
EDG	32 EDG	06/03/86 18:55	06/03/86 20:40	1.75	STARTED/SECURED 32 EDG		SRO
EDG	33 EDG	06/05/86 16:49	06/05/86 18:00	1.18	33 EDG ON/OFF BUS		SRO
EDG	31 EDG	08/23/86 10:07	08/23/86 11:32	1.42	STARTED/SECURED 31 EDG FOR TEST		SRO
EDG	31 EDG	08/23/86 10:23	08/23/86 11:32	1.15	31 EDG ON/OFF BUS		SRO
EDG	32 EDG	08/27/86 16:50	08/27/86 17:53	1.05	32 EDG ON/OFF BUS		SRO
EDG	31 EDG	09/11/86 11:30	09/11/86 11:50	0.33	RAN 31 EDG FOR CHEM SAMPLES		SRO
EDG	32 EDG	09/11/86 11:55	09/11/86 12:40	0.75	RAN 32 EDG FOR CHEM SAMPLES		SRO
EDG	31 EDG	09/11/86 13:30	09/11/86 14:53	1.38	RAN 31 EDG		SRO
EDG	31 EDG	09/17/86 19:33	09/17/86 20:25	0.87	STARTED/SECURED 31 EDG		SRO
EDG	32 EDG	10/07/86 09:37	10/07/86 11:15	1.63	STARTED/SECURED 32 EDG		SRO
EDG	33 EDG	10/15/86 23:52	10/16/86 01:05	1.22	33 EDG ON/OFF BUS		SRO
EDG	32 EDG	10/16/86 01:26	10/16/86 02:39	1.22	32 EDG ON/OFF BUS		SRO
EDG	33 EDG	11/13/86 14:15	11/13/86 15:15	1.00	COMPLETED REQUIRED TESTS ON 33 EDG FIRE PROTECTION.	ASSUMED START TIME	SRO
EDG	32 EDG	11/20/86 15:30	11/20/86 16:42	1.20	STARTED/SECURED 32 EDG FOR RESET		SRO
EDG	31 EDG	12/03/86 17:28	12/03/86 18:36	1.13	STARTED/SECURED 31 EDG		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
EDG	31 EDG	12/03/86 17:36	12/03/86 18:33	0.95	31 EDG ON/OFF BUS		SRO
EDG	32 EDG	12/03/86 18:39	12/03/86 19:47	1.13	STARTED/SECURED 32 EDG		SRO
EDG	32 EDG	12/03/86 18:42	12/03/86 19:45	1.05	32 EDG ON/OFF BUS		SRO
EDG	31 EDG	03/09/87 00:10	03/09/87 01:17	1.12	31 EDG ON/OFF BUS		SRO
EDG	32 EDG	03/09/87 01:32	03/09/87 02:39	1.12	32 EDG ON/OFF BUS		SRO
EDG	33 EDG	03/09/87 02:51	03/09/87 04:00	1.15	33 EDG ON/OFF BUS		SRO
EDG	32 EDG	03/13/87 13:55	03/13/87 14:55	1.00	32 EDG ON/OFF BUS		SRO
EDG	32 EDG	03/13/87 13:55	03/13/87 14:57	1.03	STARTED/SECURED 32 EDG		SRO
EDG	33 EDG	03/17/87 17:05	03/17/87 18:30	1.42	STARTED/SECURED 33 EDG		SRO
EDG	31 EDG	04/01/87 19:00	04/01/87 20:30	1.50	RAN 31 EDG AND DECLARED OPERABLE		SRO
EDG	32 EDG	04/01/87 20:40	04/01/87 21:50	1.17	RAN 32 EDG		SRO
EDG	32 EDG	04/01/87 21:30	04/01/87 22:30	1.00	RAN 32 EDG		SRO
EDG	33 EDG	05/15/87 16:45	05/15/87 17:45	1.00	STARTED/SECURED 31 EDG	ASSUMED START TIME	SRO
EDG	33 EDG	05/15/87 16:45	05/15/87 17:45	1.00	STARTED/SECURED 33 EDG	ASSUMED START TIME	SRO
EDG	32 EDG	05/22/87 13:45	05/22/87 18:30	4.75	32 EDG OOS FOR I&C/OPERABLE		SRO
EDG	31 EDG	07/06/87 04:30	07/06/87 22:15	17.75	31 EDG OOS/OPERABLE (FOR PT)		SRO
EDG	31 EDG	07/07/87 08:35	07/07/87 09:15	0.67	RAN 31 EDG FOR OP CHECK		SRO
EDG	31 EDG	07/07/87 16:05	07/07/87 17:10	1.08	RAN 31 EDG		SRO
EDG	33 EDG	07/08/87 02:00	07/08/87 22:00	20.00	33 EDG OOS/OPERABLE (FOR MTC)		SRO
EDG	32 EDG	07/09/87 00:45	07/09/87 18:00	17.25	32 EDG OOS/OPERABLE (FOR MTC & PM)		SRO
EDG	32 EDG	07/09/87 17:08	07/09/87 17:50	0.70	RAN 32 EDG TO SUPPLY BUS 6A		SRO
EDG	33 EDG	07/10/87 09:25	07/10/87 10:38	1.22	STARTED/SECURED 33 EDG		SRO
EDG	31 EDG	10/07/87 19:37	10/07/87 20:47	1.17	STARTED/SECURED 31 EDG		SRO
EDG	33 EDG	11/08/87 17:57	11/08/87 18:57	1.00	33 EDG ON/OFF BUS		SRO
EDG	31 EDG	12/22/87 04:54	12/22/87 05:54	1.00	31 EDG ON/OFF BUS		SRO
EDG	33 EDG	03/01/88 01:50	03/01/88 03:03	1.22	RAN 33 EDG		SRO
EDG	32 EDG	03/01/88 21:30	03/01/88 22:40	1.17	STARTED/SECURED 32 EDG		SRO
EDG	32 EDG	03/01/88 21:34	03/01/88 22:39	1.08	32 EDG ON/OFF BUS		SRO
EDG	33 EDG	04/20/88 02:40	04/20/88 03:45	1.08	STARTED/SECURED 33 EDG		SRO
EDG	31 EDG	04/26/88 12:25	04/26/88 13:30	1.08	RAN 31 EDG FOR MTC. 31 EDG OPERABLE @ 1330.		SRO
EDG	33 EDG	05/12/88 19:10	05/12/88 20:15	1.08	STARTED/SECURED 33 EDG		SRO
EDG	31 EDG	05/17/88 04:56	05/17/88 05:40	0.73	STARTED/SECURED 31 EDG		SRO
EDG	33 EDG	06/18/88 18:43	06/18/88 19:50	1.12	33 EDG ON/OFF BUS		SRO
EDG	32 EDG	08/19/88 23:10	08/20/88 00:41	1.52	STARTED/SECURED 32 EDG		SRO
EDG	32 EDG	08/20/88 02:00	08/20/88 03:26	1.43	RAN 32 EDG		SRO
EDG	33 EDG	08/24/88 03:20	08/24/88 04:30	1.17	STARTED/SECURED 33 EDG		SRO
EDG	32 EDG	09/07/88 16:25	09/07/88 20:25	4.00	STARTED/SECURED 32 EDG TO REPAIR 480 V RELAY. RELAY		SRO
EDG	33 EDG	10/10/88 02:35	10/10/88 03:45	1.17	STARTED/SECURED 33 EDG		SRO
EDG	33 EDG	10/12/88 09:18	10/12/88 10:15	0.95	STARTED/SECURED 33 EDG		SRO
EDG	33 EDG	10/14/88 08:18	10/14/88 09:20	1.03	33 EDG ON/OFF BUS		SRO
EDG	31 EDG	10/14/88 09:30	10/14/88 10:31	1.02	31 EDG ON/OFF BUS		SRO
EDG	32 EDG	10/14/88 19:04	10/14/88 20:04	1.00	RAN 32 EDG TO TEST AIR START MOTOR.	ASSUMED END TIME	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
EDG	31 EDG	11/02/88 02:36	11/02/88 03:48	1.20	31 EDG ON/OFF BUS		SRO
EDG	32 EDG	11/02/88 04:59	11/02/88 06:05	1.10	32 EDG ON/OFF BUS		SRO
EDG	31 EDG	11/04/88 09:10	11/04/88 12:56	3.77	31 EDG INOPERABLE/OPERABLE FOR MTC.		SRO
EDG	32 EDG	11/19/88 14:00	11/20/88 16:40	26.67	32 EDG INOPERABLE/OPERABLE		SRO
EDG	33 EDG	12/21/88 21:30	12/21/88 22:33	1.05	STARTED/SECURED 33 EDG		SRO
EDG	31 EDG	01/13/89 12:16	01/13/89 12:35	0.32	STARTED/SECURED 31 EDG FOR CHEMISTRY.		SRO
EDG	33 EDG	02/22/89 09:08	02/22/89 09:58	0.83	RAN 33 EDG FOR I & C		SRO
EDG	33 EDG	02/22/89 13:03	02/22/89 13:27	0.40	RAN 33 EDG FOR I & C		SRO
EDG	31 EDG	03/13/89 17:15	03/13/89 18:10	0.92	STARTED/SECURED 31 EDG		SRO
EDG	32 EDG	04/17/89 08:10	04/17/89 11:22	3.20	STARTED/SECURED 32 EDG		SRO
EDG	32 EDG	04/17/89 08:32	04/17/89 10:38	2.10	32 EDG ON/OFF BUS		SRO
EDG	32 EDG	04/19/89 18:05	04/19/89 18:15	0.17	RAN 32 EDG		SRO
EDG	33 EDG	04/20/89 09:08	04/20/89 10:25	1.28	33 EDG ON/OFF BUS		SRO
EDG	33 EDG	04/21/89 14:10	04/21/89 16:39	2.48	STARTED/SECURED 33 EDG		SRO
EDG	33 EDG	04/24/89 19:00	04/24/89 19:24	0.40	RAN 33 EDG		SRO
EDG	32 EDG	04/25/89 13:45	04/25/89 13:50	0.08	RAN 32 EDG		SRO
EDG	33 EDG	04/25/89 14:20	04/25/89 14:45	0.42	STARTED/SECURED 33 EDG		SRO
EDG	32 EDG	04/25/89 20:05	04/25/89 20:20	0.25	RAN 32 EDG		SRO
EDG	32 EDG	04/27/89 08:40	04/27/89 09:15	0.58	STARTED/SECURED 32 EDG		SRO
EDG	31 EDG	04/29/89 14:10	04/29/89 17:32	3.37	STARTED/SECURED 31 EDG		SRO
EDG	31 EDG	05/08/89 02:59	05/08/89 03:47	0.80	STARTED/SECURED 31 EDG TO PICK UP LOAD ON/OFF BUS 5A		SRO
EDG	32 EDG	05/15/89 01:12	05/15/89 02:03	0.85	STARTED/SECURED 32 EDG		SRO
EDG	32 EDG	05/21/89 01:56	05/21/89 02:58	1.03	32 EDG ON/OFF BUS		SRO
EDG	31 EDG	05/21/89 03:16	05/21/89 04:20	1.07	31 EDG ON/OFF BUS		SRO
EDG	31 EDG	06/02/89 20:30	06/02/89 22:34	2.07	31 EDG ON/OFF BUS		SRO
EDG	32 EDG	06/03/89 10:20	06/03/89 10:37	0.28	STARTED/TRIPPED 32 EDG FOR OVERSPEED TEST		SRO
EDG	32 EDG	06/03/89 10:39	06/03/89 13:00	2.35	32 EDG ON/OFF BUS		SRO
EDG	32 EDG	06/03/89 10:39	06/03/89 13:04	2.42	STARTED/SECURED 32 EDG		SRO
EDG	33 EDG	06/03/89 14:15	06/03/89 17:07	2.87	STARTED/SECURED 33 EDG		SRO
EDG	33 EDG	06/03/89 14:21	06/03/89 17:07	2.77	33 EDG ON/OFF BUS		SRO
EDG	31 EDG	07/25/89 08:08	07/25/89 08:55	0.78	31 EDG ON/OFF BUS		SRO
EDG	31 EDG	07/28/89 17:35	07/28/89 18:35	1.00	STARTED/SECURED 31 EDG		SRO
EDG	32 EDG	08/09/89 09:42	08/09/89 10:25	0.72	RAN 32 EDG FOR COMPRESSION CHECKS.		SRO
EDG	32 EDG	09/01/89 08:13	09/01/89 08:16	0.05	RAN 32 EDG		SRO
EDG	33 EDG	09/01/89 08:17	09/01/89 08:20	0.05	RAN 33 EDG		SRO
EDG	33 EDG	09/10/89 09:43	09/10/89 10:45	1.03	33 EDG ON/OFF BUS		SRO
EDG	32 EDG	09/10/89 13:13	09/10/89 14:11	0.97	32 EDG ON/OFF BUS		SRO
EDG	33 EDG	09/12/89 08:32	09/12/89 08:47	0.25	RAN 33 EDG		SRO
EDG	33 EDG	09/12/89 08:55	09/12/89 09:10	0.25	RAN 33 EDG		SRO
EDG	33 EDG	10/19/89 16:22	10/19/89 16:52	0.50	33 EDG ON/OFF BUS		SRO
EDG	32 EDG	10/22/89 18:45	10/22/89 20:43	1.97	RAN 32 EDG		SRO
EDG	32 EDG	10/22/89 18:53	10/22/89 19:50	0.95	32 EDG ON/OFF BUS		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
EDG	33 EDG	10/30/89 08:10	10/30/89 09:14	1.07	33 EDG ON/OFF BUS		SRO
EDG	33 EDG	11/22/89 23:54	11/23/89 00:59	1.08	33 EDG ON/OFF BUS		SRO
EDG	32 EDG	11/23/89 01:06	11/23/89 02:06	1.00	32 EDG ON/OFF BUS		SRO
EDG	31 EDG	11/23/89 02:42	11/23/89 03:45	1.05	31 EDG ON/OFF BUS		SRO
EDG	33 EDG	01/17/90 09:25	01/17/90 10:25	1.00	RAN 33 EDG		SRO
EDG	31 EDG	01/24/90 12:00	01/24/90 14:00	2.00	STARTED/SECURED 31 EDG		SRO
EDG	32 EDG	02/15/90 09:30	02/15/90 15:15	5.75	STARTED/SECURED 32 EDG		SRO
EDG	33 EDG	02/27/90 17:23	02/27/90 18:38	1.25	RAN 33 EDG		SRO
EDG	31 EDG	03/19/90 11:20	03/19/90 11:55	0.58	RAN 31 EDG WHILE TRANSFERRING FROM 138KV FDR TO		SRO
EDG	33 EDG	03/19/90 11:20	03/19/90 11:55	0.58	RAN 33 EDG WHILE TRANSFERRING FROM 138KV FDR TO		SRO
EDG	31 EDG	03/20/90 03:50	03/20/90 04:45	0.92	STARTED/SECURED 31 EDG		SRO
EDG	32 EDG	03/23/90 16:23	03/23/90 16:24	0.02	RAN 32 EDG, EMERG S/D DUE TO HEAVY SMOKE.		SRO
EDG	32 EDG	03/25/90 02:15	03/25/90 02:55	0.67	STARTED/SECURED 32 EDG (FAILED RETEST DUE TO JACKET WATER COOLING TEMP. ALARM)		SRO
EDG	32 EDG	04/25/90 10:55	04/25/90 12:05	1.17	STARTED/SECURED 32 EDG		SRO
EDG	33 EDG	05/12/90 02:01	05/12/90 03:04	1.05	33 EDG ON/OFF BUS		SRO
EDG	31 EDG	07/25/90 12:28	07/25/90 13:35	1.12	RAN 31 EDG ON/OFF BUS		SRO
EDG	31 EDG	07/25/90 12:33	07/25/90 13:00	0.45	31 EDG ON/OFF BUS		SRO
EDG	32 EDG	07/27/90 08:30	07/27/90 09:25	0.92	STARTED/SECURED 32 EDG		SRO
EDG	31 EDG	08/03/90 18:03	08/03/90 19:00	0.95	31 EDG ON/OFF BUS		SRO
EDG	32 EDG	08/07/90 18:03	08/07/90 19:07	1.07	32 EDG SYNCHED TO BUS 6A/ OFF BUS		SRO
EDG	31 EDG	08/09/90 12:06	08/09/90 13:24	1.30	STARTED/SECURED 31 EDG		SRO
EDG	33 EDG	08/09/90 12:43	08/09/90 14:02	1.32	STARTED/SECURED 33 EDG		SRO
EDG	32 EDG	08/09/90 19:25	08/09/90 20:42	1.28	RAN 32 EDG		SRO
EDG	32 EDG	08/09/90 19:30	08/09/90 20:35	1.08	32 EDG ON/OFF BUS		SRO
EDG	32 EDG	09/24/90 16:08	09/24/90 17:15	1.12	32 EDG ON/OFF BUS		SRO
EDG	31 EDG	09/30/90 12:42	09/30/90 12:47	0.08	31 EDG CO2 DISCH TEST	ASSUMED END TIME	SRO
EDG	32 EDG	09/30/90 12:59	09/30/90 13:04	0.08	32 EDG CO2 DISCH TEST	ASSUMED END TIME	SRO
EDG	33 EDG	09/30/90 13:09	09/30/90 13:14	0.08	33 EDG CO2 DISCH TEST	ASSUMED END TIME	SRO
EDG	33 EDG	11/02/90 09:16	11/02/90 10:00	0.73	STARTED/SECURED 33 EDG		SRO
EDG	32 EDG	11/14/90 09:00	11/14/90 10:10	1.17	RAN 32 EDG		SRO
EDG	32 EDG	11/14/90 09:02	11/14/90 10:07	1.08	32 EDG ON/OFF BUS		SRO
EDG	33 EDG	11/14/90 10:38	11/14/90 11:47	1.15	RAN 33 EDG		SRO
EDG	33 EDG	11/14/90 10:40	11/14/90 11:40	1.00	33 EDG ON/OFF BUS		SRO
EDG	31 EDG	11/27/90 12:50	11/27/90 14:45	1.92	31 EDG ON/OFF BUS		SRO
EDG	31 EDG	11/28/90 09:32	11/28/90 13:09	3.62	RAN 31 EDG FOR BREAK IN TEST		SRO
EDG	32 EDG	12/03/90 20:22	12/03/90 22:39	2.28	STARTED/SECURED 32 EDG		SRO
EDG	31 EDG	12/09/90 03:45	12/09/90 04:10	0.42	31 EDG ON/OFF BUS		SRO
EDG	32 EDG	02/27/91 02:47	02/27/91 03:47	1.00	RAN 32 EDG	ASSUMED START TIME	SRO
EDG	31 EDG	02/27/91 02:55	02/27/91 03:55	1.00	RAN 31 EDG	ASSUMED START TIME	SRO
EDG	31 EDG	02/28/91 03:55	02/28/91 04:55	1.00	RAN 31 EDG	ASSUMED START TIME	SRO
EDG	32 EDG	02/28/91 04:02	02/28/91 05:02	1.00	RAN 32 EDG	ASSUMED START TIME	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
EDG	33 EDG	04/06/91 18:20	04/06/91 19:40	1.33	RAN 33 EDG		SRO
EDG	32 EDG	05/15/91 04:30	05/15/91 05:01	0.52	EDG 32 ON BUS		SRO
EDG	32 EDG	05/15/91 04:38	05/15/91 04:40	0.03	TRIPED/CLOSED 480V BUS6A EMERGENCY FEED BKR (EG-2)	ASSUMED END TIME WHEN SS6 CLOSED	SRO
EDG	32 EDG	05/21/91 12:23	05/21/91 12:32	0.15	EDG 32 ON BUS		SRO
EDG	32 EDG	06/05/91 20:56	06/05/91 22:07	1.18	RAN 32 EDG ON BUS		SRO
EDG	32 EDG	06/05/91 21:02	06/05/91 22:04	1.03	32 EDG ON BUS		SRO
EDG	31 EDG	07/02/91 20:40	07/02/91 20:50	0.17	RAN 31 EDG FOR CHEM. MIXING		SRO
EDG	33 EDG	07/16/91 04:50	07/16/91 05:00	0.17	RAN 33 EDG FOR OPERABILITY-SAT.		SRO
EDG	32 EDG	08/27/91 23:48	08/28/91 00:41	0.88	RAN 32 EDG LEAKING AT CRANKCASE		SRO
EDG	33 EDG	09/06/91 10:25	09/06/91 12:04	1.65	RAN 33 EDG FOR OPERABILITY		SRO
CS	MDP	08/05/85 19:50	08/05/85 20:05	0.25	STARTED/SECURED 31 CSP	INTSIAPCS1	SRO
CS	MDP	08/05/85 22:06	08/05/85 23:12	1.10	STARTED/SECURED 31 CSP	INTSIAPCS1	SRO
CS	MDP	08/06/85 11:31	08/06/85 12:16	0.75	STARTED/SECURED 31 CSP	INTSIAPCS1	SRO
CS	MDP	05/28/87 19:22	05/28/87 20:40	1.30	STARTED/SECURED 31 CSP TO FILL REFUELING CANAL	INTSIAPCS1	SRO
CS	MDP	02/15/89 17:30	02/15/89 19:02	1.53	STARTED/SECURED 31 CSP FOR CAVITY FILL	INTSIAPCS1	SRO
CS	MDP	02/16/89 16:27	02/16/89 17:42	1.25	STARTED/SECURED 31 CSP	INTSIAPCS1	SRO
CS	MDP	05/11/89 17:50	05/11/89 18:10	0.33	STARTED/SECURED 31 CSP FOR TEST GROUP	INTSIAPCS1	SRO
CS	MDP	05/11/89 19:42	05/11/89 20:01	0.32	STARTED/SECURED 31 CSP FOR TEST GROUP	INTSIAPCS1	SRO
CS	MDP	10/03/90 15:25	10/03/90 16:08	0.72	STARTED/SECURED 31 CSP FILLING REFUELING CAVITY	INTSIAPCS1	SRO
CS	MDP	10/03/90 18:39	10/03/90 19:25	0.77	STARTED/SECURED 31 CSP FILLING REFUELING CAVITY	INTSIAPCS1	SRO
CS	MDP	10/04/90 01:55	10/04/90 02:40	0.75	STARTED/SECURED 31 CSP FOR CAVITY FILL	INTSIAPCS1	SRO
CS	MDP	10/04/90 15:00	10/04/90 15:12	0.20	STARTED/SECURED 31 CSP TO FILL CAVITY	INTSIAPCS1	SRO
CS	MDP	08/08/85 16:00	08/08/85 16:05	0.08	STARTED/SECURED 32 CSP MOTOR FOR ROTATION CHECK	INTSIAPCS2	SRO
CS	MDP	08/28/85 12:14	08/28/85 12:30	0.27	STARTED/SECURED 32 CBSP	INTSIAPCS2	SRO
CS	MDP	09/13/85 08:10	09/13/85 08:25	0.25	STARTED/SECURED 32 CSP MTR FOR MAINT	INTSIAPCS2	SRO
CS	MDP	05/29/87 20:01	05/29/87 20:02	0.02	STARTED/SECURED 32 CSP	INTSIAPCS2	SRO
CS	MDP	05/29/87 20:27	05/29/87 21:11	0.73	STARTED/SECURED 32 CSP TO FILL RX CAVITY	INTSIAPCS2	SRO
CS	MDP	05/30/87 15:07	05/30/87 15:20	0.22	STARTED/SECURED 32 CSP TO FILL RX CAVITY	INTSIAPCS2	SRO
CS	MDP	06/05/87 01:18	06/05/87 01:32	0.23	STARTED/SECURED 32 CSP TO FILL CAVITY	INTSIAPCS2	SRO
CS	MDP	06/20/87 12:25	06/20/87 12:29	0.07	STARTED/SECURED 32 CSP TO FILL CAVITY	INTSIAPCS2	SRO
CS	MDP	06/21/87 03:13	06/21/87 03:28	0.25	STARTED/SECURED 32 CSP TO FILL CAVITY	INTSIAPCS2	SRO
CS	MDP	05/21/89 03:52	05/21/89 05:13	1.35	STARTED/SECURED 32 CSP	INTSIAPCS2	SRO
CS	MDP	05/21/89 16:20	05/21/89 17:00	0.67	STARTED/SECURED 32 CSP	INTSIAPCS2	SRO
CS	MDP	05/21/89 18:05	05/21/89 18:20	0.25	STARTED/SECURED 32 CSP	INTSIAPCS2 ETNG, 20 MIN	SRO
CS	MDP	02/02/87 08:52	02/02/87 09:12	0.33	STARTED/SECURED 32 CSP	PUMP # NOT GIVEN.	SRO
CS	MDP	05/28/87 16:48	05/28/87 16:49	0.02	STARTED/SECURED CS PUMP	INTSIAPCS1	SRO
CS	MDP	11/10/87 10:10	11/10/87 10:15	0.08	STARTED/SECURED 31 CSP	INTSIAPCS1	SRO
CS	MDP	11/10/87 22:12	11/10/87 22:17	0.08	STARTED/SECURED 31 CSP	INTSIAPCS1	SRO
CS	MDP	05/05/88 12:42	05/05/88 13:06	0.40	STARTED/SECURED 31 CSP	INTSIAPCS1	SRO
CS	MDP	01/11/89 13:43	01/11/89 13:59	0.27	STARTED/SECURED 31 CSP FOR OPERABILITY & PT	INTSIAPCS1	SRO
CS	MDP	07/12/91 20:25	07/12/91 20:55	0.50	STARTED/SECURED 31 CSP FOR OPERABILITY	INTSIAPCS1	SRO
CS	MDP	12/12/91 10:10	12/12/91 10:30	0.33	STARTED/SECURED 31 CSP	INTSIAPCS1	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CS	MDP	11/10/87 14:16	11/10/87 14:21	0.08	STARTED/SECURED 32 CSP	INTSIAPCS2	SRO
CS	MDP	01/11/89 14:22	01/11/89 14:57	0.58	STARTED/SECURED 32 CSP	INTSIAPCS2	SRO
CS	MDP	05/02/90 14:28	05/02/90 14:49	0.35	STARTED/SECURED 32 CSP	INTSIAPCS2	SRO
CS	MDP	07/12/91 02:59	07/12/91 03:20	0.35	STARTED/SECURED 32 CSP FOR OPERABILITY	INTSIAPCS2	SRO
CS	MDP	11/13/91 01:26	11/13/91 01:28	0.03	STARTED/SECURED 32 CSP TO VERIFY PT	INTSIAPCS2	SRO
CS	MDP	12/12/91 10:48	12/12/91 11:04	0.27	STARTED/SECURED 32 CSP	INTSIAPCS2	SRO
CVC	MDP	03/27/90 20:15	09/22/90 13:38	4289.38	STARTED/SECURED 31 BATP	CSAPBA1	SRO
CVC	MDP	03/03/89 08:55	04/26/89 20:20	1307.42	STARTED/SECURED 31 BATP	CSAPBA1	SRO
CVC	MDP	09/30/90 13:30	09/30/90 00:00		STARTED/SECURED 31 BATP	CSAPBA1	SRO
CVC	MDP	05/09/89 18:39	05/16/89 09:37	158.97	STARTED/SECURED 31 BATP FOR MTC	CSAPBA1	SRO
CVC	MDP	07/16/86 17:13	03/20/87 06:00	5916.78	STARTED/SECURED 31 BATP	CSAPBA1 ETNG, NEXT INOPERABLE	SRO
CVC	MDP	05/16/89 10:30	07/24/89 05:35	1651.08	STARTED/SECURED 31 BATP	CSAPBA1 ETNG, NEXT INOPERABLE	SRO
CVC	MDP	03/20/90 10:15	03/26/90 11:40	145.42	STARTED/SECURED 31 BATP	CSAPBA1 ETNG, NEXT INOPERABLE	SRO
CVC	MDP	03/24/91 04:40	03/24/91 14:20	9.67	STARTED/SECURED 32 BATP	CSAPBA2	SRO
CVC	MDP	03/24/91 14:20	05/06/91 07:15	1024.92	STARTED/SECURED 32 BATP	CSAPBA2	SRO
CVC	MDP	08/16/87 12:41	08/16/87 00:00		STARTED/SECURED 32 BATP	CSAPBA2	SRO
CVC	MDP	04/30/89 10:15	05/09/89 18:35	224.33	STARTED/SECURED 32 BATP	CSAPBA2	SRO
CVC	MDP	05/15/89 22:09	05/15/89 00:00		STARTED/SECURED 32 BATP	CSAPBA2	SRO
CVC	MDP	05/23/88 12:30	11/26/88 10:00	4485.50	STARTED/SECURED 32 BATP FOR MTC	CSAPBA2	SRO
CVC	MDP	03/20/90 16:53	04/20/90 05:30	732.62	STARTED/SECURED 32 BATP	CSAPBA2 ETNG, USE NEXT INOPERABLE TIME	SRO
CVC	MDP	01/21/85 20:57	01/25/85 16:44	91.78	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	06/08/85 11:15	06/08/85 12:40	1.42	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	09/14/85 13:32	09/16/85 05:30	39.97	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	09/22/85 15:45	09/23/85 10:40	18.92	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	09/23/85 11:30	09/26/85 08:55	69.42	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	09/28/85 04:09	09/28/85 05:10	1.02	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	09/28/85 05:40	09/28/85 06:40	1.00	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	09/28/85 07:25	11/08/85 00:02	976.62	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	05/14/86 00:15	05/14/86 00:34	0.32	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	05/14/86 01:10	05/15/86 07:50	30.67	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	05/17/86 16:35	05/18/86 17:00	24.42	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	09/09/86 18:38	09/11/86 18:50	48.20	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	05/26/87 22:20	05/27/87 01:15	2.92	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	05/27/87 03:35	05/27/87 05:07	1.53	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	05/24/88 23:59	05/25/88 01:33	1.57	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	05/25/88 04:33	05/25/88 05:57	1.40	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	10/14/88 02:57	10/14/88 04:28	1.52	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	10/20/88 02:17	10/23/88 00:37	70.33	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	02/06/89 14:45	02/06/89 15:43	0.97	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	06/12/89 11:07	06/12/89 11:31	0.40	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	06/15/89 14:40	06/15/89 14:50	0.17	STARTED/SECURED 31 CHGP	CSAPCH1	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CVC	MDP	06/18/89 11:40	08/10/89 12:10	1272.50	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	12/05/90 17:43	12/05/90 17:44	0.02	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	12/12/90 12:58	12/12/90 13:13	0.25	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	05/20/91 01:46	05/20/91 05:02	3.27	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	05/20/91 16:36	05/20/91 18:20	1.73	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	05/20/91 19:10	05/20/91 20:10	1.00	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	05/20/91 20:15	05/20/91 21:44	1.48	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	10/25/91 00:35	10/25/91 01:43	1.13	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	10/25/91 04:00	11/07/91 12:20	320.33	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	06/17/89 16:12	06/17/89 16:32	0.33	STARTED/SECURED 31 CHGP FOR TEST	CSAPCH1	SRO
CVC	MDP	08/20/87 14:20	08/20/87 14:40	0.33	STARTED/SECURED 31 CHGP FOR TEST GROUP	CSAPCH1	SRO
CVC	MDP	05/11/88 08:35	05/11/88 10:45	2.17	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	05/11/88 17:47	05/11/88 18:30	0.72	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	03/22/90 23:59	03/23/90 00:38	0.65	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	05/23/88 12:50	05/23/88 12:50	0.00	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	05/23/88 14:25	05/24/88 18:17	27.87	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	05/24/88 18:52	05/24/88 20:06	1.23	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	05/25/88 09:25	05/25/88 10:52	1.45	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	05/25/88 19:07	06/20/88 02:10	607.05	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	11/18/88 00:00	11/18/88 15:05	15.08	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	11/18/88 21:55	11/18/88 22:26	0.52	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	11/18/88 23:45	11/19/88 01:35	1.83	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	11/19/88 02:50	11/19/88 04:27	1.62	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	11/19/88 04:45	11/19/88 05:15	0.50	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	11/19/88 05:32	11/19/88 07:38	2.10	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	11/19/88 09:01	11/29/88 21:16	252.25	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	06/12/89 20:20	06/12/89 20:25	0.08	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	06/17/89 13:10	06/17/89 13:15	0.08	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	10/20/89 13:36	10/21/89 12:25	22.82	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	10/23/89 15:04	10/23/89 15:26	0.37	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	12/06/90 17:56	12/06/90 21:30	3.57	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	12/06/90 23:20	12/07/90 01:22	2.03	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	12/07/90 03:57	12/07/90 05:56	1.98	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	12/07/90 08:15	12/07/90 09:50	1.58	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	12/07/90 11:00	12/07/90 12:15	1.25	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	12/07/90 14:10	12/07/90 15:10	1.00	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	12/15/90 18:40	12/15/90 18:52	0.20	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	12/16/90 20:45	12/16/90 21:40	0.92	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	04/04/91 14:00	04/05/91 14:13	24.22	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	05/20/91 07:59	05/20/91 11:30	3.52	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	05/20/91 12:51	05/20/91 14:40	1.82	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	12/12/90 05:52	12/12/90 05:52	0.00	STARTED/SECURED 31 CHGP DUE TO RCS PRESSURE	CSAPCH1 CCP	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CVC	MDP	12/15/90 20:37	12/16/90 20:44	24.12	STARTED/SECURED 31 CHGP FOR BREAK IN	CSAPCH1 CCP	SRO
CVC	MDP	04/03/90 13:20	04/07/90 21:55	104.58	STARTED/SECURED 31 CHGP	CSAPCH1 ET CCP	SRO
CVC	MDP	05/20/86 21:30	05/29/86 00:32	195.03	STARTED/SECURED 31 CHGP	CSAPCH1 ET CCP	SRO
CVC	MDP	06/12/89 14:43	06/12/89 15:55	1.20	STARTED/SECURED 31 CHGP	CSAPCH1 ET CCP	SRO
CVC	MDP	03/18/90 06:27	03/18/90 11:15	4.80	STARTED/SECURED 31 CHGP	CSAPCH1 ET CCP	SRO
CVC	MDP	03/18/90 12:33	03/31/90 10:00	309.45	STARTED/SECURED 31 CHGP	CSAPCH1 ET CCP	SRO
CVC	MDP	12/05/90 18:56	12/06/90 16:25	21.48	STARTED/SECURED 31 CHGP FILLING RCS	CSAPCH1 ET CCP	SRO
CVC	MDP	02/07/89 14:40	02/07/89 00:00		STARTED/SECURED 31 CHGP LOCALLY FOR PM	CSAPCH1 ETNG	SRO
CVC	MDP	06/07/85 21:14	06/08/85 11:15	14.02	STARTED/SECURED 31 CHGP	CSAPCH1 ETNG, USE NEXT START TIME	SRO
CVC	MDP	05/13/86 06:20	05/14/86 00:15	17.92	STARTED/SECURED 31 CHGP	CSAPCH1 ETNG, USE NEXT START TIME	SRO
CVC	MDP	04/03/87 15:50	04/07/87 08:30	88.67	STARTED/SECURED 31 CHGP	CSAPCH1 ETNG, USE NEXT START TIME	SRO
CVC	MDP	08/25/87 11:30	09/11/87 20:00	416.50	STARTED/SECURED 31 CHGP	CSAPCH1 ETNG, USE NEXT START TIME	SRO
CVC	MDP	05/19/91 20:10	05/20/91 01:46	5.60	STARTED/SECURED 31 CHGP	CSAPCH1 ETNG, USE NEXT START TIME	SRO
CVC	MDP	03/30/90 20:27	03/31/90 10:00	13.55	STARTED/SECURED 31 CHGP	CSAPCH1 ST CCP	SRO
CVC	MDP	05/24/88 21:32	05/24/88 23:22	1.83	STARTED/SECURED 31 CHGP	CSAPCH1 ST CCP	SRO
CVC	MDP	06/12/89 20:29	06/15/89 12:54	64.42	STARTED/SECURED 31 CHGP	CSAPCH1 ST CCP	SRO
CVC	MDP	12/12/90 06:07	12/12/90 06:55	0.80	STARTED/SECURED 31 CHGP	CSAPCH1 ST CCP	SRO
CVC	MDP	12/12/90 17:17	12/13/90 18:16	24.98	STARTED/SECURED 31 CHGP	CSAPCH1 ST CCP	SRO
CVC	MDP	05/21/91 03:57	05/25/91 09:50	101.88	STARTED/SECURED 31 CHGP	CSAPCH1 ST CCP	SRO
CVC	MDP	04/02/90 08:35	04/03/90 13:20	28.75	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	01/21/85 22:36	01/22/85 20:57	22.35	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	01/23/85 15:17	01/23/85 15:28	0.18	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	09/16/85 05:30	09/16/85 09:00	3.50	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	09/20/85 08:07	09/20/85 13:28	5.35	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	09/20/85 14:08	09/20/85 18:30	4.37	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	09/20/85 23:17	09/22/85 15:45	40.47	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	09/23/85 10:30	09/23/85 11:10	0.67	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	03/01/86 02:25	03/01/86 02:38	0.22	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	04/26/86 13:08	04/26/86 17:45	4.62	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	04/26/86 17:50	04/26/86 18:02	0.20	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	05/19/86 12:40	05/19/86 12:49	0.15	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	05/19/86 13:32	05/19/86 13:34	0.03	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	07/14/86 08:00	07/17/86 10:25	74.42	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	09/01/86 11:19	09/09/86 18:38	199.32	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	01/31/87 14:19	01/31/87 14:24	0.08	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	02/11/87 08:40	02/20/87 02:13	209.55	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	03/31/87 10:30	04/01/87 03:56	17.43	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	04/01/87 04:08	04/01/87 05:23	1.25	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	04/01/87 06:26	04/01/87 09:17	2.85	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	05/02/87 01:02	05/02/87 01:20	0.30	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	05/02/87 01:43	05/02/87 17:39	15.93	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	07/17/87 05:05	07/18/87 15:00	33.92	STARTED/SECURED 32 CHGP	CSAPCH2	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CVC	MDP	08/20/87 15:02	08/20/87 15:16	0.23	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	08/20/87 16:52	08/20/87 16:55	0.05	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	08/20/87 21:04	08/20/87 22:55	1.85	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	08/20/87 23:15	08/21/87 06:52	7.62	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	08/21/87 10:18	08/24/87 01:49	63.52	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	08/24/87 16:21	08/25/87 11:30	19.15	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	08/30/87 15:39	08/30/87 17:16	1.62	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	10/11/88 01:40	10/11/88 01:45	0.08	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	10/20/88 10:50	11/30/88 01:48	974.97	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	06/02/89 05:20	06/03/89 22:40	41.33	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	06/03/89 23:25	06/03/89 23:37	0.20	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	06/04/89 00:35	06/05/89 17:50	41.25	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	06/05/89 22:10	06/07/89 03:26	29.27	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	06/07/89 06:10	06/07/89 06:31	0.35	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	06/07/89 22:01	06/08/89 00:27	2.43	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	06/08/89 00:49	06/08/89 02:51	2.03	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	06/08/89 03:10	06/09/89 12:30	33.33	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	06/09/89 13:12	06/12/89 14:50	73.63	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	06/15/89 12:53	06/16/89 14:31	25.63	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	03/16/90 18:55	03/17/90 12:49	17.90	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	03/17/90 21:05	03/18/90 04:30	7.42	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	12/11/90 12:22	12/11/90 12:35	0.22	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	05/22/91 15:50	05/22/91 15:50	0.00	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	05/24/91 10:23	08/19/91 12:14	2089.85	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	06/07/89 03:39	06/07/89 04:20	0.68	STARTED/SECURED 32 CHGP DUE TO LOSS OF SUCTION PRESS. LT-112 FAILED HI.	CSAPCH2	SRO
CVC	MDP	12/11/90 09:52	12/11/90 10:12	0.33	STARTED/SECURED 32 CHGP FOR BREAK IN	CSAPCH2	SRO
CVC	MDP	12/11/90 13:57	12/11/90 14:15	0.30	STARTED/SECURED 32 CHGP FOR BREAK IN	CSAPCH2	SRO
CVC	MDP	12/12/90 10:35	12/12/90 10:40	0.08	STARTED/SECURED 32 CHGP FOR MTC	CSAPCH2	SRO
CVC	MDP	06/07/89 04:45	06/07/89 04:50	0.08	STARTED/SECURED 32 CHGP FOR TEST	CSAPCH2	SRO
CVC	MDP	02/07/89 15:00	02/07/89 00:00		STARTED/SECURED 32 CHGP LOCALLY FOR PM	CSAPCH2	SRO
CVC	MDP	03/26/90 03:55	03/26/90 07:15	3.33	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	05/25/88 11:30	05/25/88 12:24	0.90	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	11/18/88 15:45	11/18/88 18:48	3.05	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	11/18/88 20:20	11/18/88 21:55	1.58	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	06/08/89 11:07	06/08/89 13:15	2.13	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	06/08/89 14:10	06/08/89 15:37	1.45	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	06/08/89 17:30	06/17/89 11:30	210.00	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	06/12/89 20:24	06/12/89 20:30	0.10	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	10/21/89 01:30	10/21/89 12:03	10.55	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	03/15/90 08:08	03/16/90 07:30	23.37	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	03/17/90 13:15	03/17/90 20:15	7.00	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CVC	MDP	12/07/90 17:36	12/07/90 18:58	1.37	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	12/07/90 20:25	12/08/90 19:30	23.08	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	12/12/90 01:07	12/12/90 04:57	3.83	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	12/14/90 02:17	12/14/90 04:10	1.88	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	12/14/90 10:12	12/14/90 10:48	0.60	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	12/17/90 22:03	12/17/90 22:14	0.18	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	12/18/90 04:54	12/18/90 05:08	0.23	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	12/20/90 01:48	01/08/91 05:00	459.20	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	12/14/90 15:45	12/15/90 11:41	19.93	STARTED/SECURED 32 CHGP (BREAK IN 32 CHGP RECIRC	CSAPCH2 CCP	SRO
CVC	MDP	12/20/90 00:48	12/20/90 01:48	1.00	STARTED/SECURED 32 CHGP ON RECIRC FOR BREAK IN	CSAPCH2 CCP	SRO
CVC	MDP	04/05/91 14:13	04/11/91 15:00	144.78	STARTED/SECURED 32 CHGP	CSAPCH2 CCP,ASSUME END TIME	SRO
CVC	MDP	03/25/90 21:40	03/26/90 01:00	3.33	STARTED/SECURED 32 CHGP	CSAPCH2 ET CCP	SRO
CVC	MDP	03/31/90 12:31	04/02/90 05:45	41.23	STARTED/SECURED 32 CHGP	CSAPCH2 ET CCP	SRO
CVC	MDP	07/23/87 16:23	07/24/87 00:31	8.13	STARTED/SECURED 32 CHGP	CSAPCH2 ET CCP	SRO
CVC	MDP	10/11/88 01:51	10/11/88 21:56	20.08	STARTED/SECURED 32 CHGP	CSAPCH2 ET CCP	SRO
CVC	MDP	06/16/89 16:43	06/17/89 11:30	18.78	STARTED/SECURED 32 CHGP	CSAPCH2 ET CCP	SRO
CVC	MDP	04/26/86 22:20	04/26/86 00:00		STARTED/SECURED 32 CHGP	CSAPCH2 ETNG	SRO
CVC	MDP	05/03/87 00:15	05/03/87 00:00		STARTED/SECURED 32 CHGP	CSAPCH2 ETNG	SRO
CVC	MDP	03/31/87 05:14	03/31/87 10:30	5.27	STARTED/SECURED 32 CHGP	CSAPCH2 ETNG, NEXT START TIME	SRO
CVC	MDP	07/23/87 04:28	07/23/87 15:15	10.78	STARTED/SECURED 32 CHGP	CSAPCH2 ST CCP	SRO
CVC	MDP	10/11/88 22:20	10/14/88 02:57	52.62	STARTED/SECURED 32 CHGP	CSAPCH2 ST CCP	SRO
CVC	MDP	10/22/89 12:40	11/13/89 02:00	517.33	STARTED/SECURED 32 CHGP	CSAPCH2 ST CCP	SRO
CVC	MDP	03/16/90 10:35	03/16/90 18:37	8.03	STARTED/SECURED 32 CHGP	CSAPCH2 ST CCP	SRO
CVC	MDP	03/31/90 10:00	03/31/90 12:31	2.52	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	04/07/90 23:30	04/16/90 09:25	201.92	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	09/23/85 11:10	09/23/85 11:30	0.33	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	09/26/85 08:55	09/28/85 07:45	46.83	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	05/15/86 07:45	05/17/86 16:35	56.83	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	05/18/86 17:00	05/20/86 21:30	52.50	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	03/27/87 19:12	03/28/87 01:13	6.02	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	08/20/87 15:50	08/20/87 16:07	0.28	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	08/20/87 16:09	08/20/87 21:04	4.92	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	08/20/87 22:55	08/20/87 23:07	0.20	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	08/30/87 15:29	08/30/87 15:35	0.10	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	05/23/88 10:21	05/23/88 10:30	0.15	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	06/12/88 08:56	06/12/88 09:01	0.08	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	06/12/88 09:22	06/12/88 10:05	0.72	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	10/14/88 04:28	10/20/88 05:20	144.87	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	10/25/91 00:30	10/25/91 00:35	0.08	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	10/25/91 01:43	10/25/91 04:00	2.28	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	11/02/91 18:17	11/02/91 18:18	0.02	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	11/02/91 19:27	11/02/91 19:30	0.05	STARTED/SECURED 33 CHGP	CSAPCH3	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CVC	MDP	12/11/90 13:19	12/11/90 13:59	0.67	STARTED/SECURED 33 CHGP FOR MAINTENANCE AND THEN	CSAPCH3	SRO
CVC	MDP	02/07/89 15:04	02/07/89 15:08	0.07	STARTED/SECURED 33 CHGP FOR PT	CSAPCH3	SRO
CVC	MDP	05/21/88 22:45	05/22/88 07:15	8.50	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	04/07/90 20:53	04/20/90 19:10	310.28	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	10/11/88 21:56	10/11/88 22:20	0.40	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	06/12/89 15:46	06/12/89 20:21	4.58	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	12/11/90 18:46	12/12/90 01:07	6.35	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	12/14/90 04:10	12/14/90 15:52	11.70	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	12/15/90 11:41	12/15/90 21:40	9.98	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	12/16/90 20:30	12/16/90 20:40	0.17	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	12/16/90 20:44	12/16/90 20:45	0.02	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	12/16/90 21:27	12/16/90 22:03	0.60	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	12/17/90 22:14	12/20/90 01:48	51.57	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	05/12/91 09:58	05/12/91 16:09	6.18	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	05/19/91 14:50	05/19/91 17:50	3.00	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	11/03/91 08:55	11/03/91 09:07	0.20	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	11/03/91 08:43	11/03/91 08:43	0.00	STARTED/SECURED 33 CHGP (TRIPPED OVERLOAD)	CSAPCH3 CCP	SRO
CVC	MDP	05/23/88 11:02	05/23/88 14:25	3.38	STARTED/SECURED 33 CHGP TO PZR, RCS SYSTEM.	CSAPCH3 CCP	SRO
CVC	MDP	10/09/88 19:00	10/11/88 07:00	36.00	STARTED/SECURED 33 CHGP	CSAPCH3 ET CCP	SRO
CVC	MDP	12/13/90 18:16	12/14/90 02:17	8.02	STARTED/SECURED 33 CHGP	CSAPCH3 ET CCP	SRO
CVC	MDP	05/19/91 00:27	05/19/91 13:43	13.27	STARTED/SECURED 33 CHGP	CSAPCH3 ET CCP	SRO
CVC	MDP	03/01/86 02:38	03/01/86 00:00		STARTED/SECURED 33 CHGP	CSAPCH3 ETNG	SRO
CVC	MDP	08/24/87 01:49	08/24/87 00:00		STARTED/SECURED 33 CHGP	CSAPCH3 ETNG	SRO
CVC	MDP	03/03/90 15:55	03/03/90 00:00		STARTED/SECURED 33 CHGP	CSAPCH3 ETNG	SRO
CVC	MDP	06/17/89 11:30	06/18/89 12:30	25.00	STARTED/SECURED 33 CHGP	CSAPCH3 ST CCP	SRO
CVC	MDP	12/12/90 04:57	12/12/90 13:30	8.55	STARTED/SECURED 33 CHGP	CSAPCH3 ST CCP	SRO
CVC	MDP	05/19/91 19:05	05/19/91 20:10	1.08	STARTED/SECURED 33 CHGP	CSAPCH3 ST CCP	SRO
CVC	MDP	03/03/90 00:00	03/03/90 15:50		STARTED/SECURED 33 CHGP	CSAPCH3 STNG	SRO
CVC	MDP	11/13/87 13:45	11/13/87 00:00		STARTED/SECURED 31 BATP	CSAPBA1	SRO
CVC	MDP	04/08/85 00:00	04/08/85 13:15		STARTED/SECURED 31 BATP	CSAPBA1	SRO
CVC	MDP	11/10/87 21:45	11/10/87 21:50	0.08	STARTED/SECURED 31 BATP	CSAPBA1	SRO
CVC	MDP	03/02/88 16:47	11/26/88 10:16	2777.48	STARTED/SECURED 31 BATP	CSAPBA1	SRO
CVC	MDP	10/15/91 00:00	10/15/91 05:55		STARTED/SECURED 31 BATP	CSAPBA1	SRO
CVC	MDP	04/14/87 03:50	04/16/87 04:40	48.83	STARTED/SECURED 31 BATP	CSAPBA1	SRO
CVC	MDP	10/15/91 21:30	10/15/91 21:30	0.00	STARTED/SECURED 31 BATP (FAILED TO START)	CSAPBA1 ETNG, NEXT INOPERABLE	SRO
CVC	MDP	04/08/85 19:30	03/31/86 10:00	8558.50	STARTED/SECURED 31 BATP	CSAPBA1 ETNG, NEXT INOPERABLE	SRO
CVC	MDP	04/16/87 11:40	09/28/87 06:30	3954.83	STARTED/SECURED 31 BATP	CSAPBA1 ETNG, NEXT INOPERABLE	SRO
CVC	MDP	09/28/87 17:30	11/10/87 15:55	1030.42	STARTED/SECURED 31 BATP	CSAPBA1 ETNG, NEXT INOPERABLE	SRO
CVC	MDP	11/26/88 10:32	03/03/89 08:20	2325.80	STARTED/SECURED 31 BATP	CSAPBA1 ETNG, NEXT INOPERABLE	SRO
CVC	MDP	07/24/89 18:40	03/19/90 09:00	5702.33	STARTED/SECURED 31 BATP	CSAPBA1 ETNG, NEXT INOPERABLE	SRO
CVC	MDP	10/15/91 22:00	11/25/91 08:15	970.25	STARTED/SECURED 31 BATP	CSAPBA2	SRO
CVC	MDP	03/21/87 14:40	03/21/87 00:00		STARTED/SECURED 32 BATP		

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CVC	MDP	11/26/88 10:10	04/04/89 19:10	3105.00	STARTED/SECURED 32 BATP	CSAPBA2	SRO
CVC	MDP	04/21/90 01:56	04/21/90 00:00		STARTED/SECURED 32 BATP	CSAPBA2	SRO
CVC	MDP	08/28/90 14:50	09/20/90 07:00	544.17	STARTED/SECURED 32 BATP	CSAPBA2	SRO
CVC	MDP	05/06/91 08:15	06/12/91 06:10	885.92	STARTED/SECURED 32 BATP	CSAPBA2	SRO
CVC	MDP	06/13/91 13:56	06/13/91 00:00		STARTED/SECURED 32 BATP	CSAPBA2	SRO
CVC	MDP	10/15/91 05:55	10/15/91 00:00		STARTED/SECURED 32 BATP	CSAPBA2	SRO
CVC	MDP	10/07/86 14:27	03/20/87 20:53	3942.43	STARTED/SECURED 32 BATP	CSAPBA2	SRO
CVC	MDP	01/29/90 19:30	03/20/90 10:15	1190.75	STARTED/SECURED 32 BATP	CSAPBA2	SRO
CVC	MDP	08/28/91 00:40	12/02/91 11:00	2314.33	STARTED/SECURED 32 BATP	CSAPBA2 ETNG, USE NEXT INOPERABLE TIME	SRO
CVC	MDP	04/08/85 13:15	04/08/85 22:00	8.75	STARTED/SECURED 32 BATP	CSAPBA2 SS LOG	SRO
CVC	MDP	04/11/91 15:00	04/12/91 20:12	29.20	STARTED/SECURED 31 CHGP	CSAPCH1 STNG	SRO
CVC	MDP	01/16/85 22:20	01/21/85 22:40	120.33	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	01/25/85 19:02	01/26/85 20:12	25.17	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	01/26/85 21:03	01/29/85 04:33	55.50	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	01/29/85 04:52	01/29/85 05:07	0.25	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	02/04/85 21:20	02/21/85 20:46	407.43	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	02/21/85 20:50	03/08/85 10:15	349.42	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	03/08/85 17:52	04/02/85 18:15	600.38	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	04/02/85 22:00	05/30/85 06:09	1376.15	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	12/12/85 11:55	12/13/85 07:52	19.95	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	12/13/85 09:08	12/14/85 01:48	16.67	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	12/14/85 01:58	12/14/85 02:29	0.52	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	01/03/86 11:00	01/23/86 20:56	489.93	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	01/24/86 08:20	01/24/86 08:47	0.45	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	01/31/86 20:59	02/10/86 17:45	236.77	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	02/18/86 19:20	02/25/86 17:15	165.92	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	02/27/86 14:05	02/27/86 14:10	0.08	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	03/05/86 13:12	03/05/86 13:35	0.38	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	03/05/86 13:45	03/05/86 14:18	0.55	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	04/22/86 17:36	04/28/86 02:45	129.15	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	06/13/86 03:10	06/18/86 11:45	128.58	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	07/02/86 23:13	07/14/86 08:00	272.78	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	09/20/86 01:06	09/20/86 01:20	0.23	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	10/06/86 13:50	11/08/86 01:30	779.67	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	11/28/86 05:13	11/28/86 20:37	15.40	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	11/28/86 20:44	11/29/86 00:18	3.57	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	11/29/86 13:53	11/29/86 13:54	0.02	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	11/29/86 14:11	12/06/86 09:42	163.52	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	12/09/86 02:50	12/09/86 03:06	0.27	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	12/09/86 03:50	12/09/86 04:05	0.25	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	12/09/86 04:55	12/09/86 05:08	0.22	STARTED/SECURED 31 CHGP	CSAPCH1	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CVC	MDP	12/09/86 05:48	12/09/86 06:04	0.27	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	12/10/86 00:07	12/10/86 00:55	0.80	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	12/10/86 03:50	12/10/86 04:42	0.87	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	12/10/86 05:10	12/10/86 05:30	0.33	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	09/12/87 01:45	09/19/87 02:10	168.42	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	09/21/87 08:30	09/21/87 08:35	0.08	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	09/24/87 02:58	10/21/87 10:45	655.78	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	12/08/87 08:53	12/10/87 03:36	42.72	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	12/16/87 09:20	12/16/87 09:40	0.33	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	12/16/87 10:00	12/16/87 10:30	0.50	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	12/16/87 11:55	12/16/87 12:20	0.42	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	12/16/87 14:40	12/16/87 15:20	0.67	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	03/26/88 05:00	03/26/88 05:15	0.25	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	03/26/88 05:50	03/26/88 06:20	0.50	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	02/03/89 22:54	02/03/89 23:04	0.17	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	02/04/89 17:15	02/05/89 16:33	23.30	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	08/11/89 08:11	08/17/89 08:45	144.57	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	08/28/89 08:55	08/28/89 12:02	3.12	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	09/20/89 20:50	09/27/89 00:36	147.77	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	01/26/90 10:40	01/27/90 02:18	15.63	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	02/02/90 20:25	03/03/90 15:55	691.50	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	04/16/90 09:25	04/16/90 10:10	0.75	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	06/21/90 18:14	06/21/90 18:30	0.27	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	06/27/90 21:45	06/28/90 09:35	11.83	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	06/28/90 09:40	06/28/90 09:45	0.08	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	06/28/90 09:50	06/28/90 10:35	0.75	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	07/09/90 10:15	07/09/90 10:35	0.33	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	07/09/90 10:37	07/11/90 13:10	50.55	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	07/13/90 16:54	07/13/90 18:00	1.10	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	09/15/90 10:40	09/17/90 11:43	49.05	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	09/10/91 03:43	09/10/91 04:56	1.22	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	09/11/91 03:15	09/11/91 05:30	2.25	STARTED/SECURED 31 CHGP	CSAPCH1	SRO
CVC	MDP	08/19/91 12:32	08/28/91 08:19	211.78	STARTED/SECURED 31 CHGP (TRIPPED)	CSAPCH1	SRO
CVC	MDP	09/24/86 23:40	09/25/86 00:02	0.37	STARTED/SECURED 31 CHGP FOR BREAK IN	CSAPCH1	SRO
CVC	MDP	09/25/86 00:40	09/25/86 01:00	0.33	STARTED/SECURED 31 CHGP FOR BREAK IN	CSAPCH1	SRO
CVC	MDP	09/25/86 01:30	09/25/86 01:52	0.37	STARTED/SECURED 31 CHGP FOR BREAK IN	CSAPCH1	SRO
CVC	MDP	04/05/88 09:33	04/05/88 09:45	0.20	STARTED/SECURED 31 CHGP FOR BREAK IN	CSAPCH1	SRO
CVC	MDP	02/02/90 02:19	02/02/90 16:45	14.43	STARTED/SECURED 31 CHGP FOR BREAK IN	CSAPCH1	SRO
CVC	MDP	04/18/88 20:21	04/18/88 20:36	0.25	STARTED/SECURED 31 CHGP FOR BREAK-IN.	CSAPCH1	SRO
CVC	MDP	04/19/88 08:37	04/19/88 08:56	0.32	STARTED/SECURED 31 CHGP FOR BREAK-IN.	CSAPCH1	SRO
CVC	MDP	02/01/85 08:18	02/01/85 08:35	0.28	STARTED/SECURED 31 CHGP FOR MTC	CSAPCH1	SRO
CVC	MDP	01/31/86 17:45	01/31/86 18:05	0.33	STARTED/SECURED 31 CHGP FOR MTC	CSAPCH1	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CVC	MDP	01/31/86 20:40	01/31/86 20:50	0.17	STARTED/SECURED 31 CHGP FOR MTC	CSAPCH1	SRO
CVC	MDP	07/02/86 21:51	07/02/86 22:06	0.25	STARTED/SECURED 31 CHGP FOR MTC	CSAPCH1	SRO
CVC	MDP	07/18/90 00:56	07/18/90 01:07	0.18	STARTED/SECURED 31 CHGP FOR MTC	CSAPCH1	SRO
CVC	MDP	07/18/90 03:09	07/18/90 03:21	0.20	STARTED/SECURED 31 CHGP FOR MTC	CSAPCH1	SRO
CVC	MDP	02/04/85 19:39	02/04/85 19:40	0.02	STARTED/SECURED 31 CHGP FOR MTC SEAL BREAK IN	CSAPCH1	SRO
CVC	MDP	02/04/85 19:47	02/04/85 20:32	0.75	STARTED/SECURED 31 CHGP FOR MTC SEAL BREAK IN	CSAPCH1	SRO
CVC	MDP	05/29/90 20:07	05/29/90 20:08	0.02	STARTED/SECURED 31 CHGP FOR OPERABILITY	CSAPCH1	SRO
CVC	MDP	09/25/86 13:00	09/27/86 02:45	37.75	STARTED/SECURED 31 CHGP FOR RETEST	CSAPCH1	SRO
CVC	MDP	07/18/90 13:30	07/18/90 14:25	0.92	STARTED/SECURED 31 CHGP FOR RUN IN	CSAPCH1	SRO
CVC	MDP	07/02/86 20:50	07/02/86 21:09	0.32	STARTED/SECURED 31 CHGP FOR SEAL BREAK IN	CSAPCH1	SRO
CVC	MDP	04/18/88 20:04	04/18/88 20:19	0.25	STARTED/SECURED 31 CHGP FOR SEAL BREAK-IN.	CSAPCH1	SRO
CVC	MDP	12/12/85 10:17	12/12/85 10:36	0.32	STARTED/SECURED 31 CHGP ON RECIRC FOR MTC	CSAPCH1	SRO
CVC	MDP	09/18/86 18:07	09/18/86 18:10	0.05	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	09/19/86 20:37	09/19/86 22:02	1.42	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	12/09/86 08:04	12/09/86 08:20	0.27	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	12/09/86 09:03	12/09/86 10:20	1.28	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	12/09/86 11:58	12/09/86 12:13	0.25	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	12/09/86 13:12	12/09/86 13:40	0.47	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	12/09/86 17:15	12/09/86 17:52	0.62	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	12/09/86 19:20	12/09/86 19:48	0.47	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	12/10/86 09:07	12/10/86 09:09	0.03	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	04/07/87 08:30	04/07/87 08:35	0.08	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	09/11/87 20:00	09/11/87 20:43	0.72	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	09/11/87 20:25	09/11/87 20:45	0.33	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	09/11/87 21:15	09/11/87 22:05	0.83	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	01/18/88 14:25	03/21/88 01:52	1499.45	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	04/07/88 08:48	04/07/88 10:36	1.80	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	09/28/89 13:05	09/28/89 13:06	0.02	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	09/28/89 13:25	10/12/89 00:31	323.10	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	06/23/90 01:20	06/26/90 03:15	73.92	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	07/03/90 19:42	07/07/90 17:50	94.13	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	07/13/90 20:29	07/13/90 21:10	0.68	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	07/14/90 00:35	07/16/90 16:08	63.55	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	07/18/90 16:25	07/25/90 21:37	173.20	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	09/14/90 16:10	09/15/90 11:20	19.17	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	01/08/91 05:00	01/11/91 12:45	79.75	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	04/16/91 02:45	04/20/91 02:42	95.95	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	04/20/91 06:20	04/23/91 01:05	66.75	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	04/30/91 10:40	05/13/91 16:43	318.05	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	08/13/91 02:58	08/14/91 06:00	27.03	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	09/07/91 01:20	09/07/91 01:47	0.45	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	11/26/91 17:15	12/04/91 15:19	190.07	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CVC	MDP	12/05/91 08:50	12/05/91 11:50	3.00	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	12/12/91 09:15	12/13/91 12:25	27.17	STARTED/SECURED 31 CHGP	CSAPCH1 CCP	SRO
CVC	MDP	04/05/88 10:44	04/05/88 10:59	0.25	STARTED/SECURED 31 CHGP FOR BREAK IN	CSAPCH1 CCP	SRO
CVC	MDP	04/05/88 12:15	04/05/88 12:50	0.58	STARTED/SECURED 31 CHGP FOR BREAK IN	CSAPCH1 CCP	SRO
CVC	MDP	01/29/90 10:20	01/29/90 11:50	1.50	STARTED/SECURED 31 CHGP FOR PT	CSAPCH1 CCP	SRO
CVC	MDP	04/04/88 13:51	04/04/88 14:09	0.30	STARTED/SECURED 31 CHGP ON RECIRC FOR BREAK-IN.	CSAPCH1 CCP	SRO
CVC	MDP	12/17/87 08:40	01/18/88 11:10	770.50	STARTED/SECURED 31 CHGP	CSAPCH1 ET CCP	SRO
CVC	MDP	04/19/88 10:06	04/29/88 13:01	242.92	STARTED/SECURED 31 CHGP	CSAPCH1 ET CCP	SRO
CVC	MDP	07/22/88 19:16	09/07/88 11:25	1120.15	STARTED/SECURED 31 CHGP	CSAPCH1 ET CCP	SRO
CVC	MDP	12/28/88 18:30	12/31/88 00:20	53.83	STARTED/SECURED 31 CHGP	CSAPCH1 ET CCP	SRO
CVC	MDP	11/13/89 02:35	11/20/89 01:45	167.17	STARTED/SECURED 31 CHGP	CSAPCH1 ET CCP	SRO
CVC	MDP	06/19/90 20:47	06/21/90 04:10	31.38	STARTED/SECURED 31 CHGP	CSAPCH1 ET CCP	SRO
CVC	MDP	06/28/90 10:40	07/03/90 19:30	128.83	STARTED/SECURED 31 CHGP	CSAPCH1 ET CCP	SRO
CVC	MDP	08/13/90 09:20	08/16/90 20:10	82.83	STARTED/SECURED 31 CHGP	CSAPCH1 ET CCP	SRO
CVC	MDP	08/28/91 09:40	08/29/91 04:28	18.80	STARTED/SECURED 31 CHGP	CSAPCH1 ET CCP	SRO
CVC	MDP	12/13/91 17:28	12/20/91 11:45	162.28	STARTED/SECURED 31 CHGP	CSAPCH1 ET CCP	SRO
CVC	MDP	09/10/88 00:32	09/10/88 00:00		STARTED/SECURED 31 CHGP FOR SEAL RUN-IN	CSAPCH1 ETNG	SRO
CVC	MDP	08/23/90 16:50	09/14/90 16:10	527.33	STARTED/SECURED 31 CHGP	CSAPCH1 ETNG, NEXT START TIME, CCP	SRO
CVC	MDP	12/12/85 12:45	12/13/85 09:08	20.38	STARTED/SECURED 31 CHGP	CSAPCH1 ETNG, USE NEXT START TIME	SRO
CVC	MDP	11/08/86 05:38	11/28/86 05:13	479.58	STARTED/SECURED 31 CHGP	CSAPCH1 ETNG, USE NEXT START TIME	SRO
CVC	MDP	08/17/91 09:00	08/28/91 09:40	264.67	STARTED/SECURED 31 CHGP	CSAPCH1 ETNG, USE NEXT START TIME	SRO
CVC	MDP	01/14/87 17:58	01/16/87 02:45	32.78	STARTED/SECURED 31 CHGP	CSAPCH1 ST CCP	SRO
CVC	MDP	04/07/88 12:45	04/16/88 18:08	221.38	STARTED/SECURED 31 CHGP	CSAPCH1 ST CCP	SRO
CVC	MDP	10/20/89 10:40	10/20/89 11:05	0.42	STARTED/SECURED 31 CHGP	CSAPCH1 ST CCP	SRO
CVC	MDP	04/22/90 20:40	04/24/90 04:04	31.40	STARTED/SECURED 31 CHGP	CSAPCH1 ST CCP	SRO
CVC	MDP	07/07/90 21:35	07/09/90 10:05	36.50	STARTED/SECURED 31 CHGP	CSAPCH1 ST CCP	SRO
CVC	MDP	01/11/91 14:02	02/26/91 18:13	1108.18	STARTED/SECURED 31 CHGP	CSAPCH1 ST CCP	SRO
CVC	MDP	04/23/91 01:20	04/23/91 09:10	7.83	STARTED/SECURED 31 CHGP	CSAPCH1 ST CCP	SRO
CVC	MDP	06/10/91 00:10	07/30/91 04:35	1204.42	STARTED/SECURED 31 CHGP	CSAPCH1 ST CCP	SRO
CVC	MDP	08/30/91 00:51	09/02/91 15:50	86.98	STARTED/SECURED 31 CHGP (TRIPPED)	CSAPCH1 ST CCP	SRO
CVC	MDP	09/11/91 05:30	10/25/91 00:30	1051.00	STARTED/SECURED 31 CHGP	CSAPCH1 STNG, PREVIOUS END TIME	SRO
CVC	MDP	09/20/89 20:50	09/20/89 20:50	0.00	STARTED/FAILED 32 CHGP	CSAPCH2	SRO
CVC	MDP	12/10/85 09:35	12/10/85 11:35	2.00	STARTED/SECURED 32 CHG MOTOR UNCOUPLED	CSAPCH2	SRO
CVC	MDP	01/17/85 04:36	01/17/85 04:50	0.23	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	01/17/85 08:45	01/17/85 08:50	0.08	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	01/19/85 02:10	01/19/85 02:20	0.17	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	01/24/85 16:48	01/24/85 17:00	0.20	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	01/24/85 17:33	01/24/85 18:00	0.45	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	01/25/85 08:25	01/25/85 08:30	0.08	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	01/25/85 16:25	01/25/85 16:35	0.17	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	01/25/85 16:44	01/25/85 19:02	2.30	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	01/29/85 05:05	01/30/85 01:26	20.35	STARTED/SECURED 32 CHGP	CSAPCH2	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CVC	MDP	01/30/85 01:43	02/01/85 00:17	46.57	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	02/04/85 09:56	02/04/85 10:03	0.12	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	02/21/85 20:46	02/21/85 20:50	0.07	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	11/15/85 20:30	11/15/85 20:50	0.33	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	11/20/85 20:55	11/20/85 21:08	0.22	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	11/21/85 23:25	11/22/85 00:10	0.75	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	11/26/85 01:15	11/26/85 01:35	0.33	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	11/26/85 05:26	11/26/85 05:50	0.40	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	11/26/85 18:23	11/26/85 19:26	1.05	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	11/26/85 20:55	11/26/85 21:15	0.33	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	11/27/85 03:55	11/27/85 03:59	0.07	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	11/27/85 08:58	11/27/85 09:05	0.12	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	11/27/85 19:05	11/27/85 19:20	0.25	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	12/13/85 07:52	12/13/85 09:08	1.27	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	12/14/85 01:25	12/14/85 01:58	0.55	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	12/14/85 02:29	01/03/86 11:00	488.52	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	01/08/86 18:25	01/08/86 18:35	0.17	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	01/11/86 21:40	01/11/86 21:45	0.08	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	01/24/86 13:25	01/31/86 21:06	175.68	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	02/10/86 17:45	02/18/86 19:20	193.58	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	02/27/86 14:10	02/27/86 14:20	0.17	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	02/27/86 16:44	02/27/86 16:48	0.07	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	02/28/86 04:58	02/28/86 05:15	0.28	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	03/03/86 09:54	03/03/86 10:38	0.73	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	03/03/86 10:40	03/05/86 13:45	51.08	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	03/05/86 14:18	03/27/86 02:56	516.63	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	03/28/86 18:55	04/22/86 17:41	598.77	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	05/28/86 20:09	05/28/86 20:28	0.32	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	05/28/86 21:23	05/28/86 21:43	0.33	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	05/28/86 22:28	05/28/86 22:46	0.30	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	06/19/86 19:25	06/19/86 20:00	0.58	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	06/19/86 21:19	07/07/86 03:35	414.27	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	11/07/86 17:58	11/07/86 18:10	0.20	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	11/07/86 19:30	11/07/86 19:42	0.20	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	11/07/86 20:58	11/07/86 21:08	0.17	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	11/07/86 22:05	11/07/86 22:17	0.20	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	11/08/86 01:30	11/08/86 05:38	4.13	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	11/12/86 21:33	11/12/86 22:00	0.45	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	11/14/86 00:38	11/14/86 00:54	0.27	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	11/14/86 01:48	11/14/86 02:06	0.30	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	11/14/86 02:42	11/14/86 03:04	0.37	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	11/14/86 03:45	11/14/86 04:17	0.53	STARTED/SECURED 32 CHGP	CSAPCH2	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CVC	MDP	11/14/86 05:19	11/14/86 06:20	1.02	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	11/16/86 03:06	11/16/86 03:19	0.22	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	11/28/86 23:50	11/29/86 14:12	14.37	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	12/10/86 05:30	12/11/86 23:51	42.35	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	12/14/86 10:20	12/15/86 16:08	29.80	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	12/15/86 16:40	12/18/86 08:44	64.07	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	01/01/87 06:23	01/01/87 06:24	0.02	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	01/07/87 13:16	01/07/87 14:10	0.90	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	01/09/87 11:18	01/09/87 11:20	0.03	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	01/09/87 11:35	01/09/87 11:37	0.03	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	01/09/87 11:45	01/10/87 13:29	25.73	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	01/16/87 10:10	01/16/87 19:40	9.50	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	01/21/87 12:05	01/24/87 05:10	65.08	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	02/22/87 20:35	02/23/87 18:10	21.58	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	02/23/87 18:17	03/01/87 13:27	139.17	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	03/01/87 16:28	03/02/87 04:10	11.70	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	03/07/87 19:02	03/28/87 14:25	499.38	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	09/10/87 13:03	09/10/87 13:04	0.02	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	09/19/87 02:10	09/24/87 02:58	120.80	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	10/21/87 10:25	10/21/87 10:25	0.00	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	11/22/87 19:30	11/25/87 06:00	58.50	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	11/25/87 16:30	11/25/87 16:50	0.33	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	12/10/87 03:36	12/17/87 09:00	173.40	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	04/16/88 18:08	04/19/88 10:36	64.47	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	07/22/88 18:36	07/22/88 19:16	0.67	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	12/20/88 18:20	12/28/88 18:31	192.18	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	12/31/88 11:25	02/03/89 22:55	827.50	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	08/10/89 17:48	08/11/89 08:11	14.38	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	08/17/89 19:51	08/17/89 21:29	1.63	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	04/16/90 10:10	04/16/90 10:50	0.67	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	04/24/90 04:04	04/25/90 03:40	23.60	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	04/25/90 04:32	04/25/90 10:24	5.87	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	05/23/90 01:05	05/25/90 18:45	65.67	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	06/21/90 12:55	06/21/90 13:55	1.00	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	06/21/90 16:32	06/21/90 18:15	1.72	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	06/21/90 20:22	06/21/90 20:24	0.03	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	06/21/90 21:22	06/21/90 22:05	0.72	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	06/22/90 08:50	06/22/90 09:20	0.50	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	07/11/90 13:10	07/12/90 16:47	27.62	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	07/12/90 17:51	07/14/90 00:35	30.73	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	07/16/90 08:42	07/16/90 08:43	0.02	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	08/28/91 08:19	08/28/91 08:29	0.17	STARTED/SECURED 32 CHGP	CSAPCH2	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CVC	MDP	12/05/91 11:14	12/05/91 11:14	0.00	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	12/07/91 20:35	12/07/91 20:40	0.08	STARTED/SECURED 32 CHGP	CSAPCH2	SRO
CVC	MDP	04/24/86 14:05	04/26/86 08:10	42.08	STARTED/SECURED 32 CHGP (31 & 32 IN AUTO)	CSAPCH2	SRO
CVC	MDP	12/05/91 10:30	12/05/91 10:30	0.00	STARTED/SECURED 32 CHGP (NOT PRIMED)	CSAPCH2	SRO
CVC	MDP	02/26/91 18:13	02/26/91 19:08	0.92	STARTED/SECURED 32 CHGP FOR 3PT-Q62	CSAPCH2	SRO
CVC	MDP	12/14/85 00:30	12/14/85 00:39	0.15	STARTED/SECURED 32 CHGP FOR BREAK IN	CSAPCH2	SRO
CVC	MDP	12/14/85 00:49	12/14/85 00:59	0.17	STARTED/SECURED 32 CHGP FOR BREAK IN	CSAPCH2	SRO
CVC	MDP	11/15/86 19:26	11/15/86 19:43	0.28	STARTED/SECURED 32 CHGP FOR BREAK IN	CSAPCH2	SRO
CVC	MDP	11/15/86 20:50	11/15/86 21:24	0.57	STARTED/SECURED 32 CHGP FOR BREAK IN	CSAPCH2	SRO
CVC	MDP	09/01/90 02:50	09/01/90 18:35	15.75	STARTED/SECURED 32 CHGP FOR BREAK IN	CSAPCH2	SRO
CVC	MDP	11/21/85 15:20	11/21/85 15:25	0.08	STARTED/SECURED 32 CHGP FOR MTC	CSAPCH2	SRO
CVC	MDP	02/27/86 00:10	02/27/86 00:25	0.25	STARTED/SECURED 32 CHGP FOR MTC	CSAPCH2	SRO
CVC	MDP	02/27/86 00:55	02/27/86 01:08	0.22	STARTED/SECURED 32 CHGP FOR MTC	CSAPCH2	SRO
CVC	MDP	02/27/86 01:40	02/27/86 01:59	0.32	STARTED/SECURED 32 CHGP FOR MTC	CSAPCH2	SRO
CVC	MDP	02/27/86 04:37	02/27/86 04:49	0.20	STARTED/SECURED 32 CHGP FOR MTC	CSAPCH2	SRO
CVC	MDP	02/27/86 23:48	02/28/86 00:05	0.28	STARTED/SECURED 32 CHGP FOR MTC	CSAPCH2	SRO
CVC	MDP	03/27/86 09:27	03/27/86 09:34	0.12	STARTED/SECURED 32 CHGP FOR MTC	CSAPCH2	SRO
CVC	MDP	10/11/89 17:02	10/11/89 17:03	0.02	STARTED/SECURED 32 CHGP FOR MTC	CSAPCH2	SRO
CVC	MDP	10/11/89 19:35	10/11/89 20:17	0.70	STARTED/SECURED 32 CHGP FOR MTC	CSAPCH2	SRO
CVC	MDP	10/11/89 21:37	10/11/89 22:03	0.43	STARTED/SECURED 32 CHGP FOR MTC	CSAPCH2	SRO
CVC	MDP	07/21/90 01:26	07/21/90 01:28	0.03	STARTED/SECURED 32 CHGP FOR MTC	CSAPCH2	SRO
CVC	MDP	01/26/85 20:12	01/26/85 20:50	0.63	STARTED/SECURED 32 CHGP FOR PT	CSAPCH2	SRO
CVC	MDP	11/16/87 14:30	11/16/87 14:30	0.00	STARTED/SECURED 32 CHGP FOR RETEST	CSAPCH2	SRO
CVC	MDP	12/10/85 13:40	12/10/85 13:55	0.25	STARTED/SECURED 32 CHGP FOR RUN IN	CSAPCH2	SRO
CVC	MDP	02/27/86 08:25	02/27/86 08:35	0.17	STARTED/SECURED 32 CHGP FOR RUN IN	CSAPCH2	SRO
CVC	MDP	02/27/86 17:10	02/27/86 18:02	0.87	STARTED/SECURED 32 CHGP FOR RUN IN	CSAPCH2	SRO
CVC	MDP	02/27/86 20:36	02/27/86 21:01	0.42	STARTED/SECURED 32 CHGP FOR RUN IN	CSAPCH2	SRO
CVC	MDP	06/02/90 03:57	06/19/90 20:47	424.83	STARTED/SECURED 32 CHGP FOR SEAL BREAK IN	CSAPCH2	SRO
CVC	MDP	03/28/86 00:20	03/28/86 00:37	0.28	STARTED/SECURED 32 CHGP ON RECIRC	CSAPCH2	SRO
CVC	MDP	03/28/86 01:03	03/28/86 01:18	0.25	STARTED/SECURED 32 CHGP ON RECIRC	CSAPCH2	SRO
CVC	MDP	03/28/86 02:56	03/28/86 03:26	0.50	STARTED/SECURED 32 CHGP ON RECIRC	CSAPCH2	SRO
CVC	MDP	03/28/86 04:39	03/28/86 04:57	0.30	STARTED/SECURED 32 CHGP ON RECIRC	CSAPCH2	SRO
CVC	MDP	08/17/89 18:10	08/17/89 18:43	0.55	STARTED/SECURED 32 CHGP ON RECIRC FOR MTC	CSAPCH2	SRO
CVC	MDP	04/24/90 02:36	04/24/90 03:30	0.90	STARTED/SECURED 32 CHGP ON RECIRC FOR MTC	CSAPCH2	SRO
CVC	MDP	06/02/90 01:55	06/02/90 03:05	1.17	STARTED/SECURED 32 CHGP ON RECIRC FOR PUMP BKREAK	CSAPCH2	SRO
CVC	MDP	11/26/87 02:09	12/08/87 08:53	294.73	STARTED/SECURED 32 CHGP(LEAK)	CSAPCH2	SRO
CVC	MDP	12/10/85 14:20	12/10/85 14:35	0.25	STARTED/SECURED 32 CHGP FOR OPERABILITY	CSAPCH2 15 MIN	SRO
CVC	MDP	04/29/88 13:01	04/29/88 13:25	0.40	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	11/14/86 07:58	11/14/86 08:21	0.38	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	11/18/86 23:45	11/18/86 23:56	0.18	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	11/20/86 00:47	11/20/86 01:05	0.30	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	11/28/86 16:22	11/28/86 16:27	0.08	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CVC	MDP	11/28/86 16:36	11/28/86 16:48	0.20	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	11/28/86 17:10	11/28/86 17:13	0.05	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	11/28/86 20:35	11/28/86 20:44	0.15	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	11/28/86 21:26	11/28/86 21:48	0.37	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	12/09/86 10:20	12/09/86 11:58	1.63	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	12/09/86 12:13	12/10/86 09:07	20.90	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	09/11/87 20:45	09/11/87 21:30	0.75	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	11/25/87 17:50	11/25/87 18:35	0.75	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	11/25/87 21:25	11/25/87 22:05	0.67	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	01/18/88 11:10	01/18/88 14:25	3.25	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	04/13/88 00:20	04/13/88 00:22	0.03	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	06/30/88 05:21	06/30/88 05:43	0.37	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	06/30/88 09:13	06/30/88 09:44	0.52	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	06/30/88 11:57	06/30/88 11:58	0.02	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	09/07/88 10:57	09/07/88 10:59	0.03	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	09/07/88 11:05	09/07/88 11:08	0.05	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	12/30/88 18:24	12/30/88 18:46	0.37	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	12/30/88 21:10	12/30/88 21:57	0.78	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	10/12/89 00:31	10/18/89 03:23	146.87	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	10/18/89 05:26	10/20/89 20:45	63.32	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	01/29/90 11:50	01/29/90 12:27	0.62	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	01/31/90 18:05	01/31/90 18:10	0.08	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	01/31/90 18:52	01/31/90 18:57	0.08	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	04/20/90 18:50	04/20/90 18:58	0.13	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	06/22/90 01:50	06/22/90 02:11	0.35	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	07/16/90 16:08	07/18/90 16:25	48.28	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	07/23/90 13:15	07/23/90 14:15	1.00	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	07/23/90 18:15	07/23/90 18:25	0.17	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	07/23/90 18:27	07/23/90 18:50	0.38	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	07/25/90 08:40	07/25/90 08:42	0.03	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	07/25/90 21:20	07/25/90 21:30	0.17	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	07/25/90 21:37	07/26/90 08:42	11.08	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	09/15/90 03:20	09/15/90 10:30	7.17	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	01/11/91 12:45	01/11/91 14:02	1.28	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	04/20/91 04:05	04/20/91 06:20	2.25	STARTED/SECURED 32 CHGP	CSAPCH2 CCP	SRO
CVC	MDP	12/05/91 10:13	12/05/91 10:13	0.00	STARTED/SECURED 32 CHGP (NOT PRIMED)	CSAPCH2 CCP	SRO
CVC	MDP	06/30/88 04:44	06/30/88 05:12	0.47	STARTED/SECURED 32 CHGP FOR BREAK IN	CSAPCH2 CCP	SRO
CVC	MDP	01/29/90 11:15	01/29/90 11:15	0.00	STARTED/SECURED 32 CHGP FOR PRIMING	CSAPCH2 CCP	SRO
CVC	MDP	05/18/90 17:03	05/18/90 17:03	0.00	STARTED/SECURED 32 CHGP ON RECIRC	CSAPCH2 CCP	SRO
CVC	MDP	05/18/90 17:11	05/18/90 17:14	0.05	STARTED/SECURED 32 CHGP ON RECIRC	CSAPCH2 CCP	SRO
CVC	MDP	09/11/86 18:50	09/19/86 20:38	193.80	STARTED/SECURED 32 CHGP	CSAPCH2 ET CCP	SRO
CVC	MDP	12/06/86 09:42	12/06/86 16:06	6.40	STARTED/SECURED 32 CHGP	CSAPCH2 ET CCP	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CVC	MDP	01/01/87 06:33	01/03/87 00:18	41.75	STARTED/SECURED 32 CHGP	CSAPCH2 ET CCP	SRO
CVC	MDP	06/22/90 10:35	06/23/90 02:18	15.72	STARTED/SECURED 32 CHGP	CSAPCH2 ET CCP	SRO
CVC	MDP	09/02/91 15:50	09/03/91 00:52	9.03	STARTED/SECURED 32 CHGP	CSAPCH2 ET CCP	SRO
CVC	MDP	12/07/91 21:50	12/12/91 10:42	108.87	STARTED/SECURED 32 CHGP	CSAPCH2 ET CCP	SRO
CVC	MDP	10/21/87 10:45	10/21/87 00:00		STARTED/SECURED 32 CHGP	CSAPCH2 ETNG	SRO
CVC	MDP	12/10/86 09:09	12/14/86 10:20	97.18	STARTED/SECURED 32 CHGP	CSAPCH2 ETNG, USE NEXT START TIME, CCP	SRO
CVC	MDP	04/25/90 16:05	04/25/90 00:00		STARTED/SECURED 32 CHGP	CSAPCH2 ETNG, CCP	SRO
CVC	MDP	02/03/87 13:21	02/11/87 08:40	187.32	STARTED/SECURED 32 CHGP	CSAPCH2 ETNG, NEXT START TIME	SRO
CVC	MDP	05/29/86 00:32	06/13/86 03:10	362.63	STARTED/SECURED 32 CHGP	CSAPCH2 ST CCP	SRO
CVC	MDP	09/19/86 22:02	09/20/86 01:06	3.07	STARTED/SECURED 32 CHGP	CSAPCH2 ST CCP	SRO
CVC	MDP	11/20/86 02:35	11/28/86 05:13	194.63	STARTED/SECURED 32 CHGP	CSAPCH2 ST CCP	SRO
CVC	MDP	04/07/87 08:40	04/11/87 19:40	107.00	STARTED/SECURED 32 CHGP	CSAPCH2 ST CCP	SRO
CVC	MDP	09/11/87 22:05	09/12/87 01:47	3.70	STARTED/SECURED 32 CHGP	CSAPCH2 ST CCP	SRO
CVC	MDP	06/30/88 12:03	07/08/88 10:36	190.55	STARTED/SECURED 32 CHGP	CSAPCH2 ST CCP	SRO
CVC	MDP	09/07/88 11:23	09/10/88 01:07	61.73	STARTED/SECURED 32 CHGP	CSAPCH2 ST CCP	SRO
CVC	MDP	11/29/88 21:16	11/30/88 01:48	4.53	STARTED/SECURED 32 CHGP	CSAPCH2 ST CCP	SRO
CVC	MDP	12/31/88 00:20	12/31/88 10:41	10.35	STARTED/SECURED 32 CHGP	CSAPCH2 ST CCP	SRO
CVC	MDP	08/18/89 00:00	08/28/89 08:55	248.92	STARTED/SECURED 32 CHGP	CSAPCH2 ST CCP	SRO
CVC	MDP	12/16/89 16:50	12/20/89 03:28	82.63	STARTED/SECURED 32 CHGP	CSAPCH2 ST CCP	SRO
CVC	MDP	07/12/90 17:51	07/12/90 20:45	2.90	STARTED/SECURED 32 CHGP	CSAPCH2 ST CCP	SRO
CVC	MDP	08/29/90 09:35	08/31/90 02:40	41.08	STARTED/SECURED 32 CHGP	CSAPCH2 ST CCP	SRO
CVC	MDP	03/15/91 11:37	03/18/91 09:26	69.82	STARTED/SECURED 32 CHGP	CSAPCH2 ST CCP	SRO
CVC	MDP	12/13/91 12:25	12/13/91 17:28	5.05	STARTED/SECURED 32 CHGP	CSAPCH2 ST CCP	SRO
CVC	MDP	04/20/90 19:05	04/22/90 08:17	37.20	STARTED/SECURED 32 CHGP (LEAK)	CSAPCH2 ST CCP	SRO
CVC	MDP	04/07/87 00:00	04/07/87 08:30		STARTED/SECURED 32 CHGP	CSAPCH2 STNG, CCP	SRO
CVC	MDP	09/10/87 13:04	09/11/87 20:30	31.43	STARTED/SECURED 32 CHGP	CSAPCH2 STNG, PREVIOUS END TIME	SRO
CVC	MDP	08/17/89 08:24	08/17/89 08:24	0.00	STARTED/FAILED 33 CHGP	CSAPCH3	SRO
CVC	MDP	09/20/86 01:20	09/25/86 13:05	131.75	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	01/15/85 04:38	01/16/85 22:20	41.70	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	01/25/85 16:12	01/25/85 16:18	0.10	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	01/26/85 02:40	01/26/85 02:45	0.08	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	01/26/85 20:50	01/26/85 21:03	0.22	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	01/29/85 04:33	01/29/85 04:54	0.35	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	01/30/85 01:20	01/30/85 01:47	0.45	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	02/01/85 00:07	02/04/85 09:56	81.82	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	02/04/85 10:03	02/04/85 21:21	11.30	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	03/08/85 10:15	03/08/85 17:52	7.62	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	04/02/85 18:15	04/02/85 22:00	3.75	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	05/30/85 06:09	06/10/85 17:48	275.65	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	11/08/85 00:02	11/15/85 20:30	188.47	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	11/15/85 20:50	11/20/85 20:55	120.08	STARTED/SECURED 33 CHGP	CSAPCH3	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CVC	MDP	11/20/85 21:08	11/26/85 14:32	137.40	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	11/26/85 16:45	11/27/85 09:03	16.30	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	11/27/85 09:05	11/27/85 19:07	10.03	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	11/27/85 19:20	12/10/85 15:05	307.75	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	01/23/86 17:13	01/23/86 17:30	0.28	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	01/23/86 20:24	01/24/86 13:25	17.02	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	02/25/86 17:15	02/27/86 16:44	47.48	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	02/27/86 16:48	03/01/86 02:25	33.62	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	03/27/86 02:56	03/28/86 18:55	39.98	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	09/27/86 02:45	10/06/86 13:50	227.08	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	10/31/86 01:25	10/31/86 01:35	0.17	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	12/06/86 14:24	12/06/86 14:25	0.02	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	12/06/86 14:29	12/06/86 14:30	0.02	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	12/11/86 23:51	12/14/86 10:20	58.48	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	12/15/86 16:08	12/15/86 16:40	0.53	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	12/17/86 18:52	12/17/86 19:33	0.68	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	12/17/86 21:31	12/17/86 21:58	0.45	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	12/18/86 08:44	01/01/87 06:33	333.82	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	01/07/87 14:08	01/09/87 11:49	45.68	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	01/16/87 02:45	01/16/87 10:10	7.42	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	01/16/87 17:00	01/21/87 12:05	115.08	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	01/22/87 08:58	01/22/87 08:59	0.02	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	02/19/87 17:00	02/19/87 17:23	0.38	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	02/19/87 18:40	02/19/87 19:05	0.42	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	02/19/87 20:33	02/19/87 20:57	0.40	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	02/20/87 00:30	02/22/87 20:35	68.08	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	02/23/87 18:10	02/23/87 18:17	0.12	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	03/01/87 13:27	03/01/87 16:29	3.03	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	03/02/87 04:10	03/07/87 19:02	134.87	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	04/11/87 01:50	04/11/87 02:05	0.25	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	04/11/87 17:07	04/11/87 17:26	0.32	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	04/11/87 18:31	05/04/87 07:54	541.38	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	11/25/87 01:41	11/25/87 01:46	0.08	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	11/25/87 02:01	11/25/87 02:55	0.90	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	11/25/87 04:23	11/25/87 05:23	1.00	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	11/30/88 01:48	12/20/88 18:20	496.53	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	12/27/88 19:08	12/27/88 19:10	0.03	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	08/17/89 08:45	08/17/89 20:04	11.32	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	11/13/89 02:00	11/13/89 02:35	0.58	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	12/20/89 02:02	01/26/90 10:40	896.63	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	01/27/90 00:53	02/02/90 03:25	146.53	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	02/02/90 16:45	02/02/90 20:25	3.67	STARTED/SECURED 33 CHGP	CSAPCH3	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CVC	MDP	04/25/90 03:40	04/25/90 04:32	0.87	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	06/28/90 09:35	06/28/90 09:40	0.08	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	06/28/90 09:45	06/28/90 09:50	0.08	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	06/28/90 10:35	06/28/90 10:40	0.08	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	07/09/90 10:35	07/09/90 10:37	0.03	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	07/12/90 16:47	07/12/90 17:51	1.07	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	08/19/91 12:14	08/19/91 12:32	0.30	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	08/28/91 08:29	08/28/91 09:40	1.18	STARTED/SECURED 33 CHGP	CSAPCH3	SRO
CVC	MDP	07/11/90 12:43	07/11/90 13:10	0.45	STARTED/SECURED 33 CHGP (LEAK)	CSAPCH3	SRO
CVC	MDP	01/31/85 23:31	01/31/85 23:48	0.28	STARTED/SECURED 33 CHGP FOR BREAK IN	CSAPCH3	SRO
CVC	MDP	12/17/86 16:35	12/17/86 16:48	0.22	STARTED/SECURED 33 CHGP FOR BREAK IN	CSAPCH3	SRO
CVC	MDP	01/16/87 00:32	01/16/87 00:48	0.27	STARTED/SECURED 33 CHGP FOR BREAK IN	CSAPCH3	SRO
CVC	MDP	01/16/87 01:25	01/16/87 01:40	0.25	STARTED/SECURED 33 CHGP FOR BREAK IN	CSAPCH3	SRO
CVC	MDP	01/23/87 17:58	01/23/87 18:08	0.17	STARTED/SECURED 33 CHGP FOR BREAK IN	CSAPCH3	SRO
CVC	MDP	01/23/87 19:11	01/23/87 19:27	0.27	STARTED/SECURED 33 CHGP FOR BREAK IN	CSAPCH3	SRO
CVC	MDP	01/23/87 20:29	01/23/87 20:45	0.27	STARTED/SECURED 33 CHGP FOR BREAK IN	CSAPCH3	SRO
CVC	MDP	01/23/87 21:55	01/23/87 22:10	0.25	STARTED/SECURED 33 CHGP FOR BREAK IN	CSAPCH3	SRO
CVC	MDP	01/23/87 23:16	01/23/87 23:35	0.32	STARTED/SECURED 33 CHGP FOR B REAK IN	CSAPCH3	SRO
CVC	MDP	01/24/87 04:03	02/03/87 13:21	249.30	STARTED/SECURED 33 CHGP FOR BREAK IN	CSAPCH3	SRO
CVC	MDP	02/28/87 01:40	02/28/87 12:00	10.33	STARTED/SECURED 33 CHGP FOR BREAK IN	CSAPCH3	SRO
CVC	MDP	02/28/87 05:15	02/28/87 05:35	0.33	STARTED/SECURED 33 CHGP FOR BREAK IN	CSAPCH3	SRO
CVC	MDP	03/01/87 00:33	03/01/87 00:49	0.27	STARTED/SECURED 33 CHGP FOR BREAK IN	CSAPCH3	SRO
CVC	MDP	03/01/87 01:42	03/01/87 01:53	0.18	STARTED/SECURED 33 CHGP FOR BREAK IN	CSAPCH3	SRO
CVC	MDP	03/01/87 02:33	03/01/87 02:47	0.23	STARTED/SECURED 33 CHGP FOR BREAK IN	CSAPCH3	SRO
CVC	MDP	03/01/87 03:17	03/01/87 03:33	0.27	STARTED/SECURED 33 CHGP FOR BREAK IN	CSAPCH3	SRO
CVC	MDP	03/01/87 04:08	03/01/87 04:24	0.27	STARTED/SECURED 33 CHGP FOR BREAK IN	CSAPCH3	SRO
CVC	MDP	08/31/90 02:08	09/01/90 03:26	25.30	STARTED/SECURED 33 CHGP FOR BREAK IN	CSAPCH3	SRO
CVC	MDP	02/03/89 23:03	02/04/89 13:15	14.20	STARTED/SECURED 33 CHGP FOR IS PRESS TEST	CSAPCH3	SRO
CVC	MDP	07/09/90 09:57	07/09/90 10:15	0.30	STARTED/SECURED 33 CHGP FOR MAINT	CSAPCH3	SRO
CVC	MDP	01/31/85 22:20	01/31/85 22:23	0.05	STARTED/SECURED 33 CHGP FOR MTC	CSAPCH3	SRO
CVC	MDP	11/25/88 11:58	11/25/88 11:59	0.02	STARTED/SECURED 33 CHGP FOR MTC	CSAPCH3	SRO
CVC	MDP	04/25/90 02:31	04/25/90 03:22	0.85	STARTED/SECURED 33 CHGP FOR MTC (ON RECIRC)	CSAPCH3	SRO
CVC	MDP	08/15/90 19:40	08/15/90 19:43	0.05	STARTED/SECURED 33 CHGP FOR MTC BREAKIN	CSAPCH3	SRO
CVC	MDP	07/08/88 10:36	07/22/88 18:36	344.00	STARTED/SECURED 33 CHGP FOR PT	CSAPCH3	SRO
CVC	MDP	07/12/90 13:47	07/12/90 13:51	0.07	STARTED/SECURED 33 CHGP ON RECIRC FOR MTC	CSAPCH3	SRO
CVC	MDP	01/16/87 12:43	01/16/87 13:27	0.73	STARTED/SECURED 33 CHGP WITH RECIRC OPEN	CSAPCH3	SRO
CVC	MDP	08/28/89 12:02	09/20/89 20:50	560.80	STARTED/TRIPPED 33 CHGP	CSAPCH3	SRO
CVC	MDP	09/21/89 10:51	09/21/89 10:51	0.00	STARTED/TRIPPED 33 CHGP	CSAPCH3	SRO
CVC	MDP	09/21/89 13:40	09/21/89 13:40	0.00	STARTED/TRIPPED 33 CHGP	CSAPCH3	SRO
CVC	MDP	03/21/88 01:52	04/07/88 08:48	414.93	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	12/06/86 15:36	12/06/86 17:45	2.15	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	01/02/87 19:30	01/02/87 20:07	0.62	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CVC	MDP	01/02/87 21:17	01/02/87 21:37	0.33	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	01/10/87 13:29	01/14/87 17:58	100.48	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	04/07/87 08:35	04/07/87 08:40	0.08	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	04/11/87 01:50	04/11/87 02:05	0.25	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	04/11/87 02:20	04/11/87 02:35	0.25	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	04/11/87 02:50	04/11/87 03:05	0.25	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	04/11/87 04:10	04/11/87 05:02	0.87	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	11/25/87 18:35	11/25/87 21:25	2.83	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	04/07/88 10:36	04/07/88 12:45	2.15	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	04/13/88 00:31	04/13/88 00:35	0.07	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	06/20/88 02:10	06/30/88 12:08	249.97	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	11/28/88 14:25	11/28/88 14:30	0.08	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	11/29/88 10:00	11/29/88 10:05	0.08	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	08/18/89 02:25	08/18/89 02:35	0.17	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	09/28/89 13:06	09/28/89 13:25	0.32	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	10/17/89 18:25	10/17/89 18:53	0.47	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	10/17/89 20:20	10/17/89 21:40	1.33	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	10/18/89 00:33	10/18/89 00:36	0.05	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	10/18/89 00:49	10/18/89 00:53	0.07	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	10/18/89 01:32	10/18/89 01:36	0.07	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	10/20/89 01:15	10/20/89 01:45	0.50	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	01/29/90 12:27	03/06/90 09:12	860.75	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	03/02/90 05:05	03/02/90 05:20	0.25	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	05/10/90 17:40	05/10/90 17:45	0.08	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	06/22/90 02:11	06/22/90 10:35	8.40	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	07/12/90 20:45	07/13/90 20:29	23.73	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	07/19/90 12:18	07/19/90 13:12	0.90	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	07/23/90 14:15	07/23/90 18:27	4.20	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	07/26/90 09:51	07/26/90 09:59	0.13	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	08/16/90 20:10	08/23/90 16:50	164.67	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	09/01/90 18:05	09/01/90 18:20	0.25	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	08/29/91 04:28	08/30/91 00:51	20.38	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	11/05/91 12:35	11/05/91 12:37	0.03	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	11/05/91 12:37	11/05/91 12:41	0.07	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	12/04/91 15:19	12/05/91 08:50	17.52	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	12/05/91 11:50	12/07/91 21:50	58.00	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	07/03/90 19:30	07/03/90 19:42	0.20	STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	12/20/91 11:45	12/20/91 00:00		STARTED/SECURED 33 CHGP	CSAPCH3 CCP	SRO
CVC	MDP	11/20/89 01:45	12/16/89 16:50	639.08	STARTED/SECURED 33 CHGP (LEAK)	CSAPCH3 CCP	SRO
CVC	MDP	11/29/88 13:15	11/29/88 13:45	0.50	STARTED/SECURED 33 CHGP FOR BREAK IN	CSAPCH3 CCP	SRO
CVC	MDP	11/29/88 17:30	11/29/88 17:58	0.47	STARTED/SECURED 33 CHGP FOR BREAK IN	CSAPCH3 CCP	SRO
CVC	MDP	11/29/88 20:08	11/29/88 20:46	0.63	STARTED/SECURED 33 CHGP FOR BREAK IN	CSAPCH3 CCP	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CVC	MDP	11/29/88 21:20	11/29/88 21:48	0.47	STARTED/SECURED 33 CHGP FOR BREAK IN	CSAPCH3 CCP	SRO
CVC	MDP	04/23/91 00:30	04/23/91 01:20	0.83	STARTED/SECURED 33 CHGP FOR BREAK IN	CSAPCH3 CCP	SRO
CVC	MDP	12/20/91 08:50	12/20/91 09:55	1.08	STARTED/SECURED 33 CHGP FOR BREAK IN	CSAPCH3 CCP	SRO
CVC	MDP	06/26/90 02:16	06/27/90 21:45	43.48	STARTED/SECURED 33 CHGP FOR BREAK IN DUE TO SMALL PACKING LEAK.	CSAPCH3 CCP	SRO
CVC	MDP	08/24/90 21:10	08/29/90 09:35	108.42	STARTED/SECURED 33 CHGP IN RECIRC	CSAPCH3 CCP	SRO
CVC	MDP	10/18/89 01:45	10/18/89 05:26	3.68	STARTED/SECURED 33 CHGP ON RECIRC	CSAPCH3 CCP	SRO
CVC	MDP	07/07/90 14:37	07/07/90 21:35	6.97	STARTED/SECURED 33 CHGP ON RECIRC	CSAPCH3 CCP	SRO
CVC	MDP	08/16/90 17:27	08/16/90 17:58	0.52	STARTED/SECURED 33 CHGP ON RECIRC FOR MTC BREAKIN	CSAPCH3 CCP	SRO
CVC	MDP	01/02/87 23:55	01/07/87 13:16	109.35	STARTED/TRIPPED 33 CHGP	CSAPCH3 CCP, ASSUME 33 CCP AT	SRO
CVC	MDP	04/20/91 02:42	04/20/91 04:05	1.38	STARTED/SECURED 33 CHGP	CSAPCH3 ET CCP	SRO
CVC	MDP	11/25/87 06:00	11/25/87 18:14	12.23	STARTED/SECURED 33 CHGP	CSAPCH3 ET CCP	SRO
CVC	MDP	08/17/89 20:08	08/18/89 00:05	3.95	STARTED/SECURED 33 CHGP	CSAPCH3 ET CCP	SRO
CVC	MDP	09/27/89 00:36	09/28/89 13:05	36.48	STARTED/SECURED 33 CHGP	CSAPCH3 ET CCP	SRO
CVC	MDP	04/16/90 10:50	04/22/90 20:40	153.83	STARTED/SECURED 33 CHGP	CSAPCH3 ET CCP	SRO
CVC	MDP	04/22/90 08:17	04/22/90 20:40	12.38	STARTED/SECURED 33 CHGP	CSAPCH3 ET CCP	SRO
CVC	MDP	04/25/90 09:03	04/25/90 16:12	7.15	STARTED/SECURED 33 CHGP	CSAPCH3 ET CCP	SRO
CVC	MDP	06/21/90 18:28	06/22/90 01:50	7.37	STARTED/SECURED 33 CHGP	CSAPCH3 ET CCP	SRO
CVC	MDP	02/26/91 19:08	03/15/91 11:37	400.48	STARTED/SECURED 33 CHGP	CSAPCH3 ET CCP	SRO
CVC	MDP	04/12/91 20:12	04/16/91 03:47	79.58	STARTED/SECURED 33 CHGP	CSAPCH3 ET CCP	SRO
CVC	MDP	04/23/91 09:10	04/30/91 10:55	169.75	STARTED/SECURED 33 CHGP	CSAPCH3 ET CCP	SRO
CVC	MDP	05/25/91 10:23	06/10/91 00:10	373.78	STARTED/SECURED 33 CHGP	CSAPCH3 ET CCP	SRO
CVC	MDP	07/30/91 04:35	08/13/91 02:58	334.38	STARTED/SECURED 33 CHGP	CSAPCH3 ET CCP	SRO
CVC	MDP	11/07/91 12:15	11/26/91 17:15	461.00	STARTED/SECURED 33 CHGP	CSAPCH3 ET CCP	SRO
CVC	MDP	07/19/90 16:20	07/23/90 13:55	93.58	STARTED/SECURED 33 CHGP FOR RUN-IN	CSAPCH3 ETNG, CCP	SRO
CVC	MDP	07/23/90 18:50	07/23/90 00:00		STARTED/SECURED 33 CHGP	CSAPCH3 ETNG, NEXT START TIME	SRO
CVC	MDP	02/04/89 13:15	02/04/89 17:15	4.00	STARTED/SECURED 31 CHGP	CSAPCH3 ST CCP	SRO
CVC	MDP	04/29/88 13:25	05/12/88 05:25	304.00	STARTED/SECURED 33 CHGP	CSAPCH3 ST CCP	SRO
CVC	MDP	09/03/91 00:52	09/03/91 00:00		STARTED/SECURED 33 CHGP	CSAPCH3 ST CCP	SRO
CVC	MDP	11/25/87 22:05	11/26/87 04:08	6.05	STARTED/SECURED 33 CHGP	CSAPCH3 ST CCP	SRO
CVC	MDP	08/10/89 12:10	08/10/89 17:50	5.67	STARTED/SECURED 33 CHGP	CSAPCH3 ST CCP	SRO
CVC	MDP	05/10/90 17:52	05/23/90 02:05	296.22	STARTED/SECURED 33 CHGP	CSAPCH3 ST CCP	SRO
CVC	MDP	06/21/90 04:10	06/21/90 17:40	13.50	STARTED/SECURED 33 CHGP	CSAPCH3 ST CCP	SRO
CVC	MDP	07/13/90 21:10	07/14/90 00:35	3.42	STARTED/SECURED 33 CHGP	CSAPCH3 ST CCP	SRO
CVC	MDP	09/01/90 18:35	09/14/90 22:33	315.97	STARTED/SECURED 33 CHGP	CSAPCH3 ST CCP	SRO
CVC	MDP	08/16/91 08:32	08/17/91 09:00	24.47	STARTED/SECURED 33 CHGP	CSAPCH3 ST CCP	SRO
CVC	MDP	05/25/90 17:22	06/02/90 03:05	177.72	STARTED/SECURED 33 CHGP FOR BREAK IN	CSAPCH3 ST CCP	SRO
CVC	MDP	11/22/87 00:00	11/22/87 19:30		STARTED/SECURED 33 CHGP	CSAPCH3 STNG	SRO
PPR	31 RCP	05/20/91 14:24	05/20/91 14:25	0.02	STARTED/SECURED 31 RCP AS PER SOP-RCS-1 & SOP-RCS-9	RCPCPC1	
PPR	31 RCP	09/28/90 17:38	09/28/90 17:40	0.03	BUMPED 31 RCP FOR ROTATION	RCPCPC1	
PPR	31 RCP	01/22/85 21:27	06/08/85 06:26	3272.98	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	09/25/85 23:20	04/26/86 06:17	5094.95	STARTED/SECURED 31 RCP	RCPCPC1	

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
PPR	31 RCP	05/14/86 18:48	05/14/86 18:52	0.07	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	05/16/86 23:02	05/18/86 07:50	32.80	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	05/18/86 16:31	05/20/86 02:40	34.15	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	05/21/86 17:49	07/06/86 22:09	1108.33	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	09/02/86 02:40	01/31/87 21:07	3642.45	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	02/02/87 00:29	02/11/87 13:57	229.47	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	02/13/87 00:38	03/27/87 22:19	1029.68	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	04/03/87 03:59	05/02/87 09:19	701.33	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	08/21/87 03:02	08/21/87 03:03	0.02	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	08/21/87 18:52	08/21/87 19:15	0.38	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	08/23/87 13:05	08/30/87 15:39	170.57	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	09/03/87 01:39	05/11/88 12:25	6034.77	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	05/25/88 10:36	05/25/88 10:41	0.08	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	05/27/88 18:00	06/14/88 22:28	436.47	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	06/15/88 15:48	10/11/88 07:55	2824.12	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	11/18/88 13:43	11/18/88 13:44	0.02	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	11/21/88 06:18	02/04/89 05:50	1799.53	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	06/15/89 05:47	10/20/89 13:30	3055.72	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	03/20/90 08:40	03/20/90 14:15	5.58	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	04/06/90 21:19	04/07/90 11:50	14.52	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	04/07/90 13:30	06/30/90 01:10	2003.67	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	06/30/90 16:38	09/15/90 03:37	1834.98	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	12/07/90 11:56	12/07/90 12:01	0.08	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	12/14/90 05:40	12/14/90 09:35	3.92	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	10/27/91 12:20	10/27/91 14:30	2.17	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	11/01/91 22:45	11/02/91 15:31	16.77	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	09/22/85 12:25	09/25/85 21:38	81.22	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	09/25/85 23:15	09/25/85 23:16	0.02	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	05/22/91 14:59	10/24/91 23:55	3728.93	STARTED/SECURED 31 RCP AS PER SOP-RCS-1	RCPCPC1	
PPR	31 RCP	05/24/88 22:24	05/24/88 22:25	0.02	STARTED/SECURED 31 RCP FOR 1 MIN	RCPCPC1	
PPR	31 RCP	11/19/88 07:20	11/19/88 07:21	0.02	STARTED/SECURED 31 RCP FOR 1 MIN	RCPCPC1	
PPR	31 RCP	06/08/89 09:06	06/08/89 09:07	0.02	STARTED/SECURED 31 RCP FOR 1 MIN	RCPCPC1	
PPR	31 RCP	03/18/90 17:04	03/18/90 17:05	0.02	STARTED/SECURED 31 RCP FOR 1 MIN	RCPCPC1	
PPR	31 RCP	04/02/90 05:20	04/02/90 05:25	0.08	STARTED/SECURED 31 RCP FOR 5 MIN RUN	RCPCPC1	
PPR	31 RCP	09/20/85 15:08	09/20/85 15:09	0.02	STARTED/SECURED 31 RCP FOR I MIN RUN	RCPCPC1	
PPR	31 RCP	04/01/87 17:57	04/01/87 18:01	0.07	STARTED/SECURED 31 RCP TO DEGAS RCS	RCPCPC1	
PPR	31 RCP	03/17/90 12:38	03/17/90 12:39	0.02	STARTED/SECURED 31 RCP FOR 30 SEC RUN	RCPCPC1 1 MIN	
PPR		05/14/86 06:01	05/14/86 06:03	0.03	BUMPED 31 RCP	RCPCPC1 2 MIN	
PPR		04/01/87 10:56	04/01/87 10:58	0.03	BUMPED 31 RCP	RCPCPC1 2 MIN	
PPR		12/07/90 05:45	12/07/90 05:47	0.03	BUMPED 31 RCP	RCPCPC1 2 MIN	
PPR		09/14/85 18:35	09/14/85 18:37	0.03	BUMPED 31 RCP FOR VENT RCS	RCPCPC1 2 MIN	
PPR		08/02/85 18:00	08/02/85 18:02	0.03	BUMPED 31 RCP MOTOR FOR ROTATION	RCPCPC1 2 MIN	

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
PPR		05/24/88 15:38	05/24/88 15:40	0.03	BUMPED 31 RCP. RECEIVED LOW LEVEL ALARM	RCPCPC1 2 MIN	
PPR	31 RCP	10/23/89 12:43	10/23/89 00:00		STARTED/SECURED 31 RCP	RCPCPC1 ETNG	
PPR	31 RCP	12/15/90 02:33	12/15/90 00:00		STARTED/SECURED 31 RCP	RCPCPC1 ETNG	
PPR	31 RCP	11/03/91 20:51	11/03/91 00:00		STARTED/SECURED 31 RCP	RCPCPC1 ETNG	
PPR	32 RCP	04/06/90 21:47	09/15/90 03:04	3869.28	RESTART/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	09/25/85 21:28	09/25/85 23:16	1.80	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	05/14/86 09:50	05/14/86 09:51	0.02	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	05/14/86 20:27	05/14/86 20:31	0.07	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	05/16/86 17:40	05/18/86 07:50	38.17	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	05/18/86 16:33	07/06/86 22:18	1181.75	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	09/02/86 05:40	03/27/87 19:23	4957.72	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	04/02/87 22:35	05/02/87 13:03	710.47	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	08/20/87 19:58	08/20/87 19:59	0.02	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	08/21/87 18:11	08/21/87 21:08	2.95	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	08/21/87 23:50	08/22/87 00:05	0.25	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	08/23/87 12:55	08/30/87 15:39	170.73	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	09/02/87 23:46	05/11/88 12:30	6036.73	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	05/25/88 12:14	05/25/88 12:19	0.08	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	05/27/88 23:28	06/14/88 22:28	431.00	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	06/15/88 15:51	10/11/88 07:55	2824.07	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	11/21/88 19:25	02/04/89 06:26	1787.02	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	06/08/89 18:35	06/08/89 18:40	0.08	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	06/13/89 11:06	10/20/89 13:13	3098.12	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	04/02/90 13:50	04/02/90 13:55	0.08	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	12/07/90 14:59	12/07/90 15:04	0.08	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	12/14/90 04:30	12/14/90 08:40	4.17	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	12/15/90 02:30	12/15/90 19:58	17.47	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	03/21/91 15:00	03/25/91 18:30	99.50	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	05/20/91 20:05	05/20/91 20:06	0.02	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	05/22/91 16:10	10/19/91 12:33	3596.38	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	10/24/91 18:35	10/24/91 23:55	5.33	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	10/27/91 12:26	10/27/91 14:30	2.07	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	11/01/91 22:51	11/02/91 15:32	16.68	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	09/22/85 08:55	09/22/85 09:55	1.00	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	04/06/90 21:35	04/06/90 21:37	0.03	STARTED/SECURED 32 RCP DUE TO FIRE ALARM	RCPCPC2	
PPR	32 RCP	05/25/88 01:19	05/25/88 01:20	0.02	STARTED/SECURED 32 RCP FOR 1 MIN	RCPCPC2	
PPR	32 RCP	11/19/88 03:59	11/19/88 04:00	0.02	STARTED/SECURED 32 RCP FOR 1 MIN	RCPCPC2	
PPR	32 RCP	06/08/89 15:23	06/08/89 15:24	0.02	STARTED/SECURED 32 RCP FOR 1 MIN	RCPCPC2	
PPR	32 RCP	03/18/90 19:45	03/18/90 19:46	0.02	STARTED/SECURED 32 RCP FOR 1 MIN	RCPCPC2	
PPR	32 RCP	09/20/85 17:10	09/20/85 17:11	0.02	STARTED/SECURED 32 RCP FOR I MIN RUN	RCPCPC2	
PPR		06/06/89 02:16	06/06/89 02:17	0.02	BUMPED 32 RCP FOR 30 SEC	RCPCPC2 1 MIN	
PPR	32 RCP	11/18/88 22:12	11/18/88 22:13	0.02	STARTED/SECURED 32 RCP FOR 30 SEC	RCPCPC2 1 MIN	

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
PPR		09/15/85 00:27	09/15/85 00:29	0.03	BUMPED 32 RCP	RCPCPC2 2 MIN	
PPR		04/01/87 03:08	04/01/87 03:10	0.03	BUMPED 32 RCP	RCPCPC2 2 MIN	
PPR		09/28/90 13:30	09/28/90 13:32	0.03	BUMPED 32 RCP	RCPCPC2 2 MIN	
PPR		12/06/90 16:20	12/06/90 16:22	0.03	BUMPED 32 RCP	RCPCPC2 2 MIN	
PPR	32 RCP	05/19/91 22:12	05/19/91 22:14	0.03	BUMPED 32 RCP	RCPCPC2 2 MIN	
PPR		03/31/87 03:16	03/31/87 03:18	0.03	BUMPED 32 RCP FOR ROTATION CHECK	RCPCPC2 2 MIN	
PPR	32 RCP	10/23/89 11:54	10/23/89 00:00		STARTED/SECURED 32 RCP	RCPCPC2 ETNG	
PPR	32 RCP	11/03/91 20:53	11/03/91 00:00		STARTED/SECURED 32 RCP	RCPCPC2 ETNG	
PPR	32 RCP	04/26/86 00:00	04/26/86 06:20		STARTED/SECURED 32 RCP	RCPCPC2 STNG	
PPR	32 RCP	05/02/87 00:00	05/02/87 13:03		STARTED/SECURED 32 RCP	RCPCPC2 STNG	
PPR	33 RCP	09/25/85 19:41	09/25/85 23:47	4.10	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	09/26/85 00:40	10/01/85 09:18	128.63	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	05/14/86 13:50	05/14/86 13:52	0.03	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	05/14/86 22:27	05/14/86 22:32	0.08	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	05/16/86 23:04	05/18/86 11:18	36.23	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	05/18/86 16:29	07/10/86 13:33	1269.07	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	09/02/86 11:58	03/27/87 19:22	4951.40	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	04/02/87 22:14	05/02/87 09:19	707.08	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	08/20/87 22:47	08/20/87 22:48	0.02	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	08/21/87 15:45	08/21/87 16:14	0.48	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	08/21/87 20:50	08/21/87 21:28	0.63	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	08/22/87 00:13	08/22/87 00:30	0.28	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	08/22/87 04:38	08/22/87 13:35	8.95	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	08/23/87 12:35	05/11/88 14:00	6289.42	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	05/26/88 03:14	05/26/88 18:25	15.18	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	05/26/88 18:38	10/11/88 07:00	3300.37	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	10/22/88 12:31	10/22/88 23:54	11.38	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	11/18/88 17:58	11/18/88 18:23	0.42	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	11/21/88 01:27	02/04/89 10:45	1809.30	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	03/14/90 21:57	03/14/90 22:05	0.13	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	03/20/90 08:08	03/20/90 08:44	0.60	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	03/20/90 14:10	03/20/90 16:01	1.85	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	03/20/90 22:00	03/20/90 22:20	0.33	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	04/03/90 09:10	04/03/90 09:15	0.08	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	04/04/90 06:13	04/04/90 19:15	13.03	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	04/04/90 23:03	04/07/90 22:12	71.15	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	06/30/90 16:39	09/16/90 01:36	1856.95	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	12/07/90 09:33	12/07/90 09:38	0.08	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	03/21/91 15:00	03/24/91 13:30	70.50	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	05/20/91 21:38	05/20/91 21:39	0.02	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	05/22/91 17:52	10/19/91 17:30	3599.63	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	10/22/91 14:00	10/23/91 11:36	21.60	STARTED/SECURED 33 RCP	RCPCPC3	

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
PPR	33 RCP	10/24/91 18:10	10/25/91 01:37	7.45	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	09/21/85 00:46	09/21/85 12:55	12.15	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	05/24/88 14:27	05/24/88 14:29	0.03	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	09/20/85 12:45	09/20/85 12:46	0.02	STARTED/SECURED 33 RCP FOR 1 MIN	RCPCPC3	
PPR	33 RCP	05/24/88 17:24	05/24/88 17:25	0.02	STARTED/SECURED 33 RCP FOR 1 MIN	RCPCPC3	
PPR	33 RCP	05/25/88 02:56	05/25/88 02:57	0.02	STARTED/SECURED 33 RCP FOR 1 MIN	RCPCPC3	
PPR	33 RCP	11/19/88 06:04	11/19/88 06:05	0.02	STARTED/SECURED 33 RCP FOR 1 MIN	RCPCPC3	
PPR	33 RCP	06/08/89 02:49	06/08/89 02:50	0.02	STARTED/SECURED 33 RCP FOR 1 MIN	RCPCPC3	
PPR	33 RCP	03/18/90 20:56	03/18/90 20:57	0.02	STARTED/SECURED 33 RCP FOR 1 MIN	RCPCPC3	
PPR	33 RCP	06/09/89 23:34	10/21/89 00:21	3192.78	STARTED/SECURED 33 RCP FOR HEATUP TO 185 DEGREES	RCPCPC3	
PPR	33 RCP	04/01/87 16:59	04/01/87 17:05	0.10	STARTED/SECURED 33 RCP TO DEGAS RCS	RCPCPC3	
PPR		11/18/88 18:15	11/18/88 18:16	0.02	BUMPED 33 RCP FOR 30 SEC	RCPCPC3 1 MIN	
PPR		06/06/89 19:10	06/06/89 19:11	0.02	BUMPED 33 RCP FOR 30 SEC	RCPCPC3 1 MIN	
PPR		04/01/87 05:19	04/01/87 05:21	0.03	BUMPED 33 RCP	RCPCPC3 2 MIN	
PPR		03/14/90 20:00	03/14/90 20:02	0.03	BUMPED 33 RCP	RCPCPC3 2 MIN	
PPR		03/17/90 19:35	03/17/90 19:37	0.03	BUMPED 33 RCP	RCPCPC3 2 MIN	
PPR		12/06/90 21:25	12/06/90 21:27	0.03	BUMPED 33 RCP	RCPCPC3 2 MIN	
PPR	33 RCP	05/20/91 04:25	05/20/91 04:27	0.03	BUMPED 33 RCP	RCPCPC3 2 MIN	
PPR		09/15/85 17:40	09/15/85 17:42	0.03	BUMPED 33 RCP FOR RCS VENT	RCPCPC3 2 MIN	
PPR		03/31/87 01:48	03/31/87 01:50	0.03	BUMPED 33 RCP FOR ROTATION CHECK	RCPCPC3 2 MIN	
PPR	33 RCP	10/01/85 10:30	10/01/85 00:00		STARTED/SECURED 33 RCP	RCPCPC3 ETNG	
PPR	33 RCP	10/23/89 10:33	10/23/89 00:00		STARTED/SECURED 33 RCP	RCPCPC3 ETNG	
PPR	33 RCP	04/08/90 00:45	04/08/90 00:00		STARTED/SECURED 33 RCP	RCPCPC3 ETNG	
PPR	33 RCP	12/15/90 02:35	12/15/90 00:00		STARTED/SECURED 33 RCP	RCPCPC3 ETNG	
PPR	33 RCP	10/26/91 08:59	10/26/91 00:00		STARTED/SECURED 33 RCP	RCPCPC3 ETNG	
PPR	34 RCP	05/14/86 21:22	05/14/86 21:27	0.08	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	05/15/86 09:25	05/15/86 09:27	0.03	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	05/27/86 18:35	07/16/86 06:42	1188.12	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	09/01/86 19:23	03/28/87 12:10	4984.78	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	04/01/87 14:26	04/01/87 14:35	0.15	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	04/01/87 19:48	05/04/87 07:18	779.50	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	08/21/87 00:31	08/21/87 00:32	0.02	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	08/21/87 12:47	08/21/87 13:15	0.47	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	08/21/87 16:48	08/21/87 17:00	0.20	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	08/21/87 21:34	08/21/87 21:54	0.33	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	08/22/87 02:12	08/22/87 02:54	0.70	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	08/22/87 14:30	08/23/87 06:08	15.63	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	08/23/87 12:15	08/31/87 00:25	180.17	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	09/03/87 00:55	05/13/88 07:35	6078.67	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	05/13/88 00:00	05/13/88 07:35	7.58	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	05/26/88 18:25	05/26/88 18:38	0.22	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	05/26/88 20:10	05/26/88 20:35	0.42	STARTED/SECURED 34 RCP	RCPCPC4	

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
PPR	34 RCP	05/27/88 23:20	10/11/88 07:40	3272.33	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	11/19/88 16:00	02/05/89 15:30	1871.50	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	06/14/89 04:00	06/14/89 05:55	1.92	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	06/15/89 05:42	10/21/89 12:00	3078.30	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	10/22/89 16:21	03/06/90 04:28	3228.12	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	03/20/90 07:42	03/20/90 08:10	0.47	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	03/20/90 22:19	03/20/90 22:38	0.32	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	03/21/90 03:10	03/21/90 03:32	0.37	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	04/02/90 19:57	04/02/90 20:02	0.08	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	04/03/90 11:55	04/04/90 23:06	35.18	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	04/06/90 21:15	04/07/90 16:19	19.07	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	04/07/90 18:56	04/07/90 19:04	0.13	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	04/07/90 21:39	09/15/90 04:04	3846.42	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	12/07/90 18:48	12/07/90 18:53	0.08	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	12/07/90 21:50	12/08/90 19:26	21.60	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	12/12/90 18:00	12/15/90 20:36	74.60	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	03/21/91 15:00	03/28/91 08:04	161.07	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	05/20/91 18:15	05/20/91 18:16	0.02	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	09/21/85 15:18	09/26/85 00:45	105.45	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	06/09/89 22:19	06/09/89 22:24	0.08	STARTED/SECURED 34 RCP DUE TO LO SEAL RETURN FLOW	RCPCPC4	
PPR	34 RCP	05/25/88 05:45	05/25/88 05:53	0.13	STARTED/SECURED 34 RCP DUE TO LOW SEAL RETURN FLOW	RCPCPC4	
PPR	34 RCP	05/26/88 02:09	05/26/88 03:15	1.10	STARTED/SECURED 34 RCP DUE TO LOW SEAL RETURN FLOW	RCPCPC4	
PPR	34 RCP	05/24/88 19:43	05/24/88 19:44	0.02	STARTED/SECURED 34 RCP FOR 1 MIN	RCPCPC4	
PPR	34 RCP	11/19/88 05:11	11/19/88 05:12	0.02	STARTED/SECURED 34 RCP FOR 1 MIN	RCPCPC4	
PPR	34 RCP	06/08/89 13:05	06/08/89 13:06	0.02	STARTED/SECURED 34 RCP FOR 1 MIN	RCPCPC4	
PPR	34 RCP	03/18/90 22:06	03/18/90 22:08	0.03	STARTED/SECURED 34 RCP FOR 2 MIN	RCPCPC4	
PPR	34 RCP	03/14/90 14:55	03/14/90 15:16	0.35	STARTED/SECURED 34 RCP MOTOR	RCPCPC4	
PPR		06/06/89 22:41	06/06/89 22:42	0.02	BUMPED 34 RCP FOR 30 SEC	RCPCPC4 1 MIN	
PPR	34 RCP	03/20/90 14:35	03/20/90 14:36	0.02	STARTED/SECURED 34 RCP	RCPCPC4 1 MIN	
PPR	34 RCP	03/20/90 14:35	03/20/90 14:36	0.02	STARTED/SECURED 34 RCP	RCPCPC4 1 MIN	
PPR	34 RCP	11/19/88 01:29	11/19/88 01:30	0.02	STARTED/SECURED 34 RCP FOR 30 SEC	RCPCPC4 1 MIN	
PPR		09/15/85 03:48	09/15/85 03:50	0.03	BUMPED 34 RCP	RCPCPC4 2 MIN	
PPR		04/01/87 08:30	04/01/87 08:32	0.03	BUMPED 34 RCP	RCPCPC4 2 MIN	
PPR		05/24/88 15:05	05/24/88 15:07	0.03	BUMPED 34 RCP	RCPCPC4 2 MIN	
PPR		03/18/90 04:09	03/18/90 04:11	0.03	BUMPED 34 RCP	RCPCPC4 2 MIN	
PPR		12/07/90 01:19	12/07/90 01:21	0.03	BUMPED 34 RCP	RCPCPC4 2 MIN	
PPR	34 RCP	05/17/91 19:13	05/17/91 19:15	0.03	BUMPED 34 RCP FOR ROTATION	RCPCPC4 2 MIN	
PPR		03/14/90 08:36	03/14/90 08:38	0.03	BUMPED 34 RCP MOTOR	RCPCPC4 2 MIN	
PPR	34 RCP	05/14/86 12:20	05/14/86 12:22	0.03	STARTED/SECURED 34 RCP	RCPCPC4 2 MIN	
PPR	34 RCP	12/15/90 21:19	12/15/90 00:00		STARTED/SECURED 34 RCP	RCPCPC4 ETNG	
PPR	34 RCP	05/21/91 05:59	05/21/91 00:00		STARTED/SECURED 34 RCP	RCPCPC4 ETNG	
PPR	31 RCP	03/21/91 15:00	03/24/91 10:43	67.72	STARTED/SECURED 31 RCP	RCPCPC4 ST USING CCR LOG	

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
PPR	34 RCP	04/26/86 00:00	04/26/86 08:30		STARTED/SECURED 34 RCP	RCPCPC4 STNG	
PPR	34 RCP	06/08/85 20:10	06/10/85 14:58	42.80	STARTED/SECURED 34 RCP	SS LOG UNIT COLD S/D	
PPR	31 RCP	10/13/88 03:20	10/20/88 03:29	168.15	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	04/08/91 00:53	05/12/91 08:53	824.00	STARTED/SECURED 31 RCP	RCPCPC1	
PPR	31 RCP	10/12/88 22:52	10/20/88 05:34	174.70	STARTED/SECURED 31 RCP	RCPCPC1 SS LOG UNIT TRIPPED	
PPR	32 RCP	04/08/91 01:09	05/12/91 08:53	823.73	STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	12/28/90 21:05	12/28/90 00:00		STARTED/SECURED 32 RCP	RCPCPC2	
PPR	32 RCP	10/15/88 01:20	10/20/88 06:05	124.75	STARTED/SECURED 32 RCP	RCPCPC2 ETNG	
PPR	32 RCP	04/07/91 17:45	05/13/91 14:09	860.40	STARTED/SECURED 32 RCP	RCPCPC2 SS LOG UNIT TRIPPED	
PPR	33 RCP	05/06/88 18:38	10/13/88 11:05	3832.45	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	10/13/88 05:44	10/13/88 11:08	5.40	STARTED/SECURED 33 RCP	RCPCPC3	
PPR	33 RCP	04/05/91 06:30	04/08/91 17:33	83.05	STARTED/SECURED 33 RCP	RCPCPC3 SS LOG UNIT TRIPPED	
PPR	34 RCP	04/08/91 20:18	04/08/91 20:29	0.18	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	04/08/91 21:25	05/12/91 18:02	812.62	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	04/08/91 20:56	04/08/91 21:06	0.17	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	06/07/85 19:29	06/08/85 06:26	10.95	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	06/07/85 19:29	06/08/85 02:55	7.43	STARTED/SECURED 34 RCP	RCPCPC4	
PPR	34 RCP	06/07/85 19:29	06/08/85 07:17	11.80	STARTED/SECURED 34 RCP	RCPCPC4 STNG	
RHR	MDP	06/08/85 05:44	06/08/85 06:39	0.92	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	06/08/85 08:57	06/12/85 04:30	91.55	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	06/12/85 09:35	06/24/85 07:49	286.23	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	07/08/85 10:58	08/07/85 09:19	718.35	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	09/05/85 11:05	09/10/85 09:46	118.68	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	09/10/85 09:56	09/10/85 09:57	0.02	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	09/10/85 11:21	09/10/85 16:08	4.78	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	09/10/85 17:10	09/11/85 08:38	15.47	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	09/11/85 08:58	09/11/85 13:00	4.03	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	09/11/85 13:20	09/12/85 09:26	20.10	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	09/12/85 09:32	09/12/85 14:32	5.00	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	09/12/85 16:30	09/16/85 11:02	90.53	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	09/16/85 23:42	09/17/85 19:25	19.72	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	09/21/85 19:38	09/22/85 12:50	17.20	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	04/24/86 07:55	04/24/86 08:15	0.33	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	04/26/86 11:59	05/03/86 19:03	175.07	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	05/03/86 20:16	05/11/86 12:17	184.02	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	07/10/86 16:34	07/10/86 16:46	0.20	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	07/10/86 19:01	07/14/86 11:50	88.82	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	07/17/86 19:35	08/13/86 02:46	631.18	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	08/30/86 10:41	08/31/86 09:50	23.15	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	03/28/87 05:14	04/02/87 19:34	134.33	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	05/02/87 12:28	05/02/87 13:20	0.87	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	05/06/87 15:55	05/10/87 11:55	92.00	STARTED/SECURED 31 RHRP	ACAPRH1	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
RHR	MDP	06/21/87 20:25	06/21/87 20:30	0.08	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	06/30/87 18:17	07/01/87 06:16	11.98	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	07/01/87 12:25	07/07/87 03:16	134.85	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	07/07/87 03:23	07/07/87 03:24	0.02	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	07/07/87 03:32	07/07/87 10:05	6.55	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	07/31/87 03:05	08/04/87 16:54	109.82	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	08/04/87 17:07	08/06/87 09:35	40.47	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	08/06/87 10:09	08/07/87 18:30	32.35	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	08/07/87 21:12	08/11/87 18:50	93.63	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	08/17/87 21:05	08/17/87 21:25	0.33	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	08/18/87 14:50	08/18/87 23:22	8.53	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	08/21/87 19:31	08/22/87 16:31	21.00	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	08/22/87 17:46	08/23/87 00:30	6.73	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	08/30/87 20:00	08/30/87 20:40	0.67	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	10/11/88 10:25	10/13/88 00:20	37.92	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	10/20/88 07:50	10/21/88 10:08	26.30	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	10/21/88 10:33	10/25/88 04:21	89.80	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	02/22/89 09:28	02/22/89 09:52	0.40	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	02/22/89 12:09	02/22/89 12:42	0.55	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	02/27/89 08:52	02/27/89 09:09	0.28	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	05/21/89 03:07	05/21/89 03:45	0.63	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	06/03/89 19:10	06/03/89 22:40	3.50	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	06/03/89 23:20	06/04/89 12:00	12.67	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	06/09/89 13:08	06/14/89 00:13	107.08	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	10/20/89 21:21	10/20/89 21:51	0.50	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	10/21/89 00:30	10/22/89 21:44	45.23	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	03/18/90 13:35	03/19/90 02:22	12.78	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	03/19/90 10:16	04/04/90 02:55	376.65	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	09/17/90 18:37	09/19/90 09:03	38.43	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	09/19/90 10:00	09/19/90 10:09	0.15	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	09/21/90 01:26	09/21/90 02:00	0.57	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	09/21/90 02:00	09/21/90 02:02	0.03	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	09/21/90 03:52	09/21/90 04:08	0.27	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	09/21/90 11:18	09/21/90 11:21	0.05	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	09/21/90 15:45	09/21/90 15:56	0.18	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	11/04/90 21:15	11/04/90 21:58	0.72	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	11/26/90 10:13	11/26/90 10:32	0.32	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	12/03/90 08:45	12/04/90 11:52	27.12	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	12/06/90 04:24	12/11/90 21:12	136.80	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	12/11/90 22:23	12/13/90 23:15	48.87	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	03/25/91 19:30	03/28/91 19:47	72.28	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	05/15/91 00:36	05/22/91 09:23	176.78	STARTED/SECURED 31 RHRP	ACAPRH1	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
RHR	MDP	05/11/86 14:42	05/14/86 13:10	70.47	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	06/24/87 03:57	06/30/87 14:49	154.87	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	06/05/89 20:03	06/08/89 00:35	52.53	STARTED/SECURED 31 RHRP DUE TO SEAL PACKAGE LEAK	ACAPRH1	SRO
RHR	MDP	05/11/88 14:20	05/11/88 14:33	0.22	STARTED/SECURED 31 RHRP FOR CHEM SAMPLE	ACAPRH1	SRO
RHR	MDP	11/03/90 20:08	11/03/90 20:55	0.78	STARTED/SECURED 31 RHRP FOR FLOW TEST	ACAPRH1	SRO
RHR	MDP	10/23/91 08:49	10/23/91 08:52	0.05	STARTED/SECURED 31 RHRP FOR OPERABILITY	ACAPRH1	SRO
RHR	MDP	03/28/87 02:22	03/28/87 02:37	0.25	STARTED/SECURED 31 RHRP FOR SAMPLE	ACAPRH1	SRO
RHR	MDP	10/11/88 04:45	10/11/88 05:12	0.45	STARTED/SECURED 31 RHRP FOR SAMPLE	ACAPRH1	SRO
RHR	MDP	10/20/88 05:53	10/20/88 06:10	0.28	STARTED/SECURED 31 RHRP FOR SAMPLE	ACAPRH1	SRO
RHR	MDP	08/17/87 18:20	08/17/87 18:21	0.02	STARTED/SECURED 31 RHRP FOR TEST	ACAPRH1	SRO
RHR	MDP	08/18/87 01:50	08/18/87 14:39	12.82	STARTED/SECURED 31 RHRP FOR TEST GROUP	ACAPRH1	SRO
RHR	MDP	05/20/89 13:59	05/20/89 14:05	0.10	STARTED/SECURED 31 RHRP FOR TEST GROUP	ACAPRH1	SRO
RHR	MDP	05/21/89 13:47	05/21/89 17:50	4.05	STARTED/SECURED 31 RHRP TO RECIRC RX VESSEL	ACAPRH1	SRO
RHR	MDP	05/22/89 13:28	05/22/89 17:50	4.37	STARTED/SECURED 31 RHRP TO RECIRC RX VESSEL	ACAPRH1	SRO
RHR	MDP	05/20/91 19:25	05/20/91 19:30	0.08	STARTED/SECURED 32 RHRP TO FLUSH HOT SPOT ON VLV 732	ACAPRH1	SRO
RHR	MDP	05/11/88 15:20	05/18/88 03:55	156.58	STARTED/TRIPPED 31 RHRP	ACAPRH1	SRO
RHR	MDP	09/21/90 10:40	09/21/90 10:42	0.03	BUMPED 31 RHRP	ACAPRH1 2 MIN	SRO
RHR	MDP	09/21/90 11:41	09/21/90 11:43	0.03	BUMPED 31 RHRP	ACAPRH1 2 MIN	SRO
RHR	MDP	09/20/90 23:10	09/20/90 23:12	0.03	BUMPED 31 RHRP FOR ROTATION	ACAPRH1 2 MIN	SRO
RHR	MDP	09/20/90 23:25	09/20/90 23:27	0.03	BUMPED 31 RHRP FOR ROTATION	ACAPRH1 2 MIN	SRO
RHR	MDP	12/06/90 04:15	12/06/90 04:17	0.03	BUMPED 31 RHRP FOR ROTATION	ACAPRH1 2 MIN	SRO
RHR	MDP	05/02/87 20:14	05/06/87 15:50	91.60	STARTED/SECURED 31 RHRP FOR TEMP EQUAL	ACAPRH1 ET AS 32 RHR ST	SRO
RHR	MDP	09/16/85 14:42	09/16/85 23:42	9.00	STARTED/SECURED 31 RHRP	ACAPRH1 ETNG, USE NEXT START TIME	SRO
RHR	MDP	08/30/87 22:30	09/03/87 22:30	96.00	STARTED/SECURED 31 RHRP	ACAPRH1 SEE DAILY	SRO
RHR	MDP	05/18/88 07:00	05/26/88 20:02	205.03	STARTED/SECURED 31 RHRP	ACAPRH1 ST AT 7:00, 31 RHRP WAS I/S	SRO
RHR	MDP	03/03/90 16:00	03/12/90 13:30	213.50	STARTED/SECURED 31 RHRP	ACAPRH1 USE RX S/D TIME AS ST	SRO
RHR	MDP	06/12/85 04:40	06/12/85 09:35	4.92	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	06/24/85 07:49	07/08/85 10:58	339.15	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	08/07/85 09:19	09/05/85 11:05	697.77	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	09/17/85 19:25	09/18/85 11:53	16.47	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	09/18/85 12:07	09/21/85 19:38	79.52	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	05/03/86 19:03	05/03/86 20:16	1.22	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	05/14/86 13:10	05/16/86 14:25	49.25	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	07/15/86 19:03	07/17/86 19:35	48.53	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	08/13/86 02:46	08/30/86 10:41	415.92	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	08/31/86 09:50	08/31/86 11:44	1.90	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	08/31/86 11:47	09/02/86 02:50	39.05	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	05/06/87 15:50	05/06/87 15:55	0.08	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	05/10/87 11:55	06/05/87 01:06	613.18	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	06/05/87 03:42	06/07/87 09:20	53.63	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	06/28/87 22:19	06/28/87 22:21	0.03	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	06/30/87 14:37	06/30/87 18:17	3.67	STARTED/SECURED 32 RHRP	ACAPRH2	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
RHR	MDP	07/01/87 06:14	07/01/87 12:25	6.18	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	07/12/87 01:20	07/31/87 03:05	457.75	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	08/11/87 18:50	08/18/87 01:50	151.00	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	08/18/87 23:22	08/21/87 19:31	68.15	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	08/23/87 00:30	08/23/87 14:45	14.25	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	08/23/87 16:44	08/23/87 17:10	0.43	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	05/26/88 20:02	05/27/88 15:30	19.47	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	10/22/88 12:25	10/22/88 12:32	0.12	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	10/25/88 04:21	11/23/88 10:20	701.98	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	05/21/89 14:37	05/21/89 14:42	0.08	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	05/21/89 17:50	06/01/89 21:33	267.72	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	05/22/89 14:37	05/22/89 14:42	0.08	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	05/22/89 17:50	06/03/89 19:10	289.33	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	06/01/89 21:41	06/03/89 19:10	45.48	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	06/04/89 12:00	06/04/89 16:50	4.83	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	06/04/89 16:54	06/05/89 20:03	27.15	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	06/08/89 00:33	06/09/89 12:33	36.00	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	10/22/89 16:20	10/22/89 16:31	0.18	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	03/12/90 13:30	03/18/90 13:35	144.08	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	03/19/90 02:22	03/19/90 10:16	7.90	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	09/19/90 09:03	09/19/90 10:00	0.95	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	09/19/90 10:09	09/21/90 01:26	39.28	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	09/21/90 02:02	09/21/90 03:52	1.83	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	09/21/90 04:08	10/27/90 23:20	883.20	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	11/04/90 21:00	11/04/90 21:18	0.30	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	11/08/90 03:00	11/18/90 11:17	248.28	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	11/23/90 09:45	11/26/90 10:13	72.47	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	11/26/90 10:32	12/03/90 08:45	166.22	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	12/04/90 11:52	12/04/90 12:50	0.97	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	12/04/90 19:41	12/06/90 04:24	32.72	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	03/28/91 19:43	04/04/91 10:24	158.68	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	04/04/91 10:40	04/07/91 03:05	64.42	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	05/12/91 17:50	05/15/91 00:36	54.77	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	10/24/91 14:37	10/24/91 15:00	0.38	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	10/21/88 10:08	10/21/88 10:33	0.42	STARTED/SECURED 32 RHRP FOR PT	ACAPRH2	SRO
RHR	MDP	05/20/89 11:37	05/20/89 11:44	0.12	STARTED/SECURED 32 RHRP FOR TEST GROUP	ACAPRH2 2 MIN	SRO
RHR	MDP	06/27/87 09:20	06/27/87 09:22	0.03	BUMPED 32 RHRP	ACAPRH2 2 MIN	SRO
RHR	MDP	12/04/90 04:00	12/04/90 04:02	0.03	BUMPED 32 RHRP FOR ROTATION	ACAPRH2 2 MIN	SRO
RHR	MDP	05/19/89 14:50	05/19/89 14:52	0.03	BUMPED 32 RHRP FOR SEAL SEATING	ACAPRH2 ET 12:20 (SEE LOGS)	SRO
RHR	MDP	07/14/86 11:50	07/14/86 12:20	0.50	STARTED/SECURED 32 RHRP	ACAPRH2 ET AS 31 RHRP ST	SRO
RHR	MDP	05/18/88 03:55	05/18/88 07:00	3.08	STARTED/SECURED 32 RHRP	ACAPRH2 STNG	SRO
RHR	MDP	12/09/90 00:00	12/09/90 14:28		STARTED/SECURED 32 RHRP		

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SIS	MDP	11/23/88 08:56	11/23/88 09:18	0.37	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	02/04/89 14:10	02/22/89 08:33	426.38	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	09/15/90 15:40	09/17/90 17:10	49.50	STARTED/SECURED 31 RHRP	ACAPRH1	SRO
RHR	MDP	10/09/87 02:55	10/09/87 03:15	0.33	STARTED/SECURED 31 RHRP FOR RETEST	ACAPRH1	SRO
RHR	MDP	02/04/89 12:23	02/04/89 12:48	0.42	STARTED/SECURED 31 RHRP FOR SAMPLE	ACAPRH1	SRO
RHR	MDP	09/15/90 14:18	09/15/90 14:55	0.62	STARTED/SECURED 31 RHRP ON RECIRC	ACAPRH1	SRO
RHR	MDP	05/06/88 13:17	05/06/88 13:19	0.03	STARTED/SECURED 32 RHRP	ACAPRH2	SRO
RHR	MDP	10/08/87 05:35	10/08/87 05:40	0.08	STARTED/SECURED 32 RHRP FOR OPERABILITY	ACAPRH2	SRO
SIS	MDP	07/07/87 02:04	07/07/87 02:19	0.25	STARTED/SECURED 31 RECIRC PUMP	31 RECP	SRO
SIS	MDP	05/25/89 09:55	05/25/89 09:56	0.02	STARTED/SECURED 31 RECIRC PUMP	31 RECP	SRO
SIS	MDP	06/07/89 17:43	06/07/89 18:09	0.43	STARTED/SECURED 31 RECIRC PUMP	31 RECP	SRO
SIS	MDP	06/08/89 20:23	06/08/89 20:49	0.43	STARTED/SECURED 31 RECIRC PUMP	31 RECP	SRO
SIS	MDP	06/10/89 09:29	06/10/89 09:37	0.13	STARTED/SECURED 31 RECIRC PUMP	31 RECP	SRO
SIS	MDP	09/23/90 12:33	09/23/90 12:55	0.37	STARTED/SECURED 31 RECIRC PUMP	31 RECP	SRO
SIS	MDP	07/30/85 12:00	07/30/85 12:20	0.33	STARTED/SECURED 31 RECIRC PUMP FOR PT	31 RECP	SRO
SIS	MDP	06/07/89 17:29	06/07/89 17:31	0.03	BUMPED 31 RECIRC PUMP FOR ROTATION	31 RECP 2 MIN	SRO
SIS	MDP	09/11/85 17:00	09/11/85 17:04	0.07	STARTED/SECURED 31 SIP	31SIP	SRO
SIS	MDP	05/16/86 22:00	05/16/86 22:10	0.17	STARTED/SECURED 31 SIP	31SIP	SRO
SIS	MDP	08/21/87 17:26	08/21/87 17:49	0.38	STARTED/SECURED 31 SIP	31SIP	SRO
SIS	MDP	08/23/87 01:15	08/23/87 01:20	0.08	STARTED/SECURED 31 SIP	31SIP	SRO
SIS	MDP	09/03/87 06:43	09/03/87 06:45	0.03	STARTED/SECURED 31 SIP	31SIP	SRO
SIS	MDP	05/25/88 17:43	05/25/88 17:45	0.03	STARTED/SECURED 31 SIP	31SIP	SRO
SIS	MDP	05/25/88 20:49	05/25/88 21:09	0.33	STARTED/SECURED 31 SIP	31SIP	SRO
SIS	MDP	05/25/88 21:19	05/25/88 21:27	0.13	STARTED/SECURED 31 SIP	31SIP	SRO
SIS	MDP	10/23/89 06:15	10/23/89 06:20	0.08	STARTED/SECURED 31 SIP	31SIP	SRO
SIS	MDP	12/14/90 05:30	12/14/90 05:35	0.08	STARTED/SECURED 31 SIP	31SIP	SRO
SIS	MDP	04/06/91 12:22	04/06/91 12:28	0.10	STARTED/SECURED 31 SIP	31SIP	SRO
SIS	MDP	05/21/88 10:30	05/21/88 10:56	0.43	STARTED/SECURED 31 SIP AS PER TOP-51	31SIP	SRO
SIS	MDP	05/13/86 15:59	05/13/86 16:00	0.02	STARTED/SECURED 31 SIP FOR PT	31SIP	SRO
SIS	MDP	05/13/86 16:21	05/13/86 16:22	0.02	STARTED/SECURED 31 SIP FOR PT	31SIP	SRO
SIS	MDP	06/07/89 18:39	06/07/89 19:03	0.40	STARTED/SECURED 31 SIP FOR TEST	31SIP	SRO
SIS	MDP	09/23/85 02:40	09/23/85 03:26	0.77	STARTED/SECURED 31 SIP TO FILL ACC	31SIP	SRO
SIS	MDP	09/24/85 04:40	09/24/85 04:55	0.25	STARTED/SECURED 31 SIP TO FILL ACC	31SIP	SRO
SIS	MDP	09/02/86 09:49	09/02/86 09:55	0.10	STARTED/SECURED 31 SIP TO FILL ACC	31SIP	SRO
SIS	MDP	10/13/88 07:48	10/13/88 07:51	0.05	STARTED/SECURED 31 SIP TO FILL ACC	31SIP	SRO
SIS	MDP	11/21/88 01:45	11/21/88 01:50	0.08	STARTED/SECURED 31 SIP TO FILL ACC	31SIP	SRO
SIS	MDP	06/01/89 14:00	06/01/89 14:30	0.50	STARTED/SECURED 31 SIP TO FILL ACC	31SIP	SRO
SIS	MDP	06/02/89 01:45	06/02/89 03:21	1.60	STARTED/SECURED 31 SIP TO FILL ACC	31SIP	SRO
SIS	MDP	06/11/89 08:47	06/11/89 08:54	0.12	STARTED/SECURED 31 SIP TO FILL ACC	31SIP	SRO
SIS	MDP	06/14/89 18:26	06/14/89 19:50	1.40	STARTED/SECURED 31 SIP TO FILL ACC	31SIP	SRO
SIS	MDP	04/04/90 05:45	04/04/90 06:00	0.25	STARTED/SECURED 31 SIP TO FILL ACC	31SIP	SRO
SIS	MDP	12/15/90 07:50	12/15/90 07:52	0.03	STARTED/SECURED 31 SIP TO FILL ACC	31SIP	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SIS	MDP	04/08/91 05:25	04/08/91 05:30	0.08	STARTED/SECURED 31 SIP TO FILL ACCUM	31SIP	SRO
SIS	MDP	05/25/88 19:39	05/25/88 19:41	0.03	BUMPED 31 SIP FOR ACC TEST	31SIP 2 MIN	SRO
SIS	MDP	05/26/88 22:05	05/26/88 22:15	0.17	STARTED/SECURED 31 SIP TO FILL ACC	31SIP ETNG, 10 MIN	SRO
SIS	MDP	08/17/87 21:05	08/17/87 21:25	0.33	STARTED/SECURED 31 SIP	31SIP ETNG, 20 MIN	SRO
SIS	MDP	12/12/90 05:10	12/12/90 00:00		STARTED FILLING 31 ACCUMULATOR	31SIP WAS USED, ETNG	SRO
SIS	MDP	12/12/90 05:10	12/12/90 00:00		STARTED FILLING 34 ACCUMULATOR	31SIP WAS USED, ETNG	SRO
SIS	MDP	07/07/87 01:47	07/07/87 02:03	0.27	STARTED/SECURED 32 RECIRC PUMP	32RECP	SRO
SIS	MDP	07/07/87 02:31	07/07/87 02:35	0.07	STARTED/SECURED 32 RECIRC PUMP	32RECP	SRO
SIS	MDP	05/24/89 14:20	05/24/89 14:30	0.17	STARTED/SECURED 32 RECIRC PUMP	32RECP	SRO
SIS	MDP	05/24/89 15:06	05/24/89 15:32	0.43	STARTED/SECURED 32 RECIRC PUMP	32RECP	SRO
SIS	MDP	05/25/89 10:38	05/25/89 10:49	0.18	STARTED/SECURED 32 RECIRC PUMP	32RECP	SRO
SIS	MDP	06/08/89 21:01	06/08/89 21:08	0.12	STARTED/SECURED 32 RECIRC PUMP	32RECP	SRO
SIS	MDP	09/23/90 12:59	09/23/90 13:21	0.37	STARTED/SECURED 32 RECIRC PUMP	32RECP	SRO
SIS	MDP	07/30/85 12:25	07/30/85 12:40	0.25	STARTED/SECURED 32 RECIRC PUMP FOR PT	32RECP	SRO
SIS	MDP	09/11/85 16:42	09/11/85 16:45	0.05	STARTED/SECURED 32 SIP	32SIP	SRO
SIS	MDP	08/21/87 20:32	08/21/87 20:57	0.42	STARTED/SECURED 32 SIP	32SIP	SRO
SIS	MDP	05/21/88 10:31	05/21/88 10:56	0.42	STARTED/SECURED 32 SIP	32SIP	SRO
SIS	MDP	06/07/89 19:33	06/07/89 20:05	0.53	STARTED/SECURED 32 SIP	32SIP	SRO
SIS	MDP	11/23/90 21:40	11/23/90 21:48	0.13	STARTED/SECURED 32 SIP	32SIP	SRO
SIS	MDP	05/13/86 15:34	05/13/86 15:36	0.03	STARTED/SECURED 32 SIP FOR PT	32SIP	SRO
SIS	MDP	05/13/86 16:24	05/13/86 16:26	0.03	STARTED/SECURED 32 SIP FOR PT	32SIP	SRO
SIS	MDP	05/13/86 21:50	05/13/86 21:51	0.02	STARTED/SECURED 32 SIP FOR PT	32SIP	SRO
SIS	MDP	12/13/90 14:20	12/13/90 14:25	0.08	STARTED/SECURED 32 SIP TO FILL ACC	32SIP	SRO
SIS	MDP	08/17/87 21:05	08/17/87 21:25	0.33	STARTED/SECURED 32 SIP	32SIP ETNG, 20 MIN.	SRO
SIS	MDP	09/11/85 16:21	09/11/85 16:38	0.28	STARTED/SECURED 33 SIP	33SIP	SRO
SIS	MDP	09/11/85 17:14	09/11/85 17:16	0.03	STARTED/SECURED 33 SIP	33SIP	SRO
SIS	MDP	09/12/85 21:00	09/12/85 21:10	0.17	STARTED/SECURED 33 SIP	33SIP	SRO
SIS	MDP	09/12/85 21:45	09/12/85 21:55	0.17	STARTED/SECURED 33 SIP	33SIP	SRO
SIS	MDP	08/17/87 21:05	08/17/87 21:25	0.33	STARTED/SECURED 33 SIP	33SIP	SRO
SIS	MDP	08/21/87 18:52	08/21/87 19:12	0.33	STARTED/SECURED 33 SIP	33SIP	SRO
SIS	MDP	06/07/89 20:28	06/07/89 20:51	0.38	STARTED/SECURED 33 SIP	33SIP	SRO
SIS	MDP	02/23/86 13:10	02/23/86 13:15	0.08	STARTED/SECURED 31 SIP	31SIP	SRO
SIS	MDP	01/04/87 09:30	01/04/87 09:37	0.12	STARTED/SECURED 31 SIP	31SIP	SRO
SIS	MDP	10/29/87 05:30	10/29/87 05:57	0.45	STARTED/SECURED 31 SIP	31SIP	SRO
SIS	MDP	10/30/87 16:52	10/30/87 17:12	0.33	STARTED/SECURED 31 SIP	31SIP	SRO
SIS	MDP	11/06/87 02:13	11/06/87 02:30	0.28	STARTED/SECURED 31 SIP	31SIP	SRO
SIS	MDP	07/27/88 11:03	07/27/88 11:05	0.03	STARTED/SECURED 31 SIP	31SIP	SRO
SIS	MDP	10/29/89 20:24	10/29/89 20:25	0.02	STARTED/SECURED 31 SIP	31SIP	SRO
SIS	MDP	11/24/89 09:54	11/24/89 09:55	0.02	STARTED/SECURED 31 SIP	31SIP	SRO
SIS	MDP	01/31/90 19:37	01/31/90 19:39	0.03	STARTED/SECURED 31 SIP	31SIP	SRO
SIS	MDP	04/19/91 16:42	04/19/91 16:44	0.03	STARTED/SECURED 31 SIP	31SIP	SRO
SIS	MDP	10/01/91 05:37	10/01/91 05:42	0.08	STARTED/SECURED 31 SIP FOR OPERABILITY	31SIP	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SIS	MDP	10/02/91 05:31	10/02/91 05:36	0.08	STARTED/SECURED 31 SIP FOR OPERABILITY	31SIP	SRO
SIS	MDP	12/12/91 18:39	12/12/91 18:49	0.17	STARTED/SECURED 31 SIP FOR OPERABILITY	31SIP	SRO
SIS	MDP	11/15/89 18:36	11/15/89 18:38	0.03	STARTED/SECURED 31 SIP FOR RETEST OF PT-922	31SIP	SRO
SIS	MDP	03/02/85 16:08	03/02/85 16:10	0.03	STARTED/SECURED 31 SIP TO FILL ACC	31SIP	SRO
SIS	MDP	04/14/85 08:27	04/14/85 08:29	0.03	STARTED/SECURED 31 SIP TO FILL ACC	31SIP	SRO
SIS	MDP	12/07/85 16:36	12/07/85 16:39	0.05	STARTED/SECURED 31 SIP TO FILL ACC	31SIP	SRO
SIS	MDP	12/27/85 10:55	12/27/85 10:59	0.07	STARTED/SECURED 31 SIP TO FILL ACC	31SIP	SRO
SIS	MDP	01/03/86 01:40	01/03/86 01:45	0.08	STARTED/SECURED 31 SIP TO FILL ACC	31SIP	SRO
SIS	MDP	02/05/86 02:40	02/05/86 02:45	0.08	STARTED/SECURED 31 SIP TO FILL ACC	31SIP	SRO
SIS	MDP	07/29/88 09:50	07/29/88 09:53	0.05	STARTED/SECURED 31 SIP TO FILL ACC	31SIP	SRO
SIS	MDP	10/08/88 19:45	10/08/88 19:47	0.03	STARTED/SECURED 31 SIP TO FILL ACC	31SIP	SRO
SIS	MDP	07/15/89 00:00	07/15/89 00:05	0.08	STARTED/SECURED 31 SIP TO FILL ACC	31SIP	SRO
SIS	MDP	08/14/89 08:13	08/14/89 08:21	0.13	STARTED/SECURED 31 SIP TO FILL ACC	31SIP	SRO
SIS	MDP	10/03/89 12:08	10/03/89 12:17	0.15	STARTED/SECURED 31 SIP TO FILL ACC	31SIP	SRO
SIS	MDP	04/22/90 18:15	04/22/90 18:20	0.08	STARTED/SECURED 31 SIP TO FILL ACC	31SIP	SRO
SIS	MDP	11/17/91 14:13	11/17/91 14:17	0.07	STARTED/SECURED 31 SIP TO FILL ACCUM	31SIP	SRO
SIS	MDP	06/06/86 16:33	06/06/86 16:43	0.17	STARTED/SECURED 31 SIP TO FILL ACC	31SIP ETNG, 10 MIN	SRO
SIS	MDP	01/18/90 20:10	01/18/90 20:20	0.17	STARTED/SECURED 31 SIP TO FILL ACC	31SIP ETNG, 10 MIN	SRO
SIS	MDP	10/07/91 08:15	10/07/91 08:20	0.08	STARTED/SECURED 31 SIP FOR OPERABILITY	31SIP ETNG, 5 MIN	SRO
SIS	MDP	04/03/86 10:55	04/03/86 00:00		FILLED SI ACCUMULATORS 620# - 640#	31SIP WAS USED, ETNG	SRO
SIS	MDP	01/04/87 18:40	01/04/87 18:41	0.02	STARTED/SECURED 32 SIP	32SIP	SRO
SIS	MDP	10/29/87 19:46	10/29/87 20:14	0.47	STARTED/SECURED 32 SIP	32SIP	SRO
SIS	MDP	11/06/87 02:45	11/06/87 03:03	0.30	STARTED/SECURED 32 SIP	32SIP	SRO
SIS	MDP	08/03/88 19:30	08/03/88 19:57	0.45	STARTED/SECURED 32 SIP	32SIP	SRO
SIS	MDP	04/19/91 18:58	04/19/91 19:00	0.03	STARTED/SECURED 32 SIP	32SIP	SRO
SIS	MDP	10/01/91 05:42	10/01/91 05:47	0.08	STARTED/SECURED 32 SIP FOR OPERABILITY	32SIP	SRO
SIS	MDP	12/12/91 05:22	12/12/91 05:27	0.08	STARTED/SECURED 32 SIP FOR OPERABILITY	32SIP	SRO
SIS	MDP	08/04/88 11:15	08/04/88 11:17	0.03	BUMPED 32 SIP	32SIP 2 MIN	SRO
SIS	MDP	10/07/91 08:15	10/07/91 08:20	0.08	STARTED/SECURED 32 SIP FOR OPERABILITY	32SIP ETNG, 5 MIN	SRO
SIS	MDP	10/29/87 06:18	10/29/87 06:33	0.25	STARTED/SECURED 33 SIP	33SIP	SRO
SIS	MDP	10/30/87 02:37	10/30/87 02:53	0.27	STARTED/SECURED 33 SIP	33SIP	SRO
SIS	MDP	04/11/90 14:26	04/11/90 14:27	0.02	STARTED/SECURED 33 SIP	33SIP	SRO
SIS	MDP	04/19/91 16:44	04/19/91 16:45	0.02	STARTED/SECURED 33 SIP	33SIP	SRO
SIS	MDP	07/08/88 19:58	07/08/88 20:20	0.37	STARTED/SECURED 33 SIP FOR OPERABILITY	33SIP	SRO
SIS	MDP	10/02/91 05:37	10/02/91 05:42	0.08	STARTED/SECURED 33 SIP FOR OPERABILITY	33SIP	SRO
SIS	MDP	12/12/91 05:22	12/12/91 05:27	0.08	STARTED/SECURED 33 SIP FOR OPERABILITY	33SIP	SRO
SIS	MDP	08/04/88 02:55	08/04/88 03:12	0.28	STARTED/SECURED 33 SIP FOR PT	33SIP	SRO
CDS	CD PUMP	01/23/85 08:37	01/23/85 08:54	0.28	33 COND PUMP STARTED/SECURED	END TIME (UNIT TRIP)	SRO
CDS	CD PUMP	01/23/85 12:23	01/23/85 15:01	2.63	32 COND PUMP STARTED/SECURED	END TIME (Rx TRIP)	SRO
CDS	CD PUMP	01/23/85 23:17	02/27/85 06:42	823.42	33 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO
CDS	CD PUMP	01/24/85 17:08	02/28/85 00:33	823.42	32 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO
CDS	CD PUMP	03/20/85 23:30	04/24/85 06:55	823.42	32 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CDS	CD PUMP	03/22/85 03:35	04/22/85 11:08	751.55	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	04/25/85 01:35	06/08/85 18:08	1072.55	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/11/85 18:37	09/11/85 18:44	0.12	33 COND PUMP STARTED/SECURED	END TIME (33 CP ON)	SRO
CDS	CD PUMP	09/11/85 18:40	09/11/85 18:41	0.02	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/11/85 18:41	09/11/85 19:11	0.50	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/11/85 18:45	09/11/85 19:12	0.45	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/11/85 18:53	09/11/85 19:12	0.32	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/11/85 20:43	09/11/85 20:48	0.08	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/11/85 20:45	09/11/85 21:32	0.78	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/11/85 21:28	09/11/85 21:32	0.07	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/12/85 14:51	09/12/85 14:54	0.05	32 COND PUMP MTR STARTED/SECURED FOR MTC		SRO
CDS	CD PUMP	09/19/85 12:28	09/19/85 12:31	0.05	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/19/85 12:31	09/19/85 17:02	4.52	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/20/85 17:55	09/20/85 18:11	0.27	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/24/85 14:55	09/24/85 15:32	0.62	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/25/85 00:50	09/25/85 01:00	0.17	33 COND PUMP I/S to RECIRC COND SYS. for hood spray		SRO
CDS	CD PUMP	09/25/85 02:00	09/27/85 12:05	58.08	33 COND PUMP STARTED/SECURED to RECIRC COND SYS.		SRO
CDS	CD PUMP	10/03/85 08:22	10/03/85 08:24	0.03	32 COND PUMP BUMPED for rotation chk. (OK)		SRO
CDS	CD PUMP	10/03/85 12:12	10/25/85 00:35	516.38	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	10/08/85 08:44	10/08/85 08:58	0.23	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	10/22/85 04:07	10/22/85 06:27	2.33	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	10/22/85 06:27	10/25/85 14:36	80.15	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	10/23/85 13:14	10/23/85 13:19	0.08	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	10/25/85 00:30	10/25/85 21:25	20.92	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	10/25/85 14:25	10/26/85 06:48	16.38	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	10/25/85 21:20	11/29/85 04:45	823.42	33 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO
CDS	CD PUMP	10/26/85 06:46	11/30/85 02:57	836.18	32 COND PUMP STARTED/SECURED	END DATE (32 CP ON)	SRO
CDS	CD PUMP	10/29/85 17:35	04/26/86 09:16	4287.68	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	11/30/85 02:58	11/30/85 15:37	12.65	32 COND PUMP STARTED/SECURED	END TIME (32 CP ON)	SRO
CDS	CD PUMP	11/30/85 15:38	12/12/85 12:45	285.12	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	12/06/85 00:37	01/09/86 08:02	823.42	33 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO
CDS	CD PUMP	03/01/86 04:05	04/25/86 17:32	1333.45	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	03/02/86 21:38	04/26/86 00:20	1298.70	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	04/30/86 16:23	04/30/86 16:25	0.03	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	04/30/86 16:25	04/30/86 19:40	3.25	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	05/01/86 07:48	05/01/86 07:50	0.03	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	05/01/86 07:50	05/01/86 09:00	1.17	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	05/01/86 09:21	05/01/86 09:22	0.02	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	05/01/86 09:22	05/01/86 18:38	9.27	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	05/16/86 14:10	05/16/86 14:12	0.03	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	05/16/86 14:12	05/25/86 02:54	204.70	32 COND PUMP STARTED/SECURED	END DATE (32 CP ON)	SRO
CDS	CD PUMP	05/19/86 10:09	05/26/86 19:16	177.12	31 COND PUMP STARTED/SECURED	END DATE (31 CP ON)	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CDS	CD PUMP	05/22/86 01:05	05/26/86 19:23	114.30	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	05/25/86 02:55	05/26/86 19:15	40.33	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	05/26/86 19:17	05/27/86 20:09	24.87	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	05/27/86 20:09	06/07/86 03:22	247.22	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	05/28/86 04:20	07/07/86 07:37	963.28	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	06/15/86 01:40	07/05/86 09:59	488.32	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	08/31/86 02:47	08/31/86 02:49	0.03	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	08/31/86 02:49	09/03/86 03:40	72.85	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/03/86 20:40	09/03/86 20:45	0.08	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/03/86 20:45	09/08/86 06:06	105.35	33 COND PUMP STARTED/SECURED	END TIME (33 CP ON)	SRO
CDS	CD PUMP	09/04/86 14:39	09/09/86 14:24	119.75	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/08/86 06:07	09/12/86 15:19	105.20	33 COND PUMP STARTED/SECURED	END TIME (33 CP ON)	SRO
CDS	CD PUMP	09/09/86 02:34	09/09/86 14:23	11.82	32 COND PUMP STARTED/SECURED	END TIME (32 CP ON)	SRO
CDS	CD PUMP	09/09/86 14:24	10/13/86 21:49	823.42	32 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO
CDS	CD PUMP	09/10/86 10:48	10/14/86 18:13	823.42	31 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO
CDS	CD PUMP	09/12/86 15:20	10/18/86 02:38	851.30	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	10/18/86 21:47	10/31/86 01:30	291.72	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	11/01/86 06:10	11/16/86 06:14	360.07	33 COND PUMP STARTED/SECURED	END DATE (33 CP ON)	SRO
CDS	CD PUMP	11/15/86 06:35	11/27/86 02:00	283.42	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	11/16/86 06:15	12/20/86 13:40	823.42	33 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO
CDS	CD PUMP	11/28/86 09:55	01/01/87 17:20	823.42	32 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO
CDS	CD PUMP	02/03/87 09:35	02/14/87 22:54	277.32	33 COND PUMP STARTED/SECURED	END DATE (33 CP ON)	SRO
CDS	CD PUMP	02/13/87 06:42	03/27/87 14:03	1015.35	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	02/14/87 22:55	03/27/87 18:50	979.92	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	04/02/87 15:31	04/02/87 15:33	0.03	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	04/02/87 15:33	05/02/87 13:33	718.00	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	04/03/87 22:22	04/04/87 02:52	4.50	32 COND PUMP STARTED/SECURED	END DATE (32 CP ON)	SRO
CDS	CD PUMP	04/04/87 02:53	04/18/87 02:09	335.27	32 COND PUMP STARTED/SECURED	END DATE (32 CP ON)	SRO
CDS	CD PUMP	04/05/87 04:49	04/19/87 03:23	334.57	33 COND PUMP STARTED/SECURED	END DATE (33 CP ON)	SRO
CDS	CD PUMP	04/18/87 02:10	05/01/87 15:37	325.45	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	04/19/87 03:24	05/23/87 10:49	823.42	33 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO
CDS	CD PUMP	08/15/87 09:44	08/15/87 09:46	0.03	33 COND PUMP MTR BUMPED FOR ROTATION CHECK		SRO
CDS	CD PUMP	08/16/87 22:02	08/16/87 22:04	0.03	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	08/16/87 22:04	08/17/87 15:53	17.82	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	08/18/87 19:35	08/18/87 19:36	0.02	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	08/18/87 19:36	08/20/87 15:02	43.43	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	08/21/87 15:00	08/23/87 08:53	41.88	31 COND PUMP STARTED/SECURED	END DATE (31 CP ON)	SRO
CDS	CD PUMP	08/21/87 15:00	08/21/87 18:34	3.57	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	08/23/87 08:53	08/23/87 08:54	0.02	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	08/23/87 08:54	08/23/87 22:19	13.42	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	08/24/87 18:01	08/24/87 18:03	0.03	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	08/24/87 18:03	08/25/87 09:33	15.50	32 COND PUMP STARTED/SECURED		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CDS	CD PUMP	08/26/87 01:30	08/26/87 01:31	0.02	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	08/26/87 01:31	08/30/87 17:30	111.98	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/01/87 20:50	09/01/87 20:51	0.02	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/01/87 20:51	09/03/87 23:05	50.23	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/03/87 19:30	09/16/87 14:45	307.25	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/04/87 15:26	09/04/87 17:39	2.22	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/05/87 02:27	09/15/87 21:35	259.13	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/08/87 23:10	09/09/87 09:36	10.43	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/09/87 12:00	09/09/87 15:26	3.43	33 COND PUMP STARTED/SECURED	END TIME (33 CP ON)	SRO
CDS	CD PUMP	09/09/87 15:27	09/09/87 15:28	0.02	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/09/87 18:53	09/09/87 18:56	0.05	33 COND PUMP STARTED/SECURED MTR FOR MTC		SRO
CDS	CD PUMP	09/09/87 20:20	09/10/87 19:50	23.50	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/15/87 17:30	09/15/87 17:32	0.03	33 COND PUMP MOTOR BUMPED		SRO
CDS	CD PUMP	09/15/87 21:35	09/17/87 14:35	41.00	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/16/87 00:00	09/16/87 00:00	0.00	31 Cond. Pump secured.		DSR
CDS	CD PUMP	09/16/87 07:00	09/16/87 15:00	8.00	32 COND PUMP HELD OFF FOR MTC/IS	BOTH TIMES	SRO
CDS	CD PUMP	09/16/87 14:45	12/13/87 06:05	2103.33	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/16/87 15:00	09/16/87 23:00	8.00	31 COND PUMP HELD OFF FOR MTC/IS	BOTH TIMES	SRO
CDS	CD PUMP	09/18/87 00:35	10/22/87 08:00	823.42	33 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO
CDS	CD PUMP	12/14/87 04:27	12/24/87 00:03	235.60	32 COND PUMP STARTED/SECURED	END DATE (32 CP ON)	SRO
CDS	CD PUMP	12/24/87 00:04	01/27/88 07:29	823.42	32 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO
CDS	CD PUMP	12/25/87 10:15	01/28/88 17:40	823.42	33 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO
CDS	CD PUMP	02/03/88 18:20	03/09/88 01:45	823.42	32 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO
CDS	CD PUMP	02/04/88 12:02	03/09/88 19:27	823.42	33 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO
CDS	CD PUMP	04/01/88 01:45	04/01/88 18:50	17.08	32 COND PUMP HELD OFF/RETURNED TO SERVICE		SRO
CDS	CD PUMP	04/02/88 17:50	05/10/88 20:55	915.08	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	04/03/88 20:50	04/06/88 20:35	71.75	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	04/06/88 20:03	05/11/88 03:29	823.42	31 COND PUMP STARTED/SECURED	StartDate (AvgDuration)	SRO
CDS	CD PUMP	04/07/88 02:26	05/11/88 17:40	831.23	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	05/27/88 18:10	05/27/88 18:12	0.03	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	05/27/88 18:12	06/08/88 12:32	282.33	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	05/29/88 10:41	06/13/88 11:17	360.60	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	06/01/88 07:45	06/12/88 08:53	265.13	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	06/11/88 21:55	06/12/88 08:53	10.97	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	06/14/88 07:57	06/14/88 07:58	0.02	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	06/14/88 07:58	06/14/88 08:01	0.05	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	06/14/88 08:15	06/14/88 08:18	0.05	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	06/14/88 08:17	06/14/88 10:52	2.58	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	06/15/88 13:15	06/15/88 13:16	0.02	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	06/15/88 13:16	07/19/88 20:41	823.42	32 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO
CDS	CD PUMP	06/15/88 20:16	08/10/88 21:48	1345.53	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	06/16/88 14:07	07/20/88 21:32	823.42	33 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CDS	CD PUMP	08/12/88 04:30	10/10/88 17:16	1428.77	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	10/10/88 17:16	10/11/88 11:05	17.82	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	10/12/88 20:36	10/12/88 20:37	0.02	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	10/12/88 21:30	10/15/88 21:39	72.15	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	10/12/88 21:30	10/13/88 22:20	24.84	32 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO
CDS	CD PUMP	10/15/88 11:40	10/20/88 01:39	109.98	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	10/16/88 16:01	10/21/88 12:20	116.32	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	10/17/88 04:14	10/19/88 23:53	67.65	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	11/11/88 00:40	11/11/88 00:41	0.02	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	11/11/88 00:41	02/04/89 00:21	2039.67	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	11/22/88 18:20	02/05/89 09:05	1790.75	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	11/24/88 02:14	11/24/88 03:11	0.95	33 COND PUMP STARTED/SECURED	END DATE (33 CP ON)	SRO
CDS	CD PUMP	11/24/88 03:12	02/03/89 16:51	1717.65	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	04/17/89 09:19	04/17/89 09:21	0.03	33 COND PUMP BUMPED FOR ROTATION		SRO
CDS	CD PUMP	04/20/89 15:46	04/20/89 15:48	0.03	33 COND PUMP MOTOR BUMPED FOR ROTATION		SRO
CDS	CD PUMP	04/20/89 18:07	04/20/89 18:09	0.03	32 COND PUMP MOTOR BUMPED		SRO
CDS	CD PUMP	04/21/89 02:24	04/21/89 10:45	8.35	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	04/21/89 10:55	04/21/89 10:57	0.03	32 COND PUMP BUMPED FOR ROTATION		SRO
CDS	CD PUMP	04/21/89 14:40	04/21/89 14:55	0.25	33 COND PUMP MOTOR STARTED/SECURED		SRO
CDS	CD PUMP	04/21/89 17:08	04/21/89 17:10	0.03	32 COND PUMP RAN		SRO
CDS	CD PUMP	04/21/89 17:21	04/26/89 20:18	122.95	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	04/23/89 17:14	04/23/89 17:16	0.03	33 COND PUMP BUMPED FOR ROTATION		SRO
CDS	CD PUMP	04/26/89 20:18	05/08/89 03:13	270.92	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	05/03/89 18:15	05/04/89 19:05	24.84	31 COND PUMP STARTED/SECURED Mtr.for rotation chk.	END DATE (AvgDuration)	SRO
CDS	CD PUMP	05/08/89 04:32	05/15/89 01:36	165.07	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	05/15/89 02:20	05/18/89 07:40	77.33	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	06/13/89 17:20	06/27/89 05:30	324.17	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	06/23/89 15:10	06/30/89 20:53	173.72	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	06/27/89 05:30	06/27/89 05:35	0.08	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	06/27/89 05:35	06/30/89 16:24	82.82	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	06/28/89 12:20	06/28/89 12:23	0.05	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	06/28/89 20:05	06/28/89 20:07	0.03	31 COND PUMP STARTED/SECURED (NOT PUMPING)	2 MIN RUN TIME	SRO
CDS	CD PUMP	06/30/89 16:00	08/03/89 23:25	823.42	31 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO
CDS	CD PUMP	06/30/89 20:35	09/28/89 22:13	2161.63	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	07/01/89 03:30	08/04/89 10:55	823.42	32 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO
CDS	CD PUMP	09/29/89 01:36	09/29/89 01:46	0.17	33 COND PUMP RAN		SRO
CDS	CD PUMP	09/29/89 03:26	09/29/89 03:28	0.03	33 COND PUMP RAN		SRO
CDS	CD PUMP	09/29/89 04:16	09/29/89 04:18	0.03	33 COND PUMP RAN		SRO
CDS	CD PUMP	09/29/89 11:20	10/21/89 10:25	527.08	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	10/22/89 19:08	10/22/89 19:10	0.03	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	10/22/89 19:10	10/22/89 19:11	0.02	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	10/22/89 19:11	10/22/89 19:56	0.75	33 COND PUMP STARTED/SECURED		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CDS	CD PUMP	10/22/89 19:51	11/26/89 03:16	823.42	32 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO
CDS	CD PUMP	10/24/89 01:04	01/17/90 21:35	2060.52	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	10/25/89 00:54	03/02/90 18:00	3089.10	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	01/19/90 23:45	01/19/90 23:47	0.03	31 COND PUMP BUMPED FOR ROTATION		SRO
CDS	CD PUMP	01/20/90 08:59	01/20/90 09:26	0.45	31 COND PUMP RAN MOTOR		SRO
CDS	CD PUMP	01/20/90 17:20	03/03/90 16:00	1006.67	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	03/31/90 22:34	03/31/90 22:45	0.18	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	04/01/90 01:37	04/24/90 14:57	565.33	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	04/08/90 15:39	05/12/90 23:04	823.42	32 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO
CDS	CD PUMP	04/09/90 21:21	06/29/90 16:56	1939.58	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	04/24/90 20:10	05/29/90 03:35	823.42	33 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO
CDS	CD PUMP	05/29/90 22:45	06/19/90 23:42	504.95	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	06/29/90 16:56	06/30/90 11:45	18.82	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	06/30/90 11:40	06/30/90 17:25	5.75	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	06/30/90 17:20	07/11/90 05:48	252.47	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	07/01/90 01:50	07/11/90 05:44	243.90	32 COND PUMP STARTED/SECURED	END DATE (32 CP ON)	SRO
CDS	CD PUMP	07/01/90 18:50	07/23/90 14:14	523.40	33 COND PUMP STARTED/SECURED	END DATE (33 CP ON)	SRO
CDS	CD PUMP	07/11/90 05:45	07/11/90 05:47	0.03	32 COND PUMP STARTED/SECURED	END TIME (32 CP ON)	SRO
CDS	CD PUMP	07/11/90 05:48	07/23/90 14:15	296.45	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	07/14/90 00:35	07/25/90 21:37	285.03	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	07/23/90 14:15	07/23/90 18:27	4.20	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	07/23/90 18:15	07/23/90 18:25	0.17	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	07/23/90 18:27	07/23/90 18:50	0.38	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	07/23/90 18:50	08/12/90 05:01	466.18	33 COND PUMP STARTED/SECURED	END DATE (33 CP ON)	SRO
CDS	CD PUMP	07/25/90 21:20	07/25/90 21:30	0.17	32 COND PUMP STARTED/SECURED FOR RUN IN		SRO
CDS	CD PUMP	07/25/90 21:37	08/09/90 15:12	353.58	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	07/25/90 21:38	08/09/90 17:10	355.53	31 COND PUMP STARTED/SECURED	StartDate (31 CP OFF)	SRO
CDS	CD PUMP	08/09/90 17:03	09/01/90 18:35	553.53	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	08/11/90 04:13	09/09/90 13:14	705.02	31 COND PUMP STARTED/SECURED	StartDate (31 CP OFF)	SRO
CDS	CD PUMP	08/12/90 05:02	09/14/90 17:45	804.72	33 COND PUMP STARTED/SECURED - Opened disc vlv.		SRO
CDS	CD PUMP	09/01/90 18:05	09/01/90 18:20	0.25	33 COND PUMP STARTED/SECURED FOR RUN IN		SRO
CDS	CD PUMP	09/01/90 18:35	09/09/90 13:15	186.67	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/01/90 18:36	09/15/90 00:31	317.92	32 COND PUMP STARTED/SECURED	StartDate (32 CP OFF)	SRO
CDS	CD PUMP	09/09/90 13:15	09/15/90 09:48	140.55	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	09/15/90 10:40	09/16/90 11:30	24.84	31 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO
CDS	CD PUMP	12/16/90 17:25	12/21/90 09:45	112.33	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	12/21/90 09:25	12/24/90 08:10	70.75	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	12/23/90 20:45	12/29/90 12:30	135.75	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	12/24/90 08:10	12/28/90 11:44	99.57	33 COND PUMP STARTED/SECURED	END DATE (33 CP ON)	SRO
CDS	CD PUMP	12/26/90 14:37	12/26/90 14:55	0.30	32 COND PUMP MTR STARTED/SECURED		SRO
CDS	CD PUMP	12/26/90 17:05	12/26/90 17:30	0.42	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	12/28/90 00:00	12/29/90 00:00	24.00	32 Cond. Pump Motor bumped for mtc.		DSR

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CDS	CD PUMP	12/28/90 11:45	01/31/91 19:10	823.42	33 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO
CDS	CD PUMP	12/28/90 14:20	12/28/90 14:25	0.08	32 COND PUMP RAN FOR BREAKIN		SRO
CDS	CD PUMP	12/28/90 17:38	12/28/90 17:40	0.03	32 COND PUMP MOTOR BUMPED		SRO
CDS	CD PUMP	12/29/90 12:15	12/30/90 22:11	33.93	32 COND PUMP STARTED/SECURED	END DATE (32 CP ON)	SRO
CDS	CD PUMP	12/30/90 22:09	01/05/91 09:30	131.35	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	12/30/90 22:12	01/04/91 23:35	121.38	32 COND PUMP STARTED/SECURED	END DATE (32 CP ON)	SRO
CDS	CD PUMP	01/04/91 23:36	01/04/91 23:38	0.03	32 COND PUMP BUMPED FOR ROTATION		SRO
CDS	CD PUMP	01/05/91 09:30	01/05/91 21:30	12.00	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	01/05/91 15:20	01/05/91 15:25	0.08	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	01/05/91 18:00	01/05/91 18:02	0.03	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	01/05/91 21:30	03/25/91 07:05	1881.58	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	01/07/91 13:18	02/10/91 20:43	823.42	32 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO
CDS	CD PUMP	03/22/91 03:33	03/23/91 04:23	24.84	32 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO
CDS	CD PUMP	03/23/91 04:04	03/23/91 04:14	0.17	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	04/07/91 20:30	04/10/91 12:05	63.58	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	04/09/91 19:23	05/11/91 17:45	766.37	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	04/11/91 01:02	05/12/91 00:16	743.23	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	04/12/91 04:37	05/13/91 09:55	749.30	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	05/22/91 14:45	05/22/91 14:47	0.03	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	05/22/91 14:47	10/19/91 06:23	3591.60	33 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	05/23/91 21:10	08/04/91 22:56	1753.77	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	05/29/91 01:00	08/24/91 11:14	2098.23	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	08/05/91 09:18	08/24/91 01:11	447.88	31 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	08/24/91 16:25	09/27/91 23:50	823.42	31 COND PUMP STARTED/SECURED	END DATE (AvgDuration)	SRO
CDS	CD PUMP	08/25/91 05:50	10/18/91 22:39	1312.82	32 COND PUMP STARTED/SECURED		SRO
CDS	CD PUMP	11/04/91 11:42	11/04/91 12:00	0.30	33 COND PUMP STARTED/SECURED		SRO
CCW	MDP	01/01/85 00:00	01/28/85 09:29	657.48	STARTED/SECURED 33 CCWP FOR 3PT-M46	STARTED IN 1984	SRO
CCW	MDP	01/28/85 08:46	01/28/85 09:37	0.85	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	01/28/85 09:29	02/25/85 09:55	672.43	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	01/28/85 09:37	02/25/85 10:20	672.72	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	02/18/85 23:42	02/18/85 23:48	0.10	STARTED/SECURED 32 CCWP FOR 3PT-Q36		SRO
CCW	MDP	02/25/85 09:55	02/25/85 10:25	0.50	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	02/25/85 10:20	03/25/85 10:10	671.83	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	02/25/85 10:25	04/23/85 10:10	1367.75	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	03/25/85 10:10	03/25/85.10:30	0.33	STARTED/SECURED 32 CCWP FOR 3PT-M46.	END DATE	SRO
CCW	MDP	03/25/85 10:25	04/23/85 10:25	696.00	STARTED/SECURED 31 CCWP FOR 3PT-M46	START DATE	SRO
CCW	MDP	04/23/85 10:10	04/23/85 10:30	0.33	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	04/23/85 10:25	06/12/85 13:10	1202.75	STARTED/SECURED 33 CCWP FOR PT		SRO
CCW	MDP	04/23/85 10:30	05/06/85 10:05	311.58	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	05/06/85 10:05	05/06/85 14:34	4.48	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	05/06/85 14:34	05/22/85 11:05	380.52	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	05/22/85 11:05	05/22/85 12:20	1.25	STARTED/SECURED 32 CCWP		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CCW	MDP	05/22/85 12:20	06/12/85 12:55	504.58	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	06/08/85 08:55	06/11/85 13:35	76.67	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	06/12/85 12:55	06/12/85 13:12	0.28	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	06/12/85 13:10	06/19/85 11:47	166.62	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	06/12/85 13:12	06/19/85 10:16	165.07	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	06/19/85 10:16	06/19/85 14:35	4.32	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	06/19/85 11:47	07/05/85 13:35	385.80	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	06/19/85 14:35	07/05/85 13:20	382.75	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	07/05/85 13:20	07/05/85 13:37	0.28	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	07/05/85 13:35	09/11/85 17:21	1635.77	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	07/05/85 13:37	09/16/85 13:01	1751.40	STARTED/SECURED 33 CCWP FOR 3PT-R25		SRO
CCW	MDP	08/13/85 04:50	08/26/85 20:10	327.33	RETURNED BKR (BUSN2A, BKR 30D) TO OP.		SRO
CCW	MDP	09/11/85 17:21	09/11/85 19:57	2.60	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	09/11/85 19:57	09/16/85 13:01	113.07	STARTED/SECURED 31 CCWP FOR 3PT-R25		SRO
CCW	MDP	09/15/85 07:15	09/15/85 10:15	3.00	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	09/16/85 13:30	10/08/85 10:55	525.42	STARTED/SECURED 33 CCWP FOR 3PT-M46	START DATE	SRO
CCW	MDP	09/16/85 14:26	09/18/85 14:21	47.92	STARTED/SECURED 31 CCWP	END DATE	SRO
CCW	MDP	09/16/85 14:26	09/16/85 17:40	3.23	STARTED/SECURED 32 CCWP	END DATE	SRO
CCW	MDP	09/17/85 16:40	09/18/85 14:36	21.93	STARTED/SECURED 32 CCWP FOR 3PT-R25	PT WAS 3PT-R25	SRO
CCW	MDP	09/18/85 14:36	10/08/85 10:20	475.73	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	10/08/85 10:20	10/08/85 11:26	1.10	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	10/08/85 10:55	10/08/85 11:15	0.33	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	10/08/85 11:15	11/06/85 10:20	695.08	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	10/08/85 11:26	11/06/85 09:41	694.25	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	11/06/85 09:41	11/06/85 10:45	1.07	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	11/06/85 10:20	12/02/85 10:30	624.17	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	11/06/85 10:45	12/02/85 10:55	624.17	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	11/23/85 04:36	11/23/85 04:39	0.05	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	12/02/85 10:30	12/02/85 11:17	0.78	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	12/02/85 10:55	01/02/86 09:53	742.97	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	12/02/85 11:17	01/02/86 10:25	743.13	STARTED/SECURED 33 CCWP FOR 3PT-M46.		SRO
CCW	MDP	01/02/86 09:53	01/02/86 10:13	0.33	STARTED/SECURED 32 CCWP FOR 3PT-M46.	END DATE	SRO
CCW	MDP	01/02/86 10:25	01/27/86 09:42	599.28	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	01/02/86 10:30	01/27/86 09:49	599.32	STARTED/SECURED 33 CCWP FOR 3PT-M46	START DATE	SRO
CCW	MDP	01/27/86 09:42	01/27/86 09:55	0.22	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	01/27/86 09:49	03/01/86 10:00	792.18	STARTED/SECURED 31 CCWP	END DATE	SRO
CCW	MDP	01/27/86 09:55	03/28/86 09:45	1439.83	STARTED/SECURED 33 CCWP FOR 3PT-M46.		SRO
CCW	MDP	03/01/86 10:00	03/01/86 23:45	13.75	STARTED/SECURED 32 CCWP	START DATE=31 OFF	SRO
CCW	MDP	03/01/86 23:45	03/28/86 09:20	633.58	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	03/28/86 09:20	03/28/86 09:50	0.50	STARTED/SECURED 32 CCWP FOR 3PT-M46.		SRO
CCW	MDP	03/28/86 09:45	05/22/86 14:25	1324.67	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	03/28/86 09:50	05/22/86 14:36	1324.77	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CCW	MDP	05/14/86 16:47	05/14/86 17:07	0.33	STARTED/SECURED 32 CCWP	END DATE	SRO
CCW	MDP	05/22/86 14:25	05/22/86 14:37	0.20	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	05/22/86 14:36	06/23/86 10:10	763.57	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	05/22/86 14:37	06/23/86 10:28	763.85	STARTED/SECURED 33 CCWP FOR 3PT-M46.		SRO
CCW	MDP	06/23/86 10:10	06/23/86 10:30	0.33	STARTED/SECURED 32 CCWP FOR 3PT-M46.		SRO
CCW	MDP	06/23/86 10:28	07/23/86 13:44	723.27	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	06/23/86 10:30	07/23/86 14:02	723.53	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	07/10/86 16:48	07/10/86 17:03	0.25	STARTED/SECURED 32 CCWP.		SRO
CCW	MDP	07/10/86 18:52	07/10/86 19:07	0.25	STARTED/SECURED 32 CCWP.	END DATE	SRO
CCW	MDP	07/16/86 04:35	07/16/86 06:51	2.27	STARTED/SECURED 32 CCWP.		SRO
CCW	MDP	07/23/86 13:44	07/23/86 15:29	1.75	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	07/23/86 14:02	09/24/86 13:15	1511.22	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	07/23/86 15:29	09/03/86 17:20	1009.85	STARTED/SECURED 33 CCWP.		SRO
CCW	MDP	08/07/86 08:43	08/07/86 09:10	0.45	STARTED/SECURED 32 CCWP FOR OPERABILITY TEST.		SRO
CCW	MDP	08/07/86 12:30	08/07/86 12:56	0.43	STARTED/SECURED 32 CCWP FOR OPERABILITY TEST.		SRO
CCW	MDP	08/30/86 13:06	08/30/86 13:08	0.03	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	09/03/86 17:15	09/03/86 18:00	0.75	STARTED/SECURED 32 CCWP FOR RETEST.		SRO
CCW	MDP	09/03/86 18:00	09/24/86 14:15	500.25	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	09/24/86 13:15	09/24/86 14:17	1.03	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	09/24/86 14:15	10/23/86 12:45	694.50	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	09/24/86 14:17	10/23/86 13:10	694.88	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	10/23/86 12:45	10/23/86 13:25	0.67	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	10/23/86 13:10	11/21/86 10:30	693.33	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	10/23/86 13:25	11/21/86 10:53	693.47	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	11/21/86 10:29	11/21/86 10:55	0.43	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	11/21/86 10:53	12/23/86 09:36	766.72	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	11/21/86 10:55	12/23/86 09:57	767.03	STARTED/SECURED 33 CCWP FOR 3PT-M46.		SRO
CCW	MDP	12/23/86 09:36	12/23/86 09:58	0.37	STARTED/SECURED 32 CCWP FOR 3PT-M46.		SRO
CCW	MDP	12/23/86 09:57	01/19/87 10:30	648.55	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	12/23/86 09:58	01/19/87 10:53	648.92	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	01/19/87 10:30	01/19/87 10:53	0.38	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	01/19/87 10:53	02/17/87 10:47	695.90	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	01/19/87 10:53	01/19/87 13:00	2.12	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	01/19/87 13:00	02/17/87 11:08	694.13	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	02/17/87 10:47	02/17/87 11:08	0.35	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	02/17/87 11:08	03/19/87 13:55	722.78	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	02/17/87 11:08	02/17/87 11:28	0.33	STARTED/SECURED 32 CCWP FOR 3PT-M46	END TIME	SRO
CCW	MDP	02/17/87 11:08	03/29/87 09:25	958.28	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	03/19/87 13:55	04/17/87 13:09	695.23	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	03/29/87 09:25	04/17/87 12:50	459.42	STARTED/SECURED 31 CCWP FOR 3PT-M46	START TIME=33 OFF	SRO
CCW	MDP	04/17/87 12:50	04/17/87 13:13	0.38	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	04/17/87 13:09	05/13/87 16:15	627.10	STARTED/SECURED 31 CCWP		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CCW	MDP	04/17/87 13:13	05/13/87 16:35	627.37	STARTED/SECURED 32 CCWP	END DATE	SRO
CCW	MDP	05/03/87 02:33	05/03/87 05:33	3.00	STARTED/SECURED 33 CCWP	END DATE	SRO
CCW	MDP	05/13/87 16:15	05/15/87 18:58	50.72	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	05/13/87 16:35	06/12/87 11:05	714.50	STARTED/SECURED 31 CCWP	START DATE	SRO
CCW	MDP	05/15/87 18:58	05/19/87 07:33	84.58	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	05/19/87 07:33	05/19/87 08:43	1.17	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	05/19/87 08:43	06/12/87 11:48	579.08	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	06/12/87 11:05	06/12/87 11:50	0.75	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	06/12/87 11:48	06/27/87 21:55	370.12	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	06/12/87 11:50	06/18/87 07:30	139.67	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	06/18/87 07:30	07/25/87 08:23	888.88	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	06/27/87 21:55	07/01/87 12:20	86.42	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	07/25/87 08:23	07/31/87 10:55	146.53	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	08/04/87 17:12	08/07/87 18:30	73.30	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	08/07/87 21:10	08/12/87 02:03	100.88	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	08/10/87 15:50	08/10/87 18:10	2.33	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	08/12/87 02:03	08/15/87 14:07	84.07	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	08/15/87 14:07	08/16/87 14:50	24.72	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	08/16/87 14:50	08/17/87 08:12	17.37	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	08/17/87 08:12	08/20/87 10:33	74.35	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	08/17/87 21:00	08/20/87 10:42	61.70	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	08/20/87 10:33	08/20/87 10:45	0.20	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	08/20/87 10:42	09/16/87 10:57	648.25	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	08/20/87 10:45	08/20/87 14:02	3.28	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	08/20/87 14:02	09/16/87 10:42	644.67	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	08/24/87 01:00	08/24/87 03:00	2.00	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	09/02/87 23:20	09/02/87 23:25	0.08	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	09/16/87 10:42	09/16/87 11:02	0.33	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	09/16/87 10:57	09/24/87 09:45	190.80	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	09/16/87 11:02	09/16/87 11:17	0.25	STARTED/SECURED 31 CCWP FOR 3PT-M46	END DATE	SRO
CCW	MDP	09/23/87 17:48	09/23/87 18:30	0.70	STARTED/SECURED 31 CCWP ON RECIRC FOR BREAKIN		SRO
CCW	MDP	09/23/87 19:45	09/23/87 20:55	1.17	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	09/23/87 21:00	10/11/87 12:12	423.20	STARTED/SECURED 31 CCWP FOR 3PT-M46	START DATE	SRO
CCW	MDP	09/24/87 09:45	10/11/87 11:39	409.90	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	09/30/87 01:20	09/30/87 04:30	3.17	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	10/11/87 11:39	10/11/87 12:12	0.55	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	10/11/87 12:12	11/11/87 18:58	750.77	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	10/11/87 12:12	10/11/87 16:02	3.83	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	10/11/87 16:02	11/11/87 19:15	747.22	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	11/11/87 18:58	11/11/87 19:16		STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	11/11/87 19:15	11/13/87 03:10	31.92	STARTED/SECURED 31 CCWP FOR CLEANING		SRO
CCW	MDP	11/11/87 19:16	11/11/87 20:49	1.55	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CCW	MDP	11/11/87 20:49	11/11/87 20:50	0.02	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	11/11/87 20:50	11/13/87 02:00	29.17	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	11/13/87 02:00	11/13/87 02:05	0.08	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	11/13/87 02:05	11/25/87 07:45	293.67	STARTED/SECURED 32 CCWP FOR MTC		SRO
CCW	MDP	11/13/87 03:10	11/13/87 09:42	6.53	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	11/13/87 09:42	12/12/87 03:09	689.45	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	11/25/87 07:55	12/07/87 11:55	292.00	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	12/07/87 11:55	12/07/87 12:11	0.27	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	12/07/87 12:11	12/12/87 02:43	110.53	STARTED/SECURED 32 CCWP FOR 3PT-M46.		SRO
CCW	MDP	12/12/87 02:43	12/12/87 03:12	0.48	STARTED/SECURED 33 CCWP FOR 3PT-M46.		SRO
CCW	MDP	12/12/87 03:09	12/19/87 01:39	166.50	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	12/12/87 03:12	01/03/88 02:50	527.63	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	12/15/87 10:00	12/19/87 02:00	88.00	OOS/OPERABLE		SRO
CCW	MDP	12/19/87 01:38	12/19/87 03:42	2.07	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	12/19/87 03:42	12/20/87 23:44	44.03	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	12/20/87 23:44	12/21/87 03:56	4.20	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	12/21/87 03:56	12/29/87 16:48	204.87	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	12/29/87 16:48	01/03/88 02:30	105.70	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	01/03/88 02:30	01/03/88 02:51	0.35	STARTED/SECURED 32 CCWP FOR 3PT-M46.		SRO
CCW	MDP	01/03/88 02:50	01/21/88 09:50	439.00	STARTED/SECURED 33 CCWP.		SRO
CCW	MDP	01/03/88 02:51	02/02/88 03:21	720.50	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	01/20/88 11:45	01/20/88 11:46	0.02	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	01/25/88 22:20	01/25/88 22:22	0.03	AUTO START when 31 EDG BKR racked in/SEC.	2 min run time	SRO
CCW	MDP	02/02/88 03:21	02/02/88 03:46	0.42	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	02/02/88 03:46	02/02/88 04:10	0.40	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	02/02/88 04:10	02/26/88 04:03	575.88	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	02/26/88 03:25	02/26/88 03:50	0.42	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	02/26/88 03:50	02/26/88 04:05	0.25	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	02/26/88 04:05	02/29/88 01:10	69.08	STARTED/SECURED 31 CCWP.		SRO
CCW	MDP	02/29/88 01:10	03/12/88 00:33	287.38	STARTED/SECURED 32 CCWP.		SRO
CCW	MDP	02/29/88 03:10	03/12/88 01:00	285.83	OOS/OPERABLE.		SRO
CCW	MDP	03/12/88 00:33	03/12/88 00:55	0.37	STARTED/SECURED 31 CCWP.		SRO
CCW	MDP	03/12/88 00:55	03/27/88 17:40	376.75	STARTED/SECURED 32 CCWP FOR 3PT-M46.		SRO
CCW	MDP	03/27/88 17:40	03/27/88 18:05	0.42	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	03/27/88 18:05	03/27/88 18:25	0.33	STARTED/SECURED 33 CCWP FOR 3PT-M46.		SRO
CCW	MDP	03/27/88 18:25	04/26/88 01:08	702.72	STARTED/SECURED 32 CCWP FOR 3PT-M46.		SRO
CCW	MDP	04/05/88 12:20	04/05/88 13:30	1.17	AUTO-START ON LOW HDS PRESS/SEC		SRO
CCW	MDP	04/05/88 12:20	04/05/88 12:22	0.03	AUTO-START ON LOW HDS PRESS/SEC	2 min run time	SRO
CCW	MDP	04/26/88 01:08	04/26/88 01:33	0.42	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	04/26/88 01:08	04/26/88 01:33	0.42	STARTED/SECURED 33 CCWP FOR 3PT-M46.		SRO
CCW	MDP	04/26/88 01:33	04/26/88 06:20	4.78	STARTED/SECURED 32 CCWP FOR 3PT-M46.		SRO
CCW	MDP	04/26/88 06:40	05/02/88 00:15	137.58	STARTED/SECURED 32 CCWP.	START DATE	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CCW	MDP	05/02/88 00:15	05/16/88 05:00	340.75	STARTED/SECURED 31 CCWP due to 31 CCW HX BEING DRAINED.		SRO
CCW	MDP	05/03/88 03:12	05/03/88 03:19	0.12	STARTED/SECURED 33 CCWP for 3PT-Q36 (822A & B STROKE TEST)		SRO
CCW	MDP	05/07/88 02:42	05/07/88 02:45	0.05	STARTED/SECURED 32 CCWP (SEAL LEAK).		SRO
CCW	MDP	05/09/88 08:27	05/09/88 08:35	0.13	STARTED/SECURED 32 CCWP FOR MTC INSPECTION.		SRO
CCW	MDP	05/10/88 09:38	05/10/88 09:40	0.03	BUMPED 32 CCWP FOR MTC INSPECTION OF PUMP SEAL.		SRO
CCW	MDP	05/11/88 14:00	05/30/88 14:00	456.00	STARTED/SECURED 33 CCWP FOR PT		SRO
CCW	MDP	05/11/88 19:40	05/13/88 11:25	39.75	STARTED/SECURED 32 CCWP.		SRO
CCW	MDP	05/27/88 16:15	05/27/88 16:35	0.33	STARTED/SECURED 32 CCWP.	START TIME	SRO
CCW	MDP	05/27/88 16:25	05/30/88 13:36	69.18	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	05/30/88 13:36	05/30/88 14:04	0.47	STARTED/SECURED 32 CCWP FOR 3PT-M46.		SRO
CCW	MDP	05/30/88 14:00	06/06/88 13:50	167.83	STARTED/SECURED 31 CCWP.		SRO
CCW	MDP	05/30/88 14:04	06/09/88 03:30	229.43	STARTED/SECURED 33 CCWP.		SRO
CCW	MDP	06/06/88 13:50	06/18/88 00:40	274.83	STARTED/SECURED 32 CCWP.		SRO
CCW	MDP	06/09/88 03:30	06/21/88 03:43	288.22	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	06/18/88 00:40	06/20/88 12:09	59.48	STARTED/SECURED 33 CCWP.		SRO
CCW	MDP	06/20/88 12:10	06/21/88 03:24	15.23	STARTED/SECURED 33 CCWP FOR 3PT-M46.		SRO
CCW	MDP	06/21/88 03:24	06/21/88 03:45	0.35	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	06/21/88 03:43	06/28/88 11:42	175.98	STARTED/SECURED 33 CCWP.		SRO
CCW	MDP	06/21/88 03:45	07/05/88 08:08	340.38	STARTED/SECURED 31 CCWP.		SRO
CCW	MDP	06/28/88 11:42	07/05/88 11:35	167.88	STARTED/SECURED 32 CCWP.		SRO
CCW	MDP	06/28/88 15:45	06/28/88 15:47	0.03	STARTED/SECURED 33 CCWP for bkr operability check -bkr oper		SRO
CCW	MDP	07/05/88 08:08	07/16/88 09:48	265.67	STARTED/SECURED 33 CCWP FOR 3PT-M46.		SRO
CCW	MDP	07/05/88 11:35	07/05/88 11:40	0.08	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	07/05/88 11:40	07/16/88 10:17	262.62	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	07/05/88 21:28	07/05/88 21:29	0.02	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	07/16/88 09:48	07/16/88 10:18	0.50	STARTED/SECURED 32 CCWP.		SRO
CCW	MDP	07/16/88 10:17	08/09/88 01:46	567.48	STARTED/SECURED 33 CCWP FOR 3PT-M46.		SRO
CCW	MDP	07/16/88 10:18	08/09/88 01:26	567.13	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	08/09/88 01:26	08/09/88 01:47	0.35	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	08/09/88 01:46	09/02/88 03:33	577.78	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	08/09/88 01:47	09/02/88 03:12	577.42	STARTED/SECURED 33 CCWP FOR 3PT-M46.		SRO
CCW	MDP	09/02/88 03:12	09/02/88 03:38	0.43	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	09/02/88 03:33	09/26/88 01:12	573.65	STARTED/SECURED 33 CCWP FOR 3PT-M46.		SRO
CCW	MDP	09/02/88 03:38	09/25/88 16:53	565.25	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	09/25/88 16:53	09/26/88 00:51	7.97	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	09/26/88 00:51	09/26/88 01:37	0.77	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	09/26/88 01:12	10/09/88 20:00	330.80	STARTED/SECURED 32 CCWP.		SRO
CCW	MDP	09/26/88 01:37	10/23/88 00:57	647.33	STARTED/SECURED 33 CCWP FOR 3PT-M46.		SRO
CCW	MDP	10/09/88 18:53	10/23/88 01:15	318.37	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	10/22/88 10:30	10/22/88 10:50	0.33	STARTED/SECURED 32 CCWP	START DATE	SRO
CCW	MDP	10/23/88 00:57	10/23/88 01:17	0.33	STARTED/SECURED 32 CCWP FOR 3PT-M46.		SRO
CCW	MDP	10/23/88 01:15	11/16/88 06:36	581.35	STARTED/SECURED 33 CCWP FOR 3PT-M46.		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CCW	MDP	10/23/88 01:17	11/16/88 06:30	581.22	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	11/16/88 06:30	11/16/88 06:35	0.08	STARTED/SECURED 32 CCWP FOR 3PT-M46.		SRO
CCW	MDP	11/16/88 06:35	11/25/88 17:35	227.00	STARTED/SECURED 31 CCWP.		SRO
CCW	MDP	11/16/88 06:36	11/16/88 06:37	0.02	STARTED/SECURED 32 CCWP FOR 3PT-M46.		SRO
CCW	MDP	11/16/88 06:37	11/25/88 17:06	226.48	STARTED/SECURED 33 CCWP.		SRO
CCW	MDP	11/16/88 09:05	11/16/88 09:18	0.22	STARTED/SECURED 32 CCWP FOR 3PT-M46.		SRO
CCW	MDP	11/25/88 17:06	12/10/88 12:31	355.42	STARTED/SECURED 32 CCWP FOR 3PT-M46.		SRO
CCW	MDP	11/25/88 17:35	12/10/88 13:10	355.58	STARTED/SECURED 33 CCWP FOR 3PT-M46.		SRO
CCW	MDP	12/10/88 12:31	12/10/88 13:11	0.67	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	12/10/88 13:10	01/02/89 03:30	542.33	STARTED/SECURED 32 CCWP FOR 3PT-M46.		SRO
CCW	MDP	12/10/88 13:11	01/02/89 03:48	542.62	STARTED/SECURED 33 CCWP FOR 3PT-M46.		SRO
CCW	MDP	01/02/89 03:30	01/02/89 03:49	0.32	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	01/02/89 03:48	01/27/89 10:42	606.90	STARTED/SECURED 32 CCWP FOR 3PT-M46.		SRO
CCW	MDP	01/02/89 03:49	01/27/89 10:57	607.13	STARTED/SECURED 33 CCWP FOR 3PT-M46.		SRO
CCW	MDP	01/03/89 01:04	01/03/89 01:09	0.08	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	01/17/89 12:05	01/17/89 12:10	0.08	STARTED/SECURED 31 CCWP.		SRO
CCW	MDP	01/27/89 10:42	01/27/89 10:58	0.27	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	01/27/89 10:57	02/19/89 21:00	562.05	STARTED/SECURED 32 CCWP FOR 3PT-M46.		SRO
CCW	MDP	01/27/89 10:58	02/20/89 09:31	574.55	STARTED/SECURED 33 CCWP FOR 3PT-M46.		SRO
CCW	MDP	02/07/89 16:14	02/07/89 16:34	0.33	STARTED/SECURED 31 CCWP.	START DATE	SRO
CCW	MDP	02/19/89 21:00	02/20/89 09:08	12.13	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	02/20/89 09:08	02/20/89 09:50	0.70	STARTED/SECURED 32 CCWP FOR 3PT-M46.		SRO
CCW	MDP	02/20/89 09:31	03/16/89 08:50	575.32	STARTED/SECURED 31 CCWP.		SRO
CCW	MDP	02/20/89 09:50	02/22/89 10:00	48.17	STARTED/SECURED 33 CCWP for MTC on drain vlv.		SRO
CCW	MDP	03/16/89 08:43	03/20/89 09:34	96.85	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	03/20/89 09:34	03/20/89 09:54	0.33	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	03/20/89 09:54	03/28/89 16:58	199.07	STARTED/SECURED 32 CCWP.		SRO
CCW	MDP	03/28/89 16:58	04/08/89 09:04	256.10	STARTED/SECURED 33 CCWP.		SRO
CCW	MDP	04/08/89 09:04	04/08/89 10:24	1.33	STARTED/SECURED 32 CCWP.		SRO
CCW	MDP	04/08/89 10:24	04/13/89 09:27	119.05	STARTED/SECURED 33 CCWP.		SRO
CCW	MDP	04/13/89 09:27	04/13/89 09:58	0.52	STARTED/SECURED 31 CCWP.		SRO
CCW	MDP	04/13/89 09:58	04/13/89 12:27	2.48	STARTED/SECURED 33 CCWP.		SRO
CCW	MDP	04/13/89 12:27	04/13/89 12:56	0.48	STARTED/SECURED 32 CCWP.		SRO
CCW	MDP	04/13/89 12:56	04/29/89 19:57	391.02	STARTED/SECURED 33 CCWP.		SRO
CCW	MDP	04/25/89 09:00	04/25/89 09:30	0.50	STARTED/SECURED 31 CCWP FOR 3PT-Q36.		SRO
CCW	MDP	04/29/89 19:57	05/03/89 21:40	97.72	STARTED/SECURED 32 CCWP.		SRO
CCW	MDP	05/03/89 21:40	05/08/89 14:32	112.87	STARTED/SECURED 33 CCWP.		SRO
CCW	MDP	05/08/89 14:32	05/08/89 14:55	0.38	STARTED/SECURED 31 CCWP.		SRO
CCW	MDP	05/08/89 14:55	05/08/89 15:20	0.42	STARTED/SECURED 32 CCWP.		SRO
CCW	MDP	05/08/89 15:20	06/03/89 15:46	624.43	STARTED/SECURED 31 CCWP.		SRO
CCW	MDP	05/31/89 12:40	05/31/89 16:40	4.00	STARTED/SECURED 33 CCWP.		SRO
CCW	MDP	05/31/89 16:40	06/02/89 14:58	46.30	STARTED/SECURED 32 CCWP.		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CCW	MDP	06/02/89 14:58	06/02/89 15:19	0.35	STARTED/SECURED 33 CCWP.		SRO
CCW	MDP	06/02/89 15:19	06/03/89 13:53	22.57	STARTED/SECURED 32 CCWP.		SRO
CCW	MDP	06/03/89 13:53	06/03/89 15:48	1.92	STARTED/SECURED 33 CCWP.		SRO
CCW	MDP	06/03/89 15:46	06/03/89 23:38	7.87	STARTED/SECURED 32 CCWP.		SRO
CCW	MDP	06/04/89 00:21	06/04/89 11:56	11.58	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	06/04/89 11:56	06/04/89 14:00	2.07	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	06/04/89 14:00	06/04/89 14:20	0.33	STARTED/SECURED 31 CCWP	END DATE	SRO
CCW	MDP	06/05/89 17:55	06/05/89 19:55	2.00	STARTED/SECURED 33 CCWP.	END TIME	SRO
CCW	MDP	06/05/89 21:19	06/05/89 21:37	0.30	STARTED/SECURED 33 CCWP.		SRO
CCW	MDP	06/05/89 21:37	06/06/89 13:05	15.47	STARTED/SECURED 31 CCWP.		SRO
CCW	MDP	06/06/89 13:05	06/23/89 09:40	404.58	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	06/06/89 15:57	06/09/89 11:47	67.83	STARTED/SECURED 31 CCWP.		SRO
CCW	MDP	06/09/89 11:47	06/23/89 10:20	334.55	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	06/14/89 03:25	06/14/89 03:51	0.43	STARTED/SECURED 31 CCWP.		SRO
CCW	MDP	06/23/89 09:40	06/23/89 10:27	0.78	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	06/23/89 10:20	07/10/89 20:41	418.35	STARTED/SECURED 32 CCWP.		SRO
CCW	MDP	06/23/89 10:27	07/12/89 19:45	465.30	STARTED/SECURED 33 CCWP.		SRO
CCW	MDP	07/04/89 04:54	07/04/89 05:12	0.30	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	07/04/89 05:15	07/04/89 05:19	0.07	STARTED/SECURED 31 CCWP.		SRO
CCW	MDP	07/10/89 20:41	07/18/89 17:55	189.23	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	07/12/89 19:45	07/13/89 02:43	6.97	STARTED/SECURED 32 CCWP.		SRO
CCW	MDP	07/13/89 02:43	07/13/89 18:59	16.27	STARTED/SECURED 33 CCWP.		SRO
CCW	MDP	07/13/89 18:59	07/14/89 18:02	23.05	STARTED/SECURED 32 CCWP.		SRO
CCW	MDP	07/14/89 18:02	07/18/89 18:24	96.37	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	07/18/89 17:55	07/18/89 18:41	0.77	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	07/18/89 18:24	08/11/89 03:47	561.38	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	07/18/89 18:41	08/11/89 04:10	561.48	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	08/11/89 03:47	08/11/89 04:22	0.58	STARTED/SECURED 32 CCWP FOR 3PT-M46.		SRO
CCW	MDP	08/11/89 04:10	09/08/89 20:13	688.05	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	08/11/89 04:22	08/14/89 02:58	70.60	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	08/14/89 02:58	09/01/89 18:57	447.98	STARTED/SECURED 32 CCWP.		SRO
CCW	MDP	09/01/89 18:55	09/01/89 18:57	0.03	BUMPED 33 CCWP TO SET MECH SEAL.		SRO
CCW	MDP	09/01/89 18:57	09/01/89 20:56	1.98	STARTED/SECURED 33 CCWP.		SRO
CCW	MDP	09/01/89 20:56	09/08/89 19:45	166.82	STARTED/SECURED 32 CCWP FOR 3PT-M46.		SRO
CCW	MDP	09/08/89 19:45	09/08/89 20:14	0.48	STARTED/SECURED 33 CCWP FOR RETEST & 3PT-M46		SRO
CCW	MDP	09/08/89 20:13	10/02/89 10:17	566.07	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	09/08/89 20:14	10/02/89 10:15	566.02	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	09/18/89 09:53	09/18/89 10:01	0.13	STARTED/SECURED 33 CCWP FOR 3PT-Q36.		SRO
CCW	MDP	10/02/89 10:15	10/02/89 10:35	0.33	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	10/02/89 10:17	10/26/89 19:53	585.60	STARTED/SECURED 31 CCWP.		SRO
CCW	MDP	10/02/89 10:35	10/23/89 15:55	509.33	STARTED/SECURED 32 CCWP.		SRO
CCW	MDP	10/19/89 16:33	10/19/89 16:53	0.33	STARTED/SECURED 33 CCWP.	START DATE	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CCW	MDP	10/20/89 20:25	10/22/89 22:55	50.50	STARTED/SECURED 33 CCWP.		SRO
CCW	MDP	10/23/89 15:55	10/26/89 19:53	75.97	STARTED/SECURED 33 CCWP.	END DATE=32 ON	SRO
CCW	MDP	10/26/89 19:53	10/26/89 20:18	0.42	STARTED/SECURED 32 CCWP.		SRO
CCW	MDP	10/26/89 20:18	11/19/89 11:31	567.22	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	10/26/89 20:19	10/26/89 20:20	0.02	STARTED/SECURED 32 CCWP.		SRO
CCW	MDP	10/26/89 20:20	11/19/89 11:58	567.63	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	11/19/89 11:31	11/19/89 12:00	0.48	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	11/19/89 11:58	11/27/89 00:07	180.15	STARTED/SECURED 31 CCWP.		SRO
CCW	MDP	11/19/89 12:00	11/21/89 19:55	55.92	STARTED/SECURED 33 CCWP.		SRO
CCW	MDP	11/27/89 00:07	12/02/89 02:25	122.30	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	12/02/89 02:25	12/13/89 02:50	264.42	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	12/02/89 05:38	12/02/89 05:41	0.05	STARTED/SECURED 33 CCWP.		SRO
CCW	MDP	12/04/89 03:58	12/04/89 04:10	0.20	STARTED/SECURED 32 CCWP FOR PT		SRO
CCW	MDP	12/04/89 03:58	12/04/89 04:10	0.20	STARTED/SECURED 33 CCWP FOR PT		SRO
CCW	MDP	12/13/89 02:50	12/13/89 03:44	0.90	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	12/13/89 02:50	12/13/89 03:42	0.87	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	12/13/89 03:43	01/06/90 02:30	574.78	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	12/13/89 05:50	12/13/89 05:55	0.08	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	01/06/90 02:30	01/06/90 03:16	0.77	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	01/06/90 02:30	01/06/90 03:16	0.77	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	01/06/90 03:16	01/18/90 00:30	285.23	STARTED/SECURED 31 CCWP.		SRO
CCW	MDP	01/18/90 00:30	01/30/90 09:55	297.42	STARTED/SECURED 32 CCWP FOR 3PT-M46	END DATE=31 ON	SRO
CCW	MDP	01/30/90 09:55	01/30/90 10:20	0.42	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	01/30/90 10:20	01/30/90 11:00	0.67	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	01/30/90 11:00	01/31/90 09:55	22.92	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	01/31/90 11:45	01/31/90 11:47	0.03	AUTO START OF 31 CCWP ON LOW PRES./SEC		SRO
CCW	MDP	01/31/90 11:45	01/31/90 12:15	0.50	AUTO START OF 33 CCWP ON LOW PRES./SEC		SRO
CCW	MDP	01/31/90 12:00	01/31/90 12:30	0.50	STARTED/SECURED 32 CCWP.	START TIME	SRO
CCW	MDP	01/31/90 12:30	02/23/90 03:43	543.22	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	02/19/90 00:46	02/19/90 00:57	0.18	STARTED/SECURED 32 CCWP.		SRO
CCW	MDP	02/19/90 00:47	02/19/90 00:50	0.05	STARTED/SECURED 33 CCWP.		SRO
CCW	MDP	02/23/90 03:43	02/23/90 04:08	0.42	STARTED/SECURED 32 CCWP FOR 3PT-M46.		SRO
CCW	MDP	02/23/90 04:08	02/23/90 04:32	0.40	STARTED/SECURED 33 CCWP FOR 3PT-M46.		SRO
CCW	MDP	02/23/90 04:32	03/12/90 09:52	413.33	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	03/03/90 15:30	03/03/90 16:00	0.50	STARTED/SECURED 32 CCWP.	START DATE	SRO
CCW	MDP	03/12/90 09:52	03/12/90 10:26	0.57	STARTED/SECURED 32 CCWP FOR 3PT-M46.		SRO
CCW	MDP	03/12/90 10:25	03/14/90 16:35	54.17	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	03/12/90 10:26	03/12/90 19:25	8.98	STARTED/SECURED 33 CCWP FOR 3PT-M46.		SRO
CCW	MDP	03/14/90 16:35	03/19/90 15:24	118.82	STARTED/SECURED 32 CCWP FOR PT-M46		SRO
CCW	MDP	03/15/90 19:02	03/15/90 22:02	3.00	STARTED/SECURED 33 CCWP.	START DATE	SRO
CCW	MDP	03/15/90 22:02	03/19/90 14:30	88.47	STARTED/SECURED 31 CCWP FOR PT-M46		SRO
CCW	MDP	03/19/90 14:30	03/19/90 15:23	0.88	STARTED/SECURED 33 CCWP FOR PT-M46		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CCW	MDP	03/19/90 15:23	03/21/90 09:21	41.97	STARTED/SECURED 31 CCWP.		SRO
CCW	MDP	03/19/90 15:25	04/12/90 02:55	563.50	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	03/21/90 09:21	03/21/90 10:30	1.15	STARTED/SECURED 33 CCWP.		SRO
CCW	MDP	03/21/90 10:30	04/12/90 03:14	520.73	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	04/12/90 02:55	04/12/90 03:15	0.33	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	04/12/90 03:14	05/04/90 14:33	539.32	STARTED/SECURED 32 CCWP.		SRO
CCW	MDP	04/12/90 03:15	05/02/90 08:01	484.77	STARTED/SECURED 31 CCWP.		SRO
CCW	MDP	05/02/90 08:01	05/06/90 13:57	101.93	STARTED/SECURED 33 CCWP FOR 3PT-M46.		SRO
CCW	MDP	05/02/90 11:57	05/02/90 11:59	0.03	STARTED/SECURED 31 CCWP MOTOR.	2 MIN RUN TIME	SRO
CCW	MDP	05/04/90 14:33	05/04/90 17:57	3.40	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	05/04/90 17:57	05/06/90 13:20	43.38	STARTED/SECURED 32 CCWP FOR 3PT-M46.		SRO
CCW	MDP	05/06/90 13:20	05/06/90 13:58	0.63	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	05/06/90 13:57	05/30/90 10:23	572.43	STARTED/SECURED 32 CCWP FOR 3PT-M46.		SRO
CCW	MDP	05/06/90 13:58	05/30/90 10:41	572.72	STARTED/SECURED 33 CCWP FOR 3PT-M46.		SRO
CCW	MDP	05/08/90 05:00	05/08/90 05:18	0.30	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	05/30/90 10:23	05/30/90 10:42	0.32	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	05/30/90 10:41	06/25/90 19:05	632.40	STARTED/SECURED 32 CCWP FOR 3PT-M46.		SRO
CCW	MDP	05/30/90 10:42	06/25/90 19:35	632.88	STARTED/SECURED 33 CCWP FOR 3PT-M46.		SRO
CCW	MDP	06/25/90 19:05	06/25/90 19:40	0.58	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	06/25/90 19:35	07/19/90 02:42	559.12	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	06/25/90 19:40	07/19/90 03:05	559.42	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	07/19/90 02:42	07/19/90 03:15	0.55	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	07/19/90 03:05	08/12/90 18:38	591.55	STARTED/SECURED 32 CCWP FOR 3PT-M46.		SRO
CCW	MDP	07/19/90 03:15	08/12/90 19:03	591.80	STARTED/SECURED 33 CCWP FOR 3PT-M46.		SRO
CCW	MDP	08/12/90 18:38	08/12/90 19:14	0.60	STARTED/SECURED 31 CCWP FOR 3PT-M46.		SRO
CCW	MDP	08/12/90 19:03	08/29/90 08:42	397.65	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	08/12/90 19:14	09/05/90 11:30	568.27	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	08/29/90 08:42	09/05/90 10:58	170.27	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	09/05/90 10:58	09/05/90 11:20	0.37	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	09/05/90 11:20	09/18/90 16:40	317.33	STARTED/SECURED 31 CCWP FOR 3PT-R003B		SRO
CCW	MDP	09/05/90 11:30	09/18/90 15:45	316.25	STARTED/SECURED 32 CCWP FOR 3PT-R003B		SRO
CCW	MDP	09/15/90 14:00	09/18/90 18:00	76.00	STARTED/SECURED 33 CCWP FOR 3PT-R003B		SRO
CCW	MDP	09/18/90 16:00	09/25/90 15:35	167.58	STARTED/SECURED 32 CCWP FOR START TEST		SRO
CCW	MDP	09/18/90 17:18	10/01/90 09:26	304.13	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	09/18/90 18:23	09/25/90 15:26	165.05	STARTED/SECURED 33 CCWP FOR START TEST		SRO
CCW	MDP	09/25/90 15:27	10/01/90 09:47	138.33	STARTED/SECURED 33 CCWP FOR START TEST		SRO
CCW	MDP	09/25/90 15:36	09/27/90 01:10	33.57	STARTED/SECURED 32 CCWP FOR START TEST		SRO
CCW	MDP	10/01/90 09:26	10/01/90 09:48	0.37	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	10/01/90 09:47	10/23/90 05:20	523.55	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	10/01/90 09:48	10/25/90 09:05	575.28	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	10/23/90 05:20	10/25/90 08:55	51.58	STARTED/SECURED 32 CCWP for test		SRO
CCW	MDP	10/25/90 09:05	10/26/90 13:24	28.32	STARTED/SECURED 32 CCWP		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CCW	MDP	10/25/90 09:07	10/27/90 00:40	39.55	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	10/26/90 13:24	10/26/90 13:42	0.30	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	10/26/90 13:42	11/12/90 09:51	404.15	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	11/03/90 17:30	11/06/90 00:30	55.00	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	11/12/90 09:51	11/16/90 12:23	98.53	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	11/13/90 14:30	11/18/90 08:30	114.00	STARTED/SECURED 32 CCWP	END DATE	SRO
CCW	MDP	11/16/90 12:23	11/19/90 18:17	77.90	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	11/18/90 08:30	11/19/90 18:02	33.53	STARTED/SECURED 31 CCWP	START DATE	SRO
CCW	MDP	11/19/90 18:02	11/19/90 18:22	0.33	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	11/19/90 18:17	11/28/90 13:00	210.72	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	11/19/90 18:22	12/03/90 20:15	337.88	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	12/03/90 20:15	12/04/90 16:40	20.42	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	12/04/90 16:40	12/05/90 06:20	13.67	STARTED/SECURED 31 CCWP	START DATE	SRO
CCW	MDP	12/04/90 16:40	12/04/90 17:40	1.00	STARTED/SECURED 33 CCWP	END DATE	SRO
CCW	MDP	12/05/90 01:45	12/05/90 02:45	1.00	STARTED/SECURED 33 CCWP	END DATE	SRO
CCW	MDP	12/05/90 06:20	12/07/90 06:20	48.00	STARTED/SECURED 32 CCWP	END DATE	SRO
CCW	MDP	12/09/90 14:45	12/13/90 11:33	92.80	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	12/09/90 14:45	12/10/90 10:21	19.60	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	12/10/90 10:21	12/13/90 11:03	72.70	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	12/13/90 11:03	12/13/90 11:55	0.87	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	12/13/90 11:33	01/06/91 03:16	567.72	STARTED/SECURED 31 CCWP		SRO
CCW	MDP	12/13/90 11:55	12/15/90 14:10	50.25	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	12/15/90 00:20	12/15/90 00:23	0.05	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	12/15/90 14:10	01/06/91 04:00	517.83	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	01/06/91 03:16	01/06/91 04:15	0.98	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	01/06/91 04:00	01/30/91 18:36	590.60	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	01/06/91 04:15	01/30/91 18:14	589.98	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	01/10/91 01:10	01/10/91 01:30	0.33	STARTED/SECURED 32 CCWP FOR 3PT-Q36		SRO
CCW	MDP	01/10/91 10:38	01/10/91 11:15	0.62	STARTED/SECURED 32 CCWP FOR 3PT-Q36		SRO
CCW	MDP	01/30/91 18:14	01/30/91 18:37	0.38	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	01/30/91 18:36	02/23/91 02:40	560.07	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	01/30/91 18:37	02/23/91 02:37	560.00	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	02/23/91 02:37	02/23/91 03:04	0.45	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	02/23/91 02:40	03/19/91 02:30	575.83	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	02/23/91 03:04	03/19/91 03:10	576.10	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	03/19/91 02:30	03/19/91 03:15	0.75	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	03/19/91 03:10	04/12/91 02:27	575.28	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	03/19/91 03:15	04/12/91 02:45	575.50	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	03/25/91 19:10	03/30/91 07:05	107.92	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	04/05/91 12:09	04/07/91 14:30	50.35	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	04/12/91 02:27	04/12/91 02:46	0.32	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	04/12/91 02:45	05/08/91 08:41	629.93	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
CCW	MDP	04/12/91 02:46	05/08/91 09:06	630.33	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	05/08/91 08:41	05/08/91 09:15	0.57	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	05/08/91 09:06	06/02/91 02:40	593.57	STARTED/SECURED 31 CCWP FOR 3PT-M46	END DATE	SRO
CCW	MDP	05/08/91 09:15	05/14/91 19:55	154.67	STARTED/SECURED 33 CCWP		SRO
CCW	MDP	05/12/91 15:55	05/22/91 14:52	238.95	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	05/14/91 22:05	06/02/91 02:35	436.50	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	05/22/91 16:58	05/22/91 17:03	0.08	STARTED/SECURED 32 CCWP		SRO
CCW	MDP	06/02/91 02:35	06/02/91 03:00	0.42	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	06/02/91 02:59	06/26/91 20:15	593.27	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	06/02/91 03:00	06/26/91 19:55	592.92	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	06/18/91 08:45	06/18/91 09:09	0.40	STARTED/SECURED 32 CCWP when vlv 822A opened as per 3PT-Q36		SRO
CCW	MDP	06/26/91 19:55	06/26/91 20:35	0.67	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	06/26/91 20:15	07/20/91 03:04	558.82	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	06/26/91 20:35	07/20/91 02:44	558.15	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	07/20/91 02:44	07/20/91 03:05	0.35	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	07/20/91 03:04	08/13/91 21:43	594.65	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	07/20/91 03:05	08/13/91 22:07	595.03	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	08/13/91 21:43	08/13/91 22:07	0.40	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	08/13/91 22:07	09/30/91 01:00	1130.88	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	08/13/91 22:07	09/30/91 01:20	1131.22	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	09/30/91 01:00	09/30/91 01:21	0.35	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	09/30/91 01:20	10/26/91 03:37	626.28	STARTED/SECURED 31 CCWP FOR 3PT-M46	END DATE	SRO
CCW	MDP	09/30/91 01:21	10/26/91 03:57	626.60	STARTED/SECURED 33 CCWP FOR 3PT-M46		SRO
CCW	MDP	10/26/91 03:57	10/26/91 04:29	0.53	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	10/26/91 04:17	12/14/91 20:57	1192.67	STARTED/SECURED 33 CCWP FOR 3PT-M46	START DATE	SRO
CCW	MDP	10/26/91 04:29	11/19/91 10:08	581.65	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	11/19/91 10:08	11/19/91 10:30	0.37	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	11/19/91 10:30	12/14/91 20:37	610.12	STARTED/SECURED 31 CCWP FOR 3PT-M46		SRO
CCW	MDP	12/14/91 20:37	12/14/91 20:59	0.37	STARTED/SECURED 32 CCWP FOR 3PT-M46		SRO
CCW	MDP	12/14/91 20:57	12/31/91 23:59	411.03	STARTED 31 CCWP	SECURED IN 1992	SRO
CCW	MDP	12/14/91 20:59	12/31/91 23:59	411.00	STARTED 33 CCWP	SECURED IN 1992	SRO
IAS	CMP	11/01/85 19:00	06/22/86 00:00	5573.00	32 IAC STARTED/SECURED		SRO
IAS	CMP	01/18/86 03:00	06/30/86 13:04	3922.07	31 IAC STARTED/SECURED		SRO
IAS	CMP	11/05/87 03:00	02/19/88 03:00	2544.00	31 IAC STARTED/SECURED		SRO
IAS	CMP	02/19/88 19:00	07/31/89 21:30	12674.50	31 IAC STARTED/SECURED		SRO
IAS	CMP	07/21/88 19:00	09/04/89 17:05	9838.08	32 IAC STARTED/SECURED		SRO
IAS	CMP	12/20/88 14:10	03/07/89 12:45	1846.58	33 IAC STARTED/SECURED		SRO
IAS	CMP	03/07/89 13:55	07/28/89 02:00	3420.08	33 IAC STARTED/SECURED		SRO
IAS	CMP	07/29/89 00:20	07/29/89 04:00	3.67	33 IAC STARTED/TRIPPED -HI WATER TEMP		SRO
IAS	CMP	08/03/89 16:25	02/22/90 11:00	4866.58	31 IAC STARTED/TRIPPED,opened IA to ASB IAC X-connect.		SRO
IAS	CMP	08/07/89 13:00	02/13/91 20:15	13327.25	33 IAC STARTED/SECURED FOR MTC		SRO
IAS	CMP	09/13/89 09:00	01/29/90 09:15	3312.25	32 IAC STARTED/SECURED FOR I & C & MTC		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
IAS	CMP	01/29/90 12:40	02/16/90 15:00	434.33	32 IAC STARTED/SECURED		SRO
IAS	CMP	05/19/90 00:28	06/29/90 00:00	983.53	31 IAC STARTED/SECURED		SRO
IAS	CMP	11/20/90 19:00	01/29/91 14:10	1675.17	32 IAC STARTED/SECURED		SRO
IAS	CMP	12/20/90 07:50	01/29/91 12:36	964.77	31 IAC STARTED/SECURED FOR PRESS. SW. ADJUSTMENT		SRO
IAS	CMP	01/29/91 14:10	02/13/91 15:06	360.93	31 IAC STARTED/TRIPPED -WOULD NOT RESTART		SRO
IAS	CMP	01/29/91 14:45	04/10/91 01:35	1690.83	32 IAC STARTED/SECURED		SRO
IAS	CMP	02/13/91 20:50	02/13/91 21:25	0.58	31 IAC STARTED/TRIPPED		SRO
IAS	CMP	02/13/91 22:05	09/23/91 03:30	5309.42	31 IAC STARTED/SECURED		SRO
IAS	CMP	02/15/91 22:00	03/20/91 12:30	782.50	33 IAC STARTED/TRIPPED		SRO
IAS	CMP	04/10/91 01:30	04/10/91 02:30	1.00	33 IAC STARTED/TRIPPED on high water temp		SRO
IAS	CMP	04/10/91 02:39	04/10/91 03:35	0.93	33 IAC STARTED/TRIPPED on high water temp		SRO
IAS	CMP	04/10/91 17:19	05/15/91 02:15	824.93	33 IAC STARTED/SECURED		SRO
IAS	CMP	05/03/91 16:00	06/14/91 00:00	992.00	32 IAC STARTED/SECURED		SRO
IAS	CMP	06/17/91 20:20	09/19/91 00:00	2235.67	32 IAC STARTED/SECURED		SRO
IAS	CMP	08/07/91 12:15	08/07/91 13:20	1.08	33 IAC STARTED/TRIPPED		SRO
IAS	CMP	08/08/91 10:30	08/17/91 12:40	218.17	33 IAC STARTED/TRIPPED -HI WATER TEMP		SRO
IAS	CMP	08/17/91 12:41	08/17/91 13:20	0.65	33 IAC STARTED/TRIPPED -HI WATER TEMP		SRO/D
IAS	CMP	08/21/91 03:00	11/01/91 18:35	1743.58	33 IAC STARTED/SECURED		SRO
IAS	CMP	11/01/91 18:35	11/02/91 20:50	26.25	33 IAC STARTED/SECURED		SRO
IAS	CMP	11/02/91 20:50	12/31/91 23:59	1419.15	33 IAC STARTED/SECURED		SRO
MFW	TDP	01/23/85 05:44	01/23/85 05:55	0.18	31 MBFP STARTED/TRIPPED		SRO
MFW	TDP	01/23/85 06:35	01/24/85 21:18	38.72	31 MBFP STARTED/SECURED (REQ STROKE-TESTED SAT)		SRO
MFW	TDP	01/24/85 03:07	03/19/85 13:14	1306.12	32 MBFP STARTED/SECURED		SRO
MFW	TDP	03/20/85 22:55	06/07/85 19:30	1892.58	31 MBFP STARTED/SECURED		SRO
MFW	TDP	03/21/85 00:00	03/21/85 00:00	0.00	32 MBFP held off for mtc to work on speed changer assembly.		DSR
MFW	TDP	03/21/85 05:30	03/21/85 09:00	3.50	32 MBFP STARTED/SECURED		SRO
MFW	TDP	03/21/85 09:00	03/21/85 13:10	4.17	32 MBFP HELD OFF/ IS		SRO
MFW	TDP	03/21/85 13:10	06/07/85 19:30	1878.33	32 MBFP STARTED/SECURED		SRO
MFW	TDP	10/04/85 09:15	10/26/85 01:15	520.00	31 MBFP STARTED/SECURED		SRO
MFW	TDP	10/04/85 14:35	10/04/85 18:00	3.42	32 MBFP STARTED/SECURED		SRO
MFW	TDP	10/04/85 21:40	10/25/85 02:05	484.42	32 MBFP STARTED/TRIP -SHUT DISCH & RECIRC Vlvs		SRO
MFW	TDP	10/26/85 00:15	11/29/85 08:17	824.03	32 MBFP STARTED/SEC -OPEN DISCH & RECIRC Vlvs		SRO
MFW	TDP	11/25/85 09:00	11/26/85 08:00	23.00	ISOLATE/OPEN 32 MBFP RECIRC MANUAL ISOL VLV FOR MTC		SRO
MFW	TDP	11/30/85 05:13	02/28/86 08:55	2163.70	32 MBFP STARTED/SECURED		SRO
MFW	TDP	11/30/85 15:46	02/28/86 08:55	2153.15	31 MBFP STARTED/SECURED		SRO
MFW	TDP	03/01/86 02:15	04/26/86 00:16	1342.02	31 MBFP STARTED/SECURED (Started per SOP-FW-1)		SRO
MFW	TDP	03/01/86 13:50	04/26/86 00:16	1330.43	32 MBFP STARTED/SECURED		SRO
MFW	TDP	05/03/86 01:40	05/03/86 13:40	12.00	31 MBFP I/S for boron saturation		SRO
MFW	TDP	05/17/86 01:38	05/18/86 03:23	25.75	OPENED 31 MBFP RECIRC VALVE/DISCHARGE VALVE		SRO
MFW	TDP	05/18/86 03:30	05/18/86 15:20	11.83	31 MBFP STARTED/SECURED		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
MFW	TDP	05/19/86 03:10	05/19/86 12:04	8.90	31 MBFP STARTED/SECURED		SRO
MFW	TDP	05/24/86 01:20	05/24/86 06:10	4.83	32 MBFP STARTED/TRIPPED		SRO
MFW	TDP	05/24/86 21:15	05/26/86 19:20	46.08	32 MBFP STARTED/SECURED		SRO
MFW	TDP	05/25/86 06:40	05/26/86 19:20	36.67	31 MBFP STARTED/SECURED		SRO
MFW	TDP	05/28/86 00:19	06/07/86 03:31	243.20	32 MBFP STARTED/TRIPPED MANUALLY		SRO
MFW	TDP	05/28/86 11:55	06/07/86 02:42	230.78	31 MBFP STARTED/TRIPPED MANUALLY		SRO
MFW	TDP	06/07/86 20:36	06/14/86 01:25	148.82	32 MBFP STARTED/SECURED		SRO
MFW	TDP	06/08/86 11:00	06/14/86 01:25	134.42	31 MBFP STARTED/SECURED		SRO
MFW	TDP	06/15/86 01:25	07/05/86 09:59	488.57	31 MBFP STARTED/OOS		SRO
MFW	TDP	06/15/86 10:28	07/05/86 10:02	479.57	32 MBFP STARTED/SECURED		SRO
MFW	TDP	07/05/86 22:15	07/06/86 00:51	2.60	31 MBFP STARTED/SECURED		SRO
MFW	TDP	09/04/86 05:40	09/05/86 15:57	34.28	31 MBFP STARTED/SECURED		SRO
MFW	TDP	09/05/86 08:45	09/05/86 15:58	7.22	32 MBFP STARTED/SECURED		SRO
MFW	TDP	09/06/86 12:50	09/09/86 10:00	69.17	31 MBFP STARTED/TRIPPED (Unit Trip)		SRO
MFW	TDP	09/08/86 07:30	09/09/86 10:00	26.50	32 MBFP STARTED/SECURED		SRO
MFW	TDP	09/10/86 09:10	11/14/86 09:23	1560.22	32 MBFP STARTED/SECURED		SRO
MFW	TDP	09/10/86 09:20	11/14/86 09:23	1560.05	31 MBFP STARTED/SECURED		SRO
MFW	TDP	11/15/86 03:30	01/31/87 14:02	1858.53	31 BFP'S ROLLED UP AS PER FW-1/SECURED		SRO
MFW	TDP	11/15/86 03:30	01/31/87 14:02	1858.53	32 BFP'S ROLLED UP AS PER FW-1/TRIPPED -Commence Turb Runback		SRO
MFW	TDP	02/03/87 00:20	03/27/87 18:48	1266.47	32 MBFP I/S WITH RECIRC VALVE SHUT/SECURED		SRO
MFW	TDP	02/13/87 04:35	03/27/87 18:48	1022.22	31 MBFP STARTED/SECURED		SRO
MFW	TDP	04/03/87 20:55	04/04/87 02:37	5.70	32 MBFP STARTED/SECURED		SRO
MFW	TDP	04/03/87 22:40	05/02/87 00:42	674.03	31 MBFP STARTED/SECURED		SRO
MFW	TDP	04/04/87 02:47	05/02/87 00:42	669.92	32 MBFP STARTED/SECURED		SRO
MFW	TDP	05/01/87 23:35	05/02/87 00:54	1.32	OPENED/SECURED 31 MBFP RECIRC		SRO
MFW	TDP	08/29/87 09:00	08/29/87 10:17	1.28	32 MBFP ON RECIRC/SECURED		SRO
MFW	TDP	08/29/87 13:25	09/03/87 23:05	129.67	32 MBFP ON RECIRC/SECURED		SRO
MFW	TDP	09/04/87 15:06	09/05/87 10:35	19.48	31 MBFP STARTED/TRIPPED		SRO
MFW	TDP	09/04/87 15:12	09/04/87 17:39	2.45	32 MBFP STARTED/TRIPPED		SRO
MFW	TDP	09/05/87 01:35	09/05/87 03:30	1.92	32 MBFP STARTED/SECURED		SRO
MFW	TDP	09/05/87 05:25	09/05/87 07:07	1.70	32 MBFP STARTED/SECURED		SRO
MFW	TDP	09/05/87 11:51	09/13/87 13:30	193.65	31 MBFP STARTED/TRIPPED		SRO
MFW	TDP	09/05/87 11:51	12/22/87 16:30	2596.65	32 MBFP STARTED/SECURED		SRO
MFW	TDP	09/14/87 16:00	09/15/87 18:00	26.00	31 MBFP STARTED/SECURED		SRO
MFW	TDP	09/15/87 18:15	09/16/87 19:30	25.25	31 MBFP HELD OFF		SRO
MFW	TDP	09/16/87 19:30	09/17/87 14:15	18.75	31 MBFP STARTED/TRIPPED		SRO
MFW	TDP	09/17/87 17:30	12/22/87 16:30	2303.00	31 MBFP STARTED/SECURED		SRO
MFW	TDP	12/23/87 22:45	02/02/88 21:21	982.60	31 MBFP STARTED/TRIPPED		SRO
MFW	TDP	12/24/87 09:00	12/24/87 21:31	12.52	32 MBFP STARTED/TRIPPED		SRO
MFW	TDP	12/25/87 03:10	12/25/87 04:05	0.92	32 MBFP STARTED/SECURED		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
MFW	TDP	12/25/87 05:00	02/02/88 21:20	952.33	32 MBFP STARTED/TRIPPED		SRO
MFW	TDP	02/03/88 17:15	03/31/88 14:12	1364.95	31 MBFP STARTED/SECURED		SRO
MFW	TDP	02/03/88 17:30	02/03/88 23:40	6.17	32 MBFP STARTED/SECURED		SRO
MFW	TDP	02/04/88 05:50	03/31/88 14:05	1352.25	32 MBFP STARTED/TRIPPED		SRO
MFW	TDP	04/02/88 14:05	05/11/88 05:11	927.10	31 MBFP STARTED/SECURED		SRO
MFW	TDP	04/02/88 14:30	05/11/88 05:03	926.55	32 MBFP STARTED/SECURED		SRO
MFW	TDP	05/28/88 01:20	05/28/88 06:47	5.45	OPEN & DE-ENRGZ/SHUT & ENRGZ #31 MBFP DIS VLV		SRO
MFW	TDP	05/28/88 10:18	06/12/88 08:51	358.55	31 MBFP STARTED/SECURED		SRO
MFW	TDP	05/29/88 08:25	06/12/88 08:51	336.43	32 MBFP STARTED/SECURED		SRO
MFW	TDP	06/03/88 17:25	06/03/88 18:04	0.65	32 MBFP -Cntrl.Sys.Trouble Alrm/Cleared.		SRO
MFW	TDP	06/15/88 19:10	10/09/88 18:52	2783.70	31 MBFP STARTED/SECURED		SRO
MFW	TDP	06/15/88 19:45	10/09/88 18:52	2783.12	32 MBFP STARTED/SECURED		SRO
MFW	TDP	10/13/88 17:01	10/15/88 21:21	52.33	32 MBFP STARTED/SHUTDOWN		SRO
MFW	TDP	10/15/88 09:00	10/15/88 21:40	12.67	31 MBFP STARTED/TRIPPED		SRO
MFW	TDP	10/15/88 22:00	10/15/88 22:55	0.92	31 MBFP STARTED/TRIPPED		SRO
MFW	TDP	10/16/88 07:25	10/16/88 11:40	4.25	31 MBFP STARTED/SECURED		SRO
MFW	TDP	10/16/88 12:30	10/20/88 01:30	85.00	31 MBFP STARTED/TRIPPED		SRO
MFW	TDP	10/20/88 01:12	10/20/88 03:26	2.23	32 MBFP ON RECIRC/SECURED		SRO
MFW	TDP	11/22/88 16:55	11/23/88 10:42	17.78	31 MBFP STARTED/TRIPPED		SRO
MFW	TDP	11/23/88 11:50	02/05/89 20:35	1784.75	31 MBFP STARTED/SECURED		SRO
MFW	TDP	11/23/88 11:50	02/05/89 20:35	1784.75	32 MBFP STARTED/SECURED		SRO
MFW	TDP	05/08/89 03:13	05/08/89 04:37	1.40	CLOSED/OPENED 31 MBFP RECIRC		SRO
MFW	TDP	06/23/89 16:10	10/20/89 07:00	2846.83	31 MBFP STARTED/SECURED		SRO
MFW	TDP	06/23/89 16:10	10/20/89 07:00	2846.83	32 MBFP STARTED/SECURED		SRO
MFW	TDP	10/20/89 07:44	10/20/89 10:32	2.80	31 MBFP STARTED/SECURED		SRO
MFW	TDP	10/20/89 07:46	10/20/89 10:23	2.62	32 MBFP STARTED/SECURED		SRO
MFW	TDP	10/24/89 00:50	03/02/90 21:20	3116.50	31 MBFP STARTED/SECURED		SRO
MFW	TDP	10/24/89 00:50	03/02/90 21:20	3116.50	32 MBFP STARTED/SECURED		SRO
MFW	TDP	04/08/90 07:55	04/08/90 09:10	1.25	31 MBFP STARTED/SECURED		SRO
MFW	TDP	04/08/90 13:40	08/09/90 15:15	2953.58	31 MBFP STARTED/SECURED		SRO
MFW	TDP	04/08/90 21:15	08/09/90 15:15	2946.00	32 MBFP STARTED/SECURED		SRO
MFW	TDP	07/01/90 00:10	07/02/90 08:45	32.58	B SPEED CHANNEL FAILURE ALARM FOR 32 MBFP/CLEARED		SRO
MFW	TDP	08/11/90 02:30	09/15/90 00:26	837.93	31 MBFP STARTED/SECURED		SRO
MFW	TDP	08/11/90 03:45	09/15/90 00:26	836.68	32 MBFP STARTED/SECURED		SRO
MFW	TDP	12/24/90 19:15	12/24/90 19:35	0.33	31 MBFP STARTED/TRIPPED		SRO
MFW	TDP	12/24/90 19:40	12/26/90 12:43	41.05	31 MBFP STARTED/SECURED		SRO
MFW	TDP	12/28/90 09:20	03/20/91 19:15	1977.92	31 MBFP STARTED/SECURED		SRO
MFW	TDP	12/28/90 14:25	03/20/91 19:15	1972.83	32 MBFP STARTED/SECURED		SRO
MFW	TDP	03/22/91 01:15	03/22/91 12:45	11.50	32 MBFP STARTED/SECURED AS PER SOP-FW-1		SRO
MFW	TDP	03/22/91 10:35	03/22/91 11:40	1.08	31 MBFP ON TURNING GEAR		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
MFW	TDP	03/23/91 01:20	03/23/91 06:16	4.93	32 MBFP STARTED/SECURED AS PER SOP-FW-1		SRO
MFW	TDP	03/23/91 22:40	03/24/91 01:45	3.08	31 MBFP STARTED/SECURED AS PER SOP-FW-1		SRO
MFW	TDP	04/09/91 17:25	04/10/91 12:06	18.68	31 MBFP STARTED/SECURED		SRO
MFW	TDP	04/09/91 17:36	04/10/91 12:05	18.48	32 MBFP STARTED/SECURED		SRO
MFW	TDP	04/11/91 00:45	05/12/91 00:15	743.50	31 MBFP STARTED/SECURED		SRO
MFW	TDP	04/11/91 00:59	05/12/91 00:15	743.27	32 MBFP STARTED/SECURED		SRO
MFW	TDP	05/23/91 21:50	08/24/91 11:05	2221.25	31 MBFP STARTED/SECURED		SRO
MFW	TDP	05/23/91 21:50	08/24/91 10:59	2221.15	32 MBFP STARTED/SECURED		SRO
MFW	TDP	08/24/91 17:10	10/19/91 06:18	1333.13	32 MBFP STARTED/SECURED		SRO
MFW	TDP	08/24/91 18:47	10/19/91 06:09	1331.37	31 MBFP STARTED/SECURED		SRO
MFW	TDP	11/04/91 08:32	12/31/91 23:59	1383.45	31 MBFP STARTED/SECURED		SRO
MFW	TDP	11/04/91 08:42	12/31/91 23:59	1383.28	32 MBFP STARTED/SECURED		SRO
MFW	TDP	11/05/91 00:00	04/30/92 00:00	4248.00	Oil leak. Failed retest. Replace auto stop manifold gasket.		MWR
MFW	TDP	12/18/91 00:00	07/31/92 17:00	5441.00	Inboard bearing of 31 MBFP - oil leaking through plug. Gasket needs to be replaced.		MWR
MFW	TDP	07/14/92 00:00	07/20/92 00:00	144.00	Install mod 90-03-125 "MBFP Controls Upgrade". Modify low bearing oil trip assembly. Remove plunger		MWR
MFW	TDP	07/14/92 00:00	07/29/92 10:00	369.90	Install mod 90-03-125 "MBFP Controls Upgrade". Modify low bearing oil trip assembly. Remove plunger		MWR
MSS	AOV	11/19/88 00:00	11/21/88 00:00	1.00	BLOWN DIAPHRAM		MWR
MSS	AOV	11/19/88 00:00	11/21/88 00:00	4.00	OPERATOR DIAPHRAM LEAKING AT FLANGE.		MWR
MSS	AOV	11/20/88 00:00	11/21/88 00:00	2.00	REPLACE OPERATOR DIAPHRAGMS		MWR
MSS	AOV	11/20/88 00:00	11/21/88 00:00	2.00	REPLACE OPERATOR DIAPHRAGMS		MWR
MSS	AOV	04/01/89 00:00	04/11/89 00:00	4.00	DIAPHRAGM LEAKING BY -VALVE TRAVEL WILL NOT EXCEED 80% BECAUSE OF LEAK.		MWR
MSS	AOV	04/03/89 00:00	04/11/89 00:00	8.00	VALVE AT FULL TRAVEL LEAKS AIR		MWR
MSS	AOV	03/21/90 00:00	03/25/90 00:00	4.00	33 Atmos does not open. 31 & 34 atmos. swagelock union to cash regulators on supply line to positione		MWR
MSS	AOV	03/21/90 00:00	03/25/90 00:00	4.00	33 Atmos does not open. 31 & 34 atmos. swagelock union to cash regulators on supply line to positione		MWR
MSS	AOV	03/21/90 00:00	03/25/90 00:00	4.00	33 Atmos does not open. 31 & 34 atmos. swagelock union to cash regulators on supply line to positione		MWR
MSS	AOV	09/04/90 00:00	10/26/90 00:00	1.00	Inspect linkage for integrity on 1134 thru 1137 as per maint. checklists. Discussed at PORC meeting 8/3		MWR
MSS	AOV	09/04/90 00:00	10/26/90 00:00	1.00	Inspect linkage for integrity on 1134 thru 1137 as per maint. checklists. Discussed at PORC meeting 8/3		MWR
MSS	AOV	09/04/90 00:00	10/26/90 00:00	1.00	Inspect linkage for integrity on 1134 thru 1137 as per maint. checklists. Discussed at PORC meeting 8/3		MWR
MSS	AOV	09/04/90 00:00	10/26/90 00:00	1.00	Inspect linkage for integrity on 1134 thru 1137 as per maint. checklists. Discussed at PORC meeting 8/3		MWR
MSS	AOV	10/08/90 00:00	10/24/90 00:00	4.00	Air reucer inlet & outlet nipple leaks. Clean threads and tighten fittings as per checklist. Fittings leaking.		MWR
MSS	AOV	10/24/90 00:00	11/19/90 00:00	6.00	Air reg outlet nipple leaks. repair air leaks as per attached steplist.		MWR
MSS	AOV	10/26/90 00:00	11/19/90 00:00	8.00	Valve stroke time is excessive in the opening direction (2min 17sec, should be less than 20 sec) Check		MWR
MSS	AOV	03/30/91 00:00	04/04/91 00:00	10.00	Diaphragm leaks by, valve will not open. Remove diaphragm cover from operator, remove existing diap		MWR
MSS	AOV	04/03/91 00:00	04/06/91 00:00	4.00	PM -Replace vlv operator diaphragm as per vlv PM program, procedure vlv-014-AOV Rev.0		MWR
MSS	AOV	04/03/91 00:00	04/06/91 00:00	4.00	PM -Replace vlv operator diaphragm as per vlv PM program, procedure VLV-014-AOV Rev.0		MWR
MSS	AOV	04/03/91 00:00	04/06/91 00:00	4.00	PM -Replace vlv operator diaphragm as per vlv PM program, procedure VLV-014-AOV Rev.0		MWR
MSS	AOV	04/06/91 00:00	11/06/91 00:00	2.00	Investigate sluggish stroking. Remove existing air regulator and install new as per maint steplists.		MWR
MSS	AOV	05/02/91 00:00	07/10/92 00:00	10440.00	PM -Open & inspect vlv internals as per PM program, using procedure VLV-014-AOV Rev.1		MWR
MSS	AOV	10/22/91 00:00	11/06/91 00:00	4.00	Valve sticks. Valve needs a 50% open signal to cause valve to lift off open seat sometimes. Check valv		MWR
MSS	CKV	02/09/89 00:00	06/23/89 00:00	20.00	MS-2-31 NON-RETURN CKV, NEEDS TO BE OPENED FOR INSPECTION.		MWR

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
MSS	CKV	02/09/89 00:00	06/23/89 00:00	20.00	VALVE NEEDS TO BE OPENED FOR INSPECTION		MWR
MSS	CKV	02/09/89 00:00	06/23/89 00:00	20.00	VALVE NEEDS TO BE OPENED FOR INSPECTION		MWR
MSS	CKV	02/09/89 00:00	06/23/89 00:00	12.00	NEEDS TO BE OPEN FOR INSPECTION		MWR
MSS	CKV	03/27/90 00:00	04/08/90 00:00	8.00	Valve leaks by. Replace MS-33-2 valve as per approved steplists and weld data checklists.		MWR
MSS	CKV	10/04/91 00:00	08/11/92 00:00	7488.00	PM -Open & inspect vlv internals. PM valve as per procedure VLV-013-MSS Rev.1		SRO
MSS	MSV	01/23/85 04:51	01/23/85 15:48	10.95	MS-1's OPENED/CLOSED		SRO
MSS	MSV	01/23/85 21:41	03/19/85 13:42	1312.02	MS-1's OPENED/CLOSED		MWR
MSS	MSV	01/25/85 00:00	09/15/85 00:00	5592.00	Replace solenoid vlv operators and modify control circuitry as per MOD 84-03-099 MS. -EQ replaceme		MWR
MSS	MSV	01/25/85 00:00	09/15/85 00:00	5592.00	Replace solenoid vlv operators and modify control circuitry as per MOD 84-03-099 MS. -EQ replaceme		SRO
MSS	MSV	03/20/85 21:25	06/07/85 19:31	1894.10	MS-1's OPENED/CLOSED		MWR
MSS	MSV	04/02/85 00:00	09/15/85 00:00	3984.00	Air hose to #31 MSIV too long -shorten. Copper air line has kink at elbow at coupling to air hose. Replac		MWR
MSS	MSV	09/13/85 00:00	09/19/85 00:00	144.00	31 MSIV VALVE ACTUATOR PISTON IS LEAKING AIR OUT OF VENT PORT.		SRO
MSS	MSV	09/25/85 19:15	09/26/85 12:36	17.35	MS-1's OPENED/CLOSED		SRO
MSS	MSV	10/04/85 08:45	10/04/85 19:40	10.92	MS-1's OPENED/CLOSED		SRO
MSS	MSV	10/04/85 21:30	10/15/85 15:16	257.77	MS-1's OPENED/CLOSED		SRO
MSS	MSV	10/15/85 21:12	02/28/86 09:10	3251.97	MS-1's OPENED/CLOSED (31 MSIV Delay close)		MWR
MSS	MSV	02/21/86 00:00	03/01/86 00:00	192.00	INSPECT-REPLACE AIR HOSE		MWR
MSS	MSV	02/21/86 00:00	03/01/86 00:00	192.00	INSPECT-REPLACE AIR HOSE		MWR
MSS	MSV	02/21/86 00:00	03/01/86 00:00	192.00	INSPECT-REPLACE AIR HOSE		MWR
MSS	MSV	02/28/86 00:00	02/28/86 00:00	0.00	REPLACE AIR CYLINDER ACTUATOR WITH NEW ONE		MWR
MSS	MSV	02/28/86 00:00	02/28/86 00:00	0.00	REPLACE VALVE OPERATOR		SRO
MSS	MSV	03/01/86 01:20	04/26/86 02:05	1344.75	MS-1's OPENED/CLOSED		MWR
MSS	MSV	04/29/86 00:00	05/12/86 00:00	20.00	INVESTIGATE PROBLEM WITH LINKAGE		MWR
MSS	MSV	04/30/86 00:00	05/12/86 00:00	16.00	DRILL OPERATING LEVER FOR GREASE FITTING		MWR
MSS	MSV	05/01/86 00:00	05/12/86 00:00	48.00	DRILL OPERATING LEVER FOR GREASE FITTING		MWR
MSS	MSV	05/01/86 00:00	05/12/86 00:00	32.00	DRILL OPERATING LEVER FOR GREASE FITTING		SRO
MSS	MSV	05/18/86 02:22	05/18/86 04:29	2.12	MS-1's OPENED/CLOSED		SRO
MSS	MSV	05/19/86 02:15	05/19/86 12:47	10.53	MS-1's OPENED/CLOSED		SRO
MSS	MSV	05/21/86 20:30	05/23/86 09:25	36.92	MS-1's OPENED/CLOSED		SRO
MSS	MSV	05/24/86 00:40	05/24/86 18:40	18.00	MS-1's OPENED/CLOSED		SRO
MSS	MSV	05/24/86 20:00	05/26/86 19:22	47.37	MS-1's OPENED/CLOSED		SRO
MSS	MSV	05/27/86 23:58	06/07/86 03:32	243.57	MS-1's OPENED/CLOSED		SRO
MSS	MSV	06/07/86 20:24	06/07/86 20:57	0.55	MS-1's OPENED/CLOSED		SRO
MSS	MSV	06/07/86 23:52	06/14/86 02:15	146.38	MS-1's OPENED/CLOSED		SRO
MSS	MSV	06/15/86 00:50	07/06/86 08:03	511.22	MS-1's OPENED/CLOSED		MWR
MSS	MSV	08/23/86 00:00	07/29/87 00:00	48.00	REPAIR GASKETS AND REPLACE SCREWS -PERFORM MOD 85-03-115		SRO
MSS	MSV	09/04/86 05:25	09/05/86 16:45	35.33	MS-1's OPENED/CLOSED		SRO
MSS	MSV	09/06/86 21:00	09/09/86 10:30	61.50	MS-1's OPENED/CLOSED		SRO
MSS	MSV	09/10/86 08:52	11/14/86 10:56	1562.07	MS-1's OPENED/CLOSED		SRO
MSS	MSV	11/15/86 03:07	01/31/87 14:16	1859.15	MS-1's OPENED/CLOSED		

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
MSS	MSV	02/02/87 07:18	02/11/87 08:28	5023.70	MS-1's OPENED/CLOSED		SRO
MSS	MSV	02/13/87 03:45	05/02/87 04:00	1872.25	MS-1's OPENED/CLOSED		SRO
MSS	MSV	04/18/87 01:15	05/02/87 00:47	335.53	MS-1's OPENED/CLOSED		SRO
MSS	MSV	08/30/87 11:25	08/30/87 15:00	3.58	MS-1's OPENED/CLOSED		SRO
MSS	MSV	09/03/87 16:08	09/03/87 23:25	7.28	MS-1's OPENED/CLOSED		SRO
MSS	MSV	09/04/87 11:00	09/04/87 18:50	7.83	MS-1's OPENED/CLOSED		SRO
MSS	MSV	09/05/87 00:45	12/22/87 17:09	2608.40	MS-1's OPENED/CLOSED		DSR
MSS	MSV	12/19/87 16:30	12/18/87 19:30		33 MSIV - declared inoperable.		SRO
MSS	MSV	12/23/87 22:18	02/02/88 22:20	984.03	MS-1's OPENED/CLOSED		SRO
MSS	MSV	02/03/88 16:25	03/31/88 15:30	1367.08	MS-1's OPENED/CLOSED		MWR
MSS	MSV	02/04/88 00:00	05/25/88 00:00	4.00	THE OPEN LIMIT IS NOT MAKING UP PROPERLY -HAD TO TOGGLE THIS IN THE FEILD.		SRO
MSS	MSV	04/02/88 12:55	05/11/88 13:00	936.08	MS-1's OPENED/CLOSED		SRO
MSS	MSV	05/29/88 06:45	06/12/88 09:57	339.20	MS-1's OPENED/CLOSED		SRO
MSS	MSV	06/15/88 18:14	10/09/88 20:00	2785.77	MS-1's OPENED/CLOSED		SRO
MSS	MSV	10/15/88 07:38	10/15/88 23:10	15.53	MS-1's OPENED/CLOSED		SRO
MSS	MSV	10/16/88 06:25	10/16/88 11:18	4.88	MS-1's OPENED/CLOSED		SRO
MSS	MSV	10/16/88 12:19	10/20/88 05:29	89.17	MS-1's OPENED/CLOSED (31 MSIV closed@1:47)		SRO
MSS	MSV	11/22/88 16:15	02/04/89 09:00	1768.75	MS-1's OPENED/CLOSED		MWR
MSS	MSV	11/29/88 00:00	02/16/89 00:00	1.00	Packing leak. Adjust packing -leaking end of shaft only.		MWR
MSS	MSV	11/29/88 00:00	02/17/89 00:00	3.00	PACKING LEAK		MWR
MSS	MSV	01/25/89 00:00	06/23/89 00:00	16.00	REPLACE AIR CYLINDER AS PER VLV-003-MSS REV.0		MWR
MSS	MSV	01/25/89 00:00	06/23/89 00:00	16.00	REPLACE AIR CYLINDER		MWR
MSS	MSV	01/25/89 00:00	06/23/89 00:00	16.00	REPLACE AIR CYLINDER		MWR
MSS	MSV	04/11/89 00:00	06/14/89 00:00	1536.00	Torque on conox seal assembly must be checked on limit switch.		MWR
MSS	MSV	05/01/89 00:00	06/23/89 00:00	12.00	MS 1-31 HAS A BODY TO BONNET LEAK		MWR
MSS	MSV	05/09/89 00:00	06/23/89 00:00	12.00	34 S-G MSIV 1-34 DOES NOT STROKE FULLY SHUT AND HAS DUAL INDICATION IN CCR.		MWR
MSS	MSV	06/16/89 00:00	06/23/89 00:00	4.00	PACKING LEAKING SLIGHTLY		MWR
MSS	MSV	06/16/89 00:00	06/23/89 00:00	4.00	PACKING LEAKING SLIGHTLY		MWR
MSS	MSV	06/16/89 00:00	06/23/89 00:00	4.00	PACKING LEAKING SLIGHTLY		MWR
MSS	MSV	06/16/89 00:00	06/23/89 00:00	2.00	STEAM LEAK AT PACKING GLAND		SRO
MSS	MSV	06/23/89 13:30	10/20/89 10:32	2853.03	MS-1's OPENED/CLOSED		MWR
MSS	MSV	10/04/89 00:00	03/21/90 00:00	4.00	MSIV 1-34 HAS PACKING LEAK		SRO
MSS	MSV	10/24/89 00:20	09/15/90 01:10	7824.83	MS-1's OPENED/CLOSED		SRO
MSS	MSV	04/08/90 05:40	04/08/90 09:15	3.58	MS-1's OPENED/CLOSED		SRO
MSS	MSV	04/08/90 12:55	06/29/90 13:44	1968.82	MS-1's OPENED/CLOSED		MWR
MSS	MSV	05/30/90 00:00	12/05/90 00:00	23.00	Replace limit switches (2) Install new limit switch and connection as per DEM and procedure LIM-004-		MWR
MSS	MSV	05/30/90 00:00	12/05/90 00:00	24.00	Replace limit switches (2). Replace limit switch and connectors as per DEM, steplist, and procedure LIM		MWR
MSS	MSV	05/30/90 00:00	12/05/90 00:00	30.00	Replace limit switches (2). Replace limit switch and connector as per DEM and procedure LIM-004-ELC		MWR
MSS	MSV	05/30/90 00:00	12/05/90 00:00	16.00	Replace limit switches (2). Replace limit switch and connectors and relocate box X79 as per DEM, stepli		MWR
MSS	MSV	06/14/90 00:00	12/07/90 00:00	12.00	PM -Replace air cylinder and repack vlv. per maint proc VLV-003-MSS. Open valve cover & inspect dis		MWR

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
MSS	MSV	06/14/90 00:00	12/07/90 00:00	11.00	PM -Replace air cylinder and repack vlv. Repack vlv & replace air cylinder as per maint proc VLV-003-		MWR
MSS	MSV	06/14/90 00:00	12/07/90 00:00	11.00	PM -Replace air cylinder and repack vlv. Repack vlv as per maint proc VLV-003-MSS. Open valve cov		MWR
MSS	MSV	06/14/90 00:00	12/07/90 00:00	12.00	Open & inspect check valve as per PM program and replace air cylinder & repack valve, as per maint pr		MWR
MSS	MSV	06/14/90 00:00	12/07/90 00:00	16.00	Open & inspect check valve as per PM program, per procedure. VLV-013-MSS Rev.1		MWR
MSS	MSV	06/30/90 20:35	08/09/90 16:50	956.25	MS-1's OPENED/CLOSED		SRO
MSS	MSV	08/11/90 02:00	09/15/90 01:10	839.17	MS-1's OPENED/CLOSED		SRO
MSS	MSV	12/23/90 11:40	12/27/90 12:16	96.60	MS-1's OPENED/CLOSED		SRO
MSS	MSV	12/28/90 05:35	03/20/91 22:55	1985.33	MS-1's OPENED/CLOSED		SRO
MSS	MSV	03/21/91 22:46	03/22/91 09:31	10.75	MS-1's OPENED/CLOSED		SRO
MSS	MSV	03/22/91 21:22	03/23/91 06:16	8.90	MS-1's OPENED/CLOSED (Remove steam from 2nd side -Brake VAC)		SRO
MSS	MSV	03/23/91 20:20	03/24/91 01:45	5.42	MS-1's OPENED/CLOSED		SRO
MSS	MSV	04/09/91 16:45	04/10/91 15:20	22.58	MS-1's OPENED/CLOSED		SRO
MSS	MSV	04/11/91 00:06	05/12/91 03:55	747.82	MS-1's OPENED/CLOSED		SRO
MSS	MSV	04/29/91 00:00	05/16/91 00:00	3.00	Air hose to valve operator has air leak from hole to hose. Remove old hose & replace with new clear te		MWR
MSS	MSV	05/23/91 20:45	10/19/91 06:40	3561.92	MS-1's OPENED/CLOSED		SRO
MSS	MSV	08/04/91 00:00	08/21/91 00:00	3.00	Flex hose has leak due to chafing on deck grate. Hose must be replaced and prevented from chafing.		MWR
MSS	MSV	08/21/91 00:00	08/25/91 00:00	2.00	Actuator to bushing instrument air leak for MSIV-1-31. Appears threads on actuator are not holding whic		MWR
MSS	MSV	08/24/91 00:00	08/25/91 00:00	3.00	Replacement of floex hose to actuator as per steplist. Flex hose to actuator leaking at fittings.		MWR
MSS	MSV	08/24/91 12:00	08/24/91 12:45	0.75	31 MSIV - CLOSED/OPENED FOR MTC		SRO
MSS	MSV	08/24/91 12:55	08/24/91 13:10	0.25	34 MSIV - CLOSED/OPENED FOR MTC		SRO
MSS	MSV	08/24/91 13:17	08/24/91 13:40	0.38	32 MSIV - CLOSED/OPENED FOR MTC		SRO
MSS	MSV	10/04/91 00:00	07/04/92 00:00	6576.00	PM -Replace vlv packing, air cylinder, & associated flex hose. PM valve as per procedure VLV-003-MS		MWR
MSS	MSV	10/04/91 00:00	07/29/92 00:00	7176.00	PM -Open & inspect vlv internals. Replace packing, air cylinder, & flex hose. PM valve as per procedur		MWR
MSS	MSV	10/04/91 00:00	07/10/92 00:00	6720.00	PM -Replace vlv packing, air cylinder, & associated flex hose. PM valve as per procedure VLV-003-MS		MWR
MSS	MSV	10/21/91 00:00	11/04/91 00:00	2.00	Air hose for actuating cylinder needs to be replaced. Replace existing air hoses with new as per maint.		MWR
MSS	MSV	10/21/91 00:00	11/04/91 00:00	4.00	Air hose for actuating cylinder needs to be replaced.		MWR
MSS	MSV	10/21/91 00:00	11/04/91 00:00	4.00	Air hose for actuating cylinder needs to be replaced. Replace existing actuator air hoses with new as p		MWR
MSS	MSV	11/04/91 06:28	12/31/91 23:59	1385.52	MS-1's OPENED		SRO
MSS	MSV	05/23/92 00:00	07/04/92 00:00	1008.00	MS-1-31 PM -INSPECT VALVE INTERNALS.		MWR
MSS	MSV	05/23/92 00:00	07/04/92 00:00	1008.00	PM -INSPECT VALVE INTERNALS.		MWR
MSS	MSV	05/23/92 00:00	07/10/92 00:00	1152.00	MS-1-34 PM -INSPECT VALVE INTERNALS.		MWR
MSS	MSV	07/09/92 00:00	07/18/92 00:00	216.00	Cooper elbow on IA line going to MS-1-31 MSIV air cylinder needs replacement.		MWR
MSS	PCV	05/17/85 00:00	10/07/85 00:00	3432.00	BODY TO BONNET LEAK.		MWR
MSS	PCV	08/07/85 00:00	09/23/85 00:00	1128.00	SOV IS BYPASSED -VALVE WILL NOT CLOSE -INSTALL SOV AND RECONNECT AIR PIPING.		MWR
MSS	PCV	09/18/85 00:00	09/25/85 00:00	168.00	AS PER 3PT-R32 -OPEN LIMIT SWITCH DOES NOT WORK -REPLACE.		MWR
MSS	PCV	04/03/86 00:00	04/28/86 00:00	600.00	NO POSITION INDICATION LIGHTS ON SUPV. PNL -LIMIT SWITCHES AT VALUES APPEAR TO BE		MWR
MSS	PCV	04/16/86 00:00	05/10/86 00:00	576.00	REPLACE FLEX AND LIMIT SWITCHES -PERFORM JUNCTION BOX SEALING MOD FOR EQ.		MWR
MSS	PCV	04/16/86 00:00	05/10/86 00:00	576.00	REPLACE FLEX AND LIMIT SWITCHES -PERFORM JUNCTION BOX SEALING MOD FOR EQ.		MWR
MSS	PCV	04/16/86 00:00	05/10/86 00:00	576.00	REPLACE FLEX AND LIMIT SWITCHES -PERFORM JUNCTION BOX SEALING MOD FOR EQ.		MWR
MSS	PCV	04/16/86 00:00	05/10/86 00:00	576.00	REPLACE FLEX AND LIMIT SWITCHES -PERFORM JUNCTION BOX SEALING MOD FOR EQ.		MWR

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
MSS	PCV	04/20/86 00:00	05/10/86 00:00	480.00	REPLACE FLEX AND LIMIT SWITCHES -PERFORM JUNCTION BOX SEALING MOD FOR EQ.		MWR
MSS	PCV	04/21/86 00:00	05/10/86 00:00	456.00	REPLACE FLEX AND LIMIT SWITCHES -PERFORM JUNCTION BOX SEALING MOD FOR EQ.		MWR
MSS	PCV	04/21/86 00:00	05/09/86 00:00	432.00	REPLACE FLEX AND LIMIT SWITCHES AND PERFORM JUNCTION BOX SEALING MOD FOR EQ P		MWR
MSS	PCV	04/21/86 00:00	05/09/86 00:00	432.00	REPLACE FLEX AND LIMIT SWITCHES AND PERFORM JUNCTION BOX SEALING MOD FOR EQ P		MWR
MSS	PCV	08/24/86 00:00	08/27/86 00:00	72.00	REPLACE SEALTIGHT AND WIRE		MWR
MSS	PCV	08/24/86 00:00	08/27/86 00:00	72.00	REPLACE SEALTIGHT AND WIRE		MWR
MSS	PCV	08/24/86 00:00	08/27/86 00:00	72.00	REPLACE SEALTIGHT AND WIRE		MWR
MSS	PCV	08/24/86 00:00	08/27/86 00:00	72.00	REPLACE SEALTIGHT AND WIRE		MWR
MSS	PCV	08/24/86 00:00	08/27/86 00:00	72.00	REPLACE SEALTIGHT AND WIRE		MWR
MSS	PCV	08/24/86 00:00	08/27/86 00:00	72.00	REPLACE SEALTIGHT AND WIRE		MWR
MSS	PCV	08/24/86 00:00	08/27/86 00:00	72.00	REPLACE SEALTIGHT AND WIRE		MWR
MSS	PCV	08/24/86 00:00	08/27/86 00:00	72.00	REPLACE SEALTIGHT AND WIRE		MWR
MSS	PCV	08/30/87 00:00	09/03/87 00:00	96.00	INSPECT VALVES FOR FOREIGN OBJECTS		MWR
MSS	PCV	08/30/87 00:00	09/03/87 00:00	96.00	INSPECT VALVES FOR FOREIGN OBJECTS		MWR
MSS	PCV	08/30/87 00:00	09/03/87 00:00	96.00	INSPECT VALVES FOR FOREIGN OBJECTS		MWR
MSS	PCV	08/30/87 00:00	09/03/87 00:00	96.00	INSPECT VALVES FOR FOREIGN OBJECTS		MWR
MSS	PCV	08/30/87 00:00	09/03/87 00:00	96.00	INSPECT VALVES FOR FOREIGN OBJECTS		MWR
MSS	PCV	08/30/87 00:00	09/03/87 00:00	96.00	INSPECT VALVES FOR FOREIGN OBJECTS		MWR
MSS	PCV	08/30/87 00:00	09/03/87 00:00	96.00	INSPECT VALVES FOR FOREIGN OBJECTS		MWR
MSS	PCV	08/30/87 00:00	09/03/87 00:00	96.00	INSPECT VALVES FOR FOREIGN OBJECTS		MWR
MSS	PCV	09/01/87 00:00	09/02/87 00:00	24.00	REPAIR VALVE INTERNALS		MWR
MSS	PCV	09/01/87 00:00	09/02/87 00:00	24.00	REPAIR VALVE INTERNALS		MWR
MSS	PCV	09/01/87 00:00	09/02/87 00:00	24.00	REPAIR VALVE INTERNALS		MWR
MSS	PCV	09/01/87 00:00	09/02/87 00:00	24.00	REPAIR VALVE INTERNALS		MWR
MSS	PCV	09/01/87 00:00	09/02/87 00:00	24.00	REPAIR VALVE INTERNALS		MWR
MSS	PCV	09/01/87 00:00	09/02/87 00:00	24.00	REPAIR VALVE INTERNALS		MWR
MSS	PCV	09/01/87 00:00	09/02/87 00:00	24.00	REPAIR VALVE INTERNALS		MWR
MSS	PCV	09/01/87 00:00	09/02/87 00:00	24.00	REPAIR VALVE INTERNALS		MWR
MSS	PCV	08/24/88 00:00	06/07/89 00:00	6888.00	REPLACE EXISTING 4" BLOWDOWN CONTAINMENT ISOLATION VALVES WITH 3" ISOLATION VA		MWR
MSS	PCV	08/24/88 00:00	06/07/89 00:00	6888.00	REPLACE EXISTING 4" BLOWDOWN CONTAINMENT ISOLATION VALVES WITH 3" ISOLATION VA		MWR
MSS	PCV	08/24/88 00:00	06/07/89 00:00	6888.00	REPLACE EXISTING 4" BLOWDOWN CONTAINMENT ISOLATION VALVES WITH 3" ISOLATION VA		MWR
MSS	PCV	08/24/88 00:00	06/07/89 00:00	6888.00	REPLACE EXISTING 4" BLOWDOWN CONTAINMENT ISOLATION VALVES WITH 3" ISOLATION VA		MWR
MSS	PCV	08/24/88 00:00	06/07/89 00:00	6888.00	REPLACE EXISTING 4" BLOWDOWN CONTAINMENT ISOLATION VALVES WITH 3" ISOLATION VA		MWR
MSS	PCV	08/24/88 00:00	06/07/89 00:00	6888.00	REPLACE EXISTING 4" BLOWDOWN CONTAINMENT ISOLATION VALVES WITH 3" ISOLATION VA		MWR
MSS	PCV	08/24/88 00:00	06/07/89 00:00	6888.00	REPLACE EXISTING 4" BLOWDOWN CONTAINMENT ISOLATION VALVES WITH 3" ISOLATION VA		MWR
MSS	PCV	08/24/88 00:00	06/07/89 00:00	6888.00	REPLACE XMTR'S -RETUBE AND REWIRE INSTRUMENT RACK #9 IN AFWP ROOM AS PER MOD		MWR
MSS	PCV	05/09/89 00:00	05/18/89 00:00	8.00	AIR REGULATOR LEAKS		MWR
MSS	SGBD	01/03/85 00:00	01/03/85 00:00	0.00	31 SGBD Line held off for mtc to repack needle valves.		DSR
MSS	SGBD	01/03/85 00:00	01/03/85 00:00	0.00	34 SGBD Line held off for mtc to repack needle valves.		DSR
MSS	SGBD	03/12/85 00:00	03/12/85 00:00	0.00	33 SGBD Line held off for mtc to repair flow orifice flange gasket.		DSR

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
MSS	SGBD	12/16/85 00:00	12/16/85 00:00	0.00	34 SGBD Line held off to repack BD-6-4.		DSR
MSS	SGBD	01/21/86 00:00	01/21/86 00:00	0.00	33 SGBD line held off for mtc repair packing leaks in various valves.		DSR
MSS	SGBD	01/21/86 00:00	01/21/86 00:00	0.00	34 SGBD line held off for mtc repair packing leaks in various valves.		DSR
MSS	SGBD	01/22/86 00:00	01/22/86 00:00	0.00	32 SGBD line held off for mtc repair packing leaks in various valves.		DSR
MSS	SGBD	01/24/86 00:00	01/24/86 00:00	0.00	33 SGBD line held off for mtc repack valve SGBD-8.		DSR
MSS	SOV	12/18/87 00:00	12/21/87 00:00	8.00	MS-SOV 1241 -ONE OF THE VENT SOLENOIDS FOR 33 MSIV LEAKS THROUGH.		MWR
MSS	SOV	11/05/88 00:00	04/13/89 00:00	5.00	DEFECTIVE FLEX CONDUIT TO SOV 1233		MWR
MSS	SOV	04/12/89 00:00	05/09/89 00:00	20.00	REMOVE MSIV-34 EXHAUST SOLENOID AND REPLACE WITH NEW		MWR
MSS	SOV	05/09/89 00:00	10/23/89 00:00	1.00	LEAKAGE AT SWAGELOK FITTINGS -FAILED AS PER RETEST #17677		MWR
MSS	SOV	03/27/90 00:00	10/30/90 00:00	2.00	Flex conduit is damaged. Replace damaged flex as per steplist.		MWR
MSS	SOV	04/09/90 00:00	11/11/90 00:00	4.00	SOV-1238 has teflon on pipe threads. Remove tape and apply PST as per steplist.		MWR
MSS	SRV	12/20/86 00:00	08/26/87 00:00	5976.00	PM inspection. Inspect valves MS-45,47,48, & 49 on 34 loop as per maint. proc.		MWR
MSS	SRV	12/20/86 00:00	08/26/87 00:00	5976.00	PM inspection. Inspect valves MS-45,47,48, & 49 on 34 loop as per maint. proc.		MWR
MSS	SRV	12/20/86 00:00	08/26/87 00:00	5976.00	PM inspection. Inspect valves MS-45,47,48, & 49 on 34 loop as per maint. proc.		MWR
MSS	SRV	12/20/86 00:00	08/26/87 00:00	5976.00	PM inspection. Inspect valves MS-45,47,48, & 49 on 34 loop as per maint. proc.		MWR
MSS	SRV	12/20/86 00:00	08/26/87 00:00	5976.00	PM inspection. Inspect valves MS-45,47,48, & 49 on 34 loop as per maint. proc.		MWR
MSS	SRV	12/30/86 00:00	08/26/87 00:00	5736.00	PM INSPECTION		MWR
MSS	SRV	12/30/86 00:00	08/26/87 00:00	5736.00	PM INSPECTION		MWR
MSS	SRV	12/30/86 00:00	08/26/87 00:00	5736.00	PM INSPECTION		MWR
MSS	SRV	12/30/86 00:00	08/26/87 00:00	5736.00	PM INSPECTION		MWR
MSS	SRV	12/30/86 00:00	08/26/87 00:00	5736.00	PM INSPECTION		MWR
MSS	SRV	12/30/86 00:00	08/26/87 00:00	5736.00	PM INSPECTION		MWR
MSS	SRV	12/30/86 00:00	08/26/87 00:00	5736.00	PM INSPECTION		MWR
MSS	SRV	12/30/86 00:00	08/26/87 00:00	5736.00	PM INSPECTION		MWR
MSS	SRV	12/30/86 00:00	08/26/87 00:00	5736.00	PM INSPECTION		MWR
MSS	SRV	12/30/86 00:00	08/26/87 00:00	5736.00	PM INSPECTION		MWR
MSS	SRV	12/30/86 00:00	08/26/87 00:00	5736.00	PM INSPECTION		MWR
MSS	SRV	12/30/86 00:00	08/26/87 00:00	5736.00	PM INSPECTION		MWR
MSS	SRV	12/30/86 00:00	08/26/87 00:00	5736.00	PM INSPECTION		MWR
MSS	SRV	12/30/86 00:00	08/26/87 00:00	5736.00	PM INSPECTION		MWR
MSS	SRV	04/28/88 00:00	06/25/89 00:00	10.00	Appears to be leaking by its seat (steam around muffler sleev). Open/inspect vlv MS-45-1 using MTC. P		MWR
MSS	SRV	01/04/89 00:00	06/20/89 00:00	10.00	PM OF VALUE AS PER VLV-011-MSS		MWR
MSS	SRV	01/04/89 00:00	06/20/89 00:00	10.00	PM OF VALUE AS PER VLV-011-MSS		MWR
MSS	SRV	01/04/89 00:00	06/20/89 00:00	10.00	PM OF VALUE AS PER VLV-011-MSS		MWR
MSS	SRV	01/04/89 00:00	06/20/89 00:00	10.00	PM OF VALUE AS PER VLV-011-MSS		MWR
MSS	SRV	01/04/89 00:00	06/20/89 00:00	10.00	PM OF VALUE AS PER VLV-011-MSS		MWR
MSS	SRV	01/04/89 00:00	06/20/89 00:00	10.00	PM OF VALUE AS PER VLV-011-MSS		MWR
MSS	SRV	01/04/89 00:00	06/20/89 00:00	10.00	PM OF VALUE AS PER VLV-011-MSS		MWR
MSS	SRV	01/04/89 00:00	06/20/89 00:00	10.00	PM OF VALUE AS PER VLV-011-MSS		MWR

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
MSS	SRV	01/04/89 00:00	06/20/89 00:00	10.00	PM OF VALUE AS PER VLV-011-MSS		MWR
MSS	SRV	04/10/89 00:00	06/20/89 00:00	10.00	INSTALLATION OF HYDRO PLUG		MWR
MSS	SRV	04/10/89 00:00	06/20/89 00:00	10.00	INSTALLATION OF HYDRO PLUG		MWR
MSS	SRV	04/10/89 00:00	06/20/89 00:00	10.00	INSTALLATION OF HYDRO PLUG		MWR
MSS	SRV	04/10/89 00:00	06/20/89 00:00	10.00	INSTALLATION OF HYDRO PLUG		MWR
MSS	SRV	04/10/89 00:00	06/20/89 00:00	10.00	INSTALLATION OF HYDRO PLUG		MWR
MSS	SRV	04/10/89 00:00	06/20/89 00:00	10.00	INSTALLATION OF HYDRO PLUG		MWR
MSS	SRV	04/10/89 00:00	06/20/89 00:00	10.00	INSTALLATION OF HYDRO PLUG		MWR
MSS	SRV	04/10/89 00:00	06/20/89 00:00	10.00	INSTALLATION OF HYDRO PLUG		MWR
MSS	SRV	04/10/89 00:00	06/20/89 00:00	10.00	INSTALLATION OF HYDRO PLUG		MWR
MSS	SRV	04/10/89 00:00	06/20/89 00:00	10.00	INSTALLATION OF HYDRO PLUG		MWR
MSS	SRV	04/19/90 00:00	12/17/90 00:00	6.00	Leaking through. Evaluation is required with the unit on the line. Inspect & overhaul crosby main steam		MWR
MSS	SRV	04/19/90 00:00	12/17/90 00:00	8.00	Leaking through. Evaluation is necessary with plant on the line. Inspect & overhaul crosby main steam s		MWR
MSS	SRV	07/02/90 00:00	12/17/90 00:00	6.00	PM -OPEN & INSPECT. DISASSEMBLE & INSPECT AS PER MAINT. PROC. VLV-011-MSS Rev.0		MWR
MSS	SRV	07/02/90 00:00	12/17/90 00:00	16.00	PM -OPEN & INSPECT. DISASSEMBLE & INSPECT AS PER MAINT. PROC. VLV-011-MSS Rev.0		MWR
MSS	SRV	07/02/90 00:00	12/17/90 00:00	6.00	PM -OPEN & INSPECT. DISASSEMBLE & INSPECT AS PER MAINT. PROC. VLV-011-MSS Rev.0		MWR
MSS	SRV	07/02/90 00:00	12/17/90 00:00	6.00	PM -OPEN & INSPECT. DISASSEMBLE & INSPECT AS PER MAINT. PROC. VLV-011-MSS Rev.0		MWR
MSS	SRV	07/02/90 00:00	12/17/90 00:00	6.00	PM -OPEN & INSPECT. DISASSEMBLE & INSPECT AS PER MAINT. PROC. VLV-011-MSS Rev.0		MWR
MSS	SRV	07/02/90 00:00	12/17/90 00:00	6.00	PM -OPEN & INSPECT. DISASSEMBLE & INSPECT AS PER MAINT. PROC. VLV-011-MSS Rev.0		MWR
MSS	SRV	07/02/90 00:00	12/17/90 00:00	6.00	PM -OPEN & INSPECT. DISASSEMBLE & INSPECT AS PER MAINT. PROC. VLV-011-MSS Rev.0		MWR
MSS	SRV	10/16/91 00:00	07/28/92 00:00	6864.00	PM - Open & inspect relief valve. PM valve as per procedure VLV-011-MSS Rev.1. Valve needs to be r		MWR
MSS	SRV	10/16/91 00:00	07/28/92 00:00	6864.00	PM - Open & inspect relief valve. PM valve as per procedure VLV-011-MSS Rev.1.		MWR
MSS	SRV	10/16/91 00:00	07/29/92 00:00	6888.00	PM - Open & inspect relief valve. Valve needs to be rebuilt as per procedure VLV-011-MSS Rev.1.		MWR
MSS	SRV	10/16/91 00:00	07/28/92 00:00	6864.00	PM - Open & inspect relief valve. PM valve as per procedure VLV-011-MSS Rev.1. Rebuild as per proc		MWR
MSS	SRV	10/16/91 00:00	07/29/92 00:00	6888.00	PM - Open & inspect relief valve. Rebuild as per procedure VLV-011-MSS Rev.1.		MWR
MSS	SRV	10/16/91 00:00	07/28/92 00:00	6864.00	PM - Open & inspect relief valve. PM valve as per procedure VLV-011-MSS Rev.1. Valve needs to be r		MWR
MSS	SRV	11/12/91 00:00	07/28/92 00:00	6216.00	PM -OPEN & INSPECT RELIEF VLV. Valve needs overhaul. Rebuild as per VLV-011-MSS Rev.1		MWR
MSS	SRV	11/12/91 00:00	07/28/92 00:00	6216.00	PM -OPEN & INSPECT RELIEF VLV.		MWR
MSS	SRV	11/12/91 00:00	07/28/92 00:00	6216.00	PM -OPEN & INSPECT RELIEF VLV. Rebuild as per VLV-011-MSS Rev.1		MWR
MSS	SRV	11/12/91 00:00	07/28/92 00:00	6216.00	PM -OPEN & INSPECT RELIEF VLV. Valve needs to be reguilt as per VLV-011-MSS Rev.1		MWR
MSS	SRV	07/28/92 00:00	07/30/92 00:00	48.00	S/G safety has extended blowdown period. Failed retest 91-32804-1. Adjust blowdown on MS-45-2.		MWR
SWS	MDP	12/29/84 17:26	01/13/85 18:00	360.57	STARTED/SECURED 31 SWP		SRO
SWS	MDP	12/29/84 17:27	12/29/84 17:47	0.33	STARTED/SECURED 35 SWP FOR 3PT-M35		SRO
SWS	MDP	12/29/84 17:46	02/02/85 09:52	832.10	STARTED/SECURED 33 SWP		SRO
SWS	MDP	12/29/84 17:47	12/29/84 20:50	3.05	STARTED/SECURED 36 SWP FOR 3PT-M35		SRO
SWS	MDP	12/29/84 17:49	01/04/85 12:50	139.02	STARTED/SECURED 35 SWP		SRO
SWS	MDP	12/29/84 20:50	01/04/85 07:32	130.70	STARTED/SECURED 34 SWP		SRO
SWS	MDP	01/04/85 07:30	02/02/85 09:53	698.38	STARTED/SECURED 36 SWP FOR 3PT-M35		SRO
SWS	MDP	01/04/85 12:45	02/25/85 20:34	1255.82	STARTED/SECURED 34 SWP		SRO
SWS	MDP	01/13/85 18:00	01/25/85 18:55	288.92	STARTED/SECURED 32 SWP		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	01/25/85 18:55	02/16/85 15:15	524.33	STARTED/SECURED 31 SWP		SRO
SWS	MDP	01/31/85 15:45	01/31/85 17:07	1.37	STARTED/SECURED 32 SWP		SRO
SWS	MDP	02/02/85 09:52	02/24/85 00:37	518.75	STARTED/SECURED 32 SWP FOR 3PT-M35		SRO
SWS	MDP	02/02/85 09:53	02/25/85 20:51	562.97	STARTED/SECURED 35 SWP FOR 3PT-M35		SRO
SWS	MDP	02/16/85 15:15	03/26/85 07:50	904.58	STARTED/SECURED 33 SWP FOR 3PT-M35		SRO
SWS	MDP	02/24/85 00:37	02/24/85 01:23	0.77	STARTED/SECURED 31 SWP FOR 3PT-M35		SRO
SWS	MDP	02/24/85 01:23	02/25/85 20:25	43.03	STARTED/SECURED 32 SWP FOR 3PT-M35		SRO
SWS	MDP	02/25/85 20:25	02/25/85 20:35	0.17	STARTED/SECURED 31 SWP FOR 3PT-M35		SRO
SWS	MDP	02/25/85 20:34	03/04/85 22:13	169.65	STARTED/SECURED 36 SWP		SRO
SWS	MDP	02/25/85 20:35	03/13/85 13:42	377.12	STARTED/SECURED 32 SWP		SRO
SWS	MDP	02/25/85 20:51	03/04/85 16:30	163.65	STARTED/SECURED 34 SWP		SRO
SWS	MDP	03/04/85 16:30	03/05/85 21:55	29.42	STARTED/SECURED 35 SWP		SRO
SWS	MDP	03/04/85 22:13	03/05/85 12:52	14.65	STARTED/SECURED 34 SWP		SRO
SWS	MDP	03/05/85 12:52	03/05/85 14:19	1.45	STARTED/SECURED 36 SWP		SRO
SWS	MDP	03/05/85 14:19	03/26/85 07:52	497.55	STARTED/SECURED 34 SWP		SRO
SWS	MDP	03/05/85 21:55	03/14/85 14:23	208.47	STARTED/SECURED 36 SWP		SRO
SWS	MDP	03/13/85 13:41	03/17/85 10:50	93.15	STARTED/SECURED 31 SWP		SRO
SWS	MDP	03/14/85 14:20	03/16/85 00:01	33.68	STARTED/SECURED 35 SWP		SRO
SWS	MDP	03/15/85 17:05	03/15/85 17:07	0.03	BUMPED 36 SWP FOR ROTATION		SRO
SWS	MDP	03/15/85 21:32	03/15/85 21:34	0.03	BUMPED 36 SWP FOR ROTATION		SRO
SWS	MDP	03/16/85 00:01	03/23/85 09:26	177.42	STARTED/SECURED 36 SWP		SRO
SWS	MDP	03/17/85 10:50	03/26/85 09:14	214.40	STARTED/SECURED 32 SWP		SRO
SWS	MDP	03/23/85 09:26	03/26/85 09:14	71.80	STARTED/SECURED 35 SWP		SRO
SWS	MDP	03/26/85 07:50	03/26/85 13:24	5.57	STARTED/SECURED 31 SWP		SRO
SWS	MDP	03/26/85 07:52	03/27/85 08:30	24.63	STARTED/SECURED 36 SWP		SRO
SWS	MDP	03/26/85 09:13	03/27/85 10:21	25.13	STARTED/SECURED 33 SWP		SRO
SWS	MDP	03/26/85 09:13	03/26/85 13:27	4.23	STARTED/SECURED 34 SWP		SRO
SWS	MDP	03/26/85 13:24	03/27/85 08:28	19.07	STARTED/SECURED 32 SWP		SRO
SWS	MDP	03/26/85 13:27	03/27/85 10:22	20.92	STARTED/SECURED 35 SWP		SRO
SWS	MDP	03/27/85 08:28	03/31/85 11:12	98.73	STARTED/SECURED 31 SWP		SRO
SWS	MDP	03/27/85 08:30	03/27/85 12:24	3.90	STARTED/SECURED 34 SWP		SRO
SWS	MDP	03/27/85 10:21	03/28/85 16:31	30.17	STARTED/SECURED 32 SWP		SRO
SWS	MDP	03/27/85 10:22	03/28/85 11:30	25.13	STARTED/SECURED 36 SWP		SRO
SWS	MDP	03/27/85 12:24	03/28/85 09:05	20.68	STARTED/SECURED 35 SWP		SRO
SWS	MDP	03/28/85 09:05	04/06/85 00:20	207.25	STARTED/SECURED 34 SWP		SRO
SWS	MDP	03/28/85 11:30	03/28/85 16:31	5.02	STARTED/SECURED 35 SWP		SRO
SWS	MDP	03/28/85 16:30	04/13/85 13:19	380.82	STARTED/SECURED 33 SWP		SRO
SWS	MDP	03/28/85 16:30	04/06/85 00:05	199.58	STARTED/SECURED 36 SWP		SRO
SWS	MDP	03/31/85 11:12	03/31/85 12:10	0.97	STARTED/SECURED 32 SWP		SRO
SWS	MDP	03/31/85 12:10	04/01/85 01:25	13.25	STARTED/SECURED 31 SWP		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	04/01/85 01:25	04/12/85 21:05	283.67	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/06/85 00:05	04/06/85 00:52	0.78	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/06/85 00:20	04/13/85 13:08	180.80	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/06/85 00:52	04/06/85 04:30	3.63	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/06/85 04:30	04/13/85 10:11	173.68	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/06/85 05:10	04/13/85 10:22	173.20	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/12/85 21:05	04/12/85 21:25	0.33	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/12/85 21:05	04/13/85 13:17	16.20	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/13/85 07:06	04/13/85 13:13	6.12	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/13/85 10:12	04/13/85 13:04	2.87	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/13/85 10:24	04/13/85 12:57	2.55	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/13/85 12:59	04/13/85 18:20	5.35	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/13/85 13:06	04/13/85 18:07	5.02	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/13/85 13:10	04/13/85 17:50	4.67	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/13/85 13:16	04/14/85 07:32	18.27	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/13/85 13:19	04/14/85 07:28	18.15	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/13/85 18:07	04/13/85 18:33	0.43	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/13/85 18:20	04/14/85 07:15	12.92	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/13/85 18:33	04/14/85 07:18	12.75	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/13/85 18:45	04/14/85 07:12	12.45	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/13/85 21:05	04/14/85 07:23	10.30	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/14/85 07:14	04/14/85 13:09	5.92	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/14/85 07:17	04/14/85 13:23	6.10	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/14/85 07:22	04/14/85 13:31	6.15	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/14/85 07:27	04/14/85 09:21	1.90	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/14/85 07:31	04/14/85 12:55	5.40	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/14/85 09:21	04/14/85 12:48	3.45	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/14/85 10:52	04/14/85 13:03	2.18	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/14/85 12:54	04/15/85 10:53	21.98	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/14/85 13:02	04/14/85 23:40	10.63	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/14/85 13:08	04/15/85 01:05	11.95	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/14/85 13:22	04/14/85 16:17	2.92	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/14/85 13:30	04/14/85 16:42	3.20	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/14/85 13:37	04/14/85 16:58	3.35	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/14/85 16:08	04/15/85 01:30	9.37	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/14/85 16:40	04/15/85 02:10	9.50	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/14/85 16:55	04/15/85 01:43	8.80	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/15/85 00:30	04/15/85 04:03	3.55	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/15/85 01:30	04/15/85 04:30	3.00	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/15/85 01:43	04/15/85 05:00	3.28	STARTED/SECURED 34 SWP		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	04/15/85 02:10	04/15/85 05:30	3.33	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/15/85 02:50	04/15/85 06:00	3.17	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/15/85 04:30	04/15/85 10:03	5.55	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/15/85 05:00	04/15/85 09:35	4.58	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/15/85 05:30	04/15/85 08:56	3.43	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/15/85 06:00	04/15/85 08:43	2.72	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/15/85 06:26	04/15/85 08:32	2.10	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/15/85 08:43	04/15/85 11:43	3.00	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/15/85 08:56	04/15/85 13:45	4.82	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/15/85 09:33	04/15/85 16:40	7.12	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/15/85 10:03	04/15/85 13:08	3.08	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/15/85 10:53	04/15/85 15:48	4.92	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/15/85 11:43	04/15/85 17:38	5.92	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/15/85 13:08	04/15/85 19:42	6.57	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/15/85 13:45	04/15/85 21:05	7.33	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/15/85 15:48	04/15/85 21:56	6.13	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/15/85 16:40	04/15/85 22:46	6.10	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/15/85 17:38	04/16/85 01:05	7.45	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/15/85 19:42	04/16/85 00:05	4.38	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/15/85 21:05	04/16/85 01:47	4.70	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/15/85 21:56	04/16/85 02:30	4.57	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/15/85 22:46	04/16/85 03:40	4.90	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/16/85 00:05	04/16/85 04:25	4.33	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/16/85 01:05	04/16/85 05:25	4.33	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/16/85 01:47	04/16/85 06:04	4.28	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/16/85 02:30	04/16/85 07:42	5.20	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/16/85 03:40	04/16/85 08:53	5.22	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/16/85 04:23	04/16/85 09:56	5.55	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/16/85 05:25	04/16/85 10:58	5.55	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/16/85 06:04	04/16/85 12:11	6.12	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/16/85 07:42	04/16/85 13:25	5.72	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/16/85 08:53	04/16/85 15:47	6.90	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/16/85 09:56	04/16/85 17:43	7.78	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/16/85 10:58	04/16/85 19:35	8.62	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/16/85 12:11	04/16/85 19:35	7.40	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/16/85 13:25	04/16/85 21:35	8.17	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/16/85 15:47	04/16/85 22:45	6.97	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/16/85 17:43	04/16/85 23:45	6.03	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/16/85 19:35	04/17/85 00:45	5.17	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/16/85 21:35	04/17/85 01:45	4.17	STARTED/SECURED 35 SWP		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	04/16/85 22:45	04/17/85 02:45	4.00	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/16/85 23:45	04/17/85 03:45	4.00	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/17/85 00:45	04/17/85 04:45	4.00	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/17/85 01:45	04/17/85 05:45	4.00	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/17/85 02:45	04/17/85 08:10	5.42	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/17/85 03:45	04/17/85 09:37	5.87	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/17/85 04:45	04/17/85 11:12	6.45	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/17/85 05:45	04/17/85 13:56	8.18	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/17/85 08:10	04/17/85 14:32	6.37	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/17/85 09:37	04/17/85 17:11	7.57	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/17/85 11:12	04/17/85 18:08	6.93	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/17/85 13:56	04/17/85 19:08	5.20	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/17/85 14:32	04/17/85 20:08	5.60	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/17/85 17:11	04/17/85 21:20	4.15	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/17/85 18:08	04/17/85 22:25	4.28	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/17/85 19:08	04/17/85 23:20	4.20	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/17/85 20:08	04/18/85 00:15	4.12	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/17/85 21:20	04/18/85 01:20	4.00	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/17/85 22:25	04/18/85 00:20	1.92	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/17/85 23:20	04/18/85 03:20	4.00	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/18/85 00:15	04/18/85 04:20	4.08	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/18/85 01:20	04/18/85 05:20	4.00	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/18/85 02:20	04/18/85 06:08	3.80	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/18/85 03:20	04/18/85 09:08	5.80	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/18/85 04:20	04/18/85 10:05	5.75	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/18/85 05:20	04/18/85 19:25	14.08	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/18/85 06:08	04/18/85 21:48	15.67	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/18/85 09:08	04/18/85 20:38	11.50	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/18/85 10:05	04/18/85 18:22	8.28	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/18/85 18:22	04/19/85 01:00	6.63	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/18/85 19:25	04/19/85 02:10	6.75	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/18/85 20:38	04/19/85 08:20	11.70	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/18/85 21:48	04/19/85 04:25	6.62	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/19/85 01:00	04/19/85 06:25	5.42	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/19/85 02:10	04/19/85 21:20	19.17	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/19/85 03:35	04/20/85 03:20	23.75	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/19/85 06:25	04/19/85 21:00	14.58	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/19/85 08:20	04/19/85 21:52	13.53	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/19/85 09:10	04/29/85 00:52	231.70	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/19/85 21:00	04/20/85 06:25	9.42	STARTED/SECURED 31 SWP		

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	04/19/85 21:52	04/20/85 03:20	5.47	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/19/85 22:12	04/20/85 20:13	22.02	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/20/85 01:37	04/20/85 18:46	17.15	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/20/85 03:20	04/20/85 17:40	14.33	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/20/85 06:25	04/20/85 17:10	10.75	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/20/85 06:25	04/20/85 20:55	14.50	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/20/85 17:10	04/21/85 00:55	7.75	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/20/85 17:40	04/21/85 03:10	9.50	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/20/85 19:10	04/21/85 00:55	5.75	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/20/85 20:55	04/21/85 03:03	6.13	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/20/85 21:25	04/21/85 09:45	12.33	STARTED/SECURED 36 SWP FOR B/W		SRO
SWS	MDP	04/21/85 00:55	04/21/85 05:10	4.25	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/21/85 01:40	04/21/85 12:40	11.00	STARTED/SECURED 34 SWP FOR B/W		SRO
SWS	MDP	04/21/85 03:10	04/21/85 22:38	19.47	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/21/85 04:22	04/21/85 10:53	6.52	STARTED/SECURED 32 SWP FOR B/W		SRO
SWS	MDP	04/21/85 05:00	04/21/85 11:38	6.63	STARTED/SECURED 35 SWP FOR B/W		SRO
SWS	MDP	04/21/85 05:10	04/21/85 18:23	13.22	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/21/85 10:53	04/21/85 19:53	9.00	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/21/85 11:38	04/22/85 01:58	14.33	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/21/85 12:19	04/21/85 18:48	6.48	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/21/85 12:50	04/21/85 19:21	6.52	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/21/85 13:15	04/21/85 18:23	5.13	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/21/85 18:23	04/21/85 23:53	5.50	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/21/85 18:48	04/21/85 23:54	5.10	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/21/85 19:21	04/22/85 01:58	6.62	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/21/85 19:52	04/22/85 03:58	8.10	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/21/85 23:53	04/22/85 03:58	4.08	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/22/85 00:40	04/22/85 05:45	5.08	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/22/85 01:58	04/22/85 05:47	3.82	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/22/85 02:54	04/22/85 10:50	7.93	STARTED/SECURED 35 SWP FOR B/W		SRO
SWS	MDP	04/22/85 03:58	04/22/85 09:50	5.87	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/22/85 04:48	04/22/85 09:50	5.03	STARTED/SECURED 36 SWP FOR B/W		SRO
SWS	MDP	04/22/85 05:47	04/22/85 08:55	3.13	STARTED/SECURED 33 SWP FOR B/W		SRO
SWS	MDP	04/22/85 07:00	04/22/85 19:03	12.05	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/22/85 08:55	04/22/85 19:03	10.13	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/22/85 09:50	04/22/85 18:25	8.58	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/22/85 10:50	04/22/85 20:21	9.52	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/22/85 11:43	04/22/85 19:40	7.95	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/22/85 18:25	04/23/85 01:35	7.17	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/22/85 19:03	04/23/85 19:53	24.83	STARTED/SECURED 33 SWP		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	04/22/85 19:40	04/23/85 05:00	9.33	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/22/85 20:21	04/23/85 04:35	8.23	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/22/85 20:52	04/23/85 04:05	7.22	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/23/85 01:35	04/23/85 21:08	19.55	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/23/85 04:35	04/23/85 22:16	17.68	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/23/85 05:00	04/23/85 21:50	16.83	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/23/85 05:55	04/23/85 21:08	15.22	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/23/85 19:53	04/23/85 23:45	3.87	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/23/85 21:08	04/24/85 00:45	3.62	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/23/85 21:50	04/23/85 23:45	1.92	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/23/85 22:16	04/23/85 22:50	0.57	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/23/85 22:50	04/24/85 00:25	1.58	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/23/85 23:45	04/24/85 04:15	4.50	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/23/85 23:45	04/26/85 01:35	49.83	STARTED/SECURED 35 SWP FOR 3PT-M35		SRO
SWS	MDP	04/24/85 00:25	04/26/85 07:00	54.58	STARTED/SECURED 34 SWP FOR 3PT-M35		SRO
SWS	MDP	04/24/85 00:45	04/26/85 18:40	65.92	STARTED/SECURED 32 SWP FOR 3PT-M35		SRO
SWS	MDP	04/24/85 04:15	04/26/85 18:40	62.42	STARTED/SECURED 33 SWP FOR 3PT-M35		SRO
SWS	MDP	04/24/85 04:15	04/26/85 02:00	45.75	STARTED/SECURED 36 SWP FOR 3PT-M35		SRO
SWS	MDP	04/26/85 01:35	04/27/85 04:45	27.17	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/26/85 02:00	04/26/85 16:52	14.87	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/26/85 16:52	04/27/85 02:00	9.13	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/26/85 17:20	04/27/85 02:00	8.67	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/26/85 18:18	04/27/85 02:30	8.20	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/26/85 18:40	04/27/85 02:30	7.83	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/27/85 02:00	04/28/85 05:10	27.17	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/27/85 02:30	04/28/85 03:30	25.00	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/27/85 02:30	04/28/85 04:30	26.00	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/27/85 02:50	04/28/85 04:00	25.17	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/27/85 16:22	04/28/85 03:30	11.13	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/27/85 16:22	04/28/85 04:00	11.63	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/28/85 04:00	04/29/85 03:40	23.67	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/28/85 04:00	04/29/85 04:35	24.58	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/28/85 05:10	04/28/85 18:43	13.55	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/28/85 05:10	04/28/85 18:43	13.55	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/28/85 16:54	04/29/85 04:35	11.68	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/28/85 16:54	04/29/85 03:40	10.77	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/29/85 03:40	04/29/85 09:21	5.68	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/29/85 03:40	04/29/85 09:21	5.68	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/29/85 04:35	04/29/85 10:47	6.20	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/29/85 04:35	04/29/85 10:47	6.20	STARTED/SECURED 36 SWP		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	04/29/85 09:21	05/02/85 21:30	84.15	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/29/85 09:21	05/02/85 21:30	84.15	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/29/85 10:47	04/30/85 11:06	24.32	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/29/85 10:47	04/30/85 11:06	24.32	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/30/85 11:06	05/02/85 20:50	57.73	STARTED/SECURED 31 SWP		SRO
SWS	MDP	04/30/85 11:06	05/02/85 20:50	57.73	STARTED/SECURED 36 SWP		SRO
SWS	MDP	05/02/85 20:50	05/06/85 08:11	83.35	STARTED/SECURED 32 SWP		SRO
SWS	MDP	05/02/85 20:50	05/06/85 08:11	83.35	STARTED/SECURED 35 SWP		SRO
SWS	MDP	05/02/85 21:30	05/06/85 07:48	82.30	STARTED/SECURED 31 SWP		SRO
SWS	MDP	05/02/85 21:30	05/06/85 07:48	82.30	STARTED/SECURED 36 SWP		SRO
SWS	MDP	05/06/85 07:48	05/08/85 14:05	54.28	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/06/85 07:48	05/09/85 10:55	75.12	STARTED/SECURED 34 SWP		SRO
SWS	MDP	05/06/85 08:11	05/08/85 12:45	52.57	STARTED/SECURED 31 SWP		SRO
SWS	MDP	05/06/85 08:11	05/08/85 10:36	50.42	STARTED/SECURED 36 SWP		SRO
SWS	MDP	05/08/85 10:36	05/08/85 12:40	2.07	STARTED/SECURED 35 SWP		SRO
SWS	MDP	05/08/85 12:40	05/09/85 09:15	20.58	STARTED/SECURED 36 SWP		SRO
SWS	MDP	05/08/85 12:45	05/08/85 20:50	8.08	STARTED/SECURED 32 SWP		SRO
SWS	MDP	05/08/85 14:05	05/09/85 09:15	19.17	STARTED/SECURED 31 SWP		SRO
SWS	MDP	05/08/85 20:50	05/09/85 10:55	14.08	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/09/85 09:15	05/09/85 12:30	3.25	STARTED/SECURED 32 SWP		SRO
SWS	MDP	05/09/85 09:15	05/09/85 12:30	3.25	STARTED/SECURED 35 SWP		SRO
SWS	MDP	05/09/85 10:55	05/11/85 02:15	39.33	STARTED/SECURED 31 SWP		SRO
SWS	MDP	05/09/85 10:55	05/11/85 02:15	39.33	STARTED/SECURED 36 SWP		SRO
SWS	MDP	05/09/85 12:30	05/12/85 04:00	63.50	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/09/85 12:30	05/26/85 13:16	408.77	STARTED/SECURED 34 SWP FOR 3PT-M35		SRO
SWS	MDP	05/11/85 02:15	05/24/85 07:56	317.68	STARTED/SECURED 32 SWP		SRO
SWS	MDP	05/11/85 02:15	05/24/85 07:58	317.72	STARTED/SECURED 35 SWP		SRO
SWS	MDP	05/12/85 04:00	05/13/85 01:10	21.17	STARTED/SECURED 31 SWP		SRO
SWS	MDP	05/13/85 01:10	05/26/85 13:15	324.08	STARTED/SECURED 33 SWP FOR 3PT-M35		SRO
SWS	MDP	05/24/85 07:56	05/26/85 11:05	51.15	STARTED/SECURED 31 SWP FOR 3PT-M35		SRO
SWS	MDP	05/24/85 07:58	05/30/85 13:17	149.32	STARTED/SECURED 36 SWP		SRO
SWS	MDP	05/26/85 11:05	06/11/85 09:20	382.25	STARTED/SECURED 32 SWP		SRO
SWS	MDP	05/26/85 13:15	05/27/85 13:20	24.08	STARTED/SECURED 31 SWP		SRO
SWS	MDP	05/26/85 13:16	06/17/85 10:20	525.07	STARTED/SECURED 35 SWP		SRO
SWS	MDP	05/27/85 10:08	05/29/85 00:15	38.12	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/28/85 09:34	05/31/85 01:15	63.68	STARTED/SECURED 31 SWP		SRO
SWS	MDP	05/30/85 08:00	06/11/85 09:48	289.80	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/30/85 13:17	06/07/85 09:07	187.83	STARTED/SECURED 34 SWP		SRO
SWS	MDP	06/07/85 09:07	06/07/85 11:25	2.30	STARTED/SECURED 36 SWP		SRO
SWS	MDP	06/07/85 11:25	06/17/85 08:18	236.88	STARTED/SECURED 34 SWP		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	06/08/85 21:00	06/14/85 16:52	139.87	STARTED/SECURED 31 SWP		SRO
SWS	MDP	06/14/85 16:52	06/17/85 13:18	68.43	STARTED/SECURED 32 SWP		SRO
SWS	MDP	06/17/85 08:18	06/17/85 19:51	11.55	STARTED/SECURED 36 SWP		SRO
SWS	MDP	06/17/85 10:20	06/21/85 13:05	98.75	STARTED/SECURED 34 SWP		SRO
SWS	MDP	06/17/85 13:18	06/19/85 13:46	48.47	STARTED/SECURED 33 SWP		SRO
SWS	MDP	06/17/85 19:51	06/23/85 10:18	134.45	STARTED/SECURED 35 SWP		SRO
SWS	MDP	06/19/85 13:46	06/20/85 09:42	19.93	STARTED/SECURED 31 SWP		SRO
SWS	MDP	06/20/85 09:42	06/24/85 10:13	96.52	STARTED/SECURED 32 SWP		SRO
SWS	MDP	06/20/85 13:05	06/22/85 07:54	42.82	STARTED/SECURED 36 SWP		SRO
SWS	MDP	06/22/85 07:54	06/23/85 11:11	27.28	STARTED/SECURED 34 SWP		SRO
SWS	MDP	06/23/85 10:18	06/24/85 10:12	23.90	STARTED/SECURED 31 SWP		SRO
SWS	MDP	06/23/85 11:19	06/24/85 03:00	15.68	STARTED/SECURED 34 SWP		SRO
SWS	MDP	06/24/85 10:12	06/24/85 10:15	0.05	STARTED/SECURED 33 SWP		SRO
SWS	MDP	06/24/85 10:13	07/03/85 18:18	224.08	STARTED/SECURED 31 SWP		SRO
SWS	MDP	06/24/85 10:15	07/03/85 20:45	226.50	STARTED/SECURED 32 SWP		SRO
SWS	MDP	07/03/85 18:18	07/17/85 13:30	331.20	STARTED/SECURED 34 SWP		SRO
SWS	MDP	07/03/85 20:45	07/11/85 17:00	188.25	STARTED/SECURED 36 SWP		SRO
SWS	MDP	07/08/85 20:57	07/08/85 21:12	0.25	STARTED/SECURED 35 SWP		SRO
SWS	MDP	07/08/85 21:25	07/18/85 03:31	222.10	STARTED/SECURED 35 SWP		SRO
SWS	MDP	07/17/85 13:30	08/19/85 18:33	797.05	STARTED/SECURED 36 SWP		SRO
SWS	MDP	07/19/85 21:38	07/20/85 16:20	18.70	STARTED/SECURED 31 SWP		SRO
SWS	MDP	07/20/85 16:20	07/25/85 09:05	112.75	STARTED/SECURED 33 SWP		SRO
SWS	MDP	07/25/85 08:40	08/23/85 12:34	699.90	STARTED/SECURED 35 SWP		SRO
SWS	MDP	07/25/85 09:05	07/25/85 09:15	0.17	STARTED/SECURED 31 SWP		SRO
SWS	MDP	07/25/85 09:15	08/13/85 04:20	451.08	STARTED/SECURED 32 SWP		SRO
SWS	MDP	08/13/85 04:20	08/19/85 18:33	158.22	STARTED/SECURED 33 SWP		SRO
SWS	MDP	08/19/85 18:33	08/29/85 12:33	234.00	STARTED/SECURED 31 SWP		SRO
SWS	MDP	08/19/85 18:33	08/21/85 09:30	38.95	STARTED/SECURED 34 SWP		SRO
SWS	MDP	08/21/85 04:30	08/23/85 12:59	56.48	STARTED/SECURED 36 SWP		SRO
SWS	MDP	08/23/85 12:33	08/23/85 12:52	0.32	STARTED/SECURED 32 SWP		SRO
SWS	MDP	08/23/85 12:34	08/23/85 13:01	0.45	STARTED/SECURED 34 SWP		SRO
SWS	MDP	08/23/85 12:52	08/23/85 13:17	0.42	STARTED/SECURED 33 SWP		SRO
SWS	MDP	08/23/85 12:59	09/02/85 17:00	244.02	STARTED/SECURED 35 SWP		SRO
SWS	MDP	08/23/85 13:01	09/10/85 17:51	436.83	STARTED/SECURED 36 SWP		SRO
SWS	MDP	08/23/85 13:17	08/31/85 11:33	190.27	STARTED/SECURED 31 SWP		SRO
SWS	MDP	08/31/85 11:33	09/16/85 00:45	373.20	STARTED/SECURED 33 SWP		SRO
SWS	MDP	09/10/85 17:51	09/11/85 08:31	14.67	STARTED/SECURED 34 SWP		SRO
SWS	MDP	09/11/85 08:31	09/11/85 09:42	1.18	STARTED/SECURED 31 SWP		SRO
SWS	MDP	09/11/85 09:42	09/17/85 07:11	141.48	STARTED/SECURED 36 SWP		SRO
SWS	MDP	09/15/85 09:25	09/17/85 16:45	55.33	STARTED/SECURED 31 SWP		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	09/16/85 13:09	09/16/85 13:10	0.02	STARTED/SECURED 35 SWP		SRO
SWS	MDP	09/16/85 13:39	09/17/85 02:23	12.73	STARTED/SECURED 35 SWP		SRO
SWS	MDP	09/17/85 07:11	09/17/85 08:39	1.47	STARTED/SECURED 35 SWP		SRO
SWS	MDP	09/17/85 08:39	09/17/85 08:45	0.10	STARTED/SECURED 34 SWP		SRO
SWS	MDP	09/17/85 08:45	09/17/85 08:59	0.23	STARTED/SECURED 35 SWP		SRO
SWS	MDP	09/17/85 10:15	09/17/85 10:17	0.03	STARTED/SECURED 34 SWP		SRO
SWS	MDP	09/17/85 10:29	09/17/85 10:30	0.02	STARTED/SECURED 34 SWP		SRO
SWS	MDP	09/17/85 10:36	09/17/85 10:49	0.22	STARTED/SECURED 34 SWP		SRO
SWS	MDP	09/17/85 12:56	09/17/85 15:00	2.07	STARTED/SECURED 34 SWP		SRO
SWS	MDP	09/17/85 12:56	09/17/85 15:00	2.07	STARTED/SECURED 34 SWP		SRO
SWS	MDP	09/17/85 16:45	09/17/85 17:05	0.33	STARTED/SECURED 32 SWP FOR PT		SRO
SWS	MDP	09/17/85 17:05	09/18/85 14:35	21.50	STARTED/SECURED 31 SWP		SRO
SWS	MDP	09/18/85 13:45	09/18/85 13:50	0.08	STARTED/SECURED 34 SWP		SRO
SWS	MDP	09/18/85 13:52	09/18/85 14:26	0.57	STARTED/SECURED 35 SWP		SRO
SWS	MDP	09/18/85 14:27	09/18/85 14:40	0.22	STARTED/SECURED 34 SWP		SRO
SWS	MDP	09/18/85 14:35	09/21/85 12:05	69.50	STARTED/SECURED 32 SWP		SRO
SWS	MDP	09/18/85 14:55	09/18/85 15:55	1.00	STARTED/SECURED 34 SWP		SRO
SWS	MDP	09/18/85 15:55	09/19/85 21:45	29.83	STARTED/SECURED 35 SWP		SRO
SWS	MDP	09/19/85 21:45	09/30/85 13:45	256.00	STARTED/SECURED 36 SWP		SRO
SWS	MDP	09/21/85 12:05	09/30/85 13:20	217.25	STARTED/SECURED 31 SWP		SRO
SWS	MDP	09/21/85 15:50	09/30/85 13:40	213.83	STARTED/SECURED 33 SWP		SRO
SWS	MDP	09/30/85 13:20	10/08/85 22:53	201.55	STARTED/SECURED 32 SWP		SRO
SWS	MDP	09/30/85 13:25	09/30/85 13:45	0.33	STARTED/SECURED 35 SWP		SRO
SWS	MDP	09/30/85 13:40	10/01/85 00:40	11.00	STARTED/SECURED 31 SWP		SRO
SWS	MDP	09/30/85 13:45	10/24/85 09:55	572.17	STARTED/SECURED 34 SWP FOR 3PT-M35		SRO
SWS	MDP	10/02/85 20:31	10/02/85 21:00	0.48	STARTED/SECURED 31 SWP		SRO
SWS	MDP	10/04/85 17:50	10/24/85 09:55	472.08	STARTED/SECURED 33 SWP FOR 3PT-M35		SRO
SWS	MDP	10/05/85 09:46	10/05/85 10:42	0.93	STARTED/SECURED 36 SWP		SRO
SWS	MDP	10/07/85 09:12	10/07/85 09:16	0.07	STARTED/SECURED 31 SWP MTR FOR PERFORMANCE		SRO
SWS	MDP	10/08/85 22:53	10/08/85 23:15	0.37	STARTED/SECURED 31 SWP		SRO
SWS	MDP	10/08/85 23:15	11/22/85 12:08	1068.88	STARTED/SECURED 32 SWP FOR 3PT-M35		SRO
SWS	MDP	10/24/85 09:54	11/19/85 04:03	618.15	STARTED/SECURED 31 SWP		SRO
SWS	MDP	10/24/85 09:54	11/23/85 12:47	722.88	STARTED/SECURED 36 SWP		SRO
SWS	MDP	11/19/85 04:03	11/22/85 12:08	80.08	STARTED/SECURED 33 SWP FOR 3PT-M35		SRO
SWS	MDP	11/22/85 12:08	12/11/85 19:58	463.83	STARTED/SECURED 31 SWP		SRO
SWS	MDP	11/22/85 12:18	12/12/85 13:53	481.58	STARTED/SECURED 34 SWP		SRO
SWS	MDP	11/22/85 12:45	11/22/85 12:58	0.22	STARTED/SECURED 32 SWP FOR 3PT-M35		SRO
SWS	MDP	11/22/85 12:45	12/12/85 09:39	476.90	STARTED/SECURED 35 SWP		SRO
SWS	MDP	11/22/85 12:58	12/06/85 17:32	340.57	STARTED/SECURED 33 SWP		SRO
SWS	MDP	12/06/85 17:32	12/11/85 20:45	123.22	STARTED/SECURED 32 SWP		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	12/11/85 19:58	12/16/85 09:10	109.20	STARTED/SECURED 33 SWP		SRO
SWS	MDP	12/11/85 20:45	12/17/85 10:05	133.33	STARTED/SECURED 31 SWP		SRO
SWS	MDP	12/12/85 09:39	12/21/85 10:59	217.33	STARTED/SECURED 36 SWP FOR 3PT-M35		SRO
SWS	MDP	12/16/85 09:10	01/13/86 07:34	670.40	STARTED/SECURED 32 SWP		SRO
SWS	MDP	12/17/85 10:05	12/21/85 10:58	96.88	STARTED/SECURED 33 SWP FOR 3PT-M35		SRO
SWS	MDP	12/19/85 13:30	12/19/85 20:50	7.33	STARTED/SECURED 31 SWP		SRO
SWS	MDP	12/21/85 10:58	12/31/85 09:42	238.73	STARTED/SECURED 31 SWP		SRO
SWS	MDP	12/21/85 10:59	02/10/86 19:40	1232.68	STARTED/SECURED 34 SWP		SRO
SWS	MDP	12/31/85 09:42	01/14/86 19:30	345.80	STARTED/SECURED 33 SWP		SRO
SWS	MDP	01/13/86 07:34	01/16/86 10:31	74.95	STARTED/SECURED 31 SWP FOR 3PT-M35		SRO
SWS	MDP	01/14/86 19:30	01/14/86 19:45	0.25	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	01/14/86 19:45	05/05/86 19:55	2664.17	STARTED/SECURED 33 SWP		SRO
SWS	MDP	01/16/86 10:30	02/16/86 13:30	747.00	STARTED/SECURED 32 SWP FOR 3PT-M35		SRO
SWS	MDP	01/16/86 10:30	02/10/86 17:10	606.67	STARTED/SECURED 36 SWP FOR 3PT-M35		SRO
SWS	MDP	02/10/86 17:10	02/11/86 19:10	26.00	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	02/10/86 19:40	02/16/86 13:10	137.50	STARTED/SECURED 36 SWP FOR 3PT-M35		SRO
SWS	MDP	02/11/86 19:10	02/16/86 13:30	114.33	STARTED/SECURED 34 SWP FOR 3PT-M35		SRO
SWS	MDP	02/16/86 13:10	02/24/86 02:42	181.53	STARTED/SECURED 31 SWP FOR 3PT-M35		SRO
SWS	MDP	02/16/86 13:10	02/23/86 21:45	176.58	STARTED/SECURED 35 SWP FOR 3PT-M35		SRO
SWS	MDP	02/16/86 13:30	02/26/86 18:22	244.87	STARTED/SECURED 36 SWP FOR 3PT-M35		SRO
SWS	MDP	02/24/86 13:55	02/24/86 14:25	0.50	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	02/25/86 23:08	02/25/86 23:10	0.03	BUMPED 35 SWP FOR ROTATION (SAT)		SRO
SWS	MDP	02/26/86 16:20	02/26/86 16:22	0.03	BUMPED 35 SWP FOR ROTATION (SAT)		SRO
SWS	MDP	02/26/86 18:22	02/28/86 14:08	43.77	STARTED/SECURED 35 SWP		SRO
SWS	MDP	02/28/86 18:36	03/09/86 16:05	213.48	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/03/86 04:10	03/10/86 17:39	181.48	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	03/09/86 09:25	03/09/86 17:55	8.50	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/09/86 16:05	03/09/86 19:25	3.33	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	03/09/86 19:25	03/10/86 17:35	22.17	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/10/86 17:35	03/13/86 18:22	72.78	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	03/10/86 17:39	03/17/86 13:05	163.43	STARTED/SECURED 32 SWP FOR 3PT-M35		SRO
SWS	MDP	03/10/86 17:53	03/11/86 17:40	23.78	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/11/86 17:40	03/11/86 18:10	0.50	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/12/86 19:20	03/12/86 19:40	0.33	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/12/86 19:20	03/12/86 19:40	0.33	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/13/86 18:22	03/14/86 15:41	21.32	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/14/86 15:20	03/14/86 16:52	1.53	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	03/14/86 15:40	03/14/86 17:53	2.22	STARTED/SECURED 35 SWP FOR MTC		SRO
SWS	MDP	03/14/86 16:51	03/14/86 22:06	5.25	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/14/86 17:52	03/17/86 13:08	67.27	STARTED/SECURED 34 SWP FOR 3PT-M35		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	03/14/86 22:05	03/27/86 11:05	301.00	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/17/86 13:05	03/25/86 12:30	191.42	STARTED/SECURED 31 SWP		SRO
SWS	MDP	03/17/86 13:08	03/25/86 22:30	201.37	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/25/86 12:30	03/29/86 13:40	97.17	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	03/25/86 22:30	03/25/86 22:44	0.23	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	03/25/86 22:44	03/27/86 10:36	35.87	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/27/86 10:36	03/27/86 12:08	1.53	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	03/27/86 11:05	03/27/86 11:22	0.28	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/27/86 11:22	04/15/86 10:16	454.90	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/28/86 12:08	03/30/86 01:07	36.98	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/29/86 13:30	03/29/86 16:58	3.47	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	03/29/86 16:58	04/09/86 11:40	258.70	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	03/30/86 06:04	04/09/86 00:50	234.77	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/31/86 09:30	03/31/86 13:00	3.50	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	04/05/86 01:18	04/05/86 01:40	0.37	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	04/07/86 12:00	04/09/86 00:30	36.50	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	04/09/86 00:50	04/09/86 11:48	10.97	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	04/09/86 11:40	04/10/86 17:05	29.42	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	04/09/86 11:48	04/10/86 14:12	26.40	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	04/09/86 11:58	04/10/86 11:05	23.12	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	04/10/86 14:12	04/10/86 17:15	3.05	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	04/10/86 17:05	04/10/86 21:30	4.42	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	04/11/86 19:12	04/15/86 10:11	86.98	STARTED/SECURED 32 SWP FOR 3PT-M35		SRO
SWS	MDP	04/11/86 19:13	04/14/86 17:16	70.05	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	04/14/86 17:16	04/15/86 10:18	17.03	STARTED/SECURED 36 SWP FOR 3PT-M35		SRO
SWS	MDP	04/15/86 10:11	04/16/86 09:23	23.20	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	04/15/86 10:16	04/15/86 10:34	0.30	STARTED/SECURED 34 SWP FOR 3PT-M35		SRO
SWS	MDP	04/15/86 10:18	05/03/86 09:45	431.45	STARTED/SECURED 35 SWP FOR MTC		SRO
SWS	MDP	04/15/86 10:35	04/23/86 15:40	197.08	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	04/16/86 09:23	05/05/86 17:30	464.12	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	04/23/86 15:40	04/26/86 07:44	64.07	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	04/26/86 16:40	05/05/86 20:15	219.58	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	05/05/86 19:55	05/05/86 21:00	1.08	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	05/05/86 20:15	05/08/86 07:30	59.25	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/05/86 20:15	05/05/86 20:40	0.42	STARTED/SECURED 34 SWP.	START TIME (36 SWP OFF)	SRO
SWS	MDP	05/05/86 20:40	06/17/86 19:25	1030.75	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	05/05/86 21:00	05/08/86 10:40	61.67	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	05/08/86 07:30	05/13/86 13:15	125.75	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	05/08/86 10:40	05/13/86 13:17	122.62	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	05/13/86 13:15	05/15/86 09:10	43.92	STARTED/SECURED 32 SWP.		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	05/13/86 13:17	05/14/86 01:03	11.77	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/14/86 16:15	05/15/86 09:10	16.92	STARTED/SECURED 33 SWP.		SRO
SWS	MDP	05/15/86 07:50	05/15/86 12:44	4.90	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	05/15/86 09:10	05/16/86 12:42	27.53	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	05/16/86 12:41	05/16/86 13:10	0.48	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	05/16/86 12:43	06/17/86 19:20	774.62	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	05/16/86 13:10	06/17/86 09:18	764.13	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/19/86 05:08	05/27/86 12:30	199.37	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	05/27/86 12:30	06/14/86 01:25	420.92	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	06/03/86 08:55	06/03/86 20:40	11.75	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	06/13/86 09:42	06/13/86 11:14	1.53	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	06/17/86 03:01	06/17/86 17:04	14.05	STARTED/SECURED 31 SWP FOR 3PT-M35		SRO
SWS	MDP	06/17/86 03:01	06/17/86 19:23	16.37	STARTED/SECURED 35 SWP FOR 3PT-M35		SRO
SWS	MDP	06/17/86 17:04	06/17/86 19:17	2.22	STARTED/SECURED 32 SWP FOR 3PT-M35		SRO
SWS	MDP	06/17/86 17:05	06/17/86 19:26	2.35	STARTED/SECURED 31 SWP FOR 3PT-M35		SRO
SWS	MDP	06/17/86 19:18	06/23/86 12:31	137.22	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	06/17/86 19:20	06/23/86 12:42	137.37	STARTED/SECURED 33 SWP		SRO
SWS	MDP	06/17/86 19:23	07/02/86 08:05	348.70	STARTED/SECURED 34 SWP FOR 3PT-M35		SRO
SWS	MDP	06/17/86 19:25	07/02/86 17:22	357.95	STARTED/SECURED 35 SWP FOR 3PT-M35		SRO
SWS	MDP	06/21/86 00:06	06/23/86 12:35	60.48	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	06/23/86 12:35	07/19/86 16:43	628.13	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	06/23/86 12:42	07/17/86 20:20	583.63	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	06/25/86 12:12	07/01/86 09:12	141.00	STARTED/SECURED 33 SWP.		SRO
SWS	MDP	07/02/86 08:05	07/19/86 17:14	417.15	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	07/02/86 17:21	07/19/86 16:43	407.37	STARTED/SECURED 34 SWP FOR MTC.		SRO
SWS	MDP	07/10/86 20:13	07/16/86 09:00	132.78	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	07/17/86 20:20	07/19/86 17:14	44.90	STARTED/SECURED 33 SWP		SRO
SWS	MDP	07/19/86 16:43	08/13/86 16:50	600.12	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	07/19/86 16:43	07/27/86 11:29	186.77	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	07/19/86 17:14	08/02/86 09:25	328.18	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	07/19/86 17:14	07/19/86 21:40	4.43	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	07/19/86 21:40	08/01/86 15:28	305.80	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	07/27/86 11:29	08/13/86 17:23	413.90	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	08/13/86 16:50	08/13/86 17:05	0.25	STARTED/SECURED 32 SWP FOR 3PT-M35		SRO
SWS	MDP	08/13/86 17:05	08/13/86 17:24	0.32	STARTED/SECURED 33 SWP FOR 3PT-M35		SRO
SWS	MDP	08/13/86 17:23	08/13/86 17:40	0.28	STARTED/SECURED 35 SWP FOR 3PT-M35		SRO
SWS	MDP	08/13/86 17:24	09/02/86 19:08	481.73	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	08/13/86 17:40	08/13/86 19:55	2.25	STARTED/SECURED 36 SWP FOR 3PT-M35		SRO
SWS	MDP	08/13/86 19:55	09/03/86 22:00	506.08	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	09/02/86 19:08	09/13/86 14:10	259.03	STARTED/SECURED 33 SWP FOR 3PT-M35		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	09/03/86 22:00	10/12/86 13:05	927.08	STARTED/SECURED 36 SWP FOR 3PT-M35		SRO
SWS	MDP	09/13/86 14:10	10/12/86 13:02	694.87	STARTED/SECURED 32 SWP FOR 3PT-M35		SRO
SWS	MDP	09/13/86 14:10	09/19/86 07:38	137.47	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	09/19/86 09:23	10/08/86 13:17	459.90	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	10/08/86 13:55	10/12/86 13:04	95.15	STARTED/SECURED 35 SWP FOR 3PT-M35		SRO
SWS	MDP	10/12/86 12:45	10/12/86 13:03	0.30	STARTED/SECURED 31 SWP FOR 3PT-M35		SRO
SWS	MDP	10/12/86 12:45	10/12/86 13:06	0.35	STARTED/SECURED 34 SWP FOR 3PT-M35		SRO
SWS	MDP	10/12/86 13:03	10/24/86 22:07	297.07	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	10/12/86 13:03	10/12/86 13:15	0.20	STARTED/SECURED 33 SWP FOR 3PT-M35		SRO
SWS	MDP	10/12/86 13:05	10/15/86 08:40	67.58	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	10/12/86 13:06	10/15/86 03:24	62.30	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	10/12/86 13:15	10/17/86 17:17	124.03	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	10/15/86 03:24	10/15/86 03:50	0.43	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	10/15/86 03:50	11/11/86 12:48	656.97	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	10/15/86 08:40	10/15/86 08:51	0.18	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	10/15/86 08:51	10/16/86 03:12	18.35	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	10/16/86 03:12	10/23/86 14:45	179.55	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	10/16/86 18:03	10/16/86 18:07	0.07	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	10/17/86 13:26	10/17/86 13:40	0.23	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	10/17/86 14:00	10/17/86 14:00	0.00	STARTED/SECURED 33 SWP		SRO
SWS	MDP	10/17/86 17:17	10/22/86 14:47	117.50	STARTED/SECURED 33 SWP.		SRO
SWS	MDP	10/22/86 14:47	10/22/86 15:06	0.32	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	10/22/86 17:22	10/24/86 05:40	36.30	STARTED/SECURED 31 SWP FOR RETEST.		SRO
SWS	MDP	10/23/86 14:45	10/24/86 15:20	24.58	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	10/24/86 17:04	10/24/86 17:06	0.03	BUMPED 31 SWP FOR ROTATION.		SRO
SWS	MDP	10/24/86 22:07	10/24/86 22:22	0.25	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	10/24/86 22:22	11/02/86 06:00	199.63	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	11/02/86 06:00	11/11/86 12:47	222.78	STARTED/SECURED 31 SWP FOR 3PT-M35		SRO
SWS	MDP	11/10/86 20:30	11/10/86 20:35	0.08	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	11/10/86 21:00	12/06/86 08:57	611.95	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	11/11/86 12:46	12/01/86 13:38	480.87	STARTED/SECURED 33 SWP		SRO
SWS	MDP	11/11/86 12:48	11/11/86 13:05	0.28	STARTED/SECURED 34 SWP FOR 3PT-M35		SRO
SWS	MDP	11/11/86 13:05	12/02/86 07:40	498.58	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	12/01/86 13:38	12/01/86 21:35	7.95	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	12/01/86 21:35	12/02/86 21:44	24.15	STARTED/SECURED 33 SWP FOR 3PT-M35		SRO
SWS	MDP	12/02/86 07:40	12/02/86 12:30	4.83	STARTED/SECURED 34 SWP FOR 3PT-M35		SRO
SWS	MDP	12/02/86 12:30	12/02/86 12:40	0.17	STARTED/SECURED 36 SWP FOR 3PT-M35		SRO
SWS	MDP	12/02/86 12:40	12/02/86 13:54	1.23	STARTED/SECURED 34 SWP FOR 3PT-M35		SRO
SWS	MDP	12/02/86 13:54	12/08/86 21:58	152.07	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	12/02/86 21:44	12/04/86 16:29	42.75	STARTED/SECURED 31 SWP.		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	12/04/86 16:00	12/08/86 21:00	101.00	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	12/04/86 16:29	12/08/86 20:59	100.50	STARTED/SECURED 33 SWP		SRO
SWS	MDP	12/06/86 08:57	12/08/86 17:55	56.97	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	12/08/86 17:55	12/08/86 18:10	0.25	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	12/08/86 18:10	12/09/86 09:35	15.42	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	12/08/86 20:59	12/08/86 21:57	0.97	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	12/08/86 21:00	12/18/86 05:54	224.90	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	12/08/86 21:57	12/09/86 17:27	19.50	STARTED/SECURED 33 SWP		SRO
SWS	MDP	12/08/86 21:58	12/09/86 17:28	19.50	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	12/09/86 09:35	12/09/86 21:00	11.42	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	12/09/86 17:27	12/09/86 21:00	3.55	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	12/09/86 17:28	12/09/86 21:02	3.57	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	12/09/86 21:00	12/10/86 20:30	23.50	STARTED/SECURED 33 SWP		SRO
SWS	MDP	12/09/86 21:02	12/10/86 19:05	22.05	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	12/10/86 19:05	12/13/86 09:42	62.62	STARTED/SECURED 36 SWP FOR 3PT-M35		SRO
SWS	MDP	12/10/86 20:30	12/11/86 15:46	19.27	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	12/10/86 20:30	12/12/86 23:47	51.28	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	12/11/86 15:46	12/15/86 10:27	90.68	STARTED/SECURED 33 SWP		SRO
SWS	MDP	12/12/86 23:47	12/13/86 09:42	9.92	STARTED/SECURED 31 SWP FOR 3PT-M35		SRO
SWS	MDP	12/13/86 09:42	12/20/86 23:44	182.03	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	12/13/86 09:42	12/18/86 04:58	115.27	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	12/15/86 10:27	12/16/86 02:21	15.90	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	12/16/86 02:21	12/19/86 00:40	70.32	STARTED/SECURED 33 SWP		SRO
SWS	MDP	12/18/86 04:58	12/19/86 03:31	22.55	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	12/18/86 05:54	12/19/86 00:40	18.77	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	12/18/86 12:13	12/19/86 01:03	12.83	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	12/19/86 00:40	12/20/86 01:00	24.33	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	12/19/86 01:03	12/26/86 16:19	183.27	STARTED/SECURED 33 SWP		SRO
SWS	MDP	12/19/86 03:31	12/20/86 00:46	21.25	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	12/20/86 00:46	12/20/86 17:40	16.90	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	12/20/86 01:00	12/20/86 17:10	16.17	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	12/20/86 17:10	12/21/86 00:35	7.42	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	12/20/86 17:40	12/20/86 22:12	4.53	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	12/20/86 22:12	12/21/86 00:23	2.18	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	12/20/86 23:44	12/22/86 02:25	26.68	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	12/21/86 00:23	12/22/86 02:26	26.05	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	12/21/86 00:35	12/23/86 18:45	66.17	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	12/22/86 02:25	12/27/86 17:45	135.33	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	12/22/86 02:26	12/26/86 16:03	109.62	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	12/23/86 18:45	12/26/86 15:40	68.92	STARTED/SECURED 35 SWP.		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	12/26/86 15:40	12/26/86 16:19	0.65	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	12/26/86 16:03	12/26/86 17:40	1.62	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	12/26/86 16:19	12/26/86 17:50	1.52	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	12/26/86 16:19	12/27/86 17:55	25.60	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	12/27/86 17:40	12/28/86 16:35	22.92	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	12/27/86 17:45	12/27/86 18:20	0.58	STARTED/SECURED 33 SWP		SRO
SWS	MDP	12/27/86 17:50	12/27/86 18:30	0.67	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	12/27/86 17:55	12/28/86 16:30	22.58	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	12/27/86 18:20	12/28/86 16:22	22.03	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	12/27/86 18:30	12/29/86 15:30	45.00	STARTED/SECURED 33 SWP		SRO
SWS	MDP	12/28/86 16:22	12/29/86 15:20	22.97	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	12/28/86 16:30	12/29/86 15:30	23.00	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	12/28/86 16:35	12/29/86 15:25	22.83	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	12/29/86 15:20	12/30/86 10:13	18.88	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	12/29/86 15:25	12/30/86 13:42	22.28	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	12/29/86 15:30	12/30/86 12:17	20.78	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	12/29/86 15:30	12/30/86 12:50	21.33	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	12/30/86 10:13	12/30/86 15:38	5.42	STARTED/SECURED 33 SWP		SRO
SWS	MDP	12/30/86 12:17	12/30/86 15:30	3.22	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	12/30/86 12:50	12/30/86 15:55	3.08	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	12/30/86 13:42	12/30/86 15:47	2.08	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	12/30/86 15:30	12/30/86 16:47	1.28	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	12/30/86 15:38	12/30/86 15:55	0.28	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	12/30/86 15:47	12/30/86 16:58	1.18	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	12/30/86 15:55	12/30/86 17:52	1.95	STARTED/SECURED 33 SWP		SRO
SWS	MDP	12/30/86 15:55	12/30/86 17:02	1.12	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	12/30/86 16:47	12/30/86 17:46	0.98	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	12/30/86 16:50	12/30/86 20:15	3.42	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	12/30/86 17:02	12/30/86 17:37	0.58	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	12/30/86 17:37	12/30/86 19:25	1.80	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	12/30/86 17:46	12/30/86 19:25	1.65	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	12/30/86 17:52	12/30/86 19:15	1.38	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	12/30/86 19:15	12/31/86 14:30	19.25	STARTED/SECURED 33 SWP		SRO
SWS	MDP	12/30/86 19:25	12/30/86 20:15	0.83	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	12/30/86 19:25	12/30/86 20:25	1.00	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	12/30/86 20:15	01/07/87 12:56	184.68	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	12/30/86 20:15	12/31/86 14:36	18.35	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	12/30/86 20:25	12/30/86 20:50	0.42	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	12/30/86 20:50	12/30/86 21:20	0.50	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	12/30/86 21:20	12/31/86 17:45	20.42	STARTED/SECURED 34 SWP.		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	12/31/86 14:31	01/07/87 12:44	166.22	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	12/31/86 14:36	01/01/87 08:25	17.82	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	01/01/87 08:25	01/03/87 12:00	51.58	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	01/01/87 12:30	01/03/87 11:40	47.17	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	01/03/87 11:40	01/05/87 07:34	43.90	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	01/03/87 12:00	01/05/87 07:49	43.82	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	01/05/87 07:34	01/06/87 05:45	22.18	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	01/05/87 07:49	01/06/87 05:23	21.57	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	01/06/87 05:23	01/06/87 06:07	0.73	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	01/06/87 05:45	01/07/87 06:20	24.58	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	01/06/87 06:07	01/06/87 20:15	14.13	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	01/06/87 20:15	01/08/87 14:10	41.92	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	01/07/87 06:20	01/07/87 17:32	11.20	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	01/07/87 12:44	01/09/87 05:45	41.02	STARTED/SECURED 33 SWP		SRO
SWS	MDP	01/07/87 12:56	01/11/87 03:50	86.90	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	01/07/87 17:32	01/12/87 00:45	103.22	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	01/08/87 14:10	01/10/87 16:29	50.32	STARTED/SECURED 34 SWP FOR 3PT-M35		SRO
SWS	MDP	01/09/87 05:45	01/10/87 16:28	34.72	STARTED/SECURED 32 SWP FOR 3PT-M35		SRO
SWS	MDP	01/10/87 16:04	01/10/87 19:16	3.20	STARTED/SECURED 33 SWP FOR 3PT-M35		SRO
SWS	MDP	01/10/87 16:28	01/11/87 03:50	11.37	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	01/10/87 16:29	01/12/87 01:05	32.60	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	01/10/87 19:16	01/11/87 04:15	8.98	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	01/11/87 03:50	01/11/87 04:37	0.78	STARTED/SECURED 33 SWP		SRO
SWS	MDP	01/11/87 04:15	01/11/87 10:01	5.77	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	01/11/87 04:37	01/12/87 00:45	20.13	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	01/11/87 10:01	01/11/87 18:53	8.87	STARTED/SECURED 33 SWP		SRO
SWS	MDP	01/11/87 18:53	01/12/87 01:05	6.20	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	01/12/87 00:45	01/12/87 01:20	0.58	STARTED/SECURED 33 SWP		SRO
SWS	MDP	01/12/87 00:45	01/12/87 01:20	0.58	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	01/12/87 01:05	01/12/87 06:15	5.17	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	01/12/87 01:05	01/12/87 23:55	22.83	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	01/12/87 01:20	01/12/87 20:37	19.28	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	01/12/87 01:20	01/12/87 13:18	11.97	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	01/12/87 06:15	01/12/87 07:15	1.00	STARTED/SECURED 33 SWP		SRO
SWS	MDP	01/12/87 07:15	01/13/87 20:10	36.92	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	01/12/87 20:10	02/03/87 16:43	524.55	STARTED/SECURED 33 SWP		SRO
SWS	MDP	01/12/87 23:55	02/03/87 16:47	520.87	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	01/13/87 00:18	01/15/87 07:48	55.50	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	01/13/87 20:37	01/16/87 03:15	54.63	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	01/15/87 07:48	01/16/87 03:16	19.47	STARTED/SECURED 36 SWP.		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	01/16/87 03:15	01/31/87 07:43	364.47	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	01/16/87 03:16	02/03/87 16:49	445.55	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	02/02/87 06:52	02/03/87 16:40	33.80	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	02/03/87 16:40	02/03/87 17:30	0.83	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	02/03/87 16:43	02/10/87 12:30	163.78	STARTED/SECURED 31 SWP FOR 3PT-M35		SRO
SWS	MDP	02/03/87 16:47	02/03/87 17:30	0.72	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	02/03/87 16:49	03/09/87 14:30	813.68	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	02/03/87 17:30	02/10/87 12:30	163.00	STARTED/SECURED 33 SWP FOR 3PT-M35		SRO
SWS	MDP	02/03/87 17:30	02/10/87 12:32	163.03	STARTED/SECURED 35 SWP FOR 3PT-M35		SRO
SWS	MDP	02/10/87 12:30	02/12/87 03:15	38.75	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	02/10/87 12:32	02/10/87 13:00	0.47	STARTED/SECURED 36 SWP FOR 3PT-M35		SRO
SWS	MDP	02/10/87 13:00	03/07/87 00:50	587.83	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	02/11/87 08:40	03/09/87 12:40	628.00	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	02/12/87 03:15	03/09/87 04:06	600.85	STARTED/SECURED 33 SWP		SRO
SWS	MDP	03/06/87 18:38	03/06/87 18:40	0.03	BUMPED 36 SWP FOR ROTATION CHECK.		SRO
SWS	MDP	03/06/87 21:10	03/06/87 21:12	0.03	BUMPED 36 SWP FOR ROTATION CHECK.		SRO
SWS	MDP	03/07/87 00:50	03/07/87 17:30	16.67	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/07/87 17:30	03/09/87 15:20	45.83	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/09/87 04:06	03/09/87 14:30	10.40	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	03/09/87 12:40	03/10/87 20:25	31.75	STARTED/SECURED 33 SWP		SRO
SWS	MDP	03/09/87 14:30	03/10/87 08:58	18.47	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	03/09/87 14:31	03/09/87 15:35	1.07	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/09/87 15:20	03/09/87 20:17	4.95	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	03/09/87 15:35	03/09/87 20:10	4.58	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/09/87 20:10	03/10/87 09:50	13.67	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/09/87 20:17	03/10/87 09:23	13.10	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/10/87 08:58	03/10/87 20:15	11.28	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	03/10/87 09:23	03/10/87 20:50	11.45	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	03/10/87 09:50	03/10/87 20:15	10.42	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/10/87 20:15	03/11/87 12:47	16.53	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	03/10/87 20:15	03/11/87 21:01	24.77	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/10/87 20:25	03/11/87 20:40	24.25	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	03/10/87 20:25	03/11/87 12:47	16.37	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/11/87 12:47	03/11/87 20:47	8.00	STARTED/SECURED 33 SWP		SRO
SWS	MDP	03/11/87 12:47	03/11/87 20:40	7.88	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	03/11/87 20:40	03/19/87 08:25	179.75	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	03/11/87 20:40	03/14/87 08:05	59.42	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/11/87 20:47	03/26/87 17:30	356.72	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	03/11/87 21:01	03/17/87 12:25	135.40	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	03/14/87 08:05	03/16/87 09:15	49.17	STARTED/SECURED 36 SWP.		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	03/16/87 09:15	03/17/87 12:15	27.00	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/16/87 12:15	03/19/87 08:18	68.05	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/17/87 12:25	03/25/87 19:37	199.20	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/19/87 08:18	03/25/87 21:54	157.60	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	03/19/87 18:25	03/28/87 18:47	216.37	STARTED/SECURED 33 SWP		SRO
SWS	MDP	03/25/87 19:55	03/25/87 22:35	2.67	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/25/87 22:12	03/26/87 19:10	20.97	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	03/25/87 22:35	03/26/87 00:01	1.43	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/26/87 00:01	03/26/87 01:09	1.13	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/26/87 01:09	03/26/87 06:17	5.13	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/26/87 06:17	03/26/87 15:50	9.55	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/26/87 06:48	03/26/87 07:50	1.03	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/26/87 15:50	03/28/87 01:48	33.97	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/26/87 17:30	03/26/87 17:40	0.17	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	03/26/87 17:40	03/28/87 16:58	47.30	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	03/26/87 19:10	03/26/87 20:40	1.50	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/26/87 20:40	03/27/87 04:35	7.92	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/26/87 23:54	03/27/87 03:01	3.12	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/27/87 04:25	03/27/87 06:24	1.98	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/27/87 05:02	03/27/87 16:57	11.92	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	03/27/87 16:57	03/28/87 18:47	25.83	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/27/87 16:57	03/28/87 16:18	23.35	STARTED/SECURED 36 SWP		SRO
SWS	MDP	03/28/87 09:30	03/28/87 17:40	8.17	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	03/28/87 16:18	03/29/87 20:40	28.37	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	03/28/87 16:58	03/29/87 13:52	20.90	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/28/87 17:40	03/30/87 08:54	39.23	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	03/28/87 18:47	03/29/87 15:35	20.80	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	03/29/87 13:52	03/30/87 00:32	10.67	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/29/87 15:35	03/29/87 21:50	6.25	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/29/87 21:50	03/30/87 11:28	13.63	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	03/29/87 22:10	03/30/87 19:55	21.75	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	03/30/87 00:32	04/02/87 18:23	89.85	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/30/87 08:54	03/31/87 21:30	36.60	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/30/87 11:28	04/01/87 17:47	54.32	STARTED/SECURED 33 SWP FOR 3PT-M35		SRO
SWS	MDP	03/30/87 19:55	04/02/87 08:56	61.02	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	03/31/87 21:30	03/31/87 22:15	0.75	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	03/31/87 22:15	04/01/87 18:04	19.82	STARTED/SECURED 35 SWP FOR 3PT-M35		SRO
SWS	MDP	04/01/87 17:47	04/19/87 03:47	418.00	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	04/01/87 18:04	04/01/87 18:14	0.17	STARTED/SECURED 34 SWP FOR 3PT-M35		SRO
SWS	MDP	04/01/87 18:14	04/03/87 04:31	34.28	STARTED/SECURED 36 SWP.		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	04/01/87 19:35	04/02/87 20:55	25.33	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	04/02/87 01:39	04/02/87 01:45	0.10	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	04/02/87 08:56	04/18/87 02:53	377.95	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/02/87 16:15	04/02/87 16:16	0.03	BUMPED 34 SWP FOR ROTATION		SRO
SWS	MDP	04/02/87 18:23	04/02/87 21:10	2.78	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	04/02/87 21:10	04/04/87 12:58	39.80	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	04/03/87 04:31	04/03/87 09:45	5.23	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	04/03/87 09:45	04/19/87 09:50	384.08	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	04/04/87 12:58	04/04/87 21:32	8.57	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	04/04/87 21:32	04/05/87 17:44	20.20	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	04/05/87 17:44	04/07/87 03:25	33.68	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	04/07/87 03:25	04/14/87 00:07	164.70	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	04/12/87 04:55	04/17/87 08:55	124.00	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	04/14/87 00:07	04/16/87 03:58	51.85	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	04/16/87 03:58	04/16/87 12:30	8.53	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	04/16/87 12:30	04/16/87 12:56	0.43	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	04/16/87 13:56	04/17/87 08:55	18.98	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	04/17/87 09:50	04/18/87 02:33	16.72	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	04/18/87 02:33	04/18/87 02:53	0.33	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	04/18/87 02:53	04/20/87 01:55	47.03	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	04/18/87 03:24	04/19/87 03:45	24.35	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	04/19/87 03:45	04/19/87 09:40	5.92	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	04/19/87 03:47	04/30/87 09:50	270.05	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/19/87 09:40	04/19/87 10:00	0.33	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	04/19/87 09:50	04/20/87 01:55	16.08	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	04/19/87 10:00	04/20/87 10:50	24.83	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	04/20/87 01:55	04/24/87 16:45	110.83	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	04/20/87 01:55	04/20/87 10:27	8.53	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	04/20/87 10:27	04/22/87 00:54	38.45	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	04/20/87 10:50	04/20/87 11:10	0.33	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	04/20/87 11:10	04/30/87 10:00	238.83	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	04/22/87 00:54	04/23/87 09:55	33.02	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	04/23/87 09:55	04/24/87 02:45	16.83	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	04/24/87 02:45	04/24/87 03:15	0.50	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	04/24/87 03:15	04/24/87 16:45	13.50	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	04/24/87 16:45	04/30/87 09:15	136.50	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	04/24/87 16:45	04/25/87 08:52	16.12	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	04/25/87 08:52	04/25/87 20:30	11.63	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	04/25/87 20:30	04/25/87 21:55	1.42	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	04/25/87 21:55	04/26/87 16:20	18.42	STARTED/SECURED 35 SWP.		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	04/26/87 16:20	04/26/87 19:47	3.45	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	04/26/87 19:47	04/26/87 23:25	3.63	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	04/26/87 23:25	04/28/87 21:58	46.55	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	04/28/87 21:58	04/29/87 18:38	20.67	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	04/29/87 18:38	04/30/87 09:30	14.87	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	04/30/87 09:15	05/01/87 16:58	31.72	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	04/30/87 09:30	05/01/87 12:13	26.72	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	04/30/87 09:50	05/03/87 10:20	72.50	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	04/30/87 10:00	04/30/87 10:20	0.33	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	04/30/87 10:20	05/04/87 18:10	103.83	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	05/01/87 12:13	05/01/87 16:13	4.00	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	05/01/87 16:13	05/02/87 01:47	9.57	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	05/01/87 16:58	05/15/87 11:33	330.58	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/02/87 21:20	05/03/87 08:55	11.58	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	05/02/87 22:10	05/03/87 12:30	14.33	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	05/03/87 08:55	05/04/87 17:11	32.27	STARTED/SECURED 31 SWP		SRO
SWS	MDP	05/03/87 10:20	05/04/87 10:12	23.87	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	05/03/87 12:30	05/04/87 10:53	22.38	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	05/03/87 20:10	05/04/87 12:10	16.00	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	05/04/87 10:53	05/04/87 17:35	6.70	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	05/04/87 12:10	05/06/87 21:40	57.50	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	05/04/87 17:35	05/08/87 09:15	87.67	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	05/04/87 18:10	05/05/87 00:00	5.83	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	05/15/87 11:35	05/18/87 09:01	69.43	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/20/87 08:26	05/20/87 08:28	0.03	BUMPING 34 SWP FOR ROTATION		SRO
SWS	MDP	05/20/87 08:26	05/20/87 08:28	0.03	BUMPING 35 SWP FOR ROTATION		SRO
SWS	MDP	05/20/87 08:26	05/20/87 08:28	0.03	BUMPING 36 SWP FOR ROTATION		SRO
SWS	MDP	05/22/87 13:39	05/22/87 15:06	1.45	STARTED/SECURED 34 SWP FOR TEST GROUP		SRO
SWS	MDP	05/22/87 15:06	05/22/87 16:12	1.10	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	05/22/87 15:30	05/22/87 16:12	0.70	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	05/31/87 07:58	06/04/87 09:25	97.45	STARTED/SECURED 33 SWP		SRO
SWS	MDP	06/01/87 13:22	06/01/87 14:10	0.80	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	06/06/87 13:20	06/07/87 14:40	25.33	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	06/06/87 15:58	06/06/87 16:12	0.23	STARTED/SECURED 33 SWP		SRO
SWS	MDP	06/06/87 16:12	06/08/87 12:17	44.08	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	06/18/87 14:10	06/19/87 08:11	18.02	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	06/18/87 14:10	06/19/87 08:31	18.35	STARTED/SECURED 33 SWP		SRO
SWS	MDP	06/19/87 08:31	07/05/87 11:55	387.40	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	06/19/87 09:09	07/03/87 17:05	343.93	STARTED/SECURED 33 SWP		SRO
SWS	MDP	06/30/87 14:25	06/30/87 14:27	0.03	BUMPED 36 SWP FOR ROTATION		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	07/03/87 17:05	07/03/87 17:25	0.33	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	07/03/87 17:25	07/03/87 17:43	0.30	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	07/03/87 17:43	07/06/87 19:50	74.12	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	07/05/87 11:55	07/06/87 19:38	31.72	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	07/06/87 19:38	07/08/87 15:45	44.12	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	07/06/87 19:50	07/13/87 18:23	166.55	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	07/08/87 15:45	07/10/87 18:12	50.45	STARTED/SECURED 34 SWP		SRO
SWS	MDP	07/10/87 18:12	07/10/87 18:35	0.38	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	07/10/87 18:12	07/12/87 09:35	39.38	STARTED/SECURED 35 SWP		SRO
SWS	MDP	07/10/87 18:35	07/10/87 19:17	0.70	STARTED/SECURED 33 SWP		SRO
SWS	MDP	07/12/87 09:35	07/14/87 14:45	53.17	STARTED/SECURED 33 SWP		SRO
SWS	MDP	07/12/87 19:59	07/12/87 20:18	0.32	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	07/13/87 13:34	07/13/87 14:48	1.23	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	07/13/87 18:23	07/13/87 18:31	0.13	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	07/13/87 18:31	07/16/87 14:40	68.15	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	07/14/87 14:40	07/14/87 21:01	6.35	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	07/14/87 21:01	08/04/87 18:34	501.55	STARTED/SECURED 33 SWP		SRO
SWS	MDP	07/16/87 14:40	07/20/87 09:24	90.73	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	07/20/87 09:24	07/22/87 09:30	48.10	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	07/22/87 09:30	07/23/87 04:29	18.98	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	07/23/87 04:29	07/25/87 11:05	54.60	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	07/25/87 11:05	07/29/87 18:51	103.77	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	07/29/87 18:51	07/30/87 11:20	16.48	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	07/30/87 11:20	08/04/87 18:34	127.23	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	08/04/87 18:34	08/07/87 18:30	71.93	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	08/04/87 18:34	08/05/87 10:10	15.60	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	08/07/87 13:30	08/07/87 13:32	0.03	BUMPED 35 SWP		SRO
SWS	MDP	08/07/87 21:05	08/09/87 09:38	36.55	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	08/07/87 21:05	08/12/87 00:52	99.78	STARTED/SECURED 33 SWP		SRO
SWS	MDP	08/08/87 11:45	08/08/87 11:47	0.03	BUMPED 36 SWP		SRO
SWS	MDP	08/09/87 09:38	08/09/87 10:27	0.82	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	08/09/87 10:27	08/10/87 12:05	25.63	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	08/10/87 12:05	08/11/87 14:31	26.43	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	08/11/87 13:02	08/11/87 14:08	1.10	STARTED/SECURED 34 SWP		SRO
SWS	MDP	08/11/87 14:08	08/11/87 19:40	5.53	STARTED/SECURED 35 SWP		SRO
SWS	MDP	08/11/87 14:08	08/11/87 19:40	5.53	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	08/11/87 19:40	08/12/87 16:40	21.00	STARTED/SECURED 34 SWP		SRO
SWS	MDP	08/12/87 00:52	08/12/87 10:15	9.38	STARTED/SECURED 31 SWP		SRO
SWS	MDP	08/12/87 10:15	08/17/87 08:16	118.02	STARTED/SECURED 33 SWP		SRO
SWS	MDP	08/12/87 16:40	08/13/87 00:09	7.48	STARTED/SECURED 35 SWP.		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	08/12/87 18:52	08/13/87 00:09	5.28	STARTED/SECURED 36 SWP		SRO
SWS	MDP	08/13/87 00:09	08/16/87 14:48	86.65	STARTED/SECURED 34 SWP		SRO
SWS	MDP	08/16/87 14:48	08/17/87 08:16	17.47	STARTED/SECURED 36 SWP		SRO
SWS	MDP	08/17/87 08:16	08/17/87 17:00	8.73	STARTED/SECURED 31 SWP		SRO
SWS	MDP	08/17/87 08:16	08/17/87 17:00	8.73	STARTED/SECURED 34 SWP		SRO
SWS	MDP	08/17/87 17:00	08/17/87 17:25	0.42	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	08/17/87 17:00	08/17/87 17:25	0.42	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	08/17/87 17:25	08/17/87 21:00	3.58	STARTED/SECURED 33 SWP		SRO
SWS	MDP	08/17/87 17:25	08/21/87 03:53	82.47	STARTED/SECURED 36 SWP		SRO
SWS	MDP	08/17/87 21:00	09/02/87 05:15	368.25	STARTED/SECURED 32 SWP		SRO
SWS	MDP	08/21/87 03:53	09/04/87 09:49	341.93	STARTED/SECURED 34 SWP FOR 3PT-M35		SRO
SWS	MDP	08/22/87 04:15	09/01/87 09:41	245.43	STARTED/SECURED 31 SWP		SRO
SWS	MDP	08/25/87 19:37	08/25/87 22:20	2.72	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	08/25/87 21:23	08/25/87 21:28	0.08	STARTED/SECURED 35 SWP		SRO
SWS	MDP	08/25/87 22:20	09/04/87 10:13	227.88	STARTED/SECURED 35 SWP FOR 3PT-M35		SRO
SWS	MDP	09/01/87 09:41	09/04/87 10:13	72.53	STARTED/SECURED 33 SWP FOR 3PT-M35		SRO
SWS	MDP	09/02/87 05:15	09/04/87 09:49	52.57	STARTED/SECURED 31 SWP FOR 3PT-M35		SRO
SWS	MDP	09/04/87 09:49	09/08/87 23:40	109.85	STARTED/SECURED 32 SWP		SRO
SWS	MDP	09/04/87 09:49	10/13/87 17:50	944.02	STARTED/SECURED 36 SWP		SRO
SWS	MDP	09/04/87 10:13	09/22/87 16:40	438.45	STARTED/SECURED 31 SWP		SRO
SWS	MDP	09/04/87 10:13	09/14/87 12:45	242.53	STARTED/SECURED 34 SWP		SRO
SWS	MDP	09/08/87 23:40	09/22/87 23:59	336.32	STARTED/SECURED 33 SWP		SRO
SWS	MDP	09/14/87 12:45	09/14/87 13:35	0.83	STARTED/SECURED 35 SWP		SRO
SWS	MDP	09/14/87 13:35	10/13/87 17:30	699.92	STARTED/SECURED 34 SWP FOR 3PT-M35		SRO
SWS	MDP	09/22/87 16:40	10/13/87 17:50	505.17	STARTED/SECURED 32 SWP FOR 3PT-M35		SRO
SWS	MDP	09/22/87 23:59	10/13/87 17:30	497.52	STARTED/SECURED 31 SWP FOR 3PT-M35		SRO
SWS	MDP	09/27/87 10:50	09/28/87 10:40	23.83	STARTED/SECURED 35 SWP		SRO
SWS	MDP	10/13/87 17:30	11/12/87 12:51	715.35	STARTED/SECURED 33 SWP		SRO
SWS	MDP	10/13/87 17:30	11/12/87 12:52	715.37	STARTED/SECURED 35 SWP		SRO
SWS	MDP	10/13/87 17:50	10/13/87 18:55	1.08	STARTED/SECURED 31 SWP		SRO
SWS	MDP	10/13/87 17:50	11/12/87 12:32	714.70	STARTED/SECURED 34 SWP		SRO
SWS	MDP	10/13/87 18:55	11/12/87 12:31	713.60	STARTED/SECURED 32 SWP		SRO
SWS	MDP	11/06/87 11:27	11/06/87 11:30	0.05	STARTED/SECURED 31 SWP		SRO
SWS	MDP	11/12/87 12:31	12/11/87 09:32	693.02	STARTED/SECURED 31 SWP		SRO
SWS	MDP	11/12/87 12:32	11/26/87 04:47	328.25	STARTED/SECURED 36 SWP		SRO
SWS	MDP	11/12/87 12:51	12/06/87 20:30	583.65	STARTED/SECURED 32 SWP		SRO
SWS	MDP	11/12/87 12:52	12/11/87 13:13	696.35	STARTED/SECURED 34 SWP		SRO
SWS	MDP	11/26/87 04:47	12/01/87 22:00	137.22	STARTED/SECURED 35 SWP		SRO
SWS	MDP	12/01/87 22:00	12/02/87 22:02	24.03	STARTED/SECURED 36 SWP		SRO
SWS	MDP	12/02/87 22:02	12/03/87 00:35	2.55	STARTED/SECURED 35 SWP		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	12/03/87 00:35	12/03/87 02:05	1.50	STARTED/SECURED 36 SWP		SRO
SWS	MDP	12/03/87 02:05	12/10/87 12:17	178.20	STARTED/SECURED 35 SWP		SRO
SWS	MDP	12/06/87 20:30	12/13/87 05:43	153.22	STARTED/SECURED 33 SWP		SRO
SWS	MDP	12/10/87 12:17	12/11/87 09:33	21.27	STARTED/SECURED 36 SWP		SRO
SWS	MDP	12/11/87 09:32	12/11/87 13:12	3.67	STARTED/SECURED 32 SWP		SRO
SWS	MDP	12/11/87 09:33	12/11/87 16:25	6.87	STARTED/SECURED 35 SWP		SRO
SWS	MDP	12/11/87 13:12	12/11/87 19:30	6.30	STARTED/SECURED 31 SWP		SRO
SWS	MDP	12/11/87 13:13	12/11/87 17:20	4.12	STARTED/SECURED 36 SWP		SRO
SWS	MDP	12/11/87 16:25	02/18/88 08:45	1648.33	STARTED/SECURED 34 SWP		SRO
SWS	MDP	12/11/87 17:20	12/11/87 20:30	3.17	STARTED/SECURED 35 SWP		SRO
SWS	MDP	12/11/87 19:30	12/12/87 14:14	18.73	STARTED/SECURED 32 SWP FOR 3PT-M35		SRO
SWS	MDP	12/11/87 20:30	12/12/87 14:14	17.73	STARTED/SECURED 36 SWP FOR 3PT-M35		SRO
SWS	MDP	12/12/87 14:14	12/31/87 12:35	454.35	STARTED/SECURED 31 SWP		SRO
SWS	MDP	12/12/87 14:14	12/13/87 05:43	15.48	STARTED/SECURED 35 SWP FOR 3PT-M35		SRO
SWS	MDP	12/13/87 05:43	12/14/87 08:30	26.78	STARTED/SECURED 32 SWP		SRO
SWS	MDP	12/13/87 05:43	12/18/87 16:27	130.73	STARTED/SECURED 36 SWP		SRO
SWS	MDP	12/14/87 08:30	12/14/87 21:46	13.27	STARTED/SECURED 33 SWP FOR 3PT-M35		SRO
SWS	MDP	12/14/87 21:46	12/14/87 22:00	0.23	STARTED/SECURED 32 SWP		SRO
SWS	MDP	12/14/87 22:00	12/18/87 16:27	90.45	STARTED/SECURED 32 SWP		SRO
SWS	MDP	12/18/87 16:27	12/22/87 06:09	85.70	STARTED/SECURED 33 SWP		SRO
SWS	MDP	12/18/87 16:27	12/23/87 11:35	115.13	STARTED/SECURED 35 SWP		SRO
SWS	MDP	12/22/87 06:09	12/23/87 03:40	21.52	STARTED/SECURED 32 SWP		SRO
SWS	MDP	12/23/87 03:40	01/06/88 05:40	338.00	STARTED/SECURED 33 SWP		SRO
SWS	MDP	12/23/87 11:35	12/24/87 10:10	22.58	STARTED/SECURED 36 SWP		SRO
SWS	MDP	12/24/87 10:10	12/28/87 02:40	88.50	STARTED/SECURED 35 SWP		SRO
SWS	MDP	12/28/87 02:40	12/28/87 21:03	18.38	STARTED/SECURED 36 SWP		SRO
SWS	MDP	12/29/87 21:03	12/31/87 21:55	48.87	STARTED/SECURED 35 SWP		SRO
SWS	MDP	12/31/87 12:35	01/01/88 19:55	31.33	STARTED/SECURED 32 SWP		SRO
SWS	MDP	12/31/87 21:55	01/01/88 19:55	22.00	STARTED/SECURED 36 SWP		SRO
SWS	MDP	01/01/88 19:55	01/02/88 00:45	4.83	STARTED/SECURED 31 SWP FOR ZURN WASH.		SRO
SWS	MDP	01/01/88 19:55	01/02/88 00:45	4.83	STARTED/SECURED 35 SWP FOR ZURN WASH.		SRO
SWS	MDP	01/01/88 19:55	01/02/88 00:45	4.83	STARTED/SECURED 35 SWP FOR ZURN WASH.		SRO
SWS	MDP	01/02/88 00:45	01/05/88 09:27	80.70	STARTED/SECURED 32 SWP FOR 3PT-M35		SRO
SWS	MDP	01/02/88 00:45	01/02/88 01:30	0.75	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	01/02/88 00:45	01/02/88 01:30	0.75	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	01/02/88 01:30	01/04/88 10:17	56.78	STARTED/SECURED 35 SWP FOR ZURN WASH.		SRO
SWS	MDP	01/04/88 10:17	01/05/88 09:27	23.17	STARTED/SECURED 36 SWP FOR 3PT-M35.		SRO
SWS	MDP	01/05/88 09:27	01/07/88 22:00	60.55	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	01/05/88 09:27	01/07/88 22:00	60.55	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	01/05/88 09:27	01/07/88 22:00	60.55	STARTED/SECURED 35 SWP.		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	01/06/88 05:40	01/06/88 16:14	10.57	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	01/06/88 16:14	02/05/88 14:24	718.17	STARTED/SECURED 33 SWP		SRO
SWS	MDP	01/07/88 22:00	01/12/88 08:41	106.68	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	01/07/88 22:00	01/11/88 09:37	83.62	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	01/07/88 22:00	01/12/88 08:41	106.68	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	01/11/88 09:37	02/05/88 14:24	604.78	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	01/12/88 08:41	01/29/88 08:00	407.32	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	01/29/88 08:00	01/30/88 01:35	17.58	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	01/30/88 01:35	02/02/88 00:42	71.12	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	02/02/88 00:42	02/05/88 14:55	86.22	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	02/05/88 14:24	02/29/88 13:32	575.13	STARTED/SECURED 31 SWP FOR ZURN WASH..		SRO
SWS	MDP	02/05/88 14:24	02/05/88 14:58	0.57	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	02/05/88 14:55	02/23/88 08:25	425.50	STARTED/SECURED 33 SWP		SRO
SWS	MDP	02/05/88 14:58	02/16/88 16:14	265.27	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	02/16/88 14:35	02/16/88 16:20	1.75	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	02/16/88 16:20	02/18/88 08:15	39.92	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	02/17/88 14:25	02/29/88 13:32	287.12	STARTED/SECURED 35 SWP FOR TEST		SRO
SWS	MDP	02/18/88 08:15	02/23/88 02:38	114.38	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	02/23/88 02:38	02/23/88 02:55	0.28	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	02/23/88 02:55	02/23/88 03:55	1.00	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	02/23/88 03:55	02/24/88 08:05	28.17	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	02/23/88 08:25	02/23/88 13:20	4.92	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	02/23/88 13:20	02/23/88 16:03	2.72	STARTED/SECURED 33 SWP		SRO
SWS	MDP	02/23/88 16:03	02/29/88 18:09	146.10	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	02/24/88 08:05	03/01/88 10:06	146.02	STARTED/SECURED 36 SWP FOR 3PT-M35.		SRO
SWS	MDP	02/29/88 13:32	03/29/88 03:32	686.00	STARTED/SECURED 33 SWP		SRO
SWS	MDP	02/29/88 13:32	03/01/88 10:05	20.55	STARTED/SECURED 34 SWP FOR 3PT-M35		SRO
SWS	MDP	02/29/88 18:09	03/01/88 10:06	15.95	STARTED/SECURED 31 SWP FOR 3PT-M35..		SRO
SWS	MDP	03/01/88 10:06	03/07/88 17:05	150.98	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	03/01/88 10:06	03/07/88 17:05	150.98	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	03/07/88 17:05	03/16/88 13:00	211.92	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	03/07/88 17:05	03/16/88 13:00	211.92	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/07/88 17:05	03/24/88 12:30	403.42	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/16/88 13:00	03/29/88 01:02	300.03	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	03/16/88 13:00	03/22/88 14:20	145.33	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	03/22/88 14:10	03/26/88 10:52	92.70	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/24/88 12:30	03/26/88 09:47	45.28	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	03/25/88 18:11	03/26/88 08:50	14.65	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/26/88 09:47	03/27/88 02:37	16.83	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/26/88 10:52	03/27/88 03:55	17.05	STARTED/SECURED 34 SWP.		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	03/26/88 11:00	03/29/88 03:32	64.53	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/27/88 03:55	03/29/88 02:10	46.25	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/27/88 06:20	03/29/88 02:59	44.65	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	03/29/88 01:02	03/30/88 09:15	32.22	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	03/29/88 02:59	03/29/88 05:00	2.02	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/29/88 03:32	03/30/88 01:46	22.23	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	03/29/88 03:32	03/30/88 03:24	23.87	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	03/29/88 05:00	03/30/88 03:24	22.40	STARTED/SECURED 33 SWP		SRO
SWS	MDP	03/29/88 05:00	03/30/88 01:46	20.77	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/30/88 01:46	03/30/88 09:15	7.48	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	03/30/88 01:46	03/30/88 04:32	2.77	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/30/88 03:24	03/31/88 01:33	22.15	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	03/30/88 03:24	03/31/88 05:58	26.57	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/30/88 04:32	03/31/88 01:33	21.02	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	03/30/88 09:15	04/02/88 08:20	71.08	STARTED/SECURED 33 SWP		SRO
SWS	MDP	03/30/88 11:08	03/30/88 11:58	0.83	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	03/31/88 01:33	03/31/88 03:06	1.55	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	03/31/88 01:33	03/31/88 02:41	1.13	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/31/88 02:41	04/02/88 02:20	47.65	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	03/31/88 03:06	04/03/88 03:31	72.42	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	03/31/88 05:58	03/31/88 07:57	1.98	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/31/88 06:54	04/03/88 05:10	70.27	STARTED/SECURED 35 SWP FOR 3PT-M35.		SRO
SWS	MDP	04/02/88 02:20	04/02/88 04:45	2.42	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	04/02/88 04:45	04/02/88 08:20	3.58	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	04/02/88 08:20	04/03/88 01:27	17.12	STARTED/SECURED 31 SWP FOR 3PT-M35.		SRO
SWS	MDP	04/02/88 08:20	04/02/88 13:55	5.58	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	04/02/88 13:55	04/03/88 01:26	11.52	STARTED/SECURED 33 SWP FOR 3PT-M35.		SRO
SWS	MDP	04/02/88 13:55	04/03/88 01:27	11.53	STARTED/SECURED 34 SWP FOR 3PT-M35.		SRO
SWS	MDP	04/02/88 17:50	04/03/88 03:31	9.68	STARTED/SECURED 36 SWP FOR 3PT-M35.		SRO
SWS	MDP	04/03/88 01:27	04/03/88 08:25	6.97	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/03/88 03:31	04/03/88 05:10	1.65	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	04/03/88 03:31	04/03/88 05:53	2.37	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	04/03/88 05:10	04/03/88 09:50	4.67	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	04/03/88 05:10	04/03/88 06:38	1.47	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	04/03/88 05:53	04/03/88 08:25	2.53	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	04/03/88 06:38	04/03/88 09:50	3.20	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	04/03/88 08:25	04/04/88 00:22	15.95	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	04/03/88 08:25	04/04/88 00:22	15.95	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	04/03/88 09:50	04/03/88 11:04	1.23	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/03/88 09:50	04/03/88 11:04	1.23	STARTED/SECURED 35 SWP.		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	04/03/88 11:04	04/04/88 01:31	14.45	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	04/03/88 11:04	04/04/88 01:31	14.45	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	04/03/88 13:15	04/04/88 02:19	13.07	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	04/04/88 00:22	04/04/88 13:07	12.75	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/04/88 01:31	04/04/88 02:19	0.80	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	04/04/88 01:31	04/04/88 03:25	1.90	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	04/04/88 02:19	04/04/88 04:29	2.17	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	04/04/88 02:19	04/04/88 04:29	2.17	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	04/04/88 03:25	04/04/88 05:22	1.95	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	04/04/88 04:29	04/04/88 06:33	2.07	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	04/04/88 04:29	04/04/88 14:00	9.52	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	04/04/88 05:22	04/04/88 13:20	7.97	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	04/04/88 06:33	04/04/88 15:55	9.37	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	04/04/88 06:33	04/04/88 13:34	7.02	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	04/04/88 13:07	04/04/88 17:55	4.80	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	04/04/88 13:34	04/04/88 17:55	4.35	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	04/04/88 14:00	04/04/88 15:55	1.92	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	04/04/88 15:55	04/12/88 17:22	193.45	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/04/88 15:55	04/04/88 21:05	5.17	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	04/04/88 17:55	04/04/88 21:05	3.17	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	04/04/88 17:55	04/05/88 21:40	27.75	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	04/04/88 21:05	04/05/88 21:40	24.58	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	04/04/88 21:05	04/06/88 04:25	31.33	STARTED/SECURED 34 SWP FOR ZURN WASH.		SRO
SWS	MDP	04/05/88 21:40	04/10/88 16:57	115.28	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	04/05/88 21:40	04/09/88 21:40	96.00	STARTED/SECURED 36 SWP FOR ZURN WASH.		SRO
SWS	MDP	04/06/88 04:25	04/06/88 18:55	14.50	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	04/06/88 18:55	05/04/88 02:48	655.88	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	04/09/88 03:22	05/04/88 02:25	599.05	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	04/10/88 08:05	04/10/88 15:36	7.52	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	04/10/88 16:57	04/10/88 17:59	1.03	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	04/10/88 17:59	04/12/88 05:00	35.02	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	04/10/88 21:06	04/10/88 21:10	0.07	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	04/11/88 19:50	04/13/88 16:57	45.12	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	04/12/88 17:22	04/25/88 12:47	307.42	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	04/13/88 16:57	04/22/88 21:42	220.75	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/19/88 02:15	04/24/88 12:15	130.00	STARTED/SECURED 31 SWP FOR ZURN WASH.		SRO
SWS	MDP	04/24/88 12:15	05/02/88 04:45	184.50	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/25/88 12:47	04/28/88 07:42	66.92	STARTED/SECURED 31 SWP FOR MTC.		SRO
SWS	MDP	04/28/88 07:42	04/29/88 04:55	21.22	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	04/28/88 18:50	04/28/88 19:00	0.17	STARTED/SECURED 31 SWP FOR OPERABILITY TEST		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	04/29/88 04:55	05/04/88 02:47	117.87	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	04/29/88 17:17	04/29/88 17:27	0.17	STARTED/SECURED 32 SWP FOR OPERABILITY TEST		SRO
SWS	MDP	05/02/88 04:45	05/04/88 02:24	45.65	STARTED/SECURED 32 SWP FOR PT-M35.		SRO
SWS	MDP	05/02/88 22:05	05/02/88 22:10	0.08	STARTED/SECURED 33 SWP FOR OPERABILITY TEST		SRO
SWS	MDP	05/04/88 02:24	05/04/88 02:51	0.45	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/04/88 02:25	05/17/88 20:25	330.00	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	05/04/88 02:47	05/17/88 20:25	329.63	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	05/04/88 02:48	06/04/88 10:25	751.62	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	05/04/88 02:51	06/26/88 13:20	1282.48	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	05/11/88 20:40	05/25/88 17:40	333.00	STARTED/SECURED 33 SWP.		SRO
SWS	MDP	05/17/88 20:25	06/05/88 12:11	447.77	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	05/25/88 17:40	05/27/88 21:04	51.40	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	05/27/88 21:05	06/03/88 17:20	164.25	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	06/01/88 08:37	06/04/88 10:25	73.80	STARTED/SECURED 33 SWP FOR 3PT-M35.		SRO
SWS	MDP	06/04/88 10:25	06/04/88 11:15	0.83	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	06/04/88 10:25	06/26/88 13:18	530.88	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	06/04/88 11:15	06/24/88 06:20	475.08	STARTED/SECURED 33 SWP		SRO
SWS	MDP	06/05/88 12:11	06/26/88 09:38	501.45	STARTED/SECURED 35 SWP FOR 3PT-M35.		SRO
SWS	MDP	06/06/88 00:05	06/06/88 09:18	9.22	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	06/16/88 23:50	06/20/88 12:48	84.97	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	06/20/88 12:50	06/20/88 12:57	0.12	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	06/22/88 21:39	06/22/88 21:41	0.03	BUMPED 32 SWP FOR ROTATION.		SRO
SWS	MDP	06/23/88 16:33	06/26/88 13:21	68.80	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	06/24/88 12:00	06/26/88 13:22	49.37	STARTED/SECURED 33 SWP FOR 3PT-M35.		SRO
SWS	MDP	06/26/88 09:38	07/07/88 07:35	261.95	STARTED/SECURED 34 SWP FOR MTC.		SRO
SWS	MDP	06/26/88 13:18	07/07/88 11:22	262.07	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	06/26/88 13:21	07/24/88 10:22	669.02	STARTED/SECURED 31 SWP FOR 3PT-M35.		SRO
SWS	MDP	06/26/88 13:22	07/24/88 10:42	669.33	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	06/26/88 13:28	07/24/88 11:00	669.53	STARTED/SECURED 33 SWP FOR 3PT-M35.		SRO
SWS	MDP	07/06/88 17:57	07/06/88 18:12	0.25	RAN 36 SWP FOR BKR RETEST (OPERABLE)		SRO
SWS	MDP	07/07/88 07:35	07/24/88 09:40	410.08	STARTED/SECURED 36 SWP FOR 3PT-M35.		SRO
SWS	MDP	07/07/88 11:21	07/07/88 11:36	0.25	STARTED/SECURED 34 SWP for retest		SRO
SWS	MDP	07/07/88 11:22	07/24/88 09:55	406.55	STARTED/SECURED 34 SWP FOR 3PT-M35.		SRO
SWS	MDP	07/07/88 12:24	07/07/88 12:39	0.25	STARTED/SECURED 35 SWP for retest (OPERABLE)		SRO
SWS	MDP	07/23/88 13:00	07/23/88 13:15	0.25	STARTED/SECURED 35 SWP FOR 3PT-M35.		SRO
SWS	MDP	07/24/88 09:40	07/28/88 09:51	96.18	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	07/24/88 09:55	07/28/88 05:12	91.28	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	07/24/88 10:42	09/09/88 10:25	1127.72	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	07/24/88 11:00	09/02/88 01:31	950.52	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	07/24/88 11:28	09/09/88 10:27	1126.98	STARTED/SECURED 33 SWP		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	07/28/88 05:12	08/16/88 17:56	468.73	STARTED/SECURED 34 SWP FOR 3PT-M35.		SRO
SWS	MDP	07/28/88 09:51	07/28/88 14:07	4.27	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	07/28/88 14:07	08/16/88 18:18	460.18	STARTED/SECURED 35 SWP FOR 3PT-M35.		SRO
SWS	MDP	07/31/88 20:47	07/31/88 20:58	0.18	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	08/16/88 02:50	08/16/88 05:14	2.40	STARTED/SECURED 36 SWP FOR 3PT-M35.		SRO
SWS	MDP	08/16/88 13:57	08/16/88 14:05	0.13	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	08/16/88 17:56	08/16/88 18:20	0.40	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	08/16/88 18:18	09/09/88 10:24	568.10	STARTED/SECURED 34 SWP FOR 3PT-M35.		SRO
SWS	MDP	08/16/88 18:20	09/09/88 09:59	567.65	STARTED/SECURED 35 SWP FOR 3PT-M35.		SRO
SWS	MDP	08/16/88 21:05	08/16/88 21:15	0.17	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	08/17/88 18:05	08/17/88 18:52	0.78	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	08/19/88 23:15	08/20/88 03:49	4.57	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	08/20/88 17:17	08/20/88 18:42	1.42	RAN 36 SWP.		SRO
SWS	MDP	08/20/88 20:55	08/20/88 22:18	1.38	RAN 36 SWP.		SRO
SWS	MDP	09/02/88 02:19	09/09/88 10:26	176.12	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	09/09/88 09:59	09/11/88 17:41	55.70	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	09/09/88 10:24	09/11/88 17:36	55.20	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	09/09/88 10:25	09/11/88 17:35	55.17	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	09/09/88 10:26	09/30/88 17:28	511.03	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	09/09/88 10:27	10/11/88 09:15	766.80	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	09/09/88 10:28	10/05/88 07:30	621.03	STARTED/SECURED 33 SWP		SRO
SWS	MDP	09/11/88 17:36	09/30/88 17:28	455.87	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	09/11/88 17:41	09/20/88 12:14	210.55	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	09/20/88 12:14	09/20/88 12:27	0.22	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	09/20/88 12:23	09/20/88 12:25	0.03	BUMPED 35 SWP FOR OPER - SAT.		SRO
SWS	MDP	09/20/88 12:27	10/11/88 08:55	500.47	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	09/30/88 17:25	10/22/88 10:25	521.00	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	10/05/88 07:30	10/05/88 07:31	0.02	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	10/05/88 07:30	10/05/88 08:02	0.53	STARTED/SECURED 33 SWP		SRO
SWS	MDP	10/05/88 08:02	10/05/88 08:04	0.03	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	10/05/88 08:04	10/05/88 09:09	1.08	STARTED/SECURED 33 SWP		SRO
SWS	MDP	10/05/88 09:09	10/14/88 13:40	220.52	STARTED/SECURED 31 SWP FOR P.T.		SRO
SWS	MDP	10/09/88 13:15	10/09/88 13:35	0.33	STARTED/SECURED 33 SWP FOR RETEST.		SRO
SWS	MDP	10/09/88 13:40	10/09/88 13:50	0.17	STARTED/SECURED 33 SWP. (Failed retest -Packing runs hot)		SRO
SWS	MDP	10/09/88 13:50	10/13/88 10:50	93.00	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	10/12/88 09:20	10/12/88 10:30	1.17	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	10/13/88 10:50	10/25/88 11:26	288.60	STARTED/SECURED 33 SWP		SRO
SWS	MDP	10/14/88 08:39	10/27/88 17:37	320.97	STARTED/SECURED 35 SWP FOR 3PT-M35.		SRO
SWS	MDP	10/14/88 08:49	10/14/88 08:50	0.02	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	10/25/88 11:26	10/27/88 16:23	52.95	STARTED/SECURED 31 SWP FOR 3PT-M35.		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	10/27/88 16:23	10/27/88 16:43	0.33	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	10/27/88 16:43	11/02/88 17:10	144.45	STARTED/SECURED 33 SWP		SRO
SWS	MDP	10/27/88 17:37	11/02/88 17:10	143.55	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	11/02/88 17:10	11/10/88 17:25	192.25	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	11/02/88 17:10	11/10/88 15:55	190.75	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	11/05/88 10:36	11/05/88 11:43	1.12	STARTED/SECURED 33 SWP.		SRO
SWS	MDP	11/05/88 12:50	11/05/88 13:03	0.22	RAN 33 SWP.		SRO
SWS	MDP	11/07/88 07:51	11/07/88 07:53	0.03	BUMPED 33 SWP.		SRO
SWS	MDP	11/10/88 17:25	11/19/88 10:52	209.45	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	11/10/88 17:37	11/22/88 09:57	280.33	STARTED/SECURED 31 SWP FOR 3PT-M35.		SRO
SWS	MDP	11/19/88 10:26	11/19/88 10:49	0.38	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	11/19/88 10:52	11/22/88 09:57	71.08	STARTED/SECURED 36 SWP FOR 3PT-M35.		SRO
SWS	MDP	11/20/88 14:15	11/20/88 14:17	0.03	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	11/22/88 09:57	11/22/88 10:26	0.48	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	11/22/88 09:57	11/22/88 10:26	0.48	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	11/22/88 10:26	11/29/88 03:23	160.95	STARTED/SECURED 33 SWP		SRO
SWS	MDP	11/22/88 10:26	12/17/88 12:30	602.07	STARTED/SECURED 34 SWP FOR 3PT-M35.		SRO
SWS	MDP	11/22/88 19:05	12/17/88 12:14	593.15	STARTED/SECURED 31 SWP FOR 3PT-M35.		SRO
SWS	MDP	11/29/88 13:39	11/29/88 17:40	4.02	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	11/30/88 04:02	12/01/88 20:59	40.95	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	12/01/88 09:50	12/17/88 12:14	386.40	STARTED/SECURED 36 SWP FOR 3PT-M35.		SRO
SWS	MDP	12/17/88 12:14	12/17/88 12:30	0.27	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	12/17/88 12:14	01/09/89 19:40	559.43	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	12/17/88 12:30	12/27/88 14:21	241.85	STARTED/SECURED 33 SWP		SRO
SWS	MDP	12/17/88 12:30	01/06/89 01:20	468.83	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	12/27/88 14:21	01/11/89 02:41	348.33	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	01/09/89 11:50	01/09/89 14:35	2.75	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	01/09/89 19:40	01/11/89 02:41	31.02	STARTED/SECURED 36 SWP FOR 3PT-M35.		SRO
SWS	MDP	01/10/89 10:15	01/10/89 12:58	2.72	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	01/11/89 02:41	01/11/89 03:03	0.37	STARTED/SECURED 31 SWP FOR 3PT-M35.		SRO
SWS	MDP	01/11/89 02:41	01/11/89 03:03	0.37	STARTED/SECURED 35 SWP FOR 3PT-M35.		SRO
SWS	MDP	01/11/89 03:03	02/04/89 22:58	595.92	STARTED/SECURED 33 SWP		SRO
SWS	MDP	01/11/89 03:03	01/26/89 11:56	368.88	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	01/11/89 11:02	01/11/89 13:45	2.72	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	01/12/89 13:12	02/04/89 09:45	548.55	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	01/26/89 11:56	01/27/89 03:08	15.20	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	01/27/89 03:08	01/27/89 03:11	0.05	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	01/27/89 03:11	02/04/89 17:12	206.02	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	02/02/89 08:45	02/02/89 09:30	0.75	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	02/04/89 17:13	02/04/89 23:41	6.47	STARTED/SECURED 35 SWP		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	02/04/89 18:07	02/05/89 12:43	18.60	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	02/04/89 22:58	02/04/89 23:30	0.53	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	02/04/89 23:30	02/07/89 09:38	58.13	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	02/04/89 23:41	02/05/89 13:33	13.87	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	02/06/89 11:09	02/07/89 10:00	22.85	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	02/07/89 10:00	02/09/89 16:25	54.42	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	02/07/89 16:55	02/07/89 18:55	2.00	STARTED/SECURED 33 SWP		SRO
SWS	MDP	02/09/89 16:25	02/10/89 08:30	16.08	STARTED/SECURED 33 SWP		SRO
SWS	MDP	02/10/89 08:30	02/21/89 18:09	273.65	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	02/21/89 18:09	03/08/89 19:07	360.97	STARTED/SECURED 33 SWP		SRO
SWS	MDP	03/08/89 15:05	03/08/89 16:56	1.85	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	03/08/89 16:54	03/08/89 20:14	3.33	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/08/89 20:12	03/08/89 20:37	0.42	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/08/89 20:35	03/08/89 20:46	0.18	STARTED/SECURED 33 SWP		SRO
SWS	MDP	03/08/89 20:42	03/08/89 20:59	0.28	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/08/89 20:59	03/11/89 17:04	68.08	STARTED/SECURED 33 SWP		SRO
SWS	MDP	03/10/89 16:30	03/10/89 16:36	0.10	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/10/89 16:36	03/10/89 16:42	0.10	STARTED/SECURED 36 SWP .		SRO
SWS	MDP	03/11/89 14:28	03/11/89 14:30	0.03	BUMPED 31 SWP.		SRO
SWS	MDP	03/11/89 14:43	03/11/89 14:48	0.08	RAN 34 SWP MOTOR.		SRO
SWS	MDP	03/27/89 16:46	03/27/89 16:48	0.03	BUMPED 34 SWP FOR ROTATION.		SRO
SWS	MDP	03/27/89 16:46	03/27/89 16:48	0.03	BUMPED 35 SWP FOR ROTATION.		SRO
SWS	MDP	03/27/89 16:49	03/27/89 16:51	0.03	BUMPED 36 SWP FOR ROTATION.		SRO
SWS	MDP	03/27/89 16:50	03/27/89 16:54	0.07	RAN 34 SWP FOR TEST GROUP.		SRO
SWS	MDP	03/27/89 16:56	03/27/89 17:00	0.07	RAN 35 SWP FOR TEST GROUP.		SRO
SWS	MDP	03/27/89 17:00	03/27/89 17:03	0.05	RAN 36 SWP FOR TEST GROUP.		SRO
SWS	MDP	03/27/89 17:05	03/27/89 17:09	0.07	RAN 34 SWP FOR TEST GROUP.		SRO
SWS	MDP	03/28/89 12:30	03/28/89 12:32	0.03	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	03/28/89 21:00	03/28/89 22:34	1.57	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	03/28/89 22:31	03/29/89 00:08	1.62	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/29/89 00:06	03/29/89 01:29	1.38	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	03/31/89 18:40	03/31/89 18:50	0.17	BUMPED AND RAN 35 SWP MOTOR for rotation and vibes		SRO
SWS	MDP	04/04/89 19:08	04/04/89 19:27	0.32	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	04/04/89 21:58	04/04/89 23:15	1.28	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	04/04/89 23:10	04/05/89 00:05	0.92	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	04/18/89 18:00	04/18/89 18:02	0.03	BUMPED 31 SWP FOR ROTATION CHECK.		SRO
SWS	MDP	04/18/89 18:02	04/18/89 18:04	0.03	BUMPED 32 SWP FOR ROTATION CHECK.		SRO
SWS	MDP	04/18/89 18:04	04/18/89 18:17	0.22	RAN 31 SWP.		SRO
SWS	MDP	04/18/89 18:17	04/18/89 18:25	0.13	RAN 32 SWP.		SRO
SWS	MDP	04/25/89 17:00	04/25/89 17:02	0.03	BUMPED 33 SWP MOTOR.		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	04/25/89 17:10	04/25/89 17:20	0.17	RAN 33 SWP MOTOR.		SRO
SWS	MDP	04/27/89 20:27	04/27/89 21:32	1.08	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	04/27/89 21:30	04/27/89 22:41	1.18	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	04/27/89 22:39	04/27/89 23:40	1.02	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/28/89 18:59	04/28/89 19:40	0.68	STARTED/SECURED 33 SWP		SRO
SWS	MDP	04/29/89 14:18	04/29/89 14:54	0.60	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/01/89 18:35	05/01/89 18:52	0.28	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/01/89 18:52	05/01/89 18:53	0.02	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	05/01/89 18:55	05/01/89 20:31	1.60	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	05/01/89 20:17	05/01/89 21:00	0.72	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/04/89 13:50	05/04/89 13:52	0.03	BUMPED 33 SWP MOTOR.		SRO
SWS	MDP	05/04/89 13:53	05/04/89 14:10	0.28	RAN 33 SWP MOTOR.		SRO
SWS	MDP	05/05/89 13:17	05/05/89 14:13	0.93	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/05/89 16:15	05/05/89 16:39	0.40	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	05/05/89 16:37	05/05/89 17:00	0.38	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	05/05/89 16:54	05/05/89 16:55	0.02	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	05/05/89 16:58	05/05/89 17:18	0.33	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	05/05/89 17:15	05/05/89 17:53	0.63	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	05/05/89 17:37	05/05/89 17:42	0.08	STARTED/SECURED 33 SWP MOTOR.		SRO
SWS	MDP	05/05/89 17:52	05/05/89 18:04	0.20	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	05/05/89 18:02	05/05/89 18:24	0.37	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	05/05/89 18:23	05/05/89 18:35	0.20	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	05/05/89 20:33	05/05/89 21:01	0.47	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	05/05/89 21:00	05/05/89 21:10	0.17	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	05/05/89 21:08	05/05/89 21:27	0.32	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	05/05/89 21:25	05/05/89 21:40	0.25	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	05/05/89 21:37	05/05/89 21:53	0.27	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	05/07/89 18:00	05/09/89 14:37	44.62	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	05/10/89 14:51	05/10/89 14:53	0.03	BUMPED 34 SWP MOTOR FOR ROTATION.		SRO
SWS	MDP	05/10/89 14:54	05/10/89 15:00	0.10	STARTED/SECURED 34 SWP MOTOR.		SRO
SWS	MDP	05/10/89 16:02	05/10/89 16:50	0.80	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	05/11/89 13:33	05/11/89 13:34	0.02	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	05/11/89 13:49	05/11/89 14:14	0.42	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	05/11/89 14:45	05/11/89 15:08	0.38	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	05/11/89 15:26	05/11/89 15:28	0.03	BUMPED 34 SWP.		SRO
SWS	MDP	05/11/89 15:29	05/11/89 16:01	0.53	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	05/11/89 16:24	05/11/89 17:39	1.25	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	05/11/89 16:41	05/11/89 16:43	0.03	BUMPED 33 SWP FOR ROTATION.		SRO
SWS	MDP	05/11/89 17:01	05/11/89 17:03	0.03	RAN 33 SWP MOTOR.		SRO
SWS	MDP	05/12/89 11:28	05/12/89 11:30	0.03	BUMPED 36 SWP MOTOR.		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	05/12/89 12:45	05/12/89 12:49	0.07	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/12/89 13:22	05/12/89 14:26	1.07	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	05/12/89 14:23	05/12/89 14:53	0.50	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/12/89 15:56	05/12/89 16:37	0.68	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/13/89 11:35	05/13/89 11:50	0.25	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/13/89 12:45	05/13/89 13:15	0.50	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/13/89 13:12	05/13/89 13:15	0.05	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/15/89 14:10	05/15/89 14:12	0.03	BUMPED 31 SWP FOR ROTATION CHECK.		SRO
SWS	MDP	05/15/89 14:57	05/15/89 16:06	1.15	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/16/89 19:00	05/19/89 19:10	72.17	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/19/89 14:02	05/19/89 14:44	0.70	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	05/19/89 14:44	05/20/89 15:14	24.50	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	05/20/89 15:14	05/20/89 16:25	1.18	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	05/20/89 16:25	05/21/89 00:30	8.08	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	05/20/89 17:55	05/20/89 21:30	3.58	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	05/20/89 22:45	05/20/89 22:56	0.18	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	05/20/89 22:56	05/21/89 00:13	1.28	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	05/21/89 00:13	05/21/89 00:15	0.03	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	05/21/89 10:09	05/21/89 10:14	0.08	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	05/21/89 10:58	05/21/89 12:15	1.28	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	05/21/89 12:15	05/21/89 13:47	1.53	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/21/89 13:47	05/21/89 14:15	0.47	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	05/21/89 14:45	05/21/89 16:15	1.50	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/21/89 16:10	05/21/89 16:27	0.28	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	05/21/89 16:25	05/21/89 16:35	0.17	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	05/21/89 16:35	05/21/89 16:48	0.22	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	05/21/89 16:48	05/23/89 09:02	40.23	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/22/89 14:13	05/22/89 14:32	0.32	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	05/22/89 14:30	05/22/89 14:47	0.28	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	05/23/89 08:55	05/23/89 09:46	0.85	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	05/23/89 09:43	05/23/89 10:15	0.53	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	05/23/89 10:13	05/23/89 10:22	0.15	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	05/23/89 10:21	05/24/89 02:41	16.33	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	05/23/89 12:30	05/23/89 12:43	0.22	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	05/23/89 13:15	05/23/89 17:08	3.88	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	05/23/89 13:27	05/23/89 17:27	4.00	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	05/23/89 17:08	05/23/89 17:25	0.28	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	05/24/89 12:37	05/24/89 12:58	0.35	STARTED/SECURED 34 SWP MTR FOR TEST GROUP.		SRO
SWS	MDP	05/25/89 02:42	05/25/89 02:56	0.23	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	05/25/89 03:12	05/25/89 03:15	0.05	STARTED/SECURED 33 SWP		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	05/25/89 09:00	05/25/89 13:36	4.60	STARTED/SECURED 33 SWP.		SRO
SWS	MDP	05/25/89 09:27	05/25/89 09:34	0.12	RAN 34 SWP MOTOR FOR BALANCE MOVE.		SRO
SWS	MDP	05/25/89 10:00	05/25/89 10:06	0.10	RAN 34 SWP MOTOR FOR BALANCE MOVE.		SRO
SWS	MDP	05/25/89 10:16	05/25/89 10:22	0.10	RAN 34 SWP MOTOR FOR BALANCE MOVE.		SRO
SWS	MDP	05/25/89 10:53	05/25/89 10:58	0.08	RAN 34 SWP MOTOR FOR BALANCE MOVE.		SRO
SWS	MDP	05/25/89 13:36	05/26/89 12:09	22.55	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	05/25/89 14:21	05/26/89 02:40	12.32	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	05/25/89 15:46	05/25/89 15:58	0.20	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	05/25/89 15:58	05/26/89 02:21	10.38	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	05/25/89 17:58	05/25/89 18:54	0.93	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	05/25/89 19:46	05/25/89 20:11	0.42	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	05/26/89 01:45	05/26/89 02:10	0.42	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	05/26/89 11:55	05/26/89 12:35	0.67	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	05/26/89 12:35	05/26/89 14:10	1.58	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/26/89 13:51	05/29/89 07:10	65.32	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	05/29/89 00:45	05/29/89 04:10	3.42	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	05/29/89 05:30	05/29/89 05:32	0.03	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	05/29/89 05:33	06/03/89 15:15	129.70	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	05/29/89 11:30	05/29/89 11:45	0.25	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	05/31/89 09:25	06/03/89 13:58	76.55	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	06/03/89 13:58	06/03/89 18:58	5.00	STARTED/SECURED 33 SWP		SRO
SWS	MDP	06/03/89 15:15	06/03/89 15:37	0.37	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	06/03/89 15:37	06/03/89 23:31	7.90	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	06/03/89 18:59	06/03/89 23:30	4.52	STARTED/SECURED 33 SWP		SRO
SWS	MDP	06/03/89 23:30	06/04/89 00:00	0.50	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	06/03/89 23:31	06/04/89 00:00	0.48	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	06/04/89 00:00	06/04/89 11:38	11.63	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	06/04/89 00:00	06/04/89 00:11	0.18	STARTED/SECURED 33 SWP		SRO
SWS	MDP	06/04/89 00:11	06/04/89 11:38	11.45	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	06/04/89 11:38	06/04/89 13:59	2.35	STARTED/SECURED 33 SWP		SRO
SWS	MDP	06/04/89 11:38	06/04/89 13:59	2.35	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	06/04/89 13:59	06/05/89 19:15	29.27	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	06/04/89 13:59	06/07/89 05:34	63.58	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	06/05/89 19:15	06/05/89 20:04	0.82	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	06/05/89 20:04	06/05/89 21:45	1.68	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	06/05/89 20:05	06/05/89 21:45	1.67	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	06/05/89 21:45	06/06/89 13:00	15.25	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	06/06/89 13:00	06/07/89 05:34	16.57	STARTED/SECURED 33 SWP		SRO
SWS	MDP	06/07/89 05:34	06/07/89 07:18	1.73	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	06/07/89 05:34	06/07/89 13:24	7.83	STARTED/SECURED 36 SWP.		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	06/07/89 13:24	06/08/89 11:00	21.60	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	06/07/89 20:36	06/08/89 10:03	13.45	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	06/08/89 10:03	06/08/89 10:36	0.55	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	06/08/89 10:36	06/08/89 11:00	0.40	STARTED/SECURED 33 SWP		SRO
SWS	MDP	06/08/89 11:00	07/06/89 08:54	669.90	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	06/08/89 11:00	06/08/89 11:20	0.33	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	06/08/89 11:20	06/08/89 12:35	1.25	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	06/08/89 12:35	07/06/89 10:00	669.42	STARTED/SECURED 35 SWP FOR 3PT-M35.		SRO
SWS	MDP	06/16/89 16:08	06/16/89 16:10	0.03	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	06/18/89 02:06	07/06/89 09:46	439.67	STARTED/SECURED 34 SWP FOR 3PT-M35.		SRO
SWS	MDP	06/28/89 19:00	06/28/89 21:25	2.42	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	06/29/89 05:40	06/29/89 06:36	0.93	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	07/06/89 08:54	07/06/89 09:12	0.30	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	07/06/89 09:12	08/26/89 13:05	1227.88	STARTED/SECURED 33 SWP		SRO
SWS	MDP	07/06/89 09:46	07/11/89 04:58	115.20	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	07/06/89 10:00	07/11/89 00:46	110.77	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	07/11/89 00:14	07/30/89 11:11	466.95	STARTED/SECURED 31 SWP FOR 3PT-M35.		SRO
SWS	MDP	07/11/89 00:46	07/23/89 15:30	302.73	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	07/11/89 04:58	07/16/89 06:58	122.00	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	07/21/89 16:05	08/26/89 13:10	861.08	STARTED/SECURED 36 SWP FOR 3PT-M35.		SRO
SWS	MDP	07/23/89 07:59	08/14/89 09:00	529.02	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	07/23/89 20:06	07/24/89 08:08	12.03	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	07/24/89 08:09	08/26/89 13:09	797.00	STARTED/SECURED 35 SWP FOR 3PT-M35.		SRO
SWS	MDP	07/30/89 11:11	08/26/89 12:40	649.48	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	08/14/89 09:00	08/25/89 06:00	261.00	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	08/25/89 16:45	08/26/89 13:08	20.38	STARTED/SECURED 34 SWP FOR 3PT-M35.		SRO
SWS	MDP	08/26/89 12:40	08/30/89 08:10	91.50	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	08/26/89 13:05	08/30/89 14:30	97.42	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	08/26/89 13:09	10/10/89 23:04	1089.92	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	08/26/89 13:10	10/14/89 17:45	1180.58	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	08/26/89 13:11	10/14/89 17:15	1180.07	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	08/30/89 08:10	09/20/89 09:30	505.33	STARTED/SECURED 33 SWP FOR 3PT-M35.		SRO
SWS	MDP	08/30/89 14:30	09/20/89 08:31	498.02	STARTED/SECURED 31 SWP FOR 3PT-M35.		SRO
SWS	MDP	09/20/89 08:31	10/12/89 06:25	525.90	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	09/20/89 09:30	10/14/89 17:15	583.75	STARTED/SECURED 31 SWP FOR 3PT-M35.		SRO
SWS	MDP	09/20/89 09:35	09/20/89 09:37	0.03	BUMPED 34 SWP FOR CHECK VLV TEST.		SRO
SWS	MDP	09/20/89 09:35	09/20/89 09:37	0.03	BUMPED 35 SWP FOR CHECK VLV TEST.		SRO
SWS	MDP	09/20/89 09:35	09/20/89 09:37	0.03	BUMPED 36 SWP FOR CHECK VLV TEST.		SRO
SWS	MDP	10/14/89 17:15	10/14/89 17:45	0.50	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	10/14/89 17:15	10/19/89 16:25	119.17	STARTED/SECURED 34 SWP.		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	10/14/89 17:45	10/27/89 08:09	302.40	STARTED/SECURED 33 SWP		SRO
SWS	MDP	10/16/89 19:02	10/16/89 20:20	1.30	RAN 31 SWP.		SRO
SWS	MDP	10/18/89 20:05	10/18/89 21:26	1.35	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	10/19/89 16:25	10/19/89 17:02	0.62	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	10/19/89 16:25	10/19/89 16:53	0.47	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	10/19/89 16:25	10/19/89 16:53	0.47	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	10/19/89 16:53	10/20/89 14:56	22.05	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	10/19/89 16:59	10/27/89 10:14	185.25	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	10/21/89 02:05	10/22/89 13:05	35.00	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	10/21/89 03:20	10/21/89 22:18	18.97	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	10/22/89 18:46	10/22/89 20:01	1.25	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	10/23/89 22:04	11/02/89 12:22	230.30	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	10/26/89 21:51	10/26/89 22:25	0.57	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	10/27/89 08:09	10/27/89 10:14	2.08	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	10/27/89 08:13	11/07/89 10:29	266.27	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	10/27/89 10:14	11/07/89 10:29	264.25	STARTED/SECURED 34 SWP FOR 3PT-M35.		SRO
SWS	MDP	10/30/89 08:54	10/30/89 08:59	0.08	RAN 31 SWP.		SRO
SWS	MDP	11/07/89 10:29	11/07/89 12:09	1.67	STARTED/SECURED 31 SWP FOR 3PT-M35.		SRO
SWS	MDP	11/07/89 10:29	11/07/89 12:09	1.67	STARTED/SECURED 35 SWP FOR 3PT-M35.		SRO
SWS	MDP	11/07/89 12:09	11/24/89 09:43	405.57	STARTED/SECURED 33 SWP		SRO
SWS	MDP	11/07/89 12:09	11/08/89 09:25	21.27	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	11/09/89 00:25	12/01/89 20:27	548.03	STARTED/SECURED 36 SWP FOR 3PT-M35.		SRO
SWS	MDP	11/22/89 23:46	11/23/89 03:51	4.08	RAN 31 SWP.		SRO
SWS	MDP	11/24/89 09:43	11/29/89 07:59	118.27	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	11/29/89 07:59	12/01/89 19:51	59.87	STARTED/SECURED 33 SWP FOR 3PT-M35.		SRO
SWS	MDP	12/01/89 19:51	12/01/89 20:08	0.28	STARTED/SECURED 31 SWP FOR 3PT-M35.		SRO
SWS	MDP	12/01/89 20:08	12/13/89 13:01	280.88	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	12/01/89 20:09	12/01/89 20:27	0.30	STARTED/SECURED 34 SWP FOR 3PT-M35.		SRO
SWS	MDP	12/01/89 20:27	12/05/89 09:30	85.05	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	12/04/89 12:40	12/04/89 14:15	1.58	STARTED/SECURED 33 SWP		SRO
SWS	MDP	12/04/89 17:25	12/04/89 17:26	0.02	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	12/04/89 17:29	01/05/90 08:45	759.27	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	12/04/89 17:31	12/04/89 17:32	0.02	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	12/13/89 13:01	12/13/89 13:23	0.37	STARTED/SECURED 33 SWP		SRO
SWS	MDP	12/13/89 13:23	12/15/89 09:35	44.20	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	12/15/89 09:35	12/15/89 10:35	1.00	STARTED/SECURED 33 SWP		SRO
SWS	MDP	12/15/89 10:30	01/05/90 08:45	502.25	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	01/05/90 08:45	01/05/90 09:08	0.38	STARTED/SECURED 33 SWP FOR 3PT-M35.		SRO
SWS	MDP	01/05/90 08:45	01/05/90 09:08	0.38	STARTED/SECURED 35 SWP FOR 3PT-M35.		SRO
SWS	MDP	01/05/90 09:08	01/05/90 09:37	0.48	STARTED/SECURED 31 SWP FOR 3PT-M35.		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	01/05/90 09:08	01/16/90 13:15	268.12	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	01/05/90 09:37	01/05/90 09:55	0.30	STARTED/SECURED 33 SWP		SRO
SWS	MDP	01/05/90 09:55	01/13/90 17:55	200.00	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	01/13/90 17:55	01/14/90 05:01	11.10	STARTED/SECURED 33 SWP		SRO
SWS	MDP	01/14/90 05:01	02/06/90 18:10	565.15	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	01/16/90 13:15	02/07/90 12:11	526.93	STARTED/SECURED 34 SWP FOR 3PT-M35.		SRO
SWS	MDP	01/30/90 19:37	01/31/90 11:20	15.72	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	01/31/90 11:58	01/31/90 13:03	1.08	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	02/06/90 18:10	02/07/90 12:11	18.02	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	02/07/90 12:11	02/07/90 12:30	0.32	STARTED/SECURED 33 SWP FOR 3PT-M35.		SRO
SWS	MDP	02/07/90 12:11	02/07/90 12:30	0.32	STARTED/SECURED 35 SWP FOR 3PT-M35.		SRO
SWS	MDP	02/07/90 12:30	02/14/90 10:19	165.82	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	02/07/90 12:30	02/24/90 16:25	411.92	STARTED/SECURED 36 SWP FOR 3PT-M35.		SRO
SWS	MDP	02/14/90 10:19	02/14/90 10:44	0.42	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	02/14/90 10:44	02/24/90 16:25	245.68	STARTED/SECURED 31 SWP FOR 3PT-M35.		SRO
SWS	MDP	02/24/90 16:25	02/24/90 16:45	0.33	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	02/24/90 16:25	02/24/90 16:45	0.33	STARTED/SECURED 35 SWP FOR 3PT-M35.		SRO
SWS	MDP	02/24/90 16:45	02/27/90 03:15	58.50	STARTED/SECURED 33 SWP		SRO
SWS	MDP	02/24/90 16:45	03/13/90 16:40	407.92	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	02/27/90 03:15	03/20/90 09:47	510.53	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	03/02/90 15:00	03/02/90 15:09	0.15	STARTED/SECURED 33 SWP		SRO
SWS	MDP	03/02/90 15:16	03/02/90 15:55	0.65	STARTED/SECURED 33 SWP		SRO
SWS	MDP	03/02/90 15:55	03/06/90 05:58	86.05	STARTED/SECURED 32 SWP.	START TIME (33 SWP OFF)	SRO
SWS	MDP	03/13/90 15:00	03/13/90 15:25	0.42	STARTED/SECURED 33 SWP MOTOR.		SRO
SWS	MDP	03/17/90 08:57	03/20/90 10:11	73.23	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	03/20/90 03:05	03/20/90 04:50	1.75	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/20/90 09:28	03/20/90 09:30	0.03	BUMPED 33 SWP MOTOR.	2 MIN RUN TIME	SRO
SWS	MDP	03/20/90 09:47	03/20/90 10:09	0.37	STARTED/SECURED 32 SWP LOCALLY.		SRO
SWS	MDP	03/20/90 10:09	03/21/90 21:38	35.48	STARTED/SECURED 31 SWP LOCALLY.		SRO
SWS	MDP	03/20/90 10:11	03/20/90 10:32	0.35	STARTED/SECURED 35 SWP LOCALLY.		SRO
SWS	MDP	03/20/90 10:32	03/20/90 10:50	0.30	STARTED/SECURED 36 LOCALLY.		SRO
SWS	MDP	03/20/90 10:50	03/22/90 05:30	42.67	STARTED/SECURED 34 SWP LOCALLY.		SRO
SWS	MDP	03/20/90 20:04	03/20/90 20:06	0.03	BUMPED 33 SWP FOR ROTATION.	2 MIN RUN TIME	SRO
SWS	MDP	03/21/90 01:23	03/21/90 01:32	0.15	STARTED/SECURED 33 SWP MOTOR.		SRO
SWS	MDP	03/21/90 04:15	03/21/90 04:26	0.18	STARTED/SECURED 33 SWP MOTOR.		SRO
SWS	MDP	03/21/90 05:20	03/21/90 05:28	0.13	STARTED/SECURED 33 SWP MOTOR.		SRO
SWS	MDP	03/21/90 12:18	03/21/90 12:35	0.28	STARTED/SECURED 33 SWP MOTOR.		SRO
SWS	MDP	03/21/90 21:37	03/22/90 00:30	2.88	STARTED/SECURED 33 SWP		SRO
SWS	MDP	03/22/90 00:30	03/24/90 10:13	57.72	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	03/22/90 00:35	03/22/90 00:36	0.02	STARTED & SHUTDOWN 33 SWP LOCALLY.		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	03/24/90 10:13	04/14/90 10:43	504.50	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	03/25/90 02:20	03/25/90 05:30	3.17	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	03/25/90 16:18	03/27/90 16:58	48.67	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	03/27/90 16:58	03/28/90 18:12	25.23	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	03/28/90 18:12	03/30/90 12:30	42.30	STARTED/SECURED 33 SWP.	END TIME (31 SWP ON)	SRO
SWS	MDP	03/30/90 12:30	04/14/90 10:43	358.22	STARTED/SECURED 31 SWP FOR 3PT-M35.	START TIME (31 OPERABLE)	SRO
SWS	MDP	04/14/90 10:43	04/14/90 11:05	0.37	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	04/14/90 10:43	04/14/90 11:05	0.37	STARTED/SECURED 36 SWP FOR 3PT-M35.		SRO
SWS	MDP	04/14/90 11:05	05/08/90 19:12	584.12	STARTED/SECURED 33 SWP FOR 3PT-M35.		SRO
SWS	MDP	04/14/90 11:05	05/07/90 02:08	543.05	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	05/01/90 13:52	05/02/90 12:42	22.83	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	05/07/90 02:08	05/08/90 18:49	40.68	STARTED/SECURED 36 SWP FOR 3PT-M35.		SRO
SWS	MDP	05/08/90 18:49	05/14/90 19:00	144.18	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	05/08/90 19:12	05/08/90 19:28	0.27	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	05/08/90 19:28	05/20/90 04:42	273.23	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	05/09/90 02:58	05/09/90 03:18	0.33	RAN 32 SWP.		SRO
SWS	MDP	05/12/90 01:59	05/12/90 03:09	1.17	RAN 32 SWP.		SRO
SWS	MDP	05/14/90 18:20	05/20/90 07:15	132.92	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	05/19/90 14:34	05/25/90 14:05	143.52	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	05/20/90 04:35	06/02/90 03:25	310.83	STARTED/SECURED 33 SWP FOR 3PT-M35.		SRO
SWS	MDP	05/22/90 12:52	05/22/90 13:22	0.50	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	05/23/90 13:23	05/23/90 13:25	0.03	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	05/23/90 15:42	06/02/90 02:52	227.17	STARTED/SECURED 31 SWP FOR 3PT-M35.		SRO
SWS	MDP	05/25/90 14:05	06/02/90 02:55	180.83	STARTED/SECURED 35 SWP FOR 3PT-M35.		SRO
SWS	MDP	05/29/90 09:26	06/02/90 04:40	91.23	STARTED/SECURED 36 SWP FOR 3PT-M35.		SRO
SWS	MDP	06/02/90 02:52	06/02/90 12:41	9.82	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	06/02/90 02:55	06/04/90 13:15	58.33	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	06/02/90 03:25	06/26/90 09:25	582.00	STARTED/SECURED 31 SWP FOR 3PT-M35.		SRO
SWS	MDP	06/02/90 04:40	06/02/90 04:45	0.08	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	06/02/90 04:45	07/06/90 12:22	823.62	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	06/04/90 13:15	06/26/90 09:25	524.17	STARTED/SECURED 35 SWP FOR 3PT-M35.		SRO
SWS	MDP	06/16/90 11:22	06/16/90 16:52	5.50	STARTED/SECURED 33 SWP		SRO
SWS	MDP	06/25/90 12:41	06/25/90 13:00	0.32	STARTED/SECURED 33 SWP FOR 3PT-M35.		SRO
SWS	MDP	06/26/90 09:25	07/20/90 04:12	570.78	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	06/26/90 09:25	07/20/90 04:44	571.32	STARTED/SECURED 33 SWP FOR 3PT-M35.	START TIME (31 SWP OFF)	SRO
SWS	MDP	06/26/90 09:25	06/30/90 16:35	103.17	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	06/30/90 16:35	07/20/90 04:12	467.62	STARTED/SECURED 35 SWP FOR 3PT-M35.		SRO
SWS	MDP	07/06/90 10:27	07/06/90 10:55	0.47	STARTED/ SECURED 34 SWP FOR RETEST.		SRO
SWS	MDP	07/06/90 12:22	07/16/90 21:15	248.88	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	07/16/90 21:15	07/20/90 04:44	79.48	STARTED/SECURED 36 SWP FOR 3PT-M35.		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	07/20/90 04:12	08/03/90 19:25	351.22	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	07/20/90 04:12	08/14/90 17:31	613.32	STARTED/SECURED 34 SWP FOR 3PT-M35.		SRO
SWS	MDP	07/20/90 04:44	08/07/90 19:28	446.73	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	07/20/90 04:44	08/14/90 17:35	612.85	STARTED/SECURED 35 SWP FOR 3PT-M35.		SRO
SWS	MDP	08/03/90 18:00	08/14/90 17:30	263.50	STARTED/SECURED 33 SWP FOR 3PT-M35.		SRO
SWS	MDP	08/07/90 18:05	08/14/90 17:16	167.18	STARTED/SECURED 31 SWP FOR 3PT-M35.		SRO
SWS	MDP	08/08/90 16:24	08/14/90 17:38	145.23	STARTED/SECURED 36 SWP FOR 3PT-M35.		SRO
SWS	MDP	08/14/90 17:16	09/07/90 12:42	571.43	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	08/14/90 17:30	08/28/90 11:45	330.25	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	08/14/90 17:34	09/07/90 12:51	571.28	STARTED/SECURED 34 SWP FOR 3PT-M35.		SRO
SWS	MDP	08/14/90 17:37	09/07/90 12:57	571.33	STARTED/SECURED 35 SWP FOR 3PT-M35.		SRO
SWS	MDP	08/14/90 17:40	09/07/90 13:08	571.47	STARTED/SECURED 36 SWP FOR 3PT-M35.		SRO
SWS	MDP	08/28/90 11:45	09/07/90 09:34	237.82	STARTED/SECURED 33 SWP FOR 3PT-M35.		SRO
SWS	MDP	09/07/90 09:34	09/18/90 16:20	270.77	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	09/07/90 12:42	09/18/90 17:40	268.97	STARTED/SECURED 33 SWP		SRO
SWS	MDP	09/07/90 12:57	09/18/90 16:20	267.38	STARTED/SECURED 34 SWP FOR PT-R003B.		SRO
SWS	MDP	09/07/90 12:59	09/15/90 22:08	201.15	STARTED/SECURED 35 SWP.	END TIME (36 SWP ON)	SRO
SWS	MDP	09/15/90 22:08	09/18/90 17:40	67.53	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	09/18/90 16:20	09/24/90 12:15	139.92	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	09/18/90 16:20	09/19/90 09:05	16.75	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	09/18/90 17:40	09/24/90 12:15	138.58	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	09/18/90 17:40	09/26/90 19:37	193.95	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	09/19/90 09:05	09/25/90 13:10	148.08	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	09/24/90 12:15	09/25/90 13:10	24.92	STARTED/SECURED 33 SWP		SRO
SWS	MDP	09/25/90 10:05	10/01/90 09:13	143.13	STARTED/SECURED 32 SWP.		SRO
SWS	MDP	09/25/90 13:10	09/29/90 04:53	87.72	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	09/29/90 04:53	10/01/90 09:13	52.33	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	10/01/90 09:13	10/01/90 09:43	0.50	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	10/01/90 09:13	10/01/90 09:43	0.50	STARTED/SECURED 35 SWP.		SRO
SWS	MDP	10/01/90 09:43	10/04/90 09:01	71.30	STARTED/SECURED 33 SWP		SRO
SWS	MDP	10/01/90 09:43	10/01/90 12:50	3.12	STARTED/SECURED 36 SWP		SRO
SWS	MDP	10/01/90 12:50	10/24/90 14:25	553.58	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	10/24/90 14:25	10/24/90 15:27	1.03	STARTED/SECURED 33 SWP		SRO
SWS	MDP	10/24/90 15:27	10/24/90 17:58	2.52	STARTED/SECURED 34 SWP		SRO
SWS	MDP	10/24/90 17:58	10/24/90 18:28	0.50	STARTED/SECURED 35 SWP		SRO
SWS	MDP	10/24/90 18:28	10/24/90 18:44	0.27	STARTED/SECURED 36 SWP.		SRO
SWS	MDP	10/24/90 18:44	10/24/90 18:55	0.18	STARTED/SECURED 31 SWP.		SRO
SWS	MDP	10/24/90 18:55	10/24/90 21:40	2.75	STARTED/SECURED 32 SWP		SRO
SWS	MDP	10/24/90 21:40	11/14/90 08:15	490.58	STARTED/SECURED 34 SWP.		SRO
SWS	MDP	11/16/90 10:34	11/17/90 14:02	27.47	STARTED/SECURED 35 SWP	END TIME (34 SWP ON)	SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	11/17/90 14:02	11/18/90 17:30	27.47	STARTED/SECURED 34 SWP	START TIME(35 SWP OFF)	SRO
SWS	MDP	11/18/90 17:30	11/18/90 17:48	0.30	STARTED/SECURED 36 SWP		SRO
SWS	MDP	11/18/90 17:48	11/18/90 18:05	0.28	STARTED/SECURED 35 SWP		SRO
SWS	MDP	11/18/90 18:05	11/18/90 18:21	0.27	STARTED/SECURED 31 SWP		SRO
SWS	MDP	11/18/90 18:21	11/18/90 18:36	0.25	STARTED/SECURED 32 SWP		SRO
SWS	MDP	11/18/90 18:36	11/18/90 18:51	0.25	STARTED/SECURED 33 SWP		SRO
SWS	MDP	11/18/90 18:51	11/23/90 07:45	108.90	STARTED/SECURED 34 SWP		SRO
SWS	MDP	11/23/90 07:45	12/01/90 09:20	193.58	STARTED/SECURED 35 SWP		SRO
SWS	MDP	12/01/90 09:20	12/01/90 15:20	6.00	STARTED/SECURED 36 SWP		SRO
SWS	MDP	12/01/90 15:20	12/03/90 17:11	49.85	STARTED/SECURED 33 SWP		SRO
SWS	MDP	12/03/90 17:11	12/04/90 13:25	20.23	STARTED/SECURED 35 SWP		SRO
SWS	MDP	12/04/90 13:25	12/04/90 16:48	3.38	STARTED/SECURED 34 SWP		SRO
SWS	MDP	12/04/90 16:48	12/09/90 13:46	116.97	STARTED/SECURED 33 SWP		SRO
SWS	MDP	12/09/90 13:46	12/09/90 14:25	0.65	STARTED/SECURED 31 SWP	START TIME (33 SWP OFF)	SRO
SWS	MDP	12/09/90 13:46	12/12/90 08:49	67.05	STARTED/SECURED 32 SWP		SRO
SWS	MDP	12/10/90 17:19	12/11/90 17:15	23.93	STARTED/SECURED 34 SWP		SRO
SWS	MDP	12/11/90 18:15	12/12/90 08:49	14.57	STARTED/SECURED 34 SWP		SRO
SWS	MDP	12/12/90 08:49	12/12/90 09:19	0.50	STARTED/SECURED 31 SWP		SRO
SWS	MDP	12/12/90 08:49	12/12/90 09:19	0.50	STARTED/SECURED 35 SWP		SRO
SWS	MDP	12/12/90 09:19	12/12/90 13:26	4.12	STARTED/SECURED 33 SWP		SRO
SWS	MDP	12/12/90 09:19	12/12/90 13:26	4.12	STARTED/SECURED 36 SWP		SRO
SWS	MDP	12/12/90 13:26	12/21/90 10:35	213.15	STARTED/SECURED 32 SWP		SRO
SWS	MDP	12/12/90 13:26	12/14/90 06:20	40.90	STARTED/SECURED 35 SWP		SRO
SWS	MDP	12/14/90 06:20	12/21/90 10:35	172.25	STARTED/SECURED 34 SWP		SRO
SWS	MDP	12/21/90 10:35	12/21/90 10:43	0.13	STARTED/SECURED 33 SWP		SRO
SWS	MDP	12/21/90 10:35	12/21/90 10:43	0.13	STARTED/SECURED 36 SWP		SRO
SWS	MDP	12/21/90 10:43	01/06/91 13:30	386.78	STARTED/SECURED 31 SWP		SRO
SWS	MDP	12/21/90 10:43	01/06/91 13:30	386.78	STARTED/SECURED 35 SWP		SRO
SWS	MDP	01/06/91 13:30	01/07/91 11:37	22.12	STARTED/SECURED 32 SWP		SRO
SWS	MDP	01/06/91 13:30	01/07/91 12:50	23.33	STARTED/SECURED 34 SWP		SRO
SWS	MDP	01/07/91 11:37	01/07/91 13:33	1.93	STARTED/SECURED 31 SWP		SRO
SWS	MDP	01/07/91 12:50	01/07/91 13:33	0.72	STARTED/SECURED 35 SWP		SRO
SWS	MDP	01/07/91 13:33	01/31/91 10:27	572.90	STARTED/SECURED 33 SWP FOR 3PT-M35.		SRO
SWS	MDP	01/07/91 13:33	01/22/91 18:50	365.28	STARTED/SECURED 36 SWP		SRO
SWS	MDP	01/12/91 00:37	01/12/91 02:39	2.03	STARTED/SECURED 32 SWP		SRO
SWS	MDP	01/16/91 17:47	01/17/91 01:12	7.42	STARTED/SECURED 31 SWP		SRO
SWS	MDP	01/22/91 18:50	01/29/91 04:40	153.83	STARTED/SECURED 35 SWP		SRO
SWS	MDP	01/29/91 04:40	01/31/91 10:27	53.78	STARTED/SECURED 34 SWP FOR 3PT-M35.		SRO
SWS	MDP	01/31/91 10:27	01/31/91 10:45	0.30	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	01/31/91 10:27	01/31/91 10:45	0.30	STARTED/SECURED 35 SWP		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	01/31/91 10:45	02/25/91 10:18	599.55	STARTED/SECURED 31 SWP FOR 3PT-M35.		SRO
SWS	MDP	01/31/91 10:45	02/25/91 10:18	599.55	STARTED/SECURED 36 SWP FOR 3PT-M35.		SRO
SWS	MDP	02/25/91 10:18	02/25/91 10:35	0.28	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	02/25/91 10:18	02/25/91 10:35	0.28	STARTED/SECURED 35 SWP FOR 3PT-M35.		SRO
SWS	MDP	02/25/91 10:35	02/25/91 11:55	1.33	STARTED/SECURED 33 SWP FOR 3PT-M35.		SRO
SWS	MDP	02/25/91 10:35	02/25/91 11:55	1.33	STARTED/SECURED 34 SWP FOR 3PT-M35.		SRO
SWS	MDP	02/25/91 11:55	03/06/91 16:02	220.12	STARTED/SECURED 31 SWP		SRO
SWS	MDP	02/25/91 11:55	03/12/91 15:52	363.95	STARTED/SECURED 36 SWP		SRO
SWS	MDP	03/06/91 16:02	03/25/91 15:54	455.87	STARTED/SECURED 32 SWP		SRO
SWS	MDP	03/07/91 21:42	03/07/91 22:02	0.33	STARTED/SECURED 33 SWP		SRO
SWS	MDP	03/12/91 15:52	3/12/91 21:15	5.38	STARTED/SECURED 35 SWP		SRO
SWS	MDP	03/12/91 21:45	03/18/91 22:18	144.55	STARTED/SECURED 36 SWP		SRO
SWS	MDP	03/18/91 22:18	3/19/91 17:11	18.88	STARTED/SECURED 35 SWP		SRO
SWS	MDP	03/19/91 17:11	03/25/91 15:54	142.72	STARTED/SECURED 36 SWP FOR 3PT-M35.		SRO
SWS	MDP	03/25/91 15:54	03/25/91 16:35	0.68	STARTED/SECURED 31 SWP FOR 3PT-M35.		SRO
SWS	MDP	03/25/91 15:54	03/25/91 16:35	0.68	STARTED/SECURED 34 SWP FOR 3PT-M35.		SRO
SWS	MDP	03/25/91 16:35	04/18/91 08:43	568.13	STARTED/SECURED 33 SWP		SRO
SWS	MDP	03/25/91 16:35	04/12/91 07:15	422.67	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/06/91 17:00	04/06/91 17:47	0.78	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/12/91 07:15	04/12/91 16:25	9.17	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/12/91 16:25	04/12/91 16:55	0.50	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/12/91 16:55	04/14/91 05:50	36.92	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/14/91 04:13	04/14/91 04:15	0.03	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/14/91 05:50	04/14/91 05:52	0.03	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/14/91 05:52	04/14/91 10:25	4.55	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/14/91 10:20	04/14/91 10:35	0.25	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/14/91 10:35	04/16/91 14:14	51.65	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/16/91 14:06	04/18/91 08:43	42.62	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/18/91 08:43	04/18/91 09:38	0.92	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/18/91 08:43	04/18/91 09:38	0.92	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/18/91 09:38	05/12/91 01:29	567.85	STARTED/SECURED 31 SWP FOR 3PT-M35.		SRO
SWS	MDP	04/18/91 09:38	04/22/91 10:13	96.58	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/22/91 10:13	04/22/91 17:57	7.73	STARTED/SECURED 34 SWP		SRO
SWS	MDP	04/22/91 17:52	05/04/91 10:00	280.13	STARTED/SECURED 36 SWP		SRO
SWS	MDP	04/30/91 07:24	05/02/91 13:10	53.77	STARTED/SECURED 35 SWP		SRO
SWS	MDP	04/30/91 12:30	04/30/91 12:40	0.17	STARTED/SECURED 32 SWP (FAILED 1105 OPEN FOR MTC)		SRO
SWS	MDP	04/30/91 18:30	04/30/91 19:35	1.08	STARTED/SECURED 32 SWP		SRO
SWS	MDP	04/30/91 21:25	04/30/91 22:34	1.15	STARTED/SECURED 32 SWP		SRO
SWS	MDP	05/02/91 13:10	05/02/91 13:11	0.02	STARTED/SECURED 34 SWP		SRO
SWS	MDP	05/02/91 13:11	05/02/91 13:24	0.22	STARTED/SECURED 35 SWP		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	05/02/91 13:24	05/03/91 09:35	20.18	STARTED/SECURED 34 SWP		SRO
SWS	MDP	05/03/91 09:35	05/03/91 13:35	4.00	STARTED/SECURED 35 SWP		SRO
SWS	MDP	05/03/91 13:35	05/06/91 07:55	66.33	STARTED/SECURED 34 SWP		SRO
SWS	MDP	05/04/91 10:00	05/06/91 20:30	58.50	STARTED/SECURED 35 SWP		SRO
SWS	MDP	05/06/91 07:55	5/12/91 0:20	136.42	STARTED/SECURED 36 SWP		SRO
SWS	MDP	05/06/91 20:30	05/06/91 20:38	0.13	STARTED/SECURED 34 SWP		SRO
SWS	MDP	05/06/91 20:38	05/06/91 20:52	0.23	STARTED/SECURED 35 SWP		SRO
SWS	MDP	05/06/91 20:52	05/12/91 01:30	124.63	STARTED/SECURED 34 SWP FOR 3PT-M35.		SRO
SWS	MDP	05/07/91 04:16	05/07/91 05:32	1.27	STARTED/SECURED 32 SWP		SRO
SWS	MDP	05/12/91 01:29	05/12/91 02:02	0.55	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	05/12/91 01:30	05/12/91 02:02	0.53	STARTED/SECURED 35 SWP FOR 3PT-M35.		SRO
SWS	MDP	05/12/91 02:02	05/12/91 02:22	0.33	STARTED/SECURED 33 SWP FOR 3PT-M35.		SRO
SWS	MDP	05/12/91 02:02	05/12/91 02:22	0.33	STARTED/SECURED 36 SWP FOR 3PT-M35.		SRO
SWS	MDP	05/12/91 02:22	06/05/91 10:18	583.93	STARTED/SECURED 31 SWP FOR 3PT-M35.		SRO
SWS	MDP	05/12/91 02:22	06/01/91 02:30	480.13	STARTED/SECURED 34 SWP		SRO
SWS	MDP	05/13/91 03:50	05/14/91 18:40	38.83	STARTED/SECURED 35 SWP		SRO
SWS	MDP	05/14/91 18:40	05/18/91 23:40	101.00	STARTED/SECURED 36 SWP		SRO
SWS	MDP	05/24/91 01:28	05/24/91 01:58	0.50	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/24/91 01:28	06/01/91 01:20	191.87	STARTED/SECURED 36 SWP		SRO
SWS	MDP	05/24/91 10:53	06/10/91 04:15	401.37	STARTED/SECURED 33 SWP		SRO
SWS	MDP	05/31/91 16:11	05/31/91 16:13	0.03	BUMPED 35 SWP FOR ISOLATION		SRO
SWS	MDP	06/01/91 01:20	06/01/91 01:55	0.58	STARTED/SECURED 35 SWP		SRO
SWS	MDP	06/01/91 01:55	06/01/91 02:20	0.42	STARTED/SECURED 36 SWP		SRO
SWS	MDP	06/01/91 02:20	9/24/91 20:16	2777.93	STARTED/SECURED 35 SWP		SRO
SWS	MDP	06/01/91 02:30	06/05/91 10:19	103.82	STARTED/SECURED 36 SWP FOR 3PT-M35.		SRO
SWS	MDP	06/05/91 10:18	06/10/91 18:45	128.45	STARTED/SECURED 32 SWP		SRO
SWS	MDP	06/05/91 10:19	06/05/91 10:42	0.38	STARTED/SECURED 34 SWP FOR 3PT-M35.		SRO
SWS	MDP	06/05/91 10:42	06/06/91 17:16	30.57	STARTED/SECURED 36 SWP		SRO
SWS	MDP	06/06/91 17:16	06/06/91 21:45	4.48	STARTED/SECURED 34 SWP		SRO
SWS	MDP	06/06/91 21:45	06/29/91 02:20	532.58	STARTED/SECURED 36 SWP		SRO
SWS	MDP	06/10/91 04:15	06/10/91 18:40	14.42	STARTED/SECURED 31 SWP		SRO
SWS	MDP	06/10/91 18:40	06/10/91 18:43	0.05	STARTED/SECURED 33 SWP		SRO
SWS	MDP	06/10/91 18:43	10/27/91 01:24	3318.68	STARTED/SECURED 31 SWP		SRO
SWS	MDP	06/10/91 18:45	06/29/91 02:20	439.58	STARTED/SECURED 33 SWP		SRO
SWS	MDP	06/29/91 02:20	08/24/91 11:28	1353.13	STARTED/SECURED 32 SWP		SRO
SWS	MDP	06/29/91 02:20	10/02/91 12:10	2289.83	STARTED/SECURED 34 SWP		SRO
SWS	MDP	07/17/91 20:29	10/19/91 13:34	2249.08	STARTED/SECURED 36 SWP		SRO
SWS	MDP	07/20/91 18:55	08/24/91 05:54	826.98	STARTED/SECURED 33 SWP		SRO
SWS	MDP	08/24/91 18:48	09/24/91 21:16	746.47	STARTED/SECURED 32 SWP		SRO
SWS	MDP	08/31/91 16:47	09/25/91 11:35	594.80	STARTED/SECURED 33 SWP		SRO

Table F3 System Operation Log

System	EQ Type	Start Date	End Date	Duration	Event Description	Notes	Source
SWS	MDP	09/25/91 11:35	10/03/91 10:07	190.53	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	10/02/91 12:10	10/02/91 13:05	0.92	STARTED/SECURED 35 SWP		SRO
SWS	MDP	10/03/91 10:07	10/08/91 17:20	127.22	STARTED/SECURED 33 SWP		SRO
SWS	MDP	10/03/91 10:07	10/27/91 01:24	567.28	STARTED/SECURED 35 SWP		SRO
SWS	MDP	10/26/91 11:12	10/27/91 02:10	14.97	STARTED/SECURED 36 SWP		SRO
SWS	MDP	10/27/91 01:24	10/27/91 02:10	0.77	STARTED/SECURED 32 SWP		SRO
SWS	MDP	10/27/91 01:24	11/21/91 09:32	608.13	STARTED/SECURED 34 SWP FOR 3PT-M35.		SRO
SWS	MDP	10/27/91 02:10	11/01/91 23:10	141.00	STARTED/SECURED 33 SWP		SRO
SWS	MDP	10/27/91 02:10	12/15/91 01:46	1175.60	STARTED/SECURED 35 SWP		SRO
SWS	MDP	11/16/91 05:30	11/21/91 09:30	124.00	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	11/21/91 09:30	11/21/91 10:01	0.52	STARTED/SECURED 31 SWP FOR 3PT-M35.		SRO
SWS	MDP	11/21/91 09:32	11/21/91 13:12	3.67	STARTED/SECURED 36 SWP FOR 3PT-M35.		SRO
SWS	MDP	11/21/91 10:01	11/21/91 10:20	0.32	STARTED/SECURED 33 SWP FOR 3PT-M35.		SRO
SWS	MDP	11/21/91 10:20	11/21/91 10:55	0.58	STARTED/SECURED 31 SWP FOR 3PT-M35.		SRO
SWS	MDP	11/21/91 10:55	11/30/91 14:05	219.17	STARTED/SECURED 32 SWP		SRO
SWS	MDP	11/21/91 13:12	12/31/91 23:59	970.78	STARTED 34 SWP		SRO
SWS	MDP	11/29/91 19:05	11/29/91 19:50	0.75	STARTED/SECURED 33 SWP		SRO
SWS	MDP	11/29/91 21:35	11/29/91 21:50	0.25	STARTED/SECURED 33 SWP		SRO
SWS	MDP	11/30/91 12:50	11/30/91 13:00	0.17	STARTED/SECURED 33 SWP		SRO
SWS	MDP	11/30/91 13:55	11/30/91 14:23	0.47	STARTED/SECURED 33 SWP		SRO
SWS	MDP	11/30/91 14:23	12/15/91 01:47	347.40	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	12/15/91 01:46	12/31/91 23:59	406.22	STARTED 36 SWP		SRO
SWS	MDP	12/15/91 01:47	12/15/91 02:07	0.33	STARTED/SECURED 31 SWP FOR 3PT-M35.		SRO
SWS	MDP	12/15/91 02:07	12/15/91 02:24	0.28	STARTED/SECURED 33 SWP FOR 3PT-M35.		SRO
SWS	MDP	12/15/91 02:24	12/15/91 03:41	1.28	STARTED/SECURED 32 SWP FOR 3PT-M35.		SRO
SWS	MDP	12/15/91 03:41	12/15/91 05:04	1.38	STARTED/SECURED 31 SWP FOR 3PT-M35.		SRO
SWS	MDP	12/15/91 05:04	12/15/91 05:14	0.17	STARTED/SECURED 33 SWP FOR 3PT-M35.		SRO
SWS	MDP	12/15/91 05:14	12/31/91 23:59	402.75	STARTED 31 SWP		SRO
SWS	MDP	12/26/91 13:47	12/26/91 14:00	0.22	STARTED/SECURED 35 SWP		SRO

Table F4 Summary Of System Operation Log

SYSTEM	COMP TYPE	FAILURE MODE	COMPONENTS	DEMANDS	RUN HOURS
AC4	CRB	OO	AT BREAKERS	28	---
AC4	CRB	CC	AT BREAKERS	54	---
AC6	ASW	CC	UT BREAKER AUX SWITCHES	124	---
AC6	CRB	OO	UT-ST BREAKERS	162	---
AC6	CRB	CC	UT BREAKERS	124	---
AFW	AOV	OO	PCV-1139	33	---
AFW	AOV	CC	PCV-1139	33	---
AFW	CKV	CC	AFW PUMP CHECK VALVES	1,702	---
AFW	CRB	DN	AFW PUMP BREAKERS	818	---
AFW	MDP	FS	MOTOR DRIVEN AFW PUMPS	818	---
AFW	MDP	FR	MOTOR DRIVEN AFW PUMPS	---	3,455.81
AFW	MSW	DN	AFW PUMP SWITCHES	818	---
AFW	SKV	OO	MS-41 & 42	33	---
AFW	SKV	CC	MS-41 & 42	33	---
AFW	TDP	FS	TURBINE DRIVEN AFW PUMPS	33	---
AFW	TDP	FR	TURBINE DRIVEN AFW PUMPS	---	152.82
CCW	MDP	FS	COMPONENT COOLING WATER PUMPS	467	---
CCW	MDP	FR	COMPONENT COOLING WATER PUMPS	---	86,329.62
CDS	MDP	FS	CONDENSATE PUMPS	241	---
CDS	MDP	FR	CONDENSATE PUMPS	---	88,966.75
CFC	FCU	FS	CONTAINMENT FAN COOLING UNITS	1,172	---
CFC	FCU	FR	CONTAINMENT FAN COOLING UNITS	---	190,692.75
CSS	AOV	CC	SI-1813	37	---
CSS	CKV	CC	CS PUMP DISCHARGE CHECK VALVES	37	---
CSS	CRB	DN	CS PUMP BREAKERS	37	---
CSS	MDP	FS	CONTAINMENT SPRAY PUMPS	37	---
CSS	MDP	FR	CONTAINMENT SPRAY PUMPS	---	17.31
CSS	MOV	CC	CS PUMP DISCHARGE VALVES	37	---
CSS	MSW	DN	CS PUMP SWITCHES	37	---
CSS	XVM	CC	SI-878A&B	37	---

Table F4 Summary Of System Operation Log

SYSTEM	COMP TYPE	FAILURE MODE	COMPONENTS	DEMANDS	RUN HOURS
CVC	CKV	CC	BAT PUMP DISCHARGE CHECK VALVES	38	---
CVC	CRB	DN	BAT PUMP BREAKERS	38	---
CVC	CRB	DN	CVCS PUMP BREAKERS	745	---
CVC	MDP	FS	BORIC ACID TRANSFER PUMPS	38	---
CVC	MDP	FR	BORIC ACID TRANSFER PUMPS	---	59,189.53
CVC	MSW	DN	BAT PUMP SWITCHES	38	---
CVC	MSW	DN	CVCS PUMP SWITCHES	745	---
CVC	PDP	FS	CHARGING PUMPS - POSITIVE DISPLACEMENT	745	---
CVC	PDP	FR	CHARGING PUMPS - POSITIVE DISPLACEMENT	---	50,928.85
DC1	BAT	HW	BATTERIES	119	4,755.36
DC1	BCC	HW	BATTERY CHARGERS	119	4,735.35
EDG	ASV	FE	EDG AIR START MOTORS	125	---
EDG	CRB	OO	EDG BREAKERS	125	---
EDG	ENG	FS	EMERGENCY DIESEL GENERATOR ENGINES	125	---
EDG	ENG	FR	EMERGENCY DIESEL GENERATOR ENGINES	---	219.55
EDG	GEN	HW	EMERGENCY DIESEL GENERATORS	125	---
IAS	CMP	FS	INSTRUMENT AIR COMPRESSORS	32	---
IAS	CMP	FR	INSTRUMENT AIR COMPRESSORS	---	80,860.00
LHR	CKV	CC	RECIRC PUMP DISCHARGE CHECK VALVES	16	---
LHR	CRB	DN	RECIRC PUMP BREAKERS	16	---
LHR	MDP	FS	RECIRCULATION PUMPS	16	---
LHR	MDP	FR	RECIRCULATION PUMPS	---	3.92
LHR	MOV	OO	RECIRC PUMP DISCHARGE VALVES	16	---
LHR	MOV	CC	RECIRC PUMP DISCHARGE VALVES	16	---
LHR	MSW	DN	RECIRC PUMP SWITCHES	16	---
MFW	TDP	FS	MAIN BOILER FEEDWATER PUMP	98	---
MFW	TDP	FR	MAIN BOILER FEEDWATER PUMP	---	82,339.27
MSS	AOV	OO	PCV-1134 TO 1137	23	
MSS	AOV	CC	PCV-1134 TO 1137	23	

Table F4 Summary Of System Operation Log

SYSTEM	COMP TYPE	FAILURE MODE	COMPONENTS	DEMANDS	RUN HOURS
MSS	CKV	OO	MS-2 OTHERS	58	
MSS	MSV	OO	MS-1 OTHERS	110	
MSS	MSV		MS-1 OPEN/CLOSE		
MSS	MSW	DN	PCV-1214 TO 1217	45	
MSS	PCV	OO	PCV-1214 TO 1217	45	
MSS	PCV	CC	PCV-1214 TO 1217	45	
MSS	SOV	OO	SOV-1230 TO 1245	6	
MSS	SOV	HW	SOV-1314 TO 1317	45	
MSS	SOV	CC	SOV-1230 TO 1245	6	
MSS	SRV	CO	MS-45's TO 49's		
MSS			SGBD'S		
PWS	MDP	FS	PRIMARY WATER PUMPS	59	---
PWS	MDP	FR	PRIMARY WATER PUMPS	---	25,700.09
RCS	MDP	FS	REACTOR COOLANT PUMPS	232	---
RCS	MDP	FR	REACTOR COOLANT PUMPS	---	130,202.06
RHR	CKV	CC	RHR PUMP CHECK VALVES	468	---
RHR	CRB	DN	RHR PUMP BREAKERS	156	---
RHR	MDP	FS	RHR PUMPS	156	---
RHR	MDP	FR	RHR PUMPS	---	12,506.04
RHR	MSW	DN	RHR PUMP SWITCHES	156	---
SIS	CKV	CC	SI PUMP CHECK VALVES	192	---
SIS	CRB	DN	SI PUMP BREAKERS	96	---
SIS	MDP	FS	SAFETY INJECTION PUMPS	96	---
SIS	MDP	FR	SAFETY INJECTION PUMPS	---	17.87
SIS	MSW	DN	SI PUMP SWITCHES	96	---
SWS	MDP	FS	SERVICE WATER PUMPS	1,679	---
SWS	MDP	FR	SERVICE WATER PUMPS	---	163,883.68

Table F4 Summary Of System Operation Log

NOTES

Counted modeled breakers only.
Counted modeled breakers only.
Based on UT breaker operation.

Based on turbine start demands and minimum steam flow path.
Based on turbine start demands and minimum steam flow path.
Based on pump start demands and minimum flow path.
Based on pump start demands.

Based on pump start demands.
Based on turbine start demands and minimum steam flow path.
Based on turbine start demands and minimum steam flow path.

Based on pump start demands and minimum flow path.
Based on pump start demands and minimum flow path.
Based on pump start demands.

Based on pump start demands and minimum flow path.
Based on pump start demands.
Based on pump start demands and minimum flow path.

Table F4 Summary Of System Operation Log

NOTES
Based on pump start demands and minimum flow path.
Based on pump start demands.
Based on pump start demands.
Based on pump start demands.
Based on pump start demands.
Not used in final calculation.
Not used in final calculation.
Based on EDG start demands.
Based on EDG start demands.
Based on EDG start demands.
Run hours are only rough estimates. Much of operated duration were assumed as result of missing entries in logs.
Based on pump start demands and minimum flow path.
Based on pump start demands.
Based on pump start demands and minimum flow path.
Based on pump start demands and minimum flow path.
Based on pump start demands.

Table F4 Summary Of System Operation Log

NOTES

Assumed to check the operability of both MS-1's and MS-2's.

These SOVs are the pilot valves for PCV-1214 to 1217.

PWS pump data (number of starts and operated hours) are low due to the lack of entries in the logs.

PWS pump data (number of starts and operated hours) are low due to the lack of entries in the logs.

Based on pump start demands and minimum flow path.

Based on pump start demands.

Based on pump start demands.

Based on pump start demands and minimum flow path.

Based on pump start demands.

Based on pump start demands.

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
AC4	3PT-M62	02/04/86 08:52	02/04/86 13:07	4.25	3PT-M62 (480 UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM)	SRO
AC4	3PT-M62	03/05/86 15:53	03/05/86 18:00	2.12	3PT-M62 (480 UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM)	SRO
AC4	3PT-M62	03/18/86 07:45	03/18/86 09:45	2.00	3PT-M62 (480 UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM)	SRO
AC4	3PT-M62	04/15/86 16:25	04/15/86 17:26	1.02	3PT-M62 (480 UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM)	SRO
AC4	3PT-M62	06/13/86 08:05	06/13/86 09:20	1.25	3PT-M62 (480 UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM)	SRO
AC4	3PT-M62	08/11/86 08:35	08/11/86 10:35	2.00	3PT-M62 (480 UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM)	SRO
AC4	3PT-M62	10/09/86 08:44	10/09/86 10:44	2.00	3PT-M62 (480 UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM)	SRO
AC4	3PT-M62	12/01/86 08:10	12/01/86 09:58	1.80	3PT-M62 (480 UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM)	SRO
AC4	3PT-M62	02/20/87 09:05	02/20/87 12:35	3.50	3PT-M62 (480 UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM)	SRO
AC4	3PT-M62	10/14/87 08:00	10/14/87 09:02	1.03	3PT-M62 (480 UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM)	SRO
AC4	3PT-M62	12/14/87 09:50	12/14/87 11:50	2.00	3PT-M62 (480 UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM)	SRO
AC4	3PT-M62	01/08/88 08:12	01/08/88 08:45	0.55	3PT-M62 (480 UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM)	SRO
AC4	3PT-M62	02/08/88 08:30	02/08/88 12:30	4.00	3PT-M62 (480 UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM)	SRO
AC4	3PT-M62	06/03/88 08:05	06/03/88 13:55	5.83	3PT-M62 (480 UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM)	SRO
AC4	3PT-M62	06/24/88 08:20	06/24/88 09:44	1.40	3PT-M62 (480 UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM)	SRO
AC4	3PT-M62	07/18/88 08:05	07/18/88 14:30	6.42	3PT-M62 (480 UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM)	SRO
AC4	3PT-M62	09/08/88 08:23	09/08/88 09:05	0.70	3PT-M62 (480 UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM)	SRO
AC4	3PT-M62	12/14/88 08:05	12/14/88 10:24	2.32	3PT-M62 (480 UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM)	SRO
AC4	3PT-M62	09/25/89 15:50	09/25/89 16:50	1.00	3PT-M62 (480 UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM)	SRO
AC4	3PT-M62	11/13/89 08:20	11/13/89 13:30	5.17	3PT-M62 (480 UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM)	SRO
AC4	3PT-M62	01/26/90 07:50	01/26/90 13:00	5.17	3PT-M62 (480 UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM)	SRO
AC4	3PT-M62	02/21/90 07:52	02/21/90 13:46	5.90	3PT-M62 (480 UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM)	SRO
AC4	3PT-M62	04/28/90 08:25	04/28/90 12:50	4.42	3PT-M62 (480 UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM)	SRO
AC4	3PT-M62	05/21/90 08:07	05/21/90 09:26	1.32	3PT-M62 (480 UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM)	SRO
AC4	3PT-M62	06/13/90 15:50	06/13/90 17:02	1.20	3PT-M62 (480 UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM)	SRO
AC4	3PT-M62	07/31/90 08:00	07/31/90 09:40	1.67	3PT-M62 (480 UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM)	SRO
AC4	3PT-M62	01/02/91 08:40	01/02/91 13:20	4.67	3PT-M62 (480V UV)	SRO
AC4	3PT-M62	01/31/91 08:25	01/31/91 10:10	1.75	3PT-M62 (480V UV)	SRO
AC4	3PT-M62	02/28/91 12:15	02/28/91 13:15	1.00	3PT-M62 480V UV	SRO
AC4	3PT-M62	04/19/91 08:00	04/19/91 10:30	2.50	3PT-M62 480V UV	SRO
AC4	3PT-M62	05/14/91 21:47	05/14/91 22:45	0.97	3PT-M62 480V UV	SRO
AC4	3PT-M62	08/26/91 09:20	08/26/91 13:20	4.00	3PT-M62 (480V UV/DEGRD GRID)	SRO
AC4	3PT-M62	09/23/91 08:15	09/23/91 12:15	4.00	3PT-M62 (480V UV/DEGRD GRID)	SRO
AC4	3PT-M62	11/14/91 02:00	11/14/91 04:00	2.00	PT ON 480V DEGRADED VOLTAGE TEST	SRO
AC6	3PC-R5B	02/13/89 09:00	02/14/89 15:42	30.70	3PC-R5B	SRO
AC6	3PT-M06	03/11/87 16:10	03/11/87 19:15	3.08	3PT-M06 (69KV UNDER VOLTAGE)	SRO
AC6	3PT-M06	04/08/87 16:00	04/08/87 16:30	0.50	3PT-M06 (69KV UNDER VOLTAGE)	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
AC6	3PT-M06	01/27/88 08:45	01/27/88 09:25	0.67	3PT-M06	SRO
AC6	3PT-M06	02/25/88 08:30	02/25/88 14:00	5.50	3PT-M06	SRO
AC6	3PT-M06	03/28/88 08:12	03/28/88 08:53	0.68	3PT-M06 (69KV UF & UV)	SRO
AC6	3PT-M06	04/29/88 07:58	04/29/88 08:38	0.67	3PT-M06	SRO
AC6	3PT-M06	06/01/88 21:25	06/01/88 22:30	1.08	3PT-M06	SRO
AC6	3PT-M06	06/21/88 07:55	06/21/88 08:40	0.75	3PT-M06	SRO
AC6	3PT-M06	07/15/88 12:30	07/15/88 14:10	1.67	3PT-M06	SRO
AC6	3PT-M06	12/09/88 08:25	12/09/88 12:40	4.25	3PT-M06	SRO
AC6	3PT-M06	01/03/89 08:50	01/03/89 12:00	3.17	3PT-M06	SRO
AC6	3PT-M06	07/25/89 16:37	07/25/89 17:03	0.43	3PT-M06	SRO
AC6	3PT-M06	09/13/89 15:40	09/13/89 16:05	0.42	3PT-M06	SRO
AC6	3PT-M06	01/05/90 08:25	01/05/90 09:00	0.58	3PT-M06 (69KV UF & UV)	SRO
AC6	3PT-M06	01/29/90 00:00	01/29/90 13:00	13.00	3PT-M06	SRO
AC6	3PT-M06	02/23/90 08:15	02/23/90 09:15	1.00	3PT-M06 (69KV UF & UV)	SRO
AC6	3PT-M06	04/16/90 16:00	04/16/90 16:30	0.50	3PT-M06 (69KV UF & UV)	SRO
AC6	3PT-M06	06/06/90 18:00	06/06/90 18:30	0.50	3PT-M06 (69KV UF & UV)	SRO
AC6	3PT-M06	07/02/90 07:45	07/02/90 08:00	0.25	3PT-M06	SRO
AC6	3PT-M06	07/26/90 07:35	07/26/90 08:00	0.42	3PT-M06	SRO
AC6	3PT-M06	04/23/91 09:05	04/23/91 09:45	0.67	3PT-M6 (69KV UV & UF CHECKS, STOPED WHEN BUS 2 UV RELAY TROUBLE FOUND)	SRO
AC6	3PT-M06	04/23/91 14:00	04/23/91 14:40	0.67	3PT-M6 (CONTINUE 69KV UV & UF CHECKS)	SRO
AC6	3PT-M06	07/09/91 11:30	07/09/91 14:30	3.00	PT-M6 (69KV UV/UF)	SRO
AC6	3PT-M06	07/31/91 16:35	07/31/91 17:20	0.75	PT-M6 (69KV UV/UF)	SRO
AC6	3PT-M06	09/19/91 08:25	09/19/91 10:30	2.08	3PT-M6(69KV UV,UF)	SRO
AC6	3PT-M06	12/10/91 16:00	12/10/91 18:00	2.00	3PT-MD6 (69KV UV & UF)	SRO
AC6	3PT-M06A	01/04/86 09:30	01/04/86 10:30	1.00	3PT-M06A	SRO
AC6	3PT-M06A	01/31/86 15:30	01/31/86 16:00	0.50	3PT-M06A (U/V & U/F ANALOG CHANNEL FUNCTIONAL)	SRO
AC6	3PT-M06A	05/22/86 07:48	05/22/86 08:52	1.07	3PT-M06A (U/V AND U/F ANALOG CHANNEL FUNCTIONAL)	SRO
AC6	3PT-M06A	10/11/86 08:00	10/11/86 10:30	2.50	3PT-M06A (U/V AND U/F ANALOG CHANNEL FUNCTIONAL)	SRO
AC6	3PT-M06A	11/26/86 08:20	11/26/86 12:40	4.33	3PT-M06A (69KV UNDER VOLTAGE)	SRO
AC6	3PT-M06A	01/20/87 08:00	01/20/87 12:25	4.42	3PT-M06A (69KV UNDER VOLTAGE)	SRO
AC6	3PT-M06A	02/18/87 08:58	02/18/87 12:58	4.00	3PT-M06A (69KV UNDER VOLTAGE)	SRO
AC6	3PT-M06B	01/04/86 09:30	01/04/86 10:30	1.00	3PT-M06B	SRO
AC6	3PT-M06B	01/31/86 15:30	01/31/86 16:00	0.50	3PT-M06B (U/V & U/F ANALOG CHANNEL FUNCTIONAL)	SRO
AC6	3PT-M06B	09/11/86 09:00	09/11/86 13:00	4.00	3PT-M06B (U/V AND U/F ANALOG CHANNEL FUNCTIONAL)	SRO
AC6	3PT-M06B	10/11/86 08:00	10/11/86 10:30	2.50	3PT-M06B (U/V AND U/F ANALOG CHANNEL FUNCTIONAL)	SRO
AC6	3PT-M06B	11/26/86 08:20	11/26/86 12:40	4.33	3PT-M06B (69KV UNDER VOLTAGE)	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
AC6	3PT-M06B	01/20/87 08:00	01/20/87 12:25	4.42	3PT-M06B (U/V AND U/F ANALOG CHANNEL FUNCTIONAL)	SRO
AC6	3PT-M06B	02/18/87 08:58	02/18/87 12:58	4.00	3PT-M06B (69KV UNDER VOLTAGE)	SRO
AFW	3PT-CS19	04/07/91 20:08	04/07/91 20:23	0.25	STARTED/SECURED 33 ABFP AS PER 3PT-CS19	SRO
AFW	3PT-M20	01/19/85 09:27	01/19/85 09:46	0.32	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	01/19/85 10:00	01/19/85 10:19	0.32	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	01/19/85 10:55	01/19/85 11:20	0.42	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	02/09/85 09:58	02/09/85 10:22	0.40	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	02/09/85 10:44	02/09/85 11:06	0.37	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	02/09/85 20:18	02/09/85 20:49	0.52	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	02/23/85 09:20	02/23/85 09:40	0.33	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	02/23/85 10:11	02/23/85 10:30	0.32	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	02/23/85 11:20	02/23/85 11:45	0.42	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	03/20/85 22:35	03/20/85 22:55	0.33	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	03/20/85 22:35	03/20/85 22:55	0.33	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	03/25/85 09:54	03/25/85 10:16	0.37	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	03/25/85 10:34	03/25/85 10:54	0.33	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	03/25/85 12:54	03/25/85 13:10	0.27	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	04/25/85 19:15	04/25/85 19:32	0.28	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	04/25/85 19:40	04/25/85 19:58	0.30	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	04/25/85 20:08	04/25/85 20:28	0.33	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	05/25/85 08:45	05/25/85 09:02	0.28	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	05/25/85 09:06	05/25/85 09:25	0.32	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	05/25/85 09:36	05/25/85 09:54	0.30	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	09/05/85 18:06	09/05/85 18:25	0.32	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	09/23/85 14:45	09/23/85 15:15	0.50	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	10/07/85 16:04	10/07/85 16:24	0.33	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	10/07/85 16:29	10/07/85 16:48	0.32	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	11/04/85 02:23	11/04/85 02:45	0.37	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	11/04/85 02:45	11/04/85 03:07	0.37	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	11/04/85 03:15	11/04/85 03:40	0.42	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	12/04/85 01:00	12/04/85 01:15	0.25	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	12/04/85 01:20	12/04/85 01:35	0.25	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	12/04/85 01:40	12/04/85 01:52	0.20	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	01/03/86 08:35	01/03/86 08:55	0.33	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	01/03/86 10:05	01/03/86 10:25	0.33	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	01/03/86 12:20	01/03/86 12:37	0.28	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	02/02/86 00:24	02/02/86 00:44	0.33	STARTED/SECURED 31 ABFP FOR PT-M20	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
AFW	3PT-M20	02/02/86 00:56	02/02/86 01:16	0.33	STARTED/SECURED 33 ABFP FOR PT-M20	SRO
AFW	3PT-M20	02/02/86 03:04	02/02/86 03:25	0.35	STARTED/SECURED 32 ABFP FOR PT-M20	SRO
AFW	3PT-M20	03/04/86 00:20	03/04/86 00:38	0.30	STARTED/SECURED 31 ABFP FOR PT-M20	SRO
AFW	3PT-M20	03/04/86 00:47	03/04/86 01:02	0.25	STARTED/SECURED 33 ABFP FOR PT-M20	SRO
AFW	3PT-M20	03/04/86 01:25	03/04/86 01:42	0.28	STARTED/SECURED 32 ABFP FOR PT-M20	SRO
AFW	3PT-M20	04/02/86 00:25	04/02/86 00:55	0.50	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	04/02/86 01:10	04/02/86 01:25	0.25	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	04/02/86 01:50	04/02/86 02:15	0.42	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	04/03/86 00:50	04/03/86 01:20	0.50	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	05/04/86 10:10	05/04/86 10:25	0.25	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	05/04/86 10:35	05/04/86 10:55	0.33	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	05/16/86 20:10	05/16/86 20:40	0.50	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	05/17/86 16:15	05/17/86 16:40	0.42	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	06/04/86 02:22	06/04/86 02:44	0.37	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	06/04/86 03:06	06/04/86 03:29	0.38	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	06/04/86 21:50	06/04/86 22:20	0.50	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	07/02/86 19:23	07/02/86 19:41	0.30	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	07/02/86 19:53	07/02/86 20:17	0.40	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	07/02/86 21:19	07/02/86 21:45	0.43	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	08/07/86 00:12	08/07/86 00:35	0.38	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	09/01/86 12:49	09/01/86 13:09	0.33	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	09/01/86 13:21	09/01/86 13:37	0.27	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	09/03/86 02:10	09/03/86 02:35	0.42	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	10/02/86 18:35	10/02/86 18:55	0.33	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	10/02/86 19:08	10/02/86 19:30	0.37	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	10/02/86 19:48	10/02/86 20:10	0.37	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	11/04/86 09:44	11/04/86 10:02	0.30	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	11/04/86 10:09	11/04/86 10:27	0.30	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	11/04/86 10:40	11/04/86 11:00	0.33	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	12/04/86 03:10	12/04/86 03:30	0.33	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	12/04/86 03:40	12/04/86 04:00	0.33	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	12/04/86 04:15	12/04/86 04:35	0.33	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	12/30/86 00:55	12/30/86 01:17	0.37	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	12/30/86 01:22	12/30/86 01:38	0.27	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	12/30/86 02:17	12/30/86 02:47	0.50	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	01/29/87 02:14	01/29/87 02:32	0.30	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	01/29/87 02:41	01/29/87 02:57	0.27	STARTED/SECURED 33 ABFP FOR PT	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
AFW	3PT-M20	01/30/87 00:28	01/30/87 00:49	0.35	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	02/28/87 02:33	02/28/87 02:48	0.25	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	02/28/87 02:55	02/28/87 03:10	0.25	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	02/28/87 03:20	02/28/87 03:38	0.30	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	03/31/87 01:25	03/31/87 01:45	0.33	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	04/30/87 10:05	04/30/87 10:25	0.33	STARTED/SECURED 31 ABFP	SRO
AFW	3PT-M20	04/30/87 10:58	04/30/87 11:13	0.25	STARTED/SECURED 33 ABFP	SRO
AFW	3PT-M20	04/30/87 15:30	04/30/87 15:50	0.33	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	09/10/87 09:41	09/10/87 09:56	0.25	STARTED/SECURED 31 ABFP	SRO
AFW	3PT-M20	09/10/87 10:00	09/10/87 10:15	0.25	STARTED/SECURED 33 ABFP	SRO
AFW	3PT-M20	09/10/87 13:33	09/10/87 13:48	0.25	STARTED/SECURED 32 ABFP	SRO
AFW	3PT-M20	10/10/87 02:50	10/10/87 03:10	0.33	STARTED/SECURED 33 ABFP	SRO
AFW	3PT-M20	10/10/87 03:30	10/10/87 03:45	0.25	STARTED/SECURED 31 ABFP	SRO
AFW	3PT-M20	10/10/87 12:17	10/10/87 12:36	0.32	STARTED/SECURED 32 ABFP	SRO
AFW	3PT-M20	11/09/87 03:48	11/09/87 04:07	0.32	STARTED/SECURED 31 ABFP	SRO
AFW	3PT-M20	11/09/87 04:18	11/09/87 04:34	0.27	STARTED/SECURED 33 ABFP	SRO
AFW	3PT-M20	11/09/87 04:45	11/09/87 05:10	0.42	STARTED/SECURED 32 ABFP	SRO
AFW	3PT-M20	12/09/87 12:30	12/09/87 12:52	0.37	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	12/09/87 13:00	12/09/87 13:20	0.33	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	12/09/87 19:00	12/09/87 19:21	0.35	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	01/09/88 05:25	01/09/88 05:40	0.25	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	01/09/88 05:42	01/09/88 06:00	0.30	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	01/09/88 06:03	01/09/88 06:20	0.28	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	02/10/88 01:55	02/10/88 02:12	0.28	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	02/10/88 02:16	02/10/88 02:32	0.27	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	02/10/88 02:40	02/10/88 02:57	0.28	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	03/01/88 18:23	03/01/88 18:50	0.45	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	03/01/88 19:05	03/01/88 19:25	0.33	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	03/01/88 20:00	03/01/88 20:22	0.37	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	03/25/88 00:40	03/25/88 01:05	0.42	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	03/25/88 01:12	03/25/88 01:30	0.30	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	03/25/88 02:05	03/25/88 02:25	0.33	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	04/25/88 12:18	04/25/88 12:48	0.50	STARTED/SECURED 33 ABFP FOR 3PT-M20	SRO
AFW	3PT-M20	04/25/88 19:35	04/25/88 19:52	0.28	STARTED/SECURED 31 ABFP	SRO
AFW	3PT-M20	04/25/88 20:22	04/25/88 20:44	0.37	STARTED/SECURED 32 ABFP	SRO
AFW	3PT-M20	05/27/88 20:55	05/27/88 21:30	0.58	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	06/01/88 11:55	06/01/88 12:10	0.25	STARTED/SECURED 32 ABFP FOR PT	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
AFW	3PT-M20	06/18/88 00:48	06/18/88 01:10	0.37	STARTED/SECURED 33 ABFP FOR 3PT-M20	SRO
AFW	3PT-M20	06/18/88 01:18	06/18/88 01:28	0.17	STARTED/SECURED 31 ABFP FOR 3PT-M20	SRO
AFW	3PT-M20	06/18/88 02:45	06/18/88 03:07	0.37	STARTED/SECURED 32 ABFP FOR 3PT-M20	SRO
AFW	3PT-M20	07/12/88 20:08	07/12/88 20:55	0.78	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	07/12/88 21:50	07/12/88 22:08	0.30	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	07/12/88 22:20	07/12/88 22:35	0.25	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	08/05/88 12:05	08/05/88 12:25	0.33	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	08/05/88 12:45	08/05/88 13:03	0.30	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	08/05/88 13:40	08/05/88 14:05	0.42	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	09/22/88 01:15	09/22/88 01:45	0.50	STARTED/SECURED 31 ABFP	SRO
AFW	3PT-M20	09/22/88 01:56	09/22/88 02:24	0.47	STARTED/SECURED 33 ABFP	SRO
AFW	3PT-M20	09/22/88 02:40	09/22/88 03:07	0.45	STARTED/SECURED 32 ABFP	SRO
AFW	3PT-M20	10/18/88 20:07	10/18/88 20:28	0.35	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	10/18/88 20:35	10/18/88 20:53	0.30	STARTED/SECURED 31 ABFP	SRO
AFW	3PT-M20	10/18/88 21:04	10/18/88 21:25	0.35	STARTED/SECURED 32 ABFP	SRO
AFW	3PT-M20	11/21/88 04:49	11/21/88 05:08	0.32	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	11/21/88 05:21	11/21/88 05:40	0.32	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	11/21/88 09:12	11/21/88 09:36	0.40	STARTED/SECURED 32 ABFP	SRO
AFW	3PT-M20	12/15/88 00:30	12/15/88 00:47	0.28	STARTED/SECURED 31 ABFP FOR 3PT-M20	SRO
AFW	3PT-M20	12/15/88 00:55	12/15/88 01:11	0.27	STARTED/SECURED 33 ABFP FOR 3PT-M20	SRO
AFW	3PT-M20	12/15/88 01:23	12/15/88 01:40	0.28	STARTED/SECURED 32 ABFP FOR 3PT-M20	SRO
AFW	3PT-M20	01/08/89 16:50	01/08/89 17:10	0.33	STARTED/SECURED 31 ABFP FOR 3PT-M20	SRO
AFW	3PT-M20	01/08/89 17:25	01/08/89 17:45	0.33	STARTED/SECURED 33 ABFP FOR 3PT-M20	SRO
AFW	3PT-M20	01/08/89 18:03	01/08/89 18:25	0.37	STARTED/SECURED 32 ABFP FOR 3PT-M20	SRO
AFW	3PT-M20	02/01/89 09:14	02/01/89 09:37	0.38	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	02/01/89 09:55	02/01/89 10:14	0.32	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	02/01/89 10:43	02/01/89 11:10	0.45	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	07/06/89 09:32	07/06/89 09:52	0.33	STARTED/SECURED 31 ABFP	SRO
AFW	3PT-M20	07/06/89 10:07	07/06/89 10:30	0.38	STARTED/SECURED 33 ABFP	SRO
AFW	3PT-M20	07/06/89 10:50	07/06/89 11:13	0.38	STARTED/SECURED 32 ABFP	SRO
AFW	3PT-M20	08/12/89 02:37	08/12/89 02:53	0.27	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	08/12/89 03:01	08/12/89 03:17	0.27	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	08/12/89 04:00	08/12/89 04:24	0.40	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	09/30/89 01:35	09/30/89 01:55	0.33	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	09/30/89 02:00	09/30/89 02:19	0.32	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	09/30/89 02:30	09/30/89 02:48	0.30	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	10/29/89 10:22	10/29/89 10:41	0.32	STARTED/SECURED 31 ABFP	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
AFW	3PT-M20	10/29/89 10:46	10/29/89 11:04	0.30	STARTED/SECURED 33 ABFP	SRO
AFW	3PT-M20	10/29/89 11:15	10/29/89 11:35	0.33	STARTED/SECURED 32 ABFP	SRO
AFW	3PT-M20	11/29/89 17:15	11/29/89 17:36	0.35	STARTED/SECURED 31 ABFP FOR 3PT-M20B	SRO
AFW	3PT-M20	11/29/89 17:50	11/29/89 18:10	0.33	STARTED/SECURED 33 ABFP FOR 3PT-M20B	SRO
AFW	3PT-M20	11/29/89 18:30	11/29/89 18:50	0.33	STARTED/SECURED 32 ABFP FOR 3PT-M20B	SRO
AFW	3PT-M20	12/28/89 01:40	12/28/89 01:58	0.30	STARTED/SECURED 31 ABFP FOR 3PT-M20A	SRO
AFW	3PT-M20	12/28/89 02:05	12/28/89 02:25	0.33	STARTED/SECURED 33 ABFP FOR 3PT-M20A	SRO
AFW	3PT-M20	12/28/89 02:30	12/28/89 02:53	0.38	STARTED/SECURED 32 ABFP FOR 3PT-M20A	SRO
AFW	3PT-M20	01/28/90 16:58	01/28/90 17:13	0.25	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	01/28/90 17:15	01/28/90 17:30	0.25	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	01/28/90 21:14	01/28/90 21:32	0.30	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	02/26/90 02:05	02/26/90 02:19	0.23	STARTED/SECURED 31 ABFP	SRO
AFW	3PT-M20	02/26/90 02:27	02/26/90 02:46	0.32	STARTED/SECURED 33 ABFP	SRO
AFW	3PT-M20	02/26/90 03:00	02/26/90 03:13	0.22	STARTED/SECURED 32 ABFP	SRO
AFW	3PT-M20	04/07/90 09:33	04/07/90 10:05	0.53	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	04/23/90 19:00	04/23/90 19:15	0.25	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	04/23/90 19:42	04/23/90 19:57	0.25	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	04/23/90 20:10	04/23/90 20:28	0.30	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	05/30/90 19:29	05/30/90 19:48	0.32	STARTED/SECURED 31 ABFP FOR PT-M20B	SRO
AFW	3PT-M20	05/30/90 19:54	05/30/90 20:12	0.30	STARTED/SECURED 33 ABFP	SRO
AFW	3PT-M20	05/30/90 20:33	05/30/90 20:52	0.32	STARTED/SECURED 32 ABFP	SRO
AFW	3PT-M20	06/24/90 19:30	06/24/90 19:50	0.33	STARTED/SECURED 31 ABFP FOR 3PT-M20A	SRO
AFW	3PT-M20	06/24/90 19:58	06/24/90 20:15	0.28	STARTED/SECURED 33 ABFP FOR 3PT-M20A	SRO
AFW	3PT-M20	06/24/90 20:23	06/24/90 20:45	0.37	STARTED/SECURED 32 ABFP FOR 3PT-M20A	SRO
AFW	3PT-M20	07/16/90 18:44	07/16/90 19:03	0.32	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	07/16/90 19:09	07/16/90 19:26	0.28	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	07/16/90 19:38	07/16/90 19:56	0.30	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	08/08/90 10:34	08/08/90 10:51	0.28	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	08/08/90 11:00	08/08/90 11:19	0.32	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	08/08/90 11:35	08/08/90 12:00	0.42	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	09/08/90 12:32	09/08/90 12:47	0.25	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	09/08/90 13:00	09/08/90 13:15	0.25	STARTED/SECURED 33 ABFP	SRO
AFW	3PT-M20	09/08/90 13:28	09/08/90 14:13	0.75	STARTED/SECURED 32 ABFP	SRO
AFW	3PT-M20	12/09/90 14:12	12/09/90 14:32	0.33	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	12/09/90 14:12	12/09/90 14:32	0.33	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	12/15/90 13:55	12/15/90 14:30	0.58	STARTED/SECURED 33 ABFP	SRO
AFW	3PT-M20	12/15/90 16:10	12/15/90 16:40	0.50	STARTED/SECURED 32 ABFP FOR PT	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
AFW	3PT-M20	12/15/90 18:30	12/15/90 18:43	0.22	STARTED/SECURED 31 ABFP	SRO
AFW	3PT-M20	12/30/90 03:30	12/30/90 03:45	0.25	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	12/30/90 03:55	12/30/90 04:10	0.25	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	12/30/90 04:30	12/30/90 05:00	0.50	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	01/23/91 10:37	01/23/91 11:00	0.38	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	01/23/91 11:22	01/23/91 11:42	0.33	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	01/23/91 12:17	01/23/91 12:45	0.47	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	02/16/91 18:35	02/16/91 18:50	0.25	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	02/16/91 18:55	02/16/91 19:15	0.33	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	02/16/91 19:23	02/16/91 19:43	0.33	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	03/12/91 02:28	03/12/91 02:49	0.35	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	03/12/91 02:57	03/12/91 03:16	0.32	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	03/12/91 13:45	03/12/91 14:40	0.92	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	04/09/91 09:52	04/09/91 10:18	0.43	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	04/29/91 20:37	04/29/91 20:53	0.27	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	04/29/91 21:03	04/29/91 21:20	0.28	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	04/29/91 21:50	04/29/91 22:15	0.42	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	05/26/91 18:58	05/26/91 19:17	0.32	STARTED/SECURED 31 ABFP FOR 3PT-M20B	SRO
AFW	3PT-M20	05/26/91 21:23	05/26/91 21:39	0.27	STARTED/SECURED 33 ABFP FOR 3PT-M20B	SRO
AFW	3PT-M20	06/20/91 02:55	06/20/91 03:15	0.33	STARTED/SECURED 31 ABFP FOR 3PT-M20A	SRO
AFW	3PT-M20	06/20/91 03:40	06/20/91 03:55	0.25	STARTED/SECURED 33 ABFP FOR 3PT-M20A	SRO
AFW	3PT-M20	06/20/91 04:18	06/20/91 04:45	0.45	STARTED/SECURED 32 ABFP FOR 3PT-M20A	SRO
AFW	3PT-M20	07/14/91 03:45	07/14/91 04:05	0.33	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	07/14/91 04:10	07/14/91 04:30	0.33	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	07/14/91 10:58	07/14/91 11:50	0.87	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	08/07/91 02:20	08/07/91 02:40	0.33	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	08/07/91 02:57	08/07/91 03:15	0.30	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	08/07/91 10:00	08/07/91 10:30	0.50	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	09/01/91 02:12	09/01/91 02:32	0.33	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	09/01/91 03:02	09/01/91 03:20	0.30	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	09/03/91 19:48	09/03/91 20:16	0.47	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	09/26/91 09:16	09/26/91 09:40	0.40	STARTED/SECURED 31 ABFP FOR PT	SRO
AFW	3PT-M20	09/26/91 09:45	09/26/91 10:02	0.28	STARTED/SECURED 33 ABFP FOR PT	SRO
AFW	3PT-M20	09/26/91 12:25	09/26/91 12:45	0.33	STARTED/SECURED 32 ABFP FOR PT	SRO
AFW	3PT-M20	11/18/91 10:07	11/18/91 10:27	0.33	STARTED/SECURED 31 ABFP	SRO
AFW	3PT-M20	11/18/91 10:35	11/18/91 10:55	0.33	STARTED/SECURED 33 ABFP	SRO
AFW	3PT-M20	11/18/91 13:05	11/18/91 13:35	0.50	STARTED/SECURED 32 ABFP	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
AFW	3PT-M20	11/18/91 17:35	11/18/91 17:52	0.28	STARTED/SECURED 32 ABFP	SRO
AFW	3PT-M20	12/13/91 02:28	12/13/91 02:44	0.27	STARTED/SECURED 31 ABFP FOR 3PT-M20	SRO
AFW	3PT-M20	12/13/91 03:07	12/13/91 03:29	0.37	STARTED/SECURED 33 ABFP FOR 3PT-M20	SRO
AFW	3PT-M20	12/13/91 04:15	12/13/91 04:52	0.62	STARTED/SECURED 32 ABFP FOR 3PT-M20	SRO
AFW	3PT-Q20	03/06/85 05:00	03/06/85 05:00	0.00	3PT-Q20 (ABF VALVES)	SRO
AFW	3PT-Q20	04/22/86 08:30	04/22/86 14:30	6.00	3PT-Q20 (PRM CALIB)	SRO
AFW	3PT-Q20	11/05/86 02:10	11/05/86 02:10	0.00	3PT-Q20 (ABF VALVES)	SRO
AFW	3PT-Q20	02/03/87 18:30	02/03/87 18:30	0.00	3PT-Q20 (ABF VALVES)	SRO
AFW	3PT-Q20	07/09/88 02:30	07/09/88 02:30	0.00	3PT-Q20 (ABF VALVES)	SRO
AFW	3PT-Q20	06/13/90 08:25	06/13/90 09:15	0.83	3PT-Q20 (ABF VALVES)	SRO
AFW	3PT-R20	01/28/89 07:57	01/28/89 12:25	4.47	3PT-R20 (TEMP SENSORS, ABFP BLDG)	SRO
AFW	3PT-R27	02/09/89 13:00	02/09/89 13:00	0.00	3PT-R27 TEST GROUP(CITY WATER TO ABFP)	SRO
AFW	3PT-R27	09/18/90 12:30	09/18/90 18:30	6.00	3PT-R27 TEST GROUP(CITY WATER TO ABFP)	SRO
AFW	3PT-R3D	06/05/89 20:48	06/05/89 21:10	0.37	STARTED/SECURED 31 ABFP (3PT-R3D)	SRO
AFW	3PT-R3D	06/05/89 20:48	06/05/89 21:10	0.37	STARTED/SECURED 33 ABFP (3PT-R3D)	SRO
AFW	3PT-R3D	06/05/89 20:48	06/05/89 21:10	0.37	STARTED/SECURED 31 ABFP (3PT-R3D)	SRO
AFW	3PT-R3D	06/05/89 20:48	06/05/89 21:10	0.37	STARTED/SECURED 33 ABFP (3PT-R3D)	SRO
AFW	3PT-R7	06/13/89 09:20	06/13/89 09:25	0.08	STARTED/SECURED 31 ABFP FOR 3PT-R7	SRO
AFW	3PT-R90D	05/16/89 09:10	05/16/89 09:10	0.00	STARTED/SECURED 31 ABFP PER 3PT-R90D	SRO
AFW	3PT-R90D	05/16/89 09:37	05/16/89 09:37	0.00	STARTED/SECURED 33 ABFP PER 3PT-R90D	SRO
AFW	3PT-R90D	09/19/90 12:53	09/19/90 15:30	2.62	TEST GROUP PERFORMED 3PT-R90D (ABFP FLOW)	SRO
AFW	3PT-V5	07/29/85 19:33	07/29/85 22:30	2.95	STARTED/SECURED 31 ABFP FOR 3PT-V5	SRO
AFW	3PT-V5	05/28/89 03:44	05/28/89 05:47	2.05	STARTED/SECURED 33 ABFP FOR HYDRO 33 S/G 3PT-V5	SRO
AFW	3PT-V5	11/23/90 16:20	11/23/90 17:48	1.47	STARTED/SECURED 33 ABFP FOR 3PT-V5	SRO
AFW	3PT-V5	11/23/90 19:30	11/23/90 21:15	1.75	STARTED/SECURED 33 ABFP FOR 3PT-V5	SRO
AFW	3PT-V8B	02/03/89 19:05	02/03/89 19:05	0.00	3PT-V8B TEST GROUP(ABFP TURBINE OVERSPEED TRIP)	SRO
CFC	3PT-M63	01/04/85 02:48	01/04/85 03:37	0.82	CYCLED THROUGH FCU'S FOR PT	SRO
CFC	3PT-M63	05/30/85 09:55	05/30/85 09:55	0.00	STARTED/SECURED 35 FCU FOR PT ON HEAT DETECTORS	SRO
CFC	3PT-M63	08/13/85 10:00	08/13/85 10:00	0.00	STARTED/SECURED 31 FCU LOCALLY FOR PT	SRO
CFC	3PT-M63	08/13/85 10:00	08/13/85 10:00	0.00	STARTED/SECURED 32 FCU LOCALLY FOR PT	SRO
CFC	3PT-M63	08/13/85 10:00	08/13/85 11:15	1.25	STARTED/SECURED 33 FCU LOCALLY FOR PT	SRO
CFC	3PT-M63	08/13/85 10:00	08/13/85 11:15	1.25	STARTED/SECURED 34 FCU LOCALLY FOR PT	SRO
CFC	3PT-M63	08/13/85 10:00	08/13/85 11:15	1.25	STARTED/SECURED 35 FCU LOCALLY FOR PT	SRO
CFC	3PT-M63	09/16/85 16:30	09/16/85 17:00	0.50	STARTED/SECURED 33 FCU FOR PT	SRO
CFC	3PT-M63	09/21/85 09:20	09/21/85 09:55	0.58	STARTED/SECURED 33 FCU FOR PT	SRO
CFC	3PT-M63	09/21/85 09:55	09/21/85 10:15	0.33	STARTED/SECURED 31 FCU FOR PT	SRO
CFC	3PT-M63	09/21/85 10:20	09/21/85 10:35	0.25	STARTED/SECURED 32 FCU FOR PT	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
CFC	3PT-M63	09/21/85 10:45	09/21/85 11:05	0.33	STARTED/SECURED 35 FCU FOR PT	SRO
CFC	3PT-M63	09/21/85 11:05	09/21/85 11:25	0.33	STARTED/SECURED 34 FCU FOR PT	SRO
CFC	3PT-M63	05/12/86 09:15	05/12/86 09:30	0.25	STARTED/SECURED 32 FCU FOR PT	SRO
CFC	3PT-M63	05/12/86 09:30	05/12/86 09:50	0.33	STARTED/SECURED 31 FCU FOR PT	SRO
CFC	3PT-M63	05/12/86 09:50	05/12/86 10:05	0.25	STARTED/SECURED 33 FCU FOR PT	SRO
CFC	3PT-M63	05/12/86 10:00	05/12/86 10:15	0.25	STARTED/SECURED 34 FCU FOR PT	SRO
CFC	3PT-M63	08/19/86 13:30	08/19/86 13:30	0.00	STARTED/SECURED 34 FCU FOR PT	SRO
CFC	3PT-M63	08/19/86 13:40	08/19/86 13:40	0.00	STARTED/SECURED 35 FCU FOR PT	SRO
CFC	3PT-M63	08/19/86 13:50	08/19/86 13:50	0.00	STARTED/SECURED 32 FCU FOR PT	SRO
CFC	3PT-M63	09/11/86 08:30	09/11/86 10:30	2.00	3PT-M63 FOR 32 FCU	SRO
CFC	3PT-M63	09/11/86 10:30	09/11/86 11:30	1.00	3PT-M63 FOR 31 FCU	SRO
CFC	3PT-M63	10/11/86 11:05	10/11/86 11:45	0.67	3PT-M63 FOR 31 FCU	SRO
CFC	3PT-M63	10/11/86 11:45	10/11/86 12:45	1.00	3PT-M63 FOR 32 FCU	SRO
CFC	3PT-M63	05/05/87 08:51	05/08/87 09:30	72.65	STARTED/SECURED 31 FCU FOR PT	SRO
CFC	3PT-M63	05/05/87 08:51	05/08/87 09:30	72.65	STARTED/SECURED 32 FCU FOR PT	SRO
CFC	3PT-M63	05/05/87 08:51	05/08/87 09:30	72.65	STARTED/SECURED 33 FCU FOR PT	SRO
CFC	3PT-M63	05/05/87 08:51	05/08/87 09:30	72.65	STARTED/SECURED 34 FCU FOR PT	SRO
CFC	3PT-M63	05/05/87 08:51	05/08/87 09:30	72.65	STARTED/SECURED 35 FCU FOR PT	SRO
CFC	3PT-M63	11/12/87 08:13	11/12/87 12:17	4.07	3PT-M63 FOR 32 FCU	SRO
CFC	3PT-M63	11/12/87 12:17	11/12/87 14:04	1.78	3PT-M63 FOR 31 FCU	SRO
CFC	3PT-M63	01/05/88 08:17	01/05/88 10:44	2.45	3PT-M63 FOR 32 FCU	SRO
CFC	3PT-M63	01/05/88 11:00	01/05/88 13:55	2.92	3PT-M63 FOR 31 FCU	SRO
CFC	3PT-M63	02/28/88 23:30	02/29/88 01:35	2.08	3PT-M63 FOR 32 FCU	SRO
CFC	3PT-M63	02/29/88 01:35	02/29/88 03:30	1.92	3PT-M63 FOR 31 FCU	SRO
CFC	3PT-M63	04/30/88 00:50	04/30/88 02:50	2.00	3PT-M63 FOR 31 FCU	SRO
CFC	3PT-M63	04/30/88 02:50	04/30/88 04:50	2.00	3PT-M63 FOR 32 FCU	SRO
CFC	3PT-M63	07/16/88 19:05	07/16/88 21:55	2.83	STARTED/SECURED 34 FCU FOR PT	SRO
CFC	3PT-M63	08/11/88 13:17	08/11/88 13:26	0.15	3PT-M63 FOR 32 FCU	SRO
CFC	3PT-M63	08/11/88 13:26	08/11/88 14:08	0.70	3PT-M63 FOR 31 FCU	SRO
CFC	3PT-M63	11/29/88 13:40	11/29/88 13:40	0.00	STARTED/SECURED 32 FCU FOR PT	SRO
CFC	3PT-M63	12/29/88 08:48	12/29/88 09:48	1.00	3PT-M63 FOR 32 FCU	SRO
CFC	3PT-M63	12/29/88 09:48	12/29/88 10:48	1.00	3PT-M63 FOR 31 FCU	SRO
CFC	3PT-M63	07/07/89 12:05	07/07/89 15:04	2.98	3PT-M63 FOR 31 FCU	SRO
CFC	3PT-M63	07/22/89 12:28	07/22/89 12:28	0.00	STARTED/SECURED 32 FCU FOR TESTING	SRO
CFC	3PT-M63	05/11/90 08:50	05/11/90 15:20	6.50	STARTED/SECURED 32 FCU FOR TEST	SRO
CFC	3PT-M63	11/14/90 14:28	11/14/90 14:30	0.03	STARTED/SECURED 34 FCU FOR PT	SRO
CFC	3PT-M63	12/08/90 08:54	12/09/90 13:28	28.57	STARTED/SECURED 33 FCU FOR PT	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
CFC	3PT-M63	12/09/90 13:56	12/10/90 10:36	20.67	STARTED/SECURED 35 FCU FOR PT	SRO
CFC	3PT-M68A	01/06/90 08:30	01/06/90 13:50	5.33	3PT-M68A	SRO
CFC	3PT-M68A	05/07/90 08:35	05/07/90 08:35	0.00	3PT-M68A	SRO
CFC	3PT-M68A	07/26/90 16:30	07/26/90 19:56	3.43	3PT-M68A	SRO
CFC	3PT-M68B	01/13/90 09:10	01/13/90 09:10	0.00	3PT-M68B	SRO
CFC	3PT-M68B	08/04/90 08:57	08/04/90 11:47	2.83	3PT-M68B	SRO
CFC	3PT-Q53	04/03/86 02:35	04/03/86 02:45	0.17	STARTED/SECURED 31 FCU FOR PT-Q53	SRO
CFC	3PT-Q53	04/03/86 02:55	04/03/86 03:05	0.17	STARTED/SECURED 33 FCU FOR PT-Q53	SRO
CFC	3PT-R90B	02/06/89 16:25	02/06/89 16:27	0.03	BUMPED 31 FCU FOR PT-R90B	SRO
CFC	3PT-R90B	02/06/89 16:27	02/06/89 16:29	0.03	BUMPED 32 FCU FOR PT-R90B	SRO
CFC	3PT-R90B	02/06/89 16:29	02/06/89 16:31	0.03	BUMPED 33 FCU FOR PT-R90B	SRO
CFC	3PT-R90B	02/06/89 16:34	02/06/89 16:36	0.03	BUMPED 35 FCU FOR PT-R90B	SRO
CFC	3PT-R90B	02/06/89 17:47	02/06/89 17:49	0.03	BUMPED 34 FCU FOR PT-R90B	SRO
CFC	3PT-R90B	12/21/89 00:20	12/21/89 00:55	0.58	FCU PT (3PT-R90B)	SRO
CSS	3PT-CS22	06/26/85 12:57	06/26/85 13:18	0.35	STARTED/SECURED 31 CSP FOR 3PT-CS-22	SRO
CSS	3PT-CS22	08/10/86 10:32	08/10/86 10:53	0.35	STARTED/SECURED 31 CSP FOR 3PT-CS-22 (CSP AND CHECK VLVS)	SRO
CSS	3PT-CS22	08/10/86 11:29	08/10/86 11:47	0.30	STARTED/SECURED 32 CSP FOR 3PT-CS-22	SRO
CSS	3PT-M17	01/03/85 05:00	01/03/85 05:18	0.30	STARTED/SECURED 31 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	01/03/85 06:03	01/03/85 06:20	0.28	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	02/01/85 17:42	02/01/85 18:00	0.30	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	02/01/85 20:13	02/01/85 20:29	0.27	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	03/04/85 02:15	03/04/85 02:33	0.30	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	03/04/85 04:48	03/04/85 05:05	0.28	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	04/02/85 17:45	04/02/85 18:00	0.25	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	04/02/85 20:15	04/02/85 20:35	0.33	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	05/03/85 02:24	05/03/85 02:51	0.45	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	05/03/85 03:55	05/03/85 04:22	0.45	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	05/17/85 01:25	05/17/85 01:45	0.33	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	05/17/85 02:19	05/17/85 02:40	0.35	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	06/25/85 13:26	06/25/85 13:51	0.42	STARTED/SECURED 32 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	08/25/85 13:19	08/25/85 13:23	0.07	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	08/25/85 15:10	08/25/85 15:30	0.33	STARTED/SECURED 31 CBSP FOR PT	SRO
CSS	3PT-M17	08/25/85 16:05	08/25/85 16:23	0.30	STARTED/SECURED 32 CBSP FOR PT	SRO
CSS	3PT-M17	08/26/85 17:20	08/26/85 17:45	0.42	STARTED/SECURED 32 CBSP FOR PT	SRO
CSS	3PT-M17	08/26/85 18:40	08/26/85 18:43	0.05	STARTED/SECURED 31 CBSP FOR PT	SRO
CSS	3PT-M17	08/26/85 19:27	08/26/85 19:34	0.12	STARTED/SECURED 32 CBSP FOR PT	SRO
CSS	3PT-M17	09/14/85 17:00	09/14/85 17:20	0.33	STARTED/SECURED 32 CSP FOR PT	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
CSS	3PT-M17	09/14/85 18:10	09/14/85 18:30	0.33	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	09/30/85 10:05	09/30/85 10:20	0.25	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	09/30/85 10:40	09/30/85 10:55	0.25	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	10/29/85 04:25	10/29/85 04:42	0.28	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	10/29/85 05:15	10/29/85 05:33	0.30	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	11/25/85 02:42	11/25/85 03:07	0.42	STARTED/SECURED 31 CSP	SRO
CSS	3PT-M17	11/25/85 03:43	11/25/85 04:03	0.33	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	12/24/85 16:38	12/24/85 16:50	0.20	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	12/24/85 17:15	12/24/85 17:30	0.25	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	01/07/86 01:22	01/07/86 01:38	0.27	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	01/23/86 10:05	01/23/86 10:30	0.42	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	01/23/86 11:00	01/23/86 11:20	0.33	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	02/22/86 02:34	02/22/86 02:53	0.32	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	02/22/86 03:34	02/22/86 03:50	0.27	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	03/08/86 01:51	03/08/86 02:12	0.35	STARTED/SECURED 31 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	03/31/86 16:56	03/31/86 17:12	0.27	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	03/31/86 17:50	03/31/86 18:10	0.33	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	04/23/86 02:00	04/23/86 02:20	0.33	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	04/23/86 02:55	04/23/86 03:15	0.33	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	05/12/86 12:05	05/12/86 12:15	0.17	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	05/12/86 12:45	05/12/86 13:00	0.25	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	05/22/86 08:38	05/22/86 16:10	7.53	3PT-M17 (CSP FUNCTIONAL)	SRO
CSS	3PT-M17	05/22/86 09:50	05/22/86 10:05	0.25	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	05/22/86 10:19	05/22/86 10:35	0.27	STARTED/SECURED 31 CSP	SRO
CSS	3PT-M17	06/21/86 01:00	06/21/86 01:17	0.28	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	06/21/86 01:47	06/21/86 02:03	0.27	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	07/24/86 01:53	07/24/86 02:11	0.30	STARTED/SECURED 31 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	07/24/86 02:57	07/24/86 03:18	0.35	STARTED/SECURED 32 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	08/22/86 18:15	08/22/86 18:32	0.28	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	09/21/86 02:20	09/21/86 02:37	0.28	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	09/21/86 03:20	09/21/86 03:35	0.25	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	10/19/86 18:29	10/19/86 18:47	0.30	STARTED/SECURED 31 CSP	SRO
CSS	3PT-M17	10/19/86 19:51	10/19/86 20:03	0.20	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	11/18/86 00:47	11/18/86 01:03	0.27	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	11/18/86 01:18	11/18/86 01:33	0.25	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	12/18/86 04:13	12/18/86 04:32	0.32	STARTED/SECURED 31 CSP	SRO
CSS	3PT-M17	12/18/86 05:52	12/18/86 06:10	0.30	STARTED/SECURED 32 CSP	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
CSS	3PT-M17	01/17/87 01:30	01/17/87 01:50	0.33	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	01/17/87 02:11	01/17/87 02:28	0.28	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	02/17/87 18:17	02/17/87 18:37	0.33	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	02/17/87 19:28	02/17/87 19:43	0.25	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	03/20/87 18:48	03/20/87 19:03	0.25	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	03/20/87 21:00	03/20/87 21:15	0.25	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	04/17/87 14:30	04/17/87 14:48	0.30	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	04/17/87 15:25	04/17/87 15:45	0.33	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	05/17/87 10:12	05/17/87 10:32	0.33	STARTED/SECURED 31 CSP	SRO
CSS	3PT-M17	05/17/87 11:23	05/17/87 11:46	0.38	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	07/07/87 19:05	07/07/87 19:24	0.32	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	07/07/87 19:51	07/07/87 20:10	0.32	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	08/17/87 21:05	08/17/87 21:25	0.33	STARTED/SECURED 31 CSP	SRO
CSS	3PT-M17	08/17/87 21:05	08/17/87 21:25	0.33	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	08/19/87 03:55	08/19/87 04:14	0.32	STARTED/SECURED 31 CSP	SRO
CSS	3PT-M17	08/19/87 05:12	08/19/87 05:30	0.30	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	09/17/87 03:15	09/17/87 03:40	0.42	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	09/17/87 04:15	09/17/87 04:35	0.33	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	10/18/87 19:30	10/18/87 19:45	0.25	STARTED/SECURED 31 CSP	SRO
CSS	3PT-M17	10/18/87 20:10	10/18/87 20:30	0.33	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	11/17/87 20:08	11/17/87 20:30	0.37	STARTED/SECURED 31 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	11/17/87 21:16	11/17/87 21:36	0.33	STARTED/SECURED 32 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	12/16/87 01:24	12/16/87 01:39	0.25	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	12/16/87 02:29	12/16/87 02:44	0.25	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	12/30/87 10:39	12/30/87 11:03	0.40	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	01/10/88 10:20	01/10/88 10:39	0.32	STARTED/SECURED 31 CSP	SRO
CSS	3PT-M17	01/10/88 11:28	01/10/88 11:43	0.25	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	02/11/88 02:50	02/11/88 03:06	0.27	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	02/11/88 03:30	02/11/88 03:45	0.25	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	03/06/88 02:16	03/06/88 02:35	0.32	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	03/06/88 03:15	03/06/88 03:31	0.27	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	04/06/88 01:22	04/06/88 01:42	0.33	STARTED/SECURED 31 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	04/06/88 02:22	04/06/88 02:38	0.27	STARTED/SECURED 32 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	05/05/88 04:48	05/05/88 05:17	0.48	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	05/31/88 10:32	05/31/88 10:49	0.28	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	05/31/88 11:38	05/31/88 11:52	0.23	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	06/24/88 02:58	06/24/88 03:19	0.35	STARTED/SECURED 31 CSP FOR PT	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
CSS	3PT-M17	06/24/88 04:00	06/24/88 04:19	0.32	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	07/11/88 01:20	07/11/88 01:45	0.42	STARTED/SECURED 31 CSP	SRO
CSS	3PT-M17	07/11/88 02:48	07/11/88 03:07	0.32	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	07/12/88 01:56	07/12/88 02:16	0.33	STARTED/SECURED 31 CSP	SRO
CSS	3PT-M17	07/12/88 02:57	07/12/88 03:15	0.30	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	08/06/88 00:55	08/06/88 01:12	0.28	STARTED/SECURED 32 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	08/06/88 01:37	08/06/88 01:53	0.27	STARTED/SECURED 31 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	08/30/88 10:30	08/30/88 10:46	0.27	STARTED/SECURED 31 CSP	SRO
CSS	3PT-M17	08/30/88 11:29	08/30/88 11:45	0.27	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	09/23/88 01:02	09/23/88 01:20	0.30	STARTED/SECURED 31 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	09/23/88 01:50	09/23/88 02:10	0.33	STARTED/SECURED 32 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	10/19/88 01:09	10/19/88 01:29	0.33	STARTED/SECURED 31 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	10/19/88 01:53	10/19/88 02:15	0.37	STARTED/SECURED 32 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	11/14/88 03:10	11/14/88 03:30	0.33	STARTED/SECURED 31 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	11/14/88 04:00	11/14/88 04:20	0.33	STARTED/SECURED 32 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	12/09/88 01:20	12/09/88 01:37	0.28	STARTED/SECURED 31 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	12/09/88 02:10	12/09/88 02:27	0.28	STARTED/SECURED 32 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	01/02/89 02:45	01/02/89 03:05	0.33	STARTED/SECURED 31 CSP	SRO
CSS	3PT-M17	01/02/89 03:18	01/02/89 03:37	0.32	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	01/26/89 20:15	01/26/89 20:35	0.33	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	01/26/89 20:55	01/26/89 21:13	0.30	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	02/17/89 10:05	02/17/89 10:43	0.63	STARTED/SECURED 31 CSP	SRO
CSS	3PT-M17	02/17/89 11:40	02/17/89 11:50	0.17	STARTED/SECURED 31 CSP	SRO
CSS	3PT-M17	06/06/89 17:02	06/06/89 17:19	0.28	STARTED/SECURED 31 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	06/06/89 17:40	06/06/89 17:58	0.30	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	07/01/89 03:58	07/01/89 04:20	0.37	STARTED/SECURED 31 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	07/01/89 05:05	07/01/89 05:25	0.33	STARTED/SECURED 32 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	07/26/89 09:59	07/26/89 10:20	0.35	STARTED/SECURED 31 CSP	SRO
CSS	3PT-M17	07/26/89 10:38	07/26/89 10:55	0.28	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	08/19/89 09:35	08/19/89 09:57	0.37	STARTED/SECURED 31 CSP	SRO
CSS	3PT-M17	08/19/89 10:50	08/19/89 11:10	0.33	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	09/12/89 19:36	09/12/89 19:56	0.33	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	09/12/89 20:44	09/12/89 21:02	0.30	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	09/21/89 02:58	09/21/89 03:20	0.37	STARTED/SECURED 31 CSP	SRO
CSS	3PT-M17	09/21/89 03:41	09/21/89 03:57	0.27	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	10/15/89 09:45	10/15/89 10:06	0.35	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	10/15/89 10:56	10/15/89 11:15	0.32	STARTED/SECURED 32 CSP FOR PT	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
CSS	3PT-M17	11/09/89 01:21	11/09/89 01:40	0.32	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	11/09/89 01:57	11/09/89 02:16	0.32	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	12/03/89 01:52	12/03/89 02:15	0.38	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	12/03/89 02:40	12/03/89 03:00	0.33	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	12/27/89 09:42	12/27/89 09:58	0.27	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	12/27/89 10:12	12/27/89 10:34	0.37	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	01/20/90 10:23	01/20/90 10:42	0.32	STARTED/SECURED 31 CSP	SRO
CSS	3PT-M17	01/20/90 11:43	01/20/90 12:03	0.33	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	02/13/90 15:30	02/13/90 20:35	5.08	3PT-M17 (CSP FUNCTIONAL)	SRO
CSS	3PT-M17	02/13/90 19:04	02/13/90 19:28	0.40	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	02/13/90 19:56	02/13/90 20:15	0.32	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	03/11/90 02:13	03/11/90 02:29	0.27	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	03/11/90 03:55	03/11/90 04:10	0.25	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	03/21/90 16:37	03/21/90 16:58	0.35	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	03/21/90 17:26	03/21/90 17:42	0.27	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	04/14/90 18:30	04/14/90 18:50	0.33	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	04/14/90 19:13	04/14/90 19:40	0.45	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	05/08/90 03:03	05/08/90 03:19	0.27	STARTED/SECURED 31 CSP	SRO
CSS	3PT-M17	05/08/90 03:37	05/08/90 03:58	0.35	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	06/02/90 13:22	06/02/90 13:40	0.30	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	06/02/90 14:28	06/02/90 14:49	0.35	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	06/27/90 09:13	06/27/90 09:36	0.38	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	06/27/90 09:48	06/27/90 10:08	0.33	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	07/21/90 09:25	07/21/90 09:43	0.30	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	07/21/90 10:22	07/21/90 10:42	0.33	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	08/10/90 12:46	08/10/90 13:06	0.33	STARTED/SECURED 31 CSP	SRO
CSS	3PT-M17	08/10/90 13:28	08/10/90 13:47	0.32	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	09/03/90 01:56	09/03/90 02:13	0.28	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	09/03/90 02:28	09/03/90 02:47	0.32	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	09/22/90 10:07	09/22/90 10:25	0.30	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	09/22/90 10:56	09/22/90 11:15	0.32	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	12/03/90 09:50	12/03/90 10:10	0.33	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	12/03/90 10:35	12/03/90 10:55	0.33	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	12/03/90 14:45	12/03/90 14:54	0.15	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	12/03/90 15:09	12/03/90 15:25	0.27	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	12/29/90 20:22	12/29/90 20:41	0.32	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	12/29/90 21:14	12/29/90 21:31	0.28	STARTED/SECURED 32 CSP FOR PT	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
CSS	3PT-M17	01/22/91 09:33	01/22/91 09:50	0.28	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	01/22/91 10:10	01/22/91 10:28	0.30	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	02/16/91 01:17	02/16/91 01:35	0.30	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	02/16/91 02:05	02/16/91 02:25	0.33	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	03/12/91 18:25	03/12/91 18:46	0.35	STARTED/SECURED 31 CSP	SRO
CSS	3PT-M17	03/12/91 19:27	03/12/91 19:44	0.28	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	03/27/91 10:38	03/27/91 10:55	0.28	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	03/27/91 13:55	03/27/91 14:12	0.28	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	04/05/91 11:43	04/05/91 12:00	0.28	STARTED/SECURED 31 CSP	SRO
CSS	3PT-M17	04/05/91 12:43	04/05/91 13:00	0.28	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	04/29/91 18:30	04/29/91 19:00	0.50	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	04/29/91 19:37	04/29/91 19:55	0.30	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	05/25/91 18:39	05/25/91 19:03	0.40	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	05/25/91 20:17	05/25/91 20:35	0.30	STARTED/SECURED 32 CSP	SRO
CSS	3PT-M17	06/19/91 19:13	06/19/91 19:34	0.35	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	06/19/91 20:04	06/19/91 20:23	0.32	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	08/05/91 09:53	08/05/91 10:09	0.27	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	08/05/91 10:37	08/05/91 10:53	0.27	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	08/30/91 03:08	08/30/91 03:25	0.28	STARTED/SECURED 31 CSP FOR PT	SRO
CSS	3PT-M17	08/30/91 04:08	08/30/91 04:26	0.30	STARTED/SECURED 32 CSP FOR PT	SRO
CSS	3PT-M17	09/24/91 12:00	09/24/91 13:10	1.17	3PT-M17 (CSP FUNCTIONAL)	SRO
CSS	3PT-M17	10/18/91 09:20	10/18/91 09:40	0.33	STARTED/SECURED 31 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	10/18/91 10:30	10/18/91 10:45	0.25	STARTED/SECURED 32 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	11/12/91 17:15	11/12/91 17:33	0.30	STARTED/SECURED 31 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	11/12/91 18:07	11/12/91 18:23	0.27	STARTED/SECURED 32 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	12/07/91 02:07	12/07/91 02:30	0.38	STARTED/SECURED 31 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	12/07/91 02:53	12/07/91 03:10	0.28	STARTED/SECURED 32 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	12/30/91 11:12	12/30/91 11:40	0.47	STARTED/SECURED 31 CSP FOR 3PT-M17	SRO
CSS	3PT-M17	12/30/91 13:13	12/30/91 13:31	0.30	STARTED/SECURED 32 CSP FOR 3PT-M17	SRO
CSS	3PT-Q24	04/08/86 01:12	04/08/86 01:15	0.05	3PT-Q24 (CONT SPRAY DISCH VALVES)	SRO
CSS	3PT-Q24	03/19/88 01:00	03/19/88 01:00	0.00	3PT-Q24 (CONT SPRAY DISCH VALVES)	SRO
CVC	3PC-R11	07/16/85 08:05	07/16/85 15:45	7.67	3PC-R11 (VOLUME CONTROL TANK LEVEL CALIBRATION)	SRO
CVC	3PC-R9	09/18/90 09:27	09/18/90 14:30	5.05	3PC-R9 (BORIC ACID TANK LEVEL)	SRO
CVC	3PC-R9	09/19/90 08:27	09/19/90 15:37	7.17	3PC-R9 (BORIC ACID TANK LEVEL)	SRO
CVC	3PT-Q38	07/17/86 15:00	07/17/86 15:00	0.00	3PT-Q38 (BORIC ACID TRANSFER PUMP TEST)	SRO
CVC	3PT-Q38	02/18/89 09:00	02/18/89 11:00	2.00	3PT-Q38 (BORIC ACID TRANSFER PUMP TEST)	SRO
CVC	3PT-Q40	03/19/88 01:15	03/19/88 01:15	0.00	3PT-Q40 (BIT RECIRC VALVES 1851 A & B)	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
CVC	3PT-Q40	06/26/90 05:30	06/26/90 05:30	0.00	3PT-Q40 (BIT RECIRC VALVES 1851 A & B)	SRO
CVC	3PT-Q62	04/29/88 07:45	04/29/88 07:45	0.00	3PT-Q62 (CHGP)	SRO
CVC	3PT-Q62	12/31/88 10:40	12/31/88 11:04	0.40	STARTED/SECURED 31 CHGP FOR 3PT-Q62	SRO
CVC	3PT-Q62	12/31/88 11:03	12/31/88 11:26	0.38	STARTED/SECURED 33 CHGP FOR 3PT-Q62	SRO
CVC	3PT-Q62	05/24/91 09:50	05/24/91 10:23	0.55	STARTED/SECURED 32 CHGP FOR 3PT-Q62	SRO
EDG	3PT-A14	06/20/91 08:14	06/20/91 08:52	0.63	3PT-A14(EDG SPRINGKLER TEST)	SRO
EDG	3PT-SA12	12/27/88 09:26	12/27/88 12:26	3.00	3PT-SA12 DG'S HEAT DETECTORS FUNC	SRO
EDG	3PT-V16A	01/10/85 20:07	01/10/85 21:10	1.05	31 EDG ON/OFF BUS FOR PT	SRO
EDG	3PT-V16A	01/17/85 07:50	01/17/85 09:15	1.42	STARTED/SECURED 31 EDG FOR MAINTENANCE PM	SRO
EDG	3PT-V16A	02/03/85 19:39	02/03/85 21:07	1.47	STARTED/SECURED 31 EDG FOR PT	SRO
EDG	3PT-V16A	02/28/85 03:28	02/28/85 04:45	1.28	31 EDG IN SERVICE FOR PT	SRO
EDG	3PT-V16A	03/23/85 19:50	03/23/85 20:55	1.08	31 EDG ON/OFF BUS FOR PT	SRO
EDG	3PT-V16A	04/17/85 01:55	04/17/85 03:00	1.08	31 EDG ON/OFF BUS FOR PT	SRO
EDG	3PT-V16A	04/25/85 15:54	04/25/85 16:58	1.07	31 EDG ON/OFF BUS FOR PT	SRO
EDG	3PT-V16A	05/12/85 02:38	05/12/85 03:42	1.07	31 EDG ON/OFF BUS FOR PT	SRO
EDG	3PT-V16A	06/04/85 00:37	06/04/85 01:39	1.03	RAN 31 EDG FOR PT	SRO
EDG	3PT-V16A	07/01/85 08:20	07/01/85 09:25	1.08	STARTED/SECURED 31 EDG FOR PT	SRO
EDG	3PT-V16A	08/18/85 11:17	08/18/85 12:15	0.97	31 EDG ON/OFF BUS	SRO
EDG	3PT-V16A	09/13/85 11:10	09/13/85 12:15	1.08	31 EDG IN SERVICE FOR PT	SRO
EDG	3PT-V16A	10/05/85 12:22	10/05/85 13:26	1.07	31 EDG ON/OFF BUS FOR PT	SRO
EDG	3PT-V16A	10/28/85 20:35	10/28/85 22:05	1.50	STARTED/SECURED 31 EDG FOR PT	SRO
EDG	3PT-V16A	11/14/85 20:42	11/14/85 22:00	1.30	31 EDG IN SERVICE FOR OPERABILITY TEST	SRO
EDG	3PT-V16A	12/09/85 12:40	12/09/85 13:50	1.17	RAN 31 EDG FOR PT	SRO
EDG	3PT-V16A	01/02/86 18:13	01/02/86 19:28	1.25	RAN 31 EDG FOR PT	SRO
EDG	3PT-V16A	01/26/86 03:00	01/26/86 04:15	1.25	RAN 31 EDG FOR PT	SRO
EDG	3PT-V16A	02/11/86 18:30	02/11/86 19:40	1.17	STARTED/SECURED 31 EDG FOR PT	SRO
EDG	3PT-V16A	02/13/86 19:40	02/13/86 21:20	1.67	STARTED/SECURED 31 EDG FOR PT-V16 (DG FUNCTIONAL)	SRO
EDG	3PT-V16A	02/20/86 20:00	02/20/86 21:05	1.08	31 EDG ON/OFF BUS FOR PT	SRO
EDG	3PT-V16A	03/15/86 15:45	03/15/86 16:46	1.02	RAN 31 EDG FOR PT-V16 (EDG FUNCTIONAL)	SRO
EDG	3PT-V16A	04/08/86 16:00	04/08/86 18:00	2.00	3PT-V16 (31 DIESEL GENERATOR FUNCTIONAL)	SRO
EDG	3PT-V16A	05/01/86 19:40	05/01/86 20:45	1.08	31 EDG ON/OFF BUS FOR PT	SRO
EDG	3PT-V16A	05/29/86 11:50	05/29/86 12:55	1.08	31 EDG IN SERVICE FOR PT	SRO
EDG	3PT-V16A	06/19/86 02:53	06/19/86 04:00	1.12	31 EDG ON/OFF BUS FOR PT	SRO
EDG	3PT-V16A	07/13/86 09:35	07/13/86 10:45	1.17	STARTED/SECURED 31 EDG FOR PT	SRO
EDG	3PT-V16A	08/05/86 19:05	08/05/86 20:12	1.12	STARTED/SECURED 31 EDG FOR PT-V16 (EDG FUNCTIONAL)	SRO
EDG	3PT-V16A	08/29/86 00:37	08/29/86 01:42	1.08	STARTED/SECURED 31 EDG FOR PT	SRO
EDG	3PT-V16A	09/22/86 03:00	09/22/86 04:00	1.00	STARTED/SECURED 31 EDG	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
EDG	3PT-V16A	10/16/86 08:58	10/16/86 10:05	1.12	RAN 31 EDG FOR PT	SRO
EDG	3PT-V16A	11/09/86 03:21	11/09/86 04:27	1.10	RAN 31 EDG FOR PT	SRO
EDG	3PT-V16A	12/27/86 12:45	12/27/86 13:48	1.05	RAN 31 EDG FOR PT	SRO
EDG	3PT-V16A	01/21/87 12:05	01/21/87 13:06	1.02	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	02/14/87 19:57	02/14/87 21:10	1.22	STARTED/SECURED 31 EDG FOR PT	SRO
EDG	3PT-V16A	03/09/87 00:05	03/09/87 01:17	1.20	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	03/11/87 21:11	03/11/87 23:35	2.40	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	04/25/87 10:17	04/25/87 11:32	1.25	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	06/24/87 10:30	06/24/87 11:35	1.08	RAN 31 EDG FOR OPERABILITY TEST	SRO
EDG	3PT-V16A	07/13/87 13:20	07/13/87 14:35	1.25	RAN 31 EDG FOR PT	SRO
EDG	3PT-V16A	09/03/87 17:06	09/03/87 18:00	0.90	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	09/28/87 00:56	09/28/87 02:15	1.32	STARTED/SECURED 31 EDG FOR PT	SRO
EDG	3PT-V16A	10/16/87 01:20	10/16/87 02:24	1.07	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	11/08/87 03:10	11/08/87 04:12	1.03	STARTED/SECURED 31 EDG FOR 3PT-V16	SRO
EDG	3PT-V16A	12/22/87 04:50	12/22/87 06:01	1.18	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	01/15/88 01:38	01/15/88 02:40	1.03	RAN 31 EDG FOR PT	SRO
EDG	3PT-V16A	02/09/88 01:25	02/09/88 02:35	1.17	RAN 31 EDG FOR PT-V16	SRO
EDG	3PT-V16A	03/23/88 02:50	03/23/88 04:00	1.17	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	05/08/88 21:35	05/08/88 22:48	1.22	RAN 31 EDG FOR 3PT-V16	SRO
EDG	3PT-V16A	05/29/88 21:55	05/29/88 23:00	1.08	STARTED/SECURED 31 EDG FOR PT	SRO
EDG	3PT-V16A	07/07/88 18:05	07/07/88 19:05	1.00	STARTED/SECURED 31 EDG FOR PT	SRO
EDG	3PT-V16A	07/27/88 04:20	07/27/88 05:25	1.08	RAN 31 EDG	SRO
EDG	3PT-V16A	08/16/88 02:36	08/16/88 03:48	1.20	STARTED/SECURED 31 EDG FOR PT	SRO
EDG	3PT-V16A	09/04/88 02:14	09/04/88 03:25	1.18	RAN 31 EDG FOR PT	SRO
EDG	3PT-V16A	09/24/88 09:40	09/24/88 10:42	1.03	STARTED/SECURED 31 EDG FOR PT	SRO
EDG	3PT-V16A	10/14/88 09:26	10/14/88 10:32	1.10	RAN 31 EDG	SRO
EDG	3PT-V16A	11/02/88 02:24	11/02/88 03:43	1.32	RAN 31 EDG	SRO
EDG	3PT-V16A	11/23/88 00:35	11/23/88 01:40	1.08	STARTED/SECURED 31 EDG FOR PT	SRO
EDG	3PT-V16A	12/12/88 04:09	12/12/88 05:35	1.43	RAN 31 EDG FOR PT	SRO
EDG	3PT-V16A	12/31/88 00:35	12/31/88 01:40	1.08	RAN 31 EDG FOR 3PT-V16	SRO
EDG	3PT-V16A	01/06/89 00:25	01/06/89 02:05	1.67	RAN 31 EDG FOR 3PT-V16	SRO
EDG	3PT-V16A	01/24/89 20:54	01/24/89 21:56	1.03	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	02/13/89 08:45	02/13/89 09:52	1.12	RAN 31 EDG FOR PT	SRO
EDG	3PT-V16A	03/03/89 08:35	03/03/89 09:50	1.25	STARTED/SECURED 31 EDG FOR PT	SRO
EDG	3PT-V16A	03/23/89 16:04	03/23/89 17:18	1.23	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	03/30/89 15:05	03/30/89 15:40	0.58	RAN 31 EDG FOR PT-V16	SRO
EDG	3PT-V16A	04/22/89 08:05	04/22/89 08:30	0.42	STARTED/SECURED 31 EDG FOR 3PT-V16	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
EDG	3PT-V16A	05/02/89 17:40	05/02/89 18:50	1.17	STARTED/SECURED 31 EDG FOR PT	SRO
EDG	3PT-V16A	05/21/89 03:15	05/21/89 04:24	1.15	RAN 31 EDG	SRO
EDG	3PT-V16A	06/02/89 19:55	06/02/89 22:44	2.82	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	06/29/89 05:30	06/29/89 06:35	1.08	STARTED/SECURED 31 EDG FOR 3PT-V16	SRO
EDG	3PT-V16A	07/24/89 02:15	07/24/89 03:00	0.75	STARTED/SECURED 31 EDG (DUE TO OVERHEATING)	SRO
EDG	3PT-V16A	07/25/89 08:07	07/25/89 08:59	0.87	RAN 31 EDG	SRO
EDG	3PT-V16A	08/17/89 01:15	08/17/89 02:30	1.25	RAN 31 EDG FOR 3PT-V16	SRO
EDG	3PT-V16A	09/10/89 18:50	09/10/89 20:00	1.17	STARTED/SECURED 31 EDG FOR PT	SRO
EDG	3PT-V16A	10/04/89 18:41	10/04/89 19:45	1.07	RAN 31 EDG FOR PT-V16	SRO
EDG	3PT-V16A	10/16/89 18:58	10/16/89 20:12	1.23	RAN 31 EDG FOR 3PT-V16	SRO
EDG	3PT-V16A	10/30/89 00:07	10/30/89 01:20	1.22	RAN 31 EDG FOR PT	SRO
EDG	3PT-V16A	11/23/89 02:37	11/23/89 03:50	1.22	RAN 31 EDG	SRO
EDG	3PT-V16A	12/17/89 03:10	12/17/89 04:12	1.03	RAN 31 EDG FOR PT-V16	SRO
EDG	3PT-V16A	01/11/90 08:30	01/11/90 09:48	1.30	RAN 31 EDG FOR PT	SRO
EDG	3PT-V16A	02/04/90 18:05	02/04/90 19:12	1.12	RAN 31 EDG FOR 3PT-V16	SRO
EDG	3PT-V16A	02/28/90 02:30	02/28/90 03:36	1.10	RAN 31 EDG FOR PT	SRO
EDG	3PT-V16A	03/26/90 08:30	03/26/90 09:35	1.08	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	05/09/90 18:06	05/09/90 19:35	1.48	RAN 31 EDG	SRO
EDG	3PT-V16A	06/02/90 20:31	06/02/90 21:36	1.08	RAN 31 EDG FOR PT	SRO
EDG	3PT-V16A	06/26/90 12:10	06/26/90 13:10	1.00	STARTED/SECURED 31 EDG FOR PT-V16	SRO
EDG	3PT-V16A	07/25/90 01:34	07/25/90 02:50	1.27	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	08/03/90 17:55	08/03/90 19:10	1.25	STARTED/SECURED 31 EDG FOR PT-V16	SRO
EDG	3PT-V16A	09/24/90 12:50	09/24/90 14:07	1.28	STARTED/SECURED 31 EDG FOR PT-V16	SRO
EDG	3PT-V16A	11/27/90 12:15	11/27/90 14:45	2.50	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	12/20/90 08:08	12/20/90 09:20	1.20	STARTED/SECURED 31 EDG FOR 3PT-V16	SRO
EDG	3PT-V16A	01/13/91 20:00	01/13/91 20:48	0.80	RAN 31 EDG FOR P T	SRO
EDG	3PT-V16A	01/30/91 12:45	01/30/91 14:02	1.28	RAN 31 EDG FOR 3PT-V16	SRO
EDG	3PT-V16A	02/06/91 12:30	02/06/91 13:44	1.23	RAN 31 EDG FOR OPERABILITY-ON BUS	SRO
EDG	3PT-V16A	03/02/91 02:35	03/02/91 04:00	1.42	RAN 31 EDG-ON BUS	SRO
EDG	3PT-V16A	03/26/91 09:30	03/26/91 11:00	1.50	RAN 31 EDG FOR PT	SRO
EDG	3PT-V16A	04/05/91 21:05	04/05/91 22:28	1.38	RAN 31 EDG FOR V-16	SRO
EDG	3PT-V16A	05/26/91 04:28	05/26/91 05:50	1.37	RAN 31 EDG ON BUS	SRO
EDG	3PT-V16A	06/18/91 03:20	06/18/91 04:50	1.50	RAN 31 EDG FOR V16	SRO
EDG	3PT-V16A	07/16/91 12:55	07/16/91 14:33	1.63	RAN 31 EDG FOR RETEST	SRO
EDG	3PT-V16A	08/09/91 01:21	08/09/91 02:36	1.25	RAN 31 EDG FOR 3PT-V16	SRO
EDG	3PT-V16A	08/28/91 18:59	08/28/91 20:18	1.32	RAN 31 EDG (ON BUS)	SRO
EDG	3PT-V16A	09/21/91 17:35	09/21/91 19:00	1.42	RAN 31 EDG FOR 3PT-V16	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
EDG	3PT-V16A	10/15/91 12:08	10/15/91 13:15	1.12	RAN 31 EDG (ON BUS)	SRO
EDG	3PT-V16A	10/30/91 09:23	10/30/91 10:55	1.53	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	11/13/91 08:20	11/13/91 09:52	1.53	RAN 31 EDG FOR V16	SRO
EDG	3PT-V16A	12/06/91 18:17	12/06/91 19:23	1.10	RAN 31 EDG FOR V16	SRO
EDG	3PT-V16A	12/30/91 11:54	12/30/91 12:57	1.05	RAN 31 EDG FOR PT-V16	SRO
EDG	3PT-V16B	01/10/85 11:51	01/10/85 13:08	1.28	RAN 32 EDG FOR 3PT-V16	SRO
EDG	3PT-V16B	01/31/85 15:30	01/31/85 16:55	1.42	STARTED/SECURED 32 EDG FOR RETEST PT	SRO
EDG	3PT-V16B	02/28/85 00:29	02/28/85 01:57	1.47	32 EDG IN SERVICE FOR PT	SRO
EDG	3PT-V16B	03/23/85 18:35	03/23/85 19:40	1.08	32 EDG ON/OFF BUS FOR PT	SRO
EDG	3PT-V16B	04/26/85 17:25	04/26/85 18:30	1.08	32 EDG ON/OFF BUS FOR PT	SRO
EDG	3PT-V16B	05/12/85 01:25	05/12/85 02:28	1.05	32 EDG ON/OFF BUS FOR PT	SRO
EDG	3PT-V16B	06/04/85 02:14	06/04/85 03:20	1.10	RAN 32 EDG FOR PT	SRO
EDG	3PT-V16B	07/01/85 09:27	07/01/85 10:28	1.02	STARTED/SECURED 32 EDG FOR PT	SRO
EDG	3PT-V16B	08/10/85 18:00	08/10/85 21:15	3.25	32 EDG ON/OFF BUS FOR PT	SRO
EDG	3PT-V16B	09/13/85 09:50	09/13/85 10:55	1.08	32 EDG IN SERVICE FOR PT	SRO
EDG	3PT-V16B	10/05/85 11:10	10/05/85 12:16	1.10	32 EDG ON/OFF BUS FOR PT	SRO
EDG	3PT-V16B	11/13/85 19:35	11/13/85 20:45	1.17	STARTED/SECURED 32 EDG FOR OPERABILITY RUN	SRO
EDG	3PT-V16B	12/09/85 10:25	12/09/85 11:30	1.08	RAN 32 EDG FOR PT	SRO
EDG	3PT-V16B	01/02/86 19:32	01/02/86 20:48	1.27	RAN 32 EDG FOR PT	SRO
EDG	3PT-V16B	01/26/86 04:20	01/26/86 05:40	1.33	RAN 32 EDG FOR PT	SRO
EDG	3PT-V16B	02/20/86 18:50	02/20/86 19:55	1.08	RAN 32 EDG FOR PT	SRO
EDG	3PT-V16B	03/11/86 18:17	03/11/86 19:07	0.83	32 EDG IN SERVICE FOR MAINT PM	SRO
EDG	3PT-V16B	03/15/86 13:45	03/15/86 14:50	1.08	RAN 32 EDG FOR PT-V16 (EDG FUNCTIONAL)	SRO
EDG	3PT-V16B	04/08/86 13:30	04/08/86 14:38	1.13	32 EDG ON/OFF BUS FOR PT	SRO
EDG	3PT-V16B	05/01/86 19:50	05/01/86 20:55	1.08	32 EDG ON/OFF BUS FOR PT	SRO
EDG	3PT-V16B	05/29/86 09:45	05/29/86 10:45	1.00	32 EDG IN SERVICE FOR PT	SRO
EDG	3PT-V16B	06/19/86 04:35	06/19/86 05:55	1.33	32 EDG ON/OFF BUS FOR PT	SRO
EDG	3PT-V16B	07/13/86 04:22	07/13/86 05:22	1.00	32 EDG ON/OFF BUS FOR PT	SRO
EDG	3PT-V16B	08/06/86 03:28	08/06/86 04:40	1.20	STARTED/SECURED 32 EDG FOR PT-V16 (EDG FUNCTIONAL)	SRO
EDG	3PT-V16B	08/29/86 17:25	08/29/86 18:30	1.08	RAN 32 EDG FOR PT	SRO
EDG	3PT-V16B	09/22/86 00:58	09/22/86 01:58	1.00	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	10/16/86 01:22	10/16/86 02:42	1.33	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	11/09/86 02:07	11/09/86 03:13	1.10	RAN 32 EDG FOR PT	SRO
EDG	3PT-V16B	12/27/86 09:24	12/27/86 10:28	1.07	RAN 32 EDG FOR PT	SRO
EDG	3PT-V16B	01/21/87 09:11	01/21/87 10:07	0.93	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	02/14/87 18:20	02/14/87 19:50	1.50	STARTED/SECURED 32 EDG FOR PT	SRO
EDG	3PT-V16B	03/09/87 01:27	03/09/87 02:45	1.30	STARTED/SECURED 32 EDG	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
EDG	3PT-V16B	04/25/87 11:37	04/25/87 12:44	1.12	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	05/20/87 11:03	05/20/87 12:05	1.03	STARTED/SECURED 32 EDG FOR TEST GROUP	SRO
EDG	3PT-V16B	05/20/87 12:13	05/20/87 13:14	1.02	STARTED/SECURED 32 EDG FOR TEST GROUP	SRO
EDG	3PT-V16B	06/19/87 11:27	06/19/87 12:40	1.22	RAN 32 EDG FOR PT	SRO
EDG	3PT-V16B	07/12/87 18:16	07/12/87 19:18	1.03	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	09/03/87 15:57	09/03/87 17:04	1.12	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	09/27/87 19:15	09/27/87 20:35	1.33	RAN 32 EDG FOR PT	SRO
EDG	3PT-V16B	10/15/87 08:40	10/15/87 10:02	1.37	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	11/08/87 04:15	11/08/87 05:20	1.08	STARTED/SECURED 32 EDG FOR 3PT-V16	SRO
EDG	3PT-V16B	12/21/87 21:24	12/21/87 22:37	1.22	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	01/15/88 03:50	01/15/88 04:53	1.05	RAN 32 EDG FOR PT	SRO
EDG	3PT-V16B	02/08/88 17:25	02/08/88 18:35	1.17	STARTED/SECURED 32 EDG FOR PT	SRO
EDG	3PT-V16B	03/23/88 01:40	03/23/88 02:40	1.00	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	04/16/88 13:23	04/16/88 14:23	1.00	STARTED/SECURED 32 EDG FOR PT	SRO
EDG	3PT-V16B	04/28/88 09:52	04/28/88 11:15	1.38	STARTED/SECURED 32 EDG FOR PM'S	SRO
EDG	3PT-V16B	05/09/88 01:52	05/09/88 03:07	1.25	STARTED/SECURED 32 EDG FOR PT	SRO
EDG	3PT-V16B	06/19/88 00:40	06/19/88 02:00	1.33	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	07/07/88 08:30	07/07/88 09:30	1.00	STARTED/SECURED 32 EDG FOR PT-V16	SRO
EDG	3PT-V16B	07/26/88 20:20	07/26/88 21:45	1.42	RAN 32 EDG	SRO
EDG	3PT-V16B	08/16/88 03:53	08/16/88 05:11	1.30	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	08/17/88 18:08	08/17/88 18:32	0.40	STARTED/TRIPPED 32 EDG FOR 3PT-V16 RETEST (24hr LOC)	SRO
EDG	3PT-V16B	09/04/88 18:00	09/04/88 19:07	1.12	STARTED/SECURED 32 EDG FOR PT RETEST	SRO
EDG	3PT-V16B	09/08/88 17:55	09/08/88 19:19	1.40	RAN 32 EDG	SRO
EDG	3PT-V16B	09/24/88 10:43	09/24/88 11:44	1.02	STARTED/SECURED 32 EDG FOR PT	SRO
EDG	3PT-V16B	10/14/88 02:42	10/14/88 03:46	1.07	STARTED/SECURED 32 EDG FOR 3PT-V16	SRO
EDG	3PT-V16B	11/02/88 04:56	11/02/88 06:07	1.18	RAN 32 EDG	SRO
EDG	3PT-V16B	11/23/88 01:45	11/23/88 02:55	1.17	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	12/12/88 02:50	12/12/88 04:04	1.23	RAN 32 EDG FOR PT	SRO
EDG	3PT-V16B	12/16/88 02:03	12/16/88 03:40	1.62	STARTED/SECURED 32 EDG FOR MAINT AND V-16	SRO
EDG	3PT-V16B	12/31/88 01:45	12/31/88 02:50	1.08	RAN 32 EDG FOR 3PT-V16	SRO
EDG	3PT-V16B	01/24/89 18:12	01/24/89 19:22	1.17	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	02/13/89 12:27	02/13/89 13:37	1.17	RAN 32 EDG FOR PT	SRO
EDG	3PT-V16B	03/04/89 08:45	03/04/89 10:10	1.42	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	03/23/89 13:50	03/23/89 14:57	1.12	STARTED/SECURED 32 EDG FOR PT	SRO
EDG	3PT-V16B	03/30/89 15:50	03/30/89 16:40	0.83	RAN 32 EDG FOR V-16	SRO
EDG	3PT-V16B	04/17/89 14:25	04/17/89 19:15	4.83	RAN 32 EDG	SRO
EDG	3PT-V16B	05/21/89 01:52	05/21/89 03:01	1.15	RAN 32 EDG	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
EDG	3PT-V16B	06/01/89 21:48	06/01/89 23:05	1.28	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	06/28/89 16:20	06/28/89 17:29	1.15	STARTED/SECURED 32 EDG FOR 3PT-V16	SRO
EDG	3PT-V16B	07/23/89 20:18	07/23/89 21:25	1.12	RAN 32 EDG FOR PT-V16	SRO
EDG	3PT-V16B	07/31/89 14:33	07/31/89 14:37	0.07	RAN 32 EDG FOR 3PT-V16	SRO
EDG	3PT-V16B	08/18/89 19:40	08/18/89 20:51	1.18	RAN 32 EDG FOR PT	SRO
EDG	3PT-V16B	09/10/89 13:10	09/10/89 14:17	1.12	RAN 32 EDG	SRO
EDG	3PT-V16B	10/04/89 13:16	10/04/89 14:20	1.07	STARTED/SECURED 32 EDG FOR PT	SRO
EDG	3PT-V16B	10/29/89 18:12	10/29/89 19:20	1.13	STARTED/SECURED 32 EDG FOR PT	SRO
EDG	3PT-V16B	11/23/89 01:00	11/23/89 02:08	1.13	RAN 32 EDG	SRO
EDG	3PT-V16B	12/17/89 18:30	12/17/89 19:38	1.13	RAN 32 EDG FOR PT	SRO
EDG	3PT-V16B	01/10/90 18:50	01/10/90 20:13	1.38	RAN 32 EDG FOR 3PT-V16 (DG FUNCTIONAL)	SRO
EDG	3PT-V16B	02/04/90 10:30	02/04/90 11:45	1.25	RAN 32 EDG FOR 3PT-V16	SRO
EDG	3PT-V16B	02/07/90 01:55	02/07/90 03:05	1.17	STARTED/SECURED 32 EDG FOR 3PT-V16	SRO
EDG	3PT-V16B	03/25/90 21:17	03/25/90 22:36	1.32	STARTED/SECURED 32 EDG FOR PT	SRO
EDG	3PT-V16B	04/20/90 03:26	04/20/90 04:37	1.18	RAN 32 EDG FOR V-16 & A-21	SRO
EDG	3PT-V16B	05/10/90 19:35	05/10/90 20:50	1.25	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	06/02/90 18:23	06/02/90 19:28	1.08	RAN 32 EDG FOR PT	SRO
EDG	3PT-V16B	06/26/90 18:52	06/26/90 20:10	1.30	STARTED/SECURED 32 EDG FOR 3PT-V16	SRO
EDG	3PT-V16B	07/25/90 07:06	07/25/90 08:06	1.00	RAN 32 EDG	SRO
EDG	3PT-V16B	07/27/90 10:32	07/27/90 11:58	1.43	RAN 32 EDG FOR 3PT-V16	SRO
EDG	3PT-V16B	08/07/90 17:55	08/07/90 19:10	1.25	STARTED/SECURED 32 EDG FOR PT-V16	SRO
EDG	3PT-V16B	09/01/90 02:30	09/01/90 03:50	1.33	RAN 32 EDG FOR PT	SRO
EDG	3PT-V16B	09/24/90 16:07	09/24/90 17:27	1.33	RAN 32 EDG	SRO
EDG	3PT-V16B	10/21/90 10:28	10/21/90 11:45	1.28	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	12/03/90 03:25	12/03/90 04:45	1.33	RAN 32 EDG FOR 3PT-V16	SRO
EDG	3PT-V16B	12/06/90 11:51	12/06/90 13:20	1.48	STARTED/SECURED 32 EDG FOR PT-V16	SRO
EDG	3PT-V16B	12/20/90 09:53	12/20/90 11:10	1.28	STARTED/SECURED 32 EDG FOR 3PT-V16	SRO
EDG	3PT-V16B	01/13/91 18:33	01/13/91 20:10	1.62	RAN 32 EDG FOR P T	SRO
EDG	3PT-V16B	02/06/91 10:57	02/06/91 12:17	1.33	RAN 32 EDG FOR OPERABILITY-ON BUS	SRO
EDG	3PT-V16B	03/02/91 10:30	03/02/91 11:50	1.33	RAN 32 EDG-FOR 3PT V16	SRO
EDG	3PT-V16B	03/26/91 12:35	03/26/91 13:40	1.08	RAN 32 EDG FOR PT	SRO
EDG	3PT-V16B	04/06/91 02:20	04/06/91 03:25	1.08	RAN 32 EDG FOR V-16	SRO
EDG	3PT-V16B	05/06/91 17:20	05/06/91 18:40	1.33	RAN 32 EDG FOR 3PT-V16	SRO
EDG	3PT-V16B	05/26/91 02:50	05/26/91 04:20	1.50	RAN 32 EDG ON BUS	SRO
EDG	3PT-V16B	06/18/91 09:05	06/18/91 10:30	1.42	RAN 32 EDG FOR PT	SRO
EDG	3PT-V16B	07/18/91 04:05	07/18/91 05:30	1.42	RAN 32 EDG FOR PT	SRO
EDG	3PT-V16B	08/09/91 04:15	08/09/91 05:30	1.25	RAN 32 EDG FOR 3PT-V16	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
EDG	3PT-V16B	08/28/91 01:15	08/28/91 02:25	1.17	RAN 32 EDG LEAKING AT CRANKCASE	SRO
EDG	3PT-V16B	09/21/91 10:50	09/21/91 11:55	1.08	RAN 32 EDG FOR 3PT-V16	SRO
EDG	3PT-V16B	10/15/91 03:40	10/15/91 04:45	1.08	RAN 32 EDG FOR 3PT-V16	SRO
EDG	3PT-V16B	11/12/91 08:36	11/12/91 10:06	1.50	RAN 32 EDG FOR V16	SRO
EDG	3PT-V16B	12/06/91 02:19	12/06/91 03:26	1.12	RAN 32 EDG FOR V16	SRO
EDG	3PT-V16B	12/30/91 10:44	12/30/91 11:50	1.10	RAN 32 EDG FOR PT-V16	SRO
EDG	3PT-V16C	01/10/85 08:52	01/10/85 09:33	0.68	RAN 33 EDG FOR 3PT-V16	SRO
EDG	3PT-V16C	02/04/85 03:16	02/04/85 04:18	1.03	RAN 33 EDG FOR PT	SRO
EDG	3PT-V16C	02/27/85 10:28	02/27/85 11:45	1.28	RAN 33 EDG FOR 3PT-V16 & 3PT-Q07	SRO
EDG	3PT-V16C	03/23/85 00:17	03/23/85 01:25	1.13	STARTED/SECURED 33 EDG FOR PT	SRO
EDG	3PT-V16C	04/17/85 05:07	04/17/85 06:09	1.03	33 EDG ON/OFF BUS FOR PT	SRO
EDG	3PT-V16C	05/12/85 00:12	05/12/85 01:16	1.07	33 EDG ON/OFF BUS FOR PT	SRO
EDG	3PT-V16C	06/04/85 04:49	06/04/85 05:51	1.03	RAN 33 EDG FOR PT	SRO
EDG	3PT-V16C	07/01/85 13:30	07/01/85 14:30	1.00	STARTED/SECURED 33 EDG FOR PT	SRO
EDG	3PT-V16C	08/18/85 14:03	08/18/85 17:55	3.87	33 EDG ON/OFF BUS	SRO
EDG	3PT-V16C	09/13/85 08:40	09/13/85 09:45	1.08	33 EDG IN SERVICE FOR PT	SRO
EDG	3PT-V16C	10/05/85 09:56	10/05/85 11:05	1.15	33 EDG ON/OFF BUS FOR PT	SRO
EDG	3PT-V16C	11/15/85 16:45	11/15/85 18:05	1.33	33 EDG IN SERVICE FOR OPERABILITY TEST	SRO
EDG	3PT-V16C	12/09/85 08:58	12/09/85 10:14	1.27	RAN 33 EDG FOR PT	SRO
EDG	3PT-V16C	01/02/86 21:30	01/02/86 22:35	1.08	RAN 33 EDG FOR PT	SRO
EDG	3PT-V16C	01/26/86 05:50	01/26/86 06:58	1.13	RAN 33 EDG FOR PT	SRO
EDG	3PT-V16C	02/20/86 21:10	02/20/86 22:15	1.08	33 EDG ON/OFF BUS FOR PT	SRO
EDG	3PT-V16C	03/15/86 12:30	03/15/86 13:40	1.17	RAN 33 EDG FENERATOR FOR PT-V16 (EDG FUNCTIONAL)	SRO
EDG	3PT-V16C	05/01/86 20:55	05/01/86 22:00	1.08	33 EDG ON/OFF BUS FOR PT	SRO
EDG	3PT-V16C	05/29/86 08:25	05/29/86 09:30	1.08	33 EDG IN SERVICE FOR PT	SRO
EDG	3PT-V16C	06/18/86 20:33	06/18/86 21:27	0.90	33 EDG ON/OFF BUS FOR PT	SRO
EDG	3PT-V16C	07/13/86 02:32	07/13/86 03:27	0.92	33 EDG ON/OFF BUS FOR PT	SRO
EDG	3PT-V16C	08/06/86 13:30	08/06/86 14:35	1.08	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	08/29/86 18:45	08/29/86 19:55	1.17	RAN 33 EDG FOR PT	SRO
EDG	3PT-V16C	09/22/86 02:00	09/22/86 03:00	1.00	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	10/15/86 23:46	10/16/86 01:09	1.38	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	11/09/86 00:45	11/09/86 01:53	1.13	RAN 33 EDG FOR PT	SRO
EDG	3PT-V16C	12/04/86 16:20	12/04/86 17:30	1.17	STARTED/SECURED 33 EDG FOR PT	SRO
EDG	3PT-V16C	12/27/86 08:15	12/27/86 09:17	1.03	RAN 33 EDG FOR PT	SRO
EDG	3PT-V16C	01/21/87 08:00	01/21/87 09:05	1.08	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	02/14/87 16:43	02/14/87 17:55	1.20	STARTED/SECURED 33 EDG FOR PT	SRO
EDG	3PT-V16C	03/09/87 02:51	03/09/87 04:03	1.20	STARTED/SECURED 33 EDG	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
EDG	3PT-V16C	04/25/87 18:45	04/25/87 20:00	1.25	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	05/20/87 09:35	05/20/87 10:40	1.08	STARTED/SECURED 33 EDG FOR TEST GROUP	SRO
EDG	3PT-V16C	06/19/87 09:50	06/19/87 10:01	0.18	RAN 33 EDG FOR PT	SRO
EDG	3PT-V16C	07/12/87 17:13	07/12/87 18:15	1.03	STARTED/SECURED 33 EDG FOR PT	SRO
EDG	3PT-V16C	09/03/87 14:00	09/03/87 15:18	1.30	RAN 33 EDG FOR PT	SRO
EDG	3PT-V16C	09/27/87 13:00	09/27/87 14:15	1.25	STARTED/SECURED 33 EDG AS PER 3PT-V16	SRO
EDG	3PT-V16C	10/22/87 17:12	10/22/87 18:44	1.53	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	11/08/87 17:55	11/08/87 18:57	1.03	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	12/04/87 20:00	12/04/87 21:10	1.17	STARTED/SECURED 33 EDG FOR PT-V16	SRO
EDG	3PT-V16C	12/21/87 02:30	12/21/87 03:46	1.27	RAN 33 EDG FOR PT- V16	SRO
EDG	3PT-V16C	01/15/88 17:20	01/15/88 18:20	1.00	STARTED/SECURED 33 EDG FOR PT	SRO
EDG	3PT-V16C	02/09/88 02:30	02/09/88 03:30	1.00	RAN 33 EDG FOR PT- V16	SRO
EDG	3PT-V16C	03/23/88 00:30	03/23/88 01:35	1.08	STARTED/SECURED 33 EDG FOR PT	SRO
EDG	3PT-V16C	04/16/88 17:58	04/16/88 19:17	1.32	RAN 33 EDG FOR 3PT-V16	SRO
EDG	3PT-V16C	04/20/88 08:38	04/20/88 09:15	0.62	RAN 33 EDG FOR MAINT PT	SRO
EDG	3PT-V16C	05/09/88 08:55	05/09/88 10:15	1.33	STARTED/SECURED 33 EDG FOR PT	SRO
EDG	3PT-V16C	06/18/88 18:37	06/18/88 19:51	1.23	RAN 33 EDG	SRO
EDG	3PT-V16C	07/07/88 20:29	07/07/88 21:26	0.95	STARTED/SECURED 33 EDG FOR PT	SRO
EDG	3PT-V16C	07/26/88 21:46	07/26/88 22:52	1.10	RAN 33 EDG	SRO
EDG	3PT-V16C	08/15/88 20:15	08/15/88 21:15	1.00	RAN 33 EDG FOR 3PT-V16	SRO
EDG	3PT-V16C	09/05/88 01:55	09/05/88 03:06	1.18	RAN 33 EDG FOR PT	SRO
EDG	3PT-V16C	09/24/88 13:05	09/24/88 14:07	1.03	STARTED/SECURED 33 EDG FOR PT	SRO
EDG	3PT-V16C	10/09/88 19:36	10/10/88 00:53	5.28	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	10/14/88 08:13	10/14/88 09:22	1.15	RAN 33 EDG	SRO
EDG	3PT-V16C	11/02/88 16:27	11/02/88 17:35	1.13	RAN 33 EDG FOR PT	SRO
EDG	3PT-V16C	11/23/88 02:59	11/23/88 04:15	1.27	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	12/12/88 12:57	12/12/88 15:00	2.05	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	12/31/88 09:34	12/31/88 10:45	1.18	RAN 33 EDG FOR 3PT-V16	SRO
EDG	3PT-V16C	01/24/89 16:54	01/24/89 18:07	1.22	STARTED/SECURED 33 EDG FOR PT	SRO
EDG	3PT-V16C	02/13/89 13:39	02/13/89 14:58	1.32	RAN 33 EDG FOR PT	SRO
EDG	3PT-V16C	03/03/89 10:00	03/03/89 11:00	1.00	STARTED/SECURED 33 EDG FOR PT (ASSUME: 1 HOUR)	SRO
EDG	3PT-V16C	03/23/89 11:15	03/23/89 12:20	1.08	STARTED/SECURED 33 EDG FOR PT	SRO
EDG	3PT-V16C	03/30/89 17:35	03/30/89 18:10	0.58	RAN 33 EDG FOR PT-V16	SRO
EDG	3PT-V16C	04/20/89 09:05	04/20/89 11:23	2.30	RAN 33 EDG	SRO
EDG	3PT-V16C	05/29/89 02:04	05/29/89 03:54	1.83	STARTED/SECURED 33 EDG FOR 3PT-V16	SRO
EDG	3PT-V16C	06/28/89 17:30	06/28/89 18:30	1.00	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	07/23/89 18:55	07/23/89 20:15	1.33	RAN 33 EDG FOR PT- V16	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
EDG	3PT-V16C	08/15/89 11:58	08/15/89 13:23	1.42	STARTED/SECURED 33 EDG FOR PT	SRO
EDG	3PT-V16C	08/17/89 21:18	08/17/89 22:30	1.20	RAN 33 EDG FOR PT	SRO
EDG	3PT-V16C	09/10/89 09:37	09/10/89 10:47	1.17	RAN 33 EDG	SRO
EDG	3PT-V16C	10/04/89 12:15	10/04/89 13:15	1.00	STARTED/SECURED 33 EDG FOR PT	SRO
EDG	3PT-V16C	10/18/89 20:08	10/18/89 21:25	1.28	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	10/30/89 08:02	10/30/89 09:23	1.35	RAN 33 EDG FOR PT	SRO
EDG	3PT-V16C	11/22/89 23:45	11/23/89 01:05	1.33	RAN 33 EDG	SRO
EDG	3PT-V16C	12/17/89 09:15	12/17/89 10:50	1.58	STARTED/SECURED 33 EDG FOR PT-V16	SRO
EDG	3PT-V16C	01/11/90 12:33	01/11/90 13:40	1.12	RAN 33 EDG FOR PT	SRO
EDG	3PT-V16C	02/03/90 13:19	02/03/90 14:30	1.18	RAN 33 EDG FOR 3PT-V16	SRO
EDG	3PT-V16C	02/27/90 02:10	02/27/90 03:20	1.17	RAN 33 EDG FOR PT	SRO
EDG	3PT-V16C	03/26/90 10:10	03/26/90 11:20	1.17	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	04/19/90 20:03	04/19/90 21:13	1.17	RAN 33 EDG	SRO
EDG	3PT-V16C	05/02/90 11:24	05/02/90 12:35	1.18	STARTED/SECURED 33 EDG FOR PT	SRO
EDG	3PT-V16C	05/12/90 01:57	05/12/90 03:09	1.20	RAN 33 EDG	SRO
EDG	3PT-V16C	06/02/90 11:24	06/02/90 12:35	1.18	STARTED/SECURED 33 EDG FOR PT	SRO
EDG	3PT-V16C	06/26/90 20:12	06/26/90 21:29	1.28	STARTED/SECURED 33 EDG FOR 3PT-V16	SRO
EDG	3PT-V16C	07/20/90 09:12	07/20/90 10:15	1.05	STARTED/SECURED 33 EDG FOR PT-V16	SRO
EDG	3PT-V16C	07/25/90 07:11	07/25/90 08:11	1.00	RAN 33 EDG	SRO
EDG	3PT-V16C	07/31/90 09:00	07/31/90 10:35	1.58	STARTED/SECURED 33 EDG FOR PT	SRO
EDG	3PT-V16C	08/31/90 01:27	08/31/90 02:30	1.05	RAN 33 EDG FOR PT	SRO
EDG	3PT-V16C	09/01/90 03:55	09/01/90 05:25	1.50	RAN 33 EDG FOR PT	SRO
EDG	3PT-V16C	09/24/90 08:35	09/24/90 10:05	1.50	STARTED/SECURED 33 EDG FOR PT-V16	SRO
EDG	3PT-V16C	10/21/90 08:50	10/21/90 10:10	1.33	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	12/06/90 21:55	12/06/90 23:00	1.08	STARTED/SECURED 33 EDG FOR PT-V16	SRO
EDG	3PT-V16C	12/07/90 07:57	12/07/90 10:25	2.47	STARTED/SECURED 33 EDG FOR 3PT-R16	SRO
EDG	3PT-V16C	12/20/90 12:02	12/20/90 13:15	1.22	STARTED/SECURED 33 EDG FOR 3PT-V16	SRO
EDG	3PT-V16C	01/13/91 03:04	01/13/91 04:15	1.18	RAN 33 EDG FOR P T	SRO
EDG	3PT-V16C	02/06/91 08:26	02/06/91 09:37	1.18	RAN 33 EDG FOR OPERABILITY-ON BUS	SRO
EDG	3PT-V16C	02/28/91 09:35	02/28/91 10:20	0.75	33 EDG FUNCTIONAL TEST (V-16)	SRO
EDG	3PT-V16C	03/02/91 20:25	03/02/91 21:30	1.08	RAN 33 EDG-FOR 3PT V16	SRO
EDG	3PT-V16C	03/26/91 02:45	03/26/91 04:01	1.27	RAN 33 EDG FOR WEEKLY & OVERSPEED PT'S	SRO
EDG	3PT-V16C	04/06/91 01:08	04/06/91 02:00	0.87	RAN 33 EDG FOR V-16	SRO
EDG	3PT-V16C	05/07/91 04:15	05/07/91 05:32	1.28	RAN 33 EDG FOR PT	SRO
EDG	3PT-V16C	05/25/91 09:55	05/25/91 11:15	1.33	RAN 33 EDG FOR 3PT-V16	SRO
EDG	3PT-V16C	06/18/91 12:18	06/18/91 13:48	1.50	RAN 33 EDG	SRO
EDG	3PT-V16C	07/17/91 20:30	07/17/91 21:59	1.48	RAN 33 EDG (ON BUS)	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
EDG	3PT-V16C	08/09/91 19:10	08/09/91 20:37	1.45	RAN 33 EDG FOR 3PT-V16	SRO
EDG	3PT-V16C	08/28/91 17:34	08/28/91 18:54	1.33	RAN 33 EDG (ON BUS)	SRO
EDG	3PT-V16C	09/21/91 03:32	09/21/91 04:44	1.20	RAN 33 EDG FOR PT	SRO
EDG	3PT-V16C	10/15/91 08:56	10/15/91 10:10	1.23	RAN 33 EDG (ON BUS)	SRO
EDG	3PT-V16C	11/12/91 12:15	11/12/91 14:05	1.83	RAN 33 EDG FOR V16	SRO
EDG	3PT-V16C	12/06/91 01:01	12/06/91 02:08	1.12	RAN 33 EDG FOR V16	SRO
EDG	3PT-V16C	12/30/91 08:59	12/30/91 10:22	1.38	RAN 33 EDG FOR PT-V16	SRO
EDG	3PT-V16A	01/29/85 05:20	01/29/85 05:32	0.20	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	01/30/85 05:08	01/30/85 05:23	0.25	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	01/31/85 05:21	01/31/85 05:30	0.15	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	02/03/85 01:16	02/03/85 01:48	0.53	RAN 31 EDG	SRO
EDG	3PT-V16A	02/05/85 05:45	02/05/85 06:00	0.25	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	02/06/85 05:00	02/06/85 05:05	0.08	STARTED/SECURED 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	02/07/85 05:25	02/07/85 05:30	0.08	STARTED/SECURED 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	03/05/85 07:35	03/05/85 07:49	0.23	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	04/26/85 07:20	04/26/85 07:25	0.08	STARTED/SECURED 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	05/01/85 10:15	05/01/85 10:30	0.25	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	05/14/85 09:35	05/14/85 10:08	0.55	RAN 31 EDG (UNLOADED)	SRO
EDG	3PT-V16A	06/12/85 05:20	06/12/85 05:25	0.08	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	08/03/85 07:43	08/03/85 12:29	4.77	STARTED/SECURED 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	08/13/85 04:10	08/13/85 04:53	0.72	31 EDG IN SERVICE	SRO
EDG	3PT-V16A	10/17/85 14:10	10/17/85 14:40	0.50	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	10/30/85 09:42	10/30/85 10:11	0.48	RAN 31 EDG	SRO
EDG	3PT-V16A	10/31/85 08:11	10/31/85 08:31	0.33	RAN 31 EDG	SRO
EDG	3PT-V16A	11/13/85 05:15	11/13/85 05:30	0.25	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	11/14/85 05:30	11/14/85 05:40	0.17	RAN 31 EDG FOR OPERABILITY TEST	SRO
EDG	3PT-V16A	11/15/85 06:00	11/15/85 06:05	0.08	RAN 31 EDG FOR OPERABILITY TEST	SRO
EDG	3PT-V16A	02/13/86 12:31	02/13/86 12:55	0.40	31 EDG IN SERVICE FOR OPERABILITY	SRO
EDG	3PT-V16A	02/18/86 08:10	02/18/86 08:15	0.08	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	02/19/86 07:28	02/19/86 07:40	0.20	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	02/20/86 07:36	02/20/86 07:50	0.23	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	02/21/86 10:18	02/21/86 10:34	0.27	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	02/24/86 13:55	02/24/86 14:10	0.25	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	03/18/86 03:22	03/18/86 03:37	0.25	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	04/14/86 21:45	04/14/86 21:53	0.13	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	04/15/86 16:23	04/15/86 16:38	0.25	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	05/06/86 16:15	05/06/86 16:30	0.25	RAN 31 EDG FOR OPERABILITY	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
EDG	3PT-V16A	06/05/86 03:38	06/05/86 03:53	0.25	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	08/11/86 21:05	08/11/86 21:15	0.17	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	08/23/86 10:07	08/23/86 11:32	1.42	STARTED/SECURED 31 EDG FOR TEST	SRO
EDG	3PT-V16A	08/29/86 10:55	08/29/86 11:30	0.58	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	09/02/86 19:15	09/02/86 19:25	0.17	RAN 31 EDG FOR CHEM MIXING	SRO
EDG	3PT-V16A	09/29/86 16:00	09/29/86 16:05	0.08	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	11/14/86 22:23	11/14/86 22:41	0.30	STARTED/SECURED 31 EDG FOR PT	SRO
EDG	3PT-V16A	11/20/86 03:38	11/20/86 03:45	0.12	STARTED/SECURED 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	11/25/86 06:25	11/25/86 06:40	0.25	RAN 31 EDG FOR OPERABILITY CHECK	SRO
EDG	3PT-V16A	12/23/86 20:14	12/23/86 20:30	0.27	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	03/12/87 05:10	03/12/87 05:20	0.17	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	03/13/87 04:55	03/13/87 05:05	0.17	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	03/13/87 16:47	03/13/87 17:10	0.38	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	03/13/87 17:36	03/13/87 18:09	0.55	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	03/13/87 17:42	03/13/87 17:58	0.27	31 EDG ON/OFF BUS	SRO
EDG	3PT-V16A	03/16/87 05:45	03/16/87 05:55	0.17	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	03/17/87 05:15	03/17/87 05:26	0.18	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	04/03/87 15:47	04/03/87 16:00	0.22	RAN 31 EDG	SRO
EDG	3PT-V16A	05/10/87 17:26	05/10/87 18:02	0.60	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	05/15/87 18:55	05/15/87 19:10	0.25	RAN 33 EDG OPERABILITY	SRO
EDG	3PT-V16A	05/15/87 18:55	05/15/87 19:10	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	06/24/87 15:32	06/24/87 15:57	0.42	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	06/24/87 15:48	06/24/87 15:57	0.15	31 EDG ON/OFF BUS	SRO
EDG	3PT-V16A	06/24/87 16:45	06/24/87 16:50	0.08	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	06/27/87 08:09	06/27/87 08:20	0.18	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	07/06/87 21:45	07/06/87 22:10	0.42	RAN 31 EDG	SRO
EDG	3PT-V16A	07/23/87 17:47	07/23/87 17:59	0.20	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	10/13/87 08:07	10/13/87 08:22	0.25	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	10/14/87 04:10	10/14/87 04:26	0.27	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	10/15/87 03:33	10/15/87 03:50	0.28	RAN 31 EDG	SRO
EDG	3PT-V16A	10/20/87 04:27	10/20/87 04:37	0.17	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	10/21/87 05:21	10/21/87 05:31	0.17	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	10/22/87 05:07	10/22/87 05:17	0.17	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	12/02/87 03:25	12/02/87 04:30	1.08	STARTED/SECURED 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	12/03/87 04:55	12/03/87 05:00	0.08	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	12/04/87 02:20	12/04/87 02:25	0.08	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	12/10/87 05:00	12/10/87 05:15	0.25	RAN 31 EDG FOR OPERABILITY	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
EDG	3PT-V16A	12/11/87 04:57	12/11/87 05:12	0.25	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	01/26/88 14:10	01/26/88 14:20	0.17	RAN 31 EDG	SRO
EDG	3PT-V16A	01/27/88 04:50	01/27/88 05:05	0.25	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	01/28/88 04:40	01/28/88 04:55	0.25	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	02/27/88 02:00	02/27/88 03:10	1.17	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	02/29/88 06:00	02/29/88 06:10	0.17	RAN 31 EDG FOR OPERABILITY CHECK	SRO
EDG	3PT-V16A	03/14/88 05:49	03/14/88 05:55	0.10	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	04/19/88 05:18	04/19/88 05:29	0.18	STARTED/SECURED 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	04/21/88 21:19	04/21/88 21:28	0.15	RAN 31 EDG	SRO
EDG	3PT-V16A	04/27/88 05:20	04/27/88 05:23	0.05	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	04/28/88 05:13	04/28/88 05:16	0.05	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	05/12/88 10:50	05/12/88 10:58	0.13	RAN 31 EDG FOR OPERABILITY CHECK	SRO
EDG	3PT-V16A	05/13/88 11:25	05/13/88 11:30	0.08	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	05/13/88 13:00	05/13/88 13:35	0.58	STARTED/SECURED 31 EDG FOR PT	SRO
EDG	3PT-V16A	05/23/88 04:15	05/23/88 04:50	0.58	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	05/26/88 01:45	05/26/88 01:51	0.10	RAN 31 EDG	SRO
EDG	3PT-V16A	07/25/88 22:24	07/25/88 22:33	0.15	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	07/29/88 05:35	07/29/88 05:43	0.13	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	08/17/88 05:39	08/17/88 05:43	0.07	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	08/18/88 04:22	08/18/88 04:29	0.12	STARTED/SECURED 31 EDG FOR OPERABILITY CHECK - SAT	SRO
EDG	3PT-V16A	08/19/88 04:30	08/19/88 04:38	0.13	RAN 31 EDG	SRO
EDG	3PT-V16A	08/20/88 03:50	08/20/88 03:57	0.12	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	08/23/88 05:20	08/23/88 05:35	0.25	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	09/04/88 08:42	09/04/88 08:46	0.07	STARTED/SECURED 31 EDG FOR OPERABILITY CHECK	SRO
EDG	3PT-V16A	10/13/88 04:45	10/13/88 04:52	0.12	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16A	11/04/88 12:48	11/04/88 12:56	0.13	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	12/13/88 16:31	12/13/88 16:35	0.07	STARTED/SECURED 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	12/14/88 14:15	12/14/88 14:30	0.25	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	12/15/88 14:05	12/15/88 14:20	0.25	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	12/20/88 04:50	12/20/88 04:55	0.08	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	12/21/88 04:40	12/21/88 04:45	0.08	RAN 31 EDG	SRO
EDG	3PT-V16A	01/12/89 08:20	01/12/89 08:26	0.10	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	01/16/89 10:00	01/16/89 10:15	0.25	RAN 31 EDG	SRO
EDG	3PT-V16A	01/16/89 12:50	01/16/89 13:23	0.55	RAN 31 EDG	SRO
EDG	3PT-V16A	02/04/89 17:18	02/04/89 17:28	0.17	START/SECURED 31 EDG	SRO
EDG	3PT-V16A	05/15/89 01:11	05/15/89 01:50	0.65	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	06/02/89 23:24	06/02/89 23:34	0.17	RAN 31 EDG	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
EDG	3PT-V16A	06/04/89 13:12	06/04/89 13:43	0.52	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	07/24/89 00:15	07/24/89 00:16	0.02	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	07/31/89 21:58	07/31/89 22:10	0.20	STARTED/SECURED 31 EDG IN AUTO	SRO
EDG	3PT-V16A	08/02/89 13:44	08/02/89 13:46	0.03	RAN 31 EDG	SRO
EDG	3PT-V16A	08/02/89 20:20	08/02/89 20:30	0.17	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	08/04/89 05:13	08/04/89 05:21	0.13	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	08/07/89 07:40	08/07/89 07:45	0.08	RAN 31 EDG	SRO
EDG	3PT-V16A	08/08/89 07:35	08/08/89 07:40	0.08	RAN 31 EDG	SRO
EDG	3PT-V16A	08/11/89 14:15	08/11/89 14:20	0.08	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	08/14/89 05:12	08/14/89 05:16	0.07	RAN 31 EDG	SRO
EDG	3PT-V16A	08/15/89 01:15	08/15/89 01:20	0.08	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	10/18/89 05:25	10/18/89 05:29	0.07	STARTED/SECURED 31 EDG FOR OPERABILITY CHECK	SRO
EDG	3PT-V16A	10/19/89 04:35	10/19/89 04:38	0.05	STARTED/SECURED 31 EDG FOR OPERABILITY CHECK	SRO
EDG	3PT-V16A	11/16/89 11:41	11/16/89 11:47	0.10	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	01/08/90 08:05	01/08/90 08:20	0.25	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	01/09/90 02:00	01/09/90 03:00	1.00	STARTED/SECURED 31 EDG FOR OEPRABILITY TEST	SRO
EDG	3PT-V16A	01/10/90 05:52	01/10/90 05:57	0.08	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	01/12/90 02:37	01/12/90 02:38	0.02	RAN 31 EDG FOR RETEST	SRO
EDG	3PT-V16A	01/15/90 05:35	01/15/90 05:39	0.07	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	01/16/90 06:29	01/16/90 06:33	0.07	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	01/18/90 10:20	01/18/90 10:40	0.33	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	02/03/90 19:33	02/03/90 19:37	0.07	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	02/06/90 20:00	02/06/90 20:15	0.25	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	03/12/90 08:20	03/12/90 08:25	0.08	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	03/15/90 08:05	03/15/90 08:10	0.08	RAN 31 EDG	SRO
EDG	3PT-V16A	03/29/90 10:10	03/29/90 10:25	0.25	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	04/16/90 20:40	04/16/90 21:50	1.17	STARTED/SECURED 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	04/17/90 09:00	04/17/90 09:10	0.17	STARTED/SECURED 31 EDG FOR PT	SRO
EDG	3PT-V16A	04/18/90 04:33	04/18/90 04:48	0.25	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	04/19/90 04:33	04/19/90 04:48	0.25	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	04/24/90 06:25	04/24/90 06:40	0.25	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	04/25/90 05:20	04/25/90 05:40	0.33	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	05/09/90 21:04	05/09/90 21:08	0.07	RAN 31 EDG	SRO
EDG	3PT-V16A	05/10/90 04:51	05/10/90 05:06	0.25	RAN 31 EDG	SRO
EDG	3PT-V16A	05/11/90 04:56	05/11/90 05:11	0.25	RAN 31 EDG	SRO
EDG	3PT-V16A	07/26/90 05:20	07/26/90 05:25	0.08	RAN 31 EDG FOR OPERABILITY CHECK	SRO
EDG	3PT-V16A	07/27/90 05:12	07/27/90 05:17	0.08	RAN 31 EDG FOR OPERABILITY CHECK	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
EDG	3PT-V16A	07/30/90 07:35	07/30/90 07:55	0.33	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	07/31/90 06:08	07/31/90 06:23	0.25	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	08/06/90 08:48	08/06/90 09:00	0.20	RAN 31 EDG	SRO
EDG	3PT-V16A	08/07/90 05:12	08/07/90 05:15	0.05	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	08/08/90 05:18	08/08/90 05:33	0.25	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	08/09/90 20:42	08/09/90 20:45	0.05	RAN 31 EDG	SRO
EDG	3PT-V16A	08/14/90 19:10	08/14/90 19:15	0.08	RAN 31 EDG TO TEST OPERATION OF FCU= 1176 AND 1176A, OPENED FULLY	SRO
EDG	3PT-V16A	12/09/90 03:35	12/09/90 04:12	0.62	STARTED/SECURED 31 EDG	SRO
EDG	3PT-V16A	12/22/90 02:07	12/22/90 02:15	0.13	RAN 31 EDG	SRO
EDG	3PT-V16A	02/19/91 04:50	02/19/91 05:50	1.00	RAN 31 EDG FOR OPERABILITY-TEST	SRO
EDG	3PT-V16A	02/20/91 04:30	02/20/91 05:30	1.00	RAN 31 EDG FOR OPERABILITY-SAT	SRO
EDG	3PT-V16A	02/25/91 07:00	02/25/91 08:00	1.00	RAN 31 EDG FOR OPERABILITY-TEST	SRO
EDG	3PT-V16A	02/26/91 05:15	02/26/91 05:45	0.50	RAN 31 EDG FOR OPERABILITY-TEST	SRO
EDG	3PT-V16A	03/07/91 17:43	03/07/91 17:48	0.08	RAN 31 EDG FOR 5 MIN	SRO
EDG	3PT-V16A	04/02/91 05:15	04/02/91 05:20	0.08	RAN 31 EDG FOR OPERABILITY-SAT	SRO
EDG	3PT-V16A	04/30/91 18:30	04/30/91 19:10	0.67	RAN 31 EDG FOR OPERABILITY-GOVENOR PROBLEM	SRO
EDG	3PT-V16A	04/30/91 19:45	04/30/91 19:55	0.17	RAN 31 EDG FOR TEST-PROBLEM	SRO
EDG	3PT-V16A	04/30/91 21:25	04/30/91 22:34	1.15	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	06/04/91 05:15	06/04/91 05:25	0.17	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	06/05/91 04:53	06/05/91 05:03	0.17	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	06/07/91 07:55	06/07/91 08:00	0.08	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	06/11/91 05:15	06/11/91 05:30	0.25	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	08/26/91 05:30	08/26/91 05:35	0.08	RAN 31 EDG FOR OPERABILITY-SAT	SRO
EDG	3PT-V16A	08/27/91 05:15	08/27/91 05:25	0.17	RAN 31 EDG FOR OPERABILITY-SAT	SRO
EDG	3PT-V16A	09/04/91 05:15	09/04/91 05:30	0.25	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	09/05/91 04:45	09/05/91 04:55	0.17	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	09/06/91 05:00	09/06/91 05:10	0.17	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	12/16/91 05:35	12/16/91 05:40	0.08	RAN 31 EDG FOR OPERABILITY (EAST SIDE AIR START SOLENOID STUCK OPEN)	SRO
EDG	3PT-V16A	12/17/91 04:12	12/17/91 04:42	0.50	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	12/18/91 05:00	12/18/91 05:30	0.50	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	12/26/91 18:08	12/26/91 18:15	0.12	RAN 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16A	12/30/91 13:58	12/30/91 14:28	0.50	RAN 31 EDG FOR USING EAST SIDE AIR START MOTOR	SRO
EDG	3PT-V16A	12/31/91 00:45	12/31/91 00:55	0.17	RAN 31 EDG	SRO
EDG	3PT-V16B	01/10/85 13:20	01/10/85 13:29	0.15	RAN 32 EDG	SRO
EDG	3PT-V16B	01/14/85 08:10	01/14/85 08:40	0.50	RAN 32 EDG FOR OPERABILITY	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
EDG	3PT-V16B	01/15/85 09:30	01/15/85 09:45	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	01/16/85 07:50	01/16/85 08:00	0.17	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	01/31/85 09:06	01/31/85 09:25	0.32	32 EDG ON/OFF BUS	SRO
EDG	3PT-V16B	02/05/85 05:45	02/05/85 06:00	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	02/06/85 05:10	02/06/85 05:15	0.08	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	02/07/85 05:30	02/07/85 05:35	0.08	STARTED/SECURED 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	03/05/85 07:35	03/05/85 07:49	0.23	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	04/17/85 04:00	04/17/85 04:05	0.08	32 EDG ON/OFF BUS FOR PT	SRO
EDG	3PT-V16B	04/25/85 07:15	04/25/85 07:20	0.08	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	07/18/85 03:20	07/18/85 03:37	0.28	32 EDG ON/OFF BUS	SRO
EDG	3PT-V16B	08/13/85 05:00	08/13/85 05:08	0.13	32 EDG IN SERVICE	SRO
EDG	3PT-V16B	10/31/85 08:37	10/31/85 08:59	0.37	RAN 32 EDG - OPERABLE	SRO
EDG	3PT-V16B	10/31/85 12:35	10/31/85 13:00	0.42	RAN 32 EDG	SRO
EDG	3PT-V16B	11/14/85 05:30	11/14/85 05:40	0.17	RAN 32 EDG FOR OPERABILITY TEST	SRO
EDG	3PT-V16B	11/15/85 06:00	11/15/85 06:05	0.08	RAN 32 EDG FOR OPERABILITY TEST	SRO
EDG	3PT-V16B	02/11/86 02:20	02/11/86 02:35	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	02/13/86 07:30	02/13/86 07:40	0.17	32 EDG IN SERVICE FOR OPERABILITY CHECK	SRO
EDG	3PT-V16B	02/21/86 16:55	02/21/86 17:05	0.17	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	02/24/86 14:10	02/24/86 14:25	0.25	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	03/11/86 16:50	03/11/86 17:18	0.47	32 EDG IN SERVICE FOR MAINT PM	SRO
EDG	3PT-V16B	03/18/86 03:27	03/18/86 03:42	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	04/14/86 16:35	04/14/86 16:50	0.25	32 EDG IN SERVICE FOR OPERABILITY CHECK	SRO
EDC	3PT-V16B	05/06/86 16:15	05/06/86 16:30	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	06/02/86 08:02	06/02/86 08:19	0.28	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	06/02/86 08:02	06/02/86 08:19	0.28	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	06/05/86 03:38	06/05/86 03:53	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	08/11/86 21:20	08/11/86 21:35	0.25	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	08/17/86 19:58	08/17/86 20:00	0.03	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	08/29/86 10:55	08/29/86 11:30	0.58	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	09/17/86 05:25	09/17/86 05:40	0.25	RAN 32 EDG FOR OPERABILITY CHECK	SRO
EDG	3PT-V16B	09/29/86 15:55	09/29/86 15:59	0.07	STARTED/SECURED 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	10/20/86 09:05	10/20/86 09:10	0.08	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	10/24/86 21:03	10/24/86 21:17	0.23	STARTED/SECURED 32 EDG FOR CHEMISTRY	SRO
EDG	3PT-V16B	11/25/86 06:20	11/25/86 06:35	0.25	RAN 32 EDG FOR OPERABILITY CHECK	SRO
EDG	3PT-V16B	12/23/86 09:30	12/23/86 09:45	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	03/10/87 07:35	03/10/87 07:50	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	03/11/87 05:15	03/11/87 05:25	0.17	RAN 32 EDG FOR OPERABILITY	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
EDG	3PT-V16B	03/13/87 16:14	03/13/87 16:23	0.15	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	03/16/87 05:45	03/16/87 05:55	0.17	RAN 32 EDG TO PROVE OPERABILITY	SRO
EDG	3PT-V16B	03/17/87 05:03	03/17/87 05:14	0.18	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	04/01/87 13:55	04/01/87 14:10	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	04/03/87 16:02	04/03/87 16:17	0.25	RAN 32 EDG	SRO
EDG	3PT-V16B	05/10/87 17:27	05/10/87 18:02	0.58	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	05/22/87 18:25	05/22/87 18:30	0.08	RAN 32 EDG	SRO
EDG	3PT-V16B	10/05/87 01:35	10/05/87 01:40	0.08	RAN 32 EDG	SRO
EDG	3PT-V16B	10/06/87 03:55	10/06/87 04:10	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	10/07/87 05:00	10/07/87 05:15	0.25	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	10/13/87 21:05	10/13/87 21:40	0.58	STARTED/SECURED 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	10/19/87 03:08	10/19/87 03:25	0.28	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	10/20/87 04:45	10/20/87 04:55	0.17	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	10/21/87 05:32	10/21/87 05:42	0.17	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	10/22/87 05:20	10/22/87 05:30	0.17	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	12/01/87 04:25	12/01/87 04:35	0.17	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	12/03/87 03:40	12/03/87 03:55	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	12/04/87 02:30	12/04/87 02:35	0.08	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	12/11/87 04:57	12/11/87 05:12	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	12/14/87 05:21	12/14/87 05:36	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	01/25/88 04:20	01/25/88 04:35	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	01/26/88 08:10	01/26/88 08:25	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	01/28/88 04:40	01/28/88 04:55	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	02/26/88 12:03	02/26/88 12:24	0.35	RAN 32 EDG FOR OPERABILITY CHECK	SRO
EDG	3PT-V16B	02/29/88 06:10	02/29/88 06:20	0.17	RAN 32 EDG FOR OPERABILITY CHECK	SRO
EDG	3PT-V16B	03/14/88 21:00	03/14/88 21:20	0.33	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	04/19/88 05:30	04/19/88 05:38	0.13	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	04/21/88 21:29	04/21/88 21:33	0.07	RAN 32 EDG	SRO
EDG	3PT-V16B	04/25/88 05:05	04/25/88 05:15	0.17	STARTED/SECURED 32 EDG FOR OPERABILITY CHECK	SRO
EDG	3PT-V16B	04/26/88 05:01	04/26/88 05:05	0.07	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	05/12/88 11:00	05/12/88 11:03	0.05	RAN 32 EDG FOR OPERABILITY CHECK	SRO
EDG	3PT-V16B	05/13/88 05:10	05/13/88 05:25	0.25	RAN 32 EDG FOR OPERABILITY CHECK	SRO
EDG	3PT-V16B	05/25/88 23:46	05/25/88 23:51	0.08	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	07/25/88 22:24	07/25/88 22:33	0.15	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	07/29/88 13:12	07/29/88 13:23	0.18	RAN 32 EDG FOR RETEST	SRO
EDG	3PT-V16B	08/09/88 05:04	08/09/88 05:10	0.10	RAN 32 EDG FOR OPERABILITY TEST	SRO
EDG	3PT-V16B	08/20/88 17:16	08/20/88 17:50	0.57	RAN 32 EDG	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
EDG	3PT-V16B	08/20/88 20:55	08/20/88 22:10	1.25	RAN 32 EDG - OPERABLE	SRO
EDG	3PT-V16B	08/23/88 05:20	08/23/88 05:35	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	09/04/88 08:00	09/04/88 08:13	0.22	STARTED/SECURED 32 EDG FOR PT	SRO
EDG	3PT-V16B	09/04/88 16:44	09/04/88 16:55	0.18	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	10/12/88 12:45	10/12/88 13:00	0.25	RAN 32 EDG	SRO
EDG	3PT-V16B	11/20/88 16:26	11/20/88 16:40	0.23	STARTED/SECURED 32 EDG FOR RETEST	SRO
EDG	3PT-V16B	12/20/88 04:55	12/20/88 05:00	0.08	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	12/21/88 04:45	12/21/88 04:50	0.08	RAN 32 EDG	SRO
EDG	3PT-V16B	01/03/89 05:14	01/03/89 05:17	0.05	RAN 32 EDG	SRO
EDG	3PT-V16B	01/05/89 04:50	01/05/89 05:00	0.17	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	01/12/89 08:27	01/12/89 08:38	0.18	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	02/04/89 17:15	02/04/89 17:25	0.17	START/SECURED 32 EDG	SRO
EDG	3PT-V16B	02/15/89 17:59	02/15/89 18:04	0.08	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	02/16/89 18:15	02/16/89 18:18	0.05	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	04/22/89 09:25	04/22/89 09:30	0.08	RAN 32 EDG TO PROVE OPERABILITY	SRO
EDG	3PT-V16B	05/08/89 03:54	05/08/89 04:07	0.22	STARTED/SECURED 32 EDG TO PICK UP LOAD ON/OFF BUS 6A & 3A	SRO
EDG	3PT-V16B	07/24/89 21:45	07/24/89 21:50	0.08	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	07/25/89 16:50	07/25/89 17:15	0.42	RAN 32 EDG FOR RETEST	SRO
EDG	3PT-V16B	07/26/89 20:50	07/26/89 21:05	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	07/27/89 21:00	07/27/89 21:23	0.38	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	08/01/89 10:06	08/01/89 10:21	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	08/04/89 05:07	08/04/89 05:12	0.08	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	08/09/89 02:30	08/09/89 03:30	1.00	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	08/10/89 15:55	08/10/89 15:59	0.07	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	08/11/89 05:40	08/11/89 05:45	0.08	RAN 32 EDG	SRO
EDG	3PT-V16B	08/14/89 05:17	08/14/89 05:25	0.13	RAN 32 EDG	SRO
EDG	3PT-V16B	08/15/89 01:20	08/15/89 01:25	0.08	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	08/18/89 04:55	08/18/89 05:00	0.08	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	10/16/89 05:32	10/16/89 05:50	0.30	RAN 32 EDG	SRO
EDG	3PT-V16B	10/18/89 05:32	10/18/89 05:35	0.05	STARTED/SECURED 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	10/20/89 00:57	10/20/89 01:40	0.72	STARTED/SECURED 32 EDG FOR OPERABILITY DUE TO FUEL OIL LEAK	SRO
EDG	3PT-V16B	11/16/89 11:50	11/16/89 11:56	0.10	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	01/15/90 05:40	01/15/90 05:44	0.07	RAN 32 EDG TO PROVE OPERABILITY	SRO
EDG	3PT-V16B	01/16/90 06:34	01/16/90 06:38	0.07	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	01/18/90 10:20	01/18/90 10:40	0.33	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	01/22/90 05:27	01/22/90 05:30	0.05	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	01/23/90 04:47	01/23/90 04:49	0.03	RAN 32 EDG FOR OPERABILITY	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
EDG	3PT-V16B	01/24/90 03:35	01/24/90 03:50	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	02/03/90 18:45	02/03/90 18:47	0.03	STARTED/SECURED 32 EDG FOR 3PT-V16	SRO
EDG	3PT-V16B	03/12/90 08:30	03/12/90 08:35	0.08	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	03/14/90 12:30	03/14/90 12:37	0.12	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	03/29/90 08:44	03/29/90 08:50	0.10	STARTED/SECURED 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	04/16/90 04:16	04/16/90 04:24	0.13	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	04/17/90 04:35	04/17/90 04:50	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	04/18/90 04:40	04/18/90 04:55	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	04/19/90 04:38	04/19/90 04:53	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	05/09/90 03:07	05/09/90 03:12	0.08	RAN 32 EDG	SRO
EDG	3PT-V16B	05/11/90 04:59	05/11/90 05:14	0.25	RAN 32 EDG	SRO
EDG	3PT-V16B	07/23/90 07:53	07/23/90 08:08	0.25	RAN 32 EDG	SRO
EDG	3PT-V16B	07/30/90 07:35	07/30/90 07:55	0.33	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	07/31/90 06:08	07/31/90 06:23	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	08/02/90 09:00	08/02/90 09:20	0.33	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	08/03/90 06:08	08/03/90 06:23	0.25	RAN 32 EDG	SRO
EDG	3PT-V16B	08/08/90 05:22	08/08/90 05:37	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	08/14/90 19:04	08/14/90 19:10	0.10	RAN 32 EDG TO TEST OPERATION OF FCU= 1176 AND 1176A, OPENED FULLY	SRO
EDG	3PT-V16B	08/14/90 21:20	08/14/90 21:27	0.12	RAN 32 EDG, TESTED OPERATION OF FCU 1176 AND 1176A, SAT	SRO
EDG	3PT-V16B	09/21/90 05:20	09/21/90 05:25	0.08	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	11/02/90 09:16	11/02/90 10:00	0.73	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	11/16/90 03:40	11/16/90 04:20	0.67	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	12/05/90 13:25	12/05/90 13:45	0.33	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	12/06/90 01:38	12/06/90 01:40	0.03	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	12/08/90 21:45	12/08/90 22:15	0.50	STARTED/SECURED 32 EDG	SRO
EDG	3PT-V16B	01/29/91 05:15	01/29/91 05:30	0.25	RAN 32EDG FOR OPERABILITY-SAT	SRO
EDG	3PT-V16B	01/30/91 05:30	01/30/91 05:45	0.25	RAN 32EDG FOR OPERABILITY-SAT	SRO
EDG	3PT-V16B	01/31/91 11:35	01/31/91 11:45	0.17	RAN 32 EDG FOR OPERABILITY-SAT	SRO
EDG	3PT-V16B	02/01/91 05:50	02/01/91 06:05	0.25	RAN 32EDG FOR OPERABILITY-SAT	SRO
EDG	3PT-V16B	02/22/91 02:55	02/22/91 04:30	1.58	RAN 32 EDG FOR RETEST OPERABILITY-SAT	SRO
EDG	3PT-V16B	02/25/91 17:00	02/25/91 17:30	0.50	RAN 32 EDG FOR OPERABILITY-TESTED SAT	SRO
EDG	3PT-V16B	02/26/91 05:25	02/26/91 05:55	0.50	RAN 32 EDG FOR OPERABILITY-TEST	SRO
EDG	3PT-V16B	03/07/91 05:55	03/07/91 06:10	0.25	RAN 32 EDG FOR OPERABILITY-SAT	SRO
EDG	3PT-V16B	04/01/91 17:30	04/01/91 17:40	0.17	RAN 32 EDG FOR OPERABILITY-TEST	SRO
EDG	3PT-V16B	04/29/91 05:15	04/29/91 05:28	0.22	RAN 32 EDG FOR OPERABILITY-SAT	SRO
EDG	3PT-V16B	04/30/91 06:15	04/30/91 06:35	0.33	RAN 32 EDG FOR OPERABILITY-SAT	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
EDG	3PT-V16B	05/15/91 04:20	05/15/91 05:05	0.75	RAN 32 EDG ON BUS	SRO
EDG	3PT-V16B	05/21/91 12:18	05/21/91 12:32	0.23	RAN 32 EDG ON BUS	SRO
EDG	3PT-V16B	06/05/91 12:30	06/05/91 12:55	0.42	RAN 32 EDG FOR RETEST	SRO
EDG	3PT-V16B	06/11/91 05:15	06/11/91 05:30	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	07/02/91 20:55	07/02/91 21:10	0.25	RAN 32 EDG	SRO
EDG	3PT-V16B	07/05/91 10:25	07/05/91 10:35	0.17	RAN 32 EDG FOR OPERABILITY-ALLOW	SRO
EDG	3PT-V16B	07/15/91 04:50	07/15/91 04:58	0.13	RAN 32 EDG FOR OPERABILITY-TEST	SRO
EDG	3PT-V16B	07/16/91 04:50	07/16/91 05:00	0.17	RAN 32 EDG FOR OPERABILITY-SAT	SRO
EDG	3PT-V16B	09/04/91 05:15	09/04/91 05:30	0.25	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	09/05/91 04:45	09/05/91 04:55	0.17	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	09/06/91 05:00	09/06/91 05:10	0.17	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	10/28/91 05:22	10/28/91 05:40	0.30	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	10/29/91 04:27	10/29/91 04:40	0.22	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	10/30/91 04:49	10/30/91 05:10	0.35	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	11/08/91 21:25	11/08/91 21:32	0.12	RAN 32 EDG FOR RETEST	SRO
EDG	3PT-V16B	12/09/91 07:30	12/09/91 07:45	0.25	RAN 32 EDG FOR OPERABILITY-SAT	SRO
EDG	3PT-V16B	12/16/91 05:44	12/16/91 05:48	0.07	RAN 32 EDG FOR OPERABILITY-SAT	SRO
EDG	3PT-V16B	12/18/91 00:05	12/18/91 00:30	0.42	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	12/26/91 15:10	12/26/91 15:30	0.33	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16B	12/26/91 20:55	12/26/91 21:05	0.17	RAN 32 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	01/14/85 08:10	01/14/85 08:40	0.50	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	01/15/85 09:30	01/15/85 09:45	0.25	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	01/16/85 07:50	01/16/85 08:00	0.17	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	01/29/85 05:33	01/29/85 05:46	0.22	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	01/30/85 05:24	01/30/85 05:34	0.17	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	01/31/85 05:31	01/31/85 05:39	0.13	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	04/25/85 07:20	04/25/85 07:25	0.08	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	04/26/85 07:25	04/26/85 07:30	0.08	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	04/29/85 13:35	04/29/85 14:15	0.67	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	06/12/85 05:30	06/12/85 05:35	0.08	STARTED/SECURED 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	10/30/85 10:12	10/30/85 10:33	0.35	RAN 33 EDG - OPERABLE	SRO
EDG	3PT-V16C	11/13/85 05:15	11/13/85 05:30	0.25	RAN 33 EDG OPERABILITY	SRO
EDG	3PT-V16C	02/11/86 02:20	02/11/86 02:35	0.25	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	02/13/86 07:30	02/13/86 07:40	0.17	33 EDG IN SERVICE FOR OPERABILITY CHECK	SRO
EDG	3PT-V16C	02/18/86 08:18	02/18/86 08:36	0.30	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	02/19/86 07:50	02/19/86 08:10	0.33	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	02/20/86 07:53	02/20/86 08:07	0.23	RAN 33 EDG FOR OPERABILITY	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
EDG	3PT-V16C	02/21/86 10:16	02/21/86 10:31	0.25	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	04/14/86 17:15	04/14/86 17:27	0.20	33 EDG IN SERVICE FOR OPERABILITY CHECK	SRO
EDG	3PT-V16C	04/15/86 16:23	04/15/86 16:38	0.25	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	05/07/86 13:40	05/07/86 14:00	0.33	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	06/02/86 08:19	06/02/86 08:34	0.25	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	06/03/86 02:42	06/03/86 02:57	0.25	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	08/14/86 15:42	08/14/86 15:45	0.05	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	08/17/86 20:02	08/17/86 20:04	0.03	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	09/17/86 05:25	09/17/86 05:40	0.25	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	10/20/86 09:13	10/20/86 09:20	0.12	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	11/14/86 04:39	11/14/86 04:55	0.27	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	11/20/86 03:47	11/20/86 03:53	0.10	STARTED/SECURED 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	11/25/86 18:10	11/25/86 18:27	0.28	STARTED/SECURED 33 EDG FOR OPERABILITY TEST	SRO
EDG	3PT-V16C	12/23/86 09:33	12/23/86 09:45	0.20	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	03/10/87 07:35	03/10/87 07:50	0.25	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	03/11/87 05:15	03/11/87 05:25	0.17	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	03/12/87 05:10	03/12/87 05:20	0.17	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	03/13/87 04:55	03/13/87 05:05	0.17	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	04/01/87 13:55	04/01/87 14:10	0.25	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	04/04/87 00:21	04/04/87 00:37	0.27	RAN 32 EDG	SRO
EDG	3PT-V16C	05/10/87 17:28	05/10/87 18:05	0.62	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	05/22/87 10:03	05/22/87 10:07	0.07	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	07/08/87 21:40	07/08/87 22:00	0.33	RAN 32 EDG	SRO
EDG	3PT-V16C	07/23/87 17:47	07/23/87 17:59	0.20	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	10/06/87 03:55	10/06/87 04:10	0.25	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	10/07/87 05:00	10/07/87 05:15	0.25	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	10/13/87 08:07	10/13/87 08:22	0.25	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	10/14/87 04:27	10/14/87 04:42	0.25	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	10/15/87 03:52	10/15/87 04:08	0.27	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	10/19/87 03:26	10/19/87 03:41	0.25	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	10/20/87 19:55	10/20/87 20:25	0.50	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	10/21/87 20:33	10/21/87 20:58	0.42	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	10/21/87 21:40	10/21/87 22:13	0.55	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	12/01/87 04:25	12/01/87 04:35	0.17	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	12/02/87 04:40	12/02/87 04:45	0.08	STARTED/SECURED 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	12/10/87 05:00	12/10/87 05:15	0.25	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	12/14/87 05:21	12/14/87 05:36	0.25	RAN 33 EDG FOR OPERABILITY	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
EDG	3PT-V16C	01/25/88 04:28	01/25/88 04:43	0.25	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	01/26/88 08:20	01/26/88 08:35	0.25	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	01/27/88 05:05	01/27/88 05:20	0.25	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	01/29/88 03:55	01/29/88 04:10	0.25	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	02/11/88 13:23	02/11/88 13:45	0.37	RAN 33 EDG	SRO
EDG	3PT-V16C	02/26/88 12:26	02/26/88 12:41	0.25	RAN 33 EDG FOR OPERABILITY CHECK	SRO
EDG	3PT-V16C	03/14/88 05:39	03/14/88 05:47	0.13	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	04/21/88 20:24	04/21/88 20:35	0.18	RAN 33 EDG	SRO
EDG	3PT-V16C	04/21/88 22:16	04/21/88 22:33	0.28	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	04/25/88 05:15	04/25/88 05:25	0.17	STARTED/SECURED 33 EDG FOR OPERABILITY CHECK	SRO
EDG	3PT-V16C	04/26/88 05:08	04/26/88 05:12	0.07	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	04/27/88 05:25	04/27/88 05:28	0.05	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	04/28/88 05:19	04/28/88 05:22	0.05	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	05/12/88 16:20	05/12/88 16:30	0.17	STARTED/SECURED 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	05/17/88 04:53	05/17/88 05:30	0.62	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	05/23/88 04:15	05/23/88 04:40	0.42	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	05/25/88 23:52	05/25/88 23:56	0.07	RAN 33 EDG	SRO
EDG	3PT-V16C	05/26/88 03:33	05/26/88 03:38	0.08	RAN 33 EDG	SRO
EDG	3PT-V16C	07/29/88 05:44	07/29/88 05:51	0.12	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	08/09/88 05:04	08/09/88 05:10	0.10	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	08/16/88 13:55	08/16/88 14:00	0.08	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	08/17/88 05:45	08/17/88 05:48	0.05	STARTED/SECURED 33 EDG FOR OPERABILITY CHECK	SRO
EDG	3PT-V16C	08/18/88 04:30	08/18/88 04:36	0.10	STARTED/SECURED 33 EDG FOR OPERABILITY CHECK - SAT	SRO
EDG	3PT-V16C	08/19/88 04:30	08/19/88 04:38	0.13	RAN 33 EDG - SAT	SRO
EDG	3PT-V16C	08/20/88 03:50	08/20/88 03:57	0.12	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	09/04/88 08:48	09/04/88 08:52	0.07	STARTED/SECURED 33 EDG FOR OPERABILITY CHECK	SRO
EDG	3PT-V16C	10/09/88 18:53	10/09/88 19:29	0.60	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	10/10/88 10:45	10/10/88 11:15	0.50	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	12/12/88 09:55	12/12/88 09:56	0.02	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	12/13/88 16:36	12/13/88 16:40	0.07	STARTED/SECURED 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	12/14/88 14:11	12/14/88 14:26	0.25	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	12/15/88 14:10	12/15/88 14:25	0.25	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	01/03/89 05:21	01/03/89 05:24	0.05	RAN 33 EDG	SRO
EDG	3PT-V16C	01/05/89 04:50	01/05/89 05:00	0.17	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	01/12/89 08:40	01/12/89 08:49	0.15	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	02/04/89 17:12	02/04/89 17:22	0.17	START/SECURED 33 EDG	SRO
EDG	3PT-V16C	02/22/89 12:39	02/22/89 12:44	0.08	RAN 33 EDG FOR I & C	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
EDG	3PT-V16C	02/23/89 20:05	02/23/89 20:11	0.10	RAN 33 EDG	SRO
EDG	3PT-V16C	04/22/89 09:30	04/22/89 09:35	0.08	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	05/29/89 05:55	05/29/89 06:10	0.25	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	06/01/89 12:10	06/01/89 12:23	0.22	RAN 33 EDG FOR RETEST	SRO
EDG	3PT-V16C	06/04/89 13:12	06/04/89 13:43	0.52	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	07/24/89 21:51	07/24/89 21:57	0.10	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	07/25/89 21:08	07/25/89 21:30	0.37	RAN 33 EDG	SRO
EDG	3PT-V16C	07/26/89 20:59	07/26/89 21:14	0.25	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	07/27/89 21:00	07/27/89 21:23	0.38	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	07/31/89 14:38	07/31/89 14:42	0.07	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	08/01/89 10:00	08/01/89 10:15	0.25	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	08/07/89 07:46	08/07/89 07:51	0.08	RAN 33 EDG	SRO
EDG	3PT-V16C	08/08/89 07:41	08/08/89 07:46	0.08	RAN 33 EDG	SRO
EDG	3PT-V16C	08/11/89 05:40	08/11/89 05:45	0.08	RAN 33 EDG	SRO
EDG	3PT-V16C	08/18/89 05:00	08/18/89 05:05	0.08	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	10/16/89 05:51	10/16/89 06:06	0.25	RAN 33 EDG	SRO
EDG	3PT-V16C	10/16/89 06:27	10/16/89 06:32	0.08	RAN 33 EDG	SRO
EDG	3PT-V16C	10/19/89 04:40	10/19/89 04:44	0.07	STARTED/SECURED 33 EDG FOR OPERABILITY CHECK	SRO
EDG	3PT-V16C	10/19/89 16:22	10/19/89 17:02	0.67	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	10/20/89 03:15	10/20/89 03:25	0.17	STARTED/SECURED 31 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	10/20/89 03:28	10/20/89 03:31	0.05	STARTED/SECURED 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	11/16/89 11:58	11/16/89 12:04	0.10	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	01/08/90 08:05	01/08/90 08:20	0.25	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	01/09/90 04:00	01/09/90 05:00	1.00	STARTED/SECURED 33 EDG FOR OPERABILITY TEST	SRO
EDG	3PT-V16C	01/10/90 05:57	01/10/90 06:00	0.05	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	01/17/90 03:12	01/17/90 04:30	1.30	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	01/18/90 20:30	01/18/90 20:45	0.25	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	01/22/90 05:31	01/22/90 05:34	0.05	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	01/23/90 04:52	01/23/90 04:55	0.05	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	01/24/90 03:40	01/24/90 03:55	0.25	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	02/06/90 20:10	02/06/90 20:25	0.25	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	03/14/90 12:20	03/14/90 12:28	0.13	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	03/15/90 08:17	03/15/90 08:22	0.08	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	03/20/90 04:10	03/20/90 04:45	0.58	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	03/29/90 08:51	03/29/90 08:55	0.07	STARTED/SECURED 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	03/29/90 13:20	03/29/90 13:35	0.25	STARTED/SECURED 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	04/16/90 04:26	04/16/90 04:34	0.13	RAN 33 EDG FOR OPERABILITY	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
EDG	3PT-V16C	04/17/90 04:42	04/17/90 04:57	0.25	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	04/19/90 12:20	04/19/90 12:21	0.02	STARTED/SECURED 33 EDG - OUTPUT BKR FAIL TO CLOSE	SRO
EDG	3PT-V16C	04/24/90 06:25	04/24/90 06:40	0.25	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	04/25/90 05:20	04/25/90 05:40	0.33	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	05/09/90 03:17	05/09/90 03:18	0.02	RAN 33 EDG	SRO
EDG	3PT-V16C	05/10/90 04:55	05/10/90 05:10	0.25	RAN 33 EDG	SRO
EDG	3PT-V16C	07/23/90 07:58	07/23/90 08:13	0.25	RAN 33 EDG	SRO
EDG	3PT-V16C	07/26/90 05:25	07/26/90 05:30	0.08	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	07/27/90 05:18	07/27/90 05:23	0.08	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	08/02/90 09:00	08/02/90 09:20	0.33	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	08/03/90 06:11	08/03/90 06:26	0.25	RAN 33 EDG	SRO
EDG	3PT-V16C	08/06/90 09:00	08/06/90 09:10	0.17	RAN 32 EDG	SRO
EDG	3PT-V16C	08/07/90 05:17	08/07/90 05:19	0.03	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	08/09/90 20:48	08/09/90 20:50	0.03	RAN 32 EDG	SRO
EDG	3PT-V16C	11/16/90 03:40	11/16/90 04:20	0.67	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	12/08/90 14:42	12/08/90 15:18	0.60	STARTED/SECURED 33 EDG	SRO
EDG	3PT-V16C	12/22/90 02:07	12/22/90 02:15	0.13	RAN 32 EDG	SRO
EDG	3PT-V16C	01/29/91 05:15	01/29/91 05:30	0.25	RAN 33 EDG FOR OPERABILITY-SAT	SRO
EDG	3PT-V16C	01/30/91 05:30	01/30/91 05:45	0.25	RAN 33 EDG FOR OPERABILITY-SAT	SRO
EDG	3PT-V16C	01/31/91 11:35	01/31/91 11:45	0.17	RAN 33 EDG FOR OPERABILITY-SAT	SRO
EDG	3PT-V16C	02/01/91 05:50	02/01/91 06:05	0.25	RAN 33 EDG FOR OPERABILITY-SAT	SRO
EDG	3PT-V16C	02/19/91 04:50	02/19/91 05:50	1.00	RAN 33 EDG FOR OPERABILITY-TEST	SRO
EDG	3PT-V16C	02/20/91 04:30	02/20/91 05:30	1.00	RAN 33 EDG FOR OPERABILITY-SAT	SRO
EDG	3PT-V16C	02/25/91 07:00	02/25/91 08:00	1.00	RAN 33 EDG FOR OPERABILITY-TEST	SRO
EDG	3PT-V16C	03/07/91 05:55	03/07/91 06:10	0.25	RAN 33 EDG FOR OPERABILITY-SAT	SRO
EDG	3PT-V16C	04/01/91 17:30	04/01/91 17:40	0.17	RAN 33 EDG FOR OPERABILITY-TEST	SRO
EDG	3PT-V16C	04/29/91 05:15	04/29/91 05:28	0.22	RAN 33 EDG FOR OPERABILITY-SAT	SRO
EDG	3PT-V16C	04/30/91 06:15	04/30/91 06:35	0.33	RAN 33 EDG FOR OPERABILITY-SAT	SRO
EDG	3PT-V16C	06/04/91 05:15	06/04/91 05:25	0.17	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	06/05/91 04:53	06/05/91 05:03	0.17	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	06/07/91 08:05	06/07/91 08:10	0.08	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	06/11/91 20:53	06/11/91 21:55	1.03	RAN 33 EDG FOR OPERABILITY TEST	SRO
EDG	3PT-V16C	07/05/91 10:25	07/05/91 10:35	0.17	RAN 33 EDG FOR OPERABILITY-ALLOW	SRO
EDG	3PT-V16C	07/15/91 04:50	07/15/91 04:58	0.13	RAN 33 EDG FOR OPERABILITY-TEST	SRO
EDG	3PT-V16C	08/26/91 05:30	08/26/91 05:35	0.08	RAN 33 EDG FOR OPERABILITY-SAT	SRO
EDG	3PT-V16C	08/27/91 05:15	08/27/91 05:25	0.17	RAN 33 EDG FOR OPERABILITY-SAT	SRO
EDG	3PT-V16C	10/28/91 05:22	10/28/91 05:40	0.30	RAN 33 EDG FOR OPERABILITY	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
EDG	3PT-V16C	10/29/91 04:27	10/29/91 04:40	0.22	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	10/30/91 04:49	10/30/91 05:10	0.35	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	12/09/91 07:30	12/09/91 07:45	0.25	RAN 33 EDG FOR OPERABILITY-SAT	SRO
EDG	3PT-V16C	12/16/91 05:50	12/16/91 05:56	0.10	RAN 33 EDG FOR OPERABILITY-SAT (VOLTAGE ADJ KNOB OUT OF POSI)	SRO
EDG	3PT-V16C	12/16/91 05:50	12/16/91 05:56	0.10	RAN 33 EDG FOR ANOTHER OPERABILITY CHECK	SRO
EDG	3PT-V16C	12/17/91 04:24	12/17/91 04:54	0.50	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	12/18/91 21:38	12/18/91 21:50	0.20	RAN 33 EDG FOR OPERABILITY	SRO
EDG	3PT-V16C	12/26/91 15:15	12/26/91 15:35	0.33	RAN 33 EDG FOR OPERABILITY	SRO
MSS	3PT-CS01	10/21/88 17:30	10/21/88 17:30	0.00	3PT-CS01 (ABFP STM VLVS)	SRO
MSS	3PT-M08	02/29/88 08:30	02/29/88 09:45	1.25	I & C PERFORMED 3PT-M08 (S/G LEVEL)	SRO
MSS	3PT-M08	01/01/91 12:10	01/01/91 14:00	1.83	I & C PERFORMED 3PT-M08 (S/G LEVEL)	SRO
MSS	3PT-M08	01/25/91 07:55	01/25/91 07:55	0.00	I & C PERFORMED 3PT-M08 (S/G LEVEL)	SRO
MSS	3PT-M08	02/21/91 08:15	02/21/91 10:00	1.75	I & C PERFORMED 3PT-M08 (S/G LEVEL)	SRO
MSS	3PT-M08	04/13/91 14:40	04/13/91 14:40	0.00	I & C PERFORMED 3PT-M08 (S/G LEVEL)	SRO
MSS	3PT-M08	05/09/91 08:25	05/09/91 14:00	5.58	I & C PERFORMED 3PT-M08 (S/G LEVEL)	SRO
MSS	3PT-M08	06/05/91 08:05	06/05/91 08:05	0.00	I & C PERFORMED 3PT-M08 (S/G LEVEL)	SRO
MSS	3PT-M08	07/02/91 16:15	07/02/91 19:20	3.08	I & C PERFORMED 3PT-M08 (S/G LEVEL)	SRO
MSS	3PT-M08	07/26/91 15:55	07/26/91 20:25	4.50	I & C PERFORMED 3PT-M08 (S/G LEVEL)	SRO
MSS	3PT-M08	08/16/91 16:02	08/16/91 18:15	2.22	I & C PERFORMED 3PT-M08 (S/G LEVEL)	SRO
MSS	3PT-M08	10/08/91 08:25	10/08/91 13:10	4.75	I & C PERFORMED 3PT-M08 (S/G LEVEL)	SRO
MSS	3PT-M08	10/31/91 20:05	10/31/91 20:05	0.00	I & C PERFORMED 3PT-M08 (S/G LEVEL)	SRO
MSS	3PT-M08	12/20/91 08:00	12/20/91 10:15	2.25	I & C PERFORMED 3PT-M08 (S/G LEVEL)	SRO
MSS	3PT-M10	06/06/86 08:15	06/06/86 08:45	0.50	31 SG ATMOS IN MAN FOR 3PT-M10	SRO
MSS	3PT-M10	06/06/86 08:15	06/06/86 08:45	0.50	34 SG ATMOS IN MAN FOR 3PT-M10	SRO
MSS	3PT-M10	06/06/86 08:50	06/06/86 09:05	0.25	32 SG ATMOS IN MAN FOR 3PT-M10	SRO
MSS	3PT-M10	06/06/86 08:50	06/06/86 09:05	0.25	33 SG ATMOS IN MAN FOR 3PT-M10	SRO
MSS	3PT-M10	04/25/91 08:00	04/25/91 12:40	4.67	I & C PERFORMED 3PT-M10 (STM LINE PRESS)	SRO
MSS	3PT-M10	06/19/91 08:15	06/19/91 12:30	4.25	I & C PERFORMED 3PT-M10 (STM LINE PRESS)	SRO
MSS	3PT-M10	08/26/91 08:15	08/26/91 13:30	5.25	I & C PERFORMED 3PT-M10 (STM LINE PRESS)	SRO
MSS	3PT-M10	09/24/91 09:00	09/24/91 09:00	0.00	I & C PERFORMED 3PT-M10 (STM LINE PRESS)	SRO
MSS	3PT-M10	12/13/91 08:10	12/13/91 12:55	4.75	I & C PERFORMED 3PT-M10 (STM LINE PRESS)	SRO
MSS	3PT-M11	05/30/91 08:40	05/30/91 08:40	0.00	I & C PERFORMED PT-M11 (1ST STAGE PRESS)	SRO
MSS	3PT-M11	06/28/91 08:25	06/28/91 14:40	6.25	I & C PERFORMED PT-M11 (1ST STAGE PRESS)	SRO
MSS	3PT-M11	07/24/91 16:15	07/24/91 18:20	2.08	I & C PERFORMED PT-M11 (1ST STAGE PRESS)	SRO
MSS	3PT-M11	08/20/91 14:05	08/20/91 14:05	0.00	I & C PERFORMED PT-M11 (1ST STAGE PRESS)	SRO
MSS	3PT-M11	09/16/91 08:00	09/16/91 13:10	5.17	I & C PERFORMED PT-M11 (1ST STAGE PRESS)	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
MSS	3PT-M11	10/10/91 08:57	10/10/91 14:00	5.05	I & C PERFORMED PT-M11 (1ST STAGE PRESS)	SRO
MSS	3PT-M11	11/08/91 09:33	11/08/91 14:55	5.37	I & C PERFORMED PT-M11 (1ST STAGE PRESS)	SRO
MSS	3PT-M11	12/09/91 08:30	12/09/91 13:30	5.00	I & C PERFORMED PT-M11 (1ST STAGE PRESS)	SRO
MSS	3PT-Q21	03/19/85 11:00	03/19/85 11:00	0.00	Performed 3PT-Q21 SGBD vlv test	SRO
MSS	3PT-Q21	03/11/86 11:00	03/11/86 11:00	0.00	Performed 3PT-Q21 SGBD vlv test	SRO
MSS	3PT-Q21	11/09/86 03:00	11/09/86 03:00	0.00	Performed 3PT-Q21 SGBD vlv test	SRO
MSS	3PT-Q21	02/07/87 03:00	02/07/87 03:00	0.00	Performed 3PT-Q21 SGBD vlv test	SRO
MSS	3PT-Q21	10/08/87 19:00	10/08/87 19:00	0.00	Performed 3PT-Q21 SGBD vlv test	SRO
MSS	3PT-Q21	03/24/88 03:00	03/24/88 03:00	0.00	Performed 3PT-Q21 SGBD vlv test	SRO
MSS	3PT-Q21	01/10/90 03:00	01/10/90 03:00	0.00	Performed 3PT-Q21 SGBD vlv test	SRO
MSS	3PT-Q21	04/10/90 11:00	04/10/90 11:00	0.00	Performed 3PT-Q21 SGBD vlv test	SRO
MSS	3PT-Q21	09/11/90 11:00	09/11/90 11:00	0.00	Performed 3PT-Q21 SGBD vlv test	SRO
MSS	3PT-Q21	12/13/90 03:30	12/13/90 03:30	0.00	Performed 3PT-Q21 SGBD vlv test	SRO
MSS	3PT-Q21	08/01/91 03:00	08/01/91 03:00	0.00	Performed 3PT-Q21 SGBD vlv test	SRO
MSS	3PT-Q21	10/17/91 11:00	10/17/91 11:00	0.00	Performed 3PT-Q21 SGBD vlv test	SRO
MSS	3PT-Q21	12/31/87 19:00	12/31/87 19:00	0.00	Performed 3PT-Q21 SGBD vlv test	SRO
MSS	3PT-Q70	07/17/91 08:00	07/17/91 09:45	1.75	I & C PERFORMED 3PT-Q70	SRO
MSS	3PT-Q70	10/10/91 09:20	10/10/91 13:55	4.58	I & C PERFORMED 3PT-Q70	SRO
MSS	3PT-W02	06/05/91 12:45	06/05/91 13:15	0.50	PERFORMED 3PT-W2 (LUBE OIL PUMPS)	SRO
MSS	3PT-W02	06/19/91 13:30	06/19/91 13:55	0.42	PERFORMED 3PT-W2 (MTG LUBE OIL PUMPS)	SRO
PPR	3PC-R003A	09/27/90 14:51	09/27/90 14:51	0.00	3PC-R003A (PZR LEVEL CALIBR)	SRO
PPR	3PC-R003A	09/27/90 14:51	09/27/90 14:51	0.00	3PC-R003A (PZR LEVEL CALIBR)	SRO
PPR	3PC-R003A	09/28/90 08:52	09/28/90 08:52	0.00	3PC-R003A (PZR LEVEL CALIBR)	SRO
PPR	3PC-R003A	09/28/90 08:55	09/28/90 08:55	0.00	3PC-R003A (PZR LEVEL CALIBR)	SRO
PPR	3PC-R12	07/15/85 08:55	07/15/85 08:55	0.00	3PC-R12 (CONTAINMENT PRESSURE CALIBRATION)	SRO
PPR	3PC-R1A	09/18/90 08:30	09/18/90 18:45	10.25	3PC-R1A (RC LOOP RTD CALIB- NARROW RANGE)	SRO
PPR	3PC-R1A	09/18/90 08:30	09/18/90 08:30	0.00	3PC-R1A (RC LOOP RTD CALIB- NARROW RANGE)	SRO
PPR	3PC-R1B	09/27/90 13:15	09/27/90 13:15	0.00	3PC-R1B (RCS LOOPS TEMP CALIBR)	SRO
PPR	3PT-CS18	10/03/90 00:45	10/03/90 11:20	10.58	3PT-CS18 (PURGE ISOL VLVS TEST)	SRO
PPR	3PT-CS25	09/17/90 08:05	09/17/90 10:00	1.92	3PT-CS25 (RCP OIL COLLECTION TANK) TEST GROUP	SRO
PPR	3PT-M02	03/18/85 08:00	03/18/85 09:30	1.50	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	03/18/85 08:00	03/18/85 14:00	6.00	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	03/18/85 08:15	03/18/85 09:30	1.25	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	09/29/85 21:23	09/30/85 02:23	5.00	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	01/31/86 08:30	01/31/86 14:45	6.25	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	02/24/86 09:35	02/24/86 13:00	3.42	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	02/28/86 08:15	02/28/86 08:55	0.67	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
PPR	3PT-M02	03/25/86 08:10	03/25/86 14:29	6.32	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	04/10/86 05:45	04/10/86 20:45	15.00	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	04/10/86 16:00	04/10/86 20:40	4.67	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	04/22/86 08:00	04/22/86 14:50	6.83	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	05/20/86 08:53	05/21/86 13:45	28.87	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	07/14/86 15:15	07/14/86 18:05	2.83	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	08/12/86 08:08	08/12/86 14:00	5.87	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	09/12/86 08:00	09/12/86 13:00	5.00	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	09/12/86 12:30	09/12/86 21:06	8.60	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	10/08/86 12:41	10/08/86 13:38	0.95	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	10/09/86 08:45	10/09/86 13:45	5.00	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	11/05/86 16:20	11/05/86 21:20	5.00	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	12/04/86 16:20	12/04/86 22:10	5.83	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	02/24/87 15:30	02/24/87 18:30	3.00	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	03/26/87 07:50	03/26/87 12:50	5.00	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	10/15/87 08:10	10/15/87 14:15	6.08	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	11/20/87 08:00	11/20/87 10:25	2.42	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	12/16/87 08:30	12/16/87 13:30	5.00	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	02/08/88 08:20	02/08/88 14:00	5.67	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	02/08/88 08:30	02/08/88 12:30	4.00	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	04/01/88 22:10	04/02/88 03:10	5.00	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	05/06/88 08:05	05/06/88 09:17	1.20	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	05/06/88 12:00	05/06/88 14:05	2.08	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	06/10/88 08:20	06/10/88 13:10	4.83	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	07/28/88 08:10	07/28/88 13:10	5.00	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	07/28/88 08:10	07/28/88 13:35	5.42	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	09/22/88 09:26	09/22/88 14:30	5.07	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	09/23/88 09:20	09/23/88 10:30	1.17	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	10/18/88 08:00	10/18/88 13:45	5.75	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	12/13/88 08:45	12/13/88 13:45	5.00	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	12/13/88 08:45	12/13/88 15:15	6.50	3PT-M02/WORK SUSPENDED - NOT COMPLETE	SRO
PPR	3PT-M02	01/06/89 08:05	01/06/89 14:00	5.92	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	01/25/89 16:00	01/25/89 18:25	2.42	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	06/20/89 09:00	06/20/89 14:00	5.00	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	06/24/89 16:25	06/24/89 17:30	1.08	3PT-M02 FOR LOOP 3 DELTA T	SRO
PPR	3PT-M02	07/05/89 21:34	07/06/89 02:34	5.00	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	08/02/89 08:08	08/02/89 14:00	5.87	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
PPR	3PT-M02	09/19/89 08:45	09/19/89 13:30	4.75	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	10/14/89 08:30	10/14/89 13:30	5.00	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	10/14/89 08:30	10/14/89 13:30	5.00	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	11/08/89 16:30	11/08/89 21:05	4.58	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	12/29/89 08:25	12/29/89 12:00	3.58	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	01/02/90 08:05	01/02/90 13:30	5.42	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	01/25/90 16:00	01/25/90 18:25	2.42	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	02/20/90 08:21	02/20/90 10:45	2.40	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	02/20/90 12:30	02/20/90 14:36	2.10	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	05/04/90 16:00	05/04/90 21:40	5.67	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	05/04/90 16:00	05/04/90 21:40	5.67	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	06/04/90 00:00	06/04/90 14:50	14.83	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	06/04/90 08:40	06/04/90 14:50	6.17	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	06/28/90 08:30	06/28/90 14:35	6.08	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	07/25/90 07:11	07/25/90 12:11	5.00	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	08/16/90 16:00	08/16/90 18:42	2.70	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	01/10/91 08:30	01/10/91 15:00	6.50	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	04/11/91 09:10	04/11/91 14:05	4.92	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	05/06/91 08:40	05/06/91 13:40	5.00	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	06/03/91 08:01	06/03/91 14:00	5.98	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	10/07/91 08:20	10/07/91 12:45	4.42	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	10/31/91 08:15	10/31/91 13:15	5.00	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	11/25/91 16:08	11/25/91 21:08	5.00	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M02	12/23/91 14:25	12/23/91 19:25	5.00	3PT-M02 (RX COOLANT TEMP ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	01/28/85 08:49	01/28/85 14:28	5.65	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	03/13/85 07:45	03/13/85 10:25	2.67	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	11/19/85 08:35	11/19/85 13:37	5.03	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	01/14/86 07:30	01/14/86 10:42	3.20	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	01/15/86 09:05	01/15/86 14:00	4.92	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	02/11/86 09:20	02/11/86 14:00	4.67	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	03/11/86 08:00	03/11/86 12:37	4.62	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	06/30/86 08:33	06/30/86 09:56	1.38	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	07/29/86 15:30	07/29/86 17:00	1.50	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	09/23/86 07:50	09/23/86 13:35	5.75	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	10/24/86 08:30	10/24/86 09:40	1.17	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	11/17/86 08:20	11/17/86 14:30	6.17	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	12/15/86 08:10	12/15/86 11:22	3.20	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
PPR	3PT-M03	12/15/86 12:00	12/15/86 13:30	1.50	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	02/10/87 15:30	02/10/87 18:42	3.20	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	03/09/87 08:30	03/09/87 10:25	1.92	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	10/28/87 07:45	10/28/87 10:40	2.92	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	11/27/87 08:07	11/27/87 09:30	1.38	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	12/22/87 16:00	12/22/87 19:12	3.20	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	02/18/88 08:34	02/18/88 09:45	1.18	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	03/24/88 08:10	03/24/88 13:20	5.17	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	04/25/88 08:00	04/25/88 13:00	5.00	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	06/20/88 08:25	06/20/88 15:25	7.00	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	08/11/88 12:30	08/11/88 13:20	0.83	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	09/08/88 15:52	09/08/88 20:27	4.58	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	09/08/88 15:52	09/08/88 20:27	4.58	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	10/30/88 08:55	10/30/88 13:00	4.08	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	12/28/88 08:00	12/28/88 09:31	1.52	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	07/17/89 10:00	07/17/89 12:38	2.63	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	09/08/89 13:55	09/08/89 17:07	3.20	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	09/08/89 13:55	09/08/89 17:07	3.20	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	09/16/89 08:00	09/16/89 10:22	2.37	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	10/12/89 09:14	10/12/89 10:22	1.13	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	11/03/89 16:10	11/03/89 17:30	1.33	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	11/27/89 05:15	11/27/89 09:30	4.25	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	11/27/89 08:15	11/27/89 09:30	1.25	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	11/27/89 12:40	11/27/89 14:20	1.67	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	12/27/89 08:10	12/27/89 13:45	5.58	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	04/23/90 16:00	04/23/90 17:35	1.58	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	06/09/90 08:25	06/09/90 10:45	2.33	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	06/28/90 08:05	06/28/90 12:55	4.83	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	06/28/90 08:05	06/28/90 12:55	4.83	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	06/29/90 08:00	06/29/90 11:12	3.20	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	06/29/90 08:00	06/29/90 11:12	3.20	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	07/25/90 15:50	07/25/90 19:00	3.17	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	08/17/90 08:20	08/17/90 09:45	1.42	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	01/24/91 08:57	01/24/91 12:09	3.20	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	03/15/91 08:00	03/15/91 09:45	1.75	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	04/11/91 08:02	04/11/91 09:15	1.22	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	05/08/91 08:15	05/08/91 13:47	5.53	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
PPR	3PT-M03	06/04/91 08:25	06/04/91 12:30	4.08	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	10/11/91 08:50	10/11/91 12:02	3.20	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	11/08/91 07:46	11/08/91 11:54	4.13	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M03	12/06/91 08:10	12/06/91 12:30	4.33	3PT-M03 (RX COOLANT FLOW ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	04/11/86 15:30	04/11/86 16:30	1.00	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	07/07/86 08:00	07/07/86 09:00	1.00	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	08/01/86 08:21	08/01/86 10:21	2.00	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	08/28/86 16:00	08/28/86 18:45	2.75	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	09/26/86 08:15	09/26/86 14:38	6.38	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	10/23/86 08:36	10/23/86 09:30	0.90	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	11/18/86 08:30	11/18/86 11:00	2.50	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	12/16/86 08:25	12/16/86 10:10	1.75	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	02/11/87 07:40	02/11/87 08:20	0.67	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	03/10/87 08:18	03/10/87 19:26	11.13	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	04/03/87 00:16	04/03/87 06:00	5.73	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	12/14/87 09:20	12/14/87 11:20	2.00	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	01/07/88 08:20	01/07/88 12:25	4.08	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	02/09/88 08:00	02/09/88 13:30	5.50	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	04/01/88 16:00	04/01/88 18:00	2.00	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	04/29/88 08:38	04/29/88 12:45	4.12	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	07/25/88 08:30	07/25/88 09:05	0.58	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	08/22/88 17:00	08/22/88 18:20	1.33	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	10/13/88 00:00	10/13/88 00:25	0.42	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	11/09/88 08:01	11/09/88 10:15	2.23	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	11/09/88 08:07	11/09/88 10:15	2.13	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	12/07/88 08:10	12/07/88 08:55	0.75	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	06/26/89 09:14	06/26/89 10:05	0.85	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	08/15/89 16:10	08/15/89 16:30	0.33	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	10/03/89 08:15	10/03/89 10:00	1.75	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	10/26/89 17:00	10/26/89 17:40	0.67	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	12/12/89 17:05	12/12/89 18:30	1.42	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	01/03/90 17:40	01/03/90 18:13	0.55	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	01/27/90 08:20	01/27/90 09:15	0.92	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	03/15/90 02:00	03/15/90 02:46	0.77	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	05/01/90 07:50	05/01/90 08:45	0.92	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	05/25/90 08:45	05/25/90 09:25	0.67	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	06/04/90 12:35	06/04/90 14:35	2.00	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
PPR	3PT-M04	06/16/90 14:04	06/16/90 14:25	0.35	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	08/04/90 14:08	08/04/90 14:44	0.60	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	08/28/90 16:00	08/28/90 16:45	0.75	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	12/28/90 09:15	12/28/90 11:15	2.00	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	01/21/91 08:55	01/21/91 09:30	0.58	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	02/20/91 08:35	02/20/91 14:00	5.42	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	04/12/91 21:01	04/12/91 21:45	0.73	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	05/07/91 08:30	05/07/91 13:15	4.75	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	06/01/91 00:00	06/01/91 01:00	1.00	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	07/01/91 08:00	07/01/91 08:45	0.75	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	09/13/91 08:13	09/13/91 12:35	4.37	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M04	10/09/91 09:00	10/09/91 13:30	4.50	3PT-M04 (PRESSURIZER LEVEL ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	01/30/85 10:15	01/30/85 13:40	3.42	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	02/25/85 08:00	02/25/85 11:25	3.42	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	04/18/85 08:24	04/18/85 11:30	3.10	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	05/17/85 09:30	05/17/85 14:30	5.00	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	03/19/86 08:00	03/19/86 10:00	2.00	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	05/14/86 21:10	05/15/86 00:35	3.42	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	06/10/86 08:30	06/10/86 10:15	1.75	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	07/08/86 09:10	07/08/86 11:00	1.83	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	09/01/86 12:20	09/01/86 14:20	2.00	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	10/01/86 08:00	10/01/86 08:00	0.00	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	10/01/86 08:00	10/01/86 11:25	3.42	3PT-M05	SRO
PPR	3PT-M05	10/27/86 16:30	10/27/86 19:55	3.42	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	11/24/86 08:20	11/24/86 14:30	6.17	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	12/22/86 08:05	12/22/86 11:00	2.92	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	01/19/87 08:35	01/19/87 12:00	3.42	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	02/17/87 16:05	02/17/87 19:30	3.42	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	03/16/87 08:05	03/16/87 13:35	5.50	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	04/13/87 08:27	04/13/87 10:15	1.80	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	12/17/87 08:25	12/17/87 09:20	0.92	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	02/02/88 08:00	02/02/88 09:52	1.87	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	03/29/88 08:22	03/29/88 10:45	2.38	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	06/06/88 08:05	06/06/88 09:15	1.17	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	06/22/88 08:00	06/22/88 13:20	5.33	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	07/19/88 07:44	07/19/88 11:09	3.42	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	07/20/88 07:58	07/20/88 08:32	0.57	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
PPR	3PT-M05	09/08/88 12:45	09/08/88 16:10	3.42	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	09/12/88 08:25	09/12/88 12:40	4.25	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	10/12/88 08:30	10/12/88 13:30	5.00	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	11/07/88 08:01	11/07/88 09:30	1.48	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	12/05/88 08:15	12/05/88 13:30	5.25	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	12/05/88 08:15	12/05/88 13:30	5.25	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	01/03/89 08:00	01/03/89 10:36	2.60	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	06/26/89 20:05	06/26/89 22:35	2.50	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	08/14/89 15:50	08/14/89 18:30	2.67	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	08/28/89 09:25	08/28/89 14:35	5.17	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	09/08/89 13:15	09/08/89 13:45	0.50	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	10/02/89 08:30	10/02/89 14:10	5.67	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	12/11/89 18:20	12/11/89 21:45	3.42	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	01/15/90 08:10	01/15/90 13:08	4.97	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	02/07/90 09:00	02/07/90 14:00	5.00	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	03/01/90 16:30	03/01/90 19:00	2.50	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	06/05/90 15:30	06/05/90 18:30	3.00	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	07/23/90 12:50	07/23/90 16:15	3.42	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	08/16/90 08:05	08/16/90 12:50	4.75	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	08/16/90 08:05	08/16/90 12:50	4.75	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	01/07/91 08:00	01/07/91 11:00	3.00	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	02/01/91 08:00	02/01/91 11:25	3.42	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	04/22/91 08:08	04/22/91 14:40	6.53	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	06/14/91 00:00	06/14/91 14:10	14.17	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	08/01/91 08:29	08/01/91 13:50	5.35	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	08/23/91 08:15	08/23/91 10:25	2.17	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	09/20/91 20:00	09/20/91 23:25	3.42	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M05	11/13/91 08:34	11/13/91 12:00	3.42	3PT-M05 (PRESSURIZER PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	03/11/85 08:15	03/11/85 14:00	5.75	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	11/20/85 09:00	11/20/85 14:06	5.10	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	01/15/86 07:53	01/15/86 09:00	1.12	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	02/13/86 09:00	02/13/86 14:00	5.00	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	02/14/86 08:13	02/14/86 13:02	4.82	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	03/13/86 15:45	03/13/86 19:00	3.25	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	06/30/86 14:43	06/30/86 18:32	3.83	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	09/23/86 07:55	09/23/86 13:35	5.67	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	10/17/86 09:18	10/17/86 13:07	3.83	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
PPR	3PT-M07	11/14/86 07:58	11/14/86 11:47	3.83	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	11/14/86 16:30	11/14/86 18:30	2.00	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	01/08/87 09:45	01/08/87 10:45	1.00	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	02/06/87 08:00	02/06/87 11:00	3.00	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	03/06/87 08:52	03/06/87 13:40	4.80	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	04/03/87 07:35	04/03/87 11:24	3.83	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	10/27/87 08:00	10/27/87 14:35	6.58	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	12/21/87 07:55	12/21/87 13:00	5.08	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	02/19/88 08:00	02/19/88 14:15	6.25	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	03/23/88 08:15	03/23/88 14:15	6.00	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	04/22/88 08:00	04/22/88 13:45	5.75	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	08/01/88 08:40	08/01/88 10:30	1.83	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	08/01/88 12:30	08/01/88 13:16	0.77	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	08/25/88 15:53	08/25/88 19:30	3.62	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	09/20/88 08:05	09/20/88 13:21	5.27	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	10/15/88 00:20	10/15/88 02:35	2.25	3PT-M07/WORK SUSPENDED	SRO
PPR	3PT-M07	10/15/88 06:07	10/15/88 06:20	0.22	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	11/10/88 07:57	11/10/88 13:17	5.33	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	12/07/88 08:20	12/07/88 12:09	3.83	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	01/04/89 08:50	01/04/89 13:45	4.92	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	07/31/89 08:00	07/31/89 14:00	6.00	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	07/31/89 08:00	07/31/89 14:00	6.00	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	09/19/89 15:25	09/19/89 16:40	1.25	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	09/20/89 14:45	09/20/89 16:40	1.92	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	10/14/89 08:28	10/14/89 12:30	4.03	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	10/14/89 08:28	10/14/89 12:30	4.03	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	12/26/89 08:25	12/26/89 13:30	5.08	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	12/26/89 08:25	12/26/89 13:30	5.08	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	02/08/90 08:10	02/08/90 15:00	6.83	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	02/08/90 08:30	02/08/90 14:00	5.50	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	04/16/90 08:00	04/16/90 11:20	3.33	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	04/16/90 08:00	04/16/90 11:20	3.33	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	05/11/90 08:05	05/11/90 11:54	3.83	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	05/11/90 08:05	05/11/90 11:54	3.83	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	06/04/90 10:10	06/04/90 14:00	3.83	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	06/04/90 12:35	06/04/90 14:00	1.42	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	06/29/90 08:00	06/29/90 11:49	3.83	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
PPR	3PT-M07	06/29/90 08:00	06/30/90 01:30	17.50	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	06/30/90 00:00	06/30/90 01:30	1.50	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	07/20/90 16:00	07/20/90 21:30	5.50	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	07/20/90 16:00	07/20/90 21:30	5.50	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07	08/01/91 08:35	08/01/91 13:45	5.17	3PT-M07 (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07A	12/10/91 08:00	12/10/91 09:30	1.50	3PT-M07A (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07B	07/10/91 19:22	07/10/91 23:11	3.83	3PT-M07B (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07B	08/27/91 08:32	08/27/91 09:15	0.72	3PT-M07B (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07B	09/20/91 11:52	09/20/91 13:12	1.33	3PT-M07B (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07B	12/10/91 12:30	12/10/91 13:30	1.00	3PT-M07B (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M07C	08/27/91 12:20	08/27/91 15:15	2.92	3PT-M07C (ROD POSITION INDICATOR ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	04/14/86 07:58	04/14/86 14:20	6.37	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	05/11/86 20:48	05/11/86 22:35	1.78	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	06/09/86 07:47	06/09/86 08:47	1.00	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	07/07/86 08:00	07/07/86 10:03	2.06	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	08/04/86 15:10	08/04/86 17:13	2.06	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	09/01/86 07:51	09/01/86 09:12	1.35	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	09/24/86 08:40	09/24/86 09:30	0.83	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	09/29/86 08:30	09/29/86 10:33	2.06	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	10/27/86 08:18	10/27/86 09:36	1.30	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	12/18/86 16:50	12/18/86 17:45	0.92	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	02/14/87 08:20	02/14/87 10:23	2.06	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	04/16/87 08:24	04/16/87 14:00	5.60	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	02/16/88 08:05	02/16/88 11:05	3.00	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	03/18/88 08:25	03/18/88 10:28	2.06	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	04/19/88 07:55	04/19/88 09:58	2.06	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	08/01/88 08:04	08/01/88 09:14	1.17	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	09/21/88 08:07	09/21/88 09:06	0.98	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	10/16/88 04:55	10/16/88 05:40	0.75	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	11/10/88 08:00	11/10/88 09:10	1.17	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	12/08/88 12:55	12/08/88 14:58	2.06	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	01/05/89 08:10	01/05/89 10:15	2.08	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	09/27/89 15:50	09/27/89 16:25	0.58	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	11/16/89 08:10	11/16/89 10:00	1.83	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	01/02/90 16:20	01/02/90 19:40	3.33	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	02/15/90 16:00	02/15/90 17:05	1.08	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	04/26/90 08:25	04/26/90 10:28	2.06	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
PPR	3PT-M09	06/12/90 16:00	06/12/90 17:38	1.63	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	07/09/90 09:14	07/09/90 10:30	1.27	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	08/02/90 16:05	08/02/90 17:30	1.42	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	08/28/90 08:15	08/28/90 10:18	2.06	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	12/31/90 08:20	12/31/90 10:05	1.75	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	01/29/91 08:11	01/29/91 12:30	4.32	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M09	12/13/91 09:15	12/13/91 13:10	3.92	3PT-M09 (CONTAINMENT PRESSURE ANALOG FUNCTIONAL)	SRO
PPR	3PT-M13	12/06/86 09:25	12/06/86 13:00	3.58	3PT-M13 (REACTOR PROTECTION LOGIC FUNCTIONAL)	SRO
PPR	3PT-M13	12/28/87 08:15	12/28/87 12:09	3.90	3PT-M13 (REACTOR PROTECTION LOGIC FUNCTIONAL)	SRO
PPR	3PT-M13A	02/06/85 08:00	02/06/85 14:00	6.00	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	04/03/85 08:00	04/03/85 10:18	2.30	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	05/28/85 08:20	05/28/85 10:30	2.17	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	12/10/85 07:53	12/10/85 11:31	3.64	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	02/04/86 15:20	02/04/86 17:15	1.92	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	02/28/86 12:00	02/28/86 16:35	4.58	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	04/24/86 08:30	04/24/86 13:00	4.50	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	05/28/86 08:45	05/28/86 13:30	4.75	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	07/17/86 16:13	07/17/86 19:40	3.45	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	09/11/86 16:50	09/11/86 19:05	2.25	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	10/10/86 09:00	10/10/86 12:55	3.92	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	11/10/86 08:21	11/10/86 11:22	3.02	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	12/05/86 16:15	12/05/86 19:53	3.64	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	01/06/87 08:05	01/06/87 10:30	2.42	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	02/26/87 08:25	02/26/87 10:40	2.25	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	12/03/87 08:45	12/03/87 13:00	4.25	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	02/01/88 08:07	02/01/88 11:45	3.64	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	03/31/88 08:00	03/31/88 11:38	3.64	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	06/02/88 09:30	06/02/88 11:45	2.25	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	12/01/88 10:00	12/01/88 12:30	2.50	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	06/17/89 23:35	06/18/89 03:13	3.64	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	08/12/89 08:30	08/12/89 10:10	1.67	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	03/21/90 16:15	03/21/90 19:53	3.64	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	05/16/90 08:08	05/16/90 10:20	2.20	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	07/10/90 08:23	07/10/90 11:02	2.65	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	12/15/90 10:40	12/15/90 14:18	3.64	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	01/12/91 08:55	01/12/91 11:50	2.92	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	03/14/91 08:10	03/14/91 11:35	3.42	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
PPR	3PT-M13A	05/10/91 08:17	05/10/91 11:30	3.22	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	07/03/91 05:00	07/03/91 14:00	9.00	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	11/07/91 08:25	11/07/91 14:30	6.08	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13A	12/30/91 08:19	12/30/91 11:02	2.72	3PT-M13A (RX PROTECTION LOGIC FUNCTIONAL TRAIN A)	SRO
PPR	3PT-M13B	02/07/85 08:00	02/07/85 11:00	3.00	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	04/04/85 07:55	04/04/85 11:05	3.17	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	05/29/85 08:20	05/29/85 10:40	2.33	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	10/18/85 08:07	10/18/85 11:00	2.88	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	11/15/85 11:21	11/15/85 15:00	3.64	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	12/30/85 07:51	12/30/85 14:00	6.15	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	01/08/86 08:00	01/08/86 11:00	3.00	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	02/05/86 08:50	02/05/86 14:07	5.28	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	04/25/86 07:45	04/25/86 11:00	3.25	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	06/23/86 07:47	06/23/86 10:26	2.65	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	07/18/86 17:30	07/18/86 23:00	5.50	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	09/16/86 16:10	09/16/86 19:10	3.00	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	10/10/86 15:30	10/10/86 18:15	2.75	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	11/10/86 16:00	11/10/86 19:00	3.00	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	01/06/87 15:50	01/06/87 19:28	3.64	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	02/27/87 07:20	02/27/87 10:58	3.64	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	04/24/87 08:26	04/24/87 14:19	5.88	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	10/22/87 00:00	10/22/87 09:45	9.75	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	04/28/88 08:00	04/28/88 11:38	3.64	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	08/26/88 08:00	08/26/88 10:58	2.97	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	10/29/88 08:20	10/29/88 11:00	2.67	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	12/30/88 08:15	12/30/88 10:45	2.50	3PT-M13B (SIS LOGIC FUNC TRAIN B)	SRO
PPR	3PT-M13B	12/30/88 08:15	12/30/88 10:45	2.50	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	06/20/89 08:00	06/20/89 14:30	6.50	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	09/12/89 16:00	09/12/89 18:10	2.17	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	11/09/89 16:00	11/09/89 19:00	3.00	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	01/04/90 07:58	01/04/90 11:36	3.64	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	04/25/90 08:35	04/25/90 11:00	2.42	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	04/25/90 11:25	04/25/90 15:03	3.64	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	06/16/90 08:30	06/16/90 11:02	2.53	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	08/14/90 08:50	08/14/90 13:00	4.17	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	
PPR	3PT-M13B	08/14/90 08:50	08/14/90 13:00	4.17	3PT-M13B (SIS LOGIC FUNC TRAIN B)	SRO
PPR	3PT-M13B	02/16/91 08:05	02/16/91 11:20	3.25	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
PPR	3PT-M13B	04/12/91 08:12	04/12/91 12:12	4.00	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	09/18/91 08:25	09/18/91 10:45	2.33	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	09/27/91 09:25	09/27/91 13:25	4.00	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-M13B	12/04/91 08:02	12/04/91 11:40	3.64	3PT-M13B (RX PROTECTION LOGIC FUNCTIONAL TRAIN B)	SRO
PPR	3PT-Q28	03/21/86 15:45	03/21/86 15:45	0.00	3PT-Q28 (VC PRESSURE RELIEF VLVS)	SRO
PPR	3PT-Q28	06/21/90 21:32	06/21/90 21:40	0.13	3PT-Q28 (VC PRESSURE RELIEF VLVS)	SRO
PPR	3PT-Q32	11/05/86 02:05	11/05/86 02:05	0.00	3PT-Q32 (RCS VLVS 519, 552, 548, 549)	SRO
PPR	3PT-R04	09/27/85 17:28	09/27/85 20:02	2.57	3PT-R04 (FULL LENGTH ROD DROP TEST)	SRO
PPR	3PT-R04	12/17/90 23:00	12/18/90 04:30	5.50	3PT-R04 (FULL LENGTH ROD DROP TEST)	SRO
PPR	3PT-R114	09/18/90 08:36	09/18/90 09:12	0.60	3PT-R114 (RCS BORIC ACID) TEST GROUP	SRO
PPR	3PT-R25	09/18/90 08:32	09/18/90 10:46	2.23	3PT-R25 (RCP SEAL & CCW FLOW) TEST GROUP	SRO
PPR	3PT-R35	02/14/89 08:13	02/14/89 08:13	0.00	3PT-R35 (31&35 FCU) GROUP TEST	SRO
PPR	3PT-R35	02/14/89 08:13	02/14/89 08:13	0.00	3PT-R35 (CONT ISOL VLVS LEAKAGE TEST) TEST GROUP	SRO
PPR	3PT-R35	02/14/89 08:32	02/14/89 16:13	7.68	3PT-R35 (PAC GAS) TEST GROUP	SRO
PPR	3PT-R35	02/14/89 08:32	02/14/89 08:32	0.00	3PT-R35 (CONT ISOL VLVS LEAKAGE TEST) TEST GROUP	SRO
PPR	3PT-R35	02/14/89 16:15	02/14/89 16:15	0.00	3PT-R35 (CONT ISOL VLVS LEAKAGE TEST) TEST GROUP	SRO
PPR	3PT-R35	09/28/90 08:06	09/28/90 14:30	6.40	3PT-R35 (CONT ISOL VLVS LEAKAGE TEST) TEST GROUP	SRO
PPR	3PT-R74	02/24/89 08:55	02/24/89 08:55	0.00	3PT-R74 (RCS ACID SAMPLE) TEST GROUP	SRO
RHR	3PT-CS14	05/11/86 13:10	05/11/86 13:30	0.33	3PT-CS14	SRO
RHR	3PT-CS14	05/11/86 14:25	05/11/86 14:42	0.28	3PT-CS14	SRO
RHR	3PT-CS4	10/13/88 00:20	10/13/88 05:05	4.75	3PT-CS4	SRO
RHR	3PT-CS4	11/20/88 21:52	11/21/88 01:00	3.13	32 RHRP INOPERABLE/OPERABLE FOR 3PT-CS4	SRO
RHR	3PT-CS4	02/17/89 11:15	02/17/89 11:15	0.00	3PT-CS9 (SIS TO HOT LEG-856B&856G) TEST GROUP	SRO
RHR	3PT-CS4	04/04/90 03:00	04/04/90 04:30	1.50	3PT-CS4 (LH INJEC, ACCUM, RHR CHK VLVS LEAKAGE)	SRO
RHR	3PT-CS4	04/07/91 03:05	04/07/91 03:05	0.00	3PT-CS4 (LH INJEC, ACCUM, RHR CHK VLVS LEAKAGE)	SRO
RHR	3PT-M18	01/08/85 09:01	01/08/85 09:25	0.40	STARTED/SECURED 31 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	01/08/85 09:54	01/08/85 10:13	0.32	STARTED/SECURED 32 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	02/07/85 12:25	02/07/85 12:42	0.28	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	02/07/85 12:50	02/07/85 13:06	0.27	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	03/09/85 11:26	03/09/85 11:45	0.32	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	03/09/85 12:00	03/09/85 12:16	0.27	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	04/08/85 01:45	04/08/85 14:45	13.00	3PT-M18 (RHRP FUNCTIONAL)	SRO
RHR	3PT-M18	04/08/85 12:35	04/08/85 13:05	0.50	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	04/08/85 13:05	04/08/85 13:25	0.33	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	05/09/85 09:25	05/09/85 09:45	0.33	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	05/09/85 09:55	05/09/85 10:10	0.25	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	09/24/85 01:53	09/24/85 02:20	0.45	STARTED/SECURED 32 RHRP FOR PT	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
RHR	3PT-M18	10/08/85 13:56	10/08/85 14:16	0.33	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	10/08/85 14:33	10/08/85 14:50	0.28	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	11/04/85 17:32	11/04/85 17:56	0.40	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	11/04/85 18:45	11/04/85 19:06	0.35	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	12/04/85 09:34	12/04/85 09:55	0.35	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	12/04/85 10:12	12/04/85 10:35	0.38	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	12/04/85 18:10	12/04/85 18:28	0.30	STARTED/SECURED 32 RHRP	SRO
RHR	3PT-M18	01/05/86 10:20	01/05/86 10:35	0.25	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	01/05/86 10:45	01/05/86 11:05	0.33	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	02/02/86 09:49	02/02/86 10:01	0.20	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	02/02/86 10:44	02/02/86 11:08	0.40	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	02/02/86 11:12	02/02/86 11:28	0.27	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	03/04/86 19:58	03/04/86 20:16	0.30	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	03/04/86 20:31	03/04/86 20:53	0.37	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	03/19/86 02:00	03/19/86 02:20	0.33	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	04/18/86 08:10	04/18/86 09:25	1.25	3PT-M18 (RHRP FUNCTIONAL)	SRO
RHR	3PT-M18	04/19/86 02:15	04/19/86 02:45	0.50	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	04/19/86 03:00	04/19/86 03:30	0.50	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	06/13/86 00:40	06/13/86 00:50	0.17	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	06/13/86 01:16	06/13/86 01:35	0.32	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	06/13/86 01:45	06/13/86 02:03	0.30	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	06/27/86 18:40	06/27/86 18:55	0.25	STARTED/SECURED 31 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	07/14/86 12:20	07/14/86 19:03	6.72	STARTED/SECURED 31 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	09/14/86 03:07	09/14/86 03:28	0.35	STARTED/SECURED 31 RHRP	SRO
RHR	3PT-M18	09/14/86 03:45	09/14/86 04:04	0.32	STARTED/SECURED 32 RHRP	SRO
RHR	3PT-M18	10/12/86 03:40	10/12/86 04:05	0.42	STARTED/SECURED 31 RHRP	SRO
RHR	3PT-M18	10/12/86 04:15	10/12/86 04:30	0.25	STARTED/SECURED 32 RHRP	SRO
RHR	3PT-M18	10/16/86 17:53	10/16/86 17:55	0.03	STARTED/SECURED 31 RHRP	SRO
RHR	3PT-M18	11/10/86 16:55	11/10/86 17:12	0.28	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	11/10/86 17:18	11/10/86 17:33	0.25	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	12/10/86 02:23	12/10/86 02:42	0.32	STARTED/SECURED 31 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	12/10/86 02:52	12/10/86 03:12	0.33	STARTED/SECURED 32 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	01/10/87 09:49	01/10/87 10:17	0.47	STARTED/SECURED 32 RHRP	SRO
RHR	3PT-M18	01/10/87 10:33	01/10/87 10:59	0.43	STARTED/SECURED 31 RHRP	SRO
RHR	3PT-M18	02/08/87 08:00	02/08/87 14:30	6.50	3PT-M18 (RHRP FUNCTIONAL)	SRO
RHR	3PT-M18	02/08/87 10:45	02/08/87 11:20	0.58	STARTED/SECURED 31 RHRP	SRO
RHR	3PT-M18	02/08/87 11:40	02/08/87 11:55	0.25	STARTED/SECURED 32 RHRP	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
RHR	3PT-M18	03/10/87 19:50	03/10/87 20:05	0.25	STARTED/SECURED 31 RHRP	SRO
RHR	3PT-M18	03/10/87 20:10	03/10/87 20:30	0.33	STARTED/SECURED 32 RHRP	SRO
RHR	3PT-M18	04/09/87 13:40	04/09/87 14:00	0.33	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	04/09/87 14:30	04/09/87 14:47	0.28	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	09/17/87 19:40	09/17/87 20:00	0.33	STARTED/SECURED 31 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	09/17/87 20:10	09/17/87 20:25	0.25	STARTED/SECURED 32 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	10/17/87 18:30	10/17/87 18:50	0.33	STARTED/SECURED 31 RHRP	SRO
RHR	3PT-M18	10/17/87 19:10	10/17/87 19:30	0.33	STARTED/SECURED 32 RHRP	SRO
RHR	3PT-M18	11/16/87 01:40	11/16/87 01:56	0.27	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	11/16/87 02:25	11/16/87 02:42	0.28	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	12/18/87 02:03	12/18/87 02:26	0.38	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	12/18/87 03:05	12/18/87 03:21	0.27	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	01/09/88 19:05	01/09/88 19:25	0.33	STARTED/SECURED 31 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	01/09/88 20:20	01/09/88 20:40	0.33	STARTED/SECURED 32 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	02/08/88 01:08	02/08/88 01:27	0.32	STARTED/SECURED 31 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	02/08/88 01:44	02/08/88 02:02	0.30	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	03/03/88 02:24	03/03/88 02:45	0.35	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	03/03/88 03:10	03/03/88 03:30	0.33	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	04/05/88 17:30	04/05/88 17:50	0.33	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	04/05/88 18:20	04/05/88 18:40	0.33	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	05/03/88 05:15	05/03/88 05:40	0.42	STARTED/SECURED 32 RHRP FOR OPERABILITY	SRO
RHR	3PT-M18	05/03/88 18:20	05/03/88 18:40	0.33	STARTED/SECURED 31 RHRPP FOR OPERABILITY	SRO
RHR	3PT-M18	06/19/88 04:05	06/19/88 04:30	0.42	STARTED/SECURED 31 RHRP	SRO
RHR	3PT-M18	06/19/88 04:55	06/19/88 05:18	0.38	STARTED/SECURED 32 RHRP	SRO
RHR	3PT-M18	07/14/88 02:25	07/14/88 02:45	0.33	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	07/14/88 02:56	07/14/88 03:11	0.25	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	08/07/88 16:44	08/07/88 17:06	0.37	STARTED/SECURED 31 RHRP	SRO
RHR	3PT-M18	08/07/88 17:24	08/07/88 17:44	0.33	STARTED/SECURED 32 RHRP	SRO
RHR	3PT-M18	08/31/88 11:05	08/31/88 11:20	0.25	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	08/31/88 11:43	08/31/88 12:03	0.33	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	09/24/88 03:30	09/24/88 03:50	0.33	STARTED/SECURED 31 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	09/24/88 03:51	09/24/88 04:12	0.35	STARTED/SECURED 32 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	12/17/88 02:19	12/17/88 02:43	0.40	STARTED/SECURED 31 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	12/17/88 02:56	12/17/88 03:17	0.35	STARTED/SECURED 32 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	01/10/89 18:53	01/10/89 19:12	0.32	STARTED/SECURED 31 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	01/10/89 19:34	01/10/89 19:54	0.33	STARTED/SECURED 32 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	02/03/89 14:25	02/03/89 14:48	0.38	STARTED/SECURED 31 RHRP FOR PT	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
RHR	3PT-M18	02/03/89 15:31	02/03/89 15:49	0.30	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	02/23/89 17:10	02/23/89 17:38	0:47	STARTED/SECURED 31 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	02/23/89 17:45	02/23/89 18:08	0.38	STARTED/SECURED 32 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	05/20/89 17:00	05/20/89 17:20	0.33	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	06/19/89 10:00	06/19/89 10:21	0.35	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	06/19/89 10:31	06/19/89 10:55	0.40	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	07/15/89 01:52	07/15/89 02:05	0.22	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	07/15/89 02:16	07/15/89 02:30	0.23	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	08/09/89 02:42	08/09/89 03:40	0.97	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	08/09/89 03:24	08/09/89 03:46	0.37	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	09/02/89 18:08	09/02/89 18:24	0.27	STARTED/SECURED 31 RHRP	SRO
RHR	3PT-M18	09/02/89 18:37	09/02/89 18:52	0.25	STARTED/SECURED 32 RHRP	SRO
RHR	3PT-M18	09/26/89 09:23	09/26/89 09:41	0.30	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	09/26/89 10:01	09/26/89 10:18	0.28	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	10/26/89 10:25	10/26/89 10:40	0.25	STARTED/SECURED 31 RHRP	SRO
RHR	3PT-M18	10/26/89 10:58	10/26/89 11:15	0.28	STARTED/SECURED 32 RHRP	SRO
RHR	3PT-M18	11/19/89 18:37	11/19/89 19:07	0.50	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	11/19/89 19:30	11/19/89 20:00	0.50	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	12/14/89 09:51	12/14/89 10:07	0.27	STARTED/SECURED 31 RHRP	SRO
RHR	3PT-M18	12/14/89 10:13	12/14/89 10:31	0.30	STARTED/SECURED 32 RHRP	SRO
RHR	3PT-M18	01/07/90 01:49	01/07/90 02:06	0.28	STARTED/SECURED 31 RHRP	SRO
RHR	3PT-M18	01/07/90 02:31	01/07/90 02:52	0.35	STARTED/SECURED 32 RHRP	SRO
RHR	3PT-M18	01/31/90 02:18	01/31/90 02:45	0.45	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	01/31/90 03:30	01/31/90 03:52	0.37	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	02/24/90 03:52	02/24/90 04:12	0.33	STARTED/SECURED 31 RHRP	SRO
RHR	3PT-M18	02/24/90 04:14	02/24/90 04:30	0.27	STARTED/SECURED 32 RHRP	SRO
RHR	3PT-M18	03/02/90 01:41	03/02/90 01:58	0.28	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	04/10/90 10:15	04/10/90 10:35	0.33	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	04/10/90 11:25	04/10/90 11:48	0.38	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	05/05/90 01:40	05/05/90 02:00	0.33	STARTED/SECURED 31 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	05/05/90 02:10	05/05/90 02:33	0.38	STARTED/SECURED 32 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	05/29/90 18:30	05/29/90 18:50	0.33	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	05/29/90 19:05	05/29/90 19:25	0.33	STARTED/SECURED 32 RHRP	SRO
RHR	3PT-M18	06/22/90 18:18	06/22/90 18:37	0.32	STARTED/SECURED 31 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	06/22/90 18:40	06/22/90 18:57	0.28	STARTED/SECURED 32 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	07/16/90 10:52	07/16/90 11:10	0.30	STARTED/SECURED 31 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	07/16/90 11:32	07/16/90 11:52	0.33	STARTED/SECURED 32 RHRP FOR 3PT-M18	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
RHR	3PT-M18	08/10/90 08:00	08/10/90 08:00	0.00	3PT-M18 (RHRP FUNCTIONAL)	SRO
RHR	3PT-M18	08/10/90 08:23	08/10/90 08:42	0.32	STARTED/SECURED 31 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	08/10/90 09:54	08/10/90 10:14	0.33	STARTED/SECURED 32 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	09/03/90 16:33	09/03/90 16:50	0.28	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	09/03/90 17:03	09/03/90 17:20	0.28	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	09/17/90 17:30	09/17/90 17:55	0.42	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	09/17/90 18:05	09/17/90 18:27	0.37	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	11/07/90 21:15	11/07/90 21:38	0.38	STARTED/SECURED 31 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	11/07/90 21:45	11/07/90 22:06	0.35	STARTED/SECURED 32 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	12/17/90 09:17	12/17/90 09:42	0.42	STARTED/SECURED 31 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	12/17/90 09:47	12/17/90 10:06	0.32	STARTED/SECURED 32 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	01/10/91 11:29	01/10/91 11:46	0.28	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	01/10/91 11:57	01/10/91 12:13	0.27	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	02/03/91 10:26	02/03/91 10:47	0.35	STARTED/SECURED 31 RHRP	SRO
RHR	3PT-M18	02/03/91 11:20	02/03/91 11:38	0.30	STARTED/SECURED 32 RHRP	SRO
RHR	3PT-M18	02/27/91 09:33	02/27/91 09:48	0.25	STARTED/SECURED 31 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	02/27/91 09:54	02/27/91 10:11	0.28	STARTED/SECURED 32 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	03/25/91 08:56	03/25/91 09:15	0.32	STARTED/SECURED 31 RHRP	SRO
RHR	3PT-M18	03/25/91 09:25	03/25/91 09:45	0.33	STARTED/SECURED 32 RHRP	SRO
RHR	3PT-M18	04/18/91 13:20	04/18/91 13:40	0.33	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	04/18/91 13:44	04/18/91 14:05	0.35	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	05/12/91 08:38	05/12/91 08:58	0.33	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	05/12/91 09:06	05/12/91 09:27	0.35	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	06/05/91 09:18	06/05/91 09:37	0.32	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	06/05/91 10:00	06/05/91 10:17	0.28	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	06/29/91 10:50	06/29/91 11:22	0.53	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	06/29/91 12:00	06/29/91 12:28	0.47	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	07/23/91 09:25	07/23/91 09:45	0.33	STARTED/SECURED 31 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	07/23/91 09:50	07/23/91 10:10	0.33	STARTED/SECURED 32 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	08/16/91 02:16	08/16/91 02:37	0.35	STARTED/SECURED 31 RHRP	SRO
RHR	3PT-M18	08/16/91 04:28	08/16/91 04:50	0.37	STARTED/SECURED 32 RHRP	SRO
RHR	3PT-M18	09/11/91 10:39	09/11/91 10:57	0.30	STARTED/SECURED 31 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	09/11/91 11:17	09/11/91 11:33	0.27	STARTED/SECURED 32 RHRP FOR 3PT-M18	SRO
RHR	3PT-M18	10/07/91 10:10	10/07/91 12:30	2.33	3PT-M18 (RHRP FUNCTIONAL)	SRO
RHR	3PT-M18	10/07/91 11:28	10/07/91 11:51	0.38	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	10/07/91 11:55	10/07/91 12:19	0.40	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	10/31/91 09:50	10/31/91 10:08	0.30	STARTED/SECURED 31 RHRP FOR PT	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
RHR	3PT-M18	10/31/91 10:25	10/31/91 10:41	0.27	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	11/25/91 09:55	11/25/91 10:24	0.48	STARTED/SECURED 31 RHRP FOR PT	SRO
RHR	3PT-M18	11/25/91 10:42	11/25/91 11:01	0.32	STARTED/SECURED 32 RHRP FOR PT	SRO
RHR	3PT-M18	12/19/91 10:57	12/19/91 11:22	0.42	STARTED/SECURED 31 RHRP	SRO
RHR	3PT-M18	12/19/91 11:38	12/19/91 12:03	0.42	STARTED/SECURED 32 RHRP	SRO
RHR	3PT-Q22	05/09/86 15:45	05/09/86 16:10	0.42	3PT-Q22 (RHR SYSTEM VALVES' FUNCTIONAL)	SRO
RHR	3PT-Q22	04/07/88 06:15	04/07/88 06:15	0.00	3PT-Q22 (RHR SYSTEM VALVES' FUNCTIONAL)	SRO
RHR	3PT-Q22	06/20/91 12:45	06/20/91 13:10	0.42	3PT-Q22 (RHR SYSTEM VALVES' FUNCTIONAL)	SRO
RHR	3PT-Q36	02/19/85 23:42	02/19/85 23:48	0.10	3PT-Q36 (RHR COMPONENT COOLING VLVS-822 A/B)	SRO
RHR	3PT-Q36	02/15/86 19:20	02/15/86 19:20	0.00	3PT-Q36 (RHR COMPONENT COOLING VLVS-822 A/B)	SRO
RHR	3PT-Q36	11/05/86 01:20	11/05/86 01:20	0.00	3PT-Q36 (RHR COMPONENT COOLING VLVS-822 A+B)	SRO
RHR	3PT-R34	07/07/87 10:05	07/07/87 23:35	13.50	STARTED/SECURED 32 RHRP FOR 3PT-R34	SRO
RHR	3PT-R34	07/11/87 23:35	07/12/87 01:20	1.75	3PT-R34	SRO
RHR	3PT-R63	05/11/86 12:17	05/11/86 12:20	0.05	3PT-R63	SRO
RHR	3PT-R66	11/23/90 09:40	11/23/90 09:41	0.02	STARTED/SECURED 32 RHRP FOR 3PT-R66	SRO
SIS	3PC-R16A	09/28/90 09:29	09/28/90 09:29	0.00	3PC-R16A (31 ACCUM CALIBR)	SRO
SIS	3PC-R16A	09/28/90 09:29	09/28/90 09:29	0.00	3PC-R16A (33 ACCUM CALIBR)	SRO
SIS	3PC-R17	02/18/89 08:00	02/18/89 08:00	0.00	3PC-R17 (ACCUM PRESS CALIB)	SRO
SIS	3PT-M14	09/05/86 08:00	09/05/86 10:06	2.11	3PT-M14 (SIS LOGIC FUNCTIONAL)	SRO
SIS	3PT-M14A	01/22/85 19:35	01/22/85 22:03	2.47	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	12/30/85 07:51	12/30/85 14:00	6.15	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	03/20/86 16:00	03/20/86 17:00	1.00	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	04/17/86 07:55	04/17/86 10:01	2.11	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	05/15/86 14:20	05/15/86 16:55	2.58	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	07/10/86 08:00	07/10/86 09:30	1.50	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	08/07/86 10:20	08/07/86 12:26	2.11	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	10/02/86 08:15	10/02/86 10:21	2.11	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	10/30/86 12:30	10/30/86 14:25	1.92	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	11/01/86 13:15	11/01/86 15:21	2.11	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	11/28/86 12:00	11/28/86 14:00	2.00	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	12/26/86 08:00	12/26/86 09:18	1.30	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	01/22/87 08:07	01/22/87 10:25	2.30	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	02/12/87 21:50	02/12/87 21:55	0.08	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	02/19/87 07:20	02/19/87 09:26	2.11	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	03/18/87 15:00	03/18/87 17:06	2.11	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	03/31/87 08:43	03/31/87 10:50	2.11	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	11/04/87 12:25	11/04/87 13:10	0.75	3PT-M14A (SIS LOGIC TRAIN A)	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
SIS	3PT-M14A	11/05/87 13:34	11/05/87 14:00	0.43	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	12/07/87 08:16	12/07/87 10:22	2.11	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	12/23/87 08:25	12/23/87 15:05	6.67	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	01/22/88 12:13	01/22/88 14:00	1.78	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	02/23/88 08:00	02/23/88 09:46	1.77	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	03/25/88 09:20	03/25/88 11:10	1.83	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	04/27/88 08:00	04/27/88 09:30	1.50	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	05/31/88 09:40	05/31/88 10:30	0.83	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	06/21/88 07:50	06/21/88 10:00	2.17	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	07/15/88 08:15	07/15/88 09:50	1.58	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	09/07/88 08:10	09/07/88 11:00	2.83	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	10/31/88 09:05	10/31/88 12:55	3.83	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	11/25/88 08:24	11/25/88 13:42	5.30	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	12/19/88 08:10	12/19/88 09:55	1.75	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	12/20/88 07:55	12/20/88 10:03	2.13	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	06/28/89 08:50	06/28/89 10:00	1.17	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	08/16/89 16:50	08/16/89 17:30	0.67	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	10/02/89 16:19	10/02/89 17:30	1.18	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	11/20/89 08:17	11/20/89 10:25	2.13	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	01/26/90 15:50	01/26/90 17:30	1.67	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	04/12/90 08:30	04/12/90 10:20	1.83	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	05/03/90 16:06	05/03/90 17:30	1.40	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	05/12/90 13:05	05/12/90 14:00	0.92	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	05/29/90 07:44	05/29/90 09:50	2.11	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	06/21/90 08:30	06/21/90 10:10	1.67	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	07/19/90 16:30	07/19/90 20:00	3.50	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	07/27/90 16:03	07/27/90 21:00	4.95	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	08/14/90 16:00	08/14/90 17:05	1.08	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	12/18/90 08:10	12/18/90 10:06	1.93	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	12/18/90 09:21	12/18/90 11:27	2.11	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	01/11/91 00:01	01/11/91 01:19	1.30	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	02/08/91 13:04	02/08/91 15:05	2.02	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	02/11/91 08:35	02/11/91 09:46	1.18	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	03/12/91 08:03	03/12/91 09:37	1.57	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	05/28/91 07:58	05/28/91 10:05	2.11	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	09/30/91 10:33	09/30/91 14:20	3.78	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14A	10/25/91 17:00	10/25/91 22:20	5.33	3PT-M14A	

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
SIS	3PT-M14A	11/21/91 08:30	11/21/91 09:15	0.75	3PT-M14A (SIS LOGIC TRAIN A)	SRO
SIS	3PT-M14B	02/27/85 07:45	02/27/85 09:25	1.67	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	05/17/85 07:30	05/17/85 08:30	1.00	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	12/31/85 07:43	12/31/85 09:05	1.37	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	02/21/86 08:15	02/21/86 10:21	2.11	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	03/21/86 08:10	03/21/86 14:37	6.45	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	04/18/86 08:05	04/18/86 09:20	1.25	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	05/19/86 08:12	05/19/86 10:18	2.11	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	06/13/86 08:10	06/13/86 14:10	6.00	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	08/08/86 08:30	08/08/86 11:05	2.58	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	10/03/86 09:00	10/03/86 10:00	1.00	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	11/01/86 08:55	11/01/86 11:01	2.11	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	11/28/86 15:05	11/28/86 17:11	2.11	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	12/26/86 15:20	12/26/86 17:50	2.50	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	01/23/87 13:00	01/23/87 13:00	0.00	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	03/19/87 08:30	03/19/87 14:10	5.67	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	03/31/87 12:50	03/31/87 14:17	1.45	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	11/06/87 13:07	11/06/87 14:04	0.95	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	12/10/87 09:03	12/10/87 13:43	4.67	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	12/28/87 15:40	12/28/87 16:50	1.17	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	01/27/88 08:00	01/27/88 10:15	2.25	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	02/22/88 08:50	02/22/88 10:56	2.11	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	03/24/88 08:15	03/24/88 10:30	2.25	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	04/26/88 08:10	04/26/88 09:30	1.33	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	06/17/88 08:00	06/17/88 09:45	1.75	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	08/08/88 08:00	08/08/88 09:30	1.50	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	09/28/88 07:58	09/28/88 10:30	2.53	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	11/23/88 20:00	11/23/88 21:40	1.67	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	12/19/88 08:10	12/19/88 09:55	1.75	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	01/13/89 07:55	01/13/89 09:50	1.92	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	06/29/89 08:00	06/29/89 09:14	1.23	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	07/25/89 16:35	07/25/89 18:22	1.78	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	10/10/89 08:31	10/10/89 10:15	1.73	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	11/27/89 08:00	11/27/89 09:30	1.50	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	11/27/89 12:37	11/27/89 13:12	0.58	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	12/26/89 12:20	12/26/89 14:00	1.67	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	03/01/90 08:30	03/01/90 10:15	1.75	3PT-M14B (SIS LOGIC TRAIN B)	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
SIS	3PT-M14B	05/12/90 13:05	05/12/90 14:00	0.92	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	06/07/90 08:30	06/07/90 11:00	2.50	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	07/03/90 08:05	07/03/90 10:24	2.32	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	07/27/90 16:03	07/27/90 21:00	4.95	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	08/20/90 07:40	08/20/90 09:46	2.11	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	12/19/90 08:10	12/19/90 10:16	2.11	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	01/14/91 08:25	01/14/91 09:35	1.17	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	02/09/91 13:00	02/09/91 14:30	1.50	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	03/11/91 07:57	03/11/91 10:30	2.55	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	06/27/91 09:30	06/27/91 12:30	3.00	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	07/25/91 16:45	07/25/91 20:30	3.75	3PT-M14B	SRO
SIS	3PT-M14B	08/16/91 08:05	08/16/91 10:00	1.92	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	10/09/91 08:30	10/09/91 14:00	5.50	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	10/16/91 03:30	10/16/91 05:45	2.25	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	11/07/91 16:15	11/07/91 16:15	0.00	3PT-M14B	SRO
SIS	3PT-M14B	12/05/91 08:13	12/05/91 10:00	1.78	3PT-M14B (SIS LOGIC TRAIN B)	SRO
SIS	3PT-M14B	12/31/91 08:45	12/31/91 10:15	1.50	3PT-M14B	SRO
SIS	3PT-M16	01/17/85 18:16	01/17/85 18:32	0.27	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	01/17/85 18:56	01/17/85 19:18	0.37	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	01/17/85 19:26	01/17/85 19:46	0.33	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	02/15/85 03:35	02/15/85 03:55	0.33	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	02/15/85 04:52	02/15/85 05:18	0.43	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	02/15/85 05:26	02/15/85 05:42	0.27	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	03/16/85 09:50	03/16/85 10:09	0.32	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	03/16/85 10:54	03/16/85 11:15	0.35	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	03/16/85 13:42	03/16/85 14:03	0.35	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	04/16/85 02:25	04/16/85 02:45	0.33	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	04/16/85 03:22	04/16/85 03:42	0.33	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	04/16/85 04:02	04/16/85 04:21	0.32	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	05/16/85 12:31	05/16/85 12:49	0.30	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	05/16/85 13:46	05/16/85 14:05	0.32	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	05/16/85 17:48	05/16/85 18:12	0.40	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	09/11/85 13:26	09/11/85 13:45	0.32	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	09/11/85 14:12	09/11/85 14:28	0.27	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	09/11/85 14:40	09/11/85 14:55	0.25	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	10/11/85 01:30	10/11/85 01:50	0.33	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	10/11/85 02:26	10/11/85 02:45	0.32	STARTED/SECURED 32 SIP FOR PT	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
SIS	3PT-M16	10/11/85 02:57	10/11/85 03:17	0.33	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	11/11/85 12:47	11/11/85 13:10	0.38	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	11/11/85 13:30	11/11/85 13:55	0.42	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	11/11/85 17:30	11/11/85 18:00	0.50	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	12/12/85 02:03	12/12/85 02:33	0.50	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	12/12/85 02:39	12/12/85 02:47	0.13	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	12/12/85 02:48	12/12/85 02:59	0.18	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	01/09/86 00:55	01/09/86 01:15	0.33	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	01/09/86 01:45	01/09/86 02:05	0.33	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	01/09/86 02:13	01/09/86 02:30	0.28	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	02/08/86 12:43	02/08/86 13:08	0.42	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	02/08/86 14:10	02/08/86 14:38	0.47	STARTED/SECURED 32 SIP	SRO
SIS	3PT-M16	02/08/86 17:48	02/08/86 18:06	0.30	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	03/11/86 01:50	03/11/86 02:10	0.33	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	03/11/86 03:00	03/11/86 03:25	0.42	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	03/11/86 03:50	03/11/86 04:05	0.25	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	04/10/86 02:14	04/10/86 02:35	0.35	STARTED/SECURED 31 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	04/10/86 03:20	04/10/86 03:47	0.45	STARTED/SECURED 32 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	04/10/86 04:20	04/10/86 04:45	0.42	STARTED/SECURED 33 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	05/11/86 18:05	05/11/86 18:21	0.27	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	05/11/86 18:49	05/11/86 19:10	0.35	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	05/11/86 19:17	05/11/86 19:33	0.27	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	06/12/86 10:10	06/12/86 10:23	0.22	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	06/12/86 11:45	06/12/86 12:05	0.33	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	06/12/86 13:00	06/12/86 13:20	0.33	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	06/12/86 18:35	06/12/86 19:00	0.42	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	06/12/86 19:53	06/12/86 20:15	0.37	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	06/12/86 20:35	06/12/86 20:57	0.37	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	07/13/86 19:32	07/13/86 19:51	0.32	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	07/13/86 20:24	07/13/86 20:41	0.28	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	07/13/86 20:56	07/13/86 21:13	0.28	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	08/08/86 07:55	08/08/86 13:50	5.92	3PT-M16 (SIP FUNCTIONAL)	SRO
SIS	3PT-M16	08/08/86 10:28	08/08/86 10:58	0.50	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	08/08/86 12:58	08/08/86 13:17	0.32	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	08/08/86 13:34	08/08/86 13:50	0.27	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	09/12/86 02:03	09/12/86 02:22	0.32	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	09/12/86 02:43	09/12/86 03:07	0.40	STARTED/SECURED 32 SIP	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
SIS	3PT-M16	09/12/86 03:15	09/12/86 03:31	0.27	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	10/07/86 20:30	10/07/86 20:48	0.30	31 SIP IN SERVICE FOR PT	SRO
SIS	3PT-M16	10/07/86 21:10	10/07/86 21:27	0.28	32 SIP IN SERVICE FOR PT	SRO
SIS	3PT-M16	10/07/86 21:37	10/07/86 21:54	0.28	33 SIP IN SERVICE FOR PT	SRO
SIS	3PT-M16	11/05/86 17:55	11/05/86 18:13	0.30	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	11/05/86 18:37	11/05/86 18:38	0.02	STARTED/SECURED 32 SIP	SRO
SIS	3PT-M16	11/05/86 19:19	11/05/86 19:33	0.23	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	12/06/86 03:45	12/06/86 04:03	0.30	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	12/06/86 04:22	12/06/86 04:42	0.33	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	12/06/86 04:59	12/06/86 05:15	0.27	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	01/04/87 09:39	01/04/87 09:55	0.27	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	01/04/87 10:27	01/04/87 10:49	0.37	STARTED/SECURED 32 SIP	SRO
SIS	3PT-M16	01/04/87 11:00	01/04/87 11:15	0.25	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	02/04/87 01:12	02/04/87 01:42	0.50	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	02/04/87 02:52	02/04/87 03:17	0.42	STARTED/SECURED 32 SIP	SRO
SIS	3PT-M16	02/04/87 03:33	02/04/87 03:53	0.33	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	03/11/87 01:44	03/11/87 02:00	0.27	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	03/11/87 02:34	03/11/87 02:50	0.27	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	03/11/87 03:05	03/11/87 03:21	0.27	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	04/06/87 12:38	04/06/87 13:00	0.37	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	04/06/87 13:43	04/06/87 14:08	0.42	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	04/06/87 14:20	04/06/87 14:37	0.28	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	09/04/87 08:40	09/04/87 09:00	0.33	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	09/04/87 09:18	09/04/87 09:57	0.65	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	09/04/87 09:50	09/04/87 10:10	0.33	STARTED/SECURED 32 SIP	SRO
SIS	3PT-M16	10/05/87 19:01	10/05/87 19:27	0.43	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	10/05/87 20:00	10/05/87 20:30	0.50	STARTED/SECURED 32 SIP	SRO
SIS	3PT-M16	10/05/87 20:45	10/05/87 21:01	0.27	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	11/04/87 19:14	11/04/87 19:16	0.03	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	11/05/87 04:10	11/05/87 04:28	0.30	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	11/05/87 04:50	11/05/87 05:15	0.42	STARTED/SECURED 32 SIP	SRO
SIS	3PT-M16	11/29/87 02:28	11/29/87 02:47	0.32	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	11/29/87 03:15	11/29/87 03:32	0.28	STARTED/SECURED 32 SIP	SRO
SIS	3PT-M16	11/29/87 03:59	11/29/87 04:15	0.27	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	12/26/87 01:51	12/26/87 02:09	0.30	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	12/26/87 02:21	12/26/87 02:51	0.50	STARTED/SECURED 32 SIP	SRO
SIS	3PT-M16	12/26/87 03:31	12/26/87 03:46	0.25	STARTED/SECURED 33 SIP	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
SIS	3PT-M16	01/26/88 12:10	01/26/88 12:36	0.43	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	01/26/88 12:45	01/26/88 13:00	0.25	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	01/26/88 13:15	01/26/88 13:30	0.25	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	02/25/88 18:30	02/25/88 18:50	0.33	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	02/25/88 19:22	02/25/88 19:47	0.42	STARTED/SECURED 32 SIP	SRO
SIS	3PT-M16	02/25/88 19:55	02/25/88 20:06	0.18	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	03/26/88 20:40	03/26/88 21:00	0.33	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	03/27/88 01:25	03/27/88 01:50	0.42	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	03/27/88 02:20	03/27/88 02:37	0.28	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	04/28/88 03:17	04/28/88 03:33	0.27	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	04/28/88 03:50	04/28/88 04:05	0.25	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	04/28/88 04:24	04/28/88 04:39	0.25	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	05/30/88 18:10	05/30/88 18:25	0.25	STARTED/SECURED 31 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	05/30/88 19:40	05/30/88 20:00	0.33	STARTED/SECURED 32 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	05/30/88 20:40	05/30/88 21:10	0.50	STARTED/SECURED 33 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	06/19/88 17:03	06/19/88 17:21	0.30	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	06/19/88 17:56	06/19/88 18:14	0.30	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	06/19/88 18:34	06/19/88 18:54	0.33	STARTED/SECURED 32 SIP	SRO
SIS	3PT-M16	07/08/88 02:15	07/08/88 02:32	0.28	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	07/08/88 02:57	07/08/88 03:14	0.28	STARTED/SECURED 32 SIP	SRO
SIS	3PT-M16	07/08/88 03:21	07/08/88 03:40	0.32	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	08/28/88 10:22	08/28/88 10:40	0.30	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	08/28/88 10:55	08/28/88 11:08	0.22	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	08/28/88 11:25	08/28/88 11:34	0.15	STARTED/SECURED 32 SIP	SRO
SIS	3PT-M16	09/21/88 02:03	09/21/88 02:24	0.35	STARTED/SECURED 31 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	09/21/88 02:52	09/21/88 03:13	0.35	STARTED/SECURED 32 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	09/21/88 03:36	09/21/88 03:55	0.32	STARTED/SECURED 33 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	10/17/88 19:49	10/17/88 20:10	0.35	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	10/17/88 20:25	10/17/88 20:47	0.37	STARTED/SECURED 32 SIP	SRO
SIS	3PT-M16	10/17/88 21:01	10/17/88 21:22	0.35	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	11/20/88 13:37	11/20/88 14:25	0.80	STARTED/SECURED 31 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	11/20/88 15:45	11/20/88 16:08	0.38	STARTED/SECURED 32 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	11/20/88 16:42	11/20/88 16:58	0.27	STARTED/SECURED 33 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	12/14/88 03:15	12/14/88 03:37	0.37	STARTED/SECURED 31 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	12/14/88 03:59	12/14/88 04:25	0.43	STARTED/SECURED 32 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	12/14/88 04:33	12/14/88 05:53	1.33	STARTED/SECURED 33 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	01/07/89 02:48	01/07/89 03:10	0.37	STARTED/SECURED 31 SIP FOR PT & FILLED ACC	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
SIS	3PT-M16	01/07/89 03:52	01/07/89 04:08	0.27	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	01/07/89 04:34	01/07/89 04:49	0.25	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	01/31/89 09:51	01/31/89 10:07	0.27	STARTED/SECURED 31 SIP FOR PT & FILLED ACC	SRO
SIS	3PT-M16	01/31/89 10:34	01/31/89 10:53	0.32	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	01/31/89 11:05	01/31/89 11:21	0.27	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	06/02/89 00:35	06/02/89 01:08	0.55	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	06/02/89 01:30	06/02/89 01:40	0.17	STARTED/SECURED 32 SIP	SRO
SIS	3PT-M16	06/02/89 01:53	06/02/89 02:18	0.42	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	07/03/89 12:38	07/03/89 12:55	0.28	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	07/03/89 13:40	07/03/89 13:58	0.30	STARTED/SECURED 32 SIP	SRO
SIS	3PT-M16	07/03/89 14:40	07/03/89 14:56	0.27	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	07/28/89 10:47	07/28/89 11:12	0.42	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	07/28/89 12:20	07/28/89 12:40	0.33	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	07/28/89 13:00	07/28/89 13:25	0.42	STARTED/SECURED 32 SIP	SRO
SIS	3PT-M16	08/22/89 01:37	08/22/89 01:52	0.25	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	08/22/89 02:20	08/22/89 02:35	0.25	STARTED/SECURED 32 SIP	SRO
SIS	3PT-M16	08/22/89 02:53	08/22/89 03:08	0.25	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	09/15/89 10:00	09/15/89 10:20	0.33	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	09/15/89 11:10	09/15/89 11:29	0.32	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	09/15/89 12:05	09/15/89 12:28	0.38	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	10/10/89 17:29	10/10/89 17:50	0.35	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	10/10/89 18:16	10/10/89 18:34	0.30	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	10/10/89 18:48	10/10/89 19:07	0.32	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	11/04/89 02:42	11/04/89 03:02	0.33	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	11/04/89 03:36	11/04/89 03:56	0.33	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	11/04/89 04:15	11/04/89 04:32	0.28	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	11/28/89 10:12	11/28/89 10:32	0.33	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	11/28/89 11:17	11/28/89 11:37	0.33	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	11/28/89 12:00	11/28/89 12:20	0.33	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	12/22/89 02:55	12/22/89 03:20	0.42	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	12/22/89 03:37	12/22/89 04:03	0.43	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	12/22/89 04:10	12/22/89 04:35	0.42	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	01/17/90 18:48	01/17/90 19:18	0.50	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	01/17/90 20:01	01/17/90 20:20	0.32	STARTED/SECURED 32 SIP	SRO
SIS	3PT-M16	01/17/90 20:45	01/17/90 21:00	0.25	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	02/10/90 09:58	02/10/90 10:16	0.30	STARTED/SECURED 31 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	02/10/90 10:45	02/10/90 11:12	0.45	STARTED/SECURED 32 SIP FOR PT	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
SIS	3PT-M16	02/10/90 11:38	02/10/90 11:56	0.30	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	03/20/90 12:12	03/20/90 12:37	0.42	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	03/20/90 13:03	03/20/90 13:20	0.28	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	03/20/90 13:36	03/20/90 13:51	0.25	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	04/11/90 13:26	04/11/90 13:50	0.40	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	04/11/90 14:30	04/11/90 14:45	0.25	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	04/11/90 17:37	04/11/90 17:57	0.33	STARTED/SECURED 32 SIP	SRO
SIS	3PT-M16	05/07/90 01:35	05/07/90 01:55	0.33	STARTED/SECURED 31 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	05/07/90 02:18	05/07/90 02:45	0.45	STARTED/SECURED 32 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	05/07/90 03:30	05/07/90 03:48	0.30	STARTED/SECURED 33 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	05/31/90 03:05	05/31/90 03:25	0.33	STARTED/SECURED 31 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	05/31/90 04:48	05/31/90 05:02	0.23	STARTED/SECURED 32 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	05/31/90 05:48	05/31/90 06:04	0.27	STARTED/SECURED 33 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	06/25/90 11:22	06/25/90 11:44	0.37	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	06/25/90 12:40	06/25/90 13:11	0.52	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	06/25/90 13:50	06/25/90 14:10	0.33	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	07/23/90 09:48	07/23/90 10:04	0.27	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	07/23/90 10:51	07/23/90 11:10	0.32	STARTED/SECURED 32 SIP	SRO
SIS	3PT-M16	07/23/90 11:36	07/23/90 11:55	0.32	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	08/20/90 19:19	08/20/90 19:43	0.40	STARTED/SECURED 31 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	08/20/90 20:37	08/20/90 21:05	0.47	STARTED/SECURED 32 SIP	SRO
SIS	3PT-M16	08/20/90 21:32	08/20/90 21:52	0.33	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	12/04/90 13:32	12/04/90 13:56	0.40	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	12/04/90 14:23	12/04/90 14:48	0.42	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	12/04/90 15:10	12/04/90 15:33	0.38	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	01/03/91 09:35	01/03/91 09:59	0.40	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	01/03/91 10:15	01/03/91 10:40	0.42	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	01/03/91 10:59	01/03/91 11:15	0.27	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	01/30/91 10:30	01/30/91 12:58	2.47	3PT-M16 (SIP FUNCTIONAL)	SRO
SIS	3PT-M16	01/30/91 11:02	01/30/91 11:19	0.28	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	01/30/91 11:46	01/30/91 12:07	0.35	STARTED/SECURED 32 SIP	SRO
SIS	3PT-M16	01/30/91 12:22	01/30/91 12:39	0.28	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	02/23/91 09:50	02/23/91 10:05	0.25	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	02/23/91 10:30	02/23/91 10:50	0.33	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	02/23/91 11:05	02/23/91 11:25	0.33	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	03/19/91 10:38	03/19/91 10:56	0.30	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	03/19/91 11:22	03/19/91 11:51	0.48	STARTED/SECURED 32 SIP	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
SIS	3PT-M16	03/19/91 12:07	03/19/91 12:26	0.32	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	04/09/91 00:11	04/09/91 00:29	0.30	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	04/09/91 00:51	04/09/91 01:13	0.37	STARTED/SECURED 32 SIP	SRO
SIS	3PT-M16	04/09/91 01:19	04/09/91 01:37	0.30	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	05/03/91 02:52	05/03/91 05:00	2.13	3PT-M16 (SIP FUNCTIONAL)	SRO
SIS	3PT-M16	05/23/91 03:53	05/23/91 04:10	0.28	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	05/23/91 04:30	05/23/91 04:49	0.32	STARTED/SECURED 32 SIP	SRO
SIS	3PT-M16	05/23/91 05:04	05/23/91 05:21	0.28	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	06/17/91 10:02	06/17/91 10:17	0.25	STARTED/SECURED 31 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	06/17/91 10:55	06/17/91 11:10	0.25	STARTED/SECURED 32 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	06/17/91 11:28	06/17/91 11:50	0.37	STARTED/SECURED 33 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	07/13/91 02:20	07/13/91 02:50	0.50	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	07/13/91 09:55	07/13/91 10:16	0.35	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	07/13/91 10:43	07/13/91 11:00	0.28	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	08/06/91 09:44	08/06/91 10:00	0.27	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	08/06/91 10:22	08/06/91 10:41	0.32	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	08/06/91 10:49	08/06/91 11:06	0.28	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	08/30/91 19:56	08/30/91 20:18	0.37	STARTED/SECURED 31 SIP FOR PT	SRO
SIS	3PT-M16	08/31/91 10:00	08/31/91 10:21	0.35	STARTED/SECURED 32 SIP FOR PT	SRO
SIS	3PT-M16	08/31/91 10:41	08/31/91 11:00	0.32	STARTED/SECURED 33 SIP FOR PT	SRO
SIS	3PT-M16	09/23/91 10:00	09/23/91 12:30	2.50	STARTED/SECURED 31 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	09/23/91 21:33	09/23/91 22:00	0.45	STARTED/SECURED 32 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	09/23/91 22:50	09/23/91 23:14	0.40	STARTED/SECURED 33 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	10/17/91 10:15	10/17/91 10:26	0.18	STARTED/SECURED 31 SIP	SRO
SIS	3PT-M16	10/17/91 11:08	10/17/91 11:27	0.32	STARTED/SECURED 33 SIP	SRO
SIS	3PT-M16	10/17/91 12:00	10/17/91 12:24	0.40	STARTED/SECURED 32 SIP	SRO
SIS	3PT-M16	11/13/91 18:19	11/13/91 18:35	0.27	STARTED/SECURED 31 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	11/13/91 19:03	11/13/91 19:33	0.50	STARTED/SECURED 32 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	11/13/91 19:50	11/13/91 20:15	0.42	STARTED/SECURED 33 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	12/10/91 05:20	12/10/91 05:44	0.40	STARTED/SECURED 33 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	12/10/91 10:10	12/10/91 10:29	0.32	STARTED/SECURED 31 SIP FOR 3PT-M16	SRO
SIS	3PT-M16	12/10/91 11:06	12/10/91 11:26	0.33	STARTED/SECURED 32 SIP FOR 3PT-M16	SRO
SIS	3PT-M24	09/14/88 19:15	09/14/88 20:00	0.75	3PT-M24 (LO PRESSURE STEAM PUMP FUNCTIONAL)	SRO
SIS	3PT-Q23	11/05/86 02:40	11/05/86 02:40	0.00	3PT-Q23 (HI HEAD SI VALVES)	SRO
SIS	3PT-Q23	04/12/88 17:48	04/12/88 17:48	0.00	3PT-Q23 (HI HEAD SI VALVES)	SRO
SIS	3PT-Q23	05/07/90 07:40	05/07/90 09:35	1.92	3PT-Q23 (HI HEAD SI VALVES)	SRO
SIS	3PT-R003A	06/03/89 21:53	06/03/89 22:40	0.78	STARTED/SECURED 3PT-R3A RECIRC SWITCH TEST	SRO

Table F5 Surveillance Test (ST) Performance Log

System	Test #	START DATE	END DATE	DURATION	EVENT DESCRIPTION	Source
SIS	3PT-R003A	09/17/90 16:45	09/17/90 19:05	2.33	3PT-R003A (SI RECIRC SWITCH FUNCTIONAL)	SRO
SIS	3PT-R003A	11/18/90 11:00	11/18/90 12:10	1.17	3PT-R003A (SI RECIRC SWITCH FUNCTIONAL)	SRO
SIS	3PT-R003A	11/18/90 14:10	11/18/90 15:05	0.92	3PT-R003A (SI RECIRC SWITCH FUNCTIONAL)	SRO
SIS	3PT-R003B	08/04/87 17:47	08/04/87 19:30	1.71	3PT-R003B (SI BKR TIMING/BUS STRIPPING)	SRO
SIS	3PT-R003B	09/18/90 14:28	09/18/90 16:00	1.53	3PT-R003B (SI BKR TIMING/BUS STRIPPING) TEST GROUP	SRO
SIS	3PT-R003B	12/03/90 17:35	12/03/90 19:30	1.92	3PT-R003B (SI BKR TIMING/BUS STRIPPING) TEST GROUP	SRO
SIS	3PT-R003B	12/04/90 13:00	12/04/90 14:40	1.67	3PT-R003B (SI BKR TIMING/BUS STRIPPING) ON BUS 3A	SRO
SIS	3PT-R003C	08/16/87 20:40	08/16/87 21:42	1.04	3PT-R003C (SI TRAIN A & B)	SRO
SIS	3PT-R003C	06/04/89 13:12	06/04/89 13:38	0.43	3PT-R003C (SI TRAIN A & B)	SRO
SIS	3PT-R003C	06/04/89 16:51	06/04/89 17:10	0.32	3PT-R003C (SI TRAIN A & B)	SRO
SIS	3PT-R003C	12/04/90 17:49	12/04/90 19:41	1.87	3PT-R003C (SI TRAIN A & B)	SRO
SIS	3PT-R003C	12/04/90 17:49	12/04/90 19:53	2.07	3PT-R003C (SI TRAIN A & B)	SRO
SIS	3PT-R003C	12/04/90 19:40	12/04/90 19:41	0.02	STARTED/SECURED 32 RHRP FOR 3PT-R003C	SRO
SIS	3PT-R003D	09/20/85 19:35	09/20/85 20:05	0.50	3PT-R003D (SI BLACKOUT)	SRO
SIS	3PT-R003D	08/17/87 21:05	08/17/87 21:05	0.00	3PT-R003D (SI BLACKOUT)	SRO
SIS	3PT-R003D	06/05/89 20:52	06/05/89 22:15	1.38	3PT-R003D (SI BLACKOUT)	SRO
SIS	3PT-R003D	12/09/90 14:16	12/09/90 14:24	0.13	3PT-R003D (SI BLACKOUT) BUS 6A DID NOT CLOSE	SRO
SIS	3PT-R003E	06/04/89 19:30	06/04/89 19:50	0.33	3PT-R003E (SI CONTAINMENT ISOL)	SRO
SIS	3PT-R17	02/08/89 12:46	02/08/89 16:07	3.35	3PT-R17/17A (ACCUM PRESS CAL)	SRO
SIS	3PT-R64	05/13/86 13:00	05/13/86 13:35	0.58	3PT-R064 (SI FULL FLOW TEST)	SRO
SIS	3PT-R64	07/17/87 00:14	07/17/87 00:17	0.05	STARTED/SECURED 31 SIP FOR 3PT-R64	SRO
SIS	3PT-R64	07/17/87 00:28	07/17/87 00:29	0.02	STARTED/SECURED 32 SIP FOR 3PT-R64	SRO
SIS	3PT-R64	07/17/87 00:39	07/17/87 00:58	0.32	STARTED/SECURED 33 SIP FOR 3PT-R64	SRO
SIS	3PT-R12	08/03/88 18:30	08/03/88 18:50	0.33	STARTED/SECURED 31 SIP FOR 3PT-RA12	SRO
SIS	3PT-V29	08/09/87 13:20	08/09/87 13:30	0.17	STARTED/SECURED 32 SIP FOR 3PT-V29	SRO
SIS	3PT-V29	08/09/87 14:00	08/09/87 14:05	0.08	STARTED/SECURED 33 SIP FOR 3PT-V29	SRO
SIS	3PT-V29	11/23/90 13:00	11/23/90 13:10	0.17	STARTED/SECURED 33 SIP FOR 3PT-V29	SRO
SIS	3PT-V29	11/23/90 13:37	11/23/90 13:45	0.13	STARTED/SECURED 33 SIP FOR 3PT-V29	SRO

Table F6 Surveillance Test (ST) Performance Log Summary

SYSTEM	PROCEDURE NUMBER	REV.	TEST PROCEDURE TITLE	TEST FREQUENCY	ACTUAL PERFORMANCE	ACCUMULATED DURATION
PPR	3PC-R01A	7	RC LOOP RTD CALIBRATION - NARROW RANGE	REFUELING	2	
PPR	3PC-R01B	6	RC LOOP RTD CALIBRATION - TAVG & DELTA T	REFUELING	1	
PPR	3PC-R03A	8	RC LOOP RTD CALIBRATION - WIDE RANGE	REFUELING	4	
RHR	3PC-R08	8	RESIDUAL HEAT FLOW CALIBRATION	REFUELING		
CVC	3PC-R09	6	BORIC ACID TANK LEVEL CALIBRATION	REFUELING	2	12.00
CVC	3PC-R11	6	VOLUME CONTROL TANK LEVEL CALIBRATION	REFUELING	1	7.67
PPR	3PC-R12	4	CONTAINMENT PRESSURE CALIBRATION	REFUELING	1	
CVC	3PC-R15	6	BORIC ACID MAKEUP FLOW CHANNEL CALIBRATION	REFUELING		
SIS	3PC-R16A	8	31 ACCUMULATOR LEVEL SYSTEM CHECK & CALIBRATION	REFUELING	2	
SIS	3PC-R17	5	ACCUMULATORS PRESSURE CALIBRATION	REFUELING	1	
CVC	3PC-R21	6	CALIBRATION CHECK OF BORON INJECTION TANK RECIRCULATION FLOW INDICATOR	REFUELING		
AC4	3PC-R27A	0	480V UNDERVOLTAGE RELAYS' INSPECTION AND CALIBRATION	REFUELING		
AC4	3PC-R27B	0	480V DEGRADED GRID VOLTAGE RELAYS' CALIBRATION	REFUELING		
AC4	3PC-R27C	0	480V ALARM RELAYS' INSPECTION AND CALIBRATION	REFUELING		
CVC	3PC-R34	2	CVCS MONITOR TANKS LEVEL CALIBRATION	REFUELING		
SIS	3PC-R38A	2	CONTAINMENT SUMP LEVEL TRANSMITTER'S CHECK AND CALIBRATION	REFUELING		
SIS	3PC-R38B	1	CONTAINMENT SUMP LEVEL SYSTEM ANALOG COMPONENTS' CHECK AND CALIBRATION	REFUELING		
SIS	3PC-R39A	2	RECIRCULATION SUMP LEVEL TRANSMITTER'S CHECK AND CALIBRATION	REFUELING		
SIS	3PC-R39B	1	RECIRCULATION SUMP LEVEL SYSTEM ANALOG COMPONENTS' CHECK AND CALIBRATION	REFUELING		
CSS	3PT-5Y01	3	CONTAINMENT SPRAY NOZZLE TEST	5 YEAR		
MSS	3PT-CS01	6	MAIN STEAM VALVES (PCV-1310A AND PCV-1310B)	AS NEEDED	1	
CCW	3PT-CS03	5	AUXILIARY COOLANT SYSTEM VALVES	AS NEEDED		
RHR	3PT-CS04	8	LOW HEAD INJECTION LINE, ACCUMULATOR AND RHR CHECK VALVE LEAKAGE TEST	AS NEEDED	5	14.13
CSS	3PT-CS06	5	CONTAINMENT SPRAY ADDITIVE TANK DISCHARGE ISOLATION VELVES	AS NEEDED		
SIS	3PT-CS08	5	SAFETY INJECTION SYSTEM RWST VALVES	AS NEEDED		
SIS	3PT-CS09	6	SAFETY INJECTION TO HOT LEG	AS NEEDED	1	

Table F6 Surveillance Test (ST) Performance Log Summary

SYSTEM	PROCEDURE NUMBER	REV.	TEST PROCEDURE TITLE	TEST FREQUENCY	ACTUAL PERFORMANCE	ACCUMULATED DURATION
RHR	3PT-CS13	5	RHR MINIFLOW VALVES 743 AND 1870	AS NEEDED		
RHR	3PT-CS14	6	RESIDUAL HEAT REMOVAL SYSTEM VALVE TEST	AS NEEDED	2	0.61
AFW	3PT-CS15	8	AUX BOILER (MOTOR DRIVEN) FEED WATER PUMP & VALVE TEST	AS NEEDED		
FWS	3PT-CS17	2	BOILER FEEDWATER CHECK VALVE CLOSURE TEST	AS NEEDED		
PPR	3PT-CS18	4	CONTAINMENT ISOLATION VALVES FUNCTIONAL	AS NEEDED	1	10.58
AFW	3PT-CS19	6	STEAM DRIVEN AUX BOILER FEED PUMP OPERATION TEST	AS NEEDED	1	0.25
CSS	3PT-CS22	4	CONTAINMENT SPRAY PUMP AND VALVES	AS NEEDED	3	1.00
SIS	3PT-CS23	6	HI-HEAD SAFETY INJECTION VALVES	AS NEEDED		
SIS	3PT-CS24	4	HI-HEAD SAFETY INJECTION OPERATED VALVES	AS NEEDED		
PPR	3PT-CS25	1	RCP OIL COLLECTION TANK	AS NEEDED	1	1.92
CVC	3PT-CS26	0	EMERGENCY BORATION FLOW PATH VALVE: CH-MOV-333	AS NEEDED		
PPR	3PT-CS29	0	REACTOR HEAD VENT VALVES TEST	AS NEEDED		
PPR	3PT-M02	23	REACTOR COOLANT TEMPERATURE ANALOG FUNCTIONAL	MONTHLY	68	351.50
PPR	3PT-M03	15	REACTOR COOLANT FLOW ANALOG FUNCTIONAL	MONTHLY	54	167.62
PPR	3PT-M04	11	PRESSURIZER LEVEL ANALOG FUNCTIONAL	MONTHLY	45	97.60
PPR	3PT-M05	19	PRESSURIZER PRESSURE ANALOG FUNCTIONAL	MONTHLY	52	188.70
RPS	3PT-M06A		U.V. AND U.F. ANALOG CHANNEL FUNCTIONAL	MONTHLY	33	66.11
RPS	3PT-M06B		U.V. AND U.F. ANALOG CHANNEL FUNCTIONAL	MONTHLY	33	69.04
PPR	3PT-M07	0	RPI ANALOG SYSTEM FUNCTIONAL - SHUTDOWN BANKS A&B	MONTHLY	51	218.82
PPR	3PT-M07A	0	RPI ANALOG SYSTEM FUNCTIONAL - SHUTDOWN BANKS C&D	MONTHLY	1	1.50
PPR	3PT-M07B	0	RPI ANALOG SYSTEM FUNCTIONAL - CONTROL BANKS B&D	MONTHLY	4	6.88
PPR	3PT-M07C	0	RPI ANALOG SYSTEM FUNCTIONAL - CONTROL BANKS A&C	MONTHLY	1	2.92
MSS	3PT-M08	14	STEAM GENERATOR LEVEL ANALOG FUNCTIONAL	MONTHLY	13	
PPR	3PT-M09	16	CONTAINMENT PRESSURE ANALOG FUNCTIONAL	MONTHLY	33	67.97
MSS	3PT-M10	11	STEAM LINE PRESSURE ANALOG FUNCTIONAL	MONTHLY	6	
MSS	3PT-M11	20	TURBINE FIRST STAGE PRESSURE ANALOG FUNCTIONAL	MONTHLY	8	

Table F6 Surveillance Test (ST) Performance Log Summary

SYSTEM	PROCEDURE NUMBER	REV.	TEST PROCEDURE TITLE	TEST FREQUENCY	ACTUAL PERFORMANCE	ACCUMULATED DURATION
PPR	3PT-M13		PROCEDURE NOT FOUND IN THE ST LIST.	MONTHLY	2	7.48
PPR	3PT-M13A	12	REACTOR PROTECTION LOGIC CHANNEL FUNCTIONAL TEST	MONTHLY	123	111.86
PPR	3PT-M13B	13	REACTOR PROTECTION LOGIC CHANNEL FUNCTIONAL TEST	MONTHLY	35	129.58
SIS	3PT-M14		PROCEDURE NOT FOUND IN THE ST LIST.	MONTHLY	1	2.11
SIS	3PT-M14A	15	SAFETY INJECTION SYSTEM LOGIC FUNCTIONAL - TRAIN A	MONTHLY	57	123.29
SIS	3PT-M14B	17	SAFETY INJECTION SYSTEM LOGIC FUNCTIONAL - TRAIN B	MONTHLY	54	115.29
SIS	3PT-M16	16	SAFETY INJECTION PUMP FUNCTIONAL TEST	MONTHLY	237	96.67
CSS	3PT-M17	15	CONTAINMENT SPRAY PUMP FUNCTIONAL TEST	MONTHLY	197	73.90
RHR	3PT-M18	14	RHR PUMP FUNCTIONAL TEST	MONTHLY	164	107.48
CCW	3PT-M19	11	AUXILIARY COMPONENT COOLING PUMP FUNCTION TEST	MONTHLY		
AFW	3PT-M20		PROCEDURE NOT FOUND IN THE ST LIST.	MONTHLY	223	77.42
AFW	3PT-M20A	3	AUX BOILER FEED PUMP FUNCTIONAL TEST	MONTHLY		
AFW	3PT-M20B	3	AUX BOILER FEED PUMP FUNCTIONAL TEST	MONTHLY		
SIS	3PT-M24	8	LOW PRESSURE STEAM DUMP FUNCTIONAL	MONTHLY	1	0.75
SWS	3PT-M35	10	SERVICE WATER PUMP OPERATIONAL TEST	MONTHLY		
CCW	3PT-M46	8	COMPONENT COOLING PUMPS FUNCTIONAL TEST	MONTHLY		
AC4	3PT-M62	7	480V UNDERVOLTAGE/DEGRADED GRID PROTECTION SYSTEM FUNCTIONAL	MONTHLY		
CFC	3PT-M63		PROCEDURE NOT FOUND IN THE ST LIST.	MONTHLY	49	3588.25
CFC	3PT-M68A	4	CONTAINMENT HYDROGEN MONITORING SYSTEM FUNCTIONAL - A	MONTHLY	3	
CFC	3PT-M68B	4	CONTAINMENT HYDROGEN MONITORING SYSTEM FUNCTIONAL - B	MONTHLY	2	
CVC	3PT-Q08	8	BORIC ACID ELECTRICAL HEAT TRACE SYSTEM FUNCTIONAL	QUARTERLY		
FWS	3PT-Q14	10	FEEDWATER FLOW ANALOG FUNCTIONAL	QUARTERLY		
CCW	3PT-Q19	6	COMPONENT COOLING VALVE TEST	QUARTERLY		
AFW	3PT-Q20	5	SURVEILLANCE AND INSERVICE TEST - AUX BOILER FEED VALVES TEST	QUARTERL	7	4.47
MSS	3PT-Q21	8	SGBD CONTAINMENT ISOLATION VALVES - PCVS 1214-17 & 1223-26	QUARTERL	13	
RHR	3PT-Q22	8	RESIDUAL HEAT REMOVAL SYSTEM VALVES FUNCTIONAL	QUARTERL	3	

Table F6 Surveillance Test (ST) Performance Log Summary

SYSTEM	PROCEDURE NUMBER	REV.	TEST PROCEDURE TITLE	TEST FREQUENCY	ACTUAL PERFORMANCE	ACCUMULATED DURATION
SIS	3PT-Q23		PROCEDURE NOT FOUND IN THE ST LIST.	QUARTERL	3	
CSS	3PT-Q24	6	CONTAINMENT SPRAY PUMP DISCHARGE ISOLATION VALVES	QUARTERL	2	
PPR	3PT-Q28	5	PRESSURE RELIEF CONTAINMENT ISOLATION VALVES	QUARTERL	2	
PPR	3PT-Q32	6	RCS VALVES 519, 552, 548, 549	QUARTERL	1	
RHR	3PT-Q36	5	RHR COMPONENT COOLING RETURN VALVES & RHR HEAT EXCHANGER CHECK VALVES	QUARTERL	6	
CVC	3PT-Q38	4	BORIC ACID TRANSFER PUMP TEST	QUARTERL	2	22.00
CVC	3PT-Q40	5	BIT RECIRCULATION TO BORIC ACID TANK VALVES: 1851A AND 1851B	QUARTERL	2	
CFC	3PT-Q53		PROCEDURE NOT FOUND IN THE ST LIST.	QUARTERL	2	0.34
SWS	3PT-Q58	1	BACK-UP SERVICE WATER PUMP OPERATIONAL TEST	QUARTERLY		
CVC	3PT-Q62	1	CHARGING PUMP OPERABILITY TEST AND INSPECTION	QUARTERL	4	
MSS	3PT-Q70	1	SGBD RADIATION MONITOR FUNCTIONAL - RM19	QUARTERL	2	
CFC	3PT-Q77	0	CONTAINMENT FAN COOLER UNITS MANUAL ISOLATION VALVES	QUARTERLY		
SIS	3PT-R002	4	RECIRCULATION SUMP LEVEL CHANNEL FUNCTIONAL TEST	REFUELING		
SIS	3PT-R003A	7	SAFETY INJECTION SYSTEM TEST - RECIRCULATION SWITCHES	REFUELING	4	5.20
SIS	3PT-R003B	8	SAFETY INJECTION SYSTEM TEST - BREAKER TIMING/BUS STRIPPING	REFUELING	4	6.83
SIS	3PT-R003C	8	SAFETY INJECTION SYSTEM TEST - TRAIN A & TRAIN B	REFUELING	6	5.74
SIS	3PT-R003D	5	SAFETY INJECTION SYSTEM TEST - BLACKOUT TEST	REFUELING	6	2.10
SIS	3PT-R003E	8	SAFETY INJECTION SYSTEM TEST - CONTAINMENT ISOLATION	REFUELING	1	0.33
PPR	3PT-R004	7	FULL LENGTH ROD DROP TIME	REFUELING	2	
AFW	3PT-R007	10	AUX BOILER FEED PUMP'S FULL FLOW TEST	REFUELING	1	
RHR	3PT-R010A	7	RESIDUAL HEAT REMOVAL SYSTEM LEAKAGE TEST	REFUELING		
SIS	3PT-R012	7	HYDROGEN RECOMBINER FUNCTIONAL	REFUELING	1	0.33
SIS	3PT-R013	7	SURVEILLANCE AND ISSUANCE TEST - RECIRCULATION PUMP FUNCTIONAL TEST	REFUELING		
SIS	3PT-R015	8	S.I. HI-HEAD CHECK VALVE LEAK TEST 857'S	REFUELING		
SIS	3PT-R017		PROCEDURE NOT FOUND IN THE ST LIST.	REFUELING	1	3.35
SIS	3PT-R017A	4	31 ACCUMULATOR PRESSURE TRANSMITTER CHECK AND CALIBRATION	REFUELING		

Table F6 Surveillance Test (ST) Performance Log Summary

SYSTEM	PROCEDURE NUMBER	REV.	TEST PROCEDURE TITLE	TEST FREQUENCY	ACTUAL PERFORMANCE	ACCUMULATED DURATION
SIS	3PT-R017B	0	32 ACCUMULATOR PRESSURE TRANSMITTER CHECK AND CALIBRATION	REFUELING		
SIS	3PT-R017C	0	33 ACCUMULATOR PRESSURE TRANSMITTER CHECK AND CALIBRATION	REFUELING		
SIS	3PT-R017D	0	34 ACCUMULATOR PRESSURE TRANSMITTER CHECK AND CALIBRATION	REFUELING		
AFW	3PT-R020	6	TEMPERATURE SENSORS, ABFP BUILDING	REFUELING	1	
CFC	3PT-R024	5	CONTAINMENT FAN COOLER SYSTEM COIL FOULING INSPECTION	REFUELING		
PPR	3PT-R025	8	ISOLATION VALVE SEAL WATER SYSTEM TEST	REFUELING	1	2.23
AFW	3PT-R027	5	CITY WATER MAKEUP SUPPLY TO ABFPS	REFUELING	2	0.74
CFC	3PT-R032B	2	CONTAINMENT FAN COOLER UNIT FILTRATION SYSTEM	REFUELING		
RHR	3PT-R034	9	RESIDUAL HEAT REMOVAL SYSTEM VALVES 730 AND 731	REFUELING	2	
CSS	3PT-R035	5	CONTAINMENT ISOLATION VALVES LEAKAGE TEST	REFUELING	11	7.68
CFC	3PT-R041	4	CHARCOAL FILTER DOUSING INSPECTION	REFUELING		
CFC	3PT-R043	3	FAN COOLER UNIT HEAT DETECTORS	REFUELING		
SIS	3PT-R054	3	REACTOR CAVITY SUMP PUMP	REFUELING		
SIS	3PT-R056	3	REACTOR CAVITY LEVEL SENSORS TEST	REFUELING		
RHR	3PT-R063	4	INSERVICE INSPECTION TEST - VALVES MOV-889A & 889B TIMING	REFUELING	1	0.05
SIS	3PT-R064	5	HIGH-HEAD SAFETY INJECTION CHECK VALVES	REFUELING	5	1.80
RHR	3PT-R066	2	RWST TO RHR PUMPS CHECK VALVE FUNCTIONAL (881)	REFUELING	1	0.02
SIS	3PT-R067	3	LOW HEAD TO HIGH HEAD RECIRCULATION STOP VALVES - SI-MOV-888A AND 888B	REFUELING		
SIS	3PT-R071	4	RECIRCULATION PUMP DISCHARGE ISOLATION VALVES - SI-MOV-1802A & 1802B	REFUELING		
PPR	3PT-R074	3	REACTOR COOLANT ACCIDENT SAMPLING SYSTEM INTEGRITY	REFUELING	1	
SIS	3PT-R076	4	BORON INJECTION TANK INLET/OUTLET ISOLATION VALVES	REFUELING		
CVC	3PT-R089	1	BORIC ACID INJECTION SAFETY RELIEF VALVE: 1823	REFUELING		
SWS	3PT-R090A	2	EMERGENCY LOCAL OPERATION OF SERVICE WATER PUMPS	REFUELING		
CFC	3PT-R090B	3	EMERGENCY LOCAL OPERATIONAL TEST OF THE FAN COOLER UNITS	REFUELING	1	
AFW	3PT-R090D	3	EMERGENCY LOCAL OPERATION OF AUX BOILER FEED PUMPS	REFUELING	3	6.22
AFW	3PT-R090E	2	EMERGENCY LOCAL OPERATION OF AUX BOILER FEED PUMP #32	REFUELING		

Table F6 Surveillance Test (ST) Performance Log Summary

SYSTEM	PROCEDURE NUMBER	REV.	TEST PROCEDURE TITLE	TEST FREQUENCY	ACTUAL PERFORMANCE	ACCUMULATED DURATION
RPS	3PT-R091	4	REACTOR TRIP AND BYPASS BREAKER RESPONSE TIME AND TRIP VERIFICATION	REFUELING		
CFC	3PT-R106	1	FAN COOLER UNIT INLET SAFETY RELIEF VALVES SWN-42'S	REFUELING		
RHR	3PT-R107	1	31 & 32 RESIDUAL HEAT EXCHANGER OUTLET SAFETY RELIEF VALVES 733A & 733B	REFUELING		
SIS	3PT-R108	1	ACCUMULATOR SAFETY RELIEF VALVES 892 A,B,C, AND D	REFUELING		
PPR	3PT-R114	2	RCS BORIC ACID LEAKAGE AND CORROSION INSPECTION	REFUELING	1	0.60
CSS	3PT-R116	1	SPRAY ADDITIVE TANK RELIEF VALVE	REFUELING		
SIS	3PT-R121	0	32 SAFETY INJECTION PUMP SUCTION ISOLATION VALVES	REFUELING		
SIS	3PT-SA33	1	REFUELING WATER STORAGE TANK LO-LO LEVEL INSTRUMENTATION SYSTEM CHECK & CALIBRATION	SEMI-ANNUAL		
AFW	3PT-V05	6	STEAM GENERATOR SECONDARY HYDRO - 840 PSIG	VARIABLE	4	
AFW	3PT-V08A	1	SURVEILLANCE TEST - ABFP TURBINE MECHANICAL OVERSPEED TRIP TEST	VARIABLE		
AFW	3PT-V08B	5	SURVEILLANCE TEST - ABFP TURBINE MECHANICAL OVERSPEED TRIP TEST	VARIABLE	1	
EDG	3PT-V16	8	DIESEL GENERATOR FUNCTIONAL	VARIABLE	See V16aA,B,C	
EDG	3PT-V16A		EDG OPERABILITY CHECK	VARIABLE	283	183.35
EDG	3PT-V16B		EDG OPERABILITY CHECK	VARIABLE	279	176.57
EDG	3PT-V16C		EDG OPERABILITY CHECK	VARIABLE	286	183.98
FWS	3PT-V26	1	FEEDWATER REGULATOR VALVES' FUNCTIONAL	VARIABLE		
CVC	3PT-V29	1	FULL FLOW THROUGH BIT TANK CHECK VALVE TEST	VARIABLE	4	0.55
CFC	3PT-V33	2	RECIRCULATION FAN COOLER UNIT FLUSH	VARIABLE		

Table F7 Surveillance Test (ST) Demand Matrix

Procedure Number	Step Ref	System	Comp ID	Logic Model	Comp Type	App FM	Initial State	Requested Action	Demand Fraction
3PT-CS8									
3PT-CS8	3.5	SI	842	NO	MOV	CC	Closed	Open	1
3PT-CS8	3.6	SI	842	YES	MOV	OO	Open	Close	1
3PT-CS8	3.6	SI	842	YES	MOV	PG			0
3PT-CS8	3.6	SI	842	YES	RCK	NO		Operate	2
3PT-CS8	3.7	SI	843	NO	MOV	CC	Closed	Open	1
3PT-CS8	3.8	SI	843	YES	MOV	OO	Open	Close	1
3PT-CS8	3.8	SI	843	YES	MOV	PG			0
3PT-CS8	3.8	SI	843	YES	RCK	NO		Operate	2
3PT-CS8	3.9	SI	1810	NO	MOV	CC	Closed	Open	1
3PT-CS8	3.10	SI	1810	YES	MOV	CO	Closed	Stay Closed	1
3PT-CS8	3.10	SI	1810	YES	MOV	OO	Open	Close	1
3PT-CS8	3.10	SI	1810	YES	MOV	PG			0
3PT-CS8	3.10	SI	1810	YES	RCK	OO		Operate	2
3PT-CS9									
3PT-CS9	3.5	SI	856J	YES	MOV	OO	Open	Close	1
3PT-CS9	3.5	SI	856H	YES	MOV	OO	Open	Close	1
3PT-CS9	3.7	SI	856B	YES	MOV	CC	Closed	Open	1
3PT-CS9	3.8	SI	856B	NO	MOV	OO	Opened	Close	1
3PT-CS9	3.9	SI	856C	YES	MOV	OO	Open	Close	1
3PT-CS9	3.9	SI	856E	YES	MOV	OO	Open	Close	1
3PT-CS9	3.10	SI	856G	YES	MOV	CC	Closed	Open	1
3PT-CS9	3.11	SI	856G	NO	MOV	OO	Opened	Close	1
3PT-CS9	3.12	SI	856J	YES	MOV	CC	Closed	Open	1
3PT-CS9	3.12	SI	856H	NO	MOV	CC	Closed	Open	1
3PT-CS9	3.12	SI	856C	NO	MOV	CC	Closed	Open	1
3PT-CS9	3.12	SI	856E	NO	MOV	CC	Closed	Open	1
3PT-CS9	3.12	SI	856H	NO	MOV	CC	Closed	Open	1
3PT-CS9	3.12	SI	856C	NO	MOV	CC	Closed	Open	1
3PT-CS13									
3PT-CS13	3.4	RHR	743	YES	MOV	OO	Open	Close	1
3PT-CS13	3.5	RHR	743	NOFM	MOV	CC	Closed	Open	1
3PT-CS13	3.5	RHR	743	YES	RCK	NO	Standby	Operate	1
3PT-CS13	3.6	RHR	743	YES	MOV	OO	Open	Close	1
3PT-CS13	3.7	RHR	1870	YES	MOV	OO	Open	Close	1
3PT-CS13	3.8	RHR	1870	NOFM	MOV	CC	Closed	Open	1
3PT-CS13	3.8	RHR	1870	YES	RCK	NO	Standby	Operate	1
3PT-CS13	3.9	RHR	1870	YES	MOV	OO	Open	Close	1
3PT-CS13	3.10	RHR	743	NOFM	MOV	CC	Closed	Open	1
3PT-CS13	3.10	RHR	1870	NOFM	MOV	CC	Closed	Open	1
3PT-CS22									
3PT-CS22	3.3	SI	876A	NO	AOV	CO	Closed	Verify Closed	1
3PT-CS22	3.3	SI	876B	NO	AOV	CO	Closed	Verify Closed	1
3PT-CS22	3.6	SI	869A	NOFM	XVM	OO	Locked Open	Close	1
3PT-CS22	3.6	SI	1841	NO	XVM	OO	Locked Open	Close	1
3PT-CS22	3.6	SI	1862	YES	XVM	OC	Open	Verify Open	1
3PT-CS22	3.6	SI	1813	NO	AOV	CC	Closed	Open	1
3PT-CS22	3.6	SI	S-202	NO	XVM	CC	Closed	Open	1

Table F7 Surveillance Test (ST) Demand Matrix

Procedure Number	Step Ref	System	Comp ID	Logic Model	Comp Type	App FM	Initial State	Requested Action	Demand Fraction
3PT-CS22	3.6	SI	1806A	NO	XVM	CC	Locked Closed	Open	1
3PT-CS22	3.6	SI	1839A	NO	XVM	OC	Locked Open	Verify LO	1
3PT-CS22	3.6	SI	865A	YES	XVM	OC	Locked Open	Verify LO	1
3PT-CS22	3.6	SI	868A	NO	XVM	CO	Locked Closed	Verify LC	1
3PT-CS22	3.6	SI	878A	NO	XVM	CC	Locked Closed	Open	1
3PT-CS22	3.6	SI	878B	NO	XVM	CO	Locked Closed	Verify LC	1
3PT-CS22	3.6	SI	1806B	NO	XVM	CO	Locked Closed	Verify LC	1
3PT-CS22	3.6	SI	873B	NO	XVM	CC	Locked Closed	Open	1
3PT-CS22	3.6	SI	1839B	NO	XVM	OO	Locked Open	Close	1
3PT-CS22	3.6	SI	133	NO	XVM	CO	Closed	Verify Closed	1
3PT-CS22	3.6.1	SI	869A	NOFM	XVM	CC	Closed	Open	1
3PT-CS22	3.6.1	SI	869A	NOFM	XVM	OO	Open	Close	1
3PT-CS22	3.8	CS	31	YES	MDP	FS	Standby	Start	1
3PT-CS22	3.8	CS	31	YES	MDP	FR	Running	Run	0.25
3PT-CS22	3.8	SI	866A	YES	MOV	CC	Closed	Open	1
3PT-CS22	3.9	SI	868A	NO	XVM	CC	Closed	Open	1
3PT-CS22	3.10	SI	1838A	NO	CKV	CC	Closed	Open	1
3PT-CS22	3.11	SI	1806A	NO	XVM	OO	Open	Close	1
3PT-CS22	3.11	SI	867A	YES	CKV	CC	Closed	Open	1
3PT-CS22	3.11	SI	1806A	NO	XVM	CC	Closed	Open	1
3PT-CS22	3.14	SI	1813	NO	AOV	OO	Open	Close	1
3PT-CS22	3.15	SI	869A	NOFM	XVM	CC	Closed	Lock Open	1
3PT-CS22	3.15	SI	1841	NO	XVM	CC	Closed	Lock Open	1
3PT-CS22	3.15	SI	1862	YES	XVM	OC	Open	Verify Open	0
3PT-CS22	3.15	SI	1813	NO	AOV	CC	Closed	Close	0
3PT-CS22	3.15	SI	S-202	NO	XVM	OO	Open	Close	1
3PT-CS22	3.15	SI	1806A	NO	XVM	OO	Open	Lock Closed	1
3PT-CS22	3.15	SI	1839A	NO	XVM	OC	Locked Open	Verify LO	0
3PT-CS22	3.15	SI	865A	YES	XVM	OC	Locked Open	Verify LO	0
3PT-CS22	3.15	SI	868A	NO	XVM	OO	Open	Lock Closed	1
3PT-CS22	3.15	SI	878A	NO	XVM	OO	Open	Lock Closed	1
3PT-CS22	3.15	SI	878B	NO	XVM	CO	Locked Closed	Verify LC	0
3PT-CS22	3.15	SI	1806B	NO	XVM	CO	Locked Closed	Verify LC	0
3PT-CS22	3.15	SI	873B	NO	XVM	OO	Open	Lock Closed	1
3PT-CS22	3.15	SI	1839B	NO	XVM	CC	Closed	Lock Open	1
3PT-CS22	3.15	SI	133	NO	XVM	CO	Closed	Verify Closed	0
3PT-CS22	3.21	SI	869B	NOFM	XVM	OO	LO	Close	1
3PT-CS22	3.21	SI	1841	NO	XVM	OO	LO	Close	1
3PT-CS22	3.21	SI	1862	YES	XVM	OC	Open	Verify Open	1
3PT-CS22	3.21	SI	1813	NO	AOV	CC	Closed	Open	1
3PT-CS22	3.21	SI	S-202	NO	XVM	CC	Closed	Open	1
3PT-CS22	3.21	SI	1806B	NO	XVM	CC	LC	Open	1
3PT-CS22	3.21	SI	1839B	NO	XVM	OC	LO	Verify Open	1
3PT-CS22	3.21	SI	865B	YES	XVM	OC	LO	Verify Open	1
3PT-CS22	3.21	SI	868B	NO	XVM	CO	LC	Verify Shut	1
3PT-CS22	3.21	SI	878B	NO	XVM	CC	LC	Open	1
3PT-CS22	3.21	SI	878A	NO	XVM	CO	LC	Verify Shut	1
3PT-CS22	3.21	SI	1806A	NO	XVM	CO	LC	Verify Shut	1
3PT-CS22	3.21	SI	873B	NO	XVM	CC	LC	Open	1
3PT-CS22	3.21	SI	1839A	NO	XVM	OO	LO	Close	1
3PT-CS22	3.21	SI	135	NO	XVM	CO	Closed	Verify Shut	1
3PT-CS22	3.21.1	SI	869B	NOFM	XVM	CC	Closed	Open	1

Table F7 Surveillance Test (ST) Demand Matrix

Procedure Number	Step Ref	System	Comp ID	Logic Model	Comp Type	App FM	Initial State	Requested Action	Demand Fraction
3PT-CS22	3.21.1	SI	869B	NOFM	XVM	OO	Open	Close	1
3PT-CS22	3.23	CS	32	YES	MDP	FS	Standby	Start	1
3PT-CS22	3.23	CS	32	YES	MDP	FR	Running	Run	0.25
3PT-CS22	3.23	SI	866B	YES	MOV	CC	Closed	Open	1
3PT-CS22	3.24	SI	868B	NO	XVM	CC	Closed	Open	1
3PT-CS22	3.25	SI	1838B	NO	CKV	CC	Closed	Open	1
3PT-CS22	3.26	SI	1806B	NO	XVM	OO	Open	Close	1
3PT-CS22	3.26	SI	867B	YES	CKV	CC	Closed	Open	1
3PT-CS22	3.26	SI	1806B	NO	XVM	CC	Closed	Open	1
3PT-CS22	3.29	SI	1813	NO	AOV	OO	Open	Close	1
3PT-CS22	3.30	SI	869B	NOFM	XVM	CC	Closed	Lock Open	1
3PT-CS22	3.30	SI	1841	NO	XVM	CC	Closed	Lock Open	1
3PT-CS22	3.30	SI	1862	YES	XVM	OC	Open	Verify Open	0
3PT-CS22	3.30	SI	1813	NO	AOV	CC	Closed	Close	0
3PT-CS22	3.30	SI	S-202	NO	XVM	OO	Open	Close	1
3PT-CS22	3.30	SI	1806B	NO	XVM	OO	Open	Lock Closed	1
3PT-CS22	3.30	SI	1839B	NO	XVM	OC	Locked Open	Verify LO	0
3PT-CS22	3.30	SI	865B	YES	XVM	OC	Locked Open	Verify LO	0
3PT-CS22	3.30	SI	868B	NO	XVM	OO	Open	Lock Closed	1
3PT-CS22	3.30	SI	878B	NO	XVM	OO	Open	Lock Closed	1
3PT-CS22	3.30	SI	878A	NO	XVM	CO	Locked Closed	Verify LC	0
3PT-CS22	3.30	SI	1806A	NO	XVM	CO	Locked Closed	Verify LC	0
3PT-CS22	3.30	SI	873B	NO	XVM	OO	Open	Lock Closed	1
3PT-CS22	3.30	SI	1839A	NO	XVM	CC	Closed	Lock Open	1
3PT-CS22	3.30	SI	135	NO	XVM	CO	Closed	Verify Closed	0
3PT-CS23									
3PT-CS23	3.3	SI	856A	NO	XVM	CC	Closed	Open	1
3PT-CS23	3.3	SI	856C	NO	MOV	CC	Closed	Open	1
3PT-CS23	3.3	SI	856D	NO	MOV	CC	Closed	Open	1
3PT-CS23	3.3	SI	856E	NO	MOV	CC	Closed	Open	1
3PT-CS23	3.3	SI	856F	NC	MOV	CC	Closed	Open	1
3PT-CS23	3.3	SI	856H	NO	MOV	CC	Closed	Open	1
3PT-CS23	3.3	SI	856J	YES	MOV	CC	Closed	Open	1
3PT-CS23	3.3	SI	856K	NO	XVM	CC	Closed	Open	1
3PT-CS23	3.4	SI	856B	NO	MOV	CO	Closed	Verify Closed	1
3PT-CS23	3.4	SI	856G	NO	MOV	CO	Closed	Verify Closed	1
3PT-CS23	3.5	SI	856B	NO	MOV	CO	Closed	Verify Closed	0
3PT-CS23	3.5	SI	856G	NO	MOV	CO	Closed	Verify Closed	0
3PT-CS23	3.3	SI	856A	YES	XVM	OC	Open	Verify Open	0
3PT-CS23	3.3	SI	856C	YES	MOV	PG	Open	Verify Open	0
3PT-CS23	3.3	SI	856D	YES	MOV	OC	Open	Verify Open	0
3PT-CS23	3.3	SI	856E	YES	MOV	PG	Open	Verify Open	0
3PT-CS23	3.3	SI	856F	YES	MOV	PG	Open	Verify Open	0
3PT-CS23	3.3	SI	856H	YES	MOV	PG	Open	Verify Open	0
3PT-CS23	3.3	SI	856J	YES	MOV	PG	Open	Verify Open	0
3PT-CS23	3.3	SI	856K	YES	XVM	PG	Open	Verify Open	0
3PT-CS24									
3PT-CS24	3.5	SI	856C	NO	MOV	CC	Closed	Open	1
3PT-CS24	3.6	SI	856C	YES	MOV	OO	Open	Close	1
3PT-CS24	3.6	SI	856C	YES	MOV	PG			0

Table F7 Surveillance Test (ST) Demand Matrix

Procedure Number	Step Ref	System	Comp ID	Logic Model	Comp Type	App FM	Initial State	Requested Action	Demand Fraction
3PT-CS24	3.6	SI	856C	YES	RCK	NO			2
3PT-CS24	3.6	SI	856C-VX	YES	RLY	NO			2
3PT-CS24	3.6	SI	856C	YES	MSW	DN			2
3PT-CS24	3.7	SI	856E	NO	MOV	CC	Closed	Open	1
3PT-CS24	3.8	SI	856E	YES	MOV	OO	Open	Close	1
3PT-CS24	3.8	SI	856E	YES	MOV	PG			0
3PT-CS24	3.8	SI	856E	YES	RCK	NO			2
3PT-CS24	3.8	SI	856E-VX	YES	RLY	NO			2
3PT-CS24	3.8	SI	856E	YES	MSW	DN			2
3PT-CS24	3.9	SI	856J	YES	MOV	CC	Closed	Open	1
3PT-CS24	3.10	SI	856J	YES	MOV	OO	Open	Close	1
3PT-CS24	3.10	SI	856J	YES	MOV	PG			0
3PT-CS24	3.10	SI	856J	YES	RCK	NO			2
3PT-CS24	3.10	SI	856J-VX	YES	RLY	NO			2
3PT-CS24	3.10	SI	856J	YES	MSW	DN			2
3PT-CS24	3.11	SI	856H	NO	MOV	CC	Closed	Open	1
3PT-CS24	3.12	SI	856H	YES	MOV	OO	Open	Close	1
3PT-CS24	3.12	SI	856H	YES	MOV	PG			0
3PT-CS24	3.12	SI	856H	YES	RCK	NO			2
3PT-CS24	3.12	SI	856H-VX	YES	RLY	NO			2
3PT-CS24	3.12	SI	856H	YES	MSW	DN			2
3PT-M16									
3PT-M16	3.4	SI	851B	NO	MOV	OO	Open	Close	1
3PT-M16	3.8	SI	100	NO	XVM	OO	Open	Close	1
3PT-M16	3.8	SI	101	NO	XVM	OO	Closed	Close	0
3PT-M16	3.8	SI	102	NO	XVM	OO	Open	Close	1
3PT-M16	3.5.15	SI	859B	NO	XVM	CC	Closed	Open	1
3PT-M16	3.5.16	SI	859A	NO	XVM			Verify Closed & Locked	
3PT-M16	3.5.16	SI	859B	NO	XVM			Verify Closed & Locked	
3PT-M16	3.5.16	SI	859C	NO	XVM			Verify Closed & Locked	
3PT-M16	3.5.18	SI	841	NO	XVM	CC	Closed	Open	1
3PT-M16	3.5.19	SI	850A	NOFM	MOV	CC	Closed	Open	1
3PT-M16	3.5.19	SI	850A	NOFM	MOV	OO	Open	Close	1
3PT-M16	3.5.2	SI	1807A	YES	XVM	PG	Open	Verify Open	1
3PT-M16	3.5.2	SI	1810	YES	MOV	PG	Open	Verify Open & De-energ.	1
3PT-M16	3.5.2	SI	1810	YES	MOV	PG	Open	Verify Open & De-energ.	1
3PT-M16	3.5.2	SI	1819A	NO	XVM	PG	Open	Verify Open	1
3PT-M16	3.5.2	SI	1862	YES	XVM	PG	Open	Verify Open	1
3PT-M16	3.5.2	SI	205	NO	XVM	CO	Closed	Verify Shut	1
3PT-M16	3.5.2	SI	206	NO	XVM	PG	Open	Verify Open	1
3PT-M16	3.5.2	SI	207	NO	XVM	CO	Closed	Verify Shut	1
3PT-M16	3.5.2	SI	841	NO	XVM	CO	Closed	Verify Closed	1
3PT-M16	3.5.2	SI	842	YES	MOV	PG	Open	Verify Open	1
3PT-M16	3.5.2	SI	843	YES	MOV	PG	Open	Verify Open	1
3PT-M16	3.5.2	SI	846	YES	XVM	PG	Open	Verify Open	1
3PT-M16	3.5.2	SI	848A	YES	XVM	PG	Open	Verify Open	1
3PT-M16	3.5.2	SI	850A	YES	MOV	PG	Open	Verify Open	1
3PT-M16	3.5.2	SI	850B	YES	XVM	PG	Open	Verify Open	1
3PT-M16	3.5.2	SI	851B	YES	MOV	OO	Open	Verify Shut	1
3PT-M16	3.5.2	SI	859A	NO	XVM	CC	Closed	Verify Open	1
3PT-M16	3.5.2	SI	859B	NO	XVM	CC	Closed	Verify Open	1

Table F7 Surveillance Test (ST) Demand Matrix

Procedure Number	Step Ref	System	Comp ID	Logic Model	Comp Type	App FM	Initial State	Requested Action	Demand Fraction
3PT-M16	3.5.2	SI	859C	NO	XVM	CC	Closed	Verify Open	1
3PT-M16	3.5.20	SI	850C	NOFM	MOV	CC	Closed	Open	1
3PT-M16	3.5.20	SI	850C	NOFM	MOV	OO	Open	Close	1
3PT-M16	3.5.21	SI	851B	NOFM	MOV	CC	Open	Close	1
3PT-M16	3.5.3	AC	749A	YES	XVM	PG		Verify Open	1
3PT-M16	3.5.3	AC	749D	YES	XVM	PG		Verify Open	1
3PT-M16	3.5.4	SI	841	NO	XVM	CO	Closed	Verify Closed	0
3PT-M16	3.5.7	SI	31	YES	MDP	FR	Running	Continue to Run	0.25
3PT-M16	3.5.7	SI	31	YES	MDP	FS	Standby	Start Pump	1
3PT-M16	3.5.8	SI	847	YES	CKV	CC	Closed	Verify Open	1
3PT-M16	3.5.8	SI	849A	YES	CKV	CC	Closed	Open	1
3PT-M16	3.5.8	SI	859B	NO	XVM	OO	Open	Close	1
3PT-M16	3.6.10	SI	849A	YES	CKV	CO	Closed	Verify Closed	1
3PT-M16	3.6.10	SI	849B	YES	CKV	CO	Closed	Verify Closed	1
3PT-M16	3.6.12	SI	1833A	NO		CC	Closed	Open	1
3PT-M16	3.6.12	SI	1833B	NO		CC	Closed	Open	1
3PT-M16	3.6.12	SI	851A	NOFM	MOV	CC	Closed	Open	1
3PT-M16	3.6.12	SI	851A	NOFM	MOV	OO	Open	Close	1
3PT-M16	3.6.12	SI	852B	YES	CKV	CC	Closed	Verify Open	1
3PT-M16	3.6.12	SI	859B	NO	XVM	OO	Open	Close	1
3PT-M16	3.6.13	SI	884B	YES	CKV	CC	Closed	Verify Open	1
3PT-M16	3.6.17	SI	859B	NO	XVM	CC	Closed	Open	1
3PT-M16	3.6.18	SI	1833A	NO				Verify Closed and Locked	
3PT-M16	3.6.18	SI	1833B	NO				Verify Closed and Locked	
3PT-M16	3.6.18	SI	859A	NO	XVM			Verify Closed and Locked	
3PT-M16	3.6.18	SI	859B	NO	XVM			Verify Closed and Locked	
3PT-M16	3.6.18	SI	859C	NO	XVM			Verify Closed and Locked	
3PT-M16	3.6.19	SI	841	NO	XVM	CC	Closed	Open	0
3PT-M16	3.6.21.3	SI	849A	YES	CKV	CO	Closed	Verify Closed	1
3PT-M16	3.6.21.3	SI	849B	YES	CKV	CO	Closed	Verify Closed	1
3PT-M16	3.6.3	SI	101	NO	XVM	CO	Closed	Verify Closed	1
3PT-M16	3.6.3	SI	1807B	YES	XVM	PG	Open	Verify Open	1
3PT-M16	3.6.3	SI	1810	YES	MOV	PG	Open	Verify Open & De-energ.	0
3PT-M16	3.6.3	SI	1819B	NO	XVM	PG	Open	Verify Open	1
3PT-M16	3.6.3	SI	1833A	NO				Verify Closed	
3PT-M16	3.6.3	SI	1833B	NO				Verify Closed	
3PT-M16	3.6.3	SI	1835A	NO	MOV	CO	Closed	Verify Closed	1
3PT-M16	3.6.3	SI	1835B	NO	MOV	CO	Closed	Verify Closed	1
3PT-M16	3.6.3	SI	1852A	NO	MOV	CO	Closed	Verify Closed	1
3PT-M16	3.6.3	SI	1852B	NO	MOV	CO	Closed	Verify Closed	1
3PT-M16	3.6.3	SI	1862	YES	XVM	PG	Open	Verify Open	0
3PT-M16	3.6.3	SI	205	NO	XVM	CO	Closed	Verify Shut	0
3PT-M16	3.6.3	SI	206	NO	XVM	PG	Open	Verify Open	0
3PT-M16	3.6.3	SI	207	NO	XVM	CO	Closed	Verify Shut	0
3PT-M16	3.6.3	SI	841	NO	XVM	CO	Closed	Verify Closed	0
3PT-M16	3.6.3	SI	842	YES	MOV	OC		Verify Open	1
3PT-M16	3.6.3	SI	843	YES	MOV	OC		Verify Open	1
3PT-M16	3.6.3	SI	846	YES	XVM	PG	Open	Verify Open	0
3PT-M16	3.6.3	SI	850A	YES	MOV	OC		Verify Open	1
3PT-M16	3.6.3	SI	850C	YES	MOV	OC		Verify Open	1
3PT-M16	3.6.3	SI	851A	YES	MOV	OC		Verify Open	1
3PT-M16	3.6.3	SI	851B	NOFM	MOV	OC		Verify Open	1

Table F7 Surveillance Test (ST) Demand Matrix

Procedure Number	Step Ref	System	Comp ID	Logic Model	Comp Type	App FM	Initial State	Requested Action	Demand Fraction
3PT-M16	3.6.3	SI	859A	NO	XVM			Verify Open	
3PT-M16	3.6.3	SI	859B	NO	XVM			Verify Open	
3PT-M16	3.6.3	SI	859C	NO	XVM			Verify Open	
3PT-M16	3.6.3	SI	887A	YES	MOV	OC		Verify Open	1
3PT-M16	3.6.3	SI	887B	YES	MOV	OC		Verify Open	1
3PT-M16	3.6.4	AC	749B	YES	XVM	PG		Verify Open	1
3PT-M16	3.6.4	AC	749E	YES	XVM	PG		Verify Open	1
3PT-M16	3.6.4	AC	787	YES	XVM	OC	Open	Verify Open	1
3PT-M16	3.6.5	SI	841	NO	XVM	CO	Closed	Verify Closed	0
3PT-M16	3.6.7	SI	100	NO	XVM	CC	Closed	Open	1
3PT-M16	3.6.7	SI	102	NO	XVM	CC	Closed	Open	1
3PT-M16	3.6.8	SI	32	YES	MDP	FR	Running	Continue to Run	0.25
3PT-M16	3.6.8	SI	32	YES	MDP	FS	Standby	Start Pump	1
3PT-M16	3.6.9	SI	1833A	NO				Verify Closed	
3PT-M16	3.6.9	SI	847	YES	CKV	CC	Closed	Verify Open	1
3PT-M16	3.6.9	SI	852A	YES	CKV	CC	Closed	Verify Open	1
3PT-M16	3.7.10	SI	884C	YES	CKV	CC	Closed	Open	1
3PT-M16	3.7.13	SI	852B	YES	CKV	CO	Closed	Verify Closed	1
3PT-M16	3.7.16	SI	859B	NO	XVM	CC	Closed	Open	1
3PT-M16	3.7.16	SI	859B	NO	XVM	OO	Open	Close	1
3PT-M16	3.7.17	SI	101	NO	XVM	OO	Open	Close	1
3PT-M16	3.7.17	SI	1833A	NO				Close	
3PT-M16	3.7.17	SI	1833B	NO				Close	
3PT-M16	3.7.17	SI	851A	NOFM	MOV	CC		Open	1
3PT-M16	3.7.17	SI	859A	NO	XVM			Close	
3PT-M16	3.7.17	SI	859B	NO	XVM			Close	
3PT-M16	3.7.17	SI	859C	NO	XVM			Close	
3PT-M16	3.7.19	SI	841	NO	XVM	CC	Closed	Open	0
3PT-M16	3.7.20.3	SI	852B	YES	CKV	CO	Closed	Verify Closed	1
3PT-M16	3.7.3	SI	102	NO	XVM	OO	Open	Verify Closed	1
3PT-M16	3.7.3	SI	1807C	YES	XVM	PG	Open	Verify Open	1
3PT-M16	3.7.3	SI	1810	YES	MOV	PG	Open	Verify Open & De-energ.	0
3PT-M16	3.7.3	SI	1819C	NO	XVM	PG	Open	Verify Open	1
3PT-M16	3.7.3	SI	1833A	NO				Verify Open	
3PT-M16	3.7.3	SI	1833B	NO				Verify Open	
3PT-M16	3.7.3	SI	1835A	NO	MOV	CO	Closed	Verify Closed	0
3PT-M16	3.7.3	SI	1835B	NO	MOV	CO	Closed	Verify Closed	0
3PT-M16	3.7.3	SI	1852A	NO	MOV	CO	Closed	Verify Closed	0
3PT-M16	3.7.3	SI	1852B	NO	MOV	CO	Closed	Verify Closed	0
3PT-M16	3.7.3	SI	1862	YES	XVM	PG	Open	Verify Open	0
3PT-M16	3.7.3	SI	205	NO	XVM	CO	Closed	Verify Shut	0
3PT-M16	3.7.3	SI	206	NO	XVM	PG	Open	Verify Open	0
3PT-M16	3.7.3	SI	207	NO	XVM	CO	Closed	Verify Shut	0
3PT-M16	3.7.3	SI	841	NO	XVM	CO	Closed	Verify Closed	0
3PT-M16	3.7.3	SI	842	YES	MOV	OC		Verify Open	1
3PT-M16	3.7.3	SI	843	YES	MOV	OC		Verify Open	1
3PT-M16	3.7.3	SI	846	YES	XVM	PG	Open	Verify Open	0
3PT-M16	3.7.3	SI	848B	YES	XVM	PG	Open	Verify Open	1
3PT-M16	3.7.3	SI	850B	YES	XVM	OC		Verify Open	1
3PT-M16	3.7.3	SI	851A	NOFM	MOV	CO		Verify Closed	1
3PT-M16	3.7.3	SI	859A	NO	XVM			Verify Open	
3PT-M16	3.7.3	SI	859B	NO	XVM			Verify Open	

Table F7 Surveillance Test (ST) Demand Matrix

Procedure Number	Step Ref	System	Comp ID	Logic Model	Comp Type	App FM	Initial State	Requested Action	Demand Fraction
3PT-M16	3.7.3	SI	859C	NO	XVM			Verify Open	
3PT-M16	3.7.4	AC	749C	YES	XVM	PG		Verify Open	1
3PT-M16	3.7.4	AC	749F	YES	XVM	PG		Verify Open	1
3PT-M16	3.7.4	AC	787	YES	XVM	OC	Open	Verify Open	0
3PT-M16	3.7.5	SI	841	NO	XVM	CO	Closed	Verify Closed	0
3PT-M16	3.7.6	SI	101	NO	XVM	CC	Closed	Open	1
3PT-M16	3.7.8	SI	32	YES	MDP	FR	Running	Continue to Run	0.25
3PT-M16	3.7.8	SI	32	YES	MDP	FS	Standby	Start Pump	1
3PT-M16	3.7.9	SI	849B	YES	CKV	CC	Closed	Open	1
3PT-M16	3.7.9	SI	859B	NO	XVM	OO	Open	Open	1
3PT-M17									
3PT-M17	3.3	SI	876A	NO	AOV	CO	Closed	Verify Closed	1
3PT-M17	3.3	SI	876B	NO	AOV	CO	Closed	Verify Closed	1
3PT-M17	3.6	SI	869A	NOFM	XVM	OO	Locked Open	Close	1
3PT-M17	3.6	SI	869B	YES	XVM	OC	Locked Open	Verify Open	1
3PT-M17	3.6	SI	1841	NO	XVM	OC	Locked Open	Verify Open	1
3PT-M17	3.6	SI	1862	YES	XVM	OC	Open	Verify Open	1
3PT-M17	3.6	SI	1813	NO	AOV	CC	Closed	Open	1
3PT-M17	3.6	SI	1806A	NO	XVM	CC	Locked Closed	Open	1
3PT-M17	3.6	SI	1806B	NO	XVM	CO	Locked Closed	Verify Shut	1
3PT-M17	3.6	SI	1839A	NO	XVM	OO	Locked Open	Close	1
3PT-M17	3.6	SI	1839B	NO	XVM	OC	Locked Open	Verify LO	1
3PT-M17	3.6	SI	865A	YES	XVM	OC	Locked Open	Verify LO	1
3PT-M17	3.6	SI	865B	YES	XVM	OC	Locked Open	Verify LO	1
3PT-M17	3.6	SI	868A	NO	XVM	CO	Locked Closed	Verify LC	1
3PT-M17	3.6	SI	868B	NO	XVM	CO	Locked Closed	Verify LC	1
3PT-M17	3.6	SI	878A	NO	XVM	CC	Locked Closed	Open	1
3PT-M17	3.6	SI	878B	NO	XVM	CO	Locked Closed	Verify LC	1
3PT-M17	3.6	SI	873B	NO	XVM	CO	Locked Closed	Verify LC	1
3PT-M17	3.6	SI	133	NO	XVM	CO	Closed	Verify Closed	1
3PT-M17	3.6	SI	135	NO	XVM	CO	Closed	Verify Closed	1
3PT-M17	3.6	SI	866A	NOFM	MOV	CO	Closed	Verify Closed	1
3PT-M17	3.6	SI	866B	NOFM	MOV	CO	Closed	Verify Closed	1
3PT-M17	3.8	CS	31	YES	MDP	FS	Standby	Start	1
3PT-M17	3.8	CS	31	YES	MDP	FR	Running	Run	0.25
3PT-M17	3.8	SI	866A	YES	MOV	CC	Closed	Open	1
3PT-M17	3.9	SI	868A	NO	XVM	CC	Locked Closed	Open	1
3PT-M17	3.10	SI	1806A	NO	XVM	OO	Open	Close	1
3PT-M17	3.10	SI	867A	YES	CKV	CC	Closed	Open	1
3PT-M17	3.10	SI	1806A	NO	XVM	CC	Closed	Open	1
3PT-M17	3.13	SI	1813	NO	AOV	OO	Open	Close	1
3PT-M17	3.14	SI	869A	NOFM	XVM	CC	Closed	Lock Open	1
3PT-M17	3.14	SI	869B	YES	XVM	OC	Locked Open	Verify Open	0
3PT-M17	3.14	SI	1841	NO	XVM	OC	Locked Open	Verify Open	0
3PT-M17	3.14	SI	1862	YES	XVM	OC	Open	Verify Open	0
3PT-M17	3.14	SI	1813	NO	AOV	CC	Closed	Verify Closed	0
3PT-M17	3.14	SI	1806A	NO	XVM	OO	Open	Lock Closed	1
3PT-M17	3.14	SI	1806B	NO	XVM	CO	Locked Closed	Verify Shut	0
3PT-M17	3.14	SI	1839A	NO	XVM	CC	Closed	Lock Open	1
3PT-M17	3.14	SI	1839B	NO	XVM	OC	Locked Open	Verify LO	0
3PT-M17	3.14	SI	865A	YES	XVM	OC	Locked Open	Verify LO	0

Table F7 Surveillance Test (ST) Demand Matrix

Procedure Number	Step Ref	System	Comp ID	Logic Model	Comp Type	App FM	Initial State	Requested Action	Demand Fraction
3PT-M17	3.14	SI	865B	YES	XVM	OC	Locked Open	Verify LO	0
3PT-M17	3.14	SI	868A	NO	XVM	OO	Open	Lock Closed	1
3PT-M17	3.14	SI	868B	NO	XVM	CO	Locked Closed	Verify LC	0
3PT-M17	3.14	SI	878A	NO	XVM	OO	Open	Lock Closed	1
3PT-M17	3.14	SI	878B	NO	XVM	CO	Locked Closed	Verify LC	0
3PT-M17	3.14	SI	873B	NO	XVM	CO	Locked Closed	Verify LC	0
3PT-M17	3.14	SI	133	NO	XVM	CO	Closed	Verify Closed	0
3PT-M17	3.14	SI	135	NO	XVM	CO	Closed	Verify Closed	0
3PT-M17	3.14	SI	866A	NOFM	MOV	OO	Open	Close	1
3PT-M17	3.14	SI	866B	NOFM	MOV	CO	Closed	Verify Closed	0
3PT-M17	3.17	SI	876A	NO	AOV	CO	Closed	Verify Closed	1
3PT-M17	3.17	SI	876B	NO	AOV	CO	Closed	Verify Closed	1
3PT-M17	3.20	SI	869A	NOFM	XVM	OC	Locked Open	Verify Open	1
3PT-M17	3.20	SI	869B	YES	XVM	OO	Locked Open	Close	1
3PT-M17	3.20	SI	1841	NO	XVM	OC	Locked Open	Verify Open	1
3PT-M17	3.20	SI	1862	YES	XVM	OC	Open	Verify Open	1
3PT-M17	3.20	SI	1813	NO	AOV	CC	Closed	Open	1
3PT-M17	3.20	SI	1806A	NO	XVM	CO	Locked Closed	Verify Shut	1
3PT-M17	3.20	SI	1806B	NO	XVM	CC	Locked Closed	Open	1
3PT-M17	3.20	SI	1839A	NO	XVM	OO	Locked Open	Close	1
3PT-M17	3.20	SI	1839B	NO	XVM	OC	Locked Open	Verify Open	1
3PT-M17	3.20	SI	865A	YES	XVM	OC	Locked Open	Verify LO	1
3PT-M17	3.20	SI	865B	YES	XVM	OC	Locked Open	Verify LO	1
3PT-M17	3.20	SI	868A	NO	XVM	CO	Locked Closed	Verify LC	1
3PT-M17	3.20	SI	868B	NO	XVM	CO	Locked Closed	Verify LC	1
3PT-M17	3.20	SI	878A	NO	XVM	CO	Locked Closed	Verify LC	1
3PT-M17	3.20	SI	878B	NO	XVM	CC	Locked Closed	Open	1
3PT-M17	3.20	SI	873B	NO	XVM	CO	Locked Closed	Verify LC	1
3PT-M17	3.20	SI	133	NO	XVM	CO	Closed	Verify Closed	1
3PT-M17	3.20	SI	135	NO	XVM	CO	Closed	Verify Closed	1
3PT-M17	3.20	SI	866A	NOFM	MOV	CO	Closed	Verify Closed	1
3PT-M17	3.20	SI	866B	NOFM	MOV	CO	Closed	Verify Closed	1
3PT-M17	3.22	CS	32	YES	MDP	FS	Standby	Start	1
3PT-M17	3.22	CS	32	YES	MDP	FR	Running	Run	0.25
3PT-M17	3.22	SI	866B	YES	MOV	CC	Closed	Open	1
3PT-M17	3.23	SI	868B	NO	XVM	CC	Locked Closed	Open	1
3PT-M17	3.24	SI	1806B	NO	XVM	OO	Open	Close	1
3PT-M17	3.24	SI	867B	YES	CKV	CC	Closed	Open	1
3PT-M17	3.24	SI	1806B	NO	XVM	CC	Closed	Open	1
3PT-M17	3.27	SI	1813	NO	AOV	OO	Open	Close	1
3PT-M17	3.28	SI	869A	NOFM	XVM	OC	Locked Open	Verify Open	0
3PT-M17	3.28	SI	869B	YES	XVM	CC	Closed	Lock Open	1
3PT-M17	3.28	SI	1841	NO	XVM	OC	Locked Open	Verify Open	0
3PT-M17	3.28	SI	1862	YES	XVM	OC	Open	Verify Open	0
3PT-M17	3.28	SI	1813	NO	AOV	CC	Closed	Verify Closed	0
3PT-M17	3.28	SI	1806A	NO	XVM	CO	Locked Closed	Verify Closed	0
3PT-M17	3.28	SI	1806B	NO	XVM	OO	Open	Lock Closed	1
3PT-M17	3.28	SI	1839A	NO	XVM	CC	Closed	Lock Open	1
3PT-M17	3.28	SI	1839B	NO	XVM	OC	Locked Open	Verify LO	0
3PT-M17	3.28	SI	865A	YES	XVM	OC	Locked Open	Verify LO	0
3PT-M17	3.28	SI	865B	YES	XVM	OC	Locked Open	Verify LO	0

Table F7 Surveillance Test (ST) Demand Matrix

Procedure Number	Step Ref	System	Comp ID	Logic Model	Comp Type	App FM	Initial State	Requested Action	Demand Fraction
3PT-M17	3.28	SI	868A	NO	XVM	CO	Closed	Verify LC	0
3PT-M17	3.28	SI	868B	NO	XVM	OO	Open	Lock Closed	1
3PT-M17	3.28	SI	878A	NO	XVM	CO	Locked Closed	Verify LC	0
3PT-M17	3.28	SI	878B	NO	XVM	OO	Open	Lock Closed	1
3PT-M17	3.28	SI	873B	NO	XVM	CO	Locked Closed	Verify LC	0
3PT-M17	3.28	SI	133	NO	XVM	CO	Closed	Verify Closed	0
3PT-M17	3.28	SI	135	NO	XVM	CO	Closed	Verify Closed	0
3PT-M17	3.28	SI	866A	NOFM	MOV	CO	Closed	Verify Closed	0
3PT-M17	3.28	SI	866B	NOFM	MOV	OO	Open	Close	1
3PT-M18									
3PT-M18	3.3	CH	133	YES	HCV	CO	NC	Verify Closed	0
3PT-M18	3.3	AC	730	NOFM	MOV	OO	NO	Close	1
3PT-M18	3.3	AC	731	NOFM	MOV	OO	NO	Close	1
3PT-M18	3.3	AC	732	NOFM	XVM	OO	NO	Close	1
3PT-M18	3.3	AC	742	YES	XVM	OC	LO	Verify Open	0
3PT-M18	3.3	AC	743	YES	MOV	OC	NO	Verify Open	0
3PT-M18	3.3	AC	744	YES	MOV	OC	NO	Verify Open & De-energ.	0
3PT-M18	3.3	SI	746	YES	MOV	OC	NO	Verify Open	1
3PT-M18	3.3	SI	747	YES	MOV	OC	NO	Verify Open	1
3PT-M18	3.3	AC	839	YES	XVM	OC	NO	Verify Open	0
3PT-M18	3.3	AC	840	YES	XVM	OC	NO	Verify Open	0
3PT-M18	3.3	AC	841	YES	XVM	OC	NO	Throttled	0
3PT-M18	3.3	AC	842	YES	XVM	OC	NO	Throttled	0
3PT-M18	3.3	AC	846	NO	XVM	OC	NO	Verify Open	1
3PT-M18	3.3	AC	847	NO	XVM	OC	NO	Verify Open	1
3PT-M18	3.3	AC	848	NO	XVM	OC	NO	Verify Open	1
3PT-M18	3.3	AC	849	NO	XVM	OC	NO	Verify Open	1
3PT-M18	3.3	SI	882	YES	MOV	OC	NO	Verify Open & De-energ.	0
3PT-M18	3.3	AC	883	YES	MOV	CO	NC	Verify Closed	0
3PT-M18	3.3	AC	1870	YES	MOV	OC	NO	Throttled	0
3PT-M18	3.3	SI	1802A	YES	MOV	CO	NC	Verify Closed	0
3PT-M18	3.3	SI	1802B	YES	MOV	CO	NC	Verify Closed	0
3PT-M18	3.3	SI	1869A	YES	MOV	OC	NO	Verify Open	0
3PT-M18	3.3	SI	1869B	YES	MOV	OC	NO	Verify Open	0
3PT-M18	3.3	AC	735A	YES	XVM	OC	NO	Verify Open & Locked	0
3PT-M18	3.3	AC	735B	YES	XVM	OC	NO	Verify Open & Locked	0
3PT-M18	3.3	AC	739A	YES	XVM	OC	NO	Verify Open & Locked	0
3PT-M18	3.3	AC	739B	YES	XVM	OC	NO	Verify Open & Locked	0
3PT-M18	3.3	AC	745A	YES	MOV	OC	NO	Verify Open	0
3PT-M18	3.3	AC	745B	YES	MOV	OC	NO	Verify Open	0
3PT-M18	3.3	AC	758A	NO	XVM	OC	NO	Verify Open	1
3PT-M18	3.3	AC	758B	NO	XVM	OC	NO	Verify Open	1
3PT-M18	3.3	SI	885A	YES	MOV	CO	NC	Verify Closed	1
3PT-M18	3.3	SI	885B	YES	MOV	CO	NC	Verify Closed	0
3PT-M18	3.3	SI	888A	YES	MOV	CO	NC	Verify Closed	0
3PT-M18	3.3	SI	888B	YES	MOV	CO	NC	Verify Closed	0
3PT-M18	3.3	SI	889A	NOFM	MOV	CO	NC	Verify Closed	1
3PT-M18	3.3	SI	889B	NOFM	MOV	CO	NC	Verify Closed	1
3PT-M18	3.3	SI	899A	YES	MOV	OC	NO	Verify Open	0
3PT-M18	3.3	SI	899B	YES	MOV	OC	NO	Verify Open	0

Table F7 Surveillance Test (ST) Demand Matrix

Procedure Number	Step Ref	System	Comp ID	Logic Model	Comp Type	App FM	Initial State	Requested Action	Demand Fraction
3PT-M18	3.4.2	AC	1871C	YES	XVM	OC	NO	Verify Flow	1
3PT-M18	3.4.2	AC	1871D	YES	XVM	OC	NO	Verify Flow	1
3PT-M18	3.4.2	AC	736A	YES	XVM	OC	NO	Verify Flow	1
3PT-M18	3.4.2	AC	737A	YES	XVM	OC	NO	Verify Flow	1
3PT-M18	3.4.2	AC	750E	YES	CKV	OC	NO	Verify Flow	1
3PT-M18	3.4.2	AC	FIC-646	YES	FIC	OC	NO	Verify Flow	1
3PT-M18	3.4.4	RHR	31	YES	MDP	FS	Standby	Start	1
3PT-M18	3.4.4	RHR	31	YES	MDP	FR	Started	Run	0.25
3PT-M18	3.4.4	RHR	31	YES	HTX	VF	Standby	Flow Check	1
3PT-M18	3.4.4	RHR	32	YES	HTX	VF	Standby	Flow Check	1
3PT-M18	3.4.4	CH	133	YES	HCV	CO	Closed	Block Flow	1
3PT-M18	3.4.4	SI	638	YES	MOV	OC	Open	Flow Check	1
3PT-M18	3.4.4	SI	640	YES	MOV	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	732	YES	XVM	CO	Closed	Block Flow	1
3PT-M18	3.4.4	AC	741	YES	CKV	CC	Closed	Open	1
3PT-M18	3.4.4	AC	741	NOFM	CKV	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	742	YES	XVM	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	743	YES	MOV	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	744	YES	MOV	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	837	YES	CKV	CC	Closed	Open	1
3PT-M18	3.4.4	AC	837	NOFM	CKV	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	838	NOFM	CKV	CO	Closed	Block Flow	1
3PT-M18	3.4.4	AC	839	YES	XVM	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	841	YES	XVM	OC	Open	Flow Check	1
3PT-M18	3.4.4	SI	846	YES	XVM	OC	LO	Flow Check	1
3PT-M18	3.4.4	SI	881	YES	CKV	CC	Closed	Open	1
3PT-M18	3.4.4	SI	881	NOFM	CKV	OC	Open	Flow Check	1
3PT-M18	3.4.4	SI	882	YES	MOV	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	883	YES	MOV	CO	Closed	Block Flow	1
3PT-M18	3.4.4	AC	1870	YES	MOV	OC	Open	Flow Check	1
3PT-M18	3.4.4	SI	1802A	YES	MOV	CO	Closed	Block Flow	1
3PT-M18	3.4.4	SI	1802B	YES	MOV	CO	Closed	Block Flow	1
3PT-M18	3.4.4	SI	1869A	YES	MOV	OC	Open	Flow Check	1
3PT-M18	3.4.4	SI	1869B	YES	MOV	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	735A	YES	XVM	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	738A	YES	CKV	CC	Closed	Open	1
3PT-M18	3.4.4	AC	738A	NOFM	CKV	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	738B	YES	CKV	CO	Closed	Block Flow	1
3PT-M18	3.4.4	AC	739A	YES	XVM	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	745A	YES	MOV	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	745B	YES	MOV	OC	Open	Flow Check	1
3PT-M18	3.4.4	SI	885B	YES	MOV	CO	Closed	Block Flow	1
3PT-M18	3.4.4	SI	888A	YES	MOV	CO	Closed	Block Flow	1
3PT-M18	3.4.4	SI	888B	YES	MOV	CO	Closed	Block Flow	1
3PT-M18	3.4.4	SI	889A	NOFM	MOV	CO	Closed	Block Flow	1
3PT-M18	3.4.4	SI	889B	NOFM	MOV	CO	Closed	Block Flow	1
3PT-M18	3.5.2	AC	1871A	YES	XVM	OC	NO	Verify Flow	1
3PT-M18	3.5.2	AC	1871B	YES	XVM	OC	NO	Verify Flow	1
3PT-M18	3.5.2	AC	736B	YES	XVM	OC	NO	Verify Flow	1
3PT-M18	3.5.2	AC	737B	YES	XVM	OC	NO	Verify Flow	1
3PT-M18	3.5.2	AC	750D	YES	CKV	OC	NO	Verify Flow	1
3PT-M18	3.5.2	AC	FIC-645	YES	FIC	OC	NO	Verify Flow	1

Table F7 Surveillance Test (ST) Demand Matrix

Procedure Number	Step Ref	System	Comp ID	Logic Model	Comp Type	App FM	Initial State	Requested Action	Demand Fraction
3PT-M18	3.5.4	RHR	32	YES	MDP	FS	Standby	Start	1
3PT-M18	3.5.4	RHR	32	YES	MDP	FR	Started	Run	0.25
3PT-M18	3.5.4	AC	837	NOFM	CKV	CO	Closed	Block Flow	1
3PT-M18	3.5.4	AC	838	YES	CKV	CC	Closed	Open	1
3PT-M18	3.5.4	AC	838	NOFM	CKV	OC	Open	Flow Check	1
3PT-M18	3.5.4	AC	840	YES	XVM	OC	Open	Flow Check	1
3PT-M18	3.5.4	AC	842	YES	XVM	OC	Open	Flow Check	1
3PT-M18	3.5.4	AC	735B	YES	XVM	OC	Open	Flow Check	1
3PT-M18	3.5.4	AC	738A	YES	CKV	CO	Closed	Block Flow	1
3PT-M18	3.5.4	AC	738B	YES	CKV	CC	Closed	Open	1
3PT-M18	3.5.4	AC	738B	NOFM	CKV	OC	Open	Flow Check	1
3PT-M18	3.5.4	AC	739B	YES	XVM	OC	Open	Flow Check	1
3PT-M18	3.6	AC	730	YES	MOV	CC	Closed	Open	1
3PT-M18	3.6	AC	731	YES	MOV	CC	Closed	Open	1
3PT-M18	3.6	AC	732	YES	XVM	CC	Closed	Open	1
3PT-M18									
3PT-M18	3.4.2	AC	1871C	YES	XVM	OC	NO	Verify Flow	1
3PT-M18	3.4.2	AC	1871D	YES	XVM	OC	NO	Verify Flow	1
3PT-M18	3.4.2	AC	736A	YES	XVM	OC	NO	Verify Flow	1
3PT-M18	3.4.2	AC	737A	YES	XVM	OC	NO	Verify Flow	1
3PT-M18	3.4.2	AC	750E	YES	CKV	OC	NO	Verify Flow	1
3PT-M18	3.4.2	AC	FIC-646	YES	FIC	OC	NO	Verify Flow	1
3PT-M18	3.4.4	RHR	31	YES	MDP	FS	Standby	Start	1
3PT-M18	3.4.4	RHR	31	YES	MDP	FR	Started	Run	0.25
3PT-M18	3.4.4	RHR	31	YES	HTX	VF	Standby	Flow Check	1
3PT-M18	3.4.4	RHR	32	YES	HTX	VF	Standby	Flow Check	1
3PT-M18	3.4.4	CH	133	YES	HCV	CO	Closed	Block Flow	1
3PT-M18	3.4.4	SI	638	YES	MOV	OC	Open	Flow Check	1
3PT-M18	3.4.4	SI	640	YES	MOV	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	730	NOFM	MOV	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	731	NOFM	MOV	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	732	NOFM	XVM	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	1836	NOFM	RRV	CO	Closed	Block Flow	1
3PT-M18	3.4.4	AC	741	YES	CKV	CC	Closed	Open	1
3PT-M18	3.4.4	AC	741	NOFM	CKV	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	742	YES	XVM	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	743	YES	MOV	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	744	YES	MOV	OC	Open	Flow Check	1
3PT-M18	3.4.4	SI	746	YES	MOV	OC	Open	Flow Check	1
3PT-M18	3.4.4	SI	747	YES	MOV	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	837	YES	CKV	CC	Closed	Open	1
3PT-M18	3.4.4	AC	837	NOFM	CKV	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	838	NOFM	CKV	CO	Closed	Block Flow	1
3PT-M18	3.4.4	AC	839	YES	XVM	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	841	YES	XVM	OC	Open	Flow Check	1
3PT-M18	3.4.4	SI	881	YES	CKV	CO	Closed	Block Flow	1
3PT-M18	3.4.4	AC	883	YES	MOV	CO	Closed	Block Flow	1
3PT-M18	3.4.4	AC	1870	YES	MOV	OC	Open	Flow Check	1
3PT-M18	3.4.4	SI	1802A	YES	MOV	CO	Closed	Block Flow	1
3PT-M18	3.4.4	SI	1802B	YES	MOV	CO	Closed	Block Flow	1

Table F7 Surveillance Test (ST) Demand Matrix

Procedure Number	Step Ref	System	Comp ID	Logic Model	Comp Type	App FM	Initial State	Requested Action	Demand Fraction
3PT-M18	3.4.4	SI	1869A	YES	MOV	OC	Open	Flow Check	1
3PT-M18	3.4.4	SI	1869B	YES	MOV	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	733A	NOFM	RRV	CO	Closed	Block Flow	1
3PT-M18	3.4.4	AC	733B	NOFM	RRV	CO	Closed	Block Flow	1
3PT-M18	3.4.4	AC	735A	YES	XVM	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	738A	YES	CKV	CC	Closed	Open	1
3PT-M18	3.4.4	AC	738A	NOFM	CKV	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	738B	YES	CKV	CO	Closed	Block Flow	1
3PT-M18	3.4.4	AC	739A	YES	XVM	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	745A	YES	MOV	OC	Open	Flow Check	1
3PT-M18	3.4.4	AC	745B	YES	MOV	OC	Open	Flow Check	1
3PT-M18	3.4.4	SI	838A	YES	CKV	CC	Closed	Open	1
3PT-M18	3.4.4	SI	838A	NOFM	CKV	OC	Open	Flow Check	1
3PT-M18	3.4.4	SI	838B	YES	CKV	CC	Closed	Open	1
3PT-M18	3.4.4	SI	838B	NOFM	CKV	OC	Open	Flow Check	1
3PT-M18	3.4.4	SI	838C	YES	CKV	CC	Closed	Open	1
3PT-M18	3.4.4	SI	838C	NOFM	CKV	OC	Open	Flow Check	1
3PT-M18	3.4.4	SI	838D	YES	CKV	CC	Closed	Open	1
3PT-M18	3.4.4	SI	838D	NOFM	CKV	OC	Open	Flow Check	1
3PT-M18	3.4.4	SI	885B	YES	MOV	CO	Closed	Block Flow	1
3PT-M18	3.4.4	SI	888A	YES	MOV	CO	Closed	Block Flow	1
3PT-M18	3.4.4	SI	888B	YES	MOV	CO	Closed	Block Flow	1
3PT-M18	3.4.4	SI	889A	NOFM	MOV	CO	Closed	Block Flow	1
3PT-M18	3.4.4	SI	889B	NOFM	MOV	CO	Closed	Block Flow	1
3PT-M18	3.4.4	SI	897A	YES	CKV	CC	Closed	Open	1
3PT-M18	3.4.4	SI	897A	NOFM	CKV	OC	Open	Flow Check	1
3PT-M18	3.4.4	SI	897B	YES	CKV	CC	Closed	Open	1
3PT-M18	3.4.4	SI	897B	NOFM	CKV	OC	Open	Flow Check	1
3PT-M18	3.4.4	SI	897C	YES	CKV	CC	Closed	Open	1
3PT-M18	3.4.4	SI	897C	NOFM	CKV	OC	Open	Flow Check	1
3PT-M18	3.4.4	SI	897D	YES	CKV	CC	Closed	Open	1
3PT-M18	3.4.4	SI	897D	NOFM	CKV	OC	Open	Flow Check	1
3PT-M18	3.4.4	SI	899A	YES	MOV	OC	Open	Flow Check	1
3PT-M18	3.4.4	SI	899B	YES	MOV	OC	Open	Flow Check	1
3PT-M18	3.5.2	AC	1871A	YES	XVM	OC	NO	Verify Flow	1
3PT-M18	3.5.2	AC	1871B	YES	XVM	OC	NO	Verify Flow	1
3PT-M18	3.5.2	AC	736B	YES	XVM	OC	NO	Verify Flow	1
3PT-M18	3.5.2	AC	737B	YES	XVM	OC	NO	Verify Flow	1
3PT-M18	3.5.2	AC	750D	YES	CKV	OC	NO	Verify Flow	1
3PT-M18	3.5.2	AC	FIC-645	YES	FIC	OC	NO	Verify Flow	1
3PT-M18	3.5.4	RHR	32	YES	MDP	FS	Standby	Start	1
3PT-M18	3.5.4	RHR	32	YES	MDP	FR	Started	Run	0.25
3PT-M18	3.5.4	AC	837	NOFM	CKV	CO	Closed	Block Flow	1
3PT-M18	3.5.4	AC	838	YES	CKV	CC	Closed	Open	1
3PT-M18	3.5.4	AC	838	NOFM	CKV	OC	Open	Flow Check	1
3PT-M18	3.5.4	AC	840	YES	XVM	OC	Open	Flow Check	1
3PT-M18	3.5.4	AC	842	YES	XVM	OC	Open	Flow Check	1
3PT-M18	3.5.4	AC	735B	YES	XVM	OC	Open	Flow Check	1
3PT-M18	3.5.4	AC	738A	YES	CKV	CO	Closed	Block Flow	1
3PT-M18	3.5.4	AC	738B	YES	CKV	CC	Closed	Open	1
3PT-M18	3.5.4	AC	738B	NOFM	CKV	OC	Open	Flow Check	1
3PT-M18	3.5.4	AC	739B	YES	XVM	OC	Open	Flow Check	1

Table F7 Surveillance Test (ST) Demand Matrix

Procedure Number	Step Ref	System	Comp ID	Logic Model	Comp Type	App FM	Initial State	Requested Action	Demand Fraction
3PT-M20A									
3PT-M20A	3.3.2	AFW	BFD-53		XVM	CO	NC	VC	1
3PT-M20A	3.3.2	AFW	CT-6		XVM	OC	LO	VO	0
3PT-M20A	3.3.2	AFW	CT-64		XVM	OC	LO	VO	0
3PT-M20A	3.3.2	AFW	CT-27		XVM	OC	LO	VO	0
3PT-M20A	3.3.2	AFW	BFD-62-4		XVM	OO	LO	Close	1
3PT-M20A	3.3.2	AFW	BFD-62-1		XVM	OO	LO	Close	1
3PT-M20A	3.3.3	AFW	FCV-1121		AOV	OC	NO	VO	0
3PT-M20A	3.3.4	AFW	FCV-1121		AOV	OO	Open	Close	1
3PT-M20A	3.3.5	AFW	FCV-1121		AOV	CC	Closed	Open	1
3PT-M20A	3.3.7	AFW	31		MDP	FS	Standby	Start	1
3PT-M20A	3.3.7	AFW	31		MDP	FR	Started	Cont. Run	0.25
3PT-M20A	3.3.7	AFW	CT-6		XVM	OC	LO	Flow Check	1
3PT-M20A	3.3.7	AFW	CT-64		XVM	OC	LO	Flow Check	1
3PT-M20A	3.3.7	AFW	CT-26		CKV	OC	Open	Flow Check	1
3PT-M20A	3.3.7	AFW	CT-27		XVM	OC	LO	Flow Check	1
3PT-M20A	3.3.7	AFW	BFD-62-4		XVM	CO	Closed	Block Flow	1
3PT-M20A	3.3.7	AFW	BFD-62-1		XVM	CO	Closed	Block Flow	1
3PT-M20A	3.3.7	AFW	BFD-77		RRV	CO	NC	Block Flow	1
3PT-M20A	3.3.8	AFW	BFD-53		XVM	CC	NC	Throttle Open	1
3PT-M20A	3.3.8	AFW	BFD-53		XVM	OC	Open	Throttle Open	1
3PT-M20A	3.3.8	AFW	BFD-52		CKV	OC	Open	Flow Check	1
3PT-M20A	3.3.8	AFW	BFD-53		XVM	OC	Open	Flow Check	1
3PT-M20A	3.3.8	AFW	BFD-55		XVM	CO	Closed	Block Flow	1
3PT-M20A	3.3.8	AFW	BFD-50		CKV	CO	Closed	Block Flow	1
3PT-M20A	3.3.9	AFW	CT-26		CKV	CC	NC	Open	1
3PT-M20A	3.3.9	AFW	BFD-52		CKV	CC	NC	Open	1
3PT-M20A	3.3.12	AFW	FCV-1121					Switch in AUTO	
3PT-M20A	3.3.13	AFW	BFD-62-4		XVM	CC	Closed	Open	1
3PT-M20A	3.3.13	AFW	BFD-62-1		XVM	CC	Closed	Open	1
3PT-M20A	3.3.13	AFW	BFD-53		XVM	OO	Open	Close	1
3PT-M20A	3.4.2	AFW	BFD-55		XVM	CO	NC	VC	1
3PT-M20A	3.4.2	AFW	CT-6		XVM	OC	LO	VO	0
3PT-M20A	3.4.2	AFW	CT-64		XVM	OC	LO	VO	0
3PT-M20A	3.4.2	AFW	CT-33		XVM	OC	LO	VO	0
3PT-M20A	3.4.2	AFW	BFD-62-2		XVM	OO	LO	Close	1
3PT-M20A	3.4.2	AFW	BFD-62-3		XVM	OO	LO	Close	1
3PT-M20A	3.4.3	AFW	FCV-1123		AOV	OC	NO	VO	0
3PT-M20A	3.4.4	AFW	FCV-1123		AOV	OO	Open	Close	1
3PT-M20A	3.4.5	AFW	FCV-1123		AOV	CC	Closed	Open	1
3PT-M20A	3.4.7	AFW	33		MDP	FS	Standby	Start	1
3PT-M20A	3.4.7	AFW	33		MDP	FR	Started	Cont. Run	0.25
3PT-M20A	3.4.7	AFW	CT-6		XVM	OC	LO	Flow Check	1
3PT-M20A	3.4.7	AFW	CT-64		XVM	OC	LO	Flow Check	1
3PT-M20A	3.4.7	AFW	CT-32		CKV	OC	Open	Flow Check	1
3PT-M20A	3.4.7	AFW	CT-33		XVM	OC	LO	Flow Check	1
3PT-M20A	3.4.7	AFW	BFD-62-2		XVM	CO	Closed	Block Flow	1
3PT-M20A	3.4.7	AFW	BFD-62-3		XVM	CO	Closed	Block Flow	1
3PT-M20A	3.4.7	AFW	BFD-78		RRV	CO	NC	Block Flow	1

Table F7 Surveillance Test (ST) Demand Matrix

Procedure Number	Step Ref	System	Comp ID	Logic Model	Comp Type	App FM	Initial State	Requested Action	Demand Fraction
3PT-M20A	3.4.8	AFW	BFD-55		XVM	CC	NC	Throttle Open	1
3PT-M20A	3.4.8	AFW	BFD-55		XVM	OC	Open	Throttle Open	1
3PT-M20A	3.4.8	AFW	BFD-54		CKV	OC	Open	Flow Check	1
3PT-M20A	3.4.8	AFW	BFD-55		XVM	OC	Open	Flow Check	1
3PT-M20A	3.4.8	AFW	BFD-53		XVM	CO	Closed	Block Flow	1
3PT-M20A	3.4.8	AFW	BFD-50		CKV	CO	Closed	Block Flow	1
3PT-M20A	3.4.9	AFW	CT-32		CKV	CC	NC	Open	1
3PT-M20A	3.4.9	AFW	BFD-54		CKV	CC	NC	Open	1
3PT-M20A	3.4.12	AFW	FCV-1123					Switch in AUTO	
3PT-M20A	3.4.13	AFW	BFD-62-2		XVM	CC	Closed	Open	1
3PT-M20A	3.4.13	AFW	BFD-62-3		XVM	CC	Closed	Open	1
3PT-M20A	3.4.13	AFW	BFD-55		XVM	OO	Open	Close	1
3PT-M20A	3.5.2	AFW	CT-6		XVM	OC	LO	VO	0
3PT-M20A	3.5.2	AFW	CT-64		XVM	OC	LO	VO	0
3PT-M20A	3.5.2	AFW	CT-30		XVM	OC	LO	VO	0
3PT-M20A	3.5.2	AFW	BFD-48-8		XVM	OO	LO	Close	1
3PT-M20A	3.5.2	AFW	BFD-48-2		XVM	OO	LO	Close	1
3PT-M20A	3.5.2	AFW	BFD-48-4		XVM	OO	LO	Close	1
3PT-M20A	3.5.2	AFW	BFD-48-6		XVM	OO	LO	Close	1
3PT-M20A	3.5.2	MS	MS-41		CKV	OO	NO	Close	1
3PT-M20A	3.5.2	MS	MS-42		CKV	OC	NO	VO	0
3PT-M20A	3.5.7	AFW	32		TDP	FS	Standby	Start	1
3PT-M20A	3.5.7	AFW	32		TDP	FR	Started	Cont. Run	0.25
3PT-M20A	3.5.7	MS	MS-42		CKV	CC	Closed	Open	1
3PT-M20A	3.5.7	MS	PCV-1139		AOV	CC	Closed	Open	1
3PT-M20A	3.5.7	MS	HCV-1118		HCV	CC	Closed	Open	1
3PT-M20A	3.5.7	MS	MS-42		CKV	OC	Open	Flow Check	1
3PT-M20A	3.5.7	MS	PCV-1310A		AOV	OC	NO	Flow Check	1
3PT-M20A	3.5.7	MS	PCV-11310B		AOV	OC	NO	Flow Check	1
3PT-M20A	3.5.7	MS	MS-54		XVM	OC	NO	Flow Check	1
3PT-M20A	3.5.7	MS	PCV-1139		AOV	OC	Open	Flow Check	1
3PT-M20A	3.5.7	MS	MS-52		RRV	CO	Closed	Block Flow	1
3PT-M20A	3.5.7	MS	HCV-1118		HCV	OC	Open	Flow Check	1
3PT-M20A	3.5.7	AFW	CT-6		XVM	OC	LO	Flow Check	1
3PT-M20A	3.5.7	AFW	CT-64		XVM	OC	LO	Flow Check	1
3PT-M20A	3.5.7	AFW	CT-29-1		CKV	OC	Open	Flow Check	1
3PT-M20A	3.5.7	AFW	CT-30		XVM	OC	LO	Flow Check	1
3PT-M20A	3.5.7	AFW	BFD-48-8		XVM	CO	Closed	Block Flow	1
3PT-M20A	3.5.7	AFW	BFD-48-2		XVM	CO	Closed	Block Flow	1
3PT-M20A	3.5.7	AFW	BFD-48-4		XVM	CO	Closed	Block Flow	1
3PT-M20A	3.5.7	AFW	BFD-48-6		XVM	CO	Closed	Block Flow	1
3PT-M20A	3.5.7	AFW	Orifice		ORF	OC	NO	Flow Check	1
3PT-M20A	3.5.7	AFW	BFD-50		CKV	OC	Open	Flow Check	1
3PT-M20A	3.5.7	AFW	BFD-51		XVM	OC	Open	Flow Check	1
3PT-M20A	3.5.7	AFW	BFD-53		XVM	CO	Closed	Block Flow	1
3PT-M20A	3.5.7	AFW	BFD-55		XVM	CO	Closed	Block Flow	1
3PT-M20A	3.5.9.2	AFW	CT-29-2		CKV	CC	NC	Open	1
3PT-M20A	3.5.9.2	AFW	BFD-50		CKV	CC	NC	Open	1
3PT-M20A	3.5.13	MS	PCV-1139		AOV	OO	Open	Close	1

Table F7 Surveillance Test (ST) Demand Matrix

Procedure Number	Step Ref	System	Comp ID	Logic Model	Comp Type	App FM	Initial State	Requested Action	Demand Fraction
3PT-M20A	3.5.14.2	MS	HCV-1118		HCV	OO	Open	Close	1
3PT-M20A	3.5.16	AFW	BFD-48-8		XVM	CC	Closed	Open	1
3PT-M20A	3.5.16	AFW	BFD-48-2		XVM	CC	Closed	Open	1
3PT-M20A	3.5.16	AFW	BFD-48-4		XVM	CC	Closed	Open	1
3PT-M20A	3.5.16	AFW	BFD-48-6		XVM	CC	Closed	Open	1
3PT-M20A	3.5.16	MS	MS-41		CKV	CC	Closed	Open	1
3PT-M20B									
3PT-M20B	3.3.2	AFW	BFD-53		XVM	CO	NC	VC	1
3PT-M20B	3.3.2	AFW	CT-6		XVM	OC	LO	VO	0
3PT-M20B	3.3.2	AFW	CT-64		XVM	OC	LO	VO	0
3PT-M20B	3.3.2	AFW	CT-27		XVM	OC	LO	VO	0
3PT-M20B	3.3.2	AFW	BFD-62-4		XVM	OO	LO	Close	1
3PT-M20B	3.3.2	AFW	BFD-62-1		XVM	OO	LO	Close	1
3PT-M20B	3.3.3	AFW	FCV-1121		AOV	OC	NO	VO	0
3PT-M20B	3.3.4	AFW	FCV-1121		AOV	OO	Open	Close	1
3PT-M20B	3.3.5	AFW	FCV-1121		AOV	CC	Closed	Open	1
3PT-M20B	3.3.7	AFW	31		MDP	FS	Standby	Start	1
3PT-M20B	3.3.7	AFW	31		MDP	FR	Started	Cont. Run	0.25
3PT-M20B	3.3.7	AFW	CT-6		XVM	OC	LO	Flow Check	1
3PT-M20B	3.3.7	AFW	CT-64		XVM	OC	LO	Flow Check	1
3PT-M20B	3.3.7	AFW	CT-26		CKV	OC	Open	Flow Check	1
3PT-M20B	3.3.7	AFW	CT-27		XVM	OC	LO	Flow Check	1
3PT-M20B	3.3.7	AFW	BFD-62-4		XVM	CO	Closed	Block Flow	1
3PT-M20B	3.3.7	AFW	BFD-62-1		XVM	CO	Closed	Block Flow	1
3PT-M20B	3.3.7	AFW	BFD-77		RRV	CO	NC	Block Flow	1
3PT-M20B	3.3.8	AFW	BFD-53		XVM	CC	NC	Throttle Open	1
3PT-M20B	3.3.8	AFW	BFD-53		XVM	OC	Open	Throttle Open	1
3PT-M20B	3.3.8	AFW	BFD-52		CKV	OC	Open	Flow Check	1
3PT-M20B	3.3.8	AFW	BFD-53		XVM	OC	Open	Flow Check	1
3PT-M20B	3.3.8	AFW	BFD-55		XVM	CO	Closed	Block Flow	1
3PT-M20B	3.3.8	AFW	BFD-50		CKV	CO	Closed	Block Flow	1
3PT-M20B	3.3.9	AFW	CT-26		CKV	CC	NC	Open	1
3PT-M20B	3.3.9	AFW	BFD-52		CKV	CC	NC	Open	1
3PT-M20B	3.3.12	AFW	FCV-1121					Switch in AUTO	
3PT-M20B	3.3.13	AFW	BFD-62-4		XVM	CC	Closed	Open	1
3PT-M20B	3.3.13	AFW	BFD-62-1		XVM	CC	Closed	Open	1
3PT-M20B	3.3.13	AFW	BFD-53		XVM	OO	Open	Close	1
3PT-M20B	3.4.2	AFW	BFD-55		XVM	CO	NC	VC	1
3PT-M20B	3.4.2	AFW	CT-6		XVM	OC	LO	VO	0
3PT-M20B	3.4.2	AFW	CT-64		XVM	OC	LO	VO	0
3PT-M20B	3.4.2	AFW	CT-33		XVM	OC	LO	VO	0
3PT-M20B	3.4.2	AFW	BFD-62-2		XVM	OO	LO	Close	1
3PT-M20B	3.4.2	AFW	BFD-62-3		XVM	OO	LO	Close	1
3PT-M20B	3.4.3	AFW	FCV-1123		AOV	OC	NO	VO	0
3PT-M20B	3.4.4	AFW	FCV-1123		AOV	OO	Open	Close	1
3PT-M20B	3.4.5	AFW	FCV-1123		AOV	CC	Closed	Open	1
3PT-M20B	3.4.7	AFW	33		MDP	FS	Standby	Start	1
3PT-M20B	3.4.7	AFW	33		MDP	FR	Started	Cont. Run	0.25
3PT-M20B	3.4.7	AFW	CT-6		XVM	OC	LO	Flow Check	1

Table F7 Surveillance Test (ST) Demand Matrix

Procedure Number	Step Ref	System	Comp ID	Logic Model	Comp Type	App FM	Initial State	Requested Action	Demand Fraction
3PT-M20B	3.4.7	AFW	CT-64		XVM	OC	LO	Flow Check	1
3PT-M20B	3.4.7	AFW	CT-32		CKV	OC	Open	Flow Check	1
3PT-M20B	3.4.7	AFW	CT-33		XVM	OC	LO	Flow Check	1
3PT-M20B	3.4.7	AFW	BFD-62-2		XVM	CO	Closed	Block Flow	1
3PT-M20B	3.4.7	AFW	BFD-62-3		XVM	CO	Closed	Block Flow	1
3PT-M20B	3.4.7	AFW	BFD-78		RRV	CO	NC	Block Flow	1
3PT-M20B	3.4.8	AFW	BFD-55		XVM	CC	NC	Throttle Open	1
3PT-M20B	3.4.8	AFW	BFD-55		XVM	OC	Open	Throttle Open	1
3PT-M20B	3.4.8	AFW	BFD-54		CKV	OC	Open	Flow Check	1
3PT-M20B	3.4.8	AFW	BFD-55		XVM	OC	Open	Flow Check	1
3PT-M20B	3.4.8	AFW	BFD-53		XVM	CO	Closed	Block Flow	1
3PT-M20B	3.4.8	AFW	BFD-50		CKV	CO	Closed	Block Flow	1
3PT-M20B	3.4.9	AFW	CT-32		CKV	CC	NC	Open	1
3PT-M20B	3.4.9	AFW	BFD-54		CKV	CC	NC	Open	1
3PT-M20B	3.4.12	AFW	FCV-1123					Switch in AUTO	
3PT-M20B	3.4.13	AFW	BFD-62-2		XVM	CC	Closed	Open	1
3PT-M20B	3.4.13	AFW	BFD-62-3		XVM	CC	Closed	Open	1
3PT-M20B	3.4.13	AFW	BFD-55		XVM	OO	Open	Close	1
3PT-M20B	3.5.2	AFW	CT-6		XVM	OC	LO	VO	0
3PT-M20B	3.5.2	AFW	CT-64		XVM	OC	LO	VO	0
3PT-M20B	3.5.2	AFW	CT-30		XVM	OC	LO	VO	0
3PT-M20B	3.5.2	AFW	BFD-48-8		XVM	OO	LO	Close	1
3PT-M20B	3.5.2	AFW	BFD-48-2		XVM	OO	LO	Close	1
3PT-M20B	3.5.2	AFW	BFD-48-4		XVM	OO	LO	Close	1
3PT-M20B	3.5.2	AFW	BFD-48-6		XVM	OO	LO	Close	1
3PT-M20B	3.5.2	MS	MS-41		CKV	OC	NO	VO	0
3PT-M20B	3.5.2	MS	MS-42		CKV	OO	NO	Close	1
3PT-M20B	3.5.7	AFW	32		TDP	FS	Standby	Start	1
3PT-M20B	3.5.7	AFW	32		TDP	FR	Started	Cont. Run	0.25
3PT-M20B	3.5.7	MS	MS-41		CKV	CC	Closed	Open	1
3PT-M20B	3.5.7	MS	PCV-1139		AOV	CC	Closed	Open	1
3PT-M20B	3.5.7	MS	HCV-1118		HCV	CC	Closed	Open	1
3PT-M20B	3.5.7	MS	MS-41		CKV	OC	Open	Flow Check	1
3PT-M20B	3.5.7	MS	PCV-1310A		AOV	OC	NO	Flow Check	1
3PT-M20B	3.5.7	MS	PCV-11310B		AOV	OC	NO	Flow Check	1
3PT-M20B	3.5.7	MS	MS-54		XVM	OC	NO	Flow Check	1
3PT-M20B	3.5.7	MS	PCV-1139		AOV	OC	Open	Flow Check	1
3PT-M20B	3.5.7	MS	MS-52		RRV	CO	Closed	Block Flow	1
3PT-M20B	3.5.7	MS	HCV-1118		HCV	OC	Open	Flow Check	1
3PT-M20B	3.5.7	AFW	CT-6		XVM	OC	LO	Flow Check	1
3PT-M20B	3.5.7	AFW	CT-64		XVM	OC	LO	Flow Check	1
3PT-M20B	3.5.7	AFW	CT-29-1		CKV	OC	Open	Flow Check	1
3PT-M20B	3.5.7	AFW	CT-30		XVM	OC	LO	Flow Check	1
3PT-M20B	3.5.7	AFW	BFD-48-8		XVM	CO	Closed	Block Flow	1
3PT-M20B	3.5.7	AFW	BFD-48-2		XVM	CO	Closed	Block Flow	1
3PT-M20B	3.5.7	AFW	BFD-48-4		XVM	CO	Closed	Block Flow	1
3PT-M20B	3.5.7	AFW	BFD-48-6		XVM	CO	Closed	Block Flow	1
3PT-M20B	3.5.7	AFW	Orifice		ORF	OC	NO	Flow Check	1
3PT-M20B	3.5.7	AFW	BFD-50		CKV	OC	Open	Flow Check	1

Table F7 Surveillance Test (ST) Demand Matrix

Procedure Number	Step Ref	System	Comp ID	Logic Model	Comp Type	App FM	Initial State	Requested Action	Demand Fraction
3PT-M20B	3.5.7	AFW	BFD-51		XVM	OC	Open	Flow Check	1
3PT-M20B	3.5.7	AFW	BFD-53		XVM	CO	Closed	Block Flow	1
3PT-M20B	3.5.7	AFW	BFD-55		XVM	CO	Closed	Block Flow	1
3PT-M20B	3.5.9.2	AFW	CT-29-2		CKV	CC	NC	Open	1
3PT-M20B	3.5.9.2	AFW	BFD-50		CKV	CC	NC	Open	1
3PT-M20B	3.5.13	MS	PCV-1139		AOV	OO	Open	Close	1
3PT-M20B	3.5.14.2	MS	HCV-1118		HCV	OO	Open	Close	1
3PT-M20B	3.5.16	AFW	BFD-48-8		XVM	CC	Closed	Open	1
3PT-M20B	3.5.16	AFW	BFD-48-2		XVM	CC	Closed	Open	1
3PT-M20B	3.5.16	AFW	BFD-48-4		XVM	CC	Closed	Open	1
3PT-M20B	3.5.16	AFW	BFD-48-6		XVM	CC	Closed	Open	1
3PT-M20B	3.5.16	MS	MS-42		CKV	CC	Closed	Open	1
3PT-M35									
3PT-M35	3.4	SWS	31	YES	MDP	FS	Standby	Start	1
3PT-M35	3.4	SWS	52/SW1	YES	CBR	DN	Open	Close	1
3PT-M35	3.4	SWS	31	YES	MDP	FR	Running	Continue to Run	log
3PT-M35	3.8.10	SWS	SWN-1-1	YES	CKV	CC	Closed	Open	1
3PT-M35	3.8.10	SWS	SWN-100-2	YES	CKV	CC	Closed	Open	1
3PT-M35	3.10	SWS	SWN-1-1		CKV	CO	Closed	Open	1
3PT-M35	3.12	SWS	31	YES	MDP	FS	Standby	Start	1
3PT-M35	3.12	SWS	52/SW1	YES	CBR	DN	Open	Close	1
3PT-M35	3.12	SWS	31	YES	MDP	FR	Running	Continue to Run	log
3PT-M35	3.16.10	SWS	SWN-1-2	YES	CKV	CC	Closed	Open	1
3PT-M35	3.16.10	SWS	SWN-100-2	YES	CKV	CC	Closed	Open	1
3PT-M35	3.18	SWS	SWN-1-2		CKV	CO	Closed	Open	1
3PT-M35	3.20	SWS	31	YES	MDP	FS	Standby	Start	1
3PT-M35	3.20	SWS	52/SW1	YES	CBR	DN	Open	Close	1
3PT-M35	3.20	SWS	31	YES	MDP	FR	Running	Continue to Run	log
3PT-M35	3.24.10	SWS	SWN-1-3	YES	CKV	CC	Closed	Open	1
3PT-M35	3.24.10	SWS	SWN-100-2	YES	CKV	CC	Closed	Open	1
3PT-M35	3.26	SWS	SWN-1-2		CKV	CO	Closed	Open	1
3PT-R003B									
3PT-R003B	3.3	SI	Rack E-2					Lift Field Wire	
3PT-R003B	3.4	SI	851A	YES	MOV	OO	Open	Close	1
3PT-R003B	3.4	SI	851B	YES	MOV	OO	Open	Close	1
3PT-R003B	3.5	SI	850B	YES	XVM	OO	Locked Open	Close	1
3PT-R003B	3.5	SI	869A	YES	XVM	OO	Locked Open	Close	1
3PT-R003B	3.5	SI	869B	YES	XVM	OO	Locked Open	Close	1
3PT-R003B	3.6	SI	850A	YES	MOV	OO	Open	Close	1
3PT-R003B	3.6	SI	850C	YES	MOV	OO	Open	Close	1
3PT-R003B	3.7.6	CCW	32	YES	RCK	NO	Open	Close	1
3PT-R003B	3.7.6	SWS	32	YES	RCK	NO	Open	Close	1
3PT-R003B	3.7.6	SI	32	YES	RCK	NO	Open	Close	1
3PT-R003B	3.7.6	CFC	32	YES	RCK	NO	Open	Close	1
3PT-R003B	3.8.8	CCW	32	YES	CRB	DN	Closed	Trip Open	1
3PT-R003B	3.8.8	SWS	32	YES	CRB	DN	Closed	Trip Open	1
3PT-R003B	3.8.8	SI	32	YES	CRB	DN	Closed	Trip Open	1
3PT-R003B	3.8.8	CFC	32	YES	CRB	DN	Closed	Trip Open	1
3PT-R003B	3.9.6	CFC	34	YES	RCK	NO	Open	Close	1

Table F7 Surveillance Test (ST) Demand Matrix

Procedure Number	Step Ref	System	Comp ID	Logic Model	Comp Type	App FM	Initial State	Requested Action	Demand Fraction
3PT-R003B	3.9.6	SWS	35	YES	RCK	NO	Open	Close	1
3PT-R003B	3.9.6	RHR	31	YES	RCK	NO	Open	Close	1
3PT-R003B	3.9.6	AFW	31	YES	RCK	NO	Open	Close	1
3PT-R003B	3.10.7	CFC	34	YES	CRB	DN	Closed	Trip Open	1
3PT-R003B	3.10.7	SWS	35	YES	CRB	DN	Closed	Trip Open	1
3PT-R003B	3.10.7	RHR	31	YES	CRB	DN	Closed	Trip Open	1
3PT-R003B	3.10.7	AFW	31	YES	CRB	DN	Closed	Trip Open	1
3PT-R003B	3.11.6	SI	31	YES	RCK	NO	Open	Close	1
3PT-R003B	3.11.6	SWS	31	YES	RCK	NO	Open	Close	1
3PT-R003B	3.11.6	CFC	31	YES	RCK	NO	Open	Close	1
3PT-R003B	3.11.6	CFC	33	YES	RCK	NO	Open	Close	1
3PT-R003B	3.11.6	CCW	31	YES	RCK	NO	Open	Close	1
3PT-R003B	3.11.10	SWS	34	YES	RCK	NO	Open	Close	1
3PT-R003B	3.11.16	CS	31	YES	RCK	NO	Open	Close	1
3PT-R003B	3.12.5	CS	31	YES	CRB	DN	Closed	Trip Open	1
3PT-R003B	3.12.5	CFC	31	YES	CRB	DN	Closed	Trip Open	1
3PT-R003B	3.12.5	SI	31	YES	CRB	DN	Closed	Trip Open	1
3PT-R003B	3.12.5	CCW	31	YES	CRB	DN	Closed	Trip Open	1
3PT-R003B	3.12.5	CFC	33	YES	CRB	DN	Closed	Trip Open	1
3PT-R003B	3.12.5	SWS	34	YES	CRB	DN	Closed	Trip Open	1
3PT-R003B	3.12.5	SWS	31	YES	CRB	DN	Closed	Trip Open	1
3PT-R003B	3.13.6	SI	33	YES	RCK	NO	Open	Close	1
3PT-R003B	3.13.6	RHR	32	YES	RCK	NO	Open	Close	1
3PT-R003B	3.13.6	SWS	33	YES	RCK	NO	Open	Close	1
3PT-R003B	3.13.6	CFC	35	YES	RCK	NO	Open	Close	1
3PT-R003B	3.13.6	AFW	33	YES	RCK	NO	Open	Close	1
3PT-R003B	3.13.6	CCW	33	YES	RCK	NO	Open	Close	1
3PT-R003B	3.13.10	SWS	36	YES	RCK	NO	Open	Close	1
3PT-R003B	3.13.16	CS	32	YES	RCK	NO	Open	Close	1
3PT-R003B	3.14.6	SI	33	YES	CRB	DN	Closed	Trip Open	1
3PT-R003B	3.14.6	RHR	32	YES	CRB	DN	Closed	Trip Open	1
3PT-R003B	3.14.6	SWS	33	YES	CRB	DN	Closed	Trip Open	1
3PT-R003B	3.14.6	CFC	35	YES	CRB	DN	Closed	Trip Open	1
3PT-R003B	3.14.6	AFW	33	YES	CRB	DN	Closed	Trip Open	1
3PT-R003B	3.14.6	CCW	33	YES	CRB	DN	Closed	Trip Open	1
3PT-R003B	3.14.6	SWS	36	YES	CRB	DN	Closed	Trip Open	1
3PT-R003B	3.14.6	CS	32	YES	CRB	DN	Closed	Trip Open	1
3PT-R003B	3.16	SI	851A	YES	MOV	CC	Closed	Open	1
3PT-R003B	3.16	SI	851B	YES	MOV	CC	Closed	Open	1
3PT-R003B	3.16	SI	850B	YES	XVM	CC	Closed	Open	1
3PT-R003B	3.16	SI	869A	YES	XVM	CC	Closed	Open	1
3PT-R003B	3.16	SI	869B	YES	XVM	CC	Closed	Open	1
3PT-R003B	3.16	SI	850A	YES	MOV	CC	Closed	Open	1
3PT-R003B	3.16	SI	850C	YES	MOV	CC	Closed	Open	1
3PT-R003C									
3PT-R003C	3.3	SI	850B	NO	XVM	OO	Open	Close	1
3PT-R003C	3.3	SI	869A	NO	XVM	OO	Open	Close	1
3PT-R003C	3.3	SI	869B	NO	XVM	OO	Open	Close	1
3PT-R64									

Table F7 Surveillance Test (ST) Demand Matrix

Procedure Number	Step Ref	System	Comp ID	Logic Model	Comp Type	App FM	Initial State	Requested Action	Demand Fraction
3PT-R64	3.3	SI	846	YES	XVM	PG	LO	Verify	1
3PT-R64	3.3	SI	1810	YES	MOV	PG	Open	Verify	1
3PT-R64	3.3	SI	848A	YES	XVM	PG	LO	Verify	1
3PT-R64	3.3	SI	1819A	NO	XVM		LO	Verify	1
3PT-R64	3.3	SI	850A	YES	MOV	PG	Open	Verify	1
3PT-R64	3.3	SI	850C	YES	MOV	PG	Open	Verify	1
3PT-R64	3.3	SI	1807A	NO	XVM		LO	Verify	1
3PT-R64	3.3	SI	887A	YES	MOV	PG	Closed	Open	1
3PT-R64	3.3	SI	887B	YES	MOV	PG	Closed	Open	1
3PT-R64	3.3	SI	1819B	NO			LO	Verify	1
3PT-R64	3.3	SI	851A	YES	MOV	PG	Closed	Open	1
3PT-R64	3.3	SI	851B	YES	MOV	PG	Closed	Open	1
3PT-R64	3.3	SI	1807B	NO			LO	Verify	1
3PT-R64	3.3	SI	848B	YES	XVM	PG	LO	Verify	1
3PT-R64	3.3	SI	1819C	NO			LO	Verify	1
3PT-R64	3.3	SI	850B	YES	XVM	PG	LO	Verify	1
3PT-R64	3.3	SI	1807C	NO			LO	Verify	1
3PT-R64	3.3	SI	842	YES	MOV	PG	Open	Verify	1
3PT-R64	3.3	SI	843	YES	MOV	PG	Open	Verify	1
3PT-R64	3.3	SI	1862	YES	XVM	OO	LO	Verify	1
3PT-R64	3.3	SI	859A	NO	XVM		Closed	Verify	1
3PT-R64	3.3	SI	859B	NO	XVM		Closed	Verify	1
3PT-R64	3.3	SI	859C	NO	XVM		Closed	Verify	1
3PT-R64	3.3	SI	839A	NO	AOV		Closed	Verify	1
3PT-R64	3.3	SI	839C	NO	AOV		Closed	Verify	1
3PT-R64	3.3	SI	839E	NO	AOV		Closed	Verify	1
3PT-R64	3.3	SI	839G	NO	AOV		Closed	Verify	1
3PT-R64	3.3	SI	890A	NO	AOV		Closed	Verify	1
3PT-R64	3.3	SI	890B	NO	AOV		Closed	Verify	1
3PT-R64	3.3	SI	890C	NO	AOV		Closed	Verify	1
3PT-R64	3.3	SI	890D	NO	AOV		Closed	Verify	1
3PT-R64	3.3	SI	888A	YES	MOV	PG	Closed	Verify	1
3PT-R64	3.3	SI	888B	YES	MOV	PG	Closed	Verify	1
3PT-R64	3.3	SI	1852A	YES	MOV	CC	Closed	Verify	1
3PT-R64	3.3	SI	1852B	YES	MOV	CC	Closed	Verify	1
3PT-R64	3.3	SI	1835A	YES	MOV	CC	Closed	Verify	1
3PT-R64	3.3	SI	1835B	YES	MOV	CC	Closed	Verify	1
3PT-R64	3.3	SI	856A	YES	XVM	PG	Open	Close	1
3PT-R64	3.3	SI	856J	YES	MOV	PG	Open	Close	1
3PT-R64	3.3	SI	856H	YES	MOV	PG	Open	Close	1
3PT-R64	3.3	SI	856K	YES	XVM	PG	Open	Close	1
3PT-R64	3.3	SI	1833A	NO	XVM		Open	Close	1
3PT-R64	3.3	SI	1833B	NO	XVM		Open	Close	1
3PT-V16									
3PT-V16	3.2.4	EDG	DG-33A	YES	ASV	FE	De-energized	Energize	1
3PT-V16	3.2.4	EDG	DG-33B	YES	ASV	FE	De-energized	Energize	1
3PT-V16	3.2.4	EDG	33 EDG	YES	ENG	FS	Standby	Start	1
3PT-V16	3.2.4	EDG	33 EDG	YES	ENG	FR	Started	Cont Run	1
3PT-V16	3.2.4	EDG	33 EDG	YES	GEN	HW	Standby	Operate	1
3PT-V16	3.2.8	AC4	52/EG3	YES	CRB	OO	Open	Close	1

Table F7 Surveillance Test (ST) Demand Matrix

Procedure Number	Step Ref	System	Comp ID	Logic Model	Comp Type	App FM	Initial State	Requested Action	Demand Fraction
3PT-V16	3.2.12	AC4	52/EG3	NOFM	CRB	CC	Closed	Open	1
3PT-V16									
3PT-V16	3.3.4	EDG	DG-32A	YES	ASV	FE	De-energized	Energize	1
3PT-V16	3.3.4	EDG	DG-32B	YES	ASV	FE	De-energized	Energize	1
3PT-V16	3.3.4	EDG	32 EDG	YES	ENG	FS	Standby	Start	1
3PT-V16	3.3.4	EDG	32 EDG	YES	ENG	FR	Started	Cont Run	1
3PT-V16	3.3.4	EDG	32 EDG	YES	GEN	HW	Standby	Operate	1
3PT-V16	3.3.8	AC4	52/EG2	YES	CRB	OO	Open	Close	1
3PT-V16	3.3.12	AC4	52/EG2	NOFM	CRB	CC	Closed	Open	1
3PT-V16	3.4.4	EDG	DG-31A	YES	ASV	FE	De-energized	Energize	1
3PT-V16	3.4.4	EDG	DG-31B	YES	ASV	FE	De-energized	Energize	1
3PT-V16	3.4.4	EDG	31 EDG	YES	ENG	FS	Standby	Start	1
3PT-V16	3.4.4	EDG	31 EDG	YES	ENG	FR	Started	Cont Run	1
3PT-V16	3.4.4	EDG	31 EDG	YES	GEN	HW	Standby	Operate	1
3PT-V16	3.4.8	AC4	52/EG1	YES	CRB	OO	Open	Close	1
3PT-V16	3.4.13	AC4	52/EG1	NOFM	CRB	CC	Closed	Open	1
3PT-V26									
3PT-V26	all	FW	417	YES	FCV	PG			
GENERAL ASSUMPTIONS AND NOTES									
1.	Logic model column can have value of YES, NO or NOFM.								
		YES indicates given component and its failure mode is modeled in system fault tree.							
		NO indicates component is not modeled in the system fault tree							
		NOFM indicates component is modeled but specified failure mode for this component is not modeled.							
2.	When evaluating modeled failure modes, the failure modes from ISLOCA were not included in the evaluation at this time.								
	This may be done later, if necessary.								
3.	Following acronyms are used for Initial State column.								
		NC - Normally Closed							
		NO - Normally Open							
		LC - Locked Closed							
		LO - Locked Open							
		LS - Locked Shut							
4.	Following acronyms are used for Requested Action column.								
		VC - Verify Closed							
		VO - Verify Open							
		FX - Flow Check							
		BF - Block Flow							

APPENDIX G

PLANT DATA

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G1 Generic Failure Data G-1

G2 Plant-Specific Failure Data G-13

G3 Maintenance Unavailability Data G-23

Table G1 Generic Failure Data

COMPONENT TYPE	FAILURE MODE	DESCRIPTION	MEAN VALUE	ERROR FACTOR	UNIT
MDP	FS	MOTOR DRIVEN PUMP FAILS TO START ON DEMAND	3.00E-03	10	D
MDP	RS	MOTOR DRIVEN PUMP FAILS TO RESTART ON DEMAND	1.50E-03	10	D
MDP	FR	MOTOR DRIVEN PUMP FAILS TO CONTINUE TO RUN	3.00E-05	10	H
TDP	FS	TURBINE DRIVEN PUMP FAILS TO START ON DEMAND	3.00E-02	10	D
TDP	FR	TURBINE DRIVEN PUMP FAILS TO CONTINUE TO RUN	5.00E-03	10	H
ENG	FS	EMERGENCY DIESEL ENGINE FAILS TO START	3.00E-02	10	D
ENG	FR	EMERGENCY DIESEL ENGINE FAILS TO RUN	2.00E-03	10	H
FCU	FS	FAN COOLING UNIT (FCU) FAILS TO START	1.00E-02	5	D
FCU	FR	FAN COOLING UNIT (FCU) FAILS TO RUN	1.00E-05	10	H
CMP	FS	INSTRUMENT AIR COMPRESSOR FAILS TO START	3.29E-03	7	
CMP	FR	INSTRUMENT AIR COMPRESSOR FAILS TO RUN	5.42E-04		H
FAN	FR	VENT FAN FAILS TO CONTINUE TO RUN	3.00E-05	10	H
FAN	FS	VENT FAN FAILS TO START ON DEMAND	5.00E-03	5	D
AOD	CC	AIR OPERATED DAMPER/LOUVER FAILS TO OPEN	1.52E-03	3	D
PND	CC	FAN COOLING UNIT (FCU) DAMPER FAILS TO OPEN	1.81E-02		D
PND	OO	FAN COOLING UNIT (FCU) DAMPER FAILS TO CLOSE	1.81E-02		D
PND	OC	FAN COOLING UNIT (FCU) DAMPER FAILS TO REMAIN OPEN	1.25E-07		H
DOR	CC	FAN COOLING UNIT BLOW-IN DOOR FAILS TO OPEN	1.07E-07	10	H
CKV	CC	CHECK VALVE FAILS TO OPEN	1.00E-04	3	D
CKV	OO	CHECK VALVE FAILS TO CLOSE	1.00E-03	3	D

Table G1 Generic Failure Data

COMPONENT TYPE	FAILURE MODE	DESCRIPTION	MEAN VALUE	ERROR FACTOR	UNIT
CKV	OC	CHECK VALVE FAILS TO REMAIN OPEN	1.25E-07		
CKV	CO	CHECK VALVE FAILS TO REMAIN CLOSED	5.36E-07	4	
CKV	LK	CHECK VALVE REVERSE LEAKAGE	5.36E-07	4	
CKV	RP	CHECK VALVE RUPTURE FAILURE	1.55E-08	20	H
SKV	CC	STOP CHECK VALVE FAILS TO OPEN	1.00E-04	3	D
SKV	OO	STOP CHECK VALVE FAIL TO CLOSE	1.00E-03	3	D
XVM	CC	MANUAL VALVE FAILS TO OPEN	1.00E-04	3	D
XVM	OO	MANUAL VALVEFAILS TO CLOSE	1.00E-04	3	D
XVM	CO	MANUAL VALVE FAILS TO REMAIN CLOSED	4.20E-08	9	H
XVM	OC	MANUAL VALVE FAILS TO REMAIN OPEN	1.00E-07	3	H
XVM	PG	MANUAL VALVE PLUGGED	1.00E-07	3	H
XVM	LK	MANUAL VALVE EXCESSIVE INTERNAL LEAKAGE	5.00E-08	10	H
XVM	RP	MANUAL VALVE RUPTURE FAILURE	5.00E-08	10	H
MOV	CC	MOTOR OPERATED VALVE (MOV) FAILS TO OPEN	3.00E-03	10	D
MOV	RO	MOTOR OPERATED VALVE (MOV) DOES NOT REOPEN	2.25E-03	10	D
MOV	OO	MOTOR OPERATED VALVE (MOV) FAILS TO CLOSE	3.00E-03	10	D
MOV	OC	MOTOR OPERATED VALVE (MOV) FAILS TO REMAIN OPEN	1.00E-07	3	H
MOV	PG	MOTOR OPERATED VALVE (MOV) FAILS TO REMAIN OPEN (PLUGGED)	1.00E-07	3	H
MOV	CO	MOTOR OPERATED VALVE (MOV) FAILS TO REMAIN CLOSED	5.00E-07	10	H
MOV	LK	MOTOR OPERATED VALVE (MOV) EXCESSIVE INTERNAL LEAKAGE	5.00E-07	10	H
MOV	RP	MOTOR OPERATED VALVE (MOV) RUPTURE FAILURE	1.00E-07	10	H
MOV	TE	MOTOR OPERATED VALVE (MOV) FAILS DURING STROKE TEST	1.70E-04	61	D
AOV	CC	AIR OPERATED VALVE (AOV) DOES NOT OPEN	1.00E-03	3	D

Table G1 Generic Failure Data

COMPONENT TYPE	FAILURE MODE	DESCRIPTION	MEAN VALUE	ERROR FACTOR	UNIT
AOV	OO	AIR OPERATED VALVE (AOV) DOES NOT CLOSE	2.00E-03	3	D
AOV	CO	AIR OPERATED VALVE (AOV) FAILS TO REMAIN CLOSED	5.00E-07	10	H
AOV	OC	AIR OPERATED VALVE (AOV) FAILS TO REMAIN OPEN	1.00E-07	3	H
AOV	PG	AIR OPERATED VALVE (AOV) FAILS CLOSED (PLUGGED)	1.00E-07	3	H
FCV	CC	FLOW CONTROL VALVE (FCV) DOES NOT OPEN	1.00E-03	3	D
FCV	CC	S/G FEEDWATER REG VALVE DOES NOT OPEN	1.00E-03	3	D
FCV	OO	FLOW CONTROL VALVE (FCV) FAIL OPEN	2.00E-03	3	D
FCV	CO	FLOW CONTROL VALVE (FCV) FAIL TO REMAIN CLOSED	5.00E-07	10	H
FCV	OC	FLOW CONTROL VALVE (FCV) FAIL TO REMAIN OPEN (FAIL CLOSED)	1.00E-07	3	H
FCV	OC	S/G FEEDWATER REG VALVE FAIL CLOSED	1.00E-07	3	H
FCV	PG	FLOW CONTROL VALVE (FCV) FAILS TO REMAIN OPEN (PLUGGED)	1.00E-07	3	H
LCV	CC	LEVEL CONTROL VALVE (LCV) FAILS TO OPEN	1.00E-03	3	D
LCV	OO	LEVEL CONTROL VALVE (LCV) FAILS TO CLOSE ON DEMAND	2.00E-03	3	D
LCV	OC	LEVEL CONTROL VALVE (LCV) FAILS TO REMAIN OPEN (FAIL CLOSED)	1.00E-07	3	H
HCV	CO	HYDRAULIC CONTROL VALVE (HCV) FAILS TO REMAIN CLOSED	5.00E-07	10	H
HCV	OC	HYDRAULIC CONTROL VALVE (HCV) FAILS TO REMAIN OPEN	1.00E-07	3	H
HCV	PG	HYDRAULIC CONTROL VALVE (HCV) FAILS TO REMAIN OPEN (PLUGGED)	1.00E-07	3	H
HCV	LK	HYDRAULIC CONTROL VALVE (HCV) EXCESSIVE INTERNAL LEAKAGE	2.40E-05	10	H
HCV	RP	HYDRAULIC CONTROL VALVE (HCV) RUPTURE FAILURE	2.66E-08	10	H

Table G1 Generic Failure Data

COMPONENT TYPE	FAILURE MODE	DESCRIPTION	MEAN VALUE	ERROR FACTOR	UNIT
PCV	CC	PRESSURE CONTROL VALVE (PCV) FAIL TO OPEN ON DEMAND	1.00E-03	3	D
PCV	OO	PRESSURE CONTROL VALVE (PCV) FAIL TO CLOSE	2.00E-03	3	D
PCV	DN	PRESSURE CONTROL VALVE (PCV) DOES NOT FUNCTION PROPERLY	1.00E-06	5	H
PCV	OC	PRESSURE CONTROL VALVE (PCV) FAILS TO REMAIN OPEN	7.00E-07	5	H
PCV	PG	PRESSURE CONTROL VALVE (PCV) PLUGGED	7.00E-07	5	H
SOV	CC	SOLENOID OPERATED VALVE (SOV) FAILS TO OPEN ON DEMAND	2.00E-03	3	D
SOV	OO	SOLENOID OPERATED VALVE (SOV) FAILS TO CLOSE ON DEMAND	2.00E-03	3	D
SOV	HW	SOLENOID OPERATED VALVE (SOV) FAILS TO FUNCTION	2.00E-03	3	D
RRV	CC	RELEIF VALVE FAILS TO OPEN	3.00E-04	10	D
RRV	CO	RELIEF VALVE FAILS TO REMAIN CLOSED	5.00E-06	10	h
SRV	CC	SAFETY RELIEF VALVE (SRV) DOES NOT OPEN	3.00E-04	5	D
SRV	OO	SAFETY RELIEF VALVE (SRV) FAILS TO RECLOSE	3.00E-03	5	D
SRV	CO	SAFETY RELIEF VALVE (SRV) FAILS TO REMAIN CLOSED (FAILS OPEN)	3.00E-06	10	H
PRV	CC	POWER OPERATED RELIEF VALVE (PORV) DOES NOT OPEN	4.27E-03	3	D
TNV	OC	OVERSPEED SOLENOID STOP VALVE INADVERTANT TRIP	1.27E-06	8	H
TCV	OC	TEMPERATURE CONTROL VALVE (TCV) FAILS TO REMAIN OPEN (FAILS	7.00E-07	5	H
ASV	FE	AIR START SOLENOID VALVE DOES NOT ENERGIZE	2.00E-03	3	D
ACU	RP	ACCUMULATOR RUPTURE	8.60E-10	30	H
ACM	RP	INSTR AIR RECIEVER RUPTURE	8.60E-10	30	H
BOT	RP	NITROGEN BOTTLE RUPTURE	8.60E-10	30	H
TNK	RP	TANK RUPTURE	8.60E-10	30	H

Table G1 Generic Failure Data

COMPONENT TYPE	FAILURE MODE	DESCRIPTION	MEAN VALUE	ERROR FACTOR	UNIT
FLT	PG	FILTER PLUGGED	3.00E-06	10	H
STR	PG	STRAINER CLOGGED (PLUGGED)	3.00E-06	10	H
HTX	RP	HEAT EXCHANGER RUPTURES	3.00E-06	10	H
HTX	VF	HEAT EXCHANGER FAILURE	3.00E-07	10	H
DRY	DN	INSTRUMENT AIR REFRIG DRYER DOES NOT OPERATE	5.00E-06	10	H
PSF	PG	PIV LEAKAGE NOT CHANNELED BACK TO PRT	5.00E-10	30	H
PSF	RP	LINE (PIPING) RUPTURE	5.00E-10	30	H
ORF	PG	BREAK DOWN ORIFICE PLUGGED	3.00E-04	3	D
ORF	RP	LETDOWN LINE ORIFICE RUPTURE FAILURE	3.00E-08	10	H
CRB	CC	CIRCUIT BREAKER (480V & 6.9KV) FAILS TO TRIP	5.00E-04	10	D
CRB	OO	CIRCUIT BREAKER (480V & 6.9KV) FAILS TO CLOSE	5.00E-04	10	D
CRB	DN	CIRCUIT BREAKER (PUMPs & FCUs) DOES NOT OPERATE	3.00E-03	10	D
CRB	CO	CIRCUIT BREAKER (480V & 13.8KV) FAILS TO REMAIN CLOSED	3.00E-07	10	H
CRB	OC	CIRCUIT BREAKER (480V) FAILS TO REMAIN TRIP	3.00E-07	10	H
SBR	OO	CIRCUIT BREAKER (MCC BREAKERS) FAILS TO CLOSE	2.27E-04	10	D
SBR	DN	CIRCUIT BREAKER (118VAC) DOES NOT OPERATE PROPERLY	2.27E-04	10	D
SBR	CO	CIRCUIT BREAKER (118V AC) FAILS TO REMAIN CLOSED	2.68E-07	7	H
BAT	HW	BATTERY HARDWARE FAILURE	1.00E-06	3	H
BCC	HW	BATTERY CHARGER FAILURE	1.00E-06	3	H
PTR	HW	POTENTIAL TRANSFORMER HARDWARE FAILURE	2.70E-06	10	H
XFR	HW	TRANSFORMER HARDWARE FAILURE	1.00E-06	10	H
INV	HW	STATIC INVERTER HARDWARE FAILURE	1.00E-04	3	H

Table G1 Generic Failure Data

COMPONENT TYPE	FAILURE MODE	DESCRIPTION	MEAN VALUE	ERROR FACTOR	UNIT
GEN	HW	DIESEL GENERATOR HARDWARE FAILURE	1.40E-03	10	H
BAC	DN	BUS FAULT	5.00E-07	3	H
BAC	HW	POWER AT TSC UPS BUS	1.00E-07	5	H
BDC	ST	DC PANEL FAULTS	3.00E-07	10	H
FUS	NO	FUSES BLOWN	3.00E-06	10	H
RCK	NO	CONTROL CIRCUIT NO OUTPUT	2.50E-03	10	D
PRY	HW	PROTECTIVE RELAY HARDWARE FAILURE	3.20E-07	10	H
RLY	NO	RELAY NO OUTPUT	3.00E-04	10	D
RCI	FE	RELAY COIL DOES NOT ENERGIZE	1.30E-04	3	D
RCS	CC	RELAY FAILS TO OPEN	1.80E-04	10	D
RCS	OO	RELAY FAILS TO CLOSE	3.00E-04	10	D
RCS	CO	RELAY FAILS TO REMAIN CLOSED	2.70E-07	10	H
RCS	OC	RELAY FAILS TO REMAIN OPEN	4.20E-07	10	H
ASW	CC	BREAKER AUX SWITCH FAIL CLOSED	3.00E-07	10	D
ASW	CO	BREAKER AUX SWITCH FAILS TO REMAIN CLOSED	2.50E-07	10	H
ASW	OC	BREAKER AUX SWITCH FAILS TO REMAIN OPEN	2.50E-07	10	H
ASW	OO	MOTOR START AUX SWITCH FAILS TO CLOSE	3.00E-07	10	D
DSW	CO	MOD SWITCH FAILS TO REMAIN CLOSED	8.30E-07	10	H
MSW	DN	MANUAL SWITCH DOES NOT OPERATE PROPERLY	3.00E-05	10	D
FSW	HI	FLOW SWITCH FAILS HIGH	1.40E-06	10	H
ASF	HI	FLOW TRANSMITTER FAILS HIGH	8.00E-07	10	H
ASF	PG	FLOW INDICATOR/TRANSMITTER BLOCKED	1.25E-07	10	H
FIC	DN	FLOW INDICATOR/CONTROLLER DOES NOT OPERATE	1.29E-05	10	H
FLC	DN	FLOW CONTROLLER DOES NOT OPERATE	1.25E-04	3	D
LSW	HI	LEVEL SWITCH FAILS HIGH	1.80E-06	10	H
LSW	DN	LEVEL SWITCH DOES NOT OPERATE	1.00E-07	10	H
ASL	HI	LEVEL TRANSMITTER FAILS HIGH	2.30E-07	10	H

Table G1 Generic Failure Data

COMPONENT TYPE	FAILURE MODE	DESCRIPTION	MEAN VALUE	ERROR FACTOR	UNIT
PSW	OC	PRESSURE SWITCH FAILS TO REMAIN OPEN	2.70E-08	10	H
ASP	HI	PRESSURE TRANSMITTER FAILS HIGH	3.00E-07	10	H
ASP	LO	PRESSURE TRANSMITTER FAILS LOW	1.50E-08	10	H
PRC	DN	PRESSURE CONTROLLER DOES NOT OPERATE	1.24E-06	10	H
ATS	HI	TEMPERTURE SWITCH FAILS HIGH	7.50E-07	10	H
TSW	LO	TEMPERATURE SWITCH FAILS LOW	7.50E-07	10	H
TSW	OO	TEMPERATURE SWITCH FAILS TO CLOSE	3.00E-07	10	H
ASX	HW	AMSAC CABINET FAILURE OF SIGNAL PROCESSING	1.70E-06	10	H
SPC	DN	SPEED CONTROLLER DOES NOT OPERATE PROPERLY	1.00E-06	10	H
TCR	DN	TOTALIZER DOES NOT OPERATE PROPERLY	1.00E-06	10	H

Table G1 Generic Failure Data

COMPONENT TYPE	FAILURE MODE	REFERENCE	COMMENTS
MDP	FS	ASEP, R1	
MDP	RS	ASEP, R1	For RHR pump only.
MDP	FR	ASEP, R1	
MDP	LK		For RHR pump seal. Hardwired in basic event (BE) file. Data from NUREG/CR-5102, Appendix F.
SDP	DN		For SI pump only.
TDP	FS	ASEP, R1	
TDP	FR	ASEP, R1	
ENG	FS	JAFNPP	
ENG	FR	JAFNPP	
FCU	FS	EG&G	Check IPPSS data
FCU	FR	EG&G	Check IPPSS data
CMP	FS	Seabrook	
CMP	FR	Surry	
FAN	FR	EG&G	
FAN	FS	EG&G	
AOD	CC	Seabrook	
PND	CC	Surry IPE	Solenoid operated damper.
PND	OO	Surry IPE	Solenoid operated damper.
PND	OC	Surry IPE	Solenoid operated damper.
DOR	CC	Seabrook	Actual failure mode is plugging mode. Data is for plugging failure mode.
CKV	CC	IREP	
CKV	OO	IREP	
CKV	OC	Surry IPE	
CKV	CO	Seabrook	
CKV	LK	Seabrook	Data same as CKV-CO.
CKV	RP	Seabrook	
SKV	CC	IREP	
SKV	OO	IREP	For ABFPT supply valve only. Data same as CKV-OO.
XVM	CC	ASEP, R1	
XVM	OO	ASEP, R1	Data same as XVM-CC
XVM	CO	Seabrook	
XVM	OC	ASEP, R1	Data same as XVM-PG
XVM	PG	ASEP, R1	
XVM	LK	EG&G	Data same as XVM-CO. Check for better data.
XVM	RP	EG&G	

Table G1 Generic Failure Data

COMPONENT TYPE	FAILURE MODE	REFERENCE	COMMENTS
MOV	CC	IREP	
MOV	RO	IREP	
MOV	OO	ASEP, R1	
MOV	OC	ASEP, R1	
MOV	PG	ASEP, R1	
MOV	CO	ASEP, R1	
MOV	LK	IREP	
MOV	RP	EG&G	
MOV	TE	Maanshan	Latent human error event
AOV	CC	ASEP, R1	INCLUDES PCV, TCV AND FCV
AOV	OO	ASEP, R1	INCLUDES PCV, TCV AND FCV
AOV	CO	ASEP, R1	INCLUDES PCV, TCV AND FCV
AOV	OC	ASEP, R1	INCLUDES PCV, TCV AND FCV
AOV	PG	ASEP, R1	INCLUDES PCV, TCV AND FCV
FCV	CC	ASEP, R1	Data same as AOV-CC.
FCV	CC	ASEP, R1	Data same as AOV-CC. This is feedwater regulating valve,
FCV	OO	ASEP, R1	Same as AOV-OO. For SWS system only.
FCV	CO	ASEP, R1	Same as AOV-CO
FCV	OC	ASEP, R1	Same as AOV-OC
FCV	OC	ASEP, R1	Data same as AOV-OC. This is feedwater regulating valve, which is AOV. System code is used to differentiate this one from other FCVs.
FCV	PG	ASEP, R1	Data same as AOV-PG
LCV	CC	ASEP, R1	Data same as AOV-CC
LCV	OO	ASEP, R1	Data same as AOV-OO
LCV	OC	ASEP, R1	Data same as AOV-OC
HCV	CO	ASEP, R1	Data same as AOV-CO
HCV	OC	ASEP, R1	Data same as AOV-OC
HCV	PG	ASEP, R1	Data same as AOV-PG
HCV	LK	ASEP, R0	Data same as AOV-LK
HCV	RP	WASH-1400	
PCV	CC	ASEP, R1	Data same as AOV-CC
PCV	OO	ASEP, R1	Data same as AOV-OO. This is feedwater regulating valve, which is AOV. System code is used to differentiate this one from other FCVs.
PCV	DN	IEEE-500	Not same as AOV
PCV	OC	IEEE-500	Not same as AOV
PCV	PG	IEEE-500	Data same as PCV-OC
SOV	CC	ASEP, R1	

Table G1 Generic Failure Data

COMPONENT TYPE	FAILURE MODE	REFERENCE	COMMENTS
SOV	OO	ASEP, R1	
SOV	HW	ASEP, R1	
RRV	CC	IREP	
RRV	CO	EG&G	
SRV	CC	EG&G	
SRV	OO	EG&G	Used fudge factor on SRV-OO
SRV	CO	EG&G	
PRV	CC	Seabrook	
TNV	OC	Seabrook	
TCV	OC	IEEE-500	Data same as PCV-OC
ASV	FE	ASEP, R1	Data same as SOV-CC
ACU	RP	GEESSAR	Data same as ACM-RP
ACM	RP	GEESSAR	
BOT	RP	GEESSAR	Data same as ACM-RP
TNK	RP	GEESSAR	Data same as ACM-RP
FLT	PG	IEEE-500	
STR	PG	IEEE-500	
HTX	RP	ASEP, R1	
HTX	VF	EG&G	
DRY	DN	EG&G	
PSF	PG	EG&G	Pipe segment failure.
PSF	RP	EG&G	Pipe segment failure.
ORF	PG	IREP	
ORF	RP	IREP	
CRB	CC	EG&G	Large breakers
CRB	OO	EG&G	Large breakers
CRB	DN	ASEP, R1	Large breakers
CRB	CO	EG&G	Large breakers
CRB	OC	EG&G	Large breakers
SBR	OO	Seabrook	Small breakers
SBR	DN	Seabrook	Small breakers
SBR	CO	Seabrook	Small breakers
BAT	HW	ASEP, R1	
BCC	HW	ASEP, R1	
PTR	HW	Browns Ferry IREP	
XFR	HW	EG&G	
INV	HW	ASEP, R1	
GEN	HW	JAFNPP	

Table G1 Generic Failure Data

COMPONENT TYPE	FAILURE MODE	REFERENCE	COMMENTS
BAC	DN	Seabrook	Data rounded off.
BAC	HW	ASEP, R1	
BDC	ST	Browns Ferry IREP	JAFNPP
FUS	NO	IREP	
RCK	NO	JAFNPP	
PRY	HW	IEEE-500	JAFNPP
RLY	NO	IREP	
RCI	FE	JAFNPP	
RCS	CC	JAFNPP	
RCS	OO	JAFNPP	
RCS	CO	JAFNPP	
RCS	OC	JAFNPP	EF increased to 10
ASW	CC	JAFNPP	Date same as ASW-OO
ASW	CO	JFNPP	
ASW	OC	JAFNPP	
ASW	OO	JAFNPP	
DSW	CO	JAFNPP	Motor Operated Disconnect (MOD) switch
MSW	DN	IREP	
FSW	HI	IEEE-500	EF assumed to 10
ASF	HI	IEEE-500	EF assumed to 10
ASF	PG	Surry IPE	EF assumed to 10
FIC	DN	Surry IPE	EF assumed to 10
FLC	DN	JAFNPP	Hand flow controller located at control station
LSW	HI	JAFNPP	EF changed to 10
LSW	DN	JAFNPP	
ASL	HI	JAFNPP	EF changed to 10
PSW	OC	JAFNPP	
ASP	HI	IEEE-500	EF assumed to be 10
ASP	LO	IEEE-500	EF assumed to be 10
PRC	DN	IEEE-500	EF assumed to be 10
ATS	HI	IEEE-500	EF assumed to be 10
TSW	LO	IEEE-500	EF assumed to be 10
TSW	OO	EG&G	Unit changed to per hour (H) based on IEEE-500 data.
ASX	HW	IEEE-500	Signal processor (software). Data from IEEE-500
SPC	DN	EG&G	Controllers
TCR	DN	EG&G	Controllers

Table G1 Generic Failure Data

COMPONENT TYPE	FAILURE MODE	REFERENCE	COMMENTS

* Failure data units are: D = demand probability, and H = hourly rate.

Table G2 Plant-Specific Failure Data

SYSTEM	COMPONENT TYPE	FAILURE MODE	DESCRIPTION	MEAN VALUE	ERROR FACTOR	UNIT
AC0	BAC	ST	BUS FAULT	4.88E-07	3	H
AC0	CRB	CO	CIRCUIT BREAKER (480V & 13.8KV) FAILS TO REMAIN CLOSED	2.78E-07	10	H
AC0	DSW	CO	MOD SWITCH FAILS TO REMAIN CLOSED	8.30E-07	10	H
AC0	RCK	NO	CONTROL CIRCUIT NO OUTPUT	2.50E-03	10	D
AC1	BAC	ST	BUS FAULT	4.77E-07	3	H
AC1	INV	HW	STATIC INVERTER HARDWARE FAILURE	9.27E-06	3	H
AC1	SBR	CO	CIRCUIT BREAKER FAILS TO REMAIN CLOSED (118V AC)	2.68E-07	7	H
AC1	SBR	DN	CIRCUIT BREAKER DOES NOT OPERATE PROPERLY (118VAC)	2.27E-04	10	D
AC1	XFR	HW	TRANSFORMER HARDWARE FAILURE	3.86E-07	10	H
AC4	ASW	CC	BREAKER AUX SWITCH FAIL CLOSED	3.00E-07	10	D
AC4	ASW	CO	BREAKER AUX SWITCH FAILS TO REMAIN CLOSED	1.30E-07	10	H
AC4	ASW	OC	BREAKER AUX SWITCH FAILS TO REMAIN OPEN	2.50E-07	10	H
AC4	BAC	ST	BUS FAULT	4.41E-07	3	H
AC4	CRB	CC	CIRCUIT BREAKER FAILS TO TRIP (6.9KV & 480V)	4.27E-04	2	D
AC4	CRB	CO	CIRCUIT BREAKER FAILS TO REMAIN CLOSED (13.8KV & 480V)	1.60E-07	10	H
AC4	CRB	OC	CIRCUIT BREAKER FAILS TO REMAIN TRIP (480V)	2.59E-07	10	H
AC4	CRB	OO	CIRCUIT BREAKER FAILS TO CLOSE (6.9KV & 480V)	4.27E-04	2	D
AC4	FUS	NO	FUSES BLOWN	7.17E-07	10	H
AC4	MSW	CO	MANUAL SWITCH DOES NOT OPERATE PROPERLY	3.00E-05	10	D
AC4	PRY	HW	PROTECTIVE RELAY HARDWARE FAILURE	3.20E-07	10	H
AC4	PTR	HW	POTENTIAL TRANSFORMER HARDWARE FAILURE	6.99E-07	10	H
AC4	RCI	FE	RELAY COIL DOES NOT ENERGIZE	1.30E-04	3	D
AC4	RCK	NO	CONTROL CIRCUIT NO OUTPUT	2.50E-03	10	D
AC4	RCS	CC	RELAY FAILS TO OPEN	1.80E-04	10	D
AC4	RCS	CO	RELAY FAILS TO REMAIN CLOSED	2.70E-07	10	H
AC4	RCS	OC	RELAY FAILS TO REMAIN OPEN	4.20E-07	10	H
AC4	RCS	OO	RELAY FAILS TO CLOSE	3.00E-04	10	D
AC4	XFR	HW	TRANSFORMER HARDWARE FAILURE	4.85E-07	10	H
AC6	ASW	CC	BREAKER AUX SWITCH FAIL CLOSED	3.00E-07	10	D
AC6	ASW	CO	BREAKER AUX SWITCH FAILS TO REMAIN CLOSED	2.21E-07	10	H
AC6	BAC	ST	BUS FAULT	4.66E-07	3	H
AC6	CRB	CC	CIRCUIT BREAKER FAILS TO TRIP (6.9KV & 480V)	3.62E-04	10	D
AC6	CRB	CO	CIRCUIT BREAKER FAILS TO REMAIN CLOSED (13.8KV & 480V)	2.03E-07	10	H
AC6	CRB	OO	CIRCUIT BREAKER FAILS TO CLOSE (6.9KV & 480V)	3.34E-04	10	D
AC6	FUS	NO	FUSES BLOWN	7.17E-07	10	H
AC6	PRY	HW	PROTECTIVE RELAY HARDWARE FAILURE	3.20E-07	10	H
AC6	PTR	HW	POTENTIAL TRANSFORMER HARDWARE FAILURE	6.99E-07	10	H
AC6	RCI	FE	RELAY COIL DOES NOT ENERGIZE	1.30E-04	3	D
AC6	RCS	OC	RELAY FAILS TO REMAIN OPEN	4.20E-07	10	H
AC6	RCS	OO	RELAY FAILS TO CLOSE	3.00E-04	10	D
AC6	RLY	NO	RELAY NO OUTPUT	3.00E-04	10	D
AC6	XFR	HW	TRANSFORMER HARDWARE FAILURE	7.90E-07	10	H

Table G2 Plant-Specific Failure Data

SYSTEM	COMPONENT TYPE	FAILURE MODE	DESCRIPTION	MEAN VALUE	ERROR FACTOR	UNIT
ACC	CKV	CC	CHECK VALVE FAILS TO OPEN	9.16E-05	3	D
ACC	CKV	CO	CHECK VALVE FAILS TO REMAIN CLOSED	4.89E-07	4	H
ACC	CKV	OC	CHECK VALVE FAILS TO REMAIN OPEN	1.17E-07	10	H
ACC	CKV	OO	CHECK VALVE FAILS TO CLOSE	1.00E-03	3	D
ACC	MDP	FR	MDP FAILS TO CONTINUE TO RUN	3.00E-05	10	H
ACC	MDP	FS	MDP FAILS TO START ON DEMAND	2.31E-03	10	D
ACC	RCK	NO	CONTROL CIRCUIT NO OUTPUT	2.50E-03	10	D
ACC	XVM	OC	MANUAL VALVE FAILS TO REMAIN OPEN	9.53E-08	3	H
ACU	CKV	CC	CHECK VALVE FAILS TO OPEN	1.00E-04	3	D
ACU	CKV	CO	CHECK VALVE FAILS TO REMAIN CLOSED	4.89E-07	4	H
ACU	CKV	LK	CHECK VALVE REVERSE LEAKAGE	5.36E-07	4	H
ACU	MOV	PG	MOV FAILS TO REMAIN OPEN (PLUGGED)	9.90E-08	3	H
AFV	FAN	FR	VENT FAN FAILS TO CONTINUE TO RUN	3.00E-05	10	H
AFV	FAN	FS	VENT FAN FAILS TO START ON DEMAND	5.00E-03	5	D
AFV	MOD	CC	MOTOR OPERATOR DAMPER FAILS TO OPEN	3.00E-03	10	D
AFV	TSW	OO	TEMPERATURE SWITCH FAILS TO CLOSE	3.00E-07	10	H
AFW	AOV	CC	AOV DOES NOT OPEN (INCLUDES PCV, TCV, FCV)	1.12E-03	2	D
AFW	AOV	CO	AOV FAILS TO REMAIN CLOSED	3.27E-07	10	H
AFW	AOV	OO	AOV DOES NOT CLOSE	2.38E-03	2	D
AFW	AOV	PG	AOV FAILS CLOSED (PLUGGED)	9.95E-08	3	H
AFW	ASF	HI	FLOW TRANSMITTER FAILS HIGH	8.00E-07	10	H
AFW	ASP	LO	PRESSURE TRANSMITTER FAILS LOW	1.50E-08	10	H
AFW	ASX	HW	FAILURE OF PROCESSING IN AMSAC CABINET	1.70E-06	10	H
AFW	ATS	HI	TEMPERTURE SWITCH FAILS HIGH	7.50E-07	10	H
AFW	BAC	HW	POWER AT TSC UPS BUS UNAVAILABLE	9.93E-08	5	H
AFW	CKV	CC	CHECK VALVE FAILS TO OPEN	8.54E-05	3	D
AFW	CKV	LK	CHECK VALVE REVERSE LEAKAGE	5.36E-07	4	H
AFW	CRB	DN	CIRCUIT BREAKER DOES NOT OPERATE (PUMP & FCU)	4.27E-04	2	D
AFW	FCV	CC	FCV (AOV) DOES NOT OPEN	1.00E-03	3	D
AFW	FCV	PG	FCV (AOV) FAILS TO REMAIN OPEN (PLUGGED)	9.86E-08	3	H
AFW	FLC	DN	FLOW CONTROLLER DOES NOT OPERATE	1.25E-04	3	D
AFW	FSW	HI	FLOW SWITCH FAILS HIGH	1.40E-06	10	H
AFW	LSW	HI	LEVEL SWITCH FAILS HIGH	1.80E-06	10	H
AFW	MDP	FR	MDP FAILS TO CONTINUE TO RUN	1.75E-05	10	H
AFW	MDP	FS	MDP FAILS TO START ON DEMAND	1.64E-03	3	D
AFW	MSW	DN	MANUAL SWITCH DOES NOT OPERATE PROPERLY	3.00E-05	10	D
AFW	ORF	PG	BREAK DOWN ORIFICE PLUGGED	3.60E-05	3	D
AFW	RCK	NO	CONTROL CIRCUIT NO OUTPUT	2.50E-03	10	D
AFW	RLY	NO	RELAY NO OUTPUT	3.00E-04	10	D
AFW	SKV	CC	STOP CHECK VALVE FAILS TO OPEN	9.74E-05	3	D
AFW	SKV	OO	ABFPT SUPPLY VLV FAIL TO CLOSE	8.74E-04	3	D
AFW	TDP	FR	TDP FAILS TO CONTINUE TO RUN	3.93E-04	10	H
AFW	TDP	FS	TDP FAILS TO START ON DEMAND	4.34E-03	4	D
AFW	TNV	OC	OVERSPEED SOLENOID STOP VALVE INADVERTANT TRIP	1.04E-06	8	H
AFW	XVM	CC	MANUAL VALVE FAILS TO OPEN	8.89E-05	3	D
AFW	XVM	PG	MANUAL VALVE PLUGGED	9.45E-08	3	H

Table G2 Plant-Specific Failure Data

SYSTEM	COMPONENT TYPE	FAILURE MODE	DESCRIPTION	MEAN VALUE	ERROR FACTOR	UNIT
CBV	ASW	OO	MOTOR START AUX SWITCH FAILS TO CLOSE	3.00E-07	10	D
CBV	FAN	FR	VENT FAN FAILS TO CONTINUE TO RUN	3.00E-05	10	H
CBV	FAN	FS	VENT FAN FAILS TO START ON DEMAND	5.00E-03	5	D
CBV	MOD	CC	MOTOR OPERATOR DAMPER FAILS TO OPEN	3.00E-03	10	D
CBV	RCK	NO	CONTROL CIRCUIT NO OUTPUT	2.50E-03	10	H
CBV	RCS	CO	RELAY FAILS TO REMAIN CLOSED	2.70E-07	10	H
CBV	TSW	OO	TEMPERATURE SWITCH FAILS TO CLOSE	3.00E-07	3	D
CCW	CKV	CC	CHECK VALVE FAILS TO OPEN	1.00E-04	4	H
CCW	CKV	CO	CHECK VALVE FAILS TO REMAIN CLOSED	5.23E-07	10	H
CCW	CKV	OC	CHECK VALVE FAILS TO REMAIN OPEN	8.54E-08	3	D
CCW	CKV	OO	CHECK VALVE FAILS TO CLOSE	1.00E-03	2	D
CCW	CRB	DN	CIRCUIT BREAKER DOES NOT OPERATE (PUMP & FCU)	4.27E-04	3	D
CCW	FCV	CC	FCV (AOV) DOES NOT OPEN	1.00E-03	10	H
CCW	HTX	RP	HEAT EXCHANGER RUPTURES	3.00E-06	10	H
CCW	HTX	VF	HEAT EXCHANGER FAILURE	2.59E-07	3	H
CCW	MDP	FR	MDP FAILS TO CONTINUE TO RUN	2.36E-05	4	D
CCW	MDP	FS	MDP FAILS TO START ON DEMAND	2.23E-03	10	D
CCW	MDP	RS	PUMP FAILS TO RESTART ON DEMAND	1.50E-03	10	D
CCW	MOV	CC	MOV FAILS TO OPEN	3.00E-03	10	H
CCW	MOV	LK	MOV EXCESSIVE INTERNAL LEAKAGE FAILURE	5.00E-07	3	H
CCW	MOV	OC	MOV FAILS TO REMAIN OPEN	9.88E-08	10	D
CCW	MOV	OO	MOV FAILS TO CLOSE	3.00E-03	10	H
CCW	MOV	RP	MOV RUPTURE FAILURE	1.00E-07	60	D
CCW	MOV	TE	MOV FAILS DURING STROKE TEST	1.70E-04	10	D
CCW	MSW	DN	MANUAL SWITCH DOES NOT OPERATE PROPERLY	2.76E-05	30	H
CCW	PSF	RP	LINE (PIPING) RUPTURE	5.00E-10	10	D
CCW	RCK	NO	CONTROL CIRCUIT NO OUTPUT	2.50E-03	10	D
CCW	RLY	NO	RELAY NO OUTPUT	3.00E-04	4	H
CCW	SDP	DN	SI SHAFT DRIVEN PUMP DOES NOT OPERATE	2.02E-04	3	D
CCW	XVM	CC	MANUAL VALVE FAILS TO OPEN	1.00E-04	3	H
CCW	XVM	OC	MANUAL VALVE FAILS TO REMAIN OPEN	8.40E-08	3	D
CCW	XVM	OO	MANUAL VALVE FAILS TO CLOSE	1.00E-04		
CDS	AOV	OC	AOV FAILS TO REMAIN OPEN	9.98E-08	3	H
CDS	AOV	OO	AOV DOES NOT CLOSE	2.00E-03	3	D
CDS	CKV	CC	CHECK VALVE FAILS TO OPEN	1.00E-04	3	D
CDS	CKV	CO	CHECK VALVE FAILS TO REMAIN CLOSED	5.00E-07	4	H
CDS	CRB	DN	CIRCUIT BREAKER DOES NOT OPERATE (PUMP & FCU)	4.27E-04	2	D
CDS	FCV	OC	FCV (AOV) FAIL TO REMAIN OPEN (FAIL CLOSED)	9.98E-08	3	H
CDS	HTX	VF	HEAT EXCHANGER FAILURE	1.16E-07	10	H
CDS	MDP	FR	MDP FAILS TO CONTINUE TO RUN	2.29E-05	3	H
CDS	MDP	FS	MDP FAILS TO START ON DEMAND	5.45E-04	10	D
CDS	MSW	DN	MANUAL SWITCH DOES NOT OPERATE PROPERLY	2.87E-05	10	D
CDS	RCK	NO	CONTROL CIRCUIT NO OUTPUT	2.50E-03	10	D
CDS	SRV	CO	SAFETY RELIEF VALVE (SRV) FAILS TO REMAIN CLOSED (FAILS OPEN)	5.19E-07	10	H
CDS	XVM	OC	MANUAL VALVE FAILS TO REMAIN OPEN	9.38E-08	3	H

Table G2 Plant-Specific Failure Data

SYSTEM	COMPONENT TYPE	FAILURE MODE	DESCRIPTION	MEAN VALUE	ERROR FACTOR	UNIT
CFC	CRB	DN	CIRCUIT BREAKER DOES NOT OPERATE (PUMP & FCU)	4.27E-04	2	D
CFC	DOR	CC	FCU BLOW IN DOOR FAILS TO OPEN	1.07E-07	10	H
CFC	FCU	FR	FAN COOLING UNIT (FCU) FAILS TO RUN	7.92E-07	10	H
CFC	FCU	FS	FAN COOLING UNIT (FCU) FAILS TO START	4.92E-04	5	D
CFC	MSW	DN	MANUAL SWITCH DOES NOT OPERATE PROPERLY	2.47E-05	10	D
CFC	PND	CC	FCU DAMPER FAILS TO OPEN	1.81E-02	10	D
CFC	PND	OC	FCU DAMPER FAILS TO REMAIN OPEN	1.07E-07	10	H
CFC	RCK	NO	CONTROL CIRCUIT NO OUTPUT	2.50E-03	10	D
CFC	SOV	HW	SOLENOID VALVE FAILS TO FUNCTION	2.00E-03	3	D
CSR	MOV	CC	MOV FAILS TO OPEN	3.00E-03	10	D
CSR	MSW	DN	MANUAL SWITCH DOES NOT OPERATE PROPERLY	3.00E-05	10	D
CSR	RCK	NO	CONTROL CIRCUIT NO OUTPUT	2.50E-03	10	D
CSS	CKV	CC	CHECK VALVE FAILS TO OPEN	9.76E-05	3	D
CSS	CRB	DN	CIRCUIT BREAKER DOES NOT OPERATE (PUMP & FCU)	4.27E-04	2	D
CSS	MDP	FR	MDP FAILS TO CONTINUE TO RUN	2.91E-05	10	H
CSS	MDP	FS	MDP FAILS TO START ON DEMAND	3.31E-04	10	D
CSS	MOV	CC	MOV FAILS TO OPEN	3.31E-04	10	D
CSS	MSW	DN	MANUAL SWITCH DOES NOT OPERATE PROPERLY	2.78E-05	10	D
CSS	RCK	NO	CONTROL CIRCUIT NO OUTPUT	2.50E-03	10	D
CSS	RLY	NO	RELAY NO OUTPUT	3.00E-04	10	D
CSS	XVM	PG	MANUAL VALVE PLUGGED	9.90E-08	3	H
CVC	AOV	CC	AOV FAILS TO OPEN	1.00E-03	3	D
CVC	AOV	CO	AOV FAILS TO REMAIN CLOSED	3.95E-07	10	H
CVC	AOV	OC	AOV FAILS TO REMAIN OPEN	9.83E-08	3	H
CVC	AOV	OO	AOV DOES NOT CLOSE	2.00E-03	3	D
CVC	ASF	PG	FLOW INDICATOR/TRANSMITTER BLOCKED	1.25E-07	10	H
CVC	CKV	CC	CHECK VALVE FAILS TO OPEN	1.00E-04	3	D
CVC	CRB	DN	CIRCUIT BREAKER DOES NOT OPERATE (PUMP & FCU)	4.27E-04	2	D
CVC	FCV	CC	FCV (AOV) DOES NOT OPEN	1.00E-03	3	D
CVC	FCV	CO	FCV (AOV) FAIL TO REMAIN CLOSED	3.95E-07	10	H
CVC	FCV	OC	FCV (AOV) FAIL TO REMAIN OPEN (FAIL CLOSED)	9.98E-08	3	H
CVC	FLC	DN	FLOW CONTROLLER DOES NOT OPERATE	1.25E-04	3	D
CVC	FLT	PG	FILTER PLUGGED	7.17E-07	10	H
CVC	HCV	CO	HCV FAILS TO REMAIN CLOSED	3.95E-07	10	H
CVC	HCV	LK	HCV EXCESSIVE INTERNAL LEAKAGE	2.40E-05	10	H
CVC	HCV	OC	HCV FAILS TO REMAIN OPEN	1.56E-07	2	H
CVC	HCV	RP	HCV RUPTURE FAILURE	2.66E-08	10	H
CVC	HTX	RP	HEAT EXCHANGER RUPTURES	3.00E-06	10	H
CVC	HTX	VF	HEAT EXCHANGER FAILURE	2.78E-07	10	H
CVC	LCV	CC	LCV FAILS TO OPEN	1.00E-03	3	D
CVC	LCV	OC	LCV FAILS TO REMAIN OPEN	2.00E-03	3	H
CVC	LCV	OO	LCV DOES NOT CLOSE	2.00E-03	3	D
CVC	MDP	FR	MDP FAILS TO CONTINUE TO RUN	3.35E-05	3	H
CVC	MDP	FS	MDP FAILS TO START ON DEMAND	1.27E-02	4	D

Table G2 Plant-Specific Failure Data

SYSTEM	COMPONENT TYPE	FAILURE MODE	DESCRIPTION	MEAN VALUE	ERROR FACTOR	UNIT
CVC	MOV	CC	MOV FAILS TO OPEN	3.00E-03	10	D
CVC	MOV	OC	MOV FAILS TO REMAIN OPEN	9.74E-08	3	H
CVC	MSW	DN	MANUAL SWITCH DOES NOT OPERATE PROPERLY	2.62E-05	10	D
CVC	ORF	RP	LETDOWN LINE ORIFICE RUPTURE FAILURE	3.00E-08	10	H
CVC	PCV	OC	PCV FAILS TO REMAIN OPEN	6.67E-07	5	H
CVC	PDP	FR	MDP FAILS TO CONTINUE TO RUN	5.61E-05	2	H
CVC	PDP	FS	MDP FAILS TO START ON DEMAND	1.45E-03	4	D
CVC	PSF	PG	PIV LEAKAGE NOT CHANNELED BACK TO PRT	4.99E-10	30	H
CVC	PSF	RP	LINE (PIPING) RUPTURE	5.00E-10	30	H
CVC	RCK	NO	CONTROL CIRCUIT NO OUTPUT	2.50E-03	10	D
CVC	RCS	CO	RELAY FAILS TO REMAIN CLOSED	2.70E-07	10	H
CVC	RLY	NO	RELAY NO OUTPUT	3.00E-04	10	D
CVC	RRV	CC	RELIEF VALVE FAILS TO OPEN	3.00E-04	10	D
CVC	RRV	CO	RELIEF VALVE FAILS TO REMAIN CLOSED	2.15E-06	10	H
CVC	SPC	DN	SPEED CONTROLLER DOES NOT OPERATE	1.47E-05	2	H
CVC	TCR	DN	TOTALIZER DOES NOT OPERATE	1.00E-06	10	H
CVC	XVM	CC	MANUAL VALVE FAILS TO OPEN	1.00E-04	3	D
CVC	XVM	OC	MANUAL VALVE FAILS TO REMAIN OPEN	9.07E-08	3	H
CVC	XVM	OO	MANUAL VALVE FAILS TO CLOSE	1.00E-04	3	D

DC1	BAT	HW	BATTERY HARDWARE FAILURE	9.11E-07	3	H
DC1	BCC	HW	BATTERY CHARGER FAILURE	9.11E-07	3	H
DC1	BDC	ST	DC PANEL FAULTS	1.83E-07	10	H
DC1	FUS	NO	FUSES BLOWN	1.04E-07	10	H
DC1	MSW	CO	MANUAL SWITCH DOES NOT OPERATE PROPERLY	1.21E-06	10	D
DC1	SBR	CO	CIRCUIT BREAKER FAILS TO REMAIN CLOSED (118V AC)	2.09E-07	7	H

DGV	AOD	CC	DAMPER/LOUVER FAILS TO OPEN	1.52E-03	3	D
DGV	ASW	OO	MOTOR START AUX SWITCH FAILS TO CLOSE	3.00E-07	10	D
DGV	FAN	FR	VENT FAN FAILS TO CONTINUE TO RUN	3.00E-05	10	H
DGV	FAN	FS	VENT FAN FAILS TO START ON DEMAND	5.00E-03	5	D
DGV	MSW	CO	MANUAL SWITCH DOES NOT OPERATE PROPERLY	3.00E-05	10	D
DGV	RCK	NO	CONTROL CIRCUIT NO OUTPUT	2.50E-03	10	D
DGV	RCS	CO	RELAY FAILS TO REMAIN CLOSED	2.70E-07	10	H
DGV	TSW	OO	TEMPERATURE SWITCH FAILS TO CLOSE	3.00E-07	10	H

EDG	ASV	FE	AIR START SOLENOID VALVE DOES NOT ENERGIZE	1.76E-03	2	D
EDG	ASW	OC	BREAKER AUX SWITCH FAILS TO REMAIN OPEN	2.50E-07	10	H
EDG	ENG	FR	DIESEL ENGINE FAILS TO RUN	1.94E-04	10	H
EDG	ENG	FS	DIESEL ENGINE FAILS TO START	1.32E-04	11	D
EDG	GEN	HW	DIESEL GENERATOR HARDWARE FAILURE	1.07E-03	4	H
EDG	LCV	OC	LCV FAILS TO REMAIN OPEN (FAIL CLOSED)	9.93E-08	3	H
EDG	LSW	OC	LEVEL SWITCH DOES NOT OPERATE	1.00E-07	10	H
EDG	LSW	OO	LEVEL SWITCH DOES NOT OPERATE	1.00E-07	10	H
EDG	MDP	FR	MDP FAILS TO CONTINUE TO RUN	3.00E-05	10	H
EDG	MDP	FS	MDP FAILS TO START ON DEMAND	3.00E-03	10	D
EDG	MSW	CO	MANUAL SWITCH DOES NOT OPERATE PROPERLY	1.21E-06	10	D
EDG	MSW	OC	MANUAL SWITCH DOES NOT OPERATE PROPERLY	3.00E-05	10	D
EDG	PRY	HW	PROTECTIVE RELAY HARDWARE FAILURE	3.20E-07	10	H
EDG	PSW	OC	PRESSURE SWITCH FAILS TO REMAIN OPEN	2.70E-08	10	H

Table G2 Plant-Specific Failure Data

SYSTEM	COMPONENT TYPE	FAILURE MODE	DESCRIPTION	MEAN VALUE	ERROR FACTOR	UNIT
EDG	RCK	NO	CONTROL CIRCUIT NO OUTPUT	2.50E-03	10	D
EDG	RCS	CC	RELAY FAILS TO OPEN	1.80E-04	10	D
EDG	RCS	CO	RELAY FAILS TO REMAIN CLOSED	2.70E-07	10	H
EDG	RCS	OC	RELAY FAILS TO REMAIN OPEN	4.20E-07	10	H
EDG	RCS	OO	RELAY FAILS TO CLOSE	3.00E-04	10	D
EDG	STR	PG	STRAINER CLOGGED (PLUGGED)	8.86E-07	10	H
EDG	TNK	RP	TANK RUPTURE	8.60E-10	30	H
FWS	CKV	CO	CHECK VALVE FAILS TO REMAIN CLOSED	4.89E-07	4	H
HHI	AOV	CO	AOV FAILS TO REMAIN CLOSED	3.95E-07	10	H
HHI	AOV	OO	AOV DOES NOT CLOSE	2.00E-03	3	D
HHI	ASL	HI	LEVEL TRANSMITTER FAILS HIGH	2.30E-07	10	H
HHI	CKV	CC	CHECK VALVE FAILS TO OPEN	8.95E-05	3	D
HHI	CKV	CO	CHECK VALVE FAILS TO REMAIN CLOSED	3.25E-07	4	H
HHI	CKV	LK	CHECK VALVE REVERSE LEAKAGE	5.36E-07	4	H
HHI	CKV	OC	CHECK VALVE FAILS TO REMAIN OPEN	1.25E-07	10	H
HHI	CKV	RP	CHECK VALVE RUPTURE FAILURE	1.55E-08	20	H
HHI	CRB	DN	CIRCUIT BREAKER DOES NOT OPERATE (PUMP & FCU)	4.27E-04	2	D
HHI	MDP	FR	MDP FAILS TO CONTINUE TO RUN	2.84E-05	10	H
HHI	MDP	FS	MDP FAILS TO START ON DEMAND	1.87E-04	10	D
HHI	MOV	CC	MOV FAILS TO OPEN	4.13E-03	2	D
HHI	MOV	CO	MOV FAILS TO REMAIN CLOSED	4.41E-07	10	H
HHI	MOV	LK	MOV EXCESSIVE INTERNAL LEAKAGE FAILURE	5.00E-07	10	H
HHI	MOV	OC	MOV FAILS TO REMAIN OPEN	9.27E-08	3	H
HHI	MOV	OO	MOV FAILS TO CLOSE	2.10E-04	10	D
HHI	MOV	PG	MOV FAILS TO REMAIN OPEN (PLUGGED)	9.27E-08	3	H
HHI	MOV	RO	MOV DOES NOT REOPEN	2.25E-03	10	D
HHI	MOV	RP	MOV RUPTURE FAILURE	1.00E-07	10	H
HHI	MSW	DN	MANUAL SWITCH DOES NOT OPERATE PROPERLY	2.61E-05	10	D
HHI	PSF	PG	PIV LEAKAGE NOT CHANNELED BACK TO PRT	4.99E-10	30	H
HHI	PSF	RP	LINE (PIPING) RUPTURE	5.00E-10	30	H
HHI	RCK	NO	CONTROL CIRCUIT NO OUTPUT	2.50E-03	10	D
HHI	RLY	NO	RELAY NO OUTPUT	3.00E-04	10	D
HHI	RRV	CC	RELIEF VALVE FAILS TO OPEN	3.00E-04	10	D
HHI	SBR	OO	CIRCUIT BREAKER FAILS TO CLOSE (MCC BREAKERS)	2.27E-04	10	D
HHI	XVM	CC	MANUAL VALVE FAILS TO OPEN	1.00E-04	3	D
HHI	XVM	OC	MANUAL VALVE FAILS TO REMAIN OPEN	9.74E-08	3	H
HHI	XVM	PG	MANUAL VALVE PLUGGED	9.74E-08	3	H
HHR	MOV	CC	MOV FAILS TO OPEN	3.00E-03	10	D
HHR	MOV	CO	MOV FAILS TO REMAIN CLOSED	3.95E-07	10	H
HHR	RCK	NO	CONTROL CIRCUIT NO OUTPUT	2.50E-03	10	D
IAS	AOV	CC	AOV DOES NOT OPEN (INCLUDES PCV, TCV, FCV)	1.00E-03	3	D
IAS	AOV	OC	AOV FAILS TO REMAIN OPEN	9.93E-08	3	H
IAS	AOV	OO	AOV DOES NOT CLOSE	2.00E-03	3	D
IAS	ATS	HI	TEMPERTURE SWITCH FAILS HIGH	7.50E-07	10	H
IAS	BAC	DN	BUS FAULT	5.00E-07	3	H

Table G2 Plant-Specific Failure Data

SYSTEM	COMPONENT TYPE	FAILURE MODE	DESCRIPTION	MEAN VALUE	ERROR FACTOR	UNIT
IAS	CKV	CC	CHECK VALVE FAILS TO OPEN	1.00E-04	3	D
IAS	CKV	CO	CHECK VALVE FAILS TO REMAIN CLOSED	5.23E-07	4	H
IAS	CKV	OC	CHECK VALVE FAILS TO REMAIN OPEN	1.04E-07	10	H
IAS	CKV	OO	CHECK VALVE FAILS TO CLOSE	1.00E-03	3	D
IAS	CMP	FR	INSTRUMENT AIR COMPRESSOR FAILS TO RUN	3.90E-05	2	H
IAS	CMP	FS	INSTRUMENT AIR COMPRESSOR FAILS TO START	2.48E-03	7	D
IAS	DRY	DN	INSTRUMENT AIR REFRIG DRYER DOES NOT OPERATE	7.13E-06	4	H
IAS	FLT	PG	FILTER PLUGGED	4.07E-07	10	H
IAS	HTX	VF	HEAT EXCHANGER FAILURE	2.61E-07	10	H
IAS	MSW	DN	MANUAL SWITCH DOES NOT OPERATE PROPERLY	2.98E-05	10	D
IAS	PCV	CC	PCV FAIL TO OPEN ON DEMAND	1.00E-03	3	D
IAS	PCV	OC	PCV FAILS TO REMAIN OPEN	6.67E-07	5	H
IAS	PRC	DN	PRESSURE CONTROLLER DOES NOT OPERATE	1.24E-06	10	H
IAS	RCK	NO	CONTROL CIRCUIT NO OUTPUT	2.50E-03	10	D
IAS	RRV	CO	RELIEF VALVE FAILS TO REMAIN CLOSED	7.93E-07	10	H
IAS	SOV	HW	SOLENOID VALVE FAILS TO FUNCTION	2.00E-03	3	D
IAS	XVM	CC	MANUAL VALVE FAILS TO OPEN	1.00E-04	3	D
IAS	XVM	OC	MANUAL VALVE FAILS TO REMAIN OPEN	1.45E-07	2	H
ICC	CKV	OC	CHECK VALVE FAILS TO REMAIN OPEN	1.17E-07	10	H
ICC	HTX	VF	HEAT EXCHANGER FAILURE	2.59E-07	10	H
ICC	MDP	FR	MDP FAILS TO CONTINUE TO RUN	3.35E-06	10	H
ICC	RRV	CO	RELIEF VALVE FAILS TO REMAIN CLOSED	1.37E-06	10	H
ICC	SOV	OC	SOV FAILS TO REMAIN OPEN	9.95E-08	3	H
ICC	XVM	OC	MANUAL VALVE FAILS TO REMAIN OPEN	9.71E-08	3	H
LHI	CKV	CC	CHECK VALVE FAILS TO OPEN	9.01E-05	3	D
LHI	CKV	CO	CHECK VALVE FAILS TO REMAIN CLOSED	4.49E-07	4	H
LHI	CKV	LK	CHECK VALVE REVERSE LEAKAGE	5.36E-07	4	H
LHI	CKV	RP	CHECK VALVE RUPTURE FAILURE	1.55E-08	20	H
LHI	CRB	DN	CIRCUIT BREAKER DOES NOT OPERATE (PUMP & FCU)	4.27E-04	2	D
LHI	HCV	OC	HCV FAILS TO REMAIN OPEN	9.90E-08	3	H
LHI	HCV	PG	HCV FAILS TO REMAIN OPEN (PLUGGED)	9.90E-08	3	H
LHI	HCV	RC	AOV DOES NOT OPEN (INCLUDES PCV, TCV, FCV)	1.00E-03	3	D
LHI	HTX	VF	HEAT EXCHANGER FAILURE	2.93E-07	10	H
LHI	MDP	FR	MDP FAILS TO CONTINUE TO RUN	8.91E-06	10	H
LHI	MDP	FS	MDP FAILS TO START ON DEMAND	1.85E-04	10	D
LHI	MDP	RS	RHR PUMP FAILS TO RESTART ON DEMAND	1.50E-03	10	D
LHI	MOV	CC	MOV FAILS TO OPEN	4.21E-04	10	D
LHI	MOV	CO	MOV FAILS TO REMAIN CLOSED	3.27E-07	10	H
LHI	MOV	OC	MOV FAILS TO REMAIN OPEN	9.56E-08	3	H
LHI	MOV	PG	MOV FAILS TO REMAIN OPEN (PLUGGED)	9.56E-08	3	H
LHI	MOV	RO	MOV DOES NOT REOPEN	2.25E-03	10	D
LHI	MSW	DN	MANUAL SWITCH DOES NOT OPERATE PROPERLY	2.61E-05	10	D
LHI	PSF	RP	LINE (PIPING) RUPTURE	5.00E-10	30	H
LHI	RCK	NO	CONTROL CIRCUIT NO OUTPUT	2.50E-03	10	D
LHI	XVM	CC	MANUAL VALVE FAILS TO OPEN	1.00E-04	3	D
LHI	XVM	OC	MANUAL VALVE FAILS TO REMAIN OPEN	9.67E-08	3	H
LHI	XVM	PG	MANUAL VALVE PLUGGED	9.67E-08	3	H

Table G2 Plant-Specific Failure Data

SYSTEM	COMPONENT TYPE	FAILURE MODE	DESCRIPTION	MEAN VALUE	ERROR FACTOR	UNIT
LHR	CKV	CC	CHECK VALVE FAILS TO OPEN	1.00E-04	3	D
LHR	CKV	CO	CHECK VALVE FAILS TO REMAIN CLOSED	5.11E-07	4	H
LHR	CRB	DN	CIRCUIT BREAKER DOES NOT OPERATE (PUMP & FCU)	4.27E-04	2	D
LHR	MDP	FR	MDP FAILS TO CONTINUE TO RUN	3.00E-05	10	H
LHR	MDP	FS	MDP FAILS TO START ON DEMAND	2.31E-03	10	D
LHR	MOV	CC	MOV FAILS TO OPEN	2.31E-03	10	D
LHR	MOV	CO	MOV FAILS TO REMAIN CLOSED	3.27E-07	10	H
LHR	MOV	LK	MOV EXCESSIVE INTERNAL LEAKAGE FAILURE	5.00E-07	10	H
LHR	MOV	OO	MOV FAILS TO CLOSE	2.31E-03	10	D
LHR	MOV	RP	MOV RUPTURE FAILURE	1.00E-07	10	H
LHR	MSW	DN	MANUAL SWITCH DOES NOT OPERATE PROPERLY	2.99E-05	10	D
LHR	PSF	PG	PIV LEAKAGE NOT CHANNELED BACK TO PRT	4.98E-10	30	H
LHR	PSF	RP	LINE (PIPING) RUPTURE	5.00E-10	30	H
LHR	RCK	NO	CONTROL CIRCUIT NO OUTPUT	2.50E-03	10	D
LHR	RLY	NO	RELAY NO OUTPUT	3.00E-04	10	D
LHR	RRV	CC	RELIEF VALVE FAILS TO OPEN	3.00E-04	10	D
MFW	ASF	HI	FLOW TRANSMITTER FAILS HIGH	8.00E-07	10	H
MFW	CKV	OC	CHECK VALVE FAILS TO REMAIN OPEN	1.04E-07	10	H
MFW	FCV	CC	S/G FEED REGULATING VALVE DOES NOT OPEN	9.48E-04	3	D
MFW	FCV	OC	S/G FEED REGULATING VALVE FAIL CLOSED	9.95E-08	3	H
MFW	HTX	VF	HEAT EXCHANGER FAILURE	2.42E-07	10	H
MFW	MOV	CC	MOV FAILS TO OPEN	3.00E-03	10	D
MFW	MOV	OC	MOV FAILS TO REMAIN OPEN	1.52E-07	2	H
MFW	RCK	NO	CONTROL CIRCUIT NO OUTPUT	2.50E-03	10	D
MFW	TDP	FR	TDP FAILS TO CONTINUE TO RUN	1.99E-06	10	H
MFW	XVM	OC	MANUAL VALVE FAILS TO REMAIN OPEN	9.76E-08	3	H
MSS	ADV	CC	ADV DOES NOT OPEN (AOV)	3.21E-03	2	D
MSS	ADV	OO	ADV FAILS TO CLOSE (AOV)	1.95E-03	3	D
MSS	AOV	CC	AOV DOES NOT OPEN (INCLUDES PCV, TCV, FCV)	1.01E+00	2	D
MSS	AOV	OO	AOV DOES NOT CLOSE	2.38E-03	2	D
MSS	CKV	OO	CHECK VALVE FAILS TO CLOSE	9.68E-04	10	H
MSS	MSV	OO	MSIV FAILS TO CLOSE	9.42E-04	10	D
MSS	PRC	DN	PRESSURE CONTROLLER DOES NOT OPERATE	1.24E-06	10	H
MSS	RCK	NO	CONTROL CIRCUIT NO OUTPUT	2.50E-03	3	D
MSS	RRV	CO	RELIEF VALVE FAILS TO REMAIN CLOSED	2.15E-06	10	H
MSS	SOV	CC	SOV FAILS TO OPEN	1.90E-03	3	D
MSS	SOV	HW	SOV FAILS TO OPEN ON DEMAND	2.00E-03	3	D
MSS	SOV	OO	SOV FAILS TO CLOSE	1.90E-03	3	D
MSS	SRV	CO	SAFETY RELIEF VALVE (SRV) FAILS TO REMAIN CLOSED (FAILS OPEN)	1.77E-07	3	D
MSS	XVM	CC	MANUAL VALVE FAILS TO OPEN	1.00E-04	3	D
MSS	XVM	OO	MANUAL VALVE FAILS TO CLOSE	1.00E-04	5	H
MWS	XVM	CC	MANUAL VALVE FAILS TO OPEN	1.00E-04		
MWS	XVM	OO	MANUAL VALVE FAILS TO CLOSE	1.00E-04	30	H
					30	H

Table G2 Plant-Specific Failure Data

SYSTEM	COMPONENT TYPE	FAILURE MODE	DESCRIPTION	MEAN VALUE	ERROR FACTOR	UNIT
NNS	PCV	DN	PRESSURE REGULATING VALVE DOES NOT FUNCTION PROPERLY	9.35E-07	3	D
					5	H
NSS	ACU	RP	ACCUMULATOR RUPTURE	8.55E-10	5	H
NSS	BOT	RP	NITROGEN BOTTLE RUPTURE	8.60E-10	10	H
NSS	CKV	CC	CHECK VALVE FAILS TO OPEN	1.00E-04	3	H
NSS	PCV	DN	PRESSURE REGULATING VALVE DOES NOT FUNCTION PROPERLY	9.35E-07		
NSS	PCV	PG	PCV PLUGGED	5.86E-07	3	D
NSS	RRV	CO	RELIEF VALVE FAILS TO REMAIN CLOSED	1.00E-06	3	D
NSS	XVM	PG	MANUAL VALVE PLUGGED	9.88E-08	10	H
					10	D
PPR	AOV	CC	AOV DOES NOT OPEN (INCLUDES PCV, TCV, FCV)	1.00E-03	10	D
PPR	AOV	OO	AOV DOES NOT CLOSE	2.00E-03	3	H
PPR	HTX	RP	HEAT EXCHANGER RUPTURES	3.00E-06	10	D
PPR	MOV	CC	MOV FAILS TO OPEN	3.00E-03	10	H
PPR	MOV	OO	MOV FAILS TO CLOSE	3.00E-03	3	D
PPR	MOV	PG	MOV FAILS TO REMAIN OPEN (PLUGGED)	9.95E-08	10	D
PPR	MSW	DN	MANUAL SWITCH DOES NOT OPERATE PROPERLY	3.00E-05	5	D
PPR	PRC	DN	PRESSURE CONTROLLER DOES NOT OPERATE	1.24E-06	5	D
PPR	PRV	CC	PORV DOES NOT OPEN	4.27E-03	3	H
PPR	RCK	NO	CONTROL CIRCUIT NO OUTPUT	2.50E-03		
PPR	SRV	CC	SRV DOES NOT OPEN	3.00E-04	3	D
PPR	SRV	OO	SRV FAILS TO RECLOSE	3.00E-03	4	H
PPR	XVM	PG	MANUAL VALVE PLUGGED	9.90E-08	10	H
					10	D
PWS	CKV	CC	CHECK VALVE FAILS TO OPEN	1.00E-04	10	D
PWS	CKV	CO	CHECK VALVE FAILS TO REMAIN CLOSED	5.11E-07	3	H
PWS	MDP	FR	MDP FAILS TO CONTINUE TO RUN	5.26E-06		
PWS	MSW	DN	MANUAL SWITCH DOES NOT OPERATE PROPERLY	2.97E-05	10	H
PWS	RCK	NO	CONTROL CIRCUIT NO OUTPUT	2.50E-03	10	H
PWS	XVM	OC	MANUAL VALVE FAILS TO REMAIN OPEN	9.86E-08	10	H
RCS	ASP	HI	PRESSURE TRANSMITTER FAILS HIGH	3.00E-07	10	H
RCS	HTX	RP	HEAT EXCHANGER RUPTURES	3.00E-06		H
RCS	MDP	FR	MDP FAILS TO CONTINUE TO RUN	1.21E-06	30	H
					9	H
RHR	HTX	RP	HEAT EXCHANGER RUPTURES	3.00E-06	10	H
RHR	MDP	LK	MDP LEAKAGE (ISLOCA)		10	H
RHR	PSF	RP	LINE (PIPING) RUPTURE	5.00E-10		
RHR	XVM	CO	MANUAL VALVE FAILS TO REMAIN CLOSED	4.20E-08	10	D
RHR	XVM	LK	MANUAL VALVE EXCESSIVE INTERNAL LEAKAGE	5.00E-08	10	D
RHR	XVM	RP	MANUAL VALVE RUPTURE FAILURE	5.00E-08	3	D
					10	D
SAS	MSW	CO	MANUAL SWITCH DOES NOT OPERATE PROPERLY	3.00E-05	10	H
SAS	MSW	OC	MANUAL SWITCH DOES NOT OPERATE PROPERLY	3.00E-05	10	H
SAS	RCI	FE	RELAY COIL DOES NOT ENERGIZE	1.30E-04	10	D
SAS	RCS	CC	RELAY FAILS TO OPEN	1.80E-04	7	H
SAS	RCS	CO	RELAY FAILS TO REMAIN CLOSED	2.70E-07		
SAS	RCS	OC	RELAY FAILS TO REMAIN OPEN	4.20E-07	10	D
SAS	RCS	OO	RELAY FAILS TO CLOSE	3.00E-04	3	D

Table G2 Plant-Specific Failure Data

SYSTEM	COMPONENT TYPE	FAILURE MODE	DESCRIPTION	MEAN VALUE	ERROR FACTOR	UNIT
SAS	SBR	CO	CIRCUIT BREAKER FAILS TO REMAIN CLOSED (118V AC)	2.68E-07	3	D

SGB	MSW	DN	MANUAL SWITCH DOES NOT OPERATE PROPERLY	2.98E-05	3	D
SGB	PCV	OO	PCV FAIL TO CLOSE	1.90E-03	3	D
SGB	SOV	HW	SOV FAILS TO OPEN ON DEMAND	1.90E-03	4	H
	---				10	H
SWS	AOV	CC	AOV DOES NOT OPEN (INCLUDES PCV, TCV, FCV)	1.00E-03	3	D
SWS	CKV	CC	CHECK VALVE FAILS TO OPEN	1.00E-04	2	D
SWS	CKV	CO	CHECK VALVE FAILS TO REMAIN CLOSED	5.11E-07	3	D
SWS	CKV	OC	CHECK VALVE FAILS TO REMAIN OPEN	1.04E-07	2	H
SWS	CKV	OO	CHECK VALVE FAILS TO CLOSE	1.00E-03	2	D
SWS	CRB	DN	CIRCUIT BREAKER DOES NOT OPERATE (PUMP & FCU)	4.27E-04	10	D
SWS	FCV	OO	SWP FCV (AOV) FAIL OPEN	2.00E-03	10	D
SWS	MDP	FR	MDP FAILS TO CONTINUE TO RUN	2.46E-05	10	D
SWS	MDP	FS	MDP FAILS TO START ON DEMAND	1.82E-03	3	H
SWS	MDP	RS	RHR PUMP FAILS TO RESTART ON DEMAND	1.50E-03	5	H

Table G3 Maintenance Unavailability Data

EVENT NAME	FAULT TREE	COMPONENT	UNAVAILABILITY
AC0-MAI-MA-13831	AC0	138KV LINE 95331	1.37E-03
AC0-MAI-MA-13832	AC0	138KV LINE 95332	1.31E-02
ACC-MAI-MA-PM31	ACC	AUXILIARY COMPONENT COOLING PUMP 31	1.10E-03
ACC-MAI-MA-PM32	ACC	AUXILIARY COMPONENT COOLING PUMP 32	5.19E-03
ACC-MAI-MA-PM33	ACC	AUXILIARY COMPONENT COOLING PUMP 33	8.87E-04
ACC-MAI-MA-PM34	ACC	AUXILIARY COMPONENT COOLING PUMP 34	9.08E-04
AFW-MAI-MA-31VLV	AFW	31 AUXILIARY FEEDWATER PUMP VALVE PATH	9.19E-05
AFW-MAI-MA-32VLV	AFW	32 AUXILIARY FEEDWATER PUMP VALVE PATH	1.07E-04
AFW-MAI-MA-33VLV	AFW	33 AUXILIARY FEEDWATER PUMP VALVE PATH	2.30E-04
AFW-MAI-MA-PM31	AFW	AUXILIARY FEEDWATER PUMP 31	5.14E-03
AFW-MAI-MA-PM33	AFW	AUXILIARY FEEDWATER PUMP 33	3.22E-03
AFW-MAI-MA-TDP32	AFW	AUXILIARY FEEDWATER PUMP 32	5.33E-03
CCW-MAI-MA-PM33	ACC	COMPONENT COOLING WATER PUMP 33	3.71E-02
CFC-MAI-MA-FCU31	CFC	FAN COOLER UNIT 31	8.13E-03
CFC-MAI-MA-FCU32	CFC	FAN COOLER UNIT 32	3.96E-03
CFC-MAI-MA-FCU33	CFC	FAN COOLER UNIT 33	1.96E-03
CFC-MAI-MA-FCU34	CFC	FAN COOLER UNIT 34	2.86E-03
CFC-MAI-MA-FCU35	CFC	FAN COOLER UNIT 35	2.67E-03
CSS-MAI-MA-PM31	CSI	CONTAINMENT SPRAY PUMP 31	2.51E-03
CSS-MAI-MA-PM32	CSI	CONTAINMENT SPRAY PUMP 32	1.11E-03
CVC-MAI-MA-110AB	BORA	BORATION PATH VIA CH-110A/B	5.52E-04
CVC-MAI-MA-BPM31	BORA	BORIC ACID TRANSFER PUMP 31	4.97E-03
CVC-MAI-MA-BPM32	BORA	BORIC ACID TRANSFER PUMP 32	6.87E-03
CVC-MAI-MA-MV333	BORA	BORATION PATH VIA CH-MOV-333	9.88E-04
CVC-MAI-MA-PM32	BORA	CHARGING PUMP 32	8.25E-02
CVC-MAI-MA-PM33	BORA	CHARGING PUMP 33	8.64E-02
CVC-MAI-MA-RWST	BORA	BORATION PATH VIA RWST	3.22E-03
DC1-MAI-MA-BCC31	125VD	125V BATTERY CHARGER 31	9.64E-03
DC1-MAI-MA-BCC32	125VD	125V BATTERY CHARGER 32	3.00E-03
DC1-MAI-MA-BCC33	125VD	125V BATTERY CHARGER 33	1.74E-03
EDG-MAI-MA-EDG31	DG31	EMERGENCY DIESEL GENERATOR 31	3.02E-02
EDG-MAI-MA-EDG32	DG32	EMERGENCY DIESEL GENERATOR 32	2.92E-02
EDG-MAI-MA-EDG33	DG33	EMERGENCY DIESEL GENERATOR 33	2.31E-02
HHI-MAI-MA-MDP31	HLRIR	HIGH HEAD SAFETY INJECTION PUMP 31	1.73E-03
HHI-MAI-MA-MDP31	HPRER	HIGH HEAD SAFETY INJECTION PUMP 31	1.73E-03
HHI-MAI-MA-MDP31	HPIL	HIGH HEAD SAFETY INJECTION PUMP 31	1.73E-03
HHI-MAI-MA-MDP31	HPRIR	HIGH HEAD SAFETY INJECTION PUMP 31	1.73E-03
HHI-MAI-MA-MDP31	HPIS	HIGH HEAD SAFETY INJECTION PUMP 31	1.73E-03
HHI-MAI-MA-MDP31	HLRER	HIGH HEAD SAFETY INJECTION PUMP 31	1.73E-03
HHI-MAI-MA-MDP32	HLRIR	HIGH HEAD SAFETY INJECTION PUMP 32	1.85E-03
HHI-MAI-MA-MDP32	HPRER	HIGH HEAD SAFETY INJECTION PUMP 32	1.85E-03
HHI-MAI-MA-MDP32	HPIL	HIGH HEAD SAFETY INJECTION PUMP 32	1.85E-03
HHI-MAI-MA-MDP32	HPRIR	HIGH HEAD SAFETY INJECTION PUMP 32	1.85E-03
HHI-MAI-MA-MDP32	HPIS	HIGH HEAD SAFETY INJECTION PUMP 32	1.85E-03
HHI-MAI-MA-MDP32	HLRER	HIGH HEAD SAFETY INJECTION PUMP 32	1.85E-03
HHI-MAI-MA-MDP33	HLRIR	HIGH HEAD SAFETY INJECTION PUMP 33	1.09E-03
HHI-MAI-MA-MDP33	HPRER	HIGH HEAD SAFETY INJECTION PUMP 33	1.09E-03
HHI-MAI-MA-MDP33	HPIL	HIGH HEAD SAFETY INJECTION PUMP 33	1.09E-03
HHI-MAI-MA-MDP33	HPRIR	HIGH HEAD SAFETY INJECTION PUMP 33	1.09E-03
HHI-MAI-MA-MDP33	HPIS	HIGH HEAD SAFETY INJECTION PUMP 33	1.09E-03

Table G3 Maintenance Unavailability Data

EVENT NAME	FAULT TREE	COMPONENT	UNAVAILABILITY
HHI-MAI-MA-MDP33	HLRER	HIGH HEAD SAFETY INJECTION PUMP 33	1.09E-03
IAS-MAI-MA-32	IAS	INSTRUMENT AIR COMPRESSOR 32	3.65E-02
LHI-MAI-MA-PM31	CSRER	RESIDUAL HEAT REMOVAL PUMP 31	5.79E-03
LHI-MAI-MA-PM31	LPI	RESIDUAL HEAT REMOVAL PUMP 31	5.79E-03
LHI-MAI-MA-PM31	RHR	RESIDUAL HEAT REMOVAL PUMP 31	5.79E-03
LHI-MAI-MA-PM31	LPRER	RESIDUAL HEAT REMOVAL PUMP 31	5.79E-03
LHI-MAI-MA-PM31	HLRER	RESIDUAL HEAT REMOVAL PUMP 31	5.79E-03
LHI-MAI-MA-PM31	HPRER	RESIDUAL HEAT REMOVAL PUMP 31	5.79E-03
LHI-MAI-MA-PM32	CSRER	RESIDUAL HEAT REMOVAL PUMP 32	1.32E-03
LHI-MAI-MA-PM32	LPI	RESIDUAL HEAT REMOVAL PUMP 32	1.32E-03
LHI-MAI-MA-PM32	RHR	RESIDUAL HEAT REMOVAL PUMP 32	1.32E-03
LHI-MAI-MA-PM32	LPRER	RESIDUAL HEAT REMOVAL PUMP 32	1.32E-03
LHI-MAI-MA-PM32	HLRER	RESIDUAL HEAT REMOVAL PUMP 32	1.32E-03
LHI-MAI-MA-PM32	HPRER	RESIDUAL HEAT REMOVAL PUMP 32	1.32E-03
PWS-MAI-MA-PWP32	PWS	PRIMARY WATER PUMP 32	1.54E-02
SWS-MAI-MA-PM33	SWS	SERVICE WATER PUMP 33	5.66E-02
SWS-MAI-MA-PM36	SWS	SERVICE WATER PUMP 36	1.82E-02
SAS-XLF-TE-SASA	SAS	SAS TRAIN A IN FUNCTIONAL TEST	3.47E-03
SAS-XLF-TE-SASB	SAS	SAS TRAIN B IN FUNCTIONAL TEST	3.90E-03

APPENDIX H

POST-ACCIDENT HUMAN ACTIONS ANALYSIS

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Section H1

CONTROL ROOM INDICATIONS AND CONTROLS

This section describes the control room instrumentation displays, panels, and switches that are important to the human actions addressed in the IP3 IPE. These descriptions are presented according to system. The locations of the displays, panels and switches in the control room are shown in Figure 3.3.3.1. All indicators, recorders, and switches are clearly labeled with nameplates. The lettering and background on these nameplates have contrasting colors and can be read easily.

H1.1 SERVICE WATER SYSTEM (SWS)

The SWS consists of essential and non-essential supply headers each supplied by three service water pumps. Three backup service water pumps are available and normally aligned to the essential header. The pumps designated for service on the essential header are selected using the service water pump select switch on CCR panel SBF-1. Service water pump breaker control switches with running lights are located on CCR panel SJF for all pumps except backup service water pump 38. The controls for the six main service water pumps have four positions (PULLOUT/STOP/AUTO/ START). The controls for backup service water pumps 37 and 39 do not have an auto-start feature.

Discharge flow and pressure indicators for each main service water pump are mounted locally. The backup pump discharge pressures are also monitored locally. Excessively high differential pressure or strainer malfunction actuates a common alarm in the CCR on panel SJF. Essential and non-essential service water header pressure indicators and low- and high-pressure alarms are provided in the CCR from PI-1190/1191, PA-1112A/1111A and PA-1112B/1111B, respectively. Service water flow from the FCUs is monitored by FT-1121/1122/1123/1124/1125 which provide indication and alarm functions on panel SBF-2. An alarm is provided in the CCR if service water flow to the EDGs fall to 1000 gpm.

H1.2 MAIN STEAM SYSTEM

The atmospheric dump valves (ADVs) are normally-closed, air-operated valves designed to fail closed on loss of power or instrument air. The ADVs may be operated manually from the CCR by placing their individual MANUAL/AUTO controller on panel FBF in the CCR. When in AUTO the ADVs will automatically lift at their manual setpoint.

The MSIVs are swing type stop check valves mounted so that reverse flow will assist in closing the valve. The MSIVs can be closed manually in accordance with emergency operating procedures should the auto signal fail. The control switches are located on panel SBF-1.

The condenser steam dump valves are controlled from flight panel FCF. A mode selector switch determines what parameter is to be used for steam dump control (pressure/ temperature/reset). During normal operation, the temperature mode is selected; for plant cool down, the pressure mode is selected. Four red lights on the flight panel indicate open valves, each light representing three valves.

H1.3 COMPONENT COOLING WATER (CCW) SYSTEM

The CCW pumps are controlled from the SGF panel in the CCR. Each pump has a control switch with START, STOP, AUTO and TRIP pullout positions. Red, green and amber lights are associated with these switches: red for ON, green for OFF and amber for over-current trip. CCW header flow indication is provided an CCR panel SGF. High or low levels in either CCW surge tank are alarmed on Panel SGF. Annunciation is provided on CCR panel SGF for low discharge pressure on CCW loop 1 or 2 and low flow to the RHR pumps. In addition, high heat exchanger outlet temperatures are alarmed on CCR panel SGF.

H1.4 PRIMARY WATER MAKE-UP SYSTEM (PWS)

Refilling the RWST is initiated manually. Normally only one primary water pump is selected to run continuously; the second primary water pump is in automatic standby. The pumps can be manually started from central control room (CCR) panel FCF. The make-up control system sends a start signal to both pumps when automatic make-up is required: the pump in operation continues to run and the standby pump starts. Primary water flow controller FIC-111 and primary water flow totalizer YIC-111 can be manually operated from CCR Panel FBF.

H1.5 AUXILIARY FEEDWATER (AFW) SYSTEM

The AFW motor-driven pumps can start automatically or be started by manual actuation--control switches are placed both locally and in the CCR on the condensate and feedwater supervisory panel SCF. The switches in the CCR have three positions : ON/AUTO/TRIP. The steam-turbine-driven pump is a variable speed device, its speed being controlled by remote pneumatic speed charger station HC-1118 located on condensate and feedwater supervisory panel SCF in the CCR. Turbine steam supply to the AFW pump is indicated and alarmed in the CCR.

AFW pump discharge pressure indicators are provided both locally and in the control room on panel FBF. The water level in the steam generators is maintained manually from the CCR by positioning the flow control valves on panel SCF. SG narrow range indicators are provided on panel FBF, while wide range level and flow indicators are provided on panel SCF.

The positions of manual valves CT-6 and CT-64 in the line from the CST to the AFW pumps are displayed and alarmed in the CCR. Redundant level indicators and control room alarms are provided to monitor the condensate storage tank volume. The valve positions for control valves PCV-1187/1188/1189 in the inlet line from the city water supply are also indicated in the CCR.

Pressure switch PC-1355S, located at the nitrogen bottles, will give an annunciated alarm in the control room to warn the operator when the nitrogen bottles need to be changed. Should city water be aligned to provide suction to the AFW pumps, city water supply pressure indication is provided on CCR panel SCF. Low suction flow to the motor-driven AFW pumps is also alarmed in the CCR.

H1.6 HIGH-HEAD SAFETY INJECTION (HHSI) SYSTEM

Manual actuation of the pumps and most of the motor-operated valves is possible from CCR panel SBF-2. Motor-operated valves SI-1810, SI-842 and SI-843, and AOVs SI-1851A/B can be activated manually from CCR panel SBF-1. Position-indicating lights are provided for each valve in the control room. Redundant level monitoring is provided for the RWST to maintain RWST water levels within technical specification requirements: level transmitter LT-920 provides CCR indication of the RWST on panel SBF-1 and level indication controller LIC-921 provides local indication. Should automatic actuation of the HHSI pumps fail, the operator can start them and open motor-operated valves SI-1852A/B and SI-1835A/B from panel SBF-2 in the control room and close the BIT recirculation isolation valves SI-1851A/B from panel SBF-1.

H1.7 LOW-HEAD SAFETY INJECTION (LHSI) / RESIDUAL HEAT REMOVAL (RHR) SYSTEM

The safety injection signal automatically starts all RHR pumps. The pumps can also be manually actuated from CCR panel SGF. The RHR pump control switches in the control room have four positions (PULLOUT/AUTO/STOP/START) with spring return to AUTO. When the pump switch is in the PULLOUT position, the safeguards equipment locked open alarm will be annunciated on panel SGF in the CCR.

The control switches for the MOVs have three positions (CLOSE/ AUTO/OPEN) with spring return to AUTO. Position-indication lights are provided in the control room for each valve. Manual operation of MOV AC-744, AC-745A/B, SI-1869A/B and SI-883 is possible from CCR panel SBF-1. MOV AC-730, AC-731, SI-638, SI-640, SI-746, SI-747 and SI-899A/B can be operated from CCR panel SGF.

H1.8 RECIRCULATION SYSTEM

The recirculation system is in standby during normal plant operation. The operator activates the system upon receipt of a low level (9.2 ft) signal from the RWST, selecting the operating mode and making the appropriate system alignments. To establish flow using the RHR pump, valve line-ups have to be changed from CCR panel SBF-1. Motor-operated valves SI-888A/B can be opened from CCR panel SBF-1 with their own switches or using recirculation switch RS-5. Motor-operated valves SI-856B and SI-856G can be operated from CCR panel SBF-2. Motor-operated valves SI-885A/B can be opened from the safeguards panel SBF-1 but are interlocked with RHR pump suction motor-operated valves AC-730 and AC-731 so that valves SI-885A/B cannot be opened if AC-730 and AC-731 are open.

Level transmitters LT-1251 and LT-1252 send signals to provide recirculation fluid inventory indication on panel FAF to verify long-term performance of the recirculation pumps. Level transmitters LT-1255 and LT-1256 send signals to provide recirculation fluid inventory indication on panel FAF to help monitor long-term operation of ECCS system.

H1.9 ACCUMULATOR SYSTEM

Motor-operated accumulator isolation valves 894A/B/C/D are normally de-energized and open, their positions being shown by indicating lights in the control room. Furthermore, a safety injection signal will also actuate the valve to ensure they are open.

Levels and pressures in the accumulators are monitored during normal operation to assure the readiness of this system. Two water level transmitters (LT-934A/B/C/D and LT-935A/B/C/D) and two pressure transmitters (PT-936A/B/C/D and PT-937A/B/C/D) are provided for each accumulator. Both level transmitters on each accumulator provide signals to indicate levels and actuate high and low- water level alarms in the control room. Similarly, both pressure indicators actuate high- and low-pressure alarms in the control room.

H1.10 CONTAINMENT SPRAY SYSTEM (CSS)

CSS pumps start automatically upon receipt of the high-high containment pressure signal; manual operation from panel SBF-1 in the control room is also possible. The CSS pump control switches in the control room have four positions (PULLOUT/STOP/AUTO/START) with spring return to AUTO. When the pump switch is in the PULLOUT position, the safeguards equipment locked open alarm will be annunciated on panel SBF-1 in the central control room. Should automatic actuation fail, the operator can start the CSS pumps and open the pump motor-operated discharge valves from panel SBF-1 in the control room.

H1.11 480-Vac ELECTRIC POWER SYSTEM

Current and potential transformers on each 480-V bus operate protective relaying to trip circuit breakers under fault, undervoltage, or underfrequency conditions. Controls for non-fire safe shutdown 480-V circuit breakers are present in CCR panel SHF. Most CCR controls for MCC driven pumps and fans consist of two-position maintained contact switches. Three-position, spring return to center, switches are generally used for motor-operated valves and switchgear circuit breakers. Red and green indicating lights show item status on most switch modules. A red light indicates a closed circuit breaker, open valve or running motor. For motor-operated valves, both lights lit simultaneously indicate that the valve is mid-stroke. CCR panel SHF contains 480-V bus voltmeters and undervoltage relay light. In addition, undervoltage on any 480-V safeguards bus is annunciated on panel SBF-2.

H1.12 118-Vac ELECTRIC POWER SYSTEM

The 118-Vac electric power system consist of eight instrument buses and associated load circuit breakers housed in eight individual distribution cabinets in the CCR. Inverters 31,32 and 33 have trouble lights and alarms on each cabinet to indicate abnormal conditions such as reverse polarity, blown fuses, high cabinet temperature, failure of cabinet cooling fans, ac-dc over/under voltage, inability to synchronize with the alternative ac source, and internal circuit breaker status. Inverters 31, 32, and 33 also have individual annunciator windows on CCR panel SGF that alarm should their transfer switches be in the 'reverse' transfer mode.

H1.13 PRIMARY PRESSURE RELIEF (PPR) SYSTEM

The PORVs can be operated manually from flight panel FCF in the CCR. The control switches for the PORV have three positions: CLOSE/AUTO/OPEN. PORV status is indicated by lights on panel FCF. A common alarm on CCR panel SBF will be triggered if either PORV is not seated. The control switches for the motor-operated block valves are also located on flight panel FCF of the CCR. The switches have four positions (PULLOUT/ CLOSE/AUTO/OPEN). Controllers PC-455G/H/K are used to operate spray valves PCV-455A/B in their manual control mode. The controllers are located on CCR flight panel FBF.

Each code safety valve has an RTD installed in its discharge pipe. When the safety valve is open, the RTD indicates a higher temperature on panel FBF in the CCR. High temperature is alarmed when an RTD senses a temperature of 250°F.

H1.14 CONDENSATE SYSTEM (CDS)

Condensate system flow paths A and B use various heat exchangers for cooling and heating water en route to the main boiler feed pumps. If the flow rate in path A decreases to 2400 gpm, the "Gland Steam Condensate Flow Low" alarm annunciates on the SCF panel in the CCR. Common boiler pump suction header PT-408B indicates boiler feed pump suction pressure on panel FAF in the CCR and provides a signal for the boiler feed pump low suction pressure runback.

On the SCF alarm panel, the "Condenser No. 32 Level" common alarm annunciates in response to signals from LC-1159-S (at 11.5 inches above normal), indicating a condenser hotwell No. 32 high level, and LC-1162-S (at 8.5 inches below normal), indicating a condenser hotwell No. 32 low-low level. Condenser No. 32 level is indicated on the SCF panel by level indicator LI-1130. The pneumatic control piping line to LCV-1129 and to LCV-1128 and LCV-1128A each pass through an auto/manual pneumatic loading station (HC-1149/1148) on panel SCF. These two loaders allow the operator to control air pressure to the excess and make-up condensate level control valve operating bellows.

Condensate pump motor bearings are cooled by the turbine hall closed cooling system. The "condensate pump motor bearing cooling water low pressure" alarm on the SCF panel in the CCR annunciates if the cooling water supply pressure drops to 30 psig. The condensate pumps are started and stopped from the feedwater and condensate supervisory panel SCF in the CCR. The condensate pump motor upper, lower, and thrust bearing temperatures are monitored by a bearing alarm located on panel SKF in the CCR. A high (185°F) temperature alerts the operator of abnormal motor bearing temperature using the "bearing monitor" alarm on the panel SEF in the CCR.

Control switches located on panel SCF allow remote operation of city water valves. Pump suction pressures for each of the three auxiliary boiler feed pumps are indicated on panel SCF in the CCR.

H1.15 MAIN FEEDWATER (MFW) SYSTEM

The boiler feedwater pump turbine speed is controlled from the CCR panel FAF to maintain the feedwater header pressure necessary for proper operation of the steam generator feed regulation valves. The low-flow bypass line regulating valves are controlled using a controller mounted on flight panel FBF in the CCR. The motor-operated main feedwater line isolation valves are operated by CLOSE/AUTO/OPEN switches located at the bottom of panel SCF.

H1.16 CHEMICAL AND VOLUME CONTROL SYSTEM (CVCS)

Charging pumps 31, 32, 33, their associated speed controllers SC-141A/B/C, and the control switches for the boric acid transfer pumps 31 and 32 can be operated from CCR panels FBF and FCF. Emergency borate valve MOV-333 is operated from panel SFF.

H1.17 SAFEGUARDS ACTUATION SYSTEM (SAS)

The safeguards actuation system is installed on four racks in the CCR. Operation of the safeguards actuation system is automatic and does not require operator action. The system is reset manually in the CCR. Reactor trip first-out annunciation is provided on flight panel FDF to indicate the cause of the reactor trip (e.g. undervoltage trip, turbine trip) to the operators. Similarly, turbine first-out annunciators are provided on flight panel FAF.

H1.18 6.9-kVac ELECTRIC POWER SYSTEM

Controls for 6.9-kVac circuit breakers are on panel SHF in the CCR and locally on the switchgear.

H1.19 OFFSITE ELECTRIC POWER SYSTEM

Motor operated disconnect switch BK-5 and circuit breaker BT5-6 are controlled from the CCR with power from 125-V dc power panels 31 or 32. Pilot wire, differential, and primary/backup lock-out relays are located in the CCR.

H1.20 EMERGENCY DIESEL GENERATOR ELECTRIC POWER SYSTEM

Engine and generator instrumentation are located at the local control panel in the diesel generator building. In addition, diesel generator output circuit breaker controls are located on panel SHF in the CCR. There are no manual start/stop controls for the diesel generators in the CCR.

H1.21 CONTAINMENT AIR RECIRCULATION COOLING AND FILTRATION SYSTEM

The safety injection signal automatically starts all containment fan cooler units. The units can also be started manually from CCR panel SBF-2. Control switches for the solenoid valves and position indicating lights for the dampers on each fan cooler unit are located on panel SBF-2 in the CCR.

H1.22 REACTOR POWER

Reactor power level and control rod position are indicated on CCR panel FCF. There are two reactor trip buttons, one on panel FCF and the other on panel SBF-2. The rod control mode selector and control switches are located on panel FCF. The main turbine can be manually tripped from flight panel FAF.

Section H2

CALCULATION OF POST-ACCIDENT HUMAN ERROR PROBABILITIES

H2.1 OPERATOR ACTION B--RECOVERY OF AC POWER

SUMMARY

a. Task. The operators restore ac power and establish core cooling in sufficient time to prevent core damage.

b. Success Criteria. The operators restore power to at least one safeguards bus (5A, 6A, or 2A/3A) and initiate safety injection. The inclusion of the initiation of safety injection is conservative because, depending when ac power is recovered, the RCP seal leak rate may still be within the make-up capacity of one charging pump.

c. Scenario/Event Tree(s) Used. Station blackout (SBO) event tree.

ACTION

a. Initial Conditions. The reactor is initially operating at full power. A loss of offsite power occurs. Subsequently, all three emergency diesel generators fail to start or to run.

b. Preceding Operator Actions. The operators will open the turbine-driven AFW pump flow control valves. If ac power recovery is not imminent, the operators will depressurize the steam generators to minimize RCS inventory loss through the RCP seals. The operators will also commence dc load shedding to preserve battery life.

c. Symptoms. All safeguards buses (5A, 6A, and 2A/3A) de-energized.

d. Indications.
"480V Safeguards Bus Undervoltage" annunciator on panel SBF-2.
480-V bus voltmeter on panel SHF.
480-V bus undervoltage relay lights on panel SHF.

e. Procedural Guidance. Upon receipt of a reactor trip, the operators will enter procedure E-0 (Reactor Trip or Safety Injection). If the EDGs fail to start, step 3 of E-0 will direct the operators to enter ECA-0.0 (Loss of All AC Power) if power cannot be restored to at least one safeguards bus. If ac power is lost subsequent to reaching step 3 of E-0, the

operators will be directed to enter ECA-0.0 from the alarm response procedure for 480-V safeguards bus undervoltage (ARP-5).

f. Response.

ECA-0.0 (Rev. 7)

Step 6.a.1 Direct NPO to manually start all emergency diesel generators (EDGs) per SOP-EL-1 (Diesel Generator Operation).

Step 6.a.2 Contact Con Ed and inform them of the extremely urgent need for ac power.

Step 6.a.3 Attempt to energize 480-Vac buses from offsite power as per SOP-EL-5 (Operation of On-Site Power Sources) or EDGs as per SOP-EL-1 (Diesel Generator Operation).

Step 6.e Start Appendix R DG as per SOP-EL-13.

PERFORMANCE SHAPING FACTORS

a. Timing.

Time Available - The time available to recover ac power depends on several factors: time of RCS depressurization; turbine-driven AFW pump availability; dc power availability; stuck-open PORV; and RCP seal leak rate.

Time Needed - The time needed to recover ac power will vary. Section 1.3.2.3 of the IPPSS [1] presents estimates of the probabilities of non-recovery for offsite power and the diesel generators as a function of time. An estimate of the probability of non-recovery of gas turbine #2 was provided by its owner, Consolidated Edison [15]. Once ac power is recovered, the operators must establish safety injection. It was assumed that 30 minutes are required for the operators to diagnose the need for RCS make-up and perform the necessary actions.

b. Competing Actions/Alarms. None.

c. Consequence of Actions.

Success - Success of this action implies that ac power is restored to at least one safeguards bus and that core cooling is established via safety injection. Because the RCP seal leak rate is time-dependent, ECCS make-up requirements will depend on when ac power is restored. Consequently, core damage may still occur even after ac power is restored.

Failure - Failure to restore ac power in time results in the core being uncovered and subsequent core damage.

d. Training/Experience. The operators have simulator training on station blackout sequences.

e. Stress. Moderately to extremely high.

f. Skill/Rule/Knowledge-Based. Rule-based. Each step is proceduralized.

g. Task Complexity. Simple to complex, depending on the cause of ac power failure. For example, recovery of a failed diesel generator may sometimes be achieved by simply resetting the trip relay and locally starting the diesel generator. At other times, however,, recovery may require the use of technical manuals/drawings or making complex adjustments to the control systems.

QUANTIFICATION

AC power can be restored using four different sources of power: diesel generators; offsite power; the gas turbine unit at Indian Point 2; and the Appendix R diesel generator. The operator action tree for restoration of ac power is shown in Figure H2.1.1. The following table describes the quantification of the failure nodes depicted in Figure H2.1.1. Table H2.1.1 shows the results of this quantification for different times.

Failure Node	Median HEP (Error Factor)	Mean HEP	Source
[a] Diesel Generator Recovery			
	----	Evaluated on a cut-set basis	IPPSS [1], Section 1.3.2.3.

Estimates for the probability of non-recovery of a single EDG were taken from Figure 1.3.2.3-1 in Section 1.3.2.3 of the IPPSS [1]. As the time to recover DG failures depends on the cause of failure, recovery of a failed diesel generator was evaluated for individual cut-sets where necessary.

[b] Offsite Power Recovery			
	----	Table H2.1.1	IPPSS, Section 1.3.2.3.

Estimates for the probability of non-recovery of offsite power were obtained using the methodology described in NUREG/CR-5032 [16]. This methodology divides plants into three groups based on their switchyard configuration and the number of sources of offsite power available. IP3 was placed in the group associated with the most conservative estimates of the probability of non-recovery. A point estimate approximation of Equation

23 in NUREG/CR-5032, quantified using lognormal fits to plant-centered, grid, and weather related data sets and weighting factors equal to the fraction of events that fall in a particular data set, was then used to derive mean values for the probability of non-recovery as a function of time. Figure H2.1.2 compares the non-recovery curve used with the empirical data presented in NUREG/CR-5032 and the curve fit to those data.

[c] Operation of Gas Turbine

----	Not credited	Reference 15.

Estimates for the unavailability of the gas turbine, including unavailability caused by hardware failures and maintenance, are presented in Reference [15]. However, no credit was taken for operation of the gas turbine because the estimated probabilities of non-recovery of offsite power may account for such a power source.

[d] Operation of Appendix R Diesel Generator

----	Table H2.1.1	Plant-specific data, NUREG/CR-4772 [17]

The unavailability of the Appendix R diesel generator caused by hardware failures was conservatively estimated to be 0.1. The HEP associated for operation of the Appendix R diesel generator was calculated using the nominal diagnosis model in NUREG/CR-4772 assuming 40 min. are required to align the diesel generator.

The probability of non-recovery of ac power and subsequent core damage were evaluated with and without RCS depressurization. The probabilities of the core being uncovered (and subsequently damaged), given successful ac power recovery and unqualified high temperature RCP seals, were derived from WCAP-10541 [2]. The final results for the quantification are shown in Figure H2.1.3 and Figure H2.1.4 for the case with RCS depressurization and without RCS depressurization, respectively.

The calculated probability of non-recovery of ac power with subsequent core damage for the case in which the RCS is depressurized is 7.1×10^{-3}. For the case where the RCS is not depressurized, the probability increases to 9×10^{-3}. These probabilities represent the recovery factors applied to selected station blackout sequences.

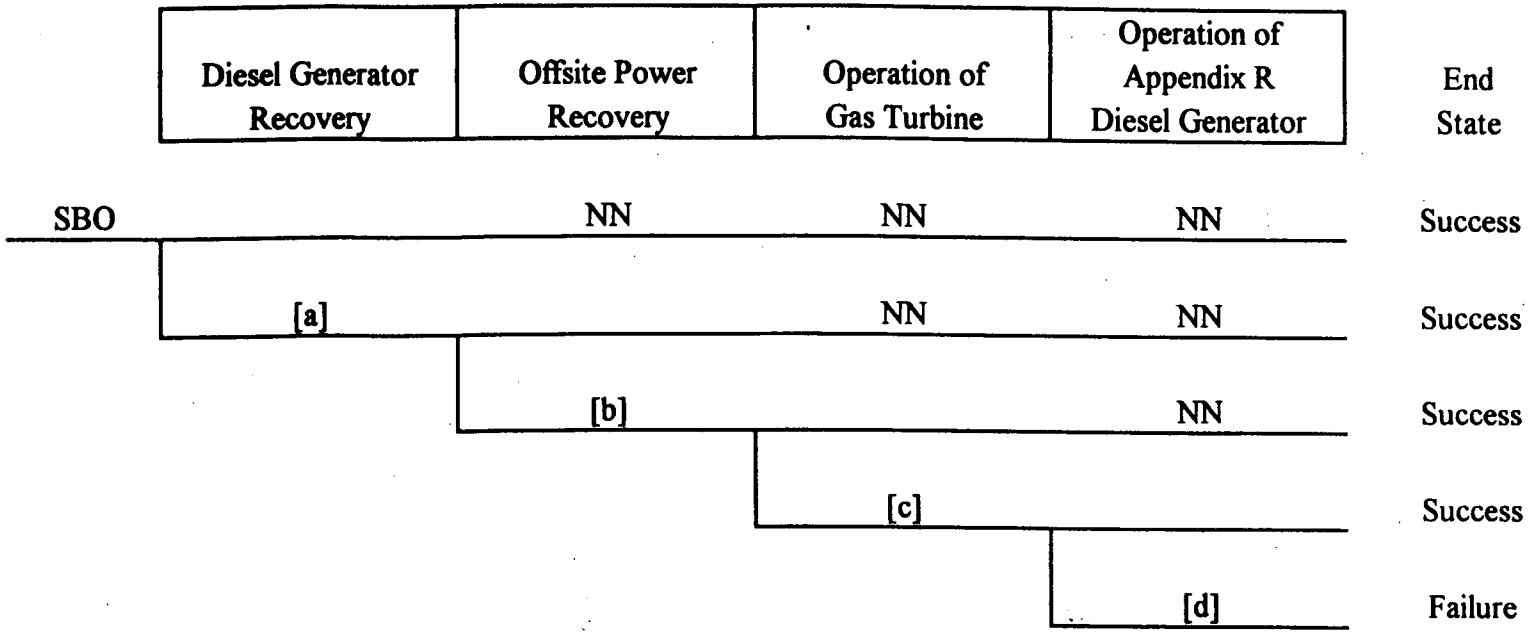
Table H2.1.1. Time-Dependent Probabilities for Non-Recovery of AC Power

Time of AC Power Recovery	Probability of Non-Recovery Of At Least 1 DG [1]	Probability of Non-Recovery of Offsite Power	Probability of Non-Recovery of Gas Turbine [2]	Probability of Non-Recovery of App. R DG	Total Prob. of Non-Recovery of AC Power
1.0 hr	1.00	0.47	1.00	0.13	6.1E-2
2.0 hr	1.00	0.34	1.00 (0.35)	0.1	3.4E-2
3.0 hr	1.00	0.25	1.00 (0.35)	0.1	2.5E-2
4.0 hr	1.00	0.18	1.00 (0.35)	0.1	1.8E-2
5.0 hr	1.00	0.13	1.00 (0.27)	0.1	1.3E-2
6.0 hr	1.00	0.095	1.00 (0.27)	0.1	9.5E-3
7.0 hr	1.00	0.071	1.00 (0.27)	0.1	7.1E-3
8.0 hr	1.00	0.055	1.00 (0.27)	0.1	5.5E-3

[1] No credit was given to recovery of a failed emergency diesel generator.

[2] No credit was given to the use of the Con Ed gas turbines -- use of the gas turbines was assumed to be included in the offsite power recovery curve. The numbers in parentheses indicate the anticipated probabilities for non-recovery if credit is given to the Con Ed gas turbine(s).

Figure H2.1.1. Operator Action B - Recovery of AC Power



NN = Not Needed

Note: The letters in brackets [ ] refer to the failure node in the quantification section.

FIGURE H2.1.2
Non-Recovery Probability Curve for Plant-Centered (Group 3) Data

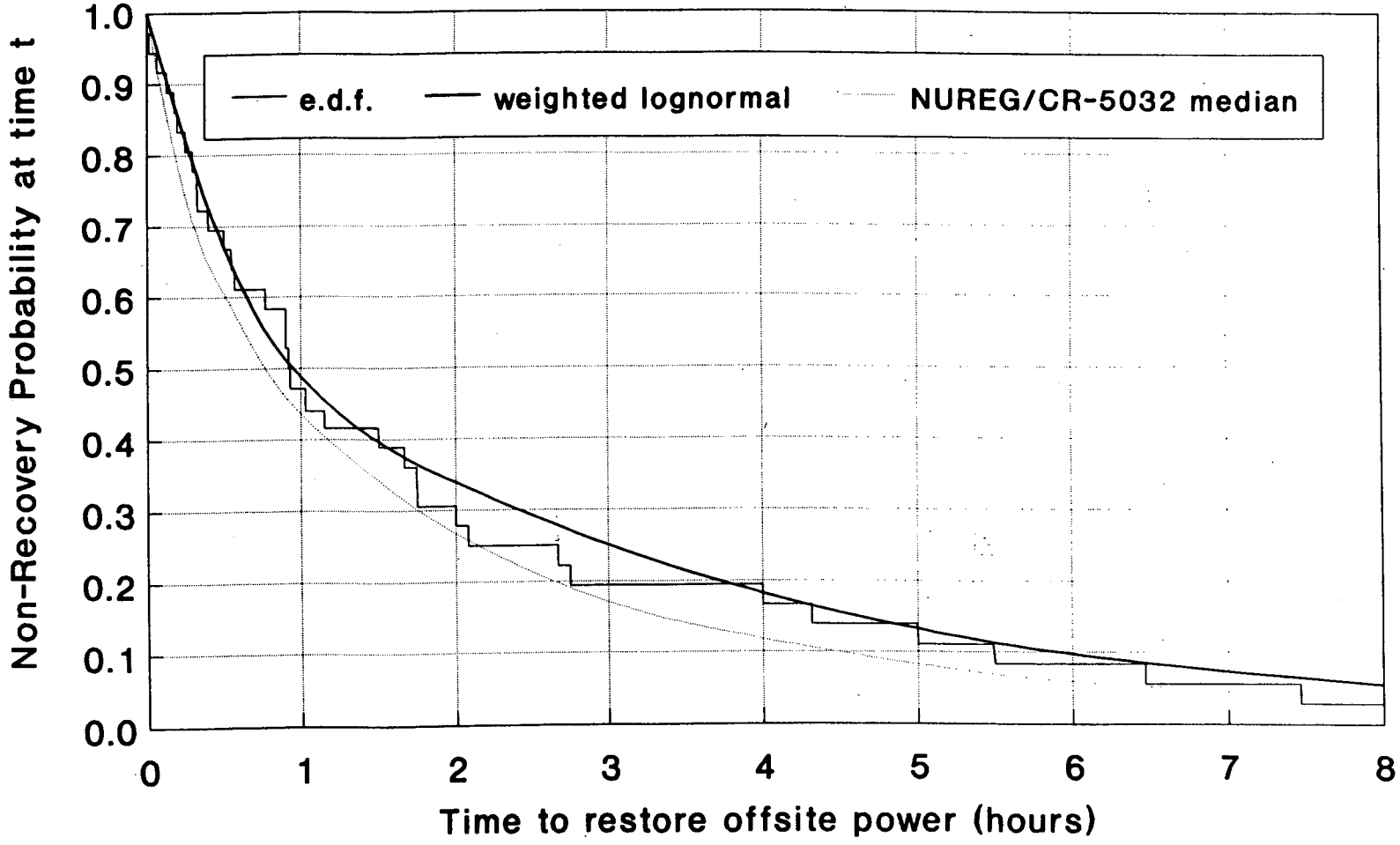


Figure H2.1.3. Sequence Quantification for Recovery or AC Power with Successful RCS Depressurization

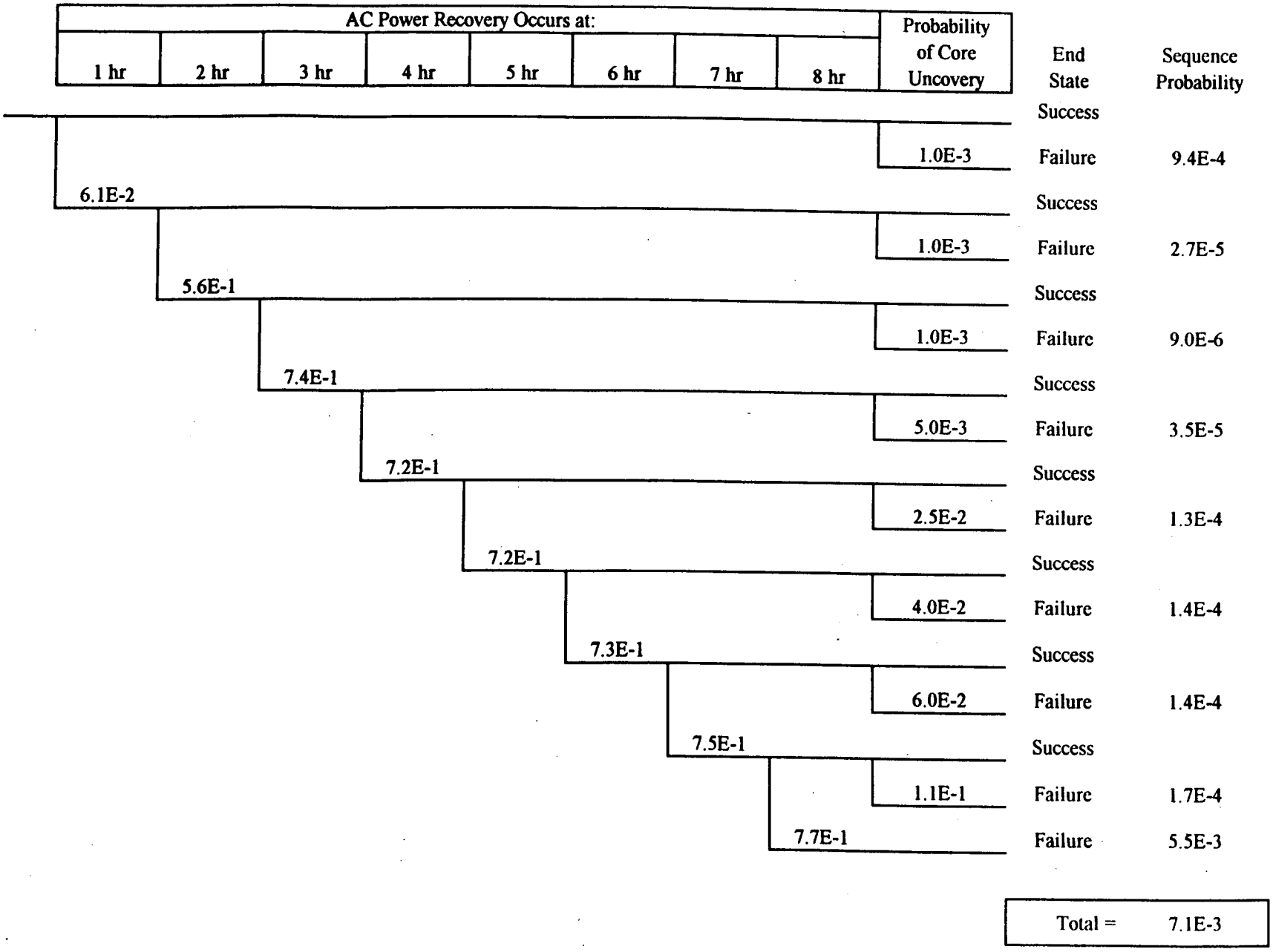
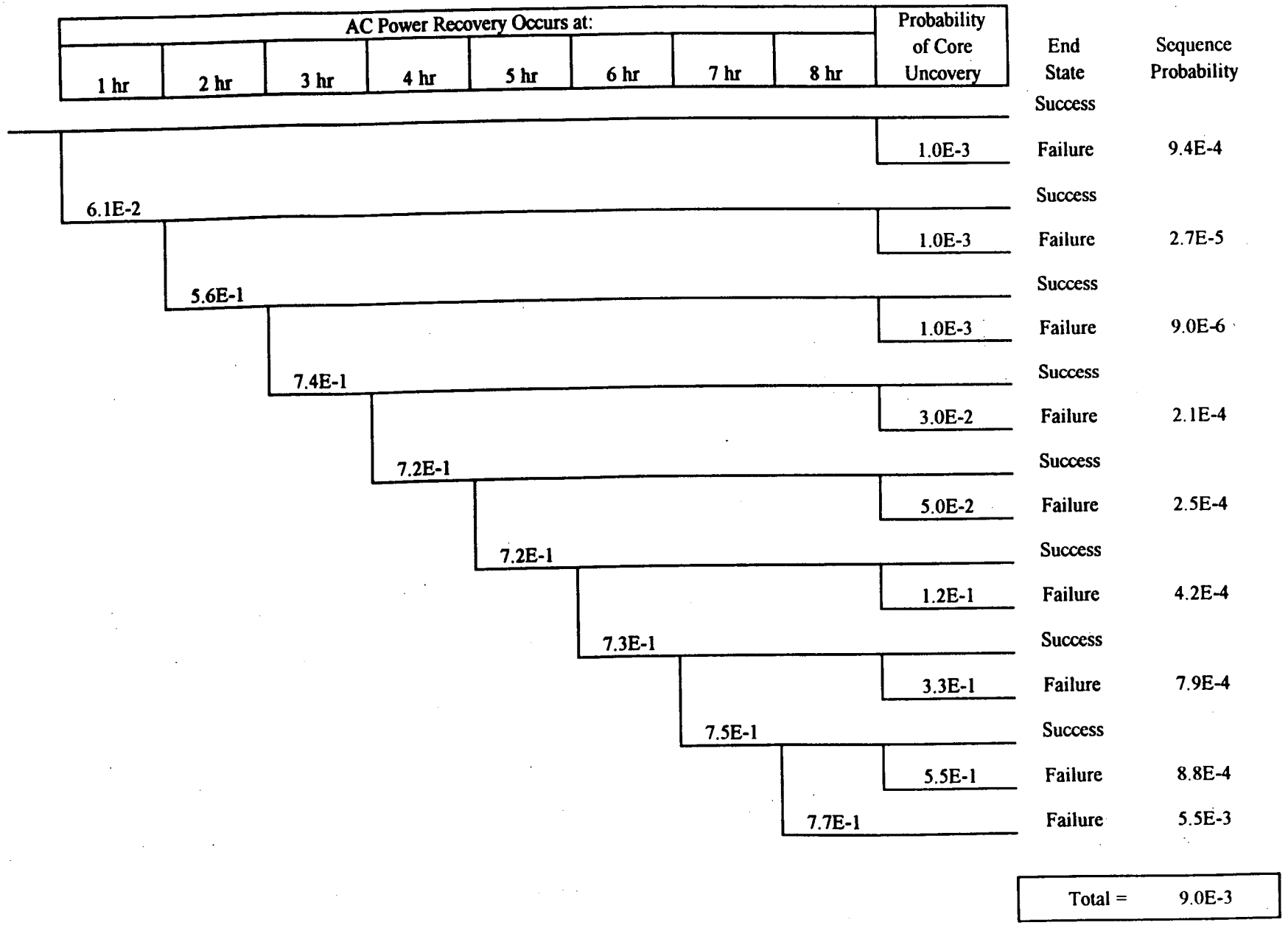


Figure H2.1.4. Sequence Quantification for Recovery of AC Power Without RCS Depressurization



H2.2 OPERATOR ACTION CWRHR--OPERATORS ALIGN BACKUP CITY WATER TO RHR PUMP 31

SUMMARY

a. Task. The operators establish cooling to RHR pump 31 using backup city water.

b. Success Criteria. Sufficient backup city water is supplied to cool RHR pump 31.

c. Scenario/Event Tree(s) Used. Special initiators (TCCW and TSWS).

ACTION

a. Initial Conditions. The reactor is operating at full power. A total loss of component cooling water occurs. A loss of RCS inventory ensues as a result of a loss of RCP seal cooling or a stuck-open PORV.

b. Preceding Operator Actions. The operators will attempt to establish backup city water to the charging pump coolers to provide continued cooling of the RCP seals.

c. Symptoms.
Low component cooling water discharge pressure.
Low RHR pump cooling flow.

d. Indications.
"Component Cooling Pump Loop 1 Discharge Low Pressure" annunciator on panel SGF.
"Component Cooling Pump Loop 2 Discharge Low Pressure" annunciator on panel SGF.
"RHR Pump Cooling Low Flow" annunciator on panel SGF.
CCW flow indicators FI-601A/B on panel SGF.
CCW-to-RHR pump flow indicators FIC-645 and FIC-646 (local indicators).

e. Procedural Guidance.
Alarm response procedure ARP-10 directs the operator to enter procedure ONOP-CC-1. Step 5.9 of ONOP-CC-1 directs the operators to tie in the backup city water cooling to RHR pump 31 using SOP-CC-1B.

f. Response.

ONOP-CC-1 (Rev. 7)

Step 5.9 If component cooling cannot be re-established and the charging or RHR pumps are to be operated, tie in the backup city water to the pumps as per SOP-CC-1B.

SOP-CC-1B (Rev. 11)

Step 4.4.1.a Close valves AC-736A, AC-737A, and AC-1871D (located in RHR pump room--15-ft elevation in PAB).

Step 4.4.1.b Install the city water supply jumper between water supply valve MW-18-16 and the tee immediately downstream of valve AC-736A. Install the drain hose onto the tee immediately downstream of valve AC-1871D. (The city water jumper hose and MW-18-16 are located on the 15-ft elevation in the PAB).

Step 4.4.1.c Open the city water supply valve MW-18-16.

PERFORMANCE SHAPING FACTORS

a. Timing.

Time Available - According to SOP-CC-1B (Step 4.4), the RHR pumps can operate without CCW for 24 hours. However, this assumes that RCS pressure is below the shut-off head of the RHR pumps. If RCS pressure is above the shut-off head of the RHR pumps, functional restoration procedure FR-C.1 cautions that the RHR pumps should not be run for more than 1.75 hours (105 minutes) without component cooling water. The quantification assumed that RCS pressure remains above the shut-off head of the RHR pumps for the first 105 minutes, at which time if city water cooling to RHR pump 31 is not established, RHR pump 31 (together with RHR pump 32) will fail.

Time Needed - 30-35 minutes. This estimate is based on walk-throughs and operator judgement. An operator simulated the task and concluded that, if only one operator were assigned to the task, repeated trips in and out of the RHR pump room would be required. Each trip would require the donning and removal of protective clothing.

b. Competing Actions/Alarms. The operators will be implementing the EOPs when they must make the decision to enter ONOP-CC-1.

c. Consequence of Actions.

Success - Success implies continued operation of RHR pump 31.

Failure - Failure results in failure of both RHR pumps and subsequent core damage.

d. Training/Experience. The operators have been trained on how to respond to a loss of CCW flow to the RHR pumps.

e. Stress. Moderate to high.

f. Skill/Rule/Knowledge-Based. Rule-based. Each step is proceduralized.

g. Task Complexity. Low to moderate

QUANTIFICATION

The operator action tree for CWRHR is shown in Figure H2.2.1. The following table describes the quantification of the failure nodes depicted in Figure H2.2.1. The mean HEP for operator action CWRHR is 3.3×10^{-2}.

Failure Node	Median HEP (Error Factor)	Mean HEP	Source (NUREG/CR-4772)
[a] Operator Diagnoses Need for City Water to RHR Pump 31			
	8.96×10^{-5} (EF=30)	7.6×10^{-4}	Table 8-2, interpolating between item 5 and item 6 (70 minutes)

Assuming that the RHR pumps will fail in 105 minutes given loss of CCW cooling and that 15 minutes is required for the NPO to establish city water cooling to RHR pump 31, diagnosis must occur within 105 - 35 minutes = 70 minutes. Given that low component cooling pump discharge pressure and low RHR pump cooling flow conditions are annunciated, the use of the median joint diagnosis curve in Table 8-2 of the ASEP HRAP to predict the HEP is felt to be conservative.

[b] Operator Performs Required Actions			
	0.02 (EF=5)		Table 8-5, item 3.
	x 5		Five critical actions.
	0.10 (EF=5)	0.161	

The critical post-diagnosis actions are closing valves AC-736A, AC-737A, and AC-1871D; installing the city water supply jumper; and opening MW-18-16. These are step-by-step actions performed under moderately high stress.

[c] Recovery

Failure to align valves properly will be indicated by lack of city water flow through the drain--flow indication (FIC-646) will be lost because of closure of manual valve AC-737A. Even though the only credible recovery action in this case is essentially a check by the operator assigned to perform the action, failure to perform the action will be quite obvious. Therefore, the post-diagnosis HEP calculated above was reduced by a factor of 5, corresponding to the associated error factor in Table 8-5.

COMMENT

It was assumed that diagnosis in operator action CWRHR repeats the diagnosis in operator action SLOCA, the alignment of city water back-up to the charging pumps (Section H2.17) but with less time available. Thus, given diagnostic error in operator action SLOCA, diagnostic error in operator action CWRHR was assumed.

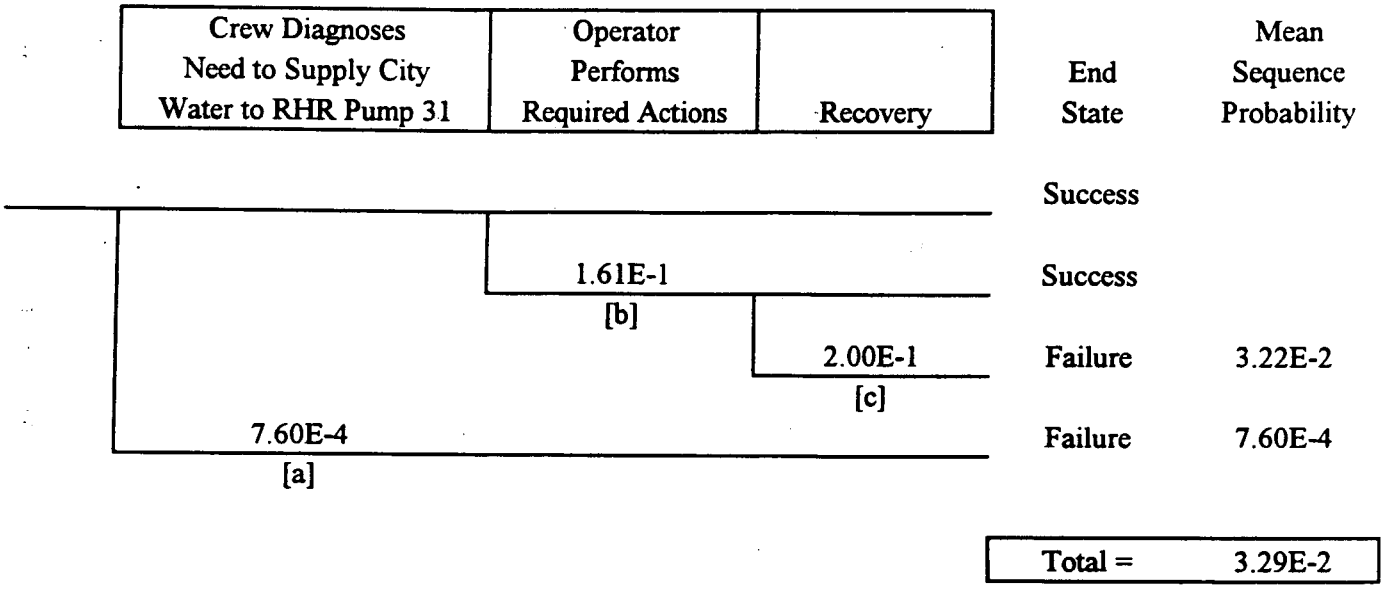
The absence of diagnostic error in operator action SLOCA was not, however, judged to reduce the probability of diagnostic error in operator action CWRHR. Thus, the HEP for operator action CWRHR given the failure of operator action SLOCA can be expressed as

$$SLOCA \times CWRHR|SLOCA = SLOCA \cap CWRHR, \text{ or}$$

$$0.021 \times CWRHR|SLOCA = 6.9\times10^{-4} + (1 - 6.9\times10^{-4})(0.0208)(0.033) = 1.38\times10^{-3}$$

$$\therefore CWRHR|SLOCA = 0.066$$

Figure H2.2.1: Human Action CWRHR - Backup City Water Provided to RHR Pump 31



H2.3 OPERATOR ACTION FB--OPERATOR INITIATES PRIMARY BLEED-AND-FEED COOLING

SUMMARY

a. Task. Operators establish core cooling using bleed and feed.

b. Success Criteria. Bleed-and-feed cooling requires at least one HHSI pump and both PORVs.

c. Scenario/Event Tree(s) Used. MSLB (T4, T5), SBO, SGTR, small LOCA, special initiators (TAC5A, TAC6A, TCCW, TSWGR, TSWS), transients (T1, T2)

ACTION

a. Initial Conditions. The reactor is operating at full power. A reactor trip occurs with subsequent loss of main feedwater. All AFW pumps fail to start or are otherwise unable to deliver sufficient flow to the steam generators.

b. Preceding Operator Actions. The operators will attempt to establish AFW flow from the control room.

c. Symptoms.
Loss of secondary cooling.
"RED" path on critical safety function "HEAT SINK".

d. Indications.
SG narrow range level (LI-417A/B/C, LI-427A/B/C, LI-437A/B/C, LI-447A/B/C) on panel FBF.
SG wide range level (LR-417-1/2, LR-437-1/2) on panel SCF.
AFW flow (FI-1200, FI-1201, FI-1202, FI-1203) on panel SCF.

e. Procedural Guidance. Upon a reactor trip, the operators will enter procedure E-0 (Reactor Trip or Safety Injection). If a safety injection signal is present, Step 20 of E-0 will transfer the operators to FR-H.1 (Response to Loss of Secondary Heat Sink) if total AFW flow is less than 355 gpm. If safety injection has not occurred (and is not needed), the operators will transfer to ES-0.1 (Reactor Trip Response). Once E-0 is exited, the STA is required to monitor the critical safety function (CSF) status trees. The functional restoration procedure for loss of secondary heat sink, FR-H.1, cautions the operators to trip all RCPs and initiate bleed-and-feed cooling immediately if the wide range level in any two SGs is less than 68 percent. Because condensate flow to the SGs cannot be established before the above criteria are met and the limited time available to successfully initiate bleed-and-feed, the operators are trained to initiate bleed-and-feed immediately.

f. Response.

FR-H.1 (Rev. 6)
Step 3 Stop all RCPs [on panel SAF].

Step 8a Manually start 3 HHSI pumps [on panel SBF-2].

Step 9 Verify RCS feed path.

Step 10 Establish RCS bleed path:
- a. Verify power to pressurizer PORV block valves available. If not, dispatch NPO to restore power to block valve RC-MOV-536 at MCC-36A and to RC-MOV-535 at MCC-36B [PAB - 55-ft elevation].
- b. Verify both pressurizer PORV block valves open. If not, open block valves [on flight panel FCF].
- c. Open both pressurizer PORVs [on flight panel FCF].

Step 11 Verify all pressurizer PORVs and block valves open.

PERFORMANCE SHAPING FACTORS

a. Timing.

Time Available - MAAP calculations have shown that if the operators fail to trip the RCPs, bleed-and-feed cooling will not be successful. It was determined that successful bleed-and-feed cooling can be established within 25 minutes of reactor trip provided that the RCPs are tripped 5 minutes after reactor trip. If the RCPs are tripped at 10 minutes, bleed-and-feed must be established before 20 minutes has elapsed after the reactor trip. If the RCPs are tripped at 15 minutes, bleed-and-feed must be initiated within the following 2 minutes.

Time Needed - If power is available to the PORV block valves, primary bleed and feed cooling can be completed within 2 minutes of tripping the RCPs. However, if a PORV block valve is not energized, it is assumed that initiation of bleed-and- feed cooling requires an additional 5 to 10 minutes because an NPO will have to locally energize the block valves at the MCCs. For quantification of the latter case, 10 minutes was assumed.

b. Competing Actions/Alarms. The only competing actions expected are those for restoring feedwater flow to the SGs. However, as the operators have been trained extensively on the importance of promptly establishing bleed-and-feed, the impact of competing actions on operator action FB is expected to be minimal.

c. Consequence of Actions.

Success - Success implies successful core cooling.

Failure - Failure requires secondary heat removal via the condensate system. If the condensate system is unavailable, core damage will occur.

d. Training/Experience. The operators are trained to initiate bleed-and-feed cooling immediately upon entering FR-H.1. Attempts to align condensate flow would be made if bleed-and-feed cooling is unsuccessful.

e. Stress. Moderately high.

f. Skill/Rule/Knowledge-Based. Rule-based. Each step is proceduralized.

g. Task Complexity. Low

QUANTIFICATION

The operator action tree for the initiation of bleed-and-feed cooling is depicted in Figure H2.3.1. The following table describes the quantification of the failure nodes depicted in Figure H2.3.1. The mean HEP for operator action FB was calculated to be 0.012.

Failure Node	Median HEP (Error Factor)	Mean HEP	Source (NUREG/CR-4772)
[a] Both PORV Block Valves Open			
	---	1.0	Estimate of the fraction of time that one or both PORV block valves are closed.

Based on PORV leakage problems, both block valves were assumed to be closed during normal operation.

[b] Both PORV Block Valves Energized			
	---	0.05	Estimate of the time that one or both PORV block valves are de-energized given that they are closed.

Given that a block valve is closed, it was conservatively assumed that there is a 5 percent probability that the block valve is de-energized because of an inoperable, as opposed to

leaking, PORV.

[c] Operator Diagnoses Need for Bleed and Feed (Given Both PORV Block Valves Open or Energized)

2.60×10^{-3} (EF=10)	6.93×10^{-3}	Using the lower bound and interpolating for 15 minutes in Table 8-2.

Because the time available to successfully establish bleed-and-feed is dependent on when the RCPs are tripped, the time available for diagnosis is the latest time at which the RCPs can be tripped and bleed and feed established. With both PORV block valves open (or closed but energized), the time available for diagnosis (beginning with tripping the RCPs) is 15 minutes. Because of the training received by the operators on this action, the lower bound HEP in Table 8-2 was used.

[d] Operators Diagnose Need for Bleed and Feed (Given One or Both Block Valves Closed and De-energized)

10^{-2} (EF=10)	2.66×10^{-2}	Table 8-2 (lower bound).

With one or both PORV block valves closed and de-energized, an NPO must be dispatched to energize the block valve(s) at the MCCs. Since travel time alone could be 5 minutes, the time available for diagnosis (beginning with tripping the RCPs) is reduced from 15 minutes (as explained for node [c]) to 10 minutes. Because of the training received by the operators on this action, the lower bound HEP in Table 8-2 was used.

[e] Operators Trip Reactor Coolant Pumps (Given Both PORV Block Valves Open or Energized)

0.004 (EF=5)	6.46×10^{-3}	Table 8-5, item 3 (lower bound).

Tripping the RCPs is a step-by-step action under moderately high stress. The lower bound value in Table 8-5 was used because frequent simulator training has made control room personnel very familiar with this action.

0.15 (EF=5)	0.24	NUREG/CR-1278, moderate dependence.

SS recovers error by the operator, assuming moderate dependence.

Total [e] = $6.46\times10^{-3} \times 0.24 = 1.55\times10^{-3}$

[f] Operators Trip Reactor Coolant Pumps (Given One or Both PORV Block Valves Closed and De-Energized)

0.004 (EF=5)	6.46×10^{-3}	Table 8-5, item 3 (lower bound).

Same as node [e] except that no credit was given to the SS recovering the failure to trip the RCPs given that one or both block valves are closed and de-energized--the SS was assumed not to be available within the first ten minutes.

[g] Operators Perform Required Actions (Given Both PORV Block Valves Open)

0.004 (EF=5)		Table 8-5, item 3 (lower bound).
x 2		Two critical actions.
0.008 (EF=5)	0.0129	

Moderately high stress was assumed for failure of the operators to start the HHSI pumps or open both PORVs. However, frequent simulator training has made control room operators very familiar with this particular scenario. Therefore, the lower bound value of the HEP was used (see Table 8-1, item 10.f).

0.054 (EF=5)	0.087	NUREG/CR-1278, low dependence.

SRO fails to verify bleed and feed at Steps 9 and 11, respectively, of FR-H.1.

Total [g] = $0.0129 \times 0.087 = 1.12 \times 10^{-3}$

[h] Operators Perform Required Actions (Given One or Both Block Valves Closed But Energized)

0.004 (EF=5)		Table 8-5, item 3 (lower bound).
x 3		Three critical actions.
0.012 (EF=5)	0.0194	

Failure of the operators to start the HHSI pumps, open the block valves, or open both PORVs. Moderately high stress was assumed. However, frequent simulator training has made control room operators very familiar with this particular scenario. Therefore, the lower bound value of the HEP was used (see Table 8-1, item 10.f).

0.054 (EF=5)	0.087	NUREG/CR-1278, low dependence.

SRO fails to verify bleed and feed at Steps 9 and 11, respectively, of FR-H.1.

Total [h] = $0.0194 \times 0.087 = 1.69 \times 10^{-3}$

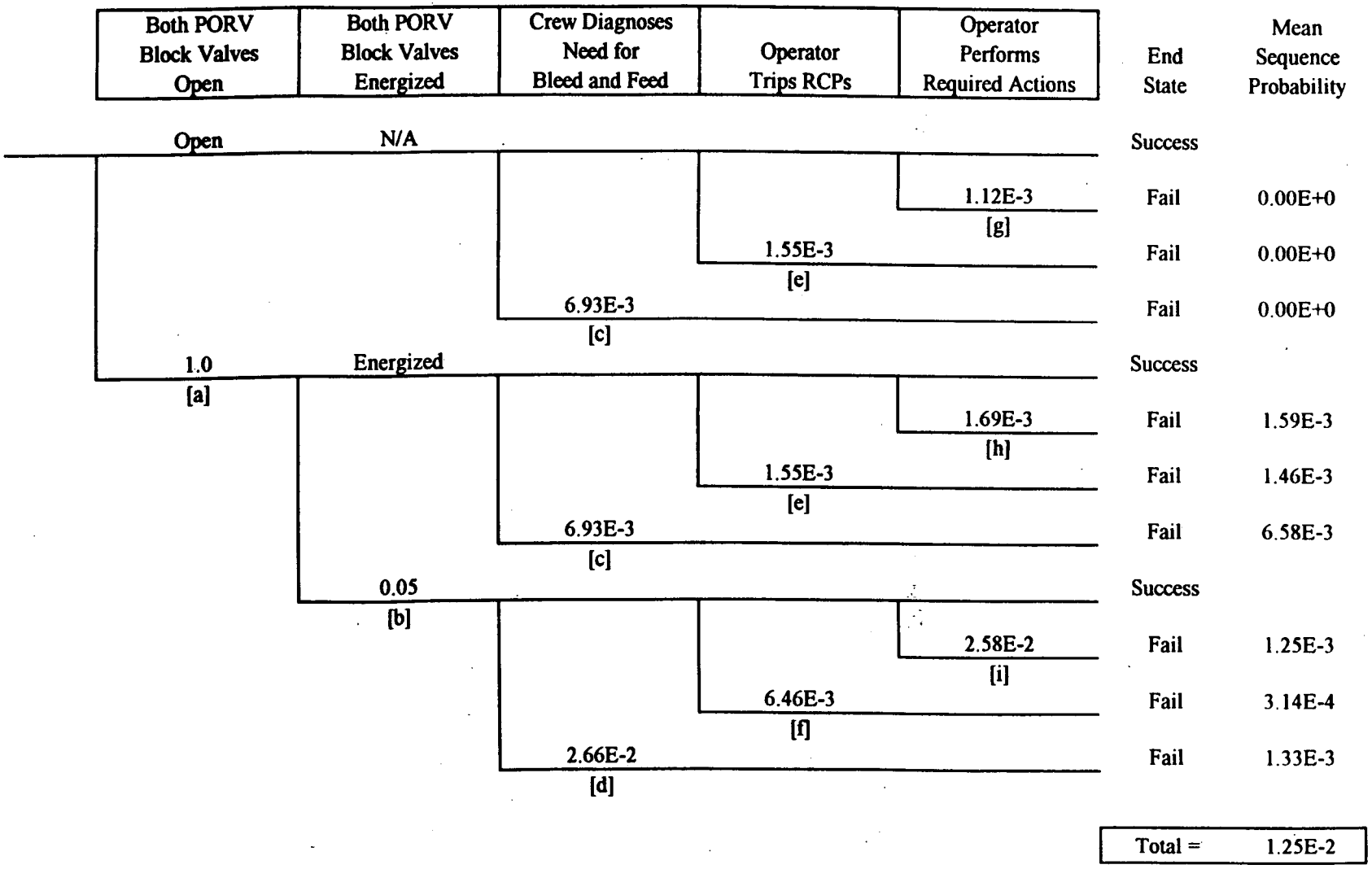
[i] Operators Perform Required Actions (Given One or Both Block Valves De-energized)

0.004 (EF=5)		Table 8-5, item 3 (lower bound).
x 4		Four critical actions.
0.016 (EF=5)	0.0258	

Moderately high stress was assumed for failure of the operators to start the HHSI pumps, energize the block valves, open the block valves, or open both PORVs. However,

frequent simulator training has made control room operators very familiar with this particular scenario. Therefore, the lower bound value of the HEP was used (see Table 8-1, item 10.f). No credit for recovery was taken because of the limited time available to recover errors.

Figure H2.3.1. Human Action FB - Operator Initiates Primary Bleed and Feed Cooling



H2.4 OPERATOR ACTION HLR--HOT-LEG LONG-TERM RECIRCULATION CORE COOLING

SUMMARY

a. Task. 21 hours after the initiating event, operators realign HHSI or RHR/recirculation pumps for hot leg recirculation.

b. Success Criteria. One of two RHR or one of two recirculation pumps deliver flow to one of two hot legs.

c. Scenario/Event Tree(s) Used. Large LOCA.

ACTION

a. Initial Conditions. The reactor is at full power. A break in the RCS occurs which is large enough to reduce RCS pressure to less than the shut-off head of the RHR/ recirculation pumps and to actuate containment spray. The reactor is tripped and SI actuated. At least one RHR/recirculation pump is available. Transfer to cold leg recirculation is successful.

b. Preceding Operator Actions. The operator will have transferred to cold leg recirculation.

c. Symptoms. Not applicable.

d. Indications. Not applicable.

e. Procedural Guidance. After having established cold leg sump recirculation as dictated by ES-1.3 (Transfer to Cold Leg Recirculation), step 54 of ES-1.3 directs the operators to enter ES-1.4 (Transfer to Hot Leg Recirculation) 8 hours after event initiation.

f. Response.

ES-1.3 (Rev. 7)

Step 2 Place recirculation switch 1 [on panel SBF-1] to OFF position.

Step 3 Locally energize valve control circuits:
- a. Hot leg injection line valve 856B at MCC-36B [PAB - 55-ft elevation].
- b. Hot leg injection line valve 856G at MCC-36A [PAB - 55-ft elevation].

Step 4 Align non-BIT hot leg injection valves [on panel SBF-2]:
- a. Close 856J and 856H.

c. Open 856B.

Step 5 Align BIT hot leg injection valves [on panel SBF-2]:
a. Close 856C and 856E.
c. Open 856G.

Step 7 Align recirculation flow to hot legs:
a. Open low-head to high-head valves 888A/B [on panel SBF-1].
b. Open 1869A/B [on panel SBF-1].
c. Open HHSI pump 32 suction valves 887A/7B [on panel SBF-2].
d. Place SI pump suction low pressure alarm block switch to UNBLOCK position.
f. Place recirculation switch 6 to OFF position [on panel SBF-1].
g. Open HHSI pump 32 discharge valve 851A/B and then start all 3 HHSI pumps [on panel SBF-2].
h. Close RHR heat exchanger discharge flow valves HCV-638 and HCV-640 [from panel SGF].
i. Verify minimum core cooling established as indicated by Graph ES14-1.

PERFORMANCE SHAPING FACTORS

a. Timing. Procedures direct the operators to transfer to hot leg recirculation 8 hours after event initiation.

Time Available - The transfer to hot leg recirculation is not required until 21 hours after the initiating event. Therefore, 21 - 8 = 13 hours are available for the operators to complete the transfer to hot leg recirculation.

Time Needed - 30 minutes.

b. Competing Actions/Alarms. None.

c. Consequence of Actions.

Success - Success results in continued core cooling.

Failure - Failure to realign ECCS pump discharge is assumed to result in boron precipitation blocking coolant flow and causing eventual core damage. This assumption is conservative since only breaks of a certain size and at specific locations are expected to require hot leg recirculation.

d. Training/Experience. The operators have been trained in this action.

e. Stress. Normal. The operators will be under high stress initially in reacting to the LOCA. However, by the time transfer to hot leg recirculation is to be made (8 hours), the operators are expected to be at a normal stress level given prior success of equipment and operator actions.

f. Skill/Rule/Knowledge-Based. Rule-based. Each step is proceduralized.

g. Task Complexity. Low.

QUANTIFICATION

A value of 10^{-4} has been assumed for the mean HEP based on the very long time available for this action (several hours), the simple nature of the actions involved, and the indications available to the operators in the event that an error is made. In addition, not all large-break LOCA events will require this action. Failure to realign the recirculation/RHR pumps for hot leg sump recirculation is expected to be dominated by hardware failures.

H2.5 OPERATOR ACTION LTS--LONG-TERM SHUTDOWN VIA EMERGENCY BORATION OF RCS OR LOCAL TRIPPING OF THE REACTOR TRIP BREAKERS/MG SETS

SUMMARY

a. Task. Should the reactor not scram, the operators must establish long-term shutdown by performing emergency boration or, for ATWS events not caused by mechanical failure of the control rods, locally tripping the reactor trip breakers or MG sets.

b. Success Criteria. The operators must perform the above tasks within 10 minutes.

c. Scenario/Event Tree(s) Used. ATWS.

ACTION

a. Initial Conditions. The reactor is operating at full power. A loss of main feedwater occurs, necessitating a reactor trip. However, the reactor fails to trip.

b. Preceding Operator Actions. The operator will attempt to manually trip the reactor. The operator will also verify turbine trip and AFW initiation and perform manual rod insertion (if the control rods are not in AUTO).

c. Symptoms.
Failure of reactor to trip.
"RED" path on critical safety function "SUBCRITICALITY".

d. Indications.
Rod bottom lights not lit.
Reactor trip and bypass breakers not open.
Rod position indicators not at zero.
Neutron flux not decreasing.

e. Procedural Guidance. Upon receiving indications of the need for a reactor trip (e.g., loss of main feedwater, turbine trip, etc.), the operators will enter procedure E-0 (Reactor Trip or Safety Injection). If unable to verify a reactor trip at step 1 of E-0, the operators will enter functional restoration procedure FR-S.1 (Response to Nuclear Power Generation/ ATWS). Long-term shutdown is classified as an immediate action step which the operators are expected to be able to perform from memory.

f. Response.

FR-S.1 (Rev. 4)--Local Tripping of the Reactor Trip Breakers/MG Sets

Step 1 If reactor will not trip, dispatch an NPO to locally open reactor trip breakers, or open the MG set output breakers, or open the MG set motor supply breakers [control building - 33-ft elevation].

FR-S.1 (Rev. 4)--Initiate Emergency Boration of RCS

Step 4.a Verify one charging pump running [on flight panel FBF].
Step 4.b Open emergency borate valve MOV-333 [from panel SFF].
Step 4.c Start both boric acid transfer pumps in high speed [from flight panel FCF].
Step 4.d Transfer operating charging pump to manual control and increase speed to maximum [from flight panel FBF].

PERFORMANCE SHAPING FACTORS

a. Timing.

Time Available - Long-term shutdown is assumed to be required within 10 minutes of the initiating event to prevent the reactor from becoming critical again as the plant cools down. For the loss of main feedwater ATWS, reactor power starts to increase again after about 6 minutes [4]. The time limit of 10 minutes is conservative because the RCS may experience several reactor power transients before core damage occurs.

Time Needed - Two minutes for emergency boration and 5-8 minutes for locally tripping the reactor trip breakers/MG sets.

b. Competing Actions/Alarms. Depending on the initiator, many alarms could be sounding when emergency boration is to be initiated (i.e., within the first 5 minutes). However, the operators will initially focus on performing the immediate action steps in FR-S.1, which include initiating emergency boration and locally tripping the reactor trip breakers/MGs.

c. Consequence of Actions.

Success - Success ensures long-term reactor shutdown (subcriticality).

Failure - Failure is assumed to result in a high pressure core melt.

d. Training/Experience. The operators have had extensive training on this action using the control room simulator.

e. Stress. Extremely high stress is assumed because of the seriousness of an ATWS event and the rapid response required.

f. Skill/Rule/Knowledge-Based. These actions are both skill- and rule-based. The operators have experience performing the actions during simulator exercises, and the action to implement emergency boration is an immediate action step committed to memory (skill-based). The actions are also rule-based because they are proceduralized in FR-S.1.

g. Task Complexity. Low.

QUANTIFICATION

The operator action tree for long-term shutdown is depicted in Figure H2.5.1. The following table describes the quantification of the failure nodes depicted in Figure H2.5.1. The total HEP for Operator Action LTS was estimated to be 2.1×10^{-3}.

Failure Node	Median HEP (Error Factor)	Mean HEP	Source (NUREG/CR-4772)

[a] Operators Diagnose Failure of Reactor Trip

10^{-4}

The probability of the operators failing to diagnose an ATWS event or not performing long-term shutdown in a timely manner is small, especially since these actions constitute immediate action steps and are well-practiced during simulator training.

[b] No Mechanical Failure of Control Rods

0.1 WCAP-11992 [5]

Regardless of the cause of the reactor trip failure, long-term shutdown can be accomplished by performing emergency boration. In addition, the operators can also achieve long-term shutdown for ATWS events caused by signal failures or reactor trip breaker failures by locally tripping the MG sets or reactor trip breakers.

[c] Operators Perform Required Actions for Emergency Boration

0.001 (EF=10)		Table 8-5, item 10.
x 3		Three critical actions.
0.003 (EF=10)	7.99×10^{-3}	

Performing emergency boration is an immediate action step in FR-S.1. No immediate recovery factor by a second person has been applied to this action.

[d] NPO Locally Trips Reactor Trip Breakers or MG Sets

0.098 (EF=5)	0.16	NUREG/CR-1278. Low dependence based on median HEP of 0.05 (step-by-step task performed under extremely high stress).

In addition to emergency boration, long-term shutdown can be accomplished by locally tripping the reactor trip breakers or MG sets, provided that the ATWS was not caused by mechanical failure of the control rods. Low dependence was assumed between the action to perform emergency boration and locally tripping the reactor--the actions are addressed in separate steps of the procedure and are performed by different personnel.

COMMENTS

It was assumed that diagnosis in operator action LTS is part of the same process as diagnosis in operator action MRI (manual rod insertion) but with more time available. This, given diagnostic error in operator action MRI, the probability of diagnostic error in operator action LTS = $10^{-4}/0.5 = 2\times10^{-4}$.

A correct diagnosis in operator action MRI was assumed to preclude diagnostic error in operator action LTS since the correct diagnosis implies that the operator has successfully diagnosed an ATWS event. In addition, operator actions MRI and LTS are affected by the cause of reactor trip failure as mechanical control rod failures preclude manual rod insertion and the local tripping of the reactor trip breakers or MG sets. Assuming 10 percent of all ATWS events are caused by mechanical control rod failures, the HEP for operator action LTS, given failure of operator action MRI, was determined by merging the two models:

$$MRI \times LTS|MRI = MRI \cap LTS$$

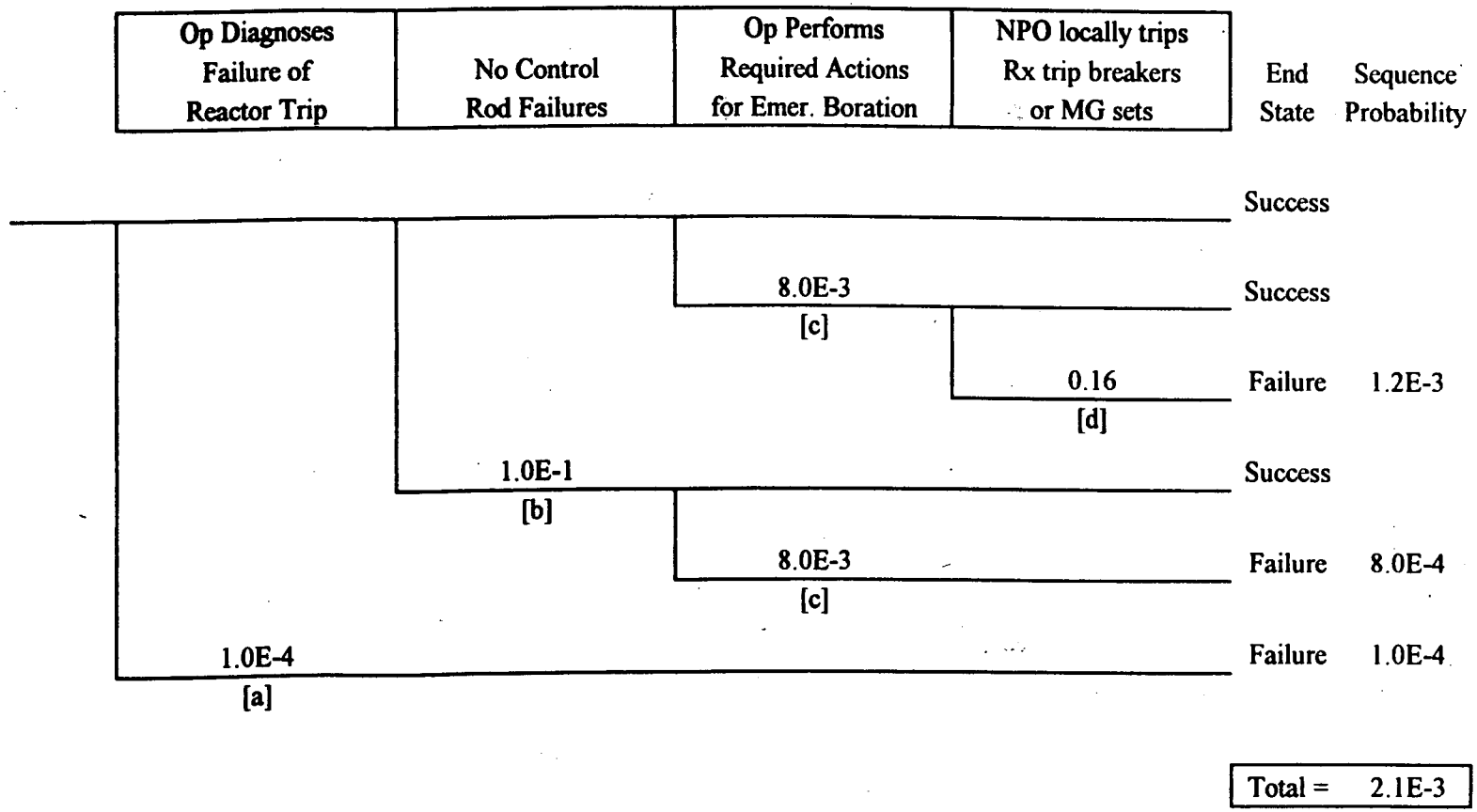
where

$MRI \cap LTS = 9.53\times10^{-4}$, and

$MRI = 0.2$

$\therefore LTS|MRI = 9.53\times10^{-4}/0.2 = 4.8\times10^{-3}$

Figure H2.5.1. Human Action LTS - Long-Term Shutdown Via Emergency Boration or Local Tripping of the Rx Trip Breakers/MG Sets



H2.6 OPERATOR ACTION MRI--MANUAL ROD INSERTION

SUMMARY

a. Task. The operator must manually insert control rods.

b. Success Criteria. The operator manually inserts control rods for one minute prior to RCS peak pressure [6].

c. Scenario/Event Tree(s) Used. ATWS.

ACTION

a. Initial Conditions. While the reactor is at full power, a reactor trip is required. However, both reactor trip breakers fail to open, and the reactor remains at power. The rod control system is in its manual mode.

b. Preceding Operator Actions. The operators will attempt to manually trip the reactor.

c. Symptoms. Failure of the reactor to trip.

d. Indications.
Rod bottom lights not lit.
Reactor trip and bypass breakers not open.
Rod position indicators not at zero.
Neutron flux not decreasing.

e. Procedural Guidance. Upon receiving indications of the need for a reactor trip (e.g., loss of main feedwater, turbine trip, etc.), the operators will enter procedure E-0 (Reactor Trip or Safety Injection). Unable to verify a reactor trip at step 1 of E-0, the operators will enter functional restoration procedure FR-S.1 (Response to Nuclear Power Generation/ATWAS). This action is classified as an immediate action step which the operators are expected to be able to perform from memory.

f. Response.

FR-S.1 (Rev. 4)
Step 1 If reactor will not trip, manually insert control rods [from flight panel FCF].

PERFORMANCE SHAPING FACTORS

a. Timing.

Time Available - Manual (or automatic) rod insertion must be performed for one minute prior to RCS peak pressure. The most limiting ATWS is the total loss of main feedwater, in which RCS pressure peaks at approximately 113 seconds after event initiation [7]. Therefore, for the control rods to be manually inserted for one minute prior to peak pressure, manual rod insertion must begin at (113 - 60) seconds = 53 seconds.

Time Needed - Manual rod insertion is performed by manipulating the rod control lever switch on flight panel FCF. It is assumed that 10 seconds are required to begin manual rod insertion.

b. Competing Actions/Alarms. Many alarms will be sounding when manual rod insertion is expected (i.e., within the first 30 seconds). However, the operators will initially focus on executing the immediate action steps in FR-S.1.

c. Consequence of Actions.

Success - Success reduces the peak RCS pressure following the ATWS and lessens the reliance on the pressurizer PORVs and safety valves to relieve pressure.

Failure - Failure increases reliance on the operation of the pressurizer PORVs and safety valves by increasing the peak RCS pressure following the ATWS.

d. Training/Experience. The operators have had extensive training on this action using the control room simulator.

e. Stress. Extremely high stress is assumed for this action based on the seriousness of an ATWS event and on the quick response required for ATWS-related actions.

f. Skill/Rule/Knowledge-Based. This action is both skill- and rule-based. The operators have experience performing manual rod insertion during ATWS simulator exercises. The action is also rule-based because it is proceduralized in FR-S.1.

g. Task Complexity. Low.

QUANTIFICATION

It was assumed that 10 percent of reactor trip failures result from mechanical failure of the control rods. Such failures preclude manual rod insertion. If the control rods are in AUTO, no operator action is required assuming the control rod system to be available. If the control

rod system is in MANUAL, manual rod insertion is required. Now in four control room simulator sessions, the control rod system was placed in MANUAL prior to the initiating event. In two sessions, the operators failed to perform manual rod insertion before 53 seconds had elapsed after the total loss of main feedwater. Therefore, a mean HEP of 0.5 was assigned to the probability that the operators fail to perform this action. It was conservatively assumed that the probability that the control rods are in manual is 0.2 and that the unavailability for the rod control system is 0.01 when the rods are in AUTO. Therefore, the HEP for operator action MRI is $0.1 + (0.9)(0.2 \times 0.5 + 0.8 \times 0.01) = 0.2$.

H2.7 OPERATOR ACTION MSGI--OPERATORS ISOLATE FAULTED STEAM GENERATOR (MAIN STEAM LINE BREAK)

SUMMARY

a. Task. The operator terminates flow to the faulted steam generator.

b. Success Criterion. Flow to the faulted steam generator is terminated.

c. Scenario/Event Tree(s) Used. Main steam line breaks (T4, T5).

ACTION

a. Initial Conditions. While the reactor is operating at full power, a steam line break occurs which results in a reactor trip and subsequent safety injection signal.

b. Preceding Operator Actions. None are required given success of all automatic actuations.

c. Symptoms.
Any SG pressure decreasing in an uncontrolled manner.
Any SG completely depressurized.

d. Indications. SG pressure (PI-419, PI-429, PI-439, PI-449) on panel FBF.

e. Procedural Guidance. Upon a reactor trip, the operators will enter procedure E-0 (Reactor Trip or Safety Injection). Since a safety injection signal will have been generated, the operators will continue in E-0 until they reach step 28. Step 28 of E-0 directs the operator to go to E-2 (Faulted Steam Generator Isolation) if the above symptoms are observed. In addition, upon exiting E-0 at Step 28, the STA is instructed to monitor the critical safety functions (CSFs). An "ORANGE" or "RED" condition on the "INTEGRITY" CSF status tree may occur. If so, Step 1 of FR-P.1 (or Step 1 of FR-P.2) directs the operator to isolate flow to the faulted steam generator. In addition, if insufficient negative reactivity is inserted by the control rods, an "ORANGE" or "RED" condition may exist on the "SUBCRITICALITY" CSF status tree. If it does, Step 11 of FR-S.1 also directs the operator to isolate flow to the faulted steam generator.

f. Response.

E-2 (Rev. 5)
Step 6b. Isolate AFW flow (to the faulted SG).

PERFORMANCE SHAPING FACTORS

a. Timing.

Time Available - The time available for the operators to isolate the faulted SG(s) is largely determined by the number of steam lines blowing down (i.e., the number of MSIVs which fail to close). Simulator exercises were performed assuming full power operation, end-of-core life conditions, and failure of all four MSIVs. For this case, all SGs depressurize in an uncontrolled manner, and procedures direct the operator to decrease AFW flow to 100 gpm to each SG. These runs showed that approximately 20 minutes are required for RCS cold leg temperatures to decrease to 287°F, which is the maximum temperature at which there is concern for PTS. However, the RCS pressure must exceed 2500 psig at this temperature in order cause imminent PTS conditions. At 1500 psig, the RCS cold leg temperatures must fall to 260°F to cause PTS conditions. Therefore, at least 20 minutes are available to isolate the faulted SG.

Time Needed - The time required to isolate AFW flow is small (less than 1 minute) compared to the time required to reach the steps which direct the operator to isolate flow (approximately 10 - 15 minutes).

b. Competing Actions/Alarms. Numerous alarms are expected to be present when the action is performed. However, the majority of the alarms will indicate the steam line break itself.

c. Consequence of Actions.

Success - Success (along with termination of safety injection) results in a stable plant, with no subsequent PTS-induced challenge to reactor vessel integrity.

Failure - Failure results in a challenge to reactor vessel integrity if high-head safety injection is not controlled.

d. Training/Experience. The operators have extensive training on this action using the control room simulator.

e. Stress. Moderately high because this action is required approximately 20 minutes after the initiating event.

f. Skill/Rule/Knowledge-Based. Rule-based. Each step is proceduralized.

g. Task Complexity. Low.

QUANTIFICATION

The quantification of the operator action to isolate the faulted steam generator is described in the following table. The total HEP for this action is 0.033.

Failure Node	Median HEP (Error Factor)	Mean HEP	Source (NUREG/CR-4772)
[a] Operators Identify Faulted SG			
	0.01 (EF=10)	2.66×10^{-2}	Table 8-2, item 2 (lower bound).

The operators must correctly identify which SG is faulted within 10 minutes. The SG pressure indicators in the CCR (flight panel FBF) will provide the necessary indications. The operators have practiced this event in simulator exercises and know which procedures to follow.

[b] Operators Perform Required Action			
	0.004 (EF=5)	6.46×10^{-3}	Table 8-5, item 3 (lower bound).

The operators must isolate AFW flow to the faulted SG. This is a step-by-step action performed under moderately high stress. The lower bound value of the estimated HEP is used because of frequent simulator training (see Table 8-1, item 10f).

Total HEP = $a + (1-a) \times b = 3.29\times10^{-2}$

H2.8 OPERATOR ACTION ODEP--OPERATOR DEPRESSURIZES RCS FOR LOW-PRESSURE INJECTION

SUMMARY

a. Task. The operator rapidly depressurizes the steam generators (SGs) by opening the condenser dump valves or steam generator atmospheric dump valves (ADVs).

b. Success Criteria. The condenser dump valves or all four SG ADVs are opened to cool and depressurize the RCS to the point where low-pressure injection can begin (i.e., < 275 psig).

c. Scenario/Event Tree(s) Used. Small and intermediate LOCAs, special initiators (TCCW and TSWS), and SGTR.

ACTION

a. Initial Conditions. The reactor is operating at full power. A primary system LOCA occurs and, because the break size is less than 0.2 ft^2, RCS pressure remains above the shut-off head of the LHSI pumps. All HHSI pumps fail to start or run. At least one AFW pump supplies feedwater to the steam generators.

b. Preceding Operator Actions. The operators will attempt to start the HHSI pumps.

c. Symptoms.
Loss of high-head safety injection pumps.
Degraded core cooling (RVLIS full range indication $\leq$ 39% or core exit TCs $\geq$ 700°F).
Inadequate core cooling (core exit TCs $\geq$ 1200°F).
Inadequate core cooling (RVLIS full range indication $\leq$ 39% and core exit TCs $\geq$ 700°F).

d. Indications.
Core exit thermocouples.
RCS subcooling.
RVLIS dynamic head indicator.
RVLIS full range indicator.

e. Procedural Guidance. Upon a reactor trip, the operators will enter procedure E-0 (Reactor Trip or Safety Injection) and proceed through E-0 until step 30. At step 30 of E-0 the operators will transfer to E-1 (Loss of Reactor or Secondary Coolant) on abnormal containment radiation, pressure, or sump level. At step 24 of E-1 the operators are instructed to check if RCS cooldown and depressurization are required. For small

LOCAs (including RCP seal LOCAs), RCS pressure will be greater than 275 psig and the transfer to procedure ES-1.2 (Post-LOCA Cooldown and Depressurization) will be made. For larger size breaks, degraded or inadequate core cooling conditions will preclude the transfer to ES-1.2, and the operators will enter functional restoration procedure FR-C.1 (Response to Inadequate Core Cooling) or FR-C.2 (Response to Degraded Core Cooling), selecting the appropriate procedure by monitoring the critical safety functions (CSFs).

f. Response.

ES-1.2 (Rev. 6) - Small Break LOCA

Step 7 Initiate RCS cooldown to cold shutdown.

- OR -

FR-C.1 (Rev. 6) - Intermediate Break LOCA

Step 11 Depressurize all intact SGs to 95 psig by dumping steam at maximum rate.
Step 12 Close all accumulator isolation valves.
Step 13 Stop all RCPs.
Step 14 Depressurize all intact SGs to atmospheric pressure by dumping steam at the maximum rate.
Step 15 Continue efforts to establish SI flow.

- OR -

FR-C.2 (Rev. 5)

Step 10 Depressurize all intact SGs to 95 psig while maintaining cooldown rate less than 100 deg. F/hr.
Step 11 Verify RHR pumps running. If not, start RHR pumps as necessary.
Step 12 Close all accumulator isolation valves.
Step 13 Stop all RCPs.

PERFORMANCE SHAPING FACTORS

a. Timing. The size of the RCS break determines the time at which degraded or inadequate core cooling is indicated.

For a 1-in. cold leg break, the core is uncovered 2.5 hours after the initiating event, and reactor vessel level decreases to 3.5 feet above the bottom of the active fuel at about 2.9 hours [9]. Core exit temperatures exceed 700°F at about 2.9 hours and 1200°F at 3.0 hours.

For a 4-in. cold leg break, sustained uncovering of the core begins approximately 12 minutes after the initiating event, and reactor vessel level decreases to 3.5 feet above the

bottom of the active fuel at about 20.0 minutes. Core exit temperatures exceed 700°F at about 20.0 minutes and 1200°F at 22.7 minutes.

Time Available - The time available to the operator to complete these actions depends on the capacity of the LHSI pumps and on the size of the break. For smaller break LOCAs, where the operators would be expected to cooldown and depressurize the RCS using procedure ES-1.2, several hours are available before core damage occurs. Regardless of break size, once core cooling is degraded or inadequate, the operators must quickly respond by implementing FR-C.2 or FR-C.1, as appropriate. No credit was taken for continued operation of the RCPs--while core cooling would be enhanced by the operation of the RCPs, the RCPs cannot be expected to run for very long with a highly voided RCS.

Time Needed - It is estimated that approximately 10 minutes are required to perform this action--5 minutes to step through procedure FR-C.1 to Step 14 and 5 minutes thereafter for depressurizing the RCS to below the shut-off head of the RHR pumps.

According to WCAP-9753 [9], opening of the condenser steam dump valves results in RCS depressurization, low head injection, and complete core recovery within 3 minutes after operator action. For cases in which condenser steam dump capability is unavailable, depressurization must be performed using the SG ADVs. According to Westinghouse Owners Group guidelines for Functional Restoration Procedure FR-C.1, opening the ADVs results in RCS depressurization, low head injection, and core recovery within 15 minutes of commencing the operation.

b. Competing Actions/Alarms. During the time when the operators are depressurizing the RCS and accumulator injection occurs, RCS cold leg temperature will decrease significantly, possibly causing a RED path on the "Inventory" critical safety function and prompting a transition to FR-P.1 (Response to Imminent Pressurized Thermal Shock Conditions). However, the "Core Cooling" CSF has priority over the "Inventory" CSF.

c. Consequence of Actions.

Success - Success implies that the RCS has been depressurized and cooled to less than 275 psig, allowing the accumulators and LHSI pumps to inject borated water from the RWST into the RCS cold legs.

Failure - Failure implies that RCS pressure remains above the shut-off head of the LHSI pumps. Because the HHSI pumps are unavailable, core damage will occur.

d. Training/Experience. The operators have been trained on this action.

e. Stress. Extremely high. While a LOCA by itself would produce a relatively high level of stress, indications of inadequate core cooling would create an extremely high level of

stress (threat stress).

f. Skill/Rule/Knowledge-Based. Rule-based. Each step is proceduralized.

g. Task Complexity. The complexity of these actions is low to moderate because of the simple nature of the tasks and the small number of steps required.

QUANTIFICATION

Small LOCA

Diagnosis Error. Because of the time available to perform this action, a screening value of 10^{-3} was assessed.

Post-Diagnosis Error. Because frequent simulator training has made the operators familiar with performing cooldown after small LOCAs, the lower bound HEP in Table 8-5 was used. In addition, moderately high stress levels have been assumed. The median HEP is 0.004 (EF=5), which results in a mean HEP of 6.5×10^{-3}.

Recovery. Assuming moderate dependence between the SS and the operators results in a median HEP of 0.15 (EF=5). The mean HEP is 0.24.

The mean HEP for operator action ODEP (SLOCA) = $10^{-3} + 6.5\times10^{-3} \times 0.24 = 2.6\times10^{-3}$.

Intermediate LOCA

The operator action tree depicting the failure of the operator to depressurize the RCS following an intermediate LOCA is shown in Figure H2.8.1. The quantification of this tree is described below. The total mean HEP for operator action ODEP-S1 was calculated to be 0.0512.

Failure Node	Median HEP (Error Factor)	Mean HEP	Source (NUREG/CR-4772)
[a] Crew Diagnoses LOCA	5.46×10^{-3} (EF=10)	0.0145	Table 8-2, interpolation between items 2 and 3.

The time available for diagnosis of the intermediate LOCA was taken as the time between loss of all high-head injection and the onset of degraded core cooling (i.e., RVLIS full

range ≤ 39 percent or core exit temperatures ≥ 700°F). Based on the analysis performed for WCAP-9753 [9] for a 4-in. cold leg break, 12 min. was assumed to be the time available for diagnosis. Because of extensive simulator training the operators have received on coping with LOCAs, the lower-bound diagnosis HEP was used.

[b] Operators Verify High-Head Safety Injection (HHSI)

10^{-3} (EF=10)	2.66×10^{-3}	Table 8-5, item 10.

Verifying HHSI was classified as an immediate action step in emergency operating procedure E-0.

[c] Inadequate Core Cooling Detected (Given Operator Verifies HHSI)

0.05 (EF=5)	0.0807	Table 8-5, item 5 (lower bound)

Given that the operators have diagnosed the LOCA and verified that HHSI is unavailable, the SRO will anticipate degraded or inadequate core cooling if all attempts to restore HHSI are unsuccessful. Because of the loss of HHSI, extremely high stress levels were assumed. However, the lower bound HEP was assigned because of the extensive training the operators have received.

0.25 (EF=5)	0.403	Table 8-5, item 5

Credit was taken for the STA monitoring the CSF status trees and confirming degraded or inadequate core cooling. The recovery from a failure to detect inadequate core cooling was classified as a dynamic action performed under extremely high stress.

Total [c] = 0.0807 × 0.403 = 0.0325

[d] Inadequate Core Cooling Detected (Given Operator Fails to Verify HHSI)

0.25 (EF=5)	0.403	Table 8-5, item 5

If the operators diagnose the LOCA but fail to monitor HHSI, credit was taken only for the STA detecting degraded or inadequate core cooling--the STA is required to monitor the critical safety functions.

[e] Operators Perform Actions

0.01 (EF=5)	0.0161	Table 8-5, item 4 (lower bound)

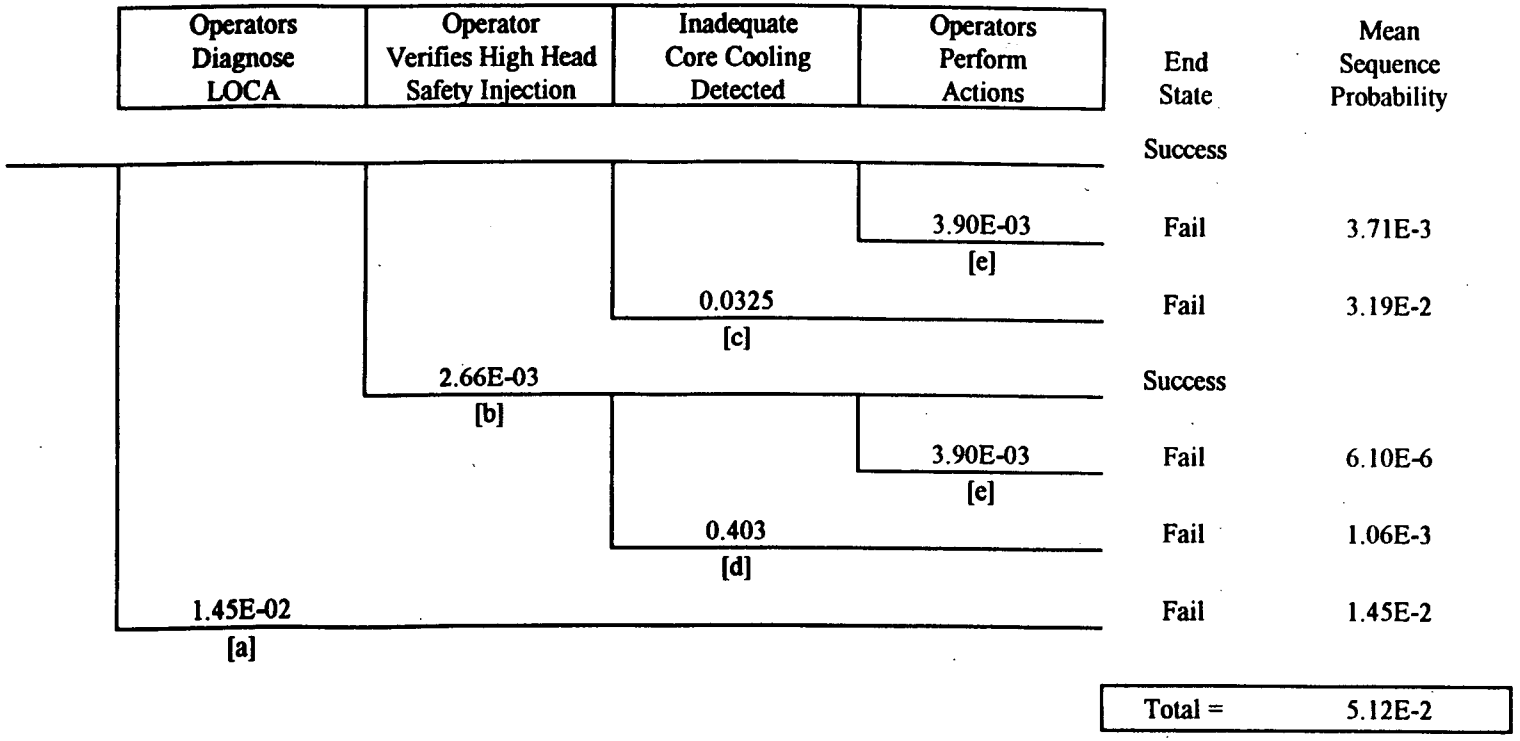
Operator action to depressurize the RCS to establish low-head safety injection flow is proceduralized in functional restoration procedures FR-C.1 and FR-C.2. Therefore, this action was classified as a step-by-step task performed under extremely high stress. However, because of frequent simulator training, the lower bound HEP was used.

0.15 (EF=5)	0.24	Table 20-17, moderate dependency

Failure of the operators to correctly perform the required action can be recovered by the SS. The cue is provided by LHSI unavailability. Moderate dependence was assumed between the SS and the operators.

Total [e] = $0.0161 \times 0.24 = 3.9 \times 10^{-3}$.

Figure 12.8.1. Operator Action ODEP-S1 -- Operator Depressurizes RCS For Low-Head Injection (Intermediate LOCA)



H2.9 OPERATOR ACTION ODEP-SBO--OPERATORS DEPRESSURIZE RCS TO REDUCE RCP SEAL LEAKAGE

SUMMARY

a. Task. The operators depressurize the RCS using the atmospheric steam dump valves (ADVs) to reduce reactor coolant loss through leaking RCP seals.

b. Success Criteria. The operators begin to depressurize the RCS within 2 hours using all four ADVs.

c. Scenario/Event Tree(s) Used. Station blackout event tree (SBO).

ACTION

a. Initial Conditions. The reactor is initially operating at full power. A loss of offsite power occurs; subsequently, all three emergency diesel generators fail. The turbine-driven AFW pump is available.

b. Preceding Operator Actions. The operators will attempt to restore ac power.

c. Symptoms. All safeguards buses de-energized (buses 5A, 6A, and 2A/3A).

d. Indications.
"480V Safeguards Bus Undervoltage" annunciator on panel SBF-2.
480-V bus voltmeter on panel SHF.
480-V bus undervoltage relay lights on panel SHF.

e. Procedural Guidance. Upon receipt of a reactor trip, the operators will enter procedure E-0 (Reactor Trip or Safety Injection). If the EDGs fail to start, step 3 of E-0 will direct the operators to enter ECA-0.0 (Loss of All AC Power) if power cannot be restored to at least one safeguards bus (i.e., bus 5A, 6A, or 2A/3A). If ac power is lost subsequent to reaching step 3 of E-0, the operators will be directed to enter ECA-0.0 from the alarm response procedure for 480-V safeguards bus undervoltage (ARP-5). Step 21 of ECA-0.0 directs the operators to depressurize the intact steam generators to 195 psig.

f. Response.

ECA-0.0 (Rev. 7)
Step 21.a Depressurize intact SGs to 195 psig by manually dumping steam at maximum rate using SG ADVs.

PERFORMANCE SHAPING FACTORS

a. Timing.

Time Available - The time available to begin RCS depressurization depends on the rate of RCS leakage through the RCP seals. Based on the analysis performed in WCAP-10541 [11], it was assumed that RCS depressurization must begin within 2 hours.

Time Needed - Since success for this action has been defined as depressurizing the RCS to minimize the RCP seal leak rate, the time required is simply the time required to step through procedure ECA-0.0 to Step 21 and establish nitrogen backup to the ARVs. One hour was assumed to be required.

b. Competing Actions/Alarms. Procedure ECA-0.0 requires the operator to stop depressurization if SG narrow range level cannot be maintained above 6 percent in any intact SG. Because of this requirement and the fact that only the turbine-driven AFW pump is available to provide make-up to the SGs, depressurization may have to be stopped temporarily to allow SG narrow range levels to increase above 6 percent. This phenomenon has been confirmed by actual observation during simulator exercises but does not have a significant impact on the quantification.

c. Consequence of Actions.

Success - Success delays core damage and, therefore, increases the time available to recover ac power. Alternatively, success decreases the probability of core damage should ac power be restored.

Failure - Failure decreases the time to core damage and, therefore, the time available to recover ac power. Alternatively, failure increases the probability of core damage once ac power is restored.

d. Training/Experience. The operators have ample experience practicing station blackout scenarios on the simulator.

e. Stress. High.

f. Skill/Rule/Knowledge-Based. Rule-based. This action is proceduralized

g. Task Complexity. Moderate. The action to depressurize the RCS using the SGs is straightforward. However, the operator must monitor the SG narrow range levels and is required by procedure to stop depressurization if they all fall below 6 percent.

QUANTIFICATION

Diagnosis. Assuming that the operators are able to step through ECA-0.0 to Step 21 and establish the nitrogen backup to the ARVs within one hour, the time available for diagnosis is 2 - 1 = 1 hour. From Table 8-2 (item 5) of the ASEP HRAP, the median HEP is 1.0^{-4} (EF=30), which yields a mean HEP of 8.5×10^{-4}.

Post-Diagnosis. This action consists of a step-by-step action performed under moderately high stress. Because the operators are well-trained on station blackout scenarios in the simulator, the lower bound of Table 8-5 (item 3) of the ASEP HRAP was chosen. The median value is 0.004 (EF=5), which translates to a mean value of 6.5×10^{-3}.

Recovery. Assuming moderate dependence between the SS and the operators results in a median recovery HEP of 0.15 (EF=5) and a mean recovery HEP of 0.24.

The mean HEP for operator action ODEP-SBO = $8.5\times10^{-4} + 6.5\times10^{-3} \times 0.24 = 2.4\times10^{-3}$

H2.10 OPERATOR ACTION ODEPR--OPERATOR DEPRESSURIZES RCS FOR POST-LOCA COOLDOWN

SUMMARY

a. Task. The operator cools the RCS by opening the atmospheric or condenser steam dump valves and depressurizes the RCS using the pressurizer PORV or spray valves.

b. Success Criteria. The operator depressurizes the RCS to below the shut-off head of the LHSI pumps.

c. Scenario/Event Tree(s) Used. Small-small, small, and intermediate LOCAs.

ACTION

a. Initial Conditions. While the reactor is operating at full power, a primary system break occurs which results in a reactor trip and safety injection. At least one HHSI pump operates in the injection mode. Because of the break size, RCS pressure remains above the shut-off head of the LHSI pumps.

b. Preceding Operator Actions. None required.

c. Symptoms. RCS pressure exceeds the shut-off head of the RHR pumps.

d. Indications. RCS pressure indicators.

e. Procedural Guidance. Upon a reactor trip, the operators will enter procedure E-0 (Reactor Trip or Safety Injection) and proceed through E-0 until step 30. At step 30 of E-0 the operators will transfer to E-1 (Loss of Reactor or Secondary Coolant) on abnormal containment radiation, pressure, or sump level. At step 24 of E-1 the operators are instructed to check if RCS cooldown and depressurization are required. For small LOCAs, RCS pressure will be greater than 275 psig and the transfer to procedure ES-1.2 (Post-LOCA Cooldown and Depressurization) will be made.

f. Response.

ES-1.2 (Rev. 6)

Step 7 Initiate RCS cooldown to cold shutdown using condenser steam dump or ADVs, while maintaining cooldown rate less than 100 deg. F/hr.

Step 11 Depressurize RCS to refill pressurizer using normal spray, one pressurizer PORV, or auxiliary spray.

PERFORMANCE SHAPING FACTORS

a. Timing.

Time Available - The action must be completed before the RWST water level decreases to 9.2 ft. Otherwise, the operators must switch to high-head recirculation cooling. The time available to depressurize the RCS depends on the rate of RWST depletion which, in turn, depends on the break size and number of ECCS pumps running. For a 0.02 ft^2 break, a break size between small and intermediate LOCAs, 9.2 ft in the RWST is reached approximately 3.0 hours after the initiating event. Larger intermediate LOCAs which do not result in RCS depressurization to below the shut-off head of the RHR pumps could reach the 9.2-ft level earlier. However, assuming that the HHSI pumps deliver flow at their maximum flow rate (650 gpm), the low-low RWST level would not be reached sooner than (346,870 - 99,475)/(3 × 650) = 127 minutes, or 2.1 hours.

Time Needed - The time required for the operators to depressurize the RCS to below the shut-off head of the RHR pumps depends on the availabilities of the condenser steam dump or atmospheric dump valves and the pressurizer spray valves or PORVs. In any case, the maximum cooldown rate allowed by procedures is 100 deg. F/hr.

b. Competing Actions/Alarms. None expected.

c. Consequence of Actions.

Success - Success allows use of low pressure sump recirculation.

Failure - Failure requires high pressure sump recirculation.

d. Training/Experience. The operators have ample experience practicing this action on the control room simulator.

e. Stress. Moderate. Core cooling and inventory control is maintained by the HHSI pumps.

f. Skill/Rule/Knowledge-Based. Rule-based--each step is proceduralized.

g. Task Complexity. Low.

QUANTIFICATION

Diagnosis Error. Because of the time available to depressurize the RCS, a screening value of 10^{-3} was assessed.

Post-Diagnosis Error. Because frequent simulator training has familiarized the operators with post-LOCA cooldown during small LOCAs, the lower-bound HEP in Table 8-5 of the ASEP HRAP was used. In addition, moderately high stress levels were assumed. The median HEP is 0.004 (EF=5), which results in a mean HEP of 6.5×10^{-3}.

Recovery. Assuming moderate dependence between the SS and the operators results in a median recovery HEP of 0.15 (EF=5) and a mean recovery HEP of 0.24.

The mean HEP for operator action ODEPR = $10^{-3} + 6.5\times10^{-3} \times 0.24 = 2.6\times10^{-3}$

H2.11 OPERATOR ACTION OHR--OPERATOR INITIATES HIGH-HEAD RECIRCULATION FLOW

SUMMARY

a. Task. The operator aligns the ECCS pumps for cold leg sump recirculation using recirculation or RHR pumps to provide suction to the HHSI pumps.

b. Success Criteria. Success requires that one of four LHSI pumps takes suction from the appropriate sump and discharges to the suction of the HHSI pump.

c. Scenario/Event Tree(s) Used. Small or intermediate LOCAs, SBO, SGTR, special initiators (TAC5A, TAC6A, TCCW, TSWS, TSWGR), transient (T1, T2), and MSLB (T4, T5).

ACTION

a. Initial Conditions. The reactor is at full power. A loss of reactor coolant occurs, resulting in a reactor trip and safety injection actuation. At least one HHSI pump operates in the injection mode.

b. Preceding Operator Actions. None required.

c. Symptoms.
"RWST Low-Low Level" annunciator lit.
Flow to at least two low-head injection lines less than 1200 gpm .

d. Indications.
RWST water level transmitter LT-920.
Low-head injection flow transmitters FT-946A/B/C/D.

e. Procedural Guidance. Upon receipt of a reactor trip and safety injection signal, the operators will enter procedure E-0 (Reactor Trip or Safety Injection). At step 30 of E-0 the operators will transfer to E-1 (Loss of Reactor or Secondary Coolant) on abnormal containment radiation, pressure, or sump level. If at any time (regardless of which procedure is in use) RWST water level falls below 9.2 ft, the operators will transfer to ES-1.3 (Transfer to Cold Leg Recirculation). The criterion for transferring to sump recirculation (9.2 ft in the RWST) is annunciated on panel SBF-2.

f. Response.

ES-1.3 (Rev. 7)

Step 2 Energize the following valve control circuits:
- a) 882 and 1870 at MCC-36B [PAB - 55-ft elevation].
- b) 1810, 743, and 744 at MCC-36A [PAB - 55-ft elevation].
- c) 842 and 843 at SBF-1.

Step 10 Reset SI.

Step 11 Reset containment spray signal.

Step 13 Place recirculation switch 1 to ON position.

This action:
1) Trips HHSI pump 32.
2) Isolates HHSI pump 32 suction valves 887A/B.
3) Trips spray pump 32 if spray pump 31 is running and closes spray pump 32 discharge valve 866B.

Step 13c Place HHSI pump 32 in PULLOUT.

Step 14 Place recirculation switch 3 to ON position.

This action:
- a) Trips both RHR pumps 31 and 32.
- b) Closes RHR suction valve 882 and discharge valve 744.

Step 15 Close SWN-FCV-1111 and SWN-FCV-1112. Then start one non-essential SW pump.

Step 17a Open recirculation pump header discharge valves 1802A/B.

Step 17c Start 31 or 32 recirculation pump. If neither recirculation pump can be started, then start an RHR pump.

Step 18 Go to Step 30 for high-head recirculation.

Step 30b Place recirculation switch 5 to ON Position.

This action:
- a) Isolates low-head recirculation header by closing valves 746, 747, 899A, and 899B.
- b) Opens low-head to high-head valves 888A/B.

c) Closes HHSI miniflow valves 842 and 843.
d) Closes RHR miniflow valves 743 and 1870.

Step 33 Place recirculation switch 8 to ON Position.

This action:
a) Closes spray pump test line valve 1813.
b) Closes HHSI suction valve 1810.

Should containment spray need to be aligned for recirculation, the following step in ES-1.3 must be performed.

Step 37b Open spray header valve 889B. If valve 889B will not open, open 889A.

PERFORMANCE SHAPING FACTORS

a. Timing. The cue for performing the switchover to cold leg recirculation is the RWST low-low level alarm (9.2 ft). The time at which this alarm can be anticipated varies with the size of the RCS break.

- *Small LOCA (8×10^{-4} to 0.02 ft^2)* - From MAAP calculations performed for a small LOCA initiator (0.02 ft^2), the low-low RWST water level (9.2 ft) was reached in 181.4 minutes (3 hours). Because this break size is at the high end of the break spectrum for small LOCAs, the switch to sump recirculation will not occur until at least 3 hours have elapsed.

- *Intermediate LOCA (0.02 to 0.2 ft^2)* - From MAAP calculations, the switch to sump recirculation will occur between 51.1 minutes (for a 0.2 ft^2 break with no containment fan coolers operating) and 3 hours (for a 0.02 ft^2 break).

Time Available - The time available to complete the switchover to cold leg recirculation depends on the size of the RCS break. Because the ECCS pumps require a minimum suction head to prevent pump cavitation and subsequent failure, it was assumed that the switch to sump recirculation must be completed before RWST level falls below the minimum required net positive suction head (NPSH).

- *Small LOCA (8.0×10^{-4} to 0.02 ft^2)* - From MAAP calculations performed for the 0.02 ft^2 break (worst case), RWST level decreases from 9.2 ft to 2 ft in 36 minutes, at which point the operators are instructed to stop all ECCS pumps taking suction from the RWST. Insufficient NPSH will occur 10 minutes after the level falls to 2 ft if the pumps are not stopped or sump recirculation has not been completed. The core will be uncovered 1.9 hours after the pumps fail; core exit temperatures will exceed 2200°F approximately 41 minutes after the core is uncovered.

- *Intermediate LOCA (0.02 to 0.2 ft^2)* - The time available to complete the switchover to sump recirculation for intermediate-break LOCAs varies with the size of the break. For 0.02-ft^2 breaks, the timing is identical to that of the small-break LOCA described above. MAAP runs have shown that for intermediate-size breaks (0.2 ft^2) with one or more containment fan cooler units operating, RWST level will decrease from 9.2 ft to 2 ft within 15 minutes. At this level the operators are instructed to stop all ECCS pumps taking suction from the RWST. Insufficient net positive suction head (NPSH) will occur approximately 5 minutes after the level reaches 2 ft, resulting in failure of HHSI, containment spray, and RHR pumps if the operators do not stop them. MAAP also showed that the core is uncovered approximately 2.1 hours (125 minutes) after the ECCS pumps are stopped, and core exit temperatures reach 2200°F approximately 30 minutes thereafter. Therefore, for intermediate-break LOCAs the average time required to deplete the RWST (from the time the low-low level alarm is reached) is (20 + 46)/2 = 33 minutes.

Time Needed - Observations made during simulator exercises indicate that approximately 5 minutes are required to step through procedure ES-1.3 and place RS #1 to the ON position. Another 10 minutes are required to complete the eight-step sequence for switchover to sump recirculation. Therefore, a total of 15 minutes may be required between the time ES-1.3 is entered and sump recirculation completed.

b. Competing Actions/Alarms. None expected for the small LOCA initiators. However, it was assumed that up to five annunciators may be sounding for intermediate LOCAs.

c. Consequence of Actions.

Success - Success implies continued core cooling using the LHSI pumps to supply sump water to the suction of the HHSI pumps.

Failure - Failure results in loss of core cooling.

d. Training/Experience. The operators have ample experience practicing this scenario on the control room simulator.

e. Stress. Moderately high stress levels were assumed for this action because of the time available before the low RWST level (9.2 ft) is reached.

f. Skill/Rule/Knowledge-Based. Rule-based. Each step is proceduralized.

g. Task Complexity. Moderate to high. This action involves a series of steps and requires the operator to monitor flows to determine whether to align the ECCS for low or high-head recirculation.

QUANTIFICATION

Small LOCA

The operator action tree depicting the failure of the operator to initiate high-head recirculation flow for a small LOCA is shown in Figure H2.11.1. The quantification of this tree is described below. The total mean HEP for operator action OHR-SLOCA was calculated to be 4.8×10^{-4}.

Failure Node	Median HEP (Error Factor)	Mean HEP	Source (NUREG/CR-4772)
[a] Crew Diagnoses LOCA			
	Negligible	10^{-5}	

The time available for diagnosis of a small LOCA, based on the time until the low-low RWST level alarm, is at least 3 hours. Because of the long time available, the diagnosis HEP was assumed to be negligible.

[b] Operators Monitor RWST Level			
	0.05 (EF=5)	0.081	Table 8-5, item 4.

Once the LOCA has been diagnosed, the primary operator will be aware of the need to monitor RWST level, as implied by procedures. This constitutes a dynamic task performed under moderately high stress.

[c] Operators Note RWST Low-Low Level (Given Crew Has Diagnosed LOCA and Monitored RWST Level)			
	Negligible	10^{-5}	

Given that the crew has successfully diagnosed the LOCA and monitored the RWST level, the probability that the operators fail to note the RWST low-low level alarm was considered to be negligible.

[d] Operators Note RWST Low-Low Level (Given Crew Has Diagnosed LOCA but Failed to Monitor RWST Level)			
	10^{-4} (EF=10)	2.7×10^{-4}	Table 8-2, interpolating between items 2 and 3 (lower bound).

Once the RWST low-low level alarms, the operators will have 46 - 15 ≈ 30 minutes to diagnose the need for sump recirculation. Because of the extensive training received by the operators on this action, the lower bound diagnosis model was used.

[e] Operators Note RWST Low-Low Level (Given Crew Has Failed to Diagnose LOCA)

0.25 (EF=5)	0.40	Table 8-5, item 5.

If the crew fails to diagnose the LOCA, they will not be expecting the low-low RWST level alarm. Therefore, when this alarm sounds, it is assumed that the operators will be under extremely high stress (threat stress).

[f] Recirculation/RHR Pump Aligned and Started (Given Crew Has Diagnosed LOCA)

0.004 (EF=5)		Table 8-5, item 3 (lower bound).
x 2		Two critical actions.
0.008 (EF=5)	0.0129	

The operator must perform two critical, step-by-step actions: 1) open recirculation pump discharge valves SI-MOV-1802A/B, and 2) start recirculation pump 31 or 32. Complete dependence is assumed between opening the two valves because opening either valve will result in success. Moderately high stress levels have been assumed. Because of extensive training, the lower bound value of the HEP was used.

0.058 (EF=5)	0.094	NUREG/CR-1278, Equation 10-15 in Table 20-17.

The procedure directs the operators to verify minimum core cooling flow upon completion of the eight-step transfer to cold leg recirculation. This satisfies the rules in NUREG/CR-1278 for the assessment of low dependence between the transfer and check.

0.15 (EF=5)	0.24	NUREG/CR-1278, moderate dependence.

SS recovers error, assuming moderate dependence.

Total [f] = $0.0129 \times 0.094 \times 0.24 = 2.9 \times 10^{-4}$

[g] Recirculation/RHR Pump Aligned and Started (Given Initial Failure to Diagnose LOCA)

0.01 (EF=5)		Table 8-5, item 4 (lower bound).
x 2		Two critical actions.
0.02 (EF=5)	0.032	

Same as failure node [f], except extremely high stress levels have been assumed given failure to diagnose the LOCA, and no credit was given to the SRO recovering the error.

[h] Diagnose Need for High-Head Recirculation (Given Crew Has Diagnosed LOCA)

N/A	Negligible

This failure should have a negligible probability compared to the other causes of failure

for this action. Omitting Step 18 of ES-1.3 could cause the operators to proceed directly to Step 19, which instructs the operators to establish low-head injection. Step 18 is a major step and, therefore, very unlikely to be overlooked. In addition, the operators should be aware of RCS pressure at the time of switchover and should realize the need for high-head recirculation. Assuming that the operators perform Step 19, a potential error mechanism could be misreading the flow indications or misinterpreting the criteria for high head injection. However, the flow indications for the low-head injection lines should indicate zero. Therefore, misinterpretation is most unlikely.

[i] Diagnose Need for High-Head Recirculation (Given Crew Has Not Diagnosed LOCA)

0.01 (EF=5)	0.0161	Table 8-5, item 4 (lower bound).

Given failure to diagnose the LOCA and extremely high stress, the operators could potentially misinterpret the need for high-head recirculation (versus low-head recirculation).

[j] RS #5 Placed to ON (Given Crew Has Diagnosed LOCA)

0.004 (EF=5)	6.46×10^{-3}	Table 8-5, item 3 (lower bound).

The operator must place recirculation switch #5 to the ON position. Moderately high stress levels were assumed. Because of extensive training, the lower bound value of the HEP was used.

0.058 (EF=5)	0.094	NUREG/CR-1278, Equation 10-15 in Table 20-17.

The procedure directs the operators to verify minimum core cooling flow upon completion of the eight-step transfer to cold leg recirculation. This satisfies the rules in NUREG/CR-1278 for the assessment of low dependence between the transfer and check.

0.15 (EF=5)	0.24	NUREG/CR-1278, moderate dependence.

SS recovers error, assuming moderate dependence.

Total [j] = $6.46\times10^{-3} \times 0.094 \times 0.24 = 1.5\times10^{-4}$

[k] RS #5 Placed to ON (Given Initial Failure to Diagnose LOCA)

0.01 (EF=5)	0.016	Table 8-5, item 4 (lower bound).

Same as failure node [j], except that extremely high stress levels have been assumed, and no credit was given to the SRO recovering the error.

Intermediate LOCA

The operator action tree depicting the failure of the operator to initiate high-head recirculation flow following an intermediate LOCA is shown in Figure H2.11.2. The quantification of this tree is described below. The total mean HEP for operator action OHR-MLOCA was calculated to be 8.6×10^{-4}.

Failure Node	Median HEP (Error Factor)	Mean HEP	Source (NUREG/CR-4772)
[a] Crew Diagnoses LOCA			
	10^{-4} (EF=10)	2.7×10^{-4}	Table 8-2, item 4 (lower bound).

The time available for diagnosis of the intermediate LOCA, based on the time until the low-low RWST level alarm, is between 51 minutes and 3 hours, depending on the size of the break. For quantification, 30 minutes was conservatively used. Because of extensive training on LOCAs, the lower bound HEP was used.

[b] Operators Monitor RWST Level			
	0.05 (EF=5)	0.081	Table 8-5, item 4.

Once the LOCA has been diagnosed, the primary operator will be aware of the need to monitor RWST level, as implied by procedures. This constitutes a dynamic task performed under moderately high stress.

[c] Operators Note RWST Low-Low Level (Given Crew Has Diagnosed LOCA and Monitored RWST Level)			
	Negligible	10^{-5}	

Given that the crew has successfully diagnosed the LOCA and monitored the RWST level, the probability that the operators fail to note the RWST low-low level alarm is considered to be negligible.

[d] Operators Note RWST Low-Low Level (Given Crew Has Diagnosed LOCA but Failed to Monitor RWST Level)			
	1.4×10^{-3} (EF=10)	3.8×10^{-3}	Table 8-2, interpolating between items 2 and 3 (lower bound).

Once the RWST low-low level alarms, the operators will have 33 - 15 = 18 minutes to diagnose the need for sump recirculation. Because of the extensive training received by the operators on this action, the lower bound diagnosis model was used.

[e] Operators Note RWST Low-Low Level (Given Crew Has Failed to Diagnose LOCA)

0.25 (EF=5)	0.40	Table 8-5, item 5.

If the crew fails to diagnose the LOCA, they will not be expecting the low-low RWST level alarm. Therefore, when this alarm sounds, it is assumed that the operators will be under extremely high stress (threat stress).

[f] Recirculation/RHR Pump Aligned and Started (Given Crew Has Diagnosed LOCA)

Total [f] = 2.9×10^{-4}, as per small LOCA, failure node [f].

[g] Recirculation/RHR Pump Aligned and Started (Given Initial Failure to Diagnose LOCA)

0.01 (EF=5)		Table 8-5, item 4 (lower bound).
x 2		Two critical actions.
0.02 (EF=5)	0.032	

Same as smal LOCA, failure node [f].

[h] Diagnose Need for High-Head Recirculation (Given Crew Has Diagnosed LOCA)

Negligible

Same as small LOCA, failure node [h].

[i] Diagnose Need for High-Head Recirculation (Given Crew Has Not Diagnosed LOCA)

0.01 (EF=5)	0.0161	Table 8-5, item 4 (lower bound).

Given failure to diagnose the LOCA and extremely high stress, the operators could potentially misinterpret the need for high-head (versus low-head) recirculation.

[j] RS #5 Placed to ON (Given Crew Has Diagnosed LOCA)

Total [j] = 1.5×10^{-4}, as per small LOCA, failure node [j].

[k] RS #5 Placed to ON (Given Initial Failure to Diagnose LOCA)

0.01 (EF=5)	0.016	Table 8-5, item 4 (lower bound).

Same as failure node [j], except that extremely high stress levels have been assumed, and no credit was given to the SRO recovering the error.

COMMENTS

Small LOCA Initiator (S2)

It was assumed that diagnosis of the LOCA in operator action OHR-S2 is part of the same process as diagnosis of the LOCA in operator action ODEPR. Thus, given diagnostic error in operator action ODEPR, the probability of error in the diagnosis of a LOCA in operator action OHR-S2 = 10^{-5} /10^{-3} = 10^{-2}. Conversely, successful diagnosis in operator action ODEPR guarantees successful diagnosis of the LOCA in operator action OHR-S2. With this logic, the HEP for operator action OHR-S2 given the failure of operator action ODEPR can be determined by merging operator action trees for the two actions. A value of 2.2×10^{-3} was calculated.

Intermediate LOCA Initiator (S1)

The dependency between error in diagnosing a LOCA in operator actions ODEPR and OHR-S1 is similar to that between ODEPR and OHR-S2 except that the time available to diagnose the LOCA is less for the intermediate LOCA. The HEP for operator action OHR-S1 given the failure of operator action ODEPR was calculated as 0.046.

Recirculation Pump Unavailability

The quantification performed above for operator action OHR assumed that the recirculation pumps were available for low pressure recirculation. However, should the recirculation pumps be unavailable, the operators must align the RHR pumps to take suction from the containment sump and deliver flow to the suction of the HHSI pumps. This aspect impacts the quantification of the HEP in the following manner:

1. Turning recirculation switch #3 to the ON position becomes a critical action if the need for sump recirculation is not diagnosed in sufficient time to allow the switchover before the RWST empties.

2. Returning recirculation switch #3 to the OFF position is also a critical action, since this action allows the operator to re-open the RHR pump discharge valve 744.

3. The operators must re-open the RHR pump discharge valve 744.

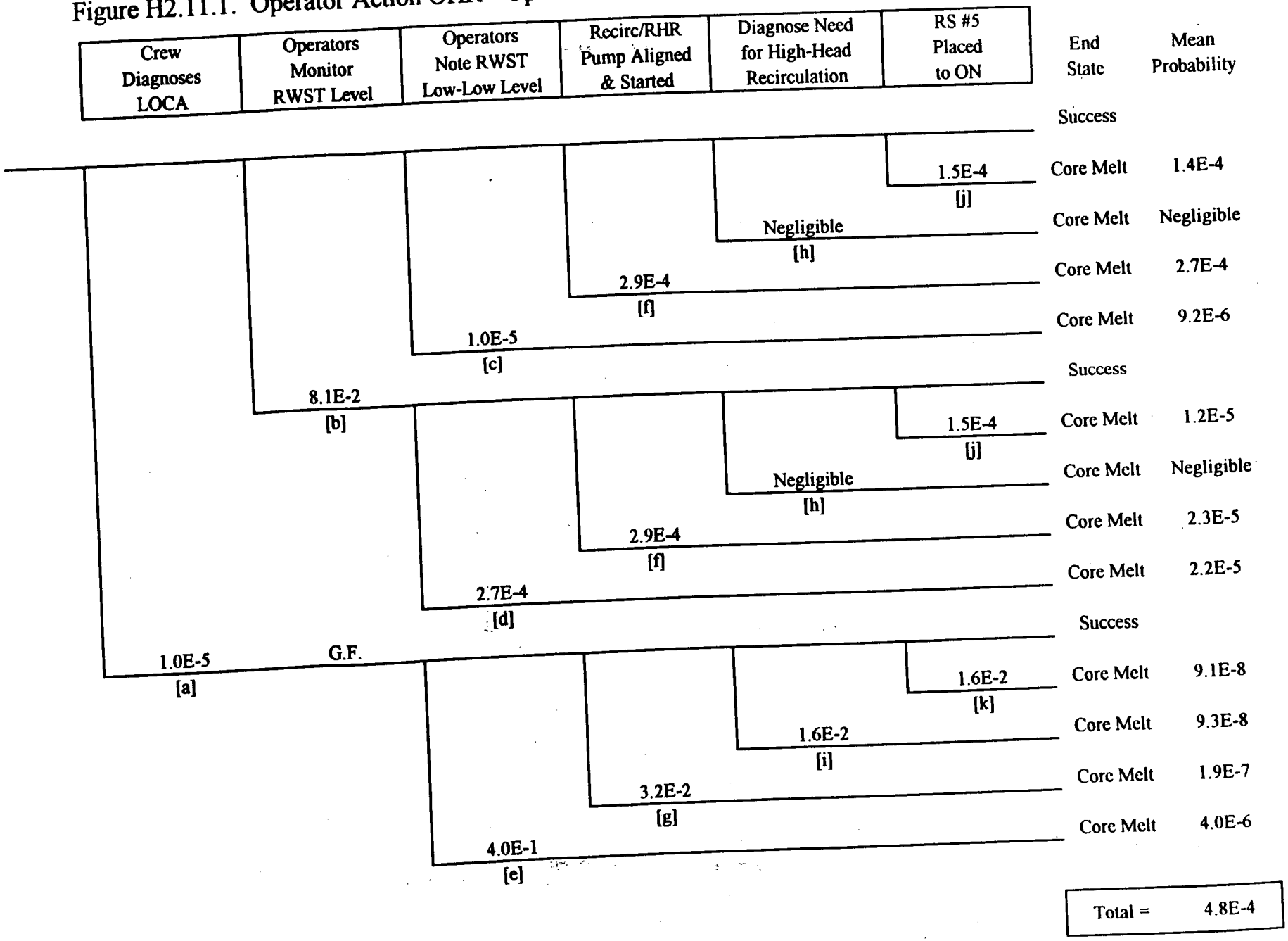
4. The operators must open the RHR pump containment sump suction valves.

5. The operators must start the RHR pump(s).

6. The operators must re-open HCV-638 or HCV-640 to establish flow through the RHR heat exchangers.

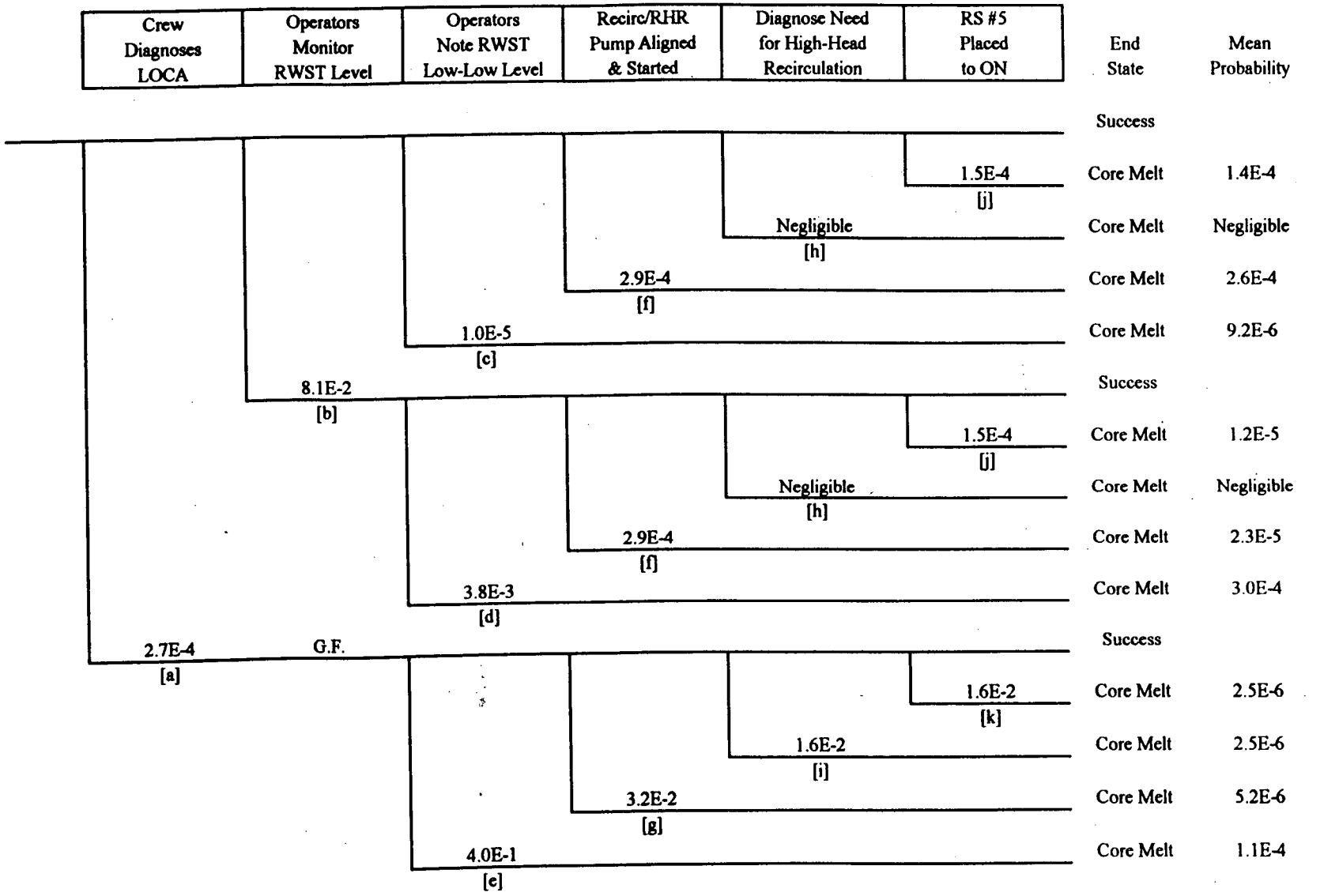
The overall effect of the above modifications to operator action OHR is shown in Table H2.12.1 of Section H2.12.

Figure H2.11.1. Operator Action OHR - Operator Initiates High-Head Recirculation Flow (Small LOCA)



G.F. = Guaranteed Failure

Figure H2.11.2. Operator Action OHR - Operator Initiates High-Head Recirculation Flow (Intermediate LOCA)



G.F. = Guaranteed Failure

H2.12 OPERATOR ACTION OLR--OPERATOR INITIATES LOW-HEAD RECIRCULATION FLOW

SUMMARY

a. Task. The operator aligns the LHSI pumps to take suction from the containment/recirculation sump.

b. Success Criteria. Success requires that flow to one of four cold legs be delivered by one of two recirculation pumps, taking suction from the recirculation sump, or by one of two RHR pumps, taking suction from the containment sump.

c. Scenario/Event Tree(s) Used. Small, intermediate, and large LOCAs, special initiators (TCCW and TSWS), and SGTR.

ACTION

a. Initial Conditions. The reactor is at full power. A loss of reactor coolant occurs, resulting in a reactor trip and safety injection signal. Subsequent plant response is conditional on the initiating event:

Large LOCAs - At least one RHR pump or two of three HHSI pumps inject RWST water into the RCS cold legs.

Small and Intermediate LOCAs - At least one of three HHSI pumps injects RWST water into the RCS cold legs. One recirculation or RHR pump is available. The operator depressurizes the RCS to below the shut-off head of the recirculation/RHR pumps.

The other initiating events were assumed to be bounded by the small LOCA case.

b. Preceding Operator Actions. For small and intermediate-break LOCAs, the operator depressurizes the RCS to below the shut-off head of the RHR pumps. For large-break LOCAs, no operator actions are required prior to sump recirculation provided automatic actions are successful.

c. Symptoms.
"RWST Low-Low Level" annunciator lit.
Greater than 1200 gpm to at least two low-head injection lines.

d. Indications.
RWST water level transmitter LT-920.
Low-head injection flow transmitters FT-946A/B/C/D.

e. Procedural Guidance. Upon receipt of a reactor trip and safety injection signal, the operators will enter procedure E-0 (Reactor Trip or Safety Injection). At step 30 of E-0 the operators will transfer to E-1 (Loss of Reactor or Secondary Coolant) on abnormal containment radiation, pressure, or sump level. If at any time (regardless of which procedure is in use) RWST water level falls below 9.2 ft, the operators will transfer to ES-1.3 (Transfer to Cold Leg Recirculation). The criterion for transferring to sump recirculation (9.2 feet in the RWST) is annunciated on panel SBF-2.

f. Response.

ES-1.3 (Rev. 7)

Step 2 Energize the following valve control circuits:
- a) 882 and 1870 at MCC-36B [PAB - 55-ft elevation].
- b) 1810, 743, and 744 at MCC-36A [PAB - 55-ft elevation].
- c) 842 and 843 at SBF-1.

Step 10 Reset SI.

Step 11 Reset containment spray signal.

Step 13 Place Recirculation Switch 1 to ON position.

This action:
- a) trips HHSI pump 32.
- b) isolates HHSI pump 32 suction valves 887A/B.
- c) trips spray pump 32 if spray pump 31 is running and closes spray pump 32 discharge valve 866B.

Step 13c Place HHSI Pump 32 in PULLOUT.

Step 14 Place recirculation switch 3 to ON position.

This action:
- a) Trips both RHR pumps 31 and 32.
- b) Closes RHR suction valve 882 and discharge valve 744.

Step 15 Close SWN-FCV-1111 and SWN-FCV-1112. Then start one non-essential SW pump.

Step 17a Open recirculation pump header discharge valves 1802A/B.

Step 17c Start recirculation pump 31 or 32. If neither recirculation pump can be started, then start an RHR pump.

Step 19 Place recirculation switch 6 to ON position.

This action trips all HHSI pumps.

Step 21 Place recirculation switch 8 to ON position.

This action:
a) Closes spray pump test line valve 1813.
b) Closes HHSI suction valve 1810.

Should containment spray be needed for recirculation, the following step in ES-1.3 must be performed.

Step 37b Open spray header valve 889B. If valve 889B will not open, open 889A.

PERFORMANCE SHAPING FACTORS

a. Timing. The cue for the switchover to cold leg recirculation is an alarm at a 9.2 ft level in the RWST. The time at which this alarm is anticipated varies with the size of the RCS break and operator action to depressurize the RCS.

- *Small LOCA* - From MAAP calculations performed for a small LOCA initiator (0.02 ft^2), the low-low RWST water level (9.2 ft) will be reached in 181.4 minutes (3 hours). Because this break size is at the high end of the break spectrum for small LOCAs, the switchover to sump recirculation will not be made until at least 3 hours have elapsed.

- *Intermediate LOCA Without Containment Spray Actuation* - Intermediate LOCAs were analyzed assuming that the break is in the high end of the spectrum (0.2 ft^2). A large break size increases the rate of RWST depletion and, therefore, decreases the time available for the operators to switch to sump recirculation. In addition, for sequences with one or more containment fan cooler units operating, MAAP runs have shown that containment spray will not be actuated (i.e., containment pressure remains below 37.2 psia). The low-low RWST level is reached in 69 minutes.

- *Intermediate LOCA With Containment Spray Actuation* - Without containment fan coolers operating, containment spray will be actuated at 14 minutes, causing the low-low RWST level to be reached in 51 minutes.

- *Large LOCA* - Assuming that the HHSI, RHR, and containment spray pumps deliver their design flow rates (400 gpm, 3000 gpm, and 3120 gpm, respectively), the low-low RWST level will be reached in (346,870 - 99,475)/(3 × 400 + 2 × 3000 + 2 × 3120) = 18 minutes. However, for large LOCAs, the design pump flow rates may be

exceeded, resulting in more rapid RWST depletion. To obtain a more realistic estimate of time to depletion, calculations were performed using the MARCH code. These results showed that the low-low RWST level is reached at approximately 16 minutes after the initiating event, which is comparable to the hand calculation.

Time Available - The time available to complete the switchover to cold leg recirculation depends on the size of the RCS break.

- *Small LOCA with Depressurization* - The time available for this scenario differs from the small LOCA scenario requiring high-pressure recirculation (Operator Action OHR) in that depressurization of the RCS to below the shut-off head of the RHR pumps will deplete the RWST more rapidly. Although the operators are instructed to shut off the RHR pumps in E-1 (Step 20) prior to depressurization if RCS pressure is stable or increasing, once RCS pressure is below the shut-off head of the RHR pumps, the operators will restart the pumps. Therefore, at the low-low RWST level, the rate of RWST depletion in this scenario will be greater than for the small LOCA scenario without RCS depressurization. For this reason, this action was conservatively modeled using the HEP derived for the intermediate LOCA without containment spray actuation (see below).

- *Intermediate LOCA Without Containment Spray Actuation* - MAAP runs have shown that for intermediate-size breaks (0.2 ft^2) with one or more containment fan cooler units operating, RWST level will decrease from 9.2 ft to 2 ft within 15 minutes, at which time the operators are instructed to stop all ECCS pumps taking suction from the RWST. Should they fail to do so, insufficient net positive suction head (NPSH) and failure of the HHSI, containment spray, and RHR pumps will occur approximately 5 minutes after the level reaches 2 ft. MAAP runs also showed that the core is uncovered approximately 2.1 hours (125 minutes) after the ECCS pumps are stopped, and core exit temperatures reach 2200°F approximately 30 minutes thereafter. To be conservative, it was assumed that recirculation must be established before the core is uncovered. Therefore, the operators have 15 + 125 = 140 minutes to establish sump recirculation assuming that the pumps are stopped when RWST level reaches 2 ft. If the operators do not stop the ECCS pumps, the RHR pumps will fail and only the recirculation pumps will be available for sump recirculation.

- *Intermediate LOCA With Containment Spray Actuation* - MAAP runs have shown that for intermediate-size breaks (0.2 ft^2) with no containment fan cooler units operating, RWST level will decrease from 9.2 ft to 2 ft within 10.7 minutes, at which time the operators are instructed to stop all ECCS pumps taking suction from the RWST. Should they fail to do so, insufficient net positive suction head (NPSH) and failure of the HHSI, containment spray, and RHR pumps will occur approximately 3.1 minutes after the level reaches 2 ft. MAAP runs also showed that the core is uncovered approximately 2.0 hours (118 minutes) after ECCS pumps are stopped, and core exit temperatures reach 2200°F approximately 26 minutes

thereafter. To be conservative, it was assumed that recirculation must be established before the core is uncovered. Therefore, the operators have 11 + 118 = 129 minutes to establish sump recirculation assuming that the pumps are stopped when RWST level reaches 2 ft. If the operators do not stop the ECCS pumps, the RHR pumps will fail and only the recirculation pumps will be available for sump recirculation.

- *Large LOCA* - Assuming that the HHSI, RHR, and containment spray pumps deliver their maximum flow (650 gpm, 5500 gpm, and 3120 each, respectively), the empty level (0 ft, or 13,902 gallons) will be reached in 85,573/(3 × 650 + 2 × 5500 + 2 × 3120) = 4.5 minutes from the time at which the 9.2-ft level is reached. If the operator does not stop the pumps taking suction from the RWST at this time, those pumps will cavitate and fail. MARCH predicts that core melt will begin approximately 34 minutes later.

Time Needed - Observations made during simulator exercises indicate that approximately 5 minutes are required to step through procedure ES-1.3 and place RS #1 to the ON position. Another 10 minutes are required to complete the eight-step sequence for switchover to sump recirculation. Therefore, a total of 15 minutes may be required between entry into ES-1.3 and the completion of sump recirculation.

b. Competing Actions/Alarms. It was assumed that up to five annunciators could be sounding at the time of sump switchover for large LOCA initiators. In addition, the operators may be prompted to make a transition to FR-P.1 (Response to Imminent Pressurized Thermal Shock Conditions). However, if a low-low RWST level occurs, ES-1.3 takes precedence over FR-P.1.

c. Consequence of Actions.

Success - Success results in continued core cooling and RCS make-up with the recirculation/RHR pumps taking suction from the appropriate sumps and delivering flow to the RCS cold legs.

Failure - Failure results in a loss of core cooling.

d. Training/Experience. The operators have ample experience practicing this scenario on the control room simulator.

e. Stress. For large-break LOCAs, extremely high stress levels were assumed. For small and intermediate-break LOCAs, moderately high stress levels were assumed because of the longer time available before the RWST low level (9.2 ft) is reached.

f. Skill/Rule/Knowledge-Based. Rule-based. Each step is proceduralized.

g. Task Complexity. Moderate to high. This action involves a series of steps and requires

the operator to monitor flows to determine whether to align the ECCS for low-head or high-head recirculation.

QUANTIFICATION

Small LOCA With Depressurization

For the reasons described above, this action was conservatively assigned the HEP calculated for the intermediate LOCA. The operator action tree depicting the failure of the operator to initiate low-head recirculation during a small LOCA is shown in Figure H2.12.1.

Intermediate LOCA

The operator action tree depicting the failure of the operator to initiate low-head recirculation during an intermediate LOCA is shown in Figure H2.12.1. Error in the diagnosis of a LOCA was not depicted in the tree as operator action OLR follows operator action ODEPR which itself requires successful diagnosis of a LOCA. The total HEP for operator action OLR was calculated to be 3.0×10^{-4}.

Failure Node	Median HEP (Error Factor)	Mean HEP	Source (NUREG/CR-4772)
[a] Operators Monitor RWST Level	0.05 (EF=5)	0.081	Table 8-5, item 4.
[b] Operators Note RWST Low-Low Level (Given Crew Has Monitored RWST Level)	Negligible	10^{-5}	
[c] Operators Note RWST Low-Low Level (Given Crew Failed to Monitor RWST Level)	2×10^{-6} (EF=30)	1.7×10^{-5}	Table 8-2 (lower bound).

Once the LOCA has been diagnosed, the primary operator will be aware of the need to monitor RWST level, as implied by procedures. This constitutes a dynamic task performed under moderately high stress.

Given that the crew has successfully diagnosed the LOCA and monitored the RWST level, the probability that the operators fail to note the RWST low-low level alarm is considered to be negligible.

With a recirculation pump available, the time available to establish low-head recirculation

cooling is equal to the time required to deplete the RWST (15 minutes) plus the time to core uncovery (125 minutes). Therefore, the total time available to diagnose the need for low-head sump recirculation is 15 + 125 - 15 = 125 minutes. The lower bound diagnosis HEP was used because of the extensive training received by the operators on this action.

[d] Recirculation/RHR Pump Aligned and Started

0.004 (EF=5)		Table 8-5, item 3 (lower bound).
x 2		Two critical actions.
0.008 (EF=5)	0.0129	

The operator must perform two critical, step-by-step actions: 1) open recirculation pump discharge valves SI-MOV-1802A/B, and 2) start recirculation pump 31 or 32. Complete dependence between opening the two valves was assumed because opening either valve will result in success. Moderately high stress levels have been assumed. Because of extensive training, the lower bound value of the HEP was used.

0.058 (EF=5)	0.094	NUREG/CR-1278, Equation 10-15 in Table 20-17.

The procedure directs the operators to verify minimum core cooling flow upon completion of the eight-step transfer to cold leg recirculation. This satisfies the rules in NUREG/CR-1278 for the assessment of low dependence between the transfer and check.

0.15 (EF=5)	0.24	NUREG/CR-1278, Equation 10-16 in Table 20-17.

SS recovers error, assuming moderate dependence between the SS and the operators.

Total (d) = $0.0129 \times 0.094 \times 0.24 = 2.9 \times 10^{-4}$.

Large LOCA

The operator action tree depicting the failure of the operator to initiate low-head recirculation following large LOCAs is shown in Figure H2.12.3. The quantification of this tree is described below. The total mean HEP for this action was calculated to be 4.4×10^{-3}.

Failure Node	Median HEP (Error Factor)	Mean HEP	Source (NUREG/CR-4772)
[a] Crew Diagnoses LOCA			
	2.1×10^{-3} (EF=10)	5.6×10^{-3}	Table 8-2 (lower bound).

The time available for diagnosis was based on the time at which the low-low RWST level is reached, approximately 16 minutes.

[b] Operators Monitor RWST Level

0.25 (EF=5)	0.40	Table 8-5, item 5.

Once the LOCA has been diagnosed, the primary operator will be aware of the need to monitor RWST level, as implied by procedures. This constitutes a dynamic task performed under extremely high stress. (Extremely high stress was assigned based on Table 8-1, item 10.e).

[c] Operators Note RWST Low-Low Level (Given Crew Has Diagnosed LOCA and Monitored RWST Level)

Negligible	10^{-5}

Given that the crew has successfully diagnosed the LOCA and monitored the RWST level, the probability that the operators fail to note the RWST low-low level alarm is considered to be negligible.

[d] Operators Note RWST Low-Low Level (Given Crew Has Diagnosed LOCA but Failed to Monitor RWST Level)

10^{-3} (EF=10)	2.7×10^{-3}	Table 8-2, item 3 (lower bound).

With a recirculation pump available, the time available to establish low-head recirculation cooling is equal to the time required to deplete the RWST (4.5 minutes) plus the time to core uncovery (30 minutes). Therefore, the total time available to diagnose the need for low-head sump recirculation is 5 + 30 - 15 = 20 minutes. The lower bound diagnosis HEP was used because of the extensive training received by the operators on this action.

[e] Operators Note RWST Low-Low Level (Given Crew Has Failed to Diagnose LOCA)

0.25 (EF=5)	0.40	Table 8-5, item 5.

If the crew fails to diagnose the LOCA, they will not be expecting the low-low RWST level alarm. Therefore, when this alarm sounds, it is assumed that the operators will be under extremely high stress (threat stress).

[f] Recirculation/RHR Pump Aligned & Started (Given Crew Has Diagnosed LOCA)

0.01 (EF=5)		Table 8-5, item 4 (lower bound).
x 2		Two critical actions.
0.02 (EF=5)	0.0323	

The operator must perform two critical, step-by-step actions: 1) open recirculation pump discharge valves SI-MOV-1802A/B, and 2) start recirculation pump 31 or 32. Complete

dependence is assumed between opening the two valves because opening either valve will result in success. Extremely high stress levels were assumed due to the presence of a large LOCA. Because of extensive training, the lower bound value of the HEP was used.

0.069 (EF=5)	0.111	NUREG/CR-1278, Equation 10-15 in Table 20-17.

The procedure directs the operators to verify minimum core cooling flow upon completion of the eight-step transfer to cold leg recirculation. This satisfies the rules in NUREG/CR-1278 for the assessment of low dependence between the transfer and check.

0.16 (EF=5)	0.26	NUREG/CR-1278, Equation 10-16 in Table 20-17.

SS recovers error, assuming moderate dependence between the SS and the operators.

Total [f] = $0.0323 \times 0.111 \times 0.26 = 9.3 \times 10^{-4}$.

[g] Recirculation/RHR Pump Aligned & Started (Given Initial Failure to Diagnose LOCA)

0.01 (EF=5)		Table 8-5, item 4 (lower bound).
× 2		Two critical actions.
× 2		Doubling rule for time stress.
0.04 (EF=5)	0.065	

Same action as failure node [f], except no credit was taken for recovery and the HEP was doubled to account for time stress.

A summary of the quantitative results for operator actions OLR and OHR (from Section H2.11) are shown in Table H2.12.1.

COMMENTS

The quantification of operator action OLR was performed assuming that the recirculation pumps are available for low pressure recirculation. However, should the recirculation pumps be unavailable, the operators must align the RHR pumps to take suction from the containment sump. This aspect changes the quantification of the human error probability in the following manner:

1. Turning recirculation switch #3 to the ON position, or stopping the RHR pumps before the RWST depletes, becomes a critical action.

2. Returning recirculation switch #3 to the OFF position also is a critical action, since this

action allows the operator to re-open the RHR pump discharge valve 744.

3. The operators must re-open the RHR pump discharge valve 744.

4. The operators must open the RHR pump suction valves (from the sump).

5. The operators must start the RHR pump(s).

6. The operators must re-open HCV-638 and/or HCV-640 to establish flow through the RHR heat exchanger(s).

The net effect of the above modifications to operator action OLR is shown in Table H2.12.1.

Figure H2.12.1. Operator Action OLR - Operator Initiates Low-Head Recirculation Flow (Small or Intermediate LOCA)

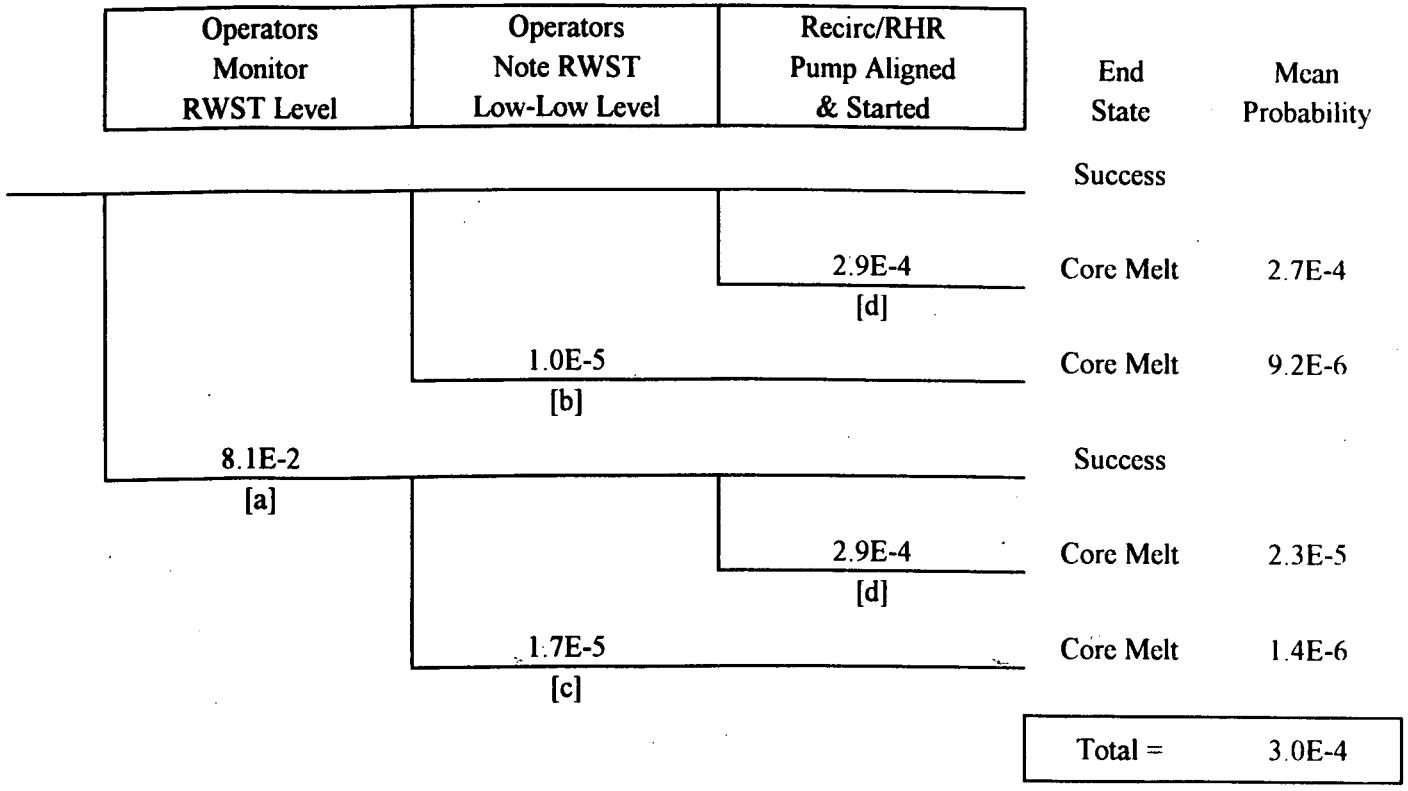
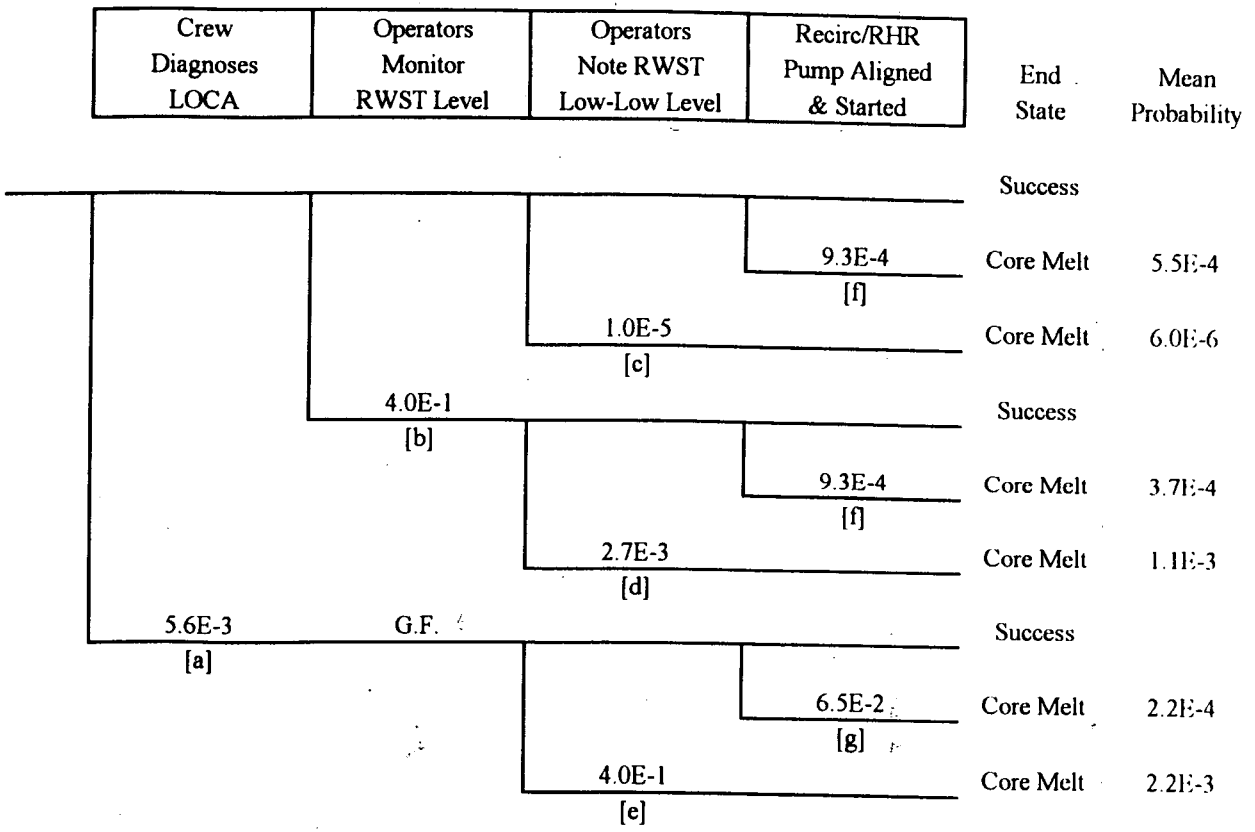


Figure H2.12.2. Operator Action OLR - Operator Initiates Low-Head Recirculation Flow (Large LOCA)



G.F. = Guaranteed Failure

Table H2.12.1. Summary of Results for Switchover to Sump Recirculation

Scenario	Recirculation and RHR Pump Status			Total Mean HEP [1]
	Recirc & RHR Pumps Available	Only Recirc Pumps Available	Only RHR Pumps Available	
HHR - SLOCA	4.8E-4	4.8E-4	2.2E-3	4.8E-4
HHR - MLOCA	8.6E-4	8.6E-4	2.3E-3	8.6E-4
LHR - SLOCA	3.0E-4	3.0E-4	9.2E-3	3.3E-4
LHR - MLOCA	3.0E-4	3.0E-4	9.2E-3	3.3E-4
LHR - LLOCA	4.4E-3	4.4E-3	0.28	5.2E-3

[1] The total mean HEP was calculated using an internal recirculation system unavailability of 2.88E-3.

H2.13 OPERATOR ACTION ORCS--OPERATOR PERFORMS EARLY (ORCS-E) OR LATE (ORCS-L) RCS COOLDOWN AND DEPRESSURIZATION

SUMMARY

a. Task. The operators depressurize the RCS using the intact steam generators to reduce and eventually terminate flow into the faulted steam generator.

b. Success Criteria. The operators reduce RCS pressure to a value at or below the pressure of the faulted steam generator.

c. Scenario/Event Tree(s) Used. SGTR.

ACTION

a. Initial Conditions. While the reactor is operating at full power, a steam generator tube ruptures.

b. Preceding Operator Actions. The operators will isolate flow to and from the faulted steam generator.

c. Symptoms. RCS pressure greater than faulted SG pressure.

d. Indications.
Core exit thermocouples.
SG pressure indicators.
RCS pressure indicators.

e. Procedural Guidance. Upon receipt of a reactor trip and safety injection signal, the operators will enter procedure E-0 (Reactor Trip or Safety Injection). Step 29 of E-0 will transfer the operators to E-3 (Steam Generator Tube Rupture) on indication of abnormal condenser air ejector, SG blowdown, or main steam line radiation.

f. Response.

E-3 (Rev. 7)
Step 20 Initiate RCS cooldown.
- a. Determine required core exit temperature (based on ruptured SG pressure).
- b-c. Dump steam to condenser (or atmosphere) from intact SGs at maximum achievable rate until core exit temperatures are less than the required temperature from Step 20.a.
- d. Stop RCS cooldown.

e. Maintain stable RCS temperature.

Step 24 Depressurize RCS to minimize break flow and refill pressurizer using pressurizer spray. If spray not available, perform Step 25.

Step 25 Depressurize RCS using pressurizer PORV to minimize break flow and refill pressurizer.

PERFORMANCE SHAPING FACTORS

a. Timing: MAAP code runs were performed for a SGTR to determine the time available to the operators to successfully cool down and depressurize the RCS. The following conditions were analyzed:

- AFW Flow Isolated - The MAAP code predicts that if the operators isolate AFW flow to the faulted steam generator at 20 minutes after reactor scram, the faulted SG will overfill 12 minutes thereafter.

- AFW Flow Not Isolated (High-Head Safety Injection Available) - MAAP predicts that should the operator fail to isolate feedwater flow to the faulted SG, the faulted SG will overfill 22 minutes after reactor scram. Alternatively, if the operators successfully isolate flow to the faulted SG but do not cool and depressurize the RCS in a timely manner, SG overfill will also occur, resulting in the release of water through the secondary safety valves. It was assumed that should this occur, the valves will fail to reclose and leakage can only be terminated if the RCS is cooled down and depressurized to cold shutdown conditions before RWST depletion. MAAP code runs showed that for an initial leak rate of 400 gpm through the ruptured tube, RWST depletion occurs at 8 hours.

- High-Head Safety Injection Unavailable - Should HHSI be unavailable, the operator must initiate RCS cooldown using the intact steam generators to allow the accumulators to inject coolant and ensure adequate core cooling until low-head injection is possible. MAAP predicts that core damage will occur at 7 hours. The timing for core damage is taken from a MAAP run in which a 400 gpm RCS break and no emergency core cooling were assumed.

Time Needed -

- AFW Flow Isolated - The time required to cooldown and depressurize the RCS is based upon exercises conducted using the control room simulator. These exercises show that with RCPs tripped, the time required to cool and depressurize the RCS to below the ruptured SG pressure is approximately 12 minutes. Tripping the RCPs requires use of a pressurizer PORV for depressurization, since the spray valves are

inoperable. Should the RCPs trip, the time required for depressurization is less. With the RCPs running, cooldown can be accomplished more rapidly, while use of the spray valves instead of the PORV results in a longer time to depressurization. The net effect, however, is that cooldown and depressurization can be accomplished more quickly (< 12 minutes) with the RCPs running. For conservatism, 12 minutes was assumed to be the time required.

- AFW Flow Not Isolated (High-Head Safety Injection Available) - It is assumed that the operators need 2 hours to bring the RCS to RHR entry conditions (assuming a cooldown rate of 100 deg. F/hr) and an additional 3 hours to bring the reactor to cold shutdown (assuming a cooldown rate of 50 deg. F/hr). Therefore, the operator must initiate cooldown within 8 - 2 - 3 = 3 hours after reactor scram to terminate RCS leakage before RWST depletion.

- High-Head Safety Injection Unavailable - At least one hour is needed for RCS cooldown to 650 psig, the pressure at which the accumulators will inject coolant into the RCS. Once the accumulators have injected, it was assumed that an additional hour is required to bring the RCS to below the shut-off head of the RHR pumps. Therefore, the latest time at which cooldown can be initiated is 7 - 1 - 1 = 5 hours (assuming a cooldown rate of 100 deg. F/hr).

b. Competing Actions/Alarms. None expected.

c. Consequence of Actions.

Success - Success terminates RCS flow into the faulted steam generator.

Failure - Failure results in continued leakage of RCS inventory into the faulted steam generator. The steam generator will eventually overfill, causing a direct release into the environment through the atmospheric dump or safety valves. The RWST will eventually deplete and, with no alternative source of water for the ECCS pumps, core damage will result.

d. Training/Experience. The operators have substantial experience practicing this scenario on the control room simulator and are well aware of the need to perform this action in a timely manner.

e. Stress. Moderately stress levels are assumed.

f. Skill/Rule/Knowledge-Based. Rule-based. Each step is proceduralized.

g. Task Complexity. Moderate.

QUANTIFICATION

Operator Action ORCS-E

Diagnosis. Diagnosis was modeled in the quantification of operator action SGISO, which assumes that feed flow to the faulted SG must be isolated within 20 minutes of the reactor trip. The 20-minute time window is based on 32 minutes required to overfill the SG and 12 minutes to cooldown and depressurize the RCS. For sequences in which the operators are unsuccessful in preventing overfill, it was assumed that the operators must cool and depressurize the RCS to cold shutdown conditions to terminate RCS leakage into the faulted SG. Because the time available to diagnose and perform this action is very long (at least 7 hours), the diagnosis HEP was considered to be negligible.

Post-Diagnosis. Post-diagnosis human error was quantified using Table 8-5 (item 3)--performing a critical step-by-step task under moderately high stress. The median HEP is 0.02 with an error factor of 5. However, because the operators have been well-trained on this action, the lower bound of the HEP (0.004) was assigned. The resultant mean HEP is 6.5×10^{-3}.

Recovery. Assuming high dependence between the SRO and the board operator and moderate dependence between the SS and board operator, the median recovery HEPs are 0.5 (EF=5) and 0.15 (EF=5), respectively. The mean recovery HEPs for the SRO and SS are 0.81 and 0.24, respectively.

The mean HEP for operator action ORCS-E = $6.5\times10^{-3} \times 0.81 \times 0.24 = 1.3\times10^{-3}$.

Operator Action ORCS-L

- *Faulted SG Isolated (Operator Action SGISO Successful With Subsequent Failure of Operator Action ORCS-E).* If operator action SGISO is successful, diagnosis in operator action ORCS-E was also assumed to be successful. Thus, failure of operator action ORCS-E was presumed to be caused by post-diagnosis human error. This failure has the same result as a failure of operator action SGISO--the faulted steam generator is overfilled and water is released through the secondary side safety valve. Although there is some dependency between the failures of early and late cooldown/depressurization, because much more time is available for late cooldown/depressurization and recovery is possible even after steam generator overfill, low dependency between early and late cooldown/depressurization was assumed. Equation 10-15 in Table 20-17 yields a non-recovery probability of $(1+19 \times 1.3 \times 10^{-3})/20 = 0.05$. Therefore, the probability that the operators fail to perform both early and late cooldown/depressurization given successful isolation of flow to the faulted steam generator is:

  ORCS-E x ORCS-L (given SGISO success) = $1.3\times10^{-3} \times 0.05 = 6.5\times10^{-5}$.

- *Faulted SG Overfilled (Operator Action SGISO Failed).* Diagnosis failure in operator action SGISO was assumed to increase the likelihood of diagnosis failure in operator action ORCS-L. The time available for diagnosis of the SGTR in ORCS-L is 3 hours, or 180 minutes. The lower bound median diagnosis HEP from Table 8-2 of NUREG/CR-4772 is 4.6×10^{-6} (EF=30), which results in a mean diagnosis HEP of 3.9×10^{-5}. The post-diagnosis HEP is the same as that for ORCS-E (i.e., 1.3×10^{-3}). The mean HEP for operator action ORCS-L (given failure to isolate flow to the faulted steam generator) is:

  $$\text{ORCS-L (given SGISO failed)} = [3.9\times10^{-5} + (2.7\times10^{-3})(1 - 3.9\times10^{-5}/2.7\times10^{-3})(1.3\times10^{-3}) + (1 - 2.7\times10^{-3})(1.25\times10^{-3})(1.3\times10^{-3})] \div 3.9\times10^{-3} = 0.01$$

H2.14 OPERATOR ACTION RHR-SD--DECAY HEAT REMOVAL PROVIDED BY RHR SHUTDOWN COOLING

SUMMARY

a. Task. The operator establishes RHR operation for normal shutdown cooling by opening the hot leg suction isolation valves, adjusting the flow control valves downstream of the RHR heat exchangers, and starting an RHR pump.

b. Success Criteria. Success requires that one RHR pump take suction from the RCS hot leg and discharge to one of four RCS cold legs.

c. Scenario/Event Tree(s) Used. Small-small LOCA and SGTR. This action is modeled for sequences in which the operator has cooled and depressurized the RCS to less than 450 psig and 350°F, with support to at least one RHR pump available.

ACTION

a. Initial Conditions. While the reactor is at full power, a loss of reactor coolant occurs. The loss is sufficient to initiate an SI signal, but not enough to actuate containment spray. The reactor is tripped and SI actuated. The RCS pressure remains above the shut-off head of the RHR pumps. At least one HHSI pump starts and injects RWST water, and at least one RHR pump starts and runs in minimum flow.

b. Preceding Operator Actions. The operator has cooled and depressurized the RCS to less than 450 psig and 350°F.

c. Symptoms. RCS pressure $\leq$450 psig and RCS temperature $\leq$350°F.

d. Indications.
Flow indication (FI-638 and FI-640).
Temperature indication (TE-639 and TE-641).
RCS temperature and pressure indication.

e. Procedural Guidance. Upon a reactor trip, the operators will enter procedure E-0 (Reactor Trip or Safety Injection) and proceed through E-0 until step 30. At step 30 of E-0 the operators will transfer to E-1 (Loss of Reactor or Secondary Coolant) on indication of abnormal containment radiation, pressure, or sump level. At step 24 of E-1, the operators are instructed to check if RCS cooldown and depressurization are required. For small LOCAs or SGTRs, RCS pressure will be greater than 275 psig and the transfer to procedure ES-1.2 (Post-LOCA Cooldown and Depressurization) will be made. Step 25 of ES-1.2 will instruct the operators to check if the RHR system can be placed in service.

If RCS temperature is less than 350°F and RCS pressure is less than 450 psig with adequate power available to at least one RHR pump, then the RHR system will be placed in service as dictated by system operating procedure SOP-RHR-1 (Residual Heat Removal System).

f. Response.

SOP-RHR-1 (Rev. 10)

Step 4.2.4 Open component cooling water valves (822A for RHR pump 31; 822B for RHR pump 32).

Step 4.2.10 Isolate the RHR loop from the RWST by closing valve 882.

Step 4.2.11 Unlock and open the manual containment isolation valve AC-732 (located at the 55-ft elevation in the PAB piping penetration area). Energize and open motor-operated RHR pump suction valves AC-730 and AC-731 (at MCC-36A and 36B, respectively--55-ft elevation in the PAB).

Step 4.2.12 Close the RHR heat exchanger discharge hand flow control valves HCV-638 and 640.

Step 4.2.13 Start an RHR pump.

Step 4.2.18 Adjust the RHR heat exchanger discharge hand flow control valves HCV-638 and HCV-640 to give the desired RCS cooldown rate.

PERFORMANCE SHAPING FACTORS

a. Timing.

Time Available - Considerable time is available for aligning RHR for normal cooldown since the AFW System can maintain RCS pressure and temperature at RHR cut-in conditions. However, the operators must establish RHR cooling before a low level (9.2 ft) is reached in the RWST.

Time Needed - The alignment to normal RHR cooldown can be accomplished within 30 minutes.

b. Competing Actions/Alarms. None expected.

c. Consequence of Actions.

Success - Success implies successful long-term RHR shutdown cooling.

Failure - Failure requires switchover to cold leg recirculation when the RWST water level reaches the low-low setpoint.

d. Training/Experience. This action is performed during normal plant trips in which the plant is brought to cold shutdown conditions and during refuelling outages.

e. Stress. Normal. While the stress levels could initially be high, by the time normal RHR cooldown is to be performed (> 4 hrs), the operators will be under considerably less stress with the plant in a stable condition. Because this action is part of the normal operating procedures, there would be very little reluctance to perform it.

f. Skill/Rule/Knowledge-Based. This action is both rule- and skill-based. The operators have experience in performing the action, and each step is proceduralized.

g. Task Complexity. This action has moderate complexity. However, the operators have considerable experience in performing it.

QUANTIFICATION

Quantification of operator action RHR-SD is described below. The total mean HEP for this action was calculated to be 9.3×10^{-4}.

Median HEP (Error Factor)	Mean HEP	Source (NUREG/CR-4772)
Diagnosis Error		
Negligible due to the long time available for this action.		
Post-Diagnosis Error		
0.004 (EF=5)		Table 8-5, item 3 (lower bound).
x 6		6 critical actions.
0.024 (EF=5)	0.039	

Recovery

Should the operators make a error in aligning the RHR system for shutdown cooling, sufficient time will be available for the operators to identify the error. The indications of a loss of shutdown cooling are increasing RCS temperature and pressure. A recovery factor of 0.0614 (EF=5) was used for recovery at a subsequent step in the procedure, assuming low dependence. The mean recovery factor is 0.099. In addition, assuming moderate dependence between the SS and the others gives a median HEP of 0.15 (EF=5) and a mean HEP of 0.24.

The mean HEP for operator action RHR-SD = $0.039 \times 0.099 \times 0.24 = 9.3\times10^{-4}$

H2.15 OPERATOR ACTION RV--OPERATOR STOPS SAFETY INJECTION FLOW TO PREVENT PRESSURIZED THERMAL SHOCK

SUMMARY

a. Task. The operators terminate safety injection flow.

b. Success Criteria. Safety injection flow is terminated.

c. Scenario/Event Tree(s) Used. MSLB (T4, T5).

ACTION

a. Initial Conditions. While the reactor is operating at full power, a main steam line breaks. The RCS cools down. Subsequently, an SI signal is generated.

b. Preceding Operator Actions. No operator actions are required if all other systems operate as designed.

c. Symptoms. "RED" Path on Critical Safety Function "INTEGRITY".

d. Indications.
RCS cold leg temperature indicators.
RCS pressure indicators.

e. Procedural Guidance. Upon a reactor trip, the operators will enter procedure E-0 (Reactor Trip or Safety Injection). Since a safety injection signal will have been generated, the operators will continue in E-0 until they reach step 28. Step 28 of E-0 directs the operator to go to E-2 (Faulted Steam Generator Isolation) if any SG depressurizes in an uncontrolled manner or is completely depressurized. Upon exiting E-0, the STA is instructed to monitor the critical safety functions (CSFs). An "ORANGE" or "RED" condition on the "INTEGRITY" CSF status tree will cause the operators to enter functional restoration procedure FR-P.1 (Response to Imminent Pressurized Thermal Shock Conditions). If the SI termination criteria are met (i.e., RCS subcooling greater than 70°F and RVLIS full range level greater than 62 percent), the HHSI pumps will be stopped as dictated by step 12 of FR-P.1.

f. Response.

FR-P.1 (Rev. 5)
Step 7 Reset SI.
Step 12 Stop SI pumps and place in AUTO.

PERFORMANCE SHAPING FACTORS

a. Timing.

Time Available - 30 minutes.

Time Needed - 10 minutes, including time required to reach Step 12 of FR-P.1 and stop SI pumps.

b. Competing Actions/Alarms. All anticipated actions/alarms are related to this action.

c. Consequence of Actions.

Success - Success precludes a challenge to reactor vessel integrity by pressurized thermal shock (PTS).

Failure - Failure results in a challenge to reactor vessel integrity by PTS.

d. Training/Experience. The operators are well trained in this action.

e. Stress. Moderately high.

f. Skill/Rule/Knowledge-Based. Rule-based. Each step is proceduralized.

g. Task Complexity. Low.

QUANTIFICATION

Diagnosis Error. The time available for diagnosis is 30 - 10 = 20 minutes. The median HEP was estimated using Table 8-2 (item 3) of NUREG/CR-4772. Because the operators are well-trained on this action, the lower bound median HEP (0.001) was used. The mean HEP is 2.7×10^{-3}.

Post-Diagnosis Error. Terminating high-head safety injection is a step-by-step action performed under moderately high stress. In addition, because frequent simulator training has made control room operators very familiar with this action, the lower bound of the estimated HEP in Table 8-5 (item 3) was used. The mean HEP is 6.5×10^{-3}.

Recovery. Assuming moderate dependence between the SS and the other operators gives a median HEP of 0.15 (EF=5) and a mean HEP of 0.24.

The mean HEP for operator action RV = $2.7\times10^{-3} + 6.5\times10^{-3} \times 0.24 = 4.3\times10^{-3}$.

COMMENTS

For steam line break accident sequences, diagnosis in operator action RV was assumed to be part of the same process as diagnosis to isolate flow to the faulted SG (operator action MSGI) but with more time available. Thus, given diagnostic error in operator action MSGI, the probability of diagnostic error in operator action RV =

$$2.73\times10^{-3} \div 2.66\times10^{-2} = 0.103$$

However, the absence of diagnostic error in operator action MSGI was not held to diminish the probability of diagnostic error in operator action RV.

Thus, the HEP for operator action RV given the failure of operator action MSGI is

$$MSGI \times RV|MSGI = MSGI \cap RV, \text{ or}$$

$$0.0329 \times RV|MSGI = 2.73\times10^{-3} + (2.66\times10^{-2})(1 - 0.103)(1.6\times10^{-3}) + (1 - 2.66\times10^{-2})(6.5\times10^{-3})(4.3\times10^{-3}) = 2.80\times10^{-3}$$

$$\therefore RV|MSGI = 0.085$$

H2.16 OPERATOR ACTION SGISO--OPERATORS ISOLATE RUPTURED STEAM GENERATOR (SGTR)

SUMMARY

a. Task. The operators isolate flow to and from the faulted steam generator.

b. Success Criteria. The operators isolate feedwater flow to the faulted steam generator and close the associated main steam isolation valve (MSIV) and atmospheric dump valve (ADV).

c. Scenario/Event Tree(s) Used. SGTR.

ACTION

a. Initial Conditions. While the reactor is operating at full power, a steam generator tube rupture occurs.

b. Preceding Operator Actions. None.

c. Symptoms.
Condenser air ejector radiation abnormal.
SG blowdown radiation abnormal.
Increasing level in one SG.
Decreasing pressurizer level and pressure.

d. Indications.
"Process Monitor High Radiation" annunciator on panel SBF-2.
"R15 Condenser Air Ejector" alarm on the radiation monitoring control cabinet.
"R19 Steam Generator Blowdown" alarm on the radiation monitoring control cabinet.
Condenser air ejector radiation monitor RM015.
Steam generator blowdown radiation monitor RM019.
Main steam radiation monitors RM062A, B, C, and D (one per SG).[1]

e. Procedural Guidance. Upon receipt of a reactor trip and safety injection signal, the operators will enter procedure E-0 (Reactor Trip or Safety Injection). Step 29 of E-0 directs the operators to implement E-3 (Steam Generator Tube Rupture) if condenser air ejector, SG blowdown, or main steam line radiation is abnormal.

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[1] According to Alarm Response Procedure ARP-40 (Rev. 6), the alarm is not presently connected to the main steam radiation monitors.

f. Response.

E-3 (Rev. 7)

Step 4 Isolate flow from ruptured SG(s).

a. Adjust faulted SG ADV controller to 1040 psig.
b. Close faulted SG MSIV and MSIV bypass valve.
c. Close faulted SG ADV. If ADV cannot be closed, locally isolate valve.
d. Locally close steam supply valve from faulted SG to turbine-driven AFW pump.
e. Verify blowdown isolation valve(s) on faulted SG closed [on panel SCF].
f. Locally isolate faulted SG steam traps upstream of MSIVs.

Step 5 Stop feed flow to ruptured SGs.

PERFORMANCE SHAPING FACTORS

a. Timing. MAAP code runs performed for a SGTR to determine the time available to the operators to successfully cool and depressurize the RCS predicted that if the operators isolate AFW flow to the faulted SG within 20 minutes of reactor scram, the time to SG overfill is 32 minutes after reactor scram. Failure to isolate feedwater flow to the faulted SG results in the SG overfilling at 22 minutes after reactor scram.

Time Available - Because the operator must also cool and depressurize the RCS to terminate leakage, it was assumed that AFW flow to the faulted SG must be isolated within 20 minutes of the reactor trip to ensure that the operator has sufficient time to cool and depressurize the RCS before SG overfill.

Time Needed - One minute to isolate the flow control valve feeding the ruptured steam generator. Fifteen minutes are estimated to be required for isolating the flow from the faulted SG, since some of the actions must be performed locally. However, local isolation of the SG steam traps and AFW turbine steam supply valve are not critical with respect to the time available to prevent SG overfill. Therefore, the limiting action is flow isolation to the faulted SG.

b. Competing Actions/Alarms. None expected.

c. Consequence of Actions.

Success - Success, in conjunction with RCS depressurization, prevents the direct release of reactor coolant into the environment through the faulted steam generator and open relief valves.

Failure - Failure results in steam generator overfill and release of RCS inventory through the atmospheric dump valve (ADV) or safety valves.

d. Training/Experience. The operators have substantial experience practicing this scenario on the simulator.

e. Stress. Moderate.

f. Skill/Rule/Knowledge-Based. Rule-based. Each step is proceduralized.

g. Task Complexity. Low.

QUANTIFICATION

Diagnosis Error. The time available for diagnosis is 20 minutes. The median HEP was estimated using Table 8-2 (item 3) of NUREG/CR-4772. Because the operators are well-trained on this action, the lower bound median HEP (10^{-3}) was used. The mean HEP is 2.7×10^{-3}.

Post-Diagnosis Error. Isolating feedwater flow to the faulted steam generator is a step-by-step action performed under moderately high stress. In addition, because frequent simulator training has made control room operators very familiar with this action, the lower bound of the estimated HEP in Table 8-5 (item 3) was used. The mean HEP is 6.46×10^{-3}.

Recovery. Assuming high dependence between the SRO and the board operator and moderate dependence for the SS results in median recovery HEPs of 0.5 (EF=5) and 0.15 (EF=5), respectively. The mean HEPs for the SRO and SS are 0.81 and 0.24, respectively.

The mean HEP for operator action SGISO = $2.7\times10^{-3} + 6.5\times10^{-3} \times 0.81 \times 0.24 = 3.9\times10^{-3}$.

H2.17 OPERATOR ACTION SLOCA--OPERATOR ALIGNS BACKUP CITY WATER TO CHARGING PUMP COOLERS

SUMMARY

a. Task. The operators supply backup city water to the charging pump coolers.

b. Success Criteria. Backup city water flow is established to at least one charging pump cooler.

c. Scenario/Event Tree(s) Used. Special initiators (TCCW, TSWS).

ACTION

a. Initial Conditions. While the reactor is operating at full power, a total loss of component cooling occurs.

b. Preceding Operator Actions. The operators trip the reactor coolant pumps.

c. Symptoms. Component cooling water low discharge pressure.

d. Indications.
"Component Cooling Pump Loop 1 Discharge Low Pressure" annunciator on panel SGF.
"Component Cooling Pump Loop 2 Discharge Low Pressure" annunciator on panel SGF.
Charging pump fluid drive cooler local flow indicator FI-637.
CCW flow indicators FI-601A/B on panel SGF.

e. Procedural Guidance.
Alarm response procedure ARP-10 directs the operator to enter procedure ONOP-CC-1. Step 5.9 of ONOP-CC-1 (Loss of Component Cooling) directs the operators to tie in backup city water cooling to the charging pumps if component cooling cannot be re-established, as dictated by SOP-CC-1B (Component Cooling System Operation).

In addition, for initiating events which result in an SI signal, Step 23 of E-0 directs the operators to locally align city water to the charging pumps if component cooling is unavailable.

f. Response.

SOP-CC-1B (Rev. 11)

Step 4.3.1.a Close telltale drain valves MW-681 and MW-684 on the city water supply line.
Step 4.3.1.b Close manual CCW inlet and outlet isolation valves AC-756A/B.
Step 4.3.1.c Open city water isolation valve MW-26 and city water backup supply valve AC-701A.
Step 4.3.1.d Remove the flange next to the city water backup drain valve AC-701B and then open the valve.

Note: Valves MW-681, MW-684, AC-756A/B, MW-26, AC-701A/B are located close to each other on the 55-ft elevation in the PAB. A phone is adjacent to the valves.

PERFORMANCE SHAPING FACTORS

a. Timing.

Time Available - Backup city water must be supplied to a running charging pump within 20 minutes of losing CCW to prevent overheating and subsequent failure of the charging pump. Should the running charging pump fail, the standby charging pumps are available to provide RCP seal cooling. Procedure SOP-CC-1B directs the operators not to operate any charging pump unless cooling water is supplied to the charging pump coolers. It was assumed that the operators will trip the running charging pump on loss of CCW flow to the coolers. (This assumption is conservative because tripping the charging pump hastens the RCP seal LOCA). Once the operators trip the charging pumps, one hour is available for the operators to align backup city water to the charging pump coolers and start the charging pumps before the RCP seal leak rate exceeds 24 gpm/pump or the capacity of the charging pumps.

Time Needed - 10-15 minutes. This estimate was based on walk-throughs with plant operators.

b. Competing Actions/Alarms. The operators will implement the EOPs once the reactor has been tripped. Therefore, procedure ONOP-CC-1 may be performed concurrently with the EOPs.

c. Consequence of Actions.

Success - Success maintains cooling of the RCP seals.

Failure - Failure results in a loss of RCP seal cooling and a primary system LOCA.

d. Training/Experience. The operators have been trained in how to respond to a loss of CCW flow to the charging pumps.

e. Stress. High stress levels are assumed based on the severity of the consequences of losing cooling to the RCP seals.

f. Skill/Rule/Knowledge-Based. Rule-based. Each step is proceduralized.

g. Task Complexity. Moderate.

QUANTIFICATION

Diagnosis Error. Assuming that the operators trip the running charging pumps on loss of CCW, 60 minutes are available to align backup city water to the charging pump coolers before RCP seal failure. Assuming that 15 minutes are required to perform the alignment, 45 minutes are available for diagnosis. Using Table 8-2 of the ASEP HRAP yields a median HEP of 2.60×10^{-4} and an error factor of 10. This results in a mean HEP of 6.9×10^{-4}.

Post-Diagnosis Error. Four critical valve manipulations must be performed by the operator. Assuming a moderate level of stress, a median HEP of $4 \times 0.02 = 0.08$ was assumed (with an error factor of 5) using Table 8-5. The associated mean HEP is 0.13. However, failure to make a proper valve alignment will be indicated by the absence of city water draining to the floor. As a result, it was decided to use the lower bound value for the post-diagnosis HEP calculated above, yielding an HEP of 0.026.

Recovery. Failure of the operator to align city water to the charging pumps will result in failure of the running charging pump. This failure should prompt the SRO to send an operator to verify proper alignment of city water to the charging pump coolers. Dependence between recovery error and post-diagnosis error will be high, however. Table 8-5 (item 7) gives a median HEP of 0.5, with an error factor of 5. The resulting mean HEP is 0.8.

The mean HEP for operator action SLOCA = $6.9\times10^{-4} + (0.026 \times 0.8) = 0.021$.

H2.18 OPERATOR ACTION VISO--OPERATOR ISOLATES INTERFACING SYSTEMS LOCA BREAK

SUMMARY

a. Task. The operators mitigate the interfacing systems LOCA by isolating the break.

b. Success Criteria. The operators close valves and isolate the break.

c. Scenario/Event Tree(s) Used. ISLOCA (V).

ACTION

a. Initial Conditions. While the reactor is operating at full power, a piping failure occurs in a system which interfaces with the RCS, causing a LOCA outside containment.

b. Preceding Operator Actions. None.

c. Symptoms. Decreasing RCS pressure and level with abnormal radiation in the plant auxiliary building (PAB).

d. Indications.
RCS pressure indicators.
Pressurizer level indicators.
Radiation monitors.

e. Procedural Guidance. The operators will enter E-0 on a reactor trip or safety injection signal. At Step 36, the operators will transfer to ECA-1.2 (LOCA Outside Containment) on PAB abnormal radiation levels.

f. Response.

ECA-1.2 (Rev. 4)

Step 4a Sequentially close and open the following valves while monitoring for an RCS pressure increase or other indication of break isolation. Leave closed any valve that, when closed, indicates break isolation.

1) 31 RHR heat exchanger outlet valve 747 [panel SGF].
2) 32 RHR heat exchanger outlet valve 746 [panel SGF].
3) HHSI cold leg injection line valve 856C [panel SBF-2].
4) HHSI cold leg injection line valve 856E [panel SBF-2].
5) HHSI cold leg injection line valve 856H [panel SBF-2].

6) HHSI cold leg injection line valve 856J [panel SBF-2].
7) RHR heat exchanger outlet to HHSI valves 1869A/B [panel SBF-1].

PERFORMANCE SHAPING FACTORS

a. Timing.

Time Available - The time available for the operators to isolate the break depends on its size and location.

Time Needed - The operators are instructed to identify the break by trial-and-error, closing valves and monitoring the resulting RCS pressure. Assuming one minute to close a valve and one minute while the operator waits for the pressure response, it will take the operators approximately 20 minutes to exercise all the valves in Step 4a of ECA-1.2.

b. Competing Actions/Alarms. No competing actions or alarms that will distract the operators from implementing the EOPs are expected.

c. Consequence of Actions.

Success - Success terminates the LOCA.

Failure - Failure results in an unisolated LOCA which bypasses the containment building.

d. Training/Experience. The operators have had training on this action.

e. Stress. High stress was assumed.

f. Skill/Rule/Knowledge-Based. This action involves a combination of rule- and knowledge-based actions. Although this action is proceduralized (rule-based), the operators must recognize the appropriate valve to close and isolate the LOCA based on RCS response (i.e., pressure).

g. Task Complexity. Low.

QUANTIFICATION

An initial screening value of 0.1 was used for the HEP of the operator failing to isolate an interfacing system LOCA.

H2.19 OPERATOR ACTION WRWST--RWST REFILLED FOR CONTINUED CORE COOLING

SUMMARY

a. Task. The operators provide make-up to the RWST using the primary water system so that, for 24 hours, sufficient water is maintained in the RWST to allow high pressure injection in the absence of cold leg recirculation capability (e.g., no/insufficient sump water inventory or loss of all recirculation and RHR pumps). Depending on the RCS conditions, the operator may have to reduce ECCS flow to match RWST make-up flow.

b. Success Criteria. At least one primary water make-up pump (150 gpm) provides make-up to the RWST.

c. Scenario/Event Tree(s) Used. SGTR. This action is taken in sequences involving a loss of reactor coolant outside containment, where the RWST is the only supply of water to the ECCS pumps.

ACTION

a. Initial Conditions. The reactor is at full power. A steam generator U-tube ruptures, resulting in the generation of an SI signal. Two scenarios may result requiring operator action to refill the RWST:

   a) If the operators are unable to depressurize the RCS to terminate leakage from the RCS, a low-low RWST water level alarm will occur at approximately 9 hours [13].

   b) If the operators depressurize the RCS but RHR shutdown cooling fails, RCS temperature and pressure will rise. RCS leakage into the secondary side will recommence, and a low-low RWST water level alarm will eventually result.

b. Preceding Operator Actions. The operators are directed by procedure to identify and then isolate the faulted steam generator (see operator action SGISO, Section H2.16). They will then attempt to depressurize the RCS to terminate leakage from the RCS to the secondary (see operator action ORCS, Section H2.13).

c. Symptoms.
Loss of internal and external recirculation capability.
Insufficient containment level (< 48' 2").
RHR shutdown cooling unavailable.
RCS depressurization not possible.
Low RWST level.

d. Indications.
"Refuel Water Storage Tank Low-Low Level" annunciator on panel SBF-2.
RWST level indicator LI-920 on panel SBF-1.
Containment sump level indicators LI-940 and LI-941 on panel SBF-1.
Recirculation sump level indicators LI-938 and LI-939 on panel SBF-1.

e. Procedural Guidance. The anticipated sequence of events leading to the operator diagnosing the need to refill the RWST is as follows. When RWST level falls below 9.2 ft, the operator is instructed to go to ES-1.3 (Transfer to Cold Leg Recirculation). At Step 1b of ES-1.3, the operators will transfer to ECA-1.1 (Loss of Emergency Coolant Recirculation) because containment level will be less than 48 ft 2 in. At Step 2 of ECA-1.1 the operators are instructed to commence make-up to the RWST.

f. Response.

ES-1.3 (Rev. 7)
Step 1b If containment level is not greater than 48 ft 2 in., go to ECA-1.1.

ECA-1.1 (Rev. 6)
Step 2 Add make-up to RWST as necessary to maintain RWST level greater than 2 feet. Refer to SOP-SI-2.

SOP-SI-2 (Rev. 5)
Step 4.1 Close manual valve CH-297, and open valves CH-295 and CH-350 (located at the 73-ft elevation in the PAB).
Step 4.2 Set the Boric Acid and Primary Water flow control valves to give the desired boron concentration.
Step 4.3 Initiate a manual blended make-up in accordance with SOP-CVCS-3.

SOP-CVCS-3 (Rev. 7)
Step 4.1.2 Place the BA transfer pump speed selector switches [on flight panel FCF] in the SLOW position.
Step 4.1.3 Place both boric acid transfer pumps [on flight panel FCF] in the AUTOMATIC position and one primary water pump in the START position.
Step 4.1.4 Place the flight panel boric acid flow controller in AUTOMATIC.
Step 4.1.5 Adjust the flight panel boric acid flow controller auto setpoint to match the RCS and blender output boron concentrations.
Step 4.2.2 Place the RCS make-up mode selector switch [on flight panel FCF] to MANUAL. Switch to START on the make-up control switch, then return switch to NORMAL.

ECA-1.1 (Rev. 6)
Step 18 If SI termination criteria cannot be met, an NPO must be dispatched to locally throttle the operating HHSI pump discharge valves to achieve the

required minimum SI flow from Figure ECA11-1.

PERFORMANCE SHAPING FACTORS

a. Timing.

Time Available - The cue for performing this action is low-low RWST water level. MARCH code runs show that, for an initial rupture leak rate of 600 gpm, RWST depletion occurs at 9 hours [13], the core is uncovered 1 hour after RWST depletion, and core damage occurs 1.5 hours thereafter. Therefore, to prevent core damage, the operator should begin to refill the RWST within 2 hours of receiving a low-low RWST water level signal. Note that this estimate is conservative because the technical support center should recognize the need for RWST make-up before the low RWST level alarm, even if the control room operators do not.

It should also be noted that the volume of water available in the RWST between the low-low level (9.2 ft) and the "empty" level (2 ft) is approximately 67,500 gallons [12] . If it is assumed that safety injection flow offsets the tube leak rate at the time of low-low RWST level and that the initial tube leak rate is 600 gpm, the RWST will deplete in approximately 1.9 hours.

Time Needed - 30 minutes from the time the decision is made to make-up the RWST. Walk-thoughs with plant operators showed that local valve manipulations can be performed within 15 minutes, including travel time. Another 15 minutes was assumed to be required for control room actions and stepping through the procedures.

b. Competing Actions/Alarms. None.

c. Consequence of Actions.

Success - Success allows core cooling to be continued by high head safety injection.

Failure - Failure results in core melt due to the eventual depletion of the RWST and loss of suction to the HHSI pumps.

d. Training/Experience. The operators have experience refilling the RWST during normal plant operations.

e. Stress. Moderate. This action is not required until several hours after the initiating event, at which time the operators will have established decay heat removal and RCS make-up.

f. Skill/Rule/Knowledge-Based. Rule- and skill-based. Each action is proceduralized. In addition, the operators have experience refilling the RWST during normal plant operations.

g. Task Complexity. Moderate.

QUANTIFICATION

The quantification of operator action WRWST is described below and depicted in Figure H2.19.1. The total mean HEP for Operator Action WRWST was estimated to be 0.18.

Failure Node	Median HEP (Error Factor)	Mean HEP	Source (NUREG/CR-4772)
[a] Operators Diagnose Need for Refilling RWST			
	0.0001 (EF=30)	8.48×10^{-4}	Table 8-2, item 5.
	The cue for performing this action is low-low RWST water level and the subsequent inability to transfer to cold leg sump recirculation. Once the operators receive the cue, it is conservatively assumed that the operators must diagnose the need for RWST refill within one hour.		
[b] NPO Performs Local Valve Alignments			
	0.02 (EF=5)		Table 8-5, item 3.
	x 3		Three critical actions
	0.06 (EF=5)	0.0968	
	The NPO must close manual valve CH-297 and open manual valves CH-295 and CH-350. These are step-by-step actions performed under moderately high stress.		
[c] Operators Perform Required Actions			
	0.004 (EF=5)	6.46×10^{-3}	Table 8-5, item 3.
	The operators must initiate a manual blended make-up.		
	0.5 (EF=5)	0.807	Table 8-5, item 7.
	The SRO will verify that the RWST is being refilled. However, there is high dependence between recovery error and previous errors.		

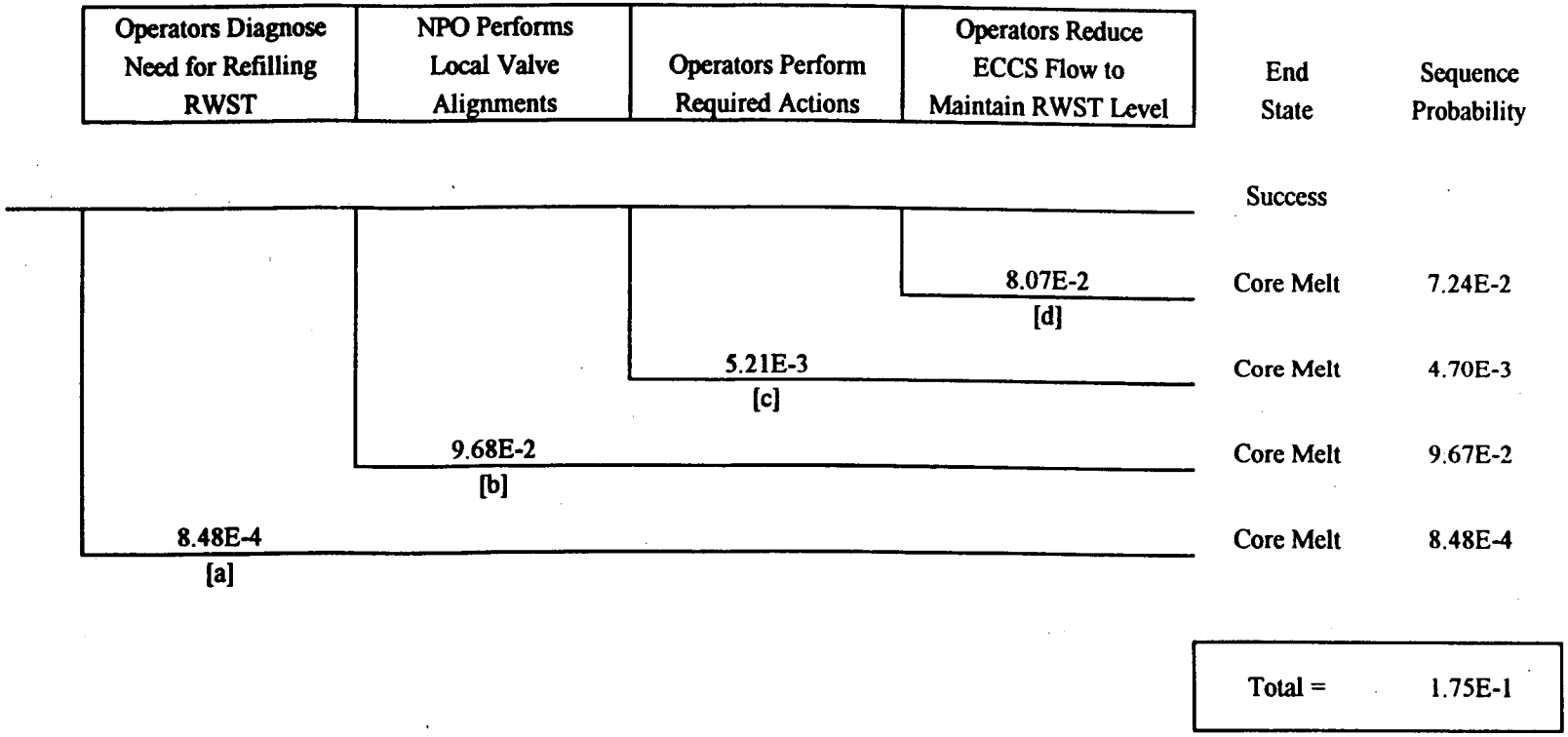
Total [c] = $6.46\times10^{-3} \times 0.807 = 5.21\times10^{-3}$

[d] Operators Reduce ECCS Flow to Maintain RWST Level

0.05 (EF=5)	0.0807	Table 8-5, item 4.

This action has been classified as a dynamic action performed under moderately high stress. Although the action to reduce ECCS flow is proceduralized, the operators must monitor ECCS flow and periodically adjust flow as necessary. Therefore, this action is classified as dynamic.

Figure H2.19.1. Human Action WRWST - RwST Refilled for Continued Core Cooling



H2.20 OPERATOR ACTION HHI-XHE-FO-898--OPERATORS OPEN MANUAL VALVE SI-898

This action was modeled in the high-head safety injection fault tree. The action is conditional on failure of the normal suction supply to the HHSI pumps. However, because it is very unlikely that the operators will diagnose the loss of suction before the HHSI pumps fail, no credit was taken for this action (HEP = 1.0).

H2.21 OPERATOR ACTION MFW--OPERATORS RE-ESTABLISH MAIN FEEDWATER SYSTEM OPERATION

SUMMARY

a. Task. The operators re-establish MFW to the steam generators.

b. Success Criteria. Main feedwater established to at least one steam generator.

c. Scenario/Event Tree(s) Used. Transient (T3), special initiators (TAC5A and TAC6A).

ACTION

a. Initial Conditions. While the reactor is operating at full power, a reactor trip occurs which results in the feed regulator valves closing. However, the main boiler feed pumps continue to run in recirculation mode. Subsequently, all AFW pumps fail to start or deliver flow to the steam generators.

b. Preceding Operator Actions. The operators will attempt to manually start the AFW pumps.

c. Symptoms. No AFW pump running.

d. Indications.
SG narrow range level (LI-417A/B/C, LI-427A/B/C, LI-437A/B/C, LI-447A/B/C) on panel FBF.
SG wide range level (LR-417-1/2, LR-437-1/2) on panel SCF.
AFW flow (FI-1200, FI-1201, FI-1202, FI-1203) on panel SCF.

e. Procedural Guidance. Upon a reactor trip, the operators will enter procedure E-0 (Reactor Trip or Safety Injection). Because an SI signal has not been generated, the operators will transfer to procedure ES-0.1 (Reactor Trip Response). Step 3 of ES-0.1 then instructs the operators to establish main feedwater flow if no auxiliary boiler feed pump can be started.

f. Response.

ES-0.1 (Rev. 7)
Step 3.c If no AFW pump can be started, then:
1) Block in TC-412M relays in safeguards initiation rack 1-2 and 2-2.
2) Attempt to establish main feed via low flow bypass valves [on panel SCF].

PERFORMANCE SHAPING FACTORS

a. Timing.

Time Available - 39 - 52 minutes, based on the time until steam generator dryout. If the reactor coolant pumps are not tripped, the steam generator inventory will be depleted in approximately 39 minutes after the reactor trip. On the other hand, if the reactor coolant pumps are tripped one minute after the reactor trip, the time before the steam generator inventory is depleted will be extended by 13 minutes.

Time Needed - 10 minutes. This is a conservative estimate of the time required to reach Step 3.c in ES-0.1 and perform the actions.

b. Competing Actions/Alarms. The operators will be monitoring SG water level. When SG narrow range level decreases below 6 percent, the operators are instructed to enter FR-H.1 (Response to Loss of Secondary Heat Sink).

c. Consequence of Actions.

Success - Success results in decay heat removal using the steam generators.

Failure - Failure requires the use of the condensate system or bleed-and-feed to remove decay heat.

d. Training/Experience. The operators have had training on this action.

e. Stress. Moderate.

f. Skill/Rule/Knowledge-Based. Provided no SI signal is generated, this action is proceduralized in ES-0.1 (rule-based). However, FR-H.1 does not contain explicit instructions to re-establish MFW flow (knowledge-based).

g. Task Complexity. Moderate.

QUANTIFICATION

No credit was taken for this action due to the lack of explicit direction in FR-H.1 to re-establish main feedwater.

H2.22 OPERATOR ACTION OAC4--OPERATOR RESETS MCCS AFTER SI/LOSP

An initial screening value of 0.1 was used for the HEP of the operators failing to reset the MCCs after a safety injection signal or loss of offsite power.

H2.23 OPERATOR ACTION OAFW2--OPERATOR ALIGNS TURBINE-DRIVEN AFW PUMP

SUMMARY

a. Task. The operator opens the turbine-driven AFW pump flow control valves to supply auxiliary feedwater to the steam generators. The operator must also reset the overspeed trip should such a trip have occurred.

b. Success Criteria. Total feedwater flow rate greater than 355 gpm to the steam generators(s).

c. Scenario/Event Tree(s) Used. These actions are modeled in the auxiliary feedwater system fault tree as basic events AFW-XHE-FO-HC405 and AFW-XHE-FO-TDP32.

ACTION

a. Initial Conditions. While the reactor is operating at full power, a reactor trip occurs with subsequent loss of main feedwater. Subsequently, SG water level falls below the setpoint for AFW actuation.

b. Preceding Operator Actions. None expected.

c. Symptoms. Reactor trip.

d. Indications.
SG narrow range level (LI-417A/B/C, LI-427A/B/C, LI-437A/B/C, LI-447A/B/C) on panel FBF.
SG wide range level (LR-417-1/2, LR-437-1/2) on panel SCF.
AFW flow (FI-1200, FI-1201, FI-1202, FI-1203) on panel SCF.

e. Procedural Guidance. Upon a reactor trip, the operators will enter procedure E-0 (Reactor Trip or Safety Injection). If a safety injection signal is present, the operators will verify that the AFW pumps are running and that the total AFW flow exceeds 355 gpm. If total AFW flow is less than 355 gpm, the operators will manually start the AFW pumps and align the valves as necessary. If no safety injection signal is present, the operators will transfer to procedure ES-0.1 (Reactor Trip Response) at Step 4 of E-0 and adjust the AFW flow control valves as necessary to establish a total AFW flow greater than 355 gpm as directed in Step 3.d of ES-0.1.

f. Response.

E-0 (Rev. 7)--Reactor Trip or Safety Injection

Step 10b. Verify turbine-driven pump running.

Step 20. Verify total AFW flow exceeds 355 gpm. If no response obtained and narrow range level indicator shows less than 6 percent in all SGs, manually start pumps and align valves as necessary. If total AFW flow exceeding 355 gpm cannot be established, go to FR-H.1 (Response to Loss of Secondary Heat Sink).

ES-0.1 (Rev. 7)--Reactor Trip Response

Step 3d. Verify total AFW flow exceeds 355 gpm. If no response obtained, adjust AFW flow control valves as necessary.

FR-H.1 (Rev. 6)--Response to Loss of Secondary Heat Sink

Step 2.a.6 Locally check the AFW flow control valves.

Step 2.b Try to restore AFW flow.

Step 2.c If total AFW flow to the SGs is less than 355 gpm, dispatch NPO to restore AFW flow locally.

PERFORMANCE SHAPING FACTORS

a. Timing.

Time Available - 52 minutes, based on the time at which the steam generator inventory is depleted.

Time Needed - Two minutes to open the AFW flow control valves from the control room. Less than 15 minutes, including travel time, to reset the turbine overspeed trip.

b. Competing Actions/Alarms. None.

c. Consequence of Actions.

Success - Success results in secondary decay heat removal.

Failure - Failure of this action, combined with failure of the two motor-driven AFW pumps, requires an alternative method of decay heat removal to be implemented--bleed-and-feed, main feedwater restoration, or condensate feed to the SGs.

d. Training/Experience. The operators have extensive training and actual experience in establishing secondary decay heat removal using the turbine-driven AFW pump.

e. Stress. Low if one motor-driven AFW pump is available. Moderate if both motor-driven AFW pumps are unavailable.

f. Skill/Rule/Knowledge-Based. Skill-based--the operators are experienced and trained on the response to low SG water level or flow. Rule-based--opening the AFW flow control valves is proceduralized. Knowledge-based--the action to reset the overspeed trip, should it be necessary, requires some diagnosis by the operator.

g. Task Complexity. Low.

QUANTIFICATION

Operator Opens AFW Flow Control Valves

Diagnosis Error. The time available for diagnosis was assumed to be 50 minutes. The lower bound median diagnosis HEP is 8.1×10^{-6} (EF=25), which results in a mean HEP of 5.5×10^{-5}.

Post-Diagnosis Error. Because the operators are very familiar with the action to open the turbine-driven AFW pump flow control valves, the lower bound of the HEP (assuming moderately high stress) in Table 8-5 (item 3) was used. The corresponding mean HEP is 6.5×10^{-3}. Assuming high dependence between the SRO and the operator and moderate dependence for the SS, the median recovery HEPs are 0.5 (EF=5) and 0.15 (EF=5), respectively. The mean recovery HEPs for the SRO and SS are 0.81 and 0.24, respectively. Therefore, the total mean HEP for failing to open the flow control valve is $6.5\times10^{-3} \times 0.81 \times 0.24 = 1.26\times10^{-3}$.

The total HEP is $5.5\times10^{-5} + 1.26\times10^{-3} = 1.3\times10^{-3}$.

Operator Resets Turbine Overspeed Trip

Diagnosis Error. The time available for diagnosis is 52 - 15 = 37 minutes. The median nominal diagnosis HEP is 5.0×10^{-4} (EF=16), which results in a mean HEP of 2.1×10^{-3}.

Post-Diagnosis Error. This action constitutes a dynamic action performed under moderately high stress because the operator must diagnose the cause of AFW pump failure. The use of item 4 in Table 8-5 yields a median HEP of 0.05 (EF=5) and a mean HEP of 0.081. Assuming high dependence between the SRO and the operator and moderate dependence for the SS, the median recovery HEPs are 0.5 (EF=5) and 0.19 (EF=5), respectively. The mean recovery HEPs for the SRO and SS are 0.81 and 0.30, respectively. Therefore, the total mean HEP for failing to reset the AFW turbine overspeed trip is $0.081 \times 0.81 \times 0.30 = 2.0\times10^{-2}$.

The total HEP is $2.1\times10^{-3} + 2.0\times10^{-2} = 0.022$.

H2.24 OPERATOR ACTION OBSWS--OPERATOR STARTS BACKUP SERVICE WATER PUMPS

No credit was given to the operators starting the backup service water pumps.

H2.25 OPERATOR ACTION OCOND--OPERATORS ALIGN CONDENSATE SYSTEM FOR SECONDARY COOLING

SUMMARY

a. Task. The operators depressurize the steam generators and establish condensate flow to them.

b. Success Criteria. The operators depressurize at least one steam generator to less than 570 psig and establish flow using at least one main condensate pump.

c. Scenario/Event Tree(s) Used. Transient (T2).

ACTION

a. Initial Conditions. While the reactor is operating at full power, a plant trip occurs with subsequent loss of main feedwater. All three AFW pumps fail to start or deliver sufficient flow to the steam generators.

b. Preceding Operator Actions. The operators will attempt to establish AFW flow. However, once the operators enter FR-H.1, they will proceed to initiate bleed-and-feed cooling based on low SG level.

c. Symptoms. Loss of main and auxiliary feedwater.

d. Indications.
SG narrow range level (LI-417A/B/C, LI-427A/B/C, LI-437A/B/C, LI-447A/B/C) on panel FBF.
SG wide range level (LR-417-1/2, LR-437-1/2) on panel SCF.
AFW flow (FI-1200, FI-1201, FI-1202, FI-1203) on panel SCF.
MFW flow (FI-418, FI-428, FI-438, FI-448).

e. Procedural Guidance. Upon receipt of a reactor trip, the operators will enter procedure E-0 (Reactor Trip or Safety Injection). If a safety injection signal is present, Step 20 of E-0 will transfer the operators to FR-H.1 (Response to Loss of Secondary Heat Sink) if total AFW flow is less than 355 gpm. If safety injection has not occurred (and is not needed), the operators will transfer to ES-0.1 (Reactor Trip Response). Once E-0 is exited, the STA is required to monitor the critical safety function (CSF) status trees. The functional restoration procedure for loss of secondary heat sink is FR-H.1. Step 5 of FR-H.1 directs the operator to depressurize the SGs and establish feed flow from the condensate system. It should be noted, however, that the criteria for initiating bleed-and-feed will be met before condensate flow can be established. Therefore, this action will

not begin until after attempts to establish decay heat removal via bleed-and-feed have failed.

f. Response.

FR-H.1 (Rev. 6)

Step 3 Stop all RCPs.

Step 4.a-c Depressurize RCS to 1850 psig using auxiliary spray or one PORV.

Step 4.e Block low pressurizer pressure SI actuation.

Step 5.c Depressurize at least one SG to less than 570 psig by dumping steam to condenser at the maximum rate. If condenser steam dump is unavailable, dump steam from SGs using atmospheric dump valves (ADVs).

Step 5.d Establish condensate flow:

1) Start one main condensate pump.
2) Reset MBFP trips.
3) Open BFP discharge valves BFD-2-31 and BFD-2-32.
4) De-energize BFD-2-31 in open position at MCC-36A.
5) De-energize BFD-2-32 in open position at MCC-36B.
6) On safeguards initiation racks G-4 and G-6 place feedwater isolation defeat key witches to the DEFEAT position.
7) Open feedwater low flow bypass valve(s) as required.

PERFORMANCE SHAPING FACTORS

a. Timing.

Time Available - 39 - 52 minutes, based on the time until steam generator dryout. If the reactor coolant pumps are not tripped, the steam generator inventory will be depleted in approximately 39 minutes after the reactor trip. On the other hand, if the reactor coolant pumps are tripped one minute after the reactor trip, the time before the steam generator inventory is depleted will be extended by 13 minutes.

Time Needed - 20 minutes was assumed to be the time required to establish condensate flow to the SGs.

b. Competing Actions/Alarms. Bleed-and-feed cooling will be attempted prior to the initiation of condensate flow. It was assumed in the quantification that the attempt to initiate bleed-and-feed cooling will consume 10 minutes.

c. Consequence of Actions.

Success - Success results in decay heat removal using the steam generators.

Failure - Since this action is taken only after attempts to establish AFW flow and bleed-and-feed cooling have failed, failure results in loss of decay heat removal and subsequent core damage.

d. Training/Experience. The operators have been extensively trained on the use of functional restoration procedure FR-H.1 (Response to Loss of Secondary Heat Sink).

e. Stress. Extremely high, since this action follows failed attempts to establish AFW flow and bleed-and-feed cooling.

f. Skill/Rule/Knowledge-Based. Rule-based (steps are proceduralized).

g. Task Complexity. Moderate.

QUANTIFICATION

Diagnosis Error. The time available for diagnosis is 47 minutes (time to SG dryout given RCPs tripped at 15 minutes) - 20 minutes (time required to align condensate) = 27 minutes. However, because the criteria for initiating bleed-and-feed will be satisfied before condensate flow can be established, the operators have been trained to immediately initiate bleed-and-feed upon entering FR-H.1. It was assumed that the operators will try to initiate bleed-and-feed cooling for 10 minutes. Therefore, the time available for diagnosis is 27 - 10 = 17 minutes. Interpolating between items 2 and 3 in Table 8-2 yields a lower bound median diagnosis HEP of 1.7×10^{-3}, with an error factor of 10. The mean diagnosis HEP is 4.6×10^{-3}.

Post-Diagnosis Error. This action constitutes a step-by-step task performed under extremely high stress. The critical actions to be performed are 1) tripping the RCPs, 2) depressurizing the SGs, and 3) establishing condensate flow. Because of the training received by the operators, the lower bound HEP was used. The lower bound median HEP for performing a step-by-step critical action under extremely high stress is 0.01 (EF=5), which yields a mean HEP of 0.016. The total mean HEP is $3 \times 0.016 = 0.048$.

Recovery. Failure to perform the required actions correctly can be recovered by the SRO at Step 6 of FR-H.1, which directs the operators to verify narrow range SG level exceeds 6 percent. Assuming low dependence between the original error and the verification step results in a median recovery HEP of 0.079 (EF=5) and a mean recovery HEP of 0.13. In addition, assuming moderate dependency between the SS and the others gives a median non-recovery probability of 0.15 (EF=5) and a mean probability of 0.24.

The total mean HEP for operator action OCOND = 4.6×10^{-3} + 0.048 × 0.13 × 0.24 = 6.1×10^{-3}

COMMENTS

The failure of the operators to establish bleed-and-feed will impact the probability that the operator also fail to align condensate flow to the steam generators in the following ways. First, failure to timely diagnose the loss of secondary heat sink is common to both, and failure to timely diagnose the need for bleed and feed will increase the probability that the operators also fail to diagnose the need for condensate flow. Secondly, failure of the operators to trip the RCPs during bleed and feed reduces the time available to align condensate flow. With this logic, the HEP for operator action OCOND given failure of operator action FB can be determined by merging the models for the two actions. A mean value of 0.37 was calculated for OCOND|FB.

$$\therefore \text{OCOND}|\text{FB} = 0.37.$$

H2.26 OPERATOR ACTION OCST--OPERATOR OPENS CITY WATER SUPPLY VALVE TO PROVIDE ALTERNATIVE AFW PUMP SUCTION

SUMMARY

a. Task. The operator provides an alternative source of water supply to the AFW pumps by opening valves PCV-1187, 1188, and/or 1189 to align the city water supply.

b. Success Criterion. An alternative supply of water is provided to at least one AFW pump.

c. Scenario/Event Tree(s) Used. The action is modeled as a recovery action for sequences involving plugging of CST isolation valve CT-6 or CT-64.

ACTION

a. Initial Conditions. The reactor is operating at full power. A reactor trip occurs with subsequent loss of main feedwater. One or more AFW pumps operate initially, supplying sufficient flow to the steam generators. Subsequently, the AFW pumps trip on low suction flow.

b. Preceding Operator Actions. None.

c. Symptoms.
Loss of secondary cooling.
"RED" path on critical safety function "HEAT SINK".

d. Indications.
SG narrow range level (LI-417A/B/C, LI-427A/B/C, LI-437A/B/C, LI-447A/B/C) on panel FBF.
SG wide range level (LR-417-1/2, LR-437-1/2) on panel SCF.
AFW flow (FI-1200, FI-1201, FI-1202, FI-1203) on panel SCF.
"Aux. Boiler Feed Low [Suction] Flow" alarm on panel SCF.

e. Procedural Guidance. Currently the EOPs do not address loss of CST suction to the AFW pumps (other than low CST level). However, the procedures are being revised to address plugging or inadvertent closure of CST isolation valve CT-6 or CT-64.

f. Response. The revised procedure will contain explicit instructions for the operators to align backup city water to the suction of the AFW pumps should low suction flow be indicated.

PERFORMANCE SHAPING FACTORS

a. Timing.

Time Available - The minimum time available to re-establish AFW pump operation is approximately 39 minutes. This time is based on the time in which the steam generator will be emptied should the reactor coolant pumps not be tripped.

Time Needed - The AFW pumps can be aligned to the city water supply from the control room. The necessary actions can be taken in two minutes.

b. Competing Actions/Alarms. The competing actions/alarms are expected to involve restoring secondary heat removal or establishing decay heat removal using bleed-and-feed cooling.

c. Consequence of Actions.

Success - Success results in availability of the AFW pumps and secondary decay heat removal.

Failure - Failure requires that secondary cooling be established using the main feedwater or condensate system, or that primary cooling be established using bleed-and-feed cooling.

d. Training/Experience. Since procedural guidance for this scenario has not yet been implemented, no training or experience exists. However, it was assumed that operators will receive training on this scenario once the procedures are revised.

e. Stress. Moderately high stress levels were assumed.

f. Skill/Rule/Knowledge-Based. Rule-based--the action will be proceduralized.

g. Task Complexity. Simple.

QUANTIFICATION

Diagnosis Error. The time available to perform this action was conservatively estimated as 30 minutes. Assuming that all the operators will receive training on this action once the procedures are in place, the nominal diagnosis HEP was used. The median nominal diagnosis HEP from Table 8-2 (item 4) is 0.001 (EF=10); the mean HEP is 0.0027.

Post-Diagnosis Error. Two critical actions must be performed: opening the city water supply valves (PCV-1187, 1188, and/or 1189), and restarting the AFW pumps. Assuming moderately high stress levels, the median HEP is $2 \times 0.02 = 0.04$, with an error factor of 5. The resulting mean HEP of 0.065. For recovery, moderate dependence was assumed between the SS and the others, giving a median recovery HEP of 0.16 (EF=5) and a mean HEP of 0.26. The total post-diagnosis HEP is, therefore, $0.065 \times 0.26 = 0.017$.

$\therefore$ OCST = 0.0027 + 0.017 = 0.02

H2.27 OPERATOR ACTION OESWS--OPERATORS RESTART ESSENTIAL SERVICE WATER PUMPS

SUMMARY

a. Task. The operator restarts an essential service water pump if it trips.

b. Success Criteria. Pump restarted.

c. Scenario/Event Tree(s) Used. This action was modeled as a recovery action for selected sequences.

ACTION

a. Initial Conditions. While the reactor is at full power, a loss of offsite power occurs. Subsequently, one or more essential service water pumps trip.

b. Preceding Operator Actions. None expected.

c. Symptoms.
Low essential service water pressure.
Insufficient cooling to components serviced by SW.
480-V switchgear motor trip.

d. Indications.
"Service Water Header [Essential] High Low Pressure" alarm.
"Containment Vent Fan Cooling Water Low Flow" alarm (common) during SI actuation.
"480 V Swgr. Motor Trip (Common)" alarm.

e. Procedural Guidance. Emergency Operating Procedure E-0 (Reactor Trip or Safety Injection) and Off-Normal Operating Procedure ONOP-RW-1.

f. Response.
If the loss of offsite power is accompanied by an SI signal, Step 8 of E-0, which is classified as an immediate action step, directs the operator to verify that the essential service water pumps are running. If they are not, the operator is instructed to identify and manually start the pumps aligned to the essential header. If no SI signal is present following the loss of offsite power, the operators will transfer to procedure ES-0.1 (Reactor Trip Response) and at Step 7 of ES-0.1 will verify that the essential service water pumps are running.

In addition to Step 8 of E-0 and Step 7 of ES-0.1, ONOP-RW-1 (Step 4.1 in the immediate operator actions) directs the operator to start service water pumps in the affected header if service water pressure is low.

PERFORMANCE SHAPING FACTORS

a. Timing.

Time Available - Emergency diesel generators (EDGs) and containment fan cooler units (FCUs) are critical loads supplied by the essential service water header during a safety injection actuation or loss of offsite power. It was assumed that these components will fail if service water is not re-established within 10 minutes.

Time Needed - 1 minute.

b. Competing Actions/Alarms. The competing actions/alarms depend on the initiating event. However, regardless of the event, the priority will be to implement the EOPs. These call for starting the essential SW pumps if they are not running.

c. Consequence of Actions.

Success - Success results in continued and sufficient flow to the essential service water header.

Failure - Failure results in loss of (or insufficient) flow to the essential service water header.

d. Training/Experience. The operators have been trained on the need to verify adequate essential service water flow during implementation of the EOPs.

e. Stress. Moderately to extremely high stress, depending on the cause of the reactor trip (i.e., on plant response).

f. Skill/Rule/Knowledge-Based. Rule-based. Each step is proceduralized.

g. Task Complexity. Simple.

QUANTIFICATION

No credit was given to the operators restarting the essential service water pumps given that they are tripped and fail to restart automatically.

H2.28 OPERATOR ACTION OMCC312A--OPERATORS ALIGN ALTERNATIVE SAFE SHUTDOWN EQUIPMENT TO MCC-312A

SUMMARY

a. Task. The operators establish RCP seal cooling by aligning and operating the alternative safe shutdown equipment from MCC-312A.

b. Success Criteria. Following failure of the 480-V safeguard buses, RCP seal cooling is restored within one hour by providing seal injection from charging pump 31 or 32 or thermal barrier cooling from component cooling pump 32. In both cases, the ultimate heat sink is provided by service water pump 38. To restore RCP seal cooling, the charging pump or component cooling pump and service water pump 38 must be aligned to MCC-312A, which is normally energized by offsite power from 6.9kv switchgear bus 1.

c. Scenario/Event Tree(s) Used. Internal flooding--initiating event TCTL-15.

ACTION

a. Initial Conditions. While the reactor is at full power, a pipe break occurs in the control building that results in the loss of all 480-Vac safeguard buses (i.e., buses 2A, 3A, 5A and 6A).

b. Preceding Operator Actions. The operators will enter procedure E-0 (Reactor Trip or Safety Injection) upon a reactor trip and open the turbine-driven AFW pump flow control valves.

c. Symptoms. All safeguard buses deenergized.

d. Indications.
"480V Safeguards Bus Undervoltage" annunciator on panel SBF-2
480-V bus voltmeter on panel SHF
480-V bus undervoltage relay ;lights on panel SHF.

e. Procedural Guidance. Upon a reactor trip, the operators will enter procedure E-0 (Reactor Trip or Safety Injection). If unable to restore power to at least one safeguards bus, the operators will transfer to ECA-0.0 (Loss of All AC Power). At step 6 of ECA-0.0, the operators are directed to restore power to the 480-Vac safeguard buses. Currently, there are, however, no explicit instructions in the EOPs that direct the operators to align alternative safe shutdown equipment to MCC-312A. While procedure SOP-EL-12 contains the necessary instructions, this procedure is used only for fire-related

events.

f. Response.

SOP-EL-12 (Rev. 8)

Step 4.1 Energize Service Water Pump 38:

1) Remove loads from bus 312 (by deenergizing MCC "E-1" feeder and all loads from PDP-TG-1 except 30A breaker, or MCC "A" and "C" feeders).

2) Close the disconnect switch for service water pump 38 on MCC-312A.

3) Start service water pump 38 at MCC-312A by pushing in and turning the key switch to the "Start" position.

Step 4.2 Energize Component Cooling Pump 32:

1) Remove loads from bus 312 (by deenergizing MCC "E-1" feeder and all loads from PDP-TG-1 except 30A breaker, or MCC "A" and "C" feeders).

2) Visually verify that the component cooling pump is not running.

3) Verify at the transfer switch that all eight indicating lights are extinguished.

4) At the transfer cabinet located adjacent to component cooling pump 32 in the PAB, place the switch in the alternative feed position by rotating in clockwise.

5) Close the disconnect switch on MCC-312A for component cooling pump 32.

6) Start component cooling pump 32 at MCC-312A by pushing in and turning the key switch to the "Start" position.

Step 4.3 Energize Charging Pump 32:

1) Remove loads from bus 312 (by deenergizing MCC "E-1" feeder and all loads from PDP-TG-1 except 30A breaker, or MCC "A" and "C" feeders).

2) Visually verify that charging pump 32 is not running.

3) Verify at the transfer switch that all eight indicating lights are extinguished.

4) Verify that the bulldog switch is open the 31 charging pump room.

5) At the transfer cabinet located adjacent to charging pump 32, place the switch in the alternative feed position by rotating in clockwise.

6) Close the disconnect switch on MCC-312A for charging pump.

7) Start charging pump 32 at MCC-312A by pushing in and turning the key switch to the "Start" position.

PERFORMANCE SHAPING FACTORS

a. Timing.

Time Available - 60 minutes were assumed to be available to re-establish RCP seal cooling. After 60 minutes, the RCP seal leak rate exceeds the capacity of one charging pump.

Time Needed - Approximately 30 minutes are needed to align and start service water pump 38, component cooling pump 32, and charging pump 31 or 32 from MCC-312A. While priorities can be established for aligning and starting the pumps, these priorities are not reflected in SOP-EL-12. These priorities are based on the facts that a failure to align service water pump 38 is less limiting (because of the large heat capacity of the service water system and thus the additional time available to recognize and recover the loss of service water flow) and that component cooling pump 32 is needed for both seal injection (cooling the charging pumps) and thermal barrier cooling.

b. Competing Actions/Alarms. The operators will continue in their efforts to restore the 480-Vac safeguard buses.

c. Consequence of Actions.

Success - Success results in decay heat removal by the turbine-driven AFW pump and limited reactor coolant loss from RCP seal leaks.

Failure - Failure results in excessive RCP seal leakage and subsequent uncovering of the core and core damage.

d. Training/Experience. The operators have had no training to deal with this scenario.

e. Stress. Extremely high stress levels were assumed.

f. Skill/Rule/Knowledge-Based. Although the actions are rule-based in that they are proceduralized, the operators must identify the correct procedure to implement. This

latter is a knowledge-based action.

g. Task Complexity. High. Several key actions must be performed and their execution requires a coordinated effort in the main control room, turbine building, and PAB.

QUANTIFICATION

Diagnosis Error. With 30 minutes available for diagnosis, the nominal diagnosis HEP from Table 8-2 of NUREG/CR-4772 was used. This yields a median HEP of 0.001 with an error factor of 10. The resulting mean diagnosis HEP is 2.7×10^{-3}.

Post-Diagnosis Error. Post-diagnosis error results from a failure to align or start service water pump 38 and component cooling pump 32 or charging pump 31 or 32. The median HEP for these actions was calculated as 0.05 (EF=5) using Table 8-5 (item 4) of NUREG/CR-4772 and assuming step-by-step actions performed under extremely high stress. The resulting mean HEP is 0.081.

Recovery. Indicating lights on MCC-312A should alert the operator to any failure to perform the required actions correctly. In addition, inadequate RCP seal cooling (e.g., low bearing/thermal barrier cooling flow and high bearing/thermal barrier cooling return temperatures) will be annunciated in the control room. Therefore, the annunciator response model was used to estimate a non-recovery probability for post-diagnosis actions. Conservatively assuming the presence of ten unrelated alarms, Table 8-4 (item 10) of NUREG/CR-4772 assigns a median HEP of 0.05 with an error factor of 10. The resulting mean non-recovery HEP is 0.13.

Therefore, assuming revised procedures,

$$\text{OAPPR} = 0.0027 + 0.081 \times 0.13 = 0.013.$$

H2.29 OPERATOR ACTION OAFW-HVAC--OPERATOR PROVIDES ALTERNATIVE AFW PUMP ROOM VENTILATION

SUMMARY

a. Task. The operator must provide auxiliary boiler feed pump (ABFP) room ventilation should normal room ventilation fail.

b. Success Criterion. ABFP room roll-up garage door opened before ABFP room temperature reaches 160°F.

c. Scenario/Event Tree(s) Used. This action is demanded should normal ABFP room ventilation system fail after a reactor trip.

ACTION

a. Initial Conditions. While the reactor is operating at full power, a reactor trip occurs. The main feedwater pumps are tripped, and one or more AFW pumps deliver flow to the steam generators. Concurrently or subsequently, a total loss of ventilation to the ABFP room occurs.

b. Preceding Operator Actions. The operators will enter procedure E-0 (Reactor Trip or Safety Injection) upon the reactor trip and continue through E-0 if a safety injection signal is present. If no safety injection signal is present, the operators will transfer to procedure ES-0.1 (Reactor Trip Response).

c. Symptoms.
High ABFP room temperature.

d. Indications.
"Aux Feed Pump Room Hi Temp" annunciator on panel SDF.

e. Procedural Guidance. Until recently, no explicit procedural guidance was provided to direct the operators to open the roll-up door in the ABFP room. However, Alarm Response Procedure ARP-7 is being revised to direct the operators to open the roll-up door if the room temperature exceeds 120°F.

f. Response.

ARP-7 (Rev. 12) - "Aux Feed Pump Room Hi Temp" alarm on panel SDF
If the temperature in the ABFP room exceeds 120°F, open the roll-up door to provide ventilation.

PERFORMANCE SHAPING FACTORS

a. Timing.

Time Available - The time available to restore ventilation to the ABFP room depends upon the number of AFW pumps operating and the initial temperature of the room. Assuming conservatively that all three AFW pumps are operating and the initial room temperature is 90°F, the room temperature will increase from 120°F (alarm setpoint) to 160°F (qualification temperature of the motor-driven AFW pumps) in 103 minutes.

Time Needed - This action, including travel time to the ABFP room, can be accomplished within 15 minutes assuming there are no heat stress-induced delays.

b. Competing Actions/Alarms. None expected.

c. Consequence of Actions.

Success - Success results in continued operability of the AFW pumps.

Failure - Failure results in the loss of all AFW pumps, requiring alternative methods to remove decay heat.

d. Training/Experience. Since the procedural guidance for this scenario has not yet been implemented, no training or experience currently exists. However, it was assumed that operators will receive training on this scenario once the procedures are revised.

e. Stress. Moderate to extremely high stress levels were assumed. Since the alarm setpoint for high ABFP room temperature is 120°F and five to ten minutes may elapse before the operator enters the ABFP room, actual room temperature on entry will be higher. Consequently, heat stress could cause extremely high stress levels.

f. Skill/Rule/Knowledge-Based. Rule-based--this action will be proceduralized.

g. Task Complexity. Simple.

QUANTIFICATION

The operators will have 103 - 15 = 88 minutes to diagnose the high temperature condition (greater than 120°F) in the ABFP room. However, the time available was conservatively assumed to be 60 minutes based on the fact that there may be delays in establishing natural air circulation. Using the nominal diagnosis model in NUREG/CR-4772, the median diagnosis HEP from Table 8-2 (item 5) is 10^{-4}, with an error factor of 30. The corresponding mean HEP is 8.5×10^{-4}. Post-diagnosis errors were considered to be negligible given

successful diagnosis.

In addition to the human error contribution for failure to establish ABFP room ventilation, failure of the annunciator module was also considered, since such a failure will preclude detection of high room temperature condition. From IEEE Standard 500-1984, the recommended failure rate for annunciator modules is 1.02×10^{-6}/hr. Operation of the annunciator is verified every refuelling outage during testing of the ABFP room temperature indicators. Therefore, the hardware contribution to failure was estimated to be 1.02×10^{-6}/hr $\times$ (1.5 $\times$ 8760 hrs)/2 = 6.7×10^{-3}.

Combining the contributions of human and hardware failures (8.5×10^{-4} and 6.7×10^{-3}, respectively), the total failure probability is 7.6×10^{-3}.

$\therefore$ OAFW-HVAC = 7.6×10^{-3}.

H2.30 OPERATOR ACTION OCTL15-HVAC--OPERATORS PROVIDE ALTERNATIVE SWITCHGEAR ROOM VENTILATION

SUMMARY

a. Task. The operator must provide 480-Vac switchgear room ventilation should normal room ventilation fail.

b. Success Criterion. Alternative room cooling established by opening doors and using a portable fan to circulate air.

c. Scenario/Event Tree(s) Used. The action is addressed in sequences which involve a failure of the 480-Vac switchgear room ventilation system.

ACTION

a. Initial Conditions. While the reactor is operating at full power, a reactor trip occurs. Concurrently or subsequently, a failure occurs which results in inadequate ventilation in the 480-Vac switchgear room.

b. Preceding Operator Actions. The operators will enter procedure E-0 (Reactor Trip or Safety Injection) upon the reactor trip and continue through E-0 if a safety injection signal is present. If there no safety injection signal is present, the operators will transfer to procedure ES-0.1 (Reactor Trip Response).

c. Symptoms.
High 480-Vac switchgear room temperature.

d. Indications.
A modification will be installed to provide a control room alarm on high control building - 15-ft elevation (480-Vac switchgear room) ambient temperature.

e. Procedural Guidance. A night order directs that the double doors to the turbine building be blocked open to allow sufficient air to circulate through the room to cool the 480-Vac switchgear and allow resetting of any breakers that may trip because of high temperatures. Prior to plant startup, this night order will be replaced with an alarm response procedure which will specify the response to increasing switchgear room ambient temperature and maintain the temperature below the design value of 104°F.

f. Response.

The alarm response procedure has not yet been developed to address a high temperature in the 480-V switchgear room. However, the new procedure will direct the operator to open the double doors to the turbine building and align a portable fan. The requirements for the portable fan, however, have yet to be determined.

PERFORMANCE SHAPING FACTORS

a. Timing.

Time Available - Equipment qualifications show that the ambient room temperature in the switchgear room must reach 117°F to trip the 480-Vac switchgear breakers. With one fan operating during a normal transient event, calculations show that the maximum room temperature will be 113°F. Therefore, no operator action is required. However, should both fans be inoperable during a transient event (or one fan inoperable during a LOCA), room temperatures will rise fairly rapidly to 117°F, requiring the operators to establish alternative ventilation and possibly reset tripped breakers.

Time Needed - The double doors to the turbine building can be opened within ten minutes (including travel time to the switchgear room); a further five minutes may be required to set up the portable fan.

b. Competing Actions/Alarms. None expected.

c. Consequence of Actions.

Success - Success results in continued operation of buses 2A, 3A, 5A, and 6A and essential equipment supplied by those buses.

Failure - Failure results in loss of all 480-Vac safeguards buses (2A, 3A, 5A, and 6A).

d. Training/Experience. Since the procedural guidance for this scenario has not yet been implemented (except in the night orders), no training or experience currently exists. However, it was assumed that each operator will receive training on this scenario once the alarm response procedures are revised.

e. Stress. Moderate to extremely high stress levels were assumed.

f. Skill/Rule/Knowledge-Based. Rule-based--this action will be proceduralized.

g. Task Complexity. Simple.

QUANTIFICATION

A modification is currently being implemented which will provide a control room alarm on high switchgear room ambient temperature. In addition, an alarm response procedure is being developed to provide guidance for establishing alternate ventilation of the switchgear room. For conditions in which normal ventilation is unable to maintain the ambient room temperature below 117°F, it was assumed that the breakers will have to be reset. Because of the time available to establish alternate room ventilation, a screening value of 0.1 was used for failure to perform the action.

$\therefore$ OCTL15-HVAC = 0.1

Section H3

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APPENDIX I

CUT SETS FOR DOMINATE ACCIDENT SEQUENCES

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I1	T3-3-T2-18	I-2
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I5	T2-32-TH-19A	I-15
I6	TDC32-2	I-16
I7	T2-18	I-22
I8	TDC31-2	I-27

Plant Damage State Group Cutsets

PDS 1 - SBO Plant Damage State Group	I-A1
PDS 2 - Transient Plant Damage State Group	I-A13
PDS 3 - LOCA Plant Damge State Group	I-A55
PDS 4 - V_Sequence Plant Damage State Group	I-A58
PDS 5 - SGTR Plant Damage State Group	I-A59

T3-3-T2-18

Initiating event frequency	= 3.6/yr
Top event unavailability	= 1.145E-06
Sequence frequency	= 4.1E-06/yr
Number of cut sets in equation	= 86
Cutoff value used last step	= 1.000E-09
Longest cut set (# of events)	= 6
Basic Event Data file referenced	= IP3Run

1	6.3000E-07	AFV-MOD-CC-IL314	FB-T2	NR-AFBV	SL-T2-SUCC	IE-T3
2	1.2810E-07	AFV-MOD-CC-IL314	NR-AFBV	PPR-PRV-CC-455C	SL-T2-SUCC	IE-T3
3	1.2810E-07	AFV-MOD-CC-IL314	NR-AFBV	PPR-PRV-CC-456	SL-T2-SUCC	IE-T3
4	2.2773E-08	AFW-CCF-FS-AFWPM	AFW-TDP-FR-TDP32	FB-T2	SL-T2-SUCC	IE-T3
5	1.4280E-08	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-64	FB-T2	SL-T2-SUCC	IE-T3
6	1.4280E-08	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-6	FB-T2	SL-T2-SUCC	IE-T3
7	1.4100E-08	AFV-MOD-CC-IL314	NR-AFBV	PPR-CCF-CC-PORVS	SL-T2-SUCC	IE-T3
8	1.2872E-08	AFW-CCF-FS-AFWPM	AFW-MAI-MA-TDP32	FB-T2	SL-T2-SUCC	IE-T3
9	1.2123E-08	AFW-CCF-FS-AFWPM	AFW-XHE-RE-AFW32	FB-T2	SL-T2-SUCC	IE-T3
10	1.0481E-08	AFW-CCF-FS-AFWPM	AFW-TDP-FS-TDP32	FB-T2	SL-T2-SUCC	IE-T3
11	6.0375E-09	AFW-CCF-FS-AFWPM	AFW-RCK-NO-TDP32	FB-T2	SL-T2-SUCC	IE-T3
12	5.0715E-09	AFW-CCF-FS-AFWPM	AFW-XHE-FO-HC405	FB-T2	SL-T2-SUCC	IE-T3
13	4.8349E-09	AFW-MAI-MA-PM31	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T3

Sequence: T3-3-T2-18

14	4.6306E-09	AFW-CCF-FS-AFWPM	AFW-TDP-FR-TDP32	PPR-PRV-CC-456	SL-T2-SUCC	IE-T3	
15	4.6306E-09	AFW-CCF-FS-AFWPM	AFW-TDP-FR-TDP32	PPR-PRV-CC-455C	SL-T2-SUCC	IE-T3	
16	4.4681E-09	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T3
17	3.1758E-09	AC4-RCI-FE-U1-6A	AFW-MAI-MA-PM31	AFW-TDP-FR-TDP32	FB-T2	SL-T2-SUCC	IE-T3
18	3.0289E-09	AFW-MAI-MA-PM33	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW31	FB-T2	SL-T2-SUCC	IE-T3
19	2.9348E-09	AC4-RCI-FE-U1-3A	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T3
20	2.9348E-09	AC4-RCI-FE-U1-6A	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW31	FB-T2	SL-T2-SUCC	IE-T3
21	2.9036E-09	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-64	PPR-PRV-CC-455C	SL-T2-SUCC	IE-T3	
22	2.9036E-09	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-64	PPR-PRV-CC-456	SL-T2-SUCC	IE-T3	
23	2.9036E-09	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-6	PPR-PRV-CC-455C	SL-T2-SUCC	IE-T3	
24	2.9036E-09	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-6	PPR-PRV-CC-456	SL-T2-SUCC	IE-T3	
25	2.7048E-09	AFW-AOV-CC-P1139	AFW-CCF-FS-AFWPM	FB-T2	SL-T2-SUCC	IE-T3	
26	2.6173E-09	AFW-CCF-FS-AFWPM	AFW-MAI-MA-TDP32	PPR-PRV-CC-455C	SL-T2-SUCC	IE-T3	
27	2.6173E-09	AFW-CCF-FS-AFWPM	AFW-MAI-MA-TDP32	PPR-PRV-CC-456	SL-T2-SUCC	IE-T3	
28	2.5738E-09	AFW-MAI-MA-PM31	AFW-XHE-RE-AFW32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T3
29	2.5447E-09	AFW-MAI-MA-PM31	AFW-RCK-NO-PM33	AFW-TDP-FR-TDP32	FB-T2	SL-T2-SUCC	IE-T3
30	2.5254E-09	AFW-MAI-MA-TDP32	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T3
31	2.4651E-09	AFW-CCF-FS-AFWPM	AFW-XHE-RE-AFW32	PPR-PRV-CC-456	SL-T2-SUCC	IE-T3	
32	2.4651E-09	AFW-CCF-FS-AFWPM	AFW-XHE-RE-AFW32	PPR-PRV-CC-455C	SL-T2-SUCC	IE-T3	

33	2.4150E-09	AC1-BAC-ST-LP324	FB-T2	NR-AFBV	SL-T2-SUCC	IE-T3		
34	2.4150E-09	AC1-BAC-ST-LB33	FB-T2	NR-AFBV	SL-T2-SUCC	IE-T3		
35	2.3790E-09	AFW-AOV-OO-11581	AFW-AOV-OO-11582	AFW-XHE-FO-CITYW	FB-T2	SL-T2-SUCC	IE-T3	
36	2.3785E-09	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T3	
37	2.3516E-09	AFW-RCK-NO-PM33	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW31	FB-T2	SL-T2-SUCC	IE-T3	
38	2.3516E-09	AC4-RCK-NO-BC36C	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T3	
39	2.3516E-09	AFW-RCK-NO-PM31	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T3	
40	2.2252E-09	AFW-MAI-MA-PM31	AFW-TDP-FS-TDP32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T3	
41	2.1312E-09	AFW-CCF-FS-AFWPM	AFW-TDP-FS-TDP32	PPR-PRV-CC-455C	SL-T2-SUCC	IE-T3		
42	2.1312E-09	AFW-CCF-FS-AFWPM	AFW-TDP-FS-TDP32	PPR-PRV-CC-456	SL-T2-SUCC	IE-T3		
43	2.0563E-09	AFW-TDP-FS-TDP32	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T3	
44	1.9895E-09	AC4-RCI-FE-U1-3A	AFW-MAI-MA-PM33	AFW-TDP-FR-TDP32	FB-T2	SL-T2-SUCC	IE-T3	
45	1.8900E-09	AFV-MOD-CC-ED311	AFV-MOD-CC-ED312	FB-T2	NR-AFBV	SL-T2-SUCC	IE-T3	
46	1.6906E-09	AC4-RCI-FE-U1-6A	AFW-MAI-MA-PM31	AFW-XHE-RE-AFW32	FB-T2	SL-T2-SUCC	IE-T3	
47	1.6588E-09	AC4-RCI-FE-U1-3A	AFW-MAI-MA-TDP32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T3	
48	1.6588E-09	AC4-RCI-FE-U1-6A	AFW-MAI-MA-TDP32	AFW-XHE-RE-AFW31	FB-T2	SL-T2-SUCC	IE-T3	
49	1.6367E-09	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW33	DC1-MAI-MA-BCC33	FB-T2	SL-T2-SUCC	IE-T3	
50	1.6124E-09	AFW-MAI-MA-PM33	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW32	FB-T2	SL-T2-SUCC	IE-T3	

Sequence: T3-3-T2-18

51	1.5941E-09	AC4-RCK-NO-BC36C	AFW-MAI-MA-PM33	AFW-TDP-FR-TDP32	FB-T2	SL-T2-SUCC	IE-T3
52	1.5941E-09	AFW-MAI-MA-PM33	AFW-RCK-NO-PM31	AFW-TDP-FR-TDP32	FB-T2	SL-T2-SUCC	IE-T3
53	1.5623E-09	AC4-RCI-FE-U1-3A	AFW-XHE-RE-AFW32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T3
54	1.5623E-09	AC4-RCI-FE-U1-6A	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW32	FB-T2	SL-T2-SUCC	IE-T3
55	1.5446E-09	AC4-RCI-FE-U1-6A	AFW-RCK-NO-PM31	AFW-TDP-FR-TDP32	FB-T2	SL-T2-SUCC	IE-T3
56	1.5446E-09	AC4-RCI-FE-U1-3A	AFW-RCK-NO-PM33	AFW-TDP-FR-TDP32	FB-T2	SL-T2-SUCC	IE-T3
57	1.4616E-09	AC4-RCI-FE-U1-6A	AFW-MAI-MA-PM31	AFW-TDP-FS-TDP32	FB-T2	SL-T2-SUCC	IE-T3
58	1.3940E-09	AFW-MAI-MA-PM33	AFW-TDP-FS-TDP32	AFW-XHE-RE-AFW31	FB-T2	SL-T2-SUCC	IE-T3
59	1.3843E-09	AFW-MAI-MA-PM31	AFW-MDP-FS-PM33	AFW-TDP-FR-TDP32	FB-T2	SL-T2-SUCC	IE-T3
60	1.3546E-09	AFW-MAI-MA-PM31	AFW-RCK-NO-PM33	AFW-XHE-RE-AFW32	FB-T2	SL-T2-SUCC	IE-T3
61	1.3507E-09	AC4-RCI-FE-U1-3A	AFW-TDP-FS-TDP32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T3
62	1.3507E-09	AC4-RCI-FE-U1-6A	AFW-TDP-FS-TDP32	AFW-XHE-RE-AFW31	FB-T2	SL-T2-SUCC	IE-T3
63	1.3503E-09	AC1-SBR-CO-LP324	FB-T2	NR-AFBV	SL-T2-SUCC	IE-T3	
64	1.3292E-09	AFW-MAI-MA-TDP32	AFW-RCK-NO-PM31	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T3
65	1.3292E-09	AFW-MAI-MA-TDP32	AFW-RCK-NO-PM33	AFW-XHE-RE-AFW31	FB-T2	SL-T2-SUCC	IE-T3
66	1.3292E-09	AC4-RCK-NO-BC36C	AFW-MAI-MA-TDP32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T3
67	1.2818E-09	AFW-MAI-MA-PM31	AFW-RCK-NO-TDP32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T3
68	1.2793E-09	AFW-MDP-FS-PM31	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T3
69	1.2793E-09	AFW-MDP-FS-PM33	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW31	FB-T2	SL-T2-SUCC	IE-T3

Sequence: T3-3-T2-18

70	1.2519E-09	AFW-RCK-NO-PM31	AFW-XHE-RE-AFW32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T3
71	1.2519E-09	AFW-RCK-NO-PM33	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW32	FB-T2	SL-T2-SUCC	IE-T3
72	1.2519E-09	AC4-RCK-NO-BC36C	AFW-XHE-RE-AFW32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T3
73	1.2377E-09	AFW-RCK-NO-PM31	AFW-RCK-NO-PM33	AFW-TDP-FR-TDP32	FB-T2	SL-T2-SUCC	IE-T3
74	1.2377E-09	AC4-RCK-NO-BC36C	AFW-RCK-NO-PM33	AFW-TDP-FR-TDP32	FB-T2	SL-T2-SUCC	IE-T3
75	1.2276E-09	AFW-CCF-FS-AFWPM	AFW-RCK-NO-TDP32	PPR-PRV-CC-456	SL-T2-SUCC	IE-T3	
76	1.2276E-09	AFW-CCF-FS-AFWPM	AFW-RCK-NO-TDP32	PPR-PRV-CC-455C	SL-T2-SUCC	IE-T3	
77	1.1845E-09	AFW-RCK-NO-TDP32	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T3
78	1.1711E-09	AFW-MAI-MA-PM31	AFW-RCK-NO-PM33	AFW-TDP-FS-TDP32	FB-T2	SL-T2-SUCC	IE-T3
79	1.1095E-09	AFW-MAI-MA-PM33	AFW-TDP-FR-TDP32	DC1-MAI-MA-BCC3	FB-T2	SL-T2-SUCC	IE-T3
80	1.0823E-09	AFW-RCK-NO-PM31	AFW-TDP-FS-TDP32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T3
81	1.0823E-09	AC4-RCK-NO-BC36C	AFW-TDP-FS-TDP32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T3
82	1.0823E-09	AFW-RCK-NO-PM33	AFW-TDP-FS-TDP32	AFW-XHE-RE-AFW31	FB-T2	SL-T2-SUCC	IE-T3
83	1.0767E-09	AFW-MAI-MA-PM31	AFW-XHE-FO-HC405	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T3
84	1.0591E-09	AC4-RCI-FE-U1-3A	AFW-MAI-MA-PM33	AFW-XHE-RE-AFW32	FB-T2	SL-T2-SUCC	IE-T3
85	1.0312E-09	AFW-CCF-FS-AFWPM	AFW-XHE-FO-HC405	PPR-PRV-CC-456	SL-T2-SUCC	IE-T3	
86	1.0312E-09	AFW-CCF-FS-AFWPM	AFW-XHE-FO-HC405	PPR-PRV-CC-455C	SL-T2-SUCC	IE-T3	

T2-32-TH-13A

Initiating event frequency	= 1.11/yr
Top event unavailability	= 3.499E-06
Sequence frequency	= 3.9E-06/yr
Number of cut sets in equation	= 1
Cutoff value used last step	= 1.000E-09
Longest cut set (# of events)	= 3
Basic Event Data file referenced	= IP3TH

1	3.4992E-06	C	MRI-SUCC	PR1	IE-T2

T1-26-TB-9

Initiating event frequency	= 6.8E-02/yr
Top event unavailability	= 3.845E-05
Sequence frequency	= 2.6E-06/yr
Number of cut sets in equation	= 1676
Cutoff value used last step	= 1.000E-09
Longest cut set (# of events)	= 7
Basic Event Data file referenced	= IP3Run

1	8.2461E-06	B-1HR	DC1-MAI-MA-BCC31	FLAG-LOSP	NR-CHGR35	SWS-MAI-MA-PM36	IE-T1
2	1.4136E-06	B-1HR	DC1-MAI-MA-BCC31	AC4-RCI-FE-U1-6A	NR-CHGR35	FLAG-LOSP	IE-T1
3	1.4136E-06	B-1HR	DC1-MAI-MA-BCC31	AC4-RCI-FE-U1-3A	NR-CHGR35	FLAG-LOSP	IE-T1
4	1.1346E-06	AFW-TDP-FR-TDP32	B-1HR	SWS-XHE-RE-SWN29	IE-T1		
5	1.1327E-06	B-1HR	DC1-MAI-MA-BCC31	FLAG-LOS	NR-CHGR35	SWS-RCK-NO-PM36	IE-T1
6	1.1327E-06	B-1HR	DC1-MAI-MA-BCC31	AC4-RCK-NO-BC36C	NR-CHGR35	FLAG-LOSP	IE-T1
7	1.1327E-06	B-1HR	DC1-MAI-MA-BCC31	AC4-RCK-NO-BCH37	NR-CHGR35	FLAG-LOSP	IE-T1
8	1.1191E-06	B-1HR	DC1-MAI-MA-BCC31	FLAG-LOSP	NR-CHGR35	SWS-STR-PG-36	IE-T1
9	7.1587E-07	B-1HR	DC1-MAI-MA-BCC31	FLAG-LOSP	NR-CHGR35	SWS-MDP-FS-PMP36	IE-T1
10	6.7962E-07	B-1HR	DC1-MAI-MA-BCC31	FLAG-LOSP	NR-CHGR35	SWS-MDP-RS-PM35	IE-T1
11	6.4131E-07	AFW-MAI-MA-TDP32	B-1HR	SWS-XHE-RE-SWN29	IE-T1		
12	6.0401E-07	AFW-XHE-RE-AFW32	B-1HR	SWS-XHE-RE-SWN29	IE-T1		

Sequence: T1-26-TB-9

13	5.2219E-07	AFW-TDP-FS-TDP32	B-1HR	SWS-XHE-RE-SWN29	IE-T1		
14	4.8753E-07	AFW-TDP-FR-TDP32	B-1HR	SWS-CCF-CC-EDGS	IE-T1		
15	4.5308E-07	B-1HR	DC1-MAI-MA-BCC31	FLAG-LOSP	NR-CHGR35	SWS-CKV-OO-SW1-4	IE-T1
16	3.5165E-07	B-1HR	DC1-MAI-MA-BCC31	EDG-GEN-HW-EDG32	NR-CHGR35	EDG-MAI-MA-EDG31	IE-T1
17	3.4001E-07	B-1HR	DC1-MAI-MA-BCC31	EDG-GEN-HW-EDG31	NR-CHGR35	EDG-MAI-MA-EDG32	IE-T1
18	3.0080E-07	AFW-RCK-NO-TDP32	B-1HR	SWS-XHE-RE-SWN29	IE-T1		
19	2.9925E-07	B-1HR	DC1-MAI-MA-BCC31	EDG-GEN-HW-EDG31	NR-CHGR35	EDG-GEN-HW-EDG32	IE-T1
20	2.7556E-07	AFW-MAI-MA-TDP32	B-1HR	SWS-CCF-CC-EDGS	IE-T1		
21	2.6732E-07	B-1HR	DC1-MAI-MA-BCC31	FLAG-LOSP	NR-CHGR35	SWS-MDP-FR-PM35	IE-T1
22	2.6732E-07	B-1HR	DC1-MAI-MA-BCC31	FLAG-LOSP	NR-CHGR35	SWS-MDP-FR-PM36	IE-T1
23	2.6149E-07	AFW-TDP-FR-TDP32	B-1HR	SWS-CCF-FR-ESSPM	IE-T1		
24	2.5953E-07	AFW-XHE-RE-AFW32	B-1HR	SWS-CCF-CC-EDGS	IE-T1		
25	2.5267E-07	AFW-XHE-FO-HC405	B-1HR	SWS-XHE-RE-SWN29	IE-T1		
26	2.5167E-07	AFW-TDP-FR-TDP32	B-1HR	AC4-RCI-FE-U1-3A	SWS-MAI-MA-PM36	IE-T1	
27	2.5167E-07	AFW-TDP-FR-TDP32	B-1HR	AC4-RCI-FE-U1-5A	SWS-MAI-MA-PM36	IE-T1	
28	2.2518E-07	B-1HR	DC1-MAI-MA-BCC31	FLAG-LOSP	NR-CHGR35	SWS-XHE-RE-PMP36	IE-T1
29	2.2438E-07	AFW-TDP-FS-TDP32	B-1HR	SWS-CCF-CC-EDGS	IE-T1		
30	1.9347E-07	B-1HR	DC1-MAI-MA-BCC31	FLAG-LOSP	NR-CHGR35	SWS-CRB-DN-52SW6	IE-T1

Sequence: T1-26-TB-9

31	1.8733E-07	B-1HR	DC1-BAT-HW-BAT31	FLAG-LOSP	SWS-MAI-MA-PM36	IE-T1	
32	1.4780E-07	AFW-MAI-MA-TDP32	B-1HR	SWS-CCF-FR-ESSPM	IE-T1		
33	1.4225E-07	AFW-MAI-MA-TDP32	B-1HR	AC4-RCI-FE-U1-3A	SWS-MAI-MA-PM36	IE-T1	
34	1.4225E-07	AFW-MAI-MA-TDP32	B-1HR	AC4-RCI-FE-U1-5A	SWS-MAI-MA-PM36	IE-T1	
35	1.4005E-07	AFW-TDP-FR-TDP32	B-1HR	SWS-XVM-OC-29	IE-T1		
36	1.4005E-07	AFW-TDP-FR-TDP32	B-1HR	SWS-XVM-OC-55	IE-T1		
37	1.3920E-07	AFW-XHE-RE-AFW32	B-1HR	SWS-CCF-FR-ESSPM	IE-T1		
38	1.3476E-07	AFW-AOV-CC-P1139	B-1HR	SWS-XHE-RE-SWN29	IE-T1		
39	1.3398E-07	AFW-XHE-RE-AFW32	B-1HR	AC4-RCI-FE-U1-3A	SWS-MAI-MA-PM36	IE-T1	
40	1.3398E-07	AFW-XHE-RE-AFW32	B-1HR	AC4-RCI-FE-U1-5A	SWS-MAI-MA-PM36	IE-T1	
41	1.2925E-07	AFW-RCK-NO-TDP32	B-1HR	SWS-CCF-CC-EDGS	IE-T1		
42	1.2100E-07	AFW-TDP-FR-TDP32	B-1HR	FLAG-LOSP	SWS-MAI-MA-PM36	SWS-MDP-RS-PM35	IE-T1
43	1.2100E-07	AFW-TDP-FR-TDP32	B-1HR	FLAG-LOSP	SWS-MAI-MA-PM36	SWS-MDP-RS-PM34	IE-T1
44	1.2035E-07	AFW-TDP-FS-TDP32	B-1HR	SWS-CCF-FR-ESSPM	IE-T1		
45	1.1599E-07	B-1HR	DC1-MAI-MA-BCC31	SWS-XHE-RE-SWN29	NR-CHGR35	IE-T1	
46	1.1583E-07	AFW-TDP-FS-TDP32	B-1HR	AC4-RCI-FE-U1-5A	SWS-MAI-MA-PM36	IE-T1	
47	1.1583E-07	AFW-TDP-FS-TDP32	B-1HR	AC4-RCI-FE-U1-3A	SWS-MAI-MA-PM36	IE-T1	
48	1.0857E-07	AFW-XHE-FO-HC405	B-1HR	SWS-CCF-CC-EDGS	IE-T1		

Sequence: T1-26-TB-9

49	9.8518E-08	B-1HR	DC1-MAI-MA-BCC31	AC4-RCS-OO-U6AX2	NR-CHGR35	EDG-MAI-MA-EDG31	FLAG-LOSP	IE-T1
50	9.6506E-08	B-1HR	DC1-MAI-MA-BCC31	AC4-XHE-RE-MCC6C	NR-CHGR35	FLAG-LOSP	IE-T1	
51	8.8406E-08	AFW-TDP-FR-TDP32	B-1HR	EDG-GEN-HW-EDG32	EDG-GEN-HW-EDG33	EDG-MAI-MA-EDG31	IE-T1	
52	8.5479E-08	AFW-TDP-FR-TDP32	B-1HR	EDG-GEN-HW-EDG31	EDG-GEN-HW-EDG33	EDG-MAI-MA-EDG32	IE-T1	
53	8.3838E-08	B-1HR	DC1-MAI-MA-BCC31	AC4-RCS-OO-U6AX2	NR-CHGR35	EDG-GEN-HW-EDG31	FLAG-LOSP	IE-T1
54	7.9161E-08	AFW-MAI-MA-TDP32	B-1HR	SWS-XVM-OC-29	IE-T1			
55	7.9161E-08	AFW-MAI-MA-TDP32	B-1HR	SWS-XVM-OC-55	IE-T1			
56	7.5233E-08	AFW-TDP-FR-TDP32	B-1HR	EDG-GEN-HW-EDG31	EDG-GEN-HW-EDG32	EDG-GEN-HW-EDG33	IE-T1	
57	7.4557E-08	AFW-XHE-RE-AFW32	B-1HR	SWS-XVM-OC-55	IE-T1			
58	7.4557E-08	AFW-XHE-RE-AFW32	B-1HR	SWS-XVM-OC-29	IE-T1			
59	7.4305E-08	B-1HR	DC1-MAI-MA-BCC31	FLAG-LOSP	NR-CHGR35	SWS-STR-PG-35	IE-T1	
60	6.9325E-08	AFW-RCK-NO-TDP32	B-1HR	SWS-CCF-FR-ESSPM	IE-T1			
61	6.8389E-08	AFW-MAI-MA-TDP32	B-1HR	FLAG-LOSP	SWS-MAI-MA-PM36	SWS-MDP-RS-PM34	IE-T1	
62	6.8389E-08	AFW-MAI-MA-TDP32	B-1HR	FLAG-LOSP	SWS-MAI-MA-PM36	SWS-MDP-RS-PM35	IE-T1	
63	6.7622E-08	AFW-TDP-FR-TDP32	B-1HR	EDG-GEN-HW-EDG31	EDG-GEN-HW-EDG32	EDG-MAI-MA-EDG33	IE-T1	
64	6.6721E-08	AFW-RCK-NO-TDP32	B-1HR	AC4-RCI-FE-U1-3A	SWS-MAI-MA-PM36	IE-T1		
65	6.6721E-08	AFW-RCK-NO-TDP32	B-1HR	AC4-RCI-FE-U1-5A	SWS-MAI-MA-PM36	IE-T1		
66	6.4458E-08	AFW-TDP-FS-TDP32	B-1HR	SWS-XVM-OC-29	IE-T1			

Sequence: T1-26-TB-9

67	6.4458E-08	AFW-TDP-FS-TDP32	B-1HR	SWS-XVM-OC-55	IE-T1			
68	6.4412E-08	AFW-XHE-RE-AFW32	B-1HR	FLAG-LOSP	SWS-MAI-MA-PM36	SWS-MDP-RS-PM35	IE-T1	
69	6.4412E-08	AFW-XHE-RE-AFW32	B-1HR	FLAG-LOSP	SWS-MAI-MA-PM36	SWS-MDP-RS-PM34	IE-T1	
70	6.3763E-08	B-1HR	DC1-MAI-MA-BCC31	EDG-ENG-FR-DG32R	NR-CHGR35	EDG-MAI-MA-EDG31	IE-T1	
71	6.1652E-08	B-1HR	DC1-MAI-MA-BCC31	EDG-ENG-FR-DG31R	NR-CHGR35	EDG-MAI-MA-EDG32	IE-T1	
72	5.8233E-08	AFW-XHE-FO-HC405	B-1HR	SWS-CCF-FR-ESSPM	IE-T1			
73	5.7904E-08	AFW-AOV-CC-P1139	B-1HR	SWS-CCF-CC-EDGS	IE-T1			
74	5.6046E-08	AFW-XHE-FO-HC405	B-1HR	AC4-RCI-FE-U1-5A	SWS-MAI-MA-PM36	IE-T1		
75	5.6046E-08	AFW-XHE-FO-HC405	B-1HR	AC4-RCI-FE-U1-3A	SWS-MAI-MA-PM36	IE-T1		
76	5.5687E-08	AFW-TDP-FS-TDP32	B-1HR	FLAG-LOSP	SWS-MAI-MA-PM36	SWS-MDP-RS-PM34	IE-T1	
77	5.5687E-08	AFW-TDP-FS-TDP32	B-1HR	FLAG-LOSP	SWS-MAI-MA-PM36	SWS-MDP-RS-PM35	IE-T1	
78	5.5261E-08	AFW-TDP-FR-TDP32	B-1HR	AC4-CRB-CC-2AT5A	EDG-MAI-MA-EDG32	IE-T1		
79	5.4262E-08	B-1HR	DC1-MAI-MA-BCC31	EDG-ENG-FR-DG32R	NR-CHGR35	EDG-GEN-HW-EDG31	IE-T1	
80	5.4262E-08	B-1HR	DC1-MAI-MA-BCC31	EDG-ENG-FR-DG31R	NR-CHGR35	EDG-GEN-HW-EDG32	IE-T1	
81	4.9969E-08	AFW-MAI-MA-TDP32	B-1HR	EDG-GEN-HW-EDG32	EDG-GEN-HW-EDG33	EDG-MAI-MA-EDG31	IE-T1	
82	4.9839E-08	B-1HR	DC1-MAI-MA-BCC31	SWS-CCF-CC-EDGS	NR-CHGR35	IE-T1		
83	4.8637E-08	AFW-TDP-FR-TDP32	B-1HR	AC4-CRB-CC-2AT5A	EDG-GEN-HW-EDG32	IE-T1		
84	4.8314E-08	AFW-MAI-MA-TDP32	B-1HR	EDG-GEN-HW-EDG31	EDG-GEN-HW-EDG33	EDG-MAI-MA-EDG32	IE-T1	

Sequence: T1-26-TB-9

85	4.7592E-08	AFW-TDP-FR-TDP32	B-1HR	SWS-MAI-MA-PM36	SWS-MDP-FR-PM35	IE-T1	
86	4.7592E-08	AFW-TDP-FR-TDP32	B-1HR	SWS-MAI-MA-PM36	SWS-MDP-FR-PM34	IE-T1	
87	4.7062E-08	AFW-XHE-RE-AFW32	B-1HR	EDG-GEN-HW-EDG32	EDG-GEN-HW-EDG33	EDG-MAI-MA-EDG31	IE-T1
88	4.6842E-08	AFW-TDP-FR-TDP32	EDG-GEN-HW-EDG32	EDG-MAI-MA-EDG31	B-BATT-NDEP	IE-T1	
89	4.5504E-08	AFW-XHE-RE-AFW32	B-1HR	EDG-GEN-HW-EDG31	EDG-GEN-HW-EDG33	EDG-MAI-MA-EDG32	IE-T1
90	4.5308E-08	B-1HR	DC1-MAI-MA-BCC31	FLAG-LOSP	NR-CHGR35	SWS-CKV-CC-SW1-6	IE-T1
91	4.5291E-08	AFW-TDP-FR-TDP32	EDG-GEN-HW-EDG31	EDG-MAI-MA-EDG32	B-BATT-NDEP	IE-T1	
92	4.3144E-08	AFW-TDP-FR-TDP32	B-1HR	AC4-RCI-FE-U1-3A	AC4-RCI-FE-U1-6A	IE-T1	
93	4.3144E-08	AFW-TDP-FR-TDP32	B-1HR	AC4-RCI-FE-U1-5A	AC4-RCI-FE-U1-6A	IE-T1	
94	4.3144E-08	AFW-TDP-FR-TDP32	B-1HR	AC4-RCI-FE-U1-3A	AC4-RCI-FE-U1-5A	IE-T1	
95	4.2941E-08	B-1HR	DC1-SBR-CO-BAT31	FLAG-LOSP	SWS-MAI-MA-PM36	IE-T1	
96	4.2523E-08	AFW-MAI-MA-TDP32	B-1HR	EDG-GEN-HW-EDG31	EDG-GEN-HW-EDG32	EDG-GEN-HW-EDG33	IE-T1
97	4.0687E-08	AFW-TDP-FS-TDP32	B-1HR	EDG-GEN-HW-EDG32	EDG-GEN-HW-EDG33	EDG-MAI-MA-EDG31	IE-T1
98	4.0050E-08	AFW-XHE-RE-AFW32	B-1HR	EDG-GEN-HW-EDG31	EDG-GEN-HW-EDG32	EDG-GEN-HW-EDG33	IE-T1
99	3.9862E-08	AFW-TDP-FR-TDP32	EDG-GEN-HW-EDG31	EDG-GEN-HW-EDG32	B-BATT-NDEP	IE-T1	
100	3.9340E-08	AFW-TDP-FS-TDP32	B-1HR	EDG-GEN-HW-EDG31	EDG-GEN-HW-EDG33	EDG-MAI-MA-EDG32	IE-T1

A-6

Initiating event frequency	= 4.77E-04/yr
Top event unavailability	= 4.401E-03
Sequence frequency	= 2.1E-06/yr
Number of cut sets in equation	= 2
Cutoff value used last step	= 1.000E-09
Longest cut set (# of events)	= 3
Basic Event Data file referenced	= IP3Run

1	4.4000E-03	OLR-A	IE-A	
2	5.5200E-07	HHI-ASL-HI-LT920	NR-LIC921	IE-A

T2-32-TH-19A

Initiating event frequency	= 1.11/yr
Top event unavailability	= 1.523E-06
Sequence frequency	= 1.7E-06/yr
Number of cut sets in equation	= 1
Cutoff value used last step	= 1.000E-09
Longest cut set (# of events)	= 3
Basic Event Data file referenced	= IP3TH

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1 1.5228E-06 C MRI PR2 IE-T2

TDC32-2

Initiating event frequency	= 3.0E-03/yr
Top event unavailability	= 4.873E-04
Sequence frequency	= 1.5E-06/yr
Number of cut sets in equation	= 354
Cutoff value used last step	= 1.000E-09
Longest cut set (# of events)	= 4
Basic Event Data file referenced	= IP3Run

1	4.8470E-05	AFW-MAI-MA-PM31	AFW-TDP-FR-TDP32	IE-TDC32
2	4.4792E-05	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW31	IE-TDC32
3	3.0000E-05	AFV-MOD-CC-IL314	NR-AFBV	IE-TDC32
4	2.5803E-05	AFW-MAI-MA-PM31	AFW-XHE-RE-AFW32	IE-TDC32
5	2.5318E-05	AFW-MAI-MA-TDP32	AFW-XHE-RE-AFW31	IE-TDC32
6	2.3845E-05	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW32	IE-TDC32
7	2.3575E-05	AFW-RCK-NO-PM31	AFW-TDP-FR-TDP32	IE-TDC32
8	2.2308E-05	AFW-MAI-MA-PM31	AFW-TDP-FS-TDP32	IE-TDC32
9	2.0615E-05	AFW-TDP-FS-TDP32	AFW-XHE-RE-AFW31	IE-TDC32
10	1.3325E-05	AFW-MAI-MA-TDP32	AFW-RCK-NO-PM31	IE-TDC32
11	1.2850E-05	AFW-MAI-MA-PM31	AFW-RCK-NO-TDP32	IE-TDC32
12	1.2825E-05	AFW-MDP-FS-PM31	AFW-TDP-FR-TDP32	IE-TDC32

Sequence: TDC32-2

13	1.2550E-05	AFW-RCK-NO-PM31	AFW-XHE-RE-AFW32	IE-TDC32
14	1.1875E-05	AFW-RCK-NO-TDP32	AFW-XHE-RE-AFW31	IE-TDC32
15	1.0850E-05	AFW-RCK-NO-PM31	AFW-TDP-FS-TDP32	IE-TDC32
16	1.0794E-05	AFW-MAI-MA-PM31	AFW-XHE-FO-HC405	IE-TDC32
17	9.9750E-06	AFW-XHE-FO-HC405	AFW-XHE-RE-AFW31	IE-TDC32
18	9.0000E-06	AFV-MOD-CC-ED311	AFV-MOD-CC-ED312	IE-TDC32
19	7.2488E-06	AFW-MAI-MA-TDP32	AFW-MDP-FS-PM31	IE-TDC32
20	6.8272E-06	AFW-MDP-FS-PM31	AFW-XHE-RE-AFW32	IE-TDC32
21	6.2500E-06	AFW-RCK-NO-PM31	AFW-RCK-NO-TDP32	IE-TDC32
22	5.9024E-06	AFW-MDP-FS-PM31	AFW-TDP-FS-TDP32	IE-TDC32
23	5.7568E-06	AFW-AOV-CC-P1139	AFW-MAI-MA-PM31	IE-TDC32
24	5.3200E-06	AFW-AOV-CC-P1139	AFW-XHE-RE-AFW31	IE-TDC32
25	5.2500E-06	AFW-RCK-NO-PM31	AFW-XHE-FO-HC405	IE-TDC32
26	4.0266E-06	AFW-CRB-DN-52AF1	AFW-TDP-FR-TDP32	IE-TDC32
27	3.9606E-06	AFW-MDP-FR-PM31	AFW-TDP-FR-TDP32	IE-TDC32
28	3.4000E-06	AFW-MDP-FS-PM31	AFW-RCK-NO-TDP32	IE-TDC32
29	2.8560E-06	AFW-MDP-FS-PM31	AFW-XHE-FO-HC405	IE-TDC32
30	2.8290E-06	AFW-RLY-NO-312-1	AFW-TDP-FR-TDP32	IE-TDC32

31	2.8000E-06	AFW-AOV-CC-P1139	AFW-RCK-NO-PM31	IE-TDC32
32	2.2759E-06	AFW-CRB-DN-52AF1	AFW-MAI-MA-TDP32	IE-TDC32
33	2.2386E-06	AFW-MAI-MA-TDP32	AFW-MDP-FR-PM31	IE-TDC32
34	2.1600E-06	AFV-FAN-FR-EF312	AFV-MOD-CC-ED311	IE-TDC32
35	2.1435E-06	AFW-CRB-DN-52AF1	AFW-XHE-RE-AFW32	IE-TDC32
36	2.1084E-06	AFW-MDP-FR-PM31	AFW-XHE-RE-AFW32	IE-TDC32
37	1.8532E-06	AFW-CRB-DN-52AF1	AFW-TDP-FS-TDP32	IE-TDC32
38	1.8228E-06	AFW-MDP-FR-PM31	AFW-TDP-FS-TDP32	IE-TDC32
39	1.5990E-06	AFW-MAI-MA-TDP32	AFW-RLY-NO-312-1	IE-TDC32
40	1.5420E-06	AFW-MAI-MA-PM31	AFW-RLY-NO-BFPL	IE-TDC32
41	1.5232E-06	AFW-AOV-CC-P1139	AFW-MDP-FS-PM31	IE-TDC32
42	1.5060E-06	AFW-RLY-NO-312-1	AFW-XHE-RE-AFW32	IE-TDC32
43	1.4250E-06	AFW-RLY-NO-BFPL	AFW-XHE-RE-AFW31	IE-TDC32
44	1.3020E-06	AFW-RLY-NO-312-1	AFW-TDP-FS-TDP32	IE-TDC32
45	1.0844E-06	AFW-CCF-FS-AFWPM	AFW-TDP-FR-TDP32	IE-TDC32
46	1.0675E-06	AFW-CRB-DN-52AF1	AFW-RCK-NO-TDP32	IE-TDC32
47	1.0500E-06	AFW-MDP-FR-PM31	AFW-RCK-NO-TDP32	IE-TDC32
48	9.0000E-07	AFV-FAN-FS-EF311	AFV-MOD-CC-ED312	IE-TDC32

Sequence: TDC32-2

49	9.0000E-07	AFV-FAN-FS-EF312	AFV-MOD-CC-ED311	IE-TDC32
50	8.9670E-07	AFW-CRB-DN-52AF1	AFW-XHE-FO-HC405	IE-TDC32
51	8.8200E-07	AFW-MDP-FR-PM31	AFW-XHE-FO-HC405	IE-TDC32
52	8.6662E-07	AFW-MAI-MA-31VLV	AFW-TDP-FR-TDP32	IE-TDC32
53	8.0532E-07	AFW-CKV-CC-BFD34	AFW-TDP-FR-TDP32	IE-TDC32
54	7.6475E-07	AFW-MAI-MA-32VLV	AFW-XHE-RE-AFW31	IE-TDC32
55	7.5000E-07	AFW-RCK-NO-TDP32	AFW-RLY-NO-312-1	IE-TDC32
56	7.5000E-07	AFW-RCK-NO-PM31	AFW-RLY-NO-BFPL	IE-TDC32
57	6.8000E-07	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-64	IE-TDC32
58	6.8000E-07	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-6	IE-TDC32
59	6.3000E-07	AFW-RLY-NO-312-1	AFW-XHE-FO-HC405	IE-TDC32
60	6.1295E-07	AFW-CCF-FS-AFWPM	AFW-MAI-MA-TDP32	IE-TDC32
61	5.7730E-07	AFW-CCF-FS-AFWPM	AFW-XHE-RE-AFW32	IE-TDC32
62	5.6540E-07	AFW-CCF-CC-TDPDV	AFW-MAI-MA-PM31	IE-TDC32
63	5.2250E-07	AFW-CCF-CC-TDPDV	AFW-XHE-RE-AFW31	IE-TDC32
64	4.9910E-07	AFW-CCF-FS-AFWPM	AFW-TDP-FS-TDP32	IE-TDC32
65	4.7824E-07	AFW-AOV-CC-P1139	AFW-CRB-DN-52AF1	IE-TDC32
66	4.7040E-07	AFW-AOV-CC-P1139	AFW-MDP-FR-PM31	IE-TDC32

Sequence: TDC32-2

67	4.6134E-07	AFW-MAI-MA-31VLV	AFW-XHE-RE-AFW32	IE-TDC32
68	4.5518E-07	AFW-CKV-CC-BFD34	AFW-MAI-MA-TDP32	IE-TDC32
69	4.3896E-07	AFW-CKV-CC-BFD5O	AFW-MAI-MA-PM31	IE-TDC32
70	4.3896E-07	AFW-CKV-CC-BFD31	AFW-MAI-MA-PM31	IE-TDC32
71	4.2871E-07	AFW-CKV-CC-BFD34	AFW-XHE-RE-AFW32	IE-TDC32
72	4.0800E-07	AFW-MDP-FS-PM31	AFW-RLY-NO-BFPL	IE-TDC32
73	4.0565E-07	AFW-CKV-CC-BFD31	AFW-XHE-RE-AFW31	IE-TDC32
74	4.0565E-07	AFW-CKV-CC-BFD5O	AFW-XHE-RE-AFW31	IE-TDC32
75	4.0250E-07	AFW-MAI-MA-32VLV	AFW-RCK-NO-PM31	IE-TDC32
76	3.9885E-07	AFW-MAI-MA-31VLV	AFW-TDP-FS-TDP32	IE-TDC32
77	3.7064E-07	AFW-CKV-CC-BFD34	AFW-TDP-FS-TDP32	IE-TDC32
78	3.3600E-07	AFW-AOV-CC-P1139	AFW-RLY-NO-312-1	IE-TDC32
79	2.8750E-07	AFW-CCF-FS-AFWPM	AFW-RCK-NO-TDP32	IE-TDC32
80	2.8290E-07	AFW-MSW-DN-1-AF1	AFW-TDP-FR-TDP32	IE-TDC32
81	2.7500E-07	AFW-CCF-CC-TDPDV	AFW-RCK-NO-PM31	IE-TDC32
82	2.4150E-07	AFW-CCF-FS-AFWPM	AFW-XHE-FO-HC405	IE-TDC32
83	2.2975E-07	AFW-MAI-MA-31VLV	AFW-RCK-NO-TDP32	IE-TDC32
84	2.1896E-07	AFW-MAI-MA-32VLV	AFW-MDP-FS-PM31	IE-TDC32

Sequence: TDC32-2

85	2.1600E-07	AFV-FAN-FR-EF312	AFV-FAN-FS-EF311	IE-TDC32
86	2.1350E-07	AFW-CKV-CC-BFD34	AFW-RCK-NO-TDP32 I	E-TDC32
87	2.1350E-07	AFW-CKV-CC-BFD5O	AFW-RCK-NO-PM31	IE-TDC32
88	2.1350E-07	AFW-CKV-CC-BFD31	AFW-RCK-NO-PM31	IE-TDC32
89	1.9299E-07	AFW-MAI-MA-31VLV	AFW-XHE-FO-HC405	IE-TDC32
90	1.8504E-07	AFW-MAI-MA-PM31	AFW-ORF-PG-TDP32	IE-TDC32
91	1.8401E-07	AFW-AOV-PG-1310A	AFW-MAI-MA-PM31	IE-TDC32
92	1.8401E-07	AFW-AOV-PG-1310B	AFW-MAI-MA-PM31	IE-TDC32
93	1.7934E-07	AFW-CKV-CC-BFD34	AFW-XHE-FO-HC405	IE-TDC32
94	1.7476E-07	AFW-MAI-MA-PM31	AFW-XVM-PG-BFD51	IE-TDC32
95	1.7476E-07	AFW-MAI-MA-PM31	AFW-XVM-PG-MS54	IE-TDC32
96	1.7100E-07	AFW-ORF-PG-TDP32	AFW-XHE-RE-AFW31	IE-TDC32
97	1.7005E-07	AFW-AOV-PG-1310B	AFW-XHE-RE-AFW31	IE-TDC32
98	1.7005E-07	AFW-AOV-PG-1310A	AFW-XHE-RE-AFW31	IE-TDC32
99	1.6150E-07	AFW-XHE-RE-AFW31	AFW-XVM-PG-MS54	IE-TDC32
100	1.6150E-07	AFW-XHE-RE-AFW31	AFW-XVM-PG-BFD51	IE-TDC32

T2-18

Initiating event frequency	= 1.11/yr
Top event unavailability	= 1.145E-06
Sequence frequency	= 1.3E-06/yr
Number of cut sets in equation	= 86
Cutoff value used last step	= 1.000E-09
Longest cut set (# of events)	= 6
Basic Event Data file referenced	= IP3Run

1	6.3000E-07	AFV-MOD-CC-IL314	FB-T2	NR-AFBV	SL-T2-SUCC	IE-T2
2	1.2810E-07	AFV-MOD-CC-IL314	NR-AFBV	PPR-PRV-CC-455C	SL-T2-SUCC	IE-T2
3	1.2810E-07	AFV-MOD-CC-IL314	NR-AFBV	PPR-PRV-CC-456	SL-T2-SUCC	IE-T2
4	2.2773E-08	AFW-CCF-FS-AFWPM	AFW-TDP-FR-TDP32	FB-T2	SL-T2-SUCC	IE-T2
5	1.4280E-08	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-64	FB-T2	SL-T2-SUCC	IE-T2
6	1.4280E-08	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-6	FB-T2	SL-T2-SUCC	IE-T2
7	1.4100E-08	AFV-MOD-CC-IL314	NR-AFBV	PPR-CCF-CC-PORVS	SL-T2-SUCC	IE-T2
8	1.2872E-08	AFW-CCF-FS-AFWPM	AFW-MAI-MA-TDP32	FB-T2	SL-T2-SUCC	IE-T2
9	1.2123E-08	AFW-CCF-FS-AFWPM	AFW-XHE-RE-AFW32	FB-T2	SL-T2-SUCC	IE-T2
10	1.0481E-08	AFW-CCF-FS-AFWPM	AFW-TDP-FS-TDP32	FB-T2	SL-T2-SUCC	IE-T2
11	6.0375E-09	AFW-CCF-FS-AFWPM	AFW-RCK-NO-TDP32	FB-T2	SL-T2-SUCC	IE-T2
12	5.0715E-09	AFW-CCF-FS-AFWPM	AFW-XHE-FO-HC405	FB-T2	SL-T2-SUCC	IE-T2
13	4.8349E-09	AFW-MAI-MA-PM31	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T2

Sequence: T2-18

14	4.6306E-09	AFW-CCF-FS-AFWPM	AFW-TDP-FR-TDP32	PPR-PRV-CC-456	SL-T2-SUCC	IE-T2	
15	4.6306E-09	AFW-CCF-FS-AFWPM	AFW-TDP-FR-TDP32	PPR-PRV-CC-455C	SL-T2-SUCC	IE-T2	
16	4.4681E-09	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T2
17	3.1758E-09	AC4-RCI-FE-U1-6A	AFW-MAI-MA-PM31	AFW-TDP-FR-TDP32	FB-T2	SL-T2-SUCC	IE-T2
18	3.0289E-09	AFW-MAI-MA-PM33	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW31	FB-T2	SL-T2-SUCC	IE-T2
19	2.9348E-09	AC4-RCI-FE-U1-3A	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T2
20	2.9348E-09	AC4-RCI-FE-U1-6A	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW31	FB-T2	SL-T2-SUCC	IE-T2
21	2.9036E-09	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-64	PPR-PRV-CC-455C	SL-T2-SUCC	IE-T2	
22	2.9036E-09	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-64	PPR-PRV-CC-456	SL-T2-SUCC	IE-T2	
23	2.9036E-09	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-6	PPR-PRV-CC-455C	SL-T2-SUCC	IE-T2	
24	2.9036E-09	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-6	PPR-PRV-CC-456	SL-T2-SUCC	IE-T2	
25	2.7048E-09	AFW-AOV-CC-P1139	AFW-CCF-FS-AFWPM	FB-T2	SL-T2-SUCC	IE-T2	
26	2.6173E-09	AFW-CCF-FS-AFWPM	AFW-MAI-MA-TDP32	PPR-PRV-CC-455C	SL-T2-SUCC	IE-T2	
27	2.6173E-09	AFW-CCF-FS-AFWPM	AFW-MAI-MA-TDP32	PPR-PRV-CC-456	SL-T2-SUCC	IE-T2	
28	2.5738E-09	AFW-MAI-MA-PM31	AFW-XHE-RE-AFW32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T2
29	2.5447E-09	AFW-MAI-MA-PM31	AFW-RCK-NO-PM33	AFW-TDP-FR-TDP32	FB-T2	SL-T2-SUCC	IE-T2
30	2.5254E-09	AFW-MAI-MA-TDP32	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T2
31	2.4651E-09	AFW-CCF-FS-AFWPM	AFW-XHE-RE-AFW32	PPR-PRV-CC-456	SL-T2-SUCC	IE-T2	
32	2.4651E-09	AFW-CCF-FS-AFWPM	AFW-XHE-RE-AFW32	PPR-PRV-CC-455C	SL-T2-SUCC	IE-T2	

Sequence: T2-18

33	2.4150E-09	AC1-BAC-ST-LP324	FB-T2	NR-AFBV	SL-T2-SUCC	IE-T2	
34	2.4150E-09	AC1-BAC-ST-LB33	FB-T2	NR-AFBV	SL-T2-SUCC	IE-T2	
35	2.3790E-09	AFW-AOV-OO-11581	AFW-AOV-OO-11582	AFW-XHE-FO-CITYW	FB-T2	SL-T2-SUCC	IE-T2
36	2.3785E-09	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T2
37	2.3516E-09	AFW-RCK-NO-PM33	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW31	FB-T2	SL-T2-SUCC	IE-T2
38	2.3516E-09	AC4-RCK-NO-BC36C	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T2
39	2.3516E-09	AFW-RCK-NO-PM31	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T2
40	2.2252E-09	AFW-MAI-MA-PM31	AFW-TDP-FS-TDP32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T2
41	2.1312E-09	AFW-CCF-FS-AFWPM	AFW-TDP-FS-TDP32	PPR-PRV-CC-455C	SL-T2-SUCC	IE-T2	
42	2.1312E-09	AFW-CCF-FS-AFWPM	AFW-TDP-FS-TDP32	PPR-PRV-CC-456	SL-T2-SUCC	IE-T2	
43	2.0563E-09	AFW-TDP-FS-TDP32	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T2
44	1.9895E-09	AC4-RCI-FE-U1-3A	AFW-MAI-MA-PM33	AFW-TDP-FR-TDP32	FB-T2	SL-T2-SUCC	IE-T2
45	1.8900E-09	AFV-MOD-CC-ED311	AFV-MOD-CC-ED312	FB-T2	NR-AFBV	SL-T2-SUCC	IE-T2
46	1.6906E-09	AC4-RCI-FE-U1-6A	AFW-MAI-MA-PM31	AFW-XHE-RE-AFW32	FB-T2	SL-T2-SUCC	IE-T2
47	1.6588E-09	AC4-RCI-FE-U1-3A	AFW-MAI-MA-TDP32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T2
48	1.6588E-09	AC4-RCI-FE-U1-6A	AFW-MAI-MA-TDP32	AFW-XHE-RE-AFW31	FB-T2	SL-T2-SUCC	IE-T2
49	1.6367E-09	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW33	DC1-MAI-MA-BCC33	FB-T2	SL-T2-SUCC	IE-T2
50	1.6124E-09	AFW-MAI-MA-PM33	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW32	FB-T2	SL-T2-SUCC	IE-T2

Sequence: T2-18

51	1.5941E-09	AC4-RCK-NO-BC36C	AFW-MAI-MA-PM33	AFW-TDP-FR-TDP32	FB-T2	SL-T2-SUCC	IE-T2
52	1.5941E-09	AFW-MAI-MA-PM33	AFW-RCK-NO-PM31	AFW-TDP-FR-TDP32	FB-T2	SL-T2-SUCC	IE-T2
53	1.5623E-09	AC4-RCI-FE-U1-3A	AFW-XHE-RE-AFW32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T2
54	1.5623E-09	AC4-RCI-FE-U1-6A	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW32	FB-T2	SL-T2-SUCC	IE-T2
55	1.5446E-09	AC4-RCI-FE-U1-6A	AFW-RCK-NO-PM31	AFW-TDP-FR-TDP32	FB-T2	SL-T2-SUCC	IE-T2
56	1.5446E-09	AC4-RCI-FE-U1-3A	AFW-RCK-NO-PM33	AFW-TDP-FR-TDP32	FB-T2	SL-T2-SUCC	IE-T2
57	1.4616E-09	AC4-RCI-FE-U1-6A	AFW-MAI-MA-PM31	AFW-TDP-FS-TDP32	FB-T2	SL-T2-SUCC	IE-T2
58	1.3940E-09	AFW-MAI-MA-PM33	AFW-TDP-FS-TDP32	AFW-XHE-RE-AFW31	FB-T2	SL-T2-SUCC	IE-T2
59	1.3843E-09	AFW-MAI-MA-PM31	AFW-MDP-FS-PM33	AFW-TDP-FR-TDP32	FB-T2	SL-T2-SUCC	IE-T2
60	1.3546E-09	AFW-MAI-MA-PM31	AFW-RCK-NO-PM33	AFW-XHE-RE-AFW32	FB-T2	SL-T2-SUCC	IE-T2
61	1.3507E-09	AC4-RCI-FE-U1-3A	AFW-TDP-FS-TDP32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T2
62	1.3507E-09	AC4-RCI-FE-U1-6A	AFW-TDP-FS-TDP32	AFW-XHE-RE-AFW31	FB-T2	SL-T2-SUCC	IE-T2
63	1.3503E-09	AC1-SBR-CO-LP324	FB-T2	NR-AFBV	SL-T2-SUCC	IE-T2	
64	1.3292E-09	AFW-MAI-MA-TDP32	AFW-RCK-NO-PM31	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T2
65	1.3292E-09	AFW-MAI-MA-TDP32	AFW-RCK-NO-PM33	AFW-XHE-RE-AFW31	FB-T2	SL-T2-SUCC	IE-T2
66	1.3292E-09	AC4-RCK-NO-BC36C	AFW-MAI-MA-TDP32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T2
67	1.2818E-09	AFW-MAI-MA-PM31	AFW-RCK-NO-TDP32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T2
68	1.2793E-09	AFW-MDP-FS-PM31	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T2
69	1.2793E-09	AFW-MDP-FS-PM33	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW31	FB-T2	SL-T2-SUCC	IE-T2

Sequence: T2-18

70	1.2519E-09	AFW-RCK-NO-PM31	AFW-XHE-RE-AFW32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T2
71	1.2519E-09	AFW-RCK-NO-PM33	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW32	FB-T2	SL-T2-SUCC	IE-T2
72	1.2519E-09	AC4-RCK-NO-BC36C	AFW-XHE-RE-AFW32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T2
73	1.2377E-09	AFW-RCK-NO-PM31	AFW-RCK-NO-PM33	AFW-TDP-FR-TDP32	FB-T2	SL-T2-SUCC	IE-T2
74	1.2377E-09	AC4-RCK-NO-BC36C	AFW-RCK-NO-PM33	AFW-TDP-FR-TDP32	FB-T2	SL-T2-SUCC	IE-T2
75	1.2276E-09	AFW-CCF-FS-AFWPM	AFW-RCK-NO-TDP32	PPR-PRV-CC-456	SL-T2-SUCC	IE-T2	
76	1.2276E-09	AFW-CCF-FS-AFWPM	AFW-RCK-NO-TDP32	PPR-PRV-CC-455C	SL-T2-SUCC	IE-T2	
77	1.1845E-09	AFW-RCK-NO-TDP32	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T2
78	1.1711E-09	AFW-MAI-MA-PM31	AFW-RCK-NO-PM33	AFW-TDP-FS-TDP32	FB-T2	SL-T2-SUCC	IE-T2
79	1.1095E-09	AFW-MAI-MA-PM33	AFW-TDP-FR-TDP32	DC1-MAI-MA-BCC33	FB-T2	SL-T2-SUCC	IE-T2
80	1.0823E-09	AFW-RCK-NO-PM31	AFW-TDP-FS-TDP32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T2
81	1.0823E-09	AC4-RCK-NO-BC36C	AFW-TDP-FS-TDP32	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T2
82	1.0823E-09	AFW-RCK-NO-PM33	AFW-TDP-FS-TDP32	AFW-XHE-RE-AFW31	FB-T2	SL-T2-SUCC	IE-T2
83	1.0767E-09	AFW-MAI-MA-PM31	AFW-XHE-FO-HC405	AFW-XHE-RE-AFW33	FB-T2	SL-T2-SUCC	IE-T2
84	1.0591E-09	AC4-RCI-FE-U1-3A	AFW-MAI-MA-PM33	AFW-XHE-RE-AFW32	FB-T2	SL-T2-SUCC	IE-T2
85	1.0312E-09	AFW-CCF-FS-AFWPM	AFW-XHE-FO-HC405	PPR-PRV-CC-456	SL-T2-SUCC	IE-T2	
86	1.0312E-09	AFW-CCF-FS-AFWPM	AFW-XHE-FO-HC405	PPR-PRV-CC-455C	SL-T2-SUCC	IE-T2	

TDC31-2

Initiating event frequency	= 3.0E-03/yr
Top event unavailability	= 3.446E-04
Sequence frequency	= 1.0E-06/yr
Number of cut sets in equation	= 213
Cutoff value used last step	= 1.000E-09
Longest cut set (# of events)	= 4
Basic Event Data file referenced	= IP3Run

1	1.1500E-04	AFW-CCF-FS-AFWPM	IE-TDC31	
2	3.0000E-05	AFV-MOD-CC-IL314	NR-AFBV	IE-TDC31
3	2.4415E-05	AFW-MAI-MA-PM31	AFW-XHE-RE-AFW33	IE-TDC31
4	2.2562E-05	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW33	IE-TDC31
5	1.5295E-05	AFW-MAI-MA-PM33	AFW-XHE-RE-AFW31	IE-TDC31
6	1.2850E-05	AFW-MAI-MA-PM31	AFW-RCK-NO-PM33	IE-TDC31
7	1.1875E-05	AFW-RCK-NO-PM33	AFW-XHE-RE-AFW31	IE-TDC31
8	1.1875E-05	AFW-RCK-NO-PM31	AFW-XHE-RE-AFW33	IE-TDC31
9	9.0000E-06	AFV-MOD-CC-ED311	AFV-MOD-CC-ED312	IE-TDC31
10	8.0500E-06	AFW-MAI-MA-PM33	AFW-RCK-NO-PM31	IE-TDC31
11	6.9904E-06	AFW-MAI-MA-PM31	AFW-MDP-FS-PM33	IE-TDC31
12	6.4600E-06	AFW-MDP-FS-PM33	AFW-XHE-RE-AFW31	IE-TDC31

13	6.4600E-06	AFW-MDP-FS-PM31	AFW-XHE-RE-AFW33	IE-TDC31
14	6.2500E-06	AFW-RCK-NO-PM31	AFW-RCK-NO-PM33	IE-TDC31
15	4.3792E-06	AFW-MAI-MA-PM33	AFW-MDP-FS-PM31	IE-TDC31
16	3.4000E-06	AFW-MDP-FS-PM33	AFW-RCK-NO-PM31	IE-TDC31
17	3.4000E-06	AFW-MDP-FS-PM31	AFW-RCK-NO-PM33	IE-TDC31
18	2.1948E-06	AFW-CRB-DN-52AF3	AFW-MAI-MA-PM31	IE-TDC31
19	2.1600E-06	AFV-FAN-FR-EF312	AFV-MOD-CC-ED311	IE-TDC31
20	2.1588E-06	AFW-MAI-MA-PM31	AFW-MDP-FR-PM33	IE-TDC31
21	2.0282E-06	AFW-CRB-DN-52AF3	AFW-XHE-RE-AFW31	IE-TDC31
22	2.0282E-06	AFW-CRB-DN-52AF1	AFW-XHE-RE-AFW33	IE-TDC31
23	1.9950E-06	AFW-MDP-FR-PM33	AFW-XHE-RE-AFW31	IE-TDC31
24	1.9950E-06	AFW-MDP-FR-PM31	AFW-XHE-RE-AFW33	IE-TDC31
25	1.8496E-06	AFW-MDP-FS-PM31	AFW-MDP-FS-PM33	IE-TDC31
26	1.5420E-06	AFW-MAI-MA-PM31	AFW-RLY-NO-332-1	IE-TDC31
27	1.4250E-06	AFW-RLY-NO-312-1	AFW-XHE-RE-AFW33	IE-TDC31
28	1.4250E-06	AFW-RLY-NO-332-1	AFW-XHE-RE-AFW31	IE-TDC31
29	1.3749E-06	AFW-CRB-DN-52AF1	AFW-MAI-MA-PM33	IE-TDC31
30	1.3524E-06	AFW-MAI-MA-PM33	AFW-MDP-FR-PM31	IE-TDC31

31	1.0925E-06	AFW-MAI-MA-33VLV	AFW-XHE-RE-AFW31	IE-TDC31
32	1.0675E-06	AFW-CRB-DN-52AF3	AFW-RCK-NO-PM31	IE-TDC31
33	1.0675E-06	AFW-CRB-DN-52AF1	AFW-RCK-NO-PM33	IE-TDC31
34	1.0500E-06	AFW-MDP-FR-PM33	AFW-RCK-NO-PM31	IE-TDC31
35	1.0500E-06	AFW-MDP-FR-PM31	AFW-RCK-NO-PM33	IE-TDC31
36	9.6600E-07	AFW-MAI-MA-PM33	AFW-RLY-NO-312-1	IE-TDC31
37	9.0000E-07	AFV-FAN-FS-EF312	AFV-MOD-CC-ED311	IE-TDC31
38	9.0000E-07	AFV-FAN-FS-EF311	AFV-MOD-CC-ED312	IE-TDC31
39	7.5000E-07	AFW-RCK-NO-PM33	AFW-RLY-NO-312-1	IE-TDC31
40	7.5000E-07	AFW-RCK-NO-PM31	AFW-RLY-NO-332-1	IE-TDC31
41	6.8000E-07	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-6	IE-TDC31
42	6.8000E-07	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-64	IE-TDC31
43	5.8072E-07	AFW-CRB-DN-52AF1	AFW-MDP-FS-PM33	IE-TDC31
44	5.8072E-07	AFW-CRB-DN-52AF3	AFW-MDP-FS-PM31	IE-TDC31
45	5.7500E-07	AFW-MAI-MA-33VLV	AFW-RCK-NO-PM31	IE-TDC31
46	5.7120E-07	AFW-MDP-FR-PM31	AFW-MDP-FS-PM33	IE-TDC31
47	5.7120E-07	AFW-MDP-FR-PM33	AFW-MDP-FS-PM31	IE-TDC31
48	4.3896E-07	AFW-CKV-CC-BFD39	AFW-MAI-MA-PM31	IE-TDC31

49	4.3652E-07	AFW-MAI-MA-31VLV	AFW-XHE-RE-AFW33	IE-TDC31
50	4.0800E-07	AFW-MDP-FS-PM33	AFW-RLY-NO-312-1	IE-TDC31
51	4.0800E-07	AFW-MDP-FS-PM31	AFW-RLY-NO-332-1	IE-TDC31
52	4.0565E-07	AFW-CKV-CC-BFD39	AFW-XHE-RE-AFW31	E-TDC31
53	4.0565E-07	AFW-CKV-CC-BFD34	AFW-XHE-RE-AFW33	IE-TDC31
54	3.1280E-07	AFW-MAI-MA-33VLV	AFW-MDP-FS-PM31	IE-TDC31
55	2.7499E-07	AFW-CKV-CC-BFD34	AFW-MAI-MA-PM33	IE-TDC31
56	2.2975E-07	AFW-MAI-MA-31VLV	AFW-RCK-NO-PM33	IE-TDC31
57	2.1600E-07	AFV-FAN-FR-EF312	AFV-FAN-FS-EF311	IE-TDC31
58	2.1350E-07	AFW-CKV-CC-BFD39	AFW-RCK-NO-PM31	IE-TDC31
59	2.1350E-07	AFW-CKV-CC-BFD34	AFW-RCK-NO-PM33	IE-TDC31
60	1.8233E-07	AFW-CRB-DN-52AF1	AFW-CRB-DN-52AF3	IE-TDC31
61	1.7934E-07	AFW-CRB-DN-52AF3	AFW-MDP-FR-PM31	IE-TDC31
62	1.7934E-07	AFW-CRB-DN-52AF1	AFW-MDP-FR-PM33	IE-TDC31
63	1.7640E-07	AFW-MDP-FR-PM31	AFW-MDP-FR-PM33	IE-TDC31
64	1.5420E-07	AFW-MAI-MA-PM31	AFW-MSW-DN-1-AF3	IE-TDC31
65	1.4250E-07	AFW-MSW-DN-1-AF1	AFW-XHE-RE-AFW33	IE-TDC31
66	1.4250E-07	AFW-MSW-DN-1-AF3	AFW-XHE-RE-AFW31	IE-TDC31

67	1.2810E-07	AFW-CRB-DN-52AF3	AFW-RLY-NO-312-1	IE-TDC31	
68	1.2810E-07	AFW-CRB-DN-52AF1	AFW-RLY-NO-332-1	IE-TDC31	
69	1.2600E-07	AFW-MDP-FR-PM33	AFW-RLY-NO-312-1	IE-TDC31	
70	1.2600E-07	AFW-MDP-FR-PM31	AFW-RLY-NO-332-1	IE-TDC31	
71	1.2498E-07	AFW-MAI-MA-31VLV	AFW-MDP-FS-PM33	IE-TDC31	
72	1.1614E-07	AFW-CKV-CC-BFD39	AFW-MDP-FS-PM31	IE-TDC31	
73	1.1614E-07	AFW-CKV-CC-BFD34	AFW-MDP-FS-PM33	IE-TDC31	
74	1.1500E-07	AC1-BAC-ST-LB33	NR-AFBV	IE-TDC31	
75	1.1500E-07	AC1-BAC-ST-LP324	NR-AFBV	IE-TDC31	
76	1.1329E-07	AFW-AOV-OO-11581	AFW-AOV-OO-11582	AFW-XHE-FO-CITYW	IE-TDC31
77	9.8210E-08	AFW-CRB-DN-52AF1	AFW-MAI-MA-33VLV	IE-TDC31	
78	9.6600E-08	AFW-MAI-MA-33VLV	AFW-MDP-FR-PM31	IE-TDC31	
79	9.6600E-08	AFW-MAI-MA-PM33	AFW-MSW-DN-1-AF1	IE-TDC31	
80	9.0000E-08	AFW-RLY-NO-312-1	AFW-RLY-NO-332-1	IE-TDC31	
81	9.0000E-08	AFV-FAN-FS-EF311	AFV-FAN-FS-EF312	IE-TDC31	
82	9.0000E-08	AFV-FAN-FR-EF311	AFV-MOD-CC-ED312	IE-TDC31	
83	7.5000E-08	AFW-MSW-DN-1-AF3	AFW-RCK-NO-PM31	IE-TDC31	
84	7.5000E-08	AFW-MSW-DN-1-AF1	AFW-RCK-NO-PM33	IE-TDC31	

85	6.9000E-08	AFW-MAI-MA-33VLV	AFW-RLY-NO-312-1	IE-TDC31
86	6.6306E-08	AFW-CKV-LK-C6949	AFW-MAI-MA-PM31	IE-TDC31
87	6.6306E-08	AFW-CKV-LK-C7049	AFW-MAI-MA-PM31	IE-TDC31
88	6.4300E-08	AC1-SBR-CO-LP324	NR-AFBV	IE-TDC31
89	6.1275E-08	AFW-CKV-LK-C6754	AFW-XHE-RE-AFW33	IE-TDC31
90	6.1275E-08	AFW-CKV-LK-C7049	AFW-XHE-RE-AFW31	IE-TDC31
91	6.1275E-08	AFW-CKV-LK-C6874	AFW-XHE-RE-AFW33	IE-TDC31
92	6.1275E-08	AFW-CKV-LK-C6949	AFW-XHE-RE-AFW31	IE-TDC31
93	4.1538E-08	AFW-CKV-LK-C6754	AFW-MAI-MA-PM33	IE-TDC31
94	4.1538E-08	AFW-CKV-LK-C6874	AFW-MAI-MA-PM33	IE-TDC31
95	4.0800E-08	AFW-MDP-FS-PM31	AFW-MSW-DN-1-AF3	IE-TDC31
96	4.0800E-08	AFW-MDP-FS-PM33	AFW-MSW-DN-1-AF1	IE-TDC31
97	3.9241E-08	AFW-CRB-DN-52AF3	AFW-MAI-MA-31VLV	IE-TDC31
98	3.8598E-08	AFW-MAI-MA-31VLV	AFW-MDP-FR-PM33	IE-TDC31
99	3.6466E-08	AFW-CKV-CC-BFD39	AFW-CRB-DN-52AF1	IE-TDC31
100	3.6466E-08	AFW-CKV-CC-BFD34	AFW-CRB-DN-52AF3	IE-TDC31

PDS 1- SBO Plant Damage State Group

Term Number	Probability of Term	Cutset Listing		
1	6.0260E-07	APP-R-CBF	IE-10FP	
2	5.6073E-07	B-1HR	DC1-MAI-MA-BCC31	FLAG-LOSP
		NR-CHGR35	SWS-MAI-MA-PM36	IE-T1
3	5.2670E-07	APP-R-CBF	IE-4FP	
4	4.8530E-07	APP-R-CBF	IE-IACCW	
5	2.5257E-07	DC1-MAI-MA-BCC31	IE-10FP	
6	2.4707E-07	AFW-TDP-FR-TDP32	IE-10FP	
7	2.2076E-07	DC1-MAI-MA-BCC31	IE-4FP	
8	2.1595E-07	AFW-TDP-FR-TDP32	IE-4FP	
9	2.0340E-07	DC1-MAI-MA-BCC31	IE-IACCW	
10	1.9897E-07	AFW-TDP-FR-TDP32	IE-IACCW	
11	1.8602E-07	SL-CBF	IE-10FP	
12	1.6259E-07	SL-CBF	IE-4FP	
13	1.5824E-07	APP-R-CBF	IE-4FP-A	
14	1.4981E-07	SL-CBF	IE-IACCW	
15	1.3965E-07	AFW-MAI-MA-TDP32	IE-10FP	
16	1.3152E-07	AFW-XHE-RE-AFW32	IE-10FP	
17	1.2360E-07	B-BATT-SUCC	ODEP-TB-SUCC	SL-DEP
		SWS-XHE-RE-SWN29	IE-T1	
18	1.2328E-07	APP-R-CBF	IE-3SW	
19	1.2206E-07	AFW-MAI-MA-TDP32	IE-4FP	
20	1.2090E-07	B1-TBF	ARSW-TBF	SL-TBF-B
		IE-TBF		
21	1.2090E-07	B1-TBF	ARSW-TBF-SUCC	SL-TBF-B
		IE-TBF		
22	1.1496E-07	AFW-XHE-RE-AFW32	IE-4FP	
23	1.1371E-07	AFW-TDP-FS-TDP32	IE-10FP	
24	1.1246E-07	AFW-MAI-MA-TDP32	IE-IACCW	
25	1.0592E-07	AFW-XHE-RE-AFW32	IE-IACCW	
26	9.9386E-08	AFW-TDP-FS-TDP32	IE-4FP	
27	9.9226E-08	B-BATT-DEP	ODEP-TB-SUCC	
SWS-XHE-RE-SWN29				
		IE-T1		
28	9.6125E-08	B-1HR	DC1-MAI-MA-BCC31	
AC4-RCI-FE-U1-6A				
		NR-CHGR35	FLAG-LOSP	IE-T1
29	9.6125E-08	B-1HR	DC1-MAI-MA-BCC31	
AC4-RCI-FE-U1-3A				
		NR-CHGR35	FLAG-LOSP	IE-T1

30	9.1574E-08	AFW-TDP-FS-TDP32	IE-IACCW	
31	7.7154E-08	AFW-TDP-FR-TDP32	B-1HR	
SWS-XHE-RE-SWN29				
		IE-T1		
32	7.7024E-08	B-1HR	DC1-MAI-MA-BCC31	
AC4-RCK-NO-BCH37				
		NR-CHGR35	FLAG-LOSP	IE-T1
33	7.7024E-08	B-1HR	DC1-MAI-MA-BCC31	
AC4-RCK-NO-BC36C				
		NR-CHGR35	FLAG-LOSP	IE-T1
34	7.7024E-08	B-1HR	DC1-MAI-MA-BCC31	FLAG-LOSP
		NR-CHGR35	SWS-RCK-NO-PM36	IE-T1
35	7.6099E-08	B-1HR	DC1-MAI-MA-BCC31	FLAG-LOSP
		NR-CHGR35	SWS-STR-PG-36	IE-T1
36	6.6930E-08	APP-R-CBF	IE-3SW-AC	
37	6.6323E-08	DC1-MAI-MA-BCC31	IE-4FP-A	
38	6.5500E-08	AFW-RCK-NO-TDP32	IE-10FP	
39	6.4878E-08	AFW-TDP-FR-TDP32	IE-4FP-A	
40	5.7250E-08	AFW-RCK-NO-TDP32	IE-4FP	
41	5.5020E-08	AFW-XHE-FO-HC405	IE-10FP	
42	5.3108E-08	B-BATT-SUCC	ODEP-TB-SUCC	SL-DEP
		SWS-CCF-CC-EDGS	IE-T1	
43	5.2750E-08	AFW-RCK-NO-TDP32	IE-IACCW	
44	5.2400E-08	PPR-AOV-OO-456	PPR-PHN-CC-DMOTR	IE-10FP
45	5.2400E-08	PPR-AOV-OO-455C	PPR-PHN-CC-DMOTR	IE-10FP
46	5.1670E-08	DC1-MAI-MA-BCC31	IE-3SW	
47	5.0545E-08	AFW-TDP-FR-TDP32	IE-3SW	
48	4.8848E-08	SL-CBF	IE-4FP-A	
49	4.8679E-08	B-1HR	DC1-MAI-MA-BCC31	FLAG-LOSP
		NR-CHGR35	SWS-MDP-FS-PMP36	IE-T1
50	4.8090E-08	AFW-XHE-FO-HC405	IE-4FP	
51	4.6214E-08	B-1HR	DC1-MAI-MA-BCC31	FLAG-LOSP
		NR-CHGR35	SWS-MDP-RS-PM35	IE-T1
52	4.5800E-08	PPR-AOV-OO-455C	PPR-PHN-CC-DMOTR	IE-4FP
53	4.5800E-08	PPR-AOV-OO-456	PPR-PHN-CC-DMOTR	IE-4FP
54	4.4310E-08	AFW-XHE-FO-HC405	IE-IACCW	

55	4.3609E-08	AFW-MAI-MA-TDP32	B-1HR	
SWS-XHE-RE-SWN29				
		IE-T1		
56	4.2636E-08	B-BATT-DEP	ODEP-TB-SUCC	
SWS-CCF-CC-EDGS				
		IE-T1		
57	4.2200E-08	PPR-AOV-OO-455C	PPR-PHN-CC-DMOTR	IE-IACCW
58	4.2200E-08	PPR-AOV-OO-456	PPR-PHN-CC-DMOTR	IE-IACCW
59	4.1072E-08	AFW-XHE-RE-AFW32	B-1HR	
SWS-XHE-RE-SWN29				
		IE-T1		
60	3.6670E-08	AFW-MAI-MA-TDP32	IE-4FP-A	
61	3.5509E-08	AFW-TDP-FS-TDP32	B-1HR	
SWS-XHE-RE-SWN29				
		IE-T1		
62	3.4538E-08	AFW-XHE-RE-AFW32	IE-4FP-A	
63	3.3152E-08	AFW-TDP-FR-TDP32	B-1HR	
SWS-CCF-CC-EDGS				
		IE-T1		
64	3.0809E-08	B-1HR	DC1-MAI-MA-BCC31	FLAG-LOSP
		NR-CHGR35	SWS-CKV-OO-SW1-4	IE-T1
65	2.9859E-08	AFW-TDP-FS-TDP32	IE-4FP-A	
66	2.8569E-08	AFW-MAI-MA-TDP32	IE-3SW	
67	2.8485E-08	B-BATT-SUCC	ODEP-TB-SUCC	SL-DEP
		SWS-CCF-FR-ESSPM	IE-T1	
68	2.8052E-08	DC1-MAI-MA-BCC31	IE-3SW-AC	
69	2.7441E-08	AFW-TDP-FR-TDP32	IE-3SW-AC	
70	2.7415E-08	B-BATT-SUCC	ODEP-TB-SUCC	SL-DEP
		AC4-RCI-FE-U1-3A	SWS-MAI-MA-PM36	IE-T1
71	2.7415E-08	B-BATT-SUCC	ODEP-TB-SUCC	SL-DEP
		AC4-RCI-FE-U1-5A	SWS-MAI-MA-PM36	IE-T1
72	2.7094E-08	B-BATT-SUCC	ODEP-TB-SUCC	SL-DEP
		AC4-CCF-HW-480VS	IE-T3	
73	2.6907E-08	AFW-XHE-RE-AFW32	IE-3SW	
74	2.3912E-08	B-1HR	DC1-MAI-MA-BCC31	
EDG-GEN-HW-EDG32				
		NR-CHGR35	EDG-MAI-MA-EDG31	IE-T1
75	2.3262E-08	AFW-TDP-FS-TDP32	IE-3SW	
76	2.3121E-08	B-1HR	DC1-MAI-MA-BCC31	
EDG-GEN-HW-EDG31				
		NR-CHGR35	EDG-MAI-MA-EDG32	IE-T1

77	2.2868E-08	B-BATT-DEP	ODEP-TB-SUCC	
SWS-CCF-FR-ESSPM				
		IE-T1		
78	2.2692E-08	B-BATT-SUCC	ODEP-TB-SUCC	SL-DEP
		EDG-CCF-HW-3EDGS	IE-T1	
79	2.2009E-08	B-BATT-DEP	ODEP-TB-SUCC	
AC4-RCI-FE-U1-3A				
		SWS-MAI-MA-PM36	IE-T1	
80	2.2009E-08	B-BATT-DEP	ODEP-TB-SUCC	
AC4-RCI-FE-U1-5A				
		SWS-MAI-MA-PM36	IE-T1	
81	2.0454E-08	AFW-RCK-NO-TDP32	B-1HR	
SWS-XHE-RE-SWN29				
		IE-T1		
82	2.0349E-08	B-1HR	DC1-MAI-MA-BCC31	
EDG-GEN-HW-EDG31				
		NR-CHGR35	EDG-GEN-HW-EDG32	IE-T1
83	1.8738E-08	AFW-MAI-MA-TDP32	B-1HR	
SWS-CCF-CC-EDGS				
		IE-T1		
84	1.8217E-08	B-BATT-DEP	ODEP-TB-SUCC	
EDG-CCF-HW-3EDGS				
		IE-T1		
85	1.8178E-08	B-1HR	DC1-MAI-MA-BCC31	FLAG-LOSP
		NR-CHGR35	SWS-MDP-FR-PM36	IE-T1
86	1.8178E-08	B-1HR	DC1-MAI-MA-BCC31	FLAG-LOSP
		NR-CHGR35	SWS-MDP-FR-PM35	IE-T1
87	1.7782E-08	AFW-TDP-FR-TDP32	B-1HR	
SWS-CCF-FR-ESSPM				
		IE-T1		
88	1.7648E-08	AFW-XHE-RE-AFW32	B-1HR	
SWS-CCF-CC-EDGS				
		IE-T1		
89	1.7200E-08	AFW-RCK-NO-TDP32	IE-4FP-A	
90	1.7182E-08	AFW-XHE-FO-HC405	B-1HR	
SWS-XHE-RE-SWN29				
		IE-T1		
91	1.7114E-08	AFW-TDP-FR-TDP32	B-1HR	
AC4-RCI-FE-U1-3A				
		SWS-MAI-MA-PM36	IE-T1	
92	1.7114E-08	AFW-TDP-FR-TDP32	B-1HR	
AC4-RCI-FE-U1-5A				
		SWS-MAI-MA-PM36	IE-T1	
93	1.5878E-08	B-1HR	DC1-MAI-MA-BCC31	
AC4-RCI-FE-U1-5A				

		AC4-RCI-FE-U1-6A	NR-CHGR35	IE-T3
94	1.5510E-08	AFW-MAI-MA-TDP32	IE-3SW-AC	
95	1.5312E-08	B-1HR	DC1-MAI-MA-BCC31	FLAG-LOSP
		NR-CHGR35	SWS-XHE-RE-PMP36	IE-T1
96	1.5258E-08	AFW-TDP-FS-TDP32	B-1HR	
SWS-CCF-CC-EDGS				
		IE-T1		
97	1.5256E-08	B-BATT-SUCC	ODEP-TB-SUCC	SL-DEP
		SWS-XVM-OC-55	IE-T1	
98	1.5256E-08	B-BATT-SUCC	ODEP-TB-SUCC	SL-DEP
		SWS-XVM-OC-29	IE-T1	
99	1.4608E-08	AFW-XHE-RE-AFW32	IE-3SW-AC	
100	1.4448E-08	AFW-XHE-FO-HC405	IE-4FP-A	
101	1.4165E-08	AFW-TDP-FR-TDP32	B-1HR	
EDG-CCF-HW-3EDGS				
		IE-T1		
102	1.3400E-08	AFW-RCK-NO-TDP32	IE-3SW	
103	1.3180E-08	B-BATT-SUCC	ODEP-TB-SUCC	SL-DEP
		FLAG-LOSP	SWS-MAI-MA-PM36	
SWS-MDP-RS-PM34				
		IE-T1		
104	1.3180E-08	B-BATT-SUCC	ODEP-TB-SUCC	SL-DEP
		FLAG-LOSP	SWS-MAI-MA-PM36	
SWS-MDP-RS-PM35				
		IE-T1		
105	1.3156E-08	B-1HR	DC1-MAI-MA-BCC31	FLAG-LOSP
		NR-CHGR35	SWS-CRB-DN-52SW6	IE-T1
106	1.2739E-08	B-1HR	DC1-BAT-HW-BAT31	FLAG-LOSP
		SWS-MAI-MA-PM36	IE-T1	
107	1.2629E-08	AFW-TDP-FS-TDP32	IE-3SW-AC	
108	1.2248E-08	B-BATT-DEP	ODEP-TB-SUCC	
SWS-XVM-OC-29				
		IE-T1		
109	1.2248E-08	B-BATT-DEP	ODEP-TB-SUCC	
SWS-XVM-OC-55				
		IE-T1		
110	1.1256E-08	AFW-XHE-FO-HC405	IE-3SW	
111	1.0581E-08	B-BATT-DEP	ODEP-TB-SUCC	FLAG-LOSP
		SWS-MAI-MA-PM36	SWS-MDP-RS-PM35	IE-T1
112	1.0581E-08	B-BATT-DEP	ODEP-TB-SUCC	FLAG-LOSP

		SWS-MAI-MA-PM36	SWS-MDP-RS-PM34	IE-T1
113	1.0445E-08	B-25HR	PPR-AOV-OO-456	
PPR-PHN-CC-DMOTR				
		SWS-XHE-RE-SWN29	IE-T1	
114	1.0445E-08	B-25HR	PPR-AOV-OO-455C	
PPR-PHN-CC-DMOTR				
		SWS-XHE-RE-SWN29	IE-T1	
115	1.0050E-08	AFW-MAI-MA-TDP32	B-1HR	
SWS-CCF-FR-ESSPM				
		IE-T1		
116	9.9086E-09	B-BATT-SUCC	ODEP-TB-SUCC	SL-DEP
		AC4-XHE-RE-MCC39	NR-CBV	FLAG-LOSP
		SWS-MAI-MA-PM36	IE-T3	
117	9.6730E-09	AFW-MAI-MA-TDP32	B-1HR	
AC4-RCI-FE-U1-3A				
		SWS-MAI-MA-PM36	IE-T1	
118	9.6730E-09	AFW-MAI-MA-TDP32	B-1HR	
AC4-RCI-FE-U1-5A				
		SWS-MAI-MA-PM36	IE-T1	
119	9.6303E-09	B-BATT-SUCC	ODEP-TB-SUCC	SL-DEP
		EDG-GEN-HW-EDG32	EDG-GEN-HW-EDG33	
EDG-MAI-MA-EDG31				
		IE-T1		
120	9.5237E-09	AFW-TDP-FR-TDP32	B-1HR	
SWS-XVM-OC-55				
		IE-T1		
121	9.5237E-09	AFW-TDP-FR-TDP32	B-1HR	
SWS-XVM-OC-29				
		IE-T1		
122	9.4659E-09	AFW-XHE-RE-AFW32	B-1HR	
SWS-CCF-FR-ESSPM				
		IE-T1		
123	9.3114E-09	B-BATT-SUCC	ODEP-TB-SUCC	SL-DEP
		EDG-GEN-HW-EDG31	EDG-GEN-HW-EDG33	
EDG-MAI-MA-EDG32				
		IE-T1		
124	9.1636E-09	AFW-AOV-CC-P1139	B-1HR	
SWS-XHE-RE-SWN29				
		IE-T1		
125	9.1104E-09	AFW-XHE-RE-AFW32	B-1HR	
AC4-RCI-FE-U1-3A				
		SWS-MAI-MA-PM36	IE-T1	
126	9.1104E-09	AFW-XHE-RE-AFW32	B-1HR	
AC4-RCI-FE-U1-5A				
		SWS-MAI-MA-PM36	IE-T1	
127	8.9652E-09	B1-TBF-SUCC	ARDG-TBF-SUCC	

SL-TBF-A-SUCC				
		DC1-MAI-MA-BCC31	IE-TBF	
128	8.9057E-09	B-1HR	DC1-MAI-MA-BCC31	
AC6-RLY-NO-85-L1				
		FLAG-LOSP	SWS-MAI-MA-PM36	NR-CHGR35
		IE-T3		
129	8.9057E-09	B-1HR	DC1-MAI-MA-BCC31	
AC6-RLY-NO-LSTBU				
		FLAG-LOSP	SWS-MAI-MA-PM36	NR-CHGR35
		IE-T3		
130	8.9057E-09	B-1HR	DC1-MAI-MA-BCC31	
AC6-RLY-NO-85-L2				
		FLAG-LOSP	SWS-MAI-MA-PM36	NR-CHGR35
		IE-T3		
131	8.9057E-09	B-1HR	DC1-MAI-MA-BCC31	
AC6-RLY-NO-86STP				
		FLAG-LOSP	SWS-MAI-MA-PM36	NR-CHGR35
		IE-T3		
132	8.7890E-09	AFW-RCK-NO-TDP32	B-1HR	
SWS-CCF-CC-EDGS				
		IE-T1		
133	8.7699E-09	B1-TBF-SUCC	ARDG-TBF-SUCC	
SL-TBF-A-SUCC				
		AFW-TDP-FR-TDP32	IE-TBF	
134	8.4706E-09	B-BATT-SUCC	ODEP-TB-SUCC	SL-DEP
		DC1-MAI-MA-BCC31	FLAG-LOSP	
SWS-MAI-MA-PM36				
		NR-CHGR35	IE-T1	
135	8.2278E-09	AFW-TDP-FR-TDP32	B-1HR	FLAG-LOSP
		SWS-MAI-MA-PM36	SWS-MDP-RS-PM34	IE-T1
136	8.2278E-09	AFW-TDP-FR-TDP32	B-1HR	FLAG-LOSP
		SWS-MAI-MA-PM36	SWS-MDP-RS-PM35	IE-T1
137	8.1953E-09	B-BATT-SUCC	ODEP-TB-SUCC	SL-DEP
		EDG-GEN-HW-EDG31	EDG-GEN-HW-EDG32	
EDG-GEN-HW-EDG33				
		IE-T1		
138	8.1837E-09	AFW-TDP-FS-TDP32	B-1HR	
SWS-CCF-FR-ESSPM				
		IE-T1		
139	8.0063E-09	AFW-MAI-MA-TDP32	B-1HR	
EDG-CCF-HW-3EDGS				
		IE-T1		

140	7.8872E-09	B-1HR	DC1-MAI-MA-BCC31	
SWS-XHE-RE-SWN29				
		NR-CHGR35	IE-T1	
141	7.8763E-09	AFW-TDP-FS-TDP32	B-1HR	
AC4-RCI-FE-U1-3A				
		SWS-MAI-MA-PM36	IE-T1	
142	7.8763E-09	AFW-TDP-FS-TDP32	B-1HR	
AC4-RCI-FE-U1-5A				
		SWS-MAI-MA-PM36	IE-T1	
143	7.7314E-09	B-BATT-DEP	ODEP-TB-SUCC	
EDG-GEN-HW-EDG32				
		EDG-GEN-HW-EDG33	EDG-MAI-MA-EDG31	IE-T1
144	7.5406E-09	AFW-XHE-RE-AFW32	B-1HR	
EDG-CCF-HW-3EDGS				
		IE-T1		
145	7.4754E-09	B-BATT-DEP	ODEP-TB-SUCC	
EDG-GEN-HW-EDG31				
		EDG-GEN-HW-EDG33	EDG-MAI-MA-EDG32	IE-T1
146	7.3828E-09	AFW-XHE-FO-HC405	B-1HR	
SWS-CCF-CC-EDGS				
		IE-T1		
147	7.3662E-09	B-BATT-SUCC	ODEP-TB-SUCC	SL-DEP
		EDG-GEN-HW-EDG31	EDG-GEN-HW-EDG32	
EDG-MAI-MA-EDG33				
		IE-T1		
148	7.2750E-09	AFW-RCK-NO-TDP32	IE-3SW-AC	
149	6.8004E-09	B-BATT-DEP	ODEP-TB-SUCC	
DC1-MAI-MA-BCC31				
		NR-CHGR35	FLAG-LOSP	
SWS-MAI-MA-PM36				
		IE-T1		
150	6.6992E-09	B-1HR	DC1-MAI-MA-BCC31	
AC4-RCS-OO-U6AX2				
		NR-CHGR35	EDG-MAI-MA-EDG31	FLAG-LOSP
		IE-T1		
151	6.5794E-09	B-BATT-DEP	ODEP-TB-SUCC	
EDG-GEN-HW-EDG31				
		EDG-GEN-HW-EDG32	EDG-GEN-HW-EDG33	IE-T1
152	6.5624E-09	B-1HR	DC1-MAI-MA-BCC31	
AC4-XHE-RE-MCC6C				
		NR-CHGR35	FLAG-LOSP	IE-T1
153	6.5192E-09	AFW-TDP-FS-TDP32	B-1HR	
EDG-CCF-HW-3EDGS				
		IE-T1		
154	6.1110E-09	AFW-XHE-FO-HC405	IE-3SW-AC	
155	6.0197E-09	B-BATT-SUCC	ODEP-TB-SUCC	SL-DEP

		AC4-CRB-CC-2AT5A	EDG-MAI-MA-EDG32	IE-T1
156	6.0116E-09	AFW-TDP-FR-TDP32	B-1HR	
EDG-GEN-HW-EDG32				
		EDG-GEN-HW-EDG33	EDG-MAI-MA-EDG31	IE-T1
157	5.9137E-09	B-BATT-DEP	ODEP-TB-SUCC	
EDG-GEN-HW-EDG31				
		EDG-GEN-HW-EDG32	EDG-MAI-MA-EDG33	IE-T1
158	5.8126E-09	AFW-TDP-FR-TDP32	B-1HR	
EDG-GEN-HW-EDG31				
		EDG-GEN-HW-EDG33	EDG-MAI-MA-EDG32	IE-T1
159	5.7010E-09	B-1HR	DC1-MAI-MA-BCC31	
AC4-RCS-OO-U6AX2				
		NR-CHGR35	EDG-GEN-HW-EDG31	FLAG-LOSP
		IE-T1		
160	5.3830E-09	AFW-MAI-MA-TDP32	B-1HR	
SWS-XVM-OC-55				
		IE-T1		
161	5.3830E-09	AFW-MAI-MA-TDP32	B-1HR	
SWS-XVM-OC-29				
		IE-T1		
162	5.2982E-09	B-BATT-SUCC	ODEP-TB-SUCC	SL-DEP
		AC4-CRB-CC-2AT5A	EDG-GEN-HW-EDG32	IE-T1
163	5.1843E-09	B-BATT-SUCC	ODEP-TB-SUCC	SL-DEP
		SWS-MAI-MA-PM36	SWS-MDP-FR-PM34	IE-T1
164	5.1843E-09	B-BATT-SUCC	ODEP-TB-SUCC	SL-DEP
		SWS-MAI-MA-PM36	SWS-MDP-FR-PM35	IE-T1
165	5.1158E-09	AFW-TDP-FR-TDP32	B-1HR	
EDG-GEN-HW-EDG31				
		EDG-GEN-HW-EDG32	EDG-GEN-HW-EDG33	IE-T1
166	5.0699E-09	AFW-XHE-RE-AFW32	B-1HR	
SWS-XVM-OC-29				
		IE-T1		
167	5.0699E-09	AFW-XHE-RE-AFW32	B-1HR	
SWS-XVM-OC-55				
		IE-T1		
168	5.0527E-09	B-1HR	DC1-MAI-MA-BCC31	FLAG-LOSP
		NR-CHGR35	SWS-STR-PG-35	IE-T1

169	4.9569E-09	B1-TBF-SUCC	ARDG-TBF-SUCC	
SL-TBF-A-SUCC				
		AFW-MAI-MA-TDP32	IE-TBF	
170	4.8328E-09	B-BATT-DEP	ODEP-TB-SUCC	
AC4-CRB-CC-2AT5A				
		EDG-MAI-MA-EDG32	IE-T1	
171	4.7141E-09	AFW-RCK-NO-TDP32	B-1HR	
SWS-CCF-FR-ESSPM				
		IE-T1		
172	4.6998E-09	B-BATT-SUCC	ODEP-TB-SUCC	SL-DEP
		AC4-RCI-FE-U1-3A	AC4-RCI-FE-U1-6A	IE-T1
173	4.6998E-09	B-BATT-SUCC	ODEP-TB-SUCC	SL-DEP
		AC4-RCI-FE-U1-3A	AC4-RCI-FE-U1-5A	IE-T1
174	4.6998E-09	B-BATT-SUCC	ODEP-TB-SUCC	SL-DEP
		AC4-RCI-FE-U1-5A	AC4-RCI-FE-U1-6A	IE-T1
175	4.6686E-09	B1-TBF-SUCC	ARDG-TBF-SUCC	
SL-TBF-A-SUCC				
		AFW-XHE-RE-AFW32	IE-TBF	
176	4.6505E-09	AFW-MAI-MA-TDP32	B-1HR	FLAG-LOSP
		SWS-MAI-MA-PM36	SWS-MDP-RS-PM34	IE-T1
177	4.6505E-09	AFW-MAI-MA-TDP32	B-1HR	FLAG-LOSP
		SWS-MAI-MA-PM36	SWS-MDP-RS-PM35	IE-T1
178	4.5983E-09	AFW-TDP-FR-TDP32	B-1HR	
EDG-GEN-HW-EDG31				
		EDG-GEN-HW-EDG32	EDG-MAI-MA-EDG33	IE-T1
179	4.5370E-09	AFW-RCK-NO-TDP32	B-1HR	
AC4-RCI-FE-U1-3A				
		SWS-MAI-MA-PM36	IE-T1	
180	4.5370E-09	AFW-RCK-NO-TDP32	B-1HR	
AC4-RCI-FE-U1-5A				
		SWS-MAI-MA-PM36	IE-T1	
181	4.4880E-09	B-25HR	PPR-AOV-OO-455C	
PPR-PHN-CC-DMOTR				
		SWS-CCF-CC-EDGS	IE-T1	
182	4.4880E-09	B-25HR	PPR-AOV-OO-456	
PPR-PHN-CC-DMOTR				
		SWS-CCF-CC-EDGS	IE-T1	
183	4.3831E-09	AFW-TDP-FS-TDP32	B-1HR	
SWS-XVM-OC-29				
		IE-T1		
184	4.3831E-09	AFW-TDP-FS-TDP32	B-1HR	

SWS-XVM-OC-55

		IE-T1		
185	4.3800E-09	AFW-XHE-RE-AFW32	B-1HR	FLAG-LOSP
		SWS-MAI-MA-PM36	SWS-MDP-RS-PM35	IE-T1
186	4.3800E-09	AFW-XHE-RE-AFW32	B-1HR	FLAG-LOSP
		SWS-MAI-MA-PM36	SWS-MDP-RS-PM34	IE-T1
187	4.3359E-09	B-1HR	DC1-MAI-MA-BCC31	
EDG-ENG-FR-DG32R				
		NR-CHGR35	EDG-MAI-MA-EDG31	IE-T1
188	4.2535E-09	B-BATT-DEP	ODEP-TB-SUCC	
AC4-CRB-CC-2AT5A				
		EDG-GEN-HW-EDG32	IE-T1	
189	4.1923E-09	B-1HR	DC1-MAI-MA-BCC31	
EDG-ENG-FR-DG31R				
		NR-CHGR35	EDG-MAI-MA-EDG32	IE-T1
190	4.1620E-09	B-BATT-DEP	ODEP-TB-SUCC	
SWS-MAI-MA-PM36				
		SWS-MDP-FR-PM34	IE-T1	
191	4.1620E-09	B-BATT-DEP	ODEP-TB-SUCC	
SWS-MAI-MA-PM36				
		SWS-MDP-FR-PM35	IE-T1	
192	4.0362E-09	B1-TBF-SUCC	ARDG-TBF-SUCC	
SL-TBF-A-SUCC				
		AFW-TDP-FS-TDP32	IE-TBF	
193	3.9598E-09	AFW-XHE-FO-HC405	B-1HR	
SWS-CCF-FR-ESSPM				
		IE-T1		
194	3.9375E-09	AFW-AOV-CC-P1139	B-1HR	
SWS-CCF-CC-EDGS				
		IE-T1		
195	3.8111E-09	AFW-XHE-FO-HC405	B-1HR	
AC4-RCI-FE-U1-3A				
		SWS-MAI-MA-PM36	IE-T1	
196	3.8111E-09	AFW-XHE-FO-HC405	B-1HR	
AC4-RCI-FE-U1-5A				
		SWS-MAI-MA-PM36	IE-T1	
197	3.7867E-09	AFW-TDP-FS-TDP32	B-1HR	FLAG-LOSP
		SWS-MAI-MA-PM36	SWS-MDP-RS-PM35	IE-T1
198	3.7867E-09	AFW-TDP-FS-TDP32	B-1HR	FLAG-LOSP
		SWS-MAI-MA-PM36	SWS-MDP-RS-PM34	IE-T1
199	3.7731E-09	B-BATT-DEP	ODEP-TB-SUCC	
AC4-RCI-FE-U1-5A				

		AC4-RCI-FE-U1-6A	IE-T1	
200	3.7731E-09	B-BATT-DEP	ODEP-TB-SUCC	
AC4-RCI-FE-U1-3A				
		AC4-RCI-FE-U1-5A	IE-T1	
201	3.7731E-09	B-BATT-DEP	ODEP-TB-SUCC	
AC4-RCI-FE-U1-3A				
		AC4-RCI-FE-U1-6A	IE-T1	
202	3.7658E-09	B-BATT-SUCC	ODEP-TB-SUCC	SL-DEP
		AC4-RCI-FE-U1-3A	SWS-RCK-NO-PM36	IE-T1

PDS 2- Transient Plant Damage State Group

Term Number	Probability of Term	Cutset Listing		
1	2.2680E-06	AFV-MOD-CC-IL314	FB-T2	NR-AFBV
		SL-T2-SUCC	IE-T3	
2	1.1086E-06	AFW-CCF-FS-AFWPM	DC1-MAI-MA-BCC31	
3	6.9930E-07	AFV-MOD-CC-IL314	FB-T2	NR-AFBV
		SL-T2-SUCC	IE-T2	
4	6.3000E-07	AFV-MOD-CC-IL314	FB-T1	NR-AFBV
5	4.6116E-07	AFV-MOD-CC-IL314	NR-AFBV	PPR-PRV-CC-456
		SL-T2-SUCC	IE-T3	
6	4.6116E-07	AFV-MOD-CC-IL314	NR-AFBV	PPR-PRV-CC-455C
		SL-T2-SUCC	IE-T3	
7	4.3290E-07	AFV-MOD-CC-IL314	NR-AFBV	OHR-T2
		SL-T2-SUCC	IE-T2	
8	3.4500E-07	AFW-CCF-FS-AFWPM	IE-TDC31	
9	2.8920E-07	AFV-MOD-CC-IL314	DC1-MAI-MA-BCC31	NR-AFBV
10	2.8750E-07	AC4-RCK-NO-BCH39	AFW-CCF-FS-AFWPM	
11	2.3536E-07	AFW-MAI-MA-PM31	AFW-XHE-RE-AFW33	DC1-MAI-MA-BCC31
12	2.1750E-07	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW33	DC1-MAI-MA-BCC31
13	1.4903E-07	AFW-TDP-FR-TDP32	DC1-BDC-ST-PP-32	IE-T3
14	1.4865E-07	AFW-MAI-MA-PM31	DC1-MAI-MA-BCC31	IE-TDC32
15	1.4744E-07	AFW-MAI-MA-PM33	AFW-XHE-RE-AFW31	DC1-MAI-MA-BCC31
16	1.4541E-07	AFW-MAI-MA-PM31	AFW-TDP-FR-TDP32	DC1-MAI-MA-BCC32
17	1.4541E-07	AFW-MAI-MA-PM31	AFW-TDP-FR-TDP32	IE-TDC32
18	1.4219E-07	AFV-MOD-CC-IL314	NR-AFBV	PPR-PRV-CC-455C
		SL-T2-SUCC	IE-T2	
19	1.4219E-07	AFV-MOD-CC-IL314	NR-AFBV	PPR-PRV-CC-456
		SL-T2-SUCC	IE-T2	
20	1.3737E-07	AFW-XHE-RE-AFW31	DC1-MAI-MA-BCC31	IE-TDC32
21	1.3438E-07	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW31	DC1-MAI-MA-BCC32
22	1.3438E-07	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW31	IE-TDC32

23	1.2810E-07	AFV-MOD-CC-IL314	NR-AFBV	
PPR-PRV-CC-455C				
24	1.2810E-07	AFV-MOD-CC-IL314	NR-AFBV	
PPR-PRV-CC-456				
25	1.2387E-07	AFW-MAI-MA-PM31	AFW-RCK-NO-PM33	
DC1-MAI-MA-BCC31				
26	1.2247E-07	C	CVC-XHE-FO-BORAT	IE-T3
27	1.2118E-07	AC4-RCK-NO-BCH37	AFW-MAI-MA-PM31	
AFW-TDP-FR-TDP32				
28	1.1447E-07	AFW-RCK-NO-PM33	AFW-XHE-RE-AFW31	
DC1-MAI-MA-BCC31				
29	1.1447E-07	AFW-RCK-NO-PM31	AFW-XHE-RE-AFW33	
DC1-MAI-MA-BCC31				
30	1.1198E-07	AC4-RCK-NO-BCH37	AFW-TDP-FR-TDP32	
AFW-XHE-RE-AFW31				
31	9.0000E-08	AFV-MOD-CC-IL314	NR-AFBV	IE-TDC32
32	9.0000E-08	AFV-MOD-CC-IL314	NR-AFBV	IE-TDC31
33	9.0000E-08	AFV-MOD-CC-IL314	DC1-MAI-MA-BCC32	NR-AFBV
34	8.4235E-08	AFW-MAI-MA-TDP32	DC1-BDC-ST-PP-32	IE-T3
35	8.1984E-08	AFW-CCF-FS-AFWPM	AFW-TDP-FR-TDP32	FB-T2
		SL-T2-SUCC	IE-T3	
36	7.9336E-08	AFW-XHE-RE-AFW32	DC1-BDC-ST-PP-32	IE-T3
37	7.7950E-08	AC4-RCI-FE-U1-6A	FLAG-SI	
LHR-PHN-PE-DECAY				
		OLR-S2-SUCC	SAS-XLF-TE-SASA	
PPR-AOV-OO-455C				
		PPR-PHN-CC-DMOTR	IE-T3	
38	7.7602E-08	AFW-MAI-MA-PM33	AFW-RCK-NO-PM31	
DC1-MAI-MA-BCC31				
39	7.7408E-08	AFW-MAI-MA-PM31	AFW-XHE-RE-AFW32	IE-TDC32
40	7.7408E-08	AFW-MAI-MA-PM31	AFW-XHE-RE-AFW32	
DC1-MAI-MA-BCC32				
41	7.5952E-08	AFW-MAI-MA-TDP32	AFW-XHE-RE-AFW31	IE-TDC32
42	7.5952E-08	AFW-MAI-MA-TDP32	AFW-XHE-RE-AFW31	
DC1-MAI-MA-BCC32				
43	7.5000E-08	AC4-RCK-NO-BCH39	AFV-MOD-CC-IL314	NR-AFBV
44	7.5000E-08	AC4-RCK-NO-BCH37	AFV-MOD-CC-IL314	NR-AFBV
45	7.3245E-08	AFW-MAI-MA-PM31	AFW-XHE-RE-AFW33	IE-TDC31
46	7.2300E-08	AC4-RCK-NO-BC36C	DC1-MAI-MA-BCC31	IE-TDC32

47	7.2300E-08	AFW-RCK-NO-PM31	DC1-MAI-MA-BCC31	IE-TDC32	
48	7.1535E-08	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW32	DC1-MAI-MA-BCC32	
49	7.1535E-08	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW32	IE-TDC32	
50	7.0725E-08	AFW-RCK-NO-PM31	AFW-TDP-FR-TDP32	DC1-MAI-MA-BCC32	
51	7.0725E-08	AC4-RCK-NO-BC36C	AFW-TDP-FR-TDP32	IE-TDC32	
52	7.0725E-08	AFW-RCK-NO-PM31	AFW-TDP-FR-TDP32	IE-TDC32	
53	6.8589E-08	AFW-TDP-FS-TDP32	DC1-BDC-ST-PP-32	IE-T3	
54	6.7687E-08	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW33	IE-TDC31	
55	6.7387E-08	AFW-MAI-MA-PM31	AFW-MDP-FS-PM33	DC1-MAI-MA-BCC31	
56	6.6923E-08	AFW-MAI-MA-PM31	AFW-TDP-FS-TDP32	DC1-MAI-MA-BCC32	
57	6.6923E-08	AFW-MAI-MA-PM31	AFW-TDP-FS-TDP32	IE-TDC32	
58	6.4507E-08	AC4-RCK-NO-BCH37	AFW-MAI-MA-PM31	AFW-XHE-RE-AFW32	
59	6.3294E-08	AC4-RCK-NO-BCH37	AFW-MAI-MA-TDP32	AFW-XHE-RE-AFW31	
60	6.2274E-08	AFW-MDP-FS-PM33	AFW-XHE-RE-AFW31	DC1-MAI-MA-BCC31	
61	6.2274E-08	AFW-MDP-FS-PM31	AFW-XHE-RE-AFW33	DC1-MAI-MA-BCC31	
62	6.1845E-08	AFW-TDP-FS-TDP32	AFW-XHE-RE-AFW31	DC1-MAI-MA-BCC32	
63	6.1845E-08	AFW-TDP-FS-TDP32	AFW-XHE-RE-AFW31	IE-TDC32	
64	6.1037E-08	AC4-RCK-NO-BCH39	AFW-MAI-MA-PM31	AFW-XHE-RE-AFW33	
65	6.0250E-08	AFW-RCK-NO-PM31	AFW-RCK-NO-PM33	DC1-MAI-MA-BCC31	
66	5.9612E-08	AC4-RCK-NO-BCH37	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW32	
67	5.9409E-08	AFW-TDP-FR-TDP32	CCW-PUMP	CWRHR-TCCW-SUCC	
		DC1-MAI-MA-BCC32	IE-SWS		
68	5.9409E-08	AFW-TDP-FR-TDP32	CCW-PUMP	DC1-MAI-MA-BCC32	
		IE-SWS			
69	5.8937E-08	AC4-RCK-NO-BCH37	AFW-RCK-NO-PM31	AFW-TDP-FR-TDP32	
70	5.6406E-08	AC4-RCK-NO-BCH39	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW33	
71	5.6160E-08	AC4-RCI-FE-U1-6A	LHR-RCK-NO-PM31		

OLR-S2-SUCC					
		PPR-AOV-OO-455C	PPR-PHN-CC-DMOTR	IE-T3	
72	5.6160E-08	AC4-RCI-FE-U1-6A	LHR-RCK-NO-1802A		
OLR-S2-SUCC					
		PPR-AOV-OO-455C	PPR-PHN-CC-DMOTR	IE-T3	
73	5.6160E-08	AC4-RCI-FE-U1-5A	LHR-RCK-NO-1802B		
OLR-S2-SUCC					
		PPR-AOV-OO-456	PPR-PHN-CC-DMOTR	IE-T3	
74	5.6160E-08	AC4-RCI-FE-U1-5A	LHR-RCK-NO-PM32		
OLR-S2-SUCC					
		PPR-AOV-OO-456	PPR-PHN-CC-DMOTR	IE-T3	
75	5.5769E-08	AC4-RCK-NO-BCH37	AFW-MAI-MA-PM31		
AFW-TDP-FS-TDP32					
76	5.1537E-08	AC4-RCK-NO-BCH37	AFW-TDP-FS-TDP32		
AFW-XHE-RE-AFW31					
77	5.1408E-08	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-6	FB-T2	
		SL-T2-SUCC	IE-T3		
78	5.1408E-08	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-64	FB-T2	
		SL-T2-SUCC	IE-T3		
79	5.0760E-08	AFV-MOD-CC-IL314	NR-AFBV		
PPR-CCF-CC-PORVS					
		SL-T2-SUCC	IE-T3		
80	4.9507E-08	AC4-RCK-NO-BCH37	AFW-TDP-FR-TDP32	CCW-PUMP	
		IE-SWS			
81	4.9507E-08	AC4-RCK-NO-BCH37	AFW-TDP-FR-TDP32	CCW-PUMP	
		CWRHR-TCCW-SUCC	IE-SWS		
82	4.9225E-08	AFW-TDP-FR-TDP32	DC1-MAI-MA-BCC33	IE-TDC32	
83	4.8110E-08	AC4-RCI-FE-U1-6A	AFW-MAI-MA-PM31	IE-TDC31	
84	4.6339E-08	AFW-CCF-FS-AFWPM	AFW-MAI-MA-TDP32	FB-T2	
		SL-T2-SUCC	IE-T3		
85	4.6260E-08	AFW-MAI-MA-PM31	DC1-MAI-MA-BCC32	IE-TDC31	
86	4.5951E-08	AFW-TDP-FR-TDP32	DC1-BDC-ST-PP-32	IE-T2	
87	4.5885E-08	AFW-MAI-MA-PM33	AFW-XHE-RE-AFW31	IE-TDC31	
88	4.4460E-08	AC4-RCI-FE-U1-6A	AFW-XHE-RE-AFW31	IE-TDC31	
89	4.3644E-08	AFW-CCF-FS-AFWPM	AFW-XHE-RE-AFW32	FB-T2	
		SL-T2-SUCC	IE-T3		

90	4.2750E-08	AFW-XHE-RE-AFW31	DC1-MAI-MA-BCC32	IE-TDC31	
91	4.2215E-08	AFW-MAI-MA-PM33	AFW-MDP-FS-PM31	DC1-MAI-MA-BCC31	
92	3.9984E-08	AFW-TDP-FR-TDP32	DC1-MAI-MA-BCC32	EDG-MAI-MA-EDG31	
		OHR-T2	IE-T3		
93	3.9975E-08	AFW-MAI-MA-TDP32	AFW-RCK-NO-PM31	DC1-MAI-MA-BCC32	
94	3.9975E-08	AFW-MAI-MA-TDP32	AFW-RCK-NO-PM31	IE-TDC32	
95	3.9975E-08	AC4-RCK-NO-BC36C	AFW-MAI-MA-TDP32	IE-TDC32	
96	3.9510E-08	AFW-RCK-NO-TDP32	DC1-BDC-ST-PP-32	IE-T3	
97	3.9331E-08	AFW-MDP-FS-PM31	DC1-MAI-MA-BCC31	IE-TDC32	
98	3.8550E-08	AFW-MAI-MA-PM31	AFW-RCK-NO-TDP32	IE-TDC32	
99	3.8550E-08	AC4-RCK-NO-BCH39	AFW-MAI-MA-PM31	IE-TDC32	
100	3.8550E-08	AFW-MAI-MA-PM31	AFW-RCK-NO-TDP32	DC1-MAI-MA-BCC32	
101	3.8550E-08	AC4-RCK-NO-BCH37	AFW-MAI-MA-PM31	IE-TDC31	
102	3.8550E-08	AFW-MAI-MA-PM31	AFW-RCK-NO-PM33	IE-TDC31	
103	3.8474E-08	AFW-MDP-FS-PM31	AFW-TDP-FR-TDP32	DC1-MAI-MA-BCC32	
104	3.8474E-08	AFW-MDP-FS-PM31	AFW-TDP-FR-TDP32	IE-TDC32	
105	3.8238E-08	AC4-RCK-NO-BCH39	AFW-MAI-MA-PM33	AFW-XHE-RE-AFW31	
106	3.7732E-08	AFW-CCF-FS-AFWPM	AFW-TDP-FS-TDP32	FB-T2	
		SL-T2-SUCC	IE-T3		
107	3.7650E-08	AC4-RCK-NO-BC36C	AFW-XHE-RE-AFW32	IE-TDC32	
108	3.7650E-08	AFW-RCK-NO-PM31	AFW-XHE-RE-AFW32	DC1-MAI-MA-BCC32	
109	3.7650E-08	AFW-RCK-NO-PM31	AFW-XHE-RE-AFW32	IE-TDC32	
110	3.5625E-08	AC4-RCK-NO-BCH39	AFW-XHE-RE-AFW31	IE-TDC32	
111	3.5625E-08	AFW-RCK-NO-PM33	AFW-XHE-RE-AFW31	IE-TDC31	
112	3.5625E-08	AFW-RCK-NO-PM31	AFW-XHE-RE-AFW33	IE-TDC31	
113	3.5625E-08	AFW-RCK-NO-TDP32	AFW-XHE-RE-AFW31	DC1-MAI-MA-BCC32	
114	3.5625E-08	AC4-RCK-NO-BCH37	AFW-XHE-RE-AFW31	IE-TDC31	

115	3.5625E-08	AC4-RCK-NO-BC36C	AFW-XHE-RE-AFW33	IE-TDC31	
116	3.5625E-08	AFW-RCK-NO-TDP32	AFW-XHE-RE-AFW31	IE-TDC32	
117	3.4026E-08	AFW-TDP-FR-TDP32	DC1-MAI-MA-BCC32	EDG-GEN-HW-EDG31	
		OHR-T2	IE-T3		
118	3.4020E-08	C	CVC-XHE-FO-BORAT		
119	3.3579E-08	AFW-MAI-MA-TDP32	CCW-PUMP	CWRHR-TCCW-SUCC	
		DC1-MAI-MA-BCC32	IE-SWS		
120	3.3579E-08	AFW-MAI-MA-TDP32	CCW-PUMP	DC1-MAI-MA-BCC32	
		IE-SWS			
121	3.3320E-08	AC4-RCK-NO-BCH37	AFW-TDP-FR-TDP32	EDG-MAI-MA-EDG31	
		OHR-T2	IE-T3		
122	3.3312E-08	AC4-RCK-NO-BCH37	AFW-MAI-MA-TDP32	AFW-RCK-NO-PM31	
123	3.3188E-08	AFW-XHE-FO-HC405	DC1-BDC-ST-PP-32	IE-T3	
124	3.2776E-08	AFW-MDP-FS-PM33	AFW-RCK-NO-PM31	DC1-MAI-MA-BCC31	
125	3.2776E-08	AFW-MDP-FS-PM31	AFW-RCK-NO-PM33	DC1-MAI-MA-BCC31	
126	3.2550E-08	AFW-RCK-NO-PM31	AFW-TDP-FS-TDP32	DC1-MAI-MA-BCC32	
127	3.2550E-08	AFW-RCK-NO-PM31	AFW-TDP-FS-TDP32	IE-TDC32	
128	3.2550E-08	AC4-RCK-NO-BC36C	AFW-TDP-FS-TDP32	IE-TDC32	
129	3.2382E-08	AFW-MAI-MA-PM31	AFW-XHE-FO-HC405	IE-TDC32	
130	3.2382E-08	AFW-MAI-MA-PM31	AFW-XHE-FO-HC405	DC1-MAI-MA-BCC32	
131	3.2125E-08	AC4-RCK-NO-BCH37	AFW-MAI-MA-PM31	AFW-RCK-NO-TDP32	
132	3.2125E-08	AC4-RCK-NO-BCH39	AFW-MAI-MA-PM31	AFW-RCK-NO-PM33	
133	3.2062E-08	AC4-RCK-NO-BCH37	AFW-MDP-FS-PM31	AFW-TDP-FR-TDP32	
134	3.1626E-08	AFW-XHE-RE-AFW32	CCW-PUMP	DC1-MAI-MA-BCC32	
		IE-SWS			
135	3.1626E-08	AFW-XHE-RE-AFW32	CCW-PUMP	CWRHR-TCCW-SUCC	
		DC1-MAI-MA-BCC32	IE-SWS		
136	3.1375E-08	AC4-RCK-NO-BCH37	AFW-RCK-NO-PM31	AFW-XHE-RE-AFW32	
137	2.9925E-08	AFW-XHE-FO-HC405	AFW-XHE-RE-AFW31	DC1-MAI-MA-BCC32	
138	2.9925E-08	AFW-XHE-FO-HC405	AFW-XHE-RE-AFW31	IE-TDC32	

139	2.9722E-08	AFW-MAI-MA-PM31	AFW-TDP-FR-TDP32	EDG-MAI-MA-EDG32	FB-T1
140	2.9687E-08	AC4-RCK-NO-BCH39	AFW-RCK-NO-PM33	AFW-XHE-RE-AFW31	
141	2.9687E-08	AC4-RCK-NO-BCH37	AFW-RCK-NO-TDP32	AFW-XHE-RE-AFW31	
142	2.9687E-08	AC4-RCK-NO-BCH39	AFW-RCK-NO-PM31	AFW-XHE-RE-AFW33	
143	2.8407E-08	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW33	EDG-MAI-MA-EDG31	FB-T1
144	2.8355E-08	AC4-RCK-NO-BCH37	AFW-TDP-FR-TDP32	EDG-GEN-HW-EDG31	OHR-T2
145	2.8080E-08	AC4-RCI-FE-U1-2A	AFV-MOD-CC-IL314	FLAG-SI	IE-TDC31
146	2.8080E-08	AC4-RCI-FE-U1-5A	AFV-MOD-CC-IL314	IE-TDC32	
147	2.8080E-08	AC4-RCI-FE-U1-3A	AFV-MOD-CC-IL314	IE-TDC32	
148	2.8080E-08	AC4-RCI-FE-U1-3A	AFV-MOD-CC-IL314	FLAG-SI	IE-TDC31
149	2.8080E-08	AC4-RCI-FE-U1-6A	AFV-MOD-CC-IL314	IE-TDC31	
150	2.7982E-08	AC4-RCK-NO-BCH37	AFW-MAI-MA-TDP32	CCW-PUMP	CWRHR-TCCW-SUCC
151	2.7982E-08	AC4-RCK-NO-BCH37	AFW-MAI-MA-TDP32	CCW-PUMP	IE-SWS
152	2.7823E-08	AFW-MAI-MA-TDP32	DC1-MAI-MA-BCC33	IE-TDC32	
153	2.7467E-08	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW31	EDG-MAI-MA-EDG32	FB-T1
154	2.7342E-08	AFW-TDP-FS-TDP32	CCW-PUMP	DC1-MAI-MA-BCC32	IE-SWS
155	2.7342E-08	AFW-TDP-FS-TDP32	CCW-PUMP	CWRHR-TCCW-SUCC	DC1-MAI-MA-BCC32
156	2.7125E-08	AC4-RCK-NO-BCH37	AFW-RCK-NO-PM31	AFW-TDP-FS-TDP32	IE-SWS
157	2.7013E-08	AC4-RCI-FE-U1-5A	FLAG-SI	LHR-PHN-PE-DECAY	OLR-S2-SUCC
SAS-XLF-TE-SASB	PPR-AOV-OO-456	PPR-PHN-CC-DMOTR	IE-T2		

158	2.7000E-08	AFV-MOD-CC-ED311	AFV-MOD-CC-ED312	IE-TDC32
159	2.7000E-08	AFV-MOD-CC-ED311	AFV-MOD-CC-ED312	IE-TDC31
160	2.6985E-08	AC4-RCK-NO-BCH37	AFW-MAI-MA-PM31	AFW-XHE-FO-HC405
161	2.6520E-08	AFV-MOD-CC-IL314	NR-AFBV	OHR-T1
		IE-T1		
162	2.6355E-08	AC4-RCK-NO-BCH37	AFW-XHE-RE-AFW32	CCW-PUMP
		IE-SWS		
163	2.6355E-08	AC4-RCK-NO-BCH37	AFW-XHE-RE-AFW32	CCW-PUMP
		CWRHR-TCCW-SUCC	IE-SWS	
164	2.6204E-08	AFW-XHE-RE-AFW32	DC1-MAI-MA-BCC33	IE-TDC32
165	2.6159E-08	AFW-MAI-MA-PM31	AFW-TDP-FR-TDP32	EDG-GEN-HW-EDG32
		FB-T1		
166	2.5973E-08	AFW-MAI-MA-TDP32	DC1-BDC-ST-PP-32	IE-T2
167	2.5279E-08	AFW-CCF-FS-AFWPM	AFW-TDP-FR-TDP32	FB-T2
		SL-T2-SUCC	IE-T2	
168	2.4937E-08	AC4-RCK-NO-BCH37	AFW-XHE-FO-HC405	AFW-XHE-RE-AFW31
169	2.4795E-08	AFW-XHE-RE-AFW33	DC1-MAI-MA-BCC33	IE-TDC31
170	2.4462E-08	AFW-XHE-RE-AFW32	DC1-BDC-ST-PP-32	IE-T2
171	2.4175E-08	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW33	EDG-GEN-HW-EDG31
		FB-T1		
172	2.4175E-08	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW31	EDG-GEN-HW-EDG32
		FB-T1		
173	2.4150E-08	AFW-MAI-MA-PM33	AFW-RCK-NO-PM31	IE-TDC31
174	2.4150E-08	AC4-RCK-NO-BC36C	AFW-MAI-MA-PM33	IE-TDC31
175	2.4035E-08	AC4-RCI-FE-U1-6A	FLAG-SI	LHR-PHN-PE-DECAY
		OLR-S2-SUCC	SAS-XLF-TE-SASA	PPR-AOV-OO-455C
		PPR-PHN-CC-DMOTR	IE-T2	
176	2.3400E-08	AC4-RCI-FE-U1-6A	AC4-RCK-NO-BC36C	IE-TDC31
177	2.3400E-08	AC4-RCI-FE-U1-6A	AFW-RCK-NO-PM31	IE-TDC31
178	2.2785E-08	AC4-RCK-NO-BCH37	AFW-TDP-FS-TDP32	CCW-PUMP

			CWRHR-TCCW-SUCC	IE-SWS	
179	2.2785E-08	AC4-RCK-NO-BCH37	AFW-TDP-FS-TDP32	CCW-PUMP	
			IE-SWS		
180	2.2773E-08	AFW-CCF-FS-AFWPM	AFW-TDP-FR-TDP32	FB-T1	
181	2.2655E-08	AFW-TDP-FS-TDP32	DC1-MAI-MA-BCC33	IE-TDC32	
182	2.2600E-08	AFW-MAI-MA-TDP32	DC1-MAI-MA-BCC32	EDG-MAI-MA-EDG31	
			OHR-T2	IE-T3	
183	2.2500E-08	AC4-RCK-NO-BC36C	AFV-MOD-CC-IL314	IE-TDC32	
184	2.2500E-08	AC4-RCK-NO-BC36C	AFV-MOD-CC-IL314	IE-TDC31	
185	2.2500E-08	AFW-RCK-NO-PM31	DC1-MAI-MA-BCC32	IE-TDC31	
186	2.2500E-08	AC4-RCK-NO-BC36C	DC1-MAI-MA-BCC32	IE-TDC31	
187	2.1746E-08	AFW-MAI-MA-TDP32	AFW-MDP-FS-PM31	DC1-MAI-MA-BCC32	
188	2.1746E-08	AFW-MAI-MA-TDP32	AFW-MDP-FS-PM31	IE-TDC32	
189	2.1735E-08	AFW-CCF-FS-AFWPM	AFW-RCK-NO-TDP32	FB-T2	
			SL-T2-SUCC	IE-T3	
190	2.1285E-08	AFW-XHE-RE-AFW32	DC1-MAI-MA-BCC32	EDG-MAI-MA-EDG31	
			OHR-T2	IE-T3	
191	2.1158E-08	AFW-CRB-DN-52AF3	AFW-MAI-MA-PM31	DC1-MAI-MA-BCC31	
192	2.1148E-08	AFW-TDP-FS-TDP32	DC1-BDC-ST-PP-32	IE-T2	
193	2.0971E-08	AFW-MAI-MA-PM31	AFW-MDP-FS-PM33	IE-TDC31	
194	2.0811E-08	AFW-MAI-MA-PM31	AFW-MDP-FR-PM33	DC1-MAI-MA-BCC31	
195	2.0482E-08	AFW-MDP-FS-PM31	AFW-XHE-RE-AFW32	IE-TDC32	
196	2.0482E-08	AFW-MDP-FS-PM31	AFW-XHE-RE-AFW32	DC1-MAI-MA-BCC32	
197	2.0125E-08	AC4-RCK-NO-BCH39	AFW-MAI-MA-PM33	AFW-RCK-NO-PM31	
198	1.9552E-08	AFW-CRB-DN-52AF3	AFW-XHE-RE-AFW31	DC1-MAI-MA-BCC31	
199	1.9552E-08	AFW-CRB-DN-52AF1	AFW-XHE-RE-AFW33	DC1-MAI-MA-BCC31	
200	1.9380E-08	AFW-MDP-FS-PM33	AFW-XHE-RE-AFW31	IE-TDC31	
201	1.9380E-08	AFW-MDP-FS-PM31	AFW-XHE-RE-AFW33	IE-TDC31	
202	1.9257E-08	AFW-MAI-MA-PM33	AFW-TDP-FR-TDP32		

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EDG-MAI-MA-EDG31
                          FB-T1
  203     1.9232E-08      AFW-MAI-MA-TDP32 DC1-MAI-MA-BCC32
EDG-GEN-HW-EDG31
                          OHR-T2           IE-T3
  204     1.9232E-08      AFW-MDP-FR-PM33  AFW-XHE-RE-AFW31
DC1-MAI-MA-BCC31
  205     1.9232E-08      AFW-MDP-FR-PM31  AFW-XHE-RE-AFW33
DC1-MAI-MA-BCC31
  206     1.8833E-08      AC4-RCK-NO-BCH37 AFW-MAI-MA-TDP32
EDG-MAI-MA-EDG31
                          OHR-T2           IE-T3
  207     1.8750E-08      AFW-RCK-NO-PM31  AFW-RCK-NO-TDP32
DC1-MAI-MA-BCC32
  208     1.8750E-08      AFW-RCK-NO-PM31  AFW-RCK-NO-PM33  IE-TDC31

  209     1.8750E-08      AC4-RCK-NO-BC36C AFW-RCK-NO-PM33  IE-TDC31

  210     1.8750E-08      AFW-RCK-NO-PM31  AFW-RCK-NO-TDP32 IE-TDC32

  211     1.8750E-08      AC4-RCK-NO-BC36C AFW-RCK-NO-TDP32 IE-TDC32

  212     1.8750E-08      AC4-RCK-NO-BCH39 AFW-RCK-NO-PM31  IE-TDC32

  213     1.8750E-08      AC4-RCK-NO-BC36C AC4-RCK-NO-BCH39 IE-TDC32

  214     1.8750E-08      AC4-RCK-NO-BC36C AC4-RCK-NO-BCH37 IE-TDC31

  215     1.8750E-08      AC4-RCK-NO-BCH37 AFW-RCK-NO-PM31  IE-TDC31

  216     1.8402E-08      AFW-TDP-FS-TDP32 DC1-MAI-MA-BCC32
EDG-MAI-MA-EDG31
                          OHR-T2           IE-T3
  217     1.8257E-08      AFW-CCF-FS-AFWPM AFW-XHE-FO-HC405 FB-T2

                          SL-T2-SUCC       IE-T3
  218     1.8122E-08      AC4-RCK-NO-BCH37 AFW-MAI-MA-TDP32
AFW-MDP-FS-PM31
  219     1.8114E-08      AFW-XHE-RE-AFW32 DC1-MAI-MA-BCC32
EDG-GEN-HW-EDG31
                          OHR-T2           IE-T3
  220     1.7830E-08      AFW-MDP-FS-PM31  AFW-MDP-FS-PM33
DC1-MAI-MA-BCC31
  221     1.7738E-08      AC4-RCK-NO-BCH37 AFW-XHE-RE-AFW32
EDG-MAI-MA-EDG31
                          OHR-T2           IE-T3
  222     1.7707E-08      AFW-MDP-FS-PM31  AFW-TDP-FS-TDP32 IE-TDC32

  223     1.7707E-08      AFW-MDP-FS-PM31  AFW-TDP-FS-TDP32
DC1-MAI-MA-BCC32
  224     1.7700E-08      AFW-AOV-CC-P1139 DC1-BDC-ST-PP-32 IE-T3
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225	1.7476E-08	AC4-RCK-NO-BCH39	AFW-MAI-MA-PM31		
AFW-MDP-FS-PM33					
226	1.7406E-08	AFW-MAI-MA-PM31	AFW-TDP-FR-TDP32		
AFW-XHE-RE-AFW33					
		FB-T2	SL-T2-SUCC	IE-T3	
227	1.7316E-08	AC4-RCI-FE-U1-6A	LHR-RCK-NO-1802A		
OLR-S2-SUCC					
		PPR-AOV-OO-455C	PPR-PHN-CC-DMOTR	IE-T2	
228	1.7316E-08	AC4-RCI-FE-U1-6A	LHR-RCK-NO-PM31		
OLR-S2-SUCC					
		PPR-AOV-OO-455C	PPR-PHN-CC-DMOTR	IE-T2	
229	1.7316E-08	AC4-RCI-FE-U1-5A	LHR-RCK-NO-PM32		
OLR-S2-SUCC					
		PPR-AOV-OO-456	PPR-PHN-CC-DMOTR	IE-T2	
230	1.7316E-08	AC4-RCI-FE-U1-5A	LHR-RCK-NO-1802B		
OLR-S2-SUCC					
		PPR-AOV-OO-456	PPR-PHN-CC-DMOTR	IE-T2	
231	1.7270E-08	AFW-AOV-CC-P1139	AFW-MAI-MA-PM31	IE-TDC32	
232	1.7270E-08	AFW-AOV-CC-P1139	AFW-MAI-MA-PM31		
DC1-MAI-MA-BCC32					
233	1.7068E-08	AC4-RCK-NO-BCH37	AFW-MDP-FS-PM31		
AFW-XHE-RE-AFW32					
234	1.6808E-08	AFW-MAI-MA-PM33	DC1-MAI-MA-BCC33	IE-TDC31	
235	1.6670E-08	AFW-CCF-FS-AFWPM	AFW-TDP-FR-TDP32		
PPR-PRV-CC-455C					
		SL-T2-SUCC	IE-T3		
236	1.6670E-08	AFW-CCF-FS-AFWPM	AFW-TDP-FR-TDP32		
PPR-PRV-CC-456					
		SL-T2-SUCC	IE-T3		
237	1.6388E-08	AFW-MAI-MA-PM33	AFW-TDP-FR-TDP32		
EDG-GEN-HW-EDG31					
		FB-T1			
238	1.6286E-08	AC4-RCI-FE-U1-6A	DC1-MAI-MA-BCC33	IE-TDC31	
239	1.6174E-08	AC4-RCI-FE-U1-6A	LHR-MDP-FR-PM31		
OLR-S2-SUCC					
		PPR-AOV-OO-455C	PPR-PHN-CC-DMOTR	IE-T3	
240	1.6174E-08	AC4-RCI-FE-U1-5A	LHR-MDP-FR-PM32		
OLR-S2-SUCC					
		PPR-AOV-OO-456	PPR-PHN-CC-DMOTR	IE-T3	
241	1.6150E-08	AC4-RCK-NO-BCH39	AFW-MDP-FS-PM31		
AFW-XHE-RE-AFW33					
242	1.6150E-08	AC4-RCK-NO-BCH39	AFW-MDP-FS-PM33		

AFW-XHE-RE-AFW31				
243	1.6085E-08	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW31	
AFW-XHE-RE-AFW33				
		FB-T2	SL-T2-SUCC	IE-T3
244	1.6056E-08	AFW-MAI-MA-TDP32	AFW-XHE-RE-AFW33	
EDG-MAI-MA-EDG31				
		FB-T1		
245	1.6027E-08	AC4-RCK-NO-BCH37	AFW-MAI-MA-TDP32	
EDG-GEN-HW-EDG31				
		OHR-T2	IE-T3	
246	1.5960E-08	AFW-AOV-CC-P1139	AFW-XHE-RE-AFW31	IE-TDC32
247	1.5960E-08	AFW-AOV-CC-P1139	AFW-XHE-RE-AFW31	
DC1-MAI-MA-BCC32				
248	1.5851E-08	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-6	FB-T2
		SL-T2-SUCC	IE-T2	
249	1.5851E-08	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-64	FB-T2
		SL-T2-SUCC	IE-T2	
250	1.5822E-08	AFW-MAI-MA-PM31	AFW-XHE-RE-AFW32	
EDG-MAI-MA-EDG32				
		FB-T1		
251	1.5750E-08	AFW-RCK-NO-PM31	AFW-XHE-FO-HC405	IE-TDC32
252	1.5750E-08	AFW-RCK-NO-TDP32	CCW-PUMP	
CWRHR-TCCW-SUCC				
		DC1-MAI-MA-BCC32	IE-SWS	
253	1.5750E-08	AFW-RCK-NO-TDP32	CCW-PUMP	
DC1-MAI-MA-BCC32				
		IE-SWS		
254	1.5750E-08	AC4-RCK-NO-BC36C	AFW-XHE-FO-HC405	IE-TDC32
255	1.5750E-08	AFW-RCK-NO-PM31	AFW-XHE-FO-HC405	
DC1-MAI-MA-BCC32				
256	1.5660E-08	AFW-TDP-FS-TDP32	DC1-MAI-MA-BCC32	
EDG-GEN-HW-EDG31				
		OHR-T2	IE-T3	
257	1.5651E-08	AFV-MOD-CC-IL314	NR-AFBV	
PPR-CCF-CC-PORVS				
		SL-T2-SUCC	IE-T2	
258	1.5649E-08	AFW-CCF-FS-AFWPM	AFW-TDP-FR-TDP32	OHR-T2
		SL-T2-SUCC	IE-T2	
259	1.5625E-08	AC4-RCK-NO-BCH39	AFW-RCK-NO-PM31	
AFW-RCK-NO-PM33				
260	1.5625E-08	AC4-RCK-NO-BCH37	AFW-RCK-NO-PM31	
AFW-RCK-NO-TDP32				
261	1.5525E-08	AFW-MAI-MA-TDP32	AFW-XHE-RE-AFW31	
EDG-MAI-MA-EDG32				
		FB-T1		

262	1.5335E-08	AC4-RCK-NO-BCH37	AFW-TDP-FS-TDP32		
EDG-MAI-MA-EDG31					
		OHR-T2	IE-T3		
263	1.5122E-08	AFW-XHE-RE-AFW32	AFW-XHE-RE-AFW33		
EDG-MAI-MA-EDG31					
		FB-T1			
264	1.5095E-08	AC4-RCK-NO-BCH37	AFW-XHE-RE-AFW32		
EDG-GEN-HW-EDG31					
		OHR-T2	IE-T3		
265	1.4951E-08	AFW-RCK-NO-PM33	AFW-TDP-FR-TDP32		
EDG-MAI-MA-EDG31					
		FB-T1			
266	1.4865E-08	AFW-MAI-MA-PM31	AFW-RLY-NO-332-1		
DC1-MAI-MA-BCC31					
267	1.4756E-08	AC4-RCK-NO-BCH37	AFW-MDP-FS-PM31		
AFW-TDP-FS-TDP32					
268	1.4622E-08	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW32		
EDG-MAI-MA-EDG32					
		FB-T1			
269	1.4456E-08	AFW-RCK-NO-PM31	AFW-TDP-FR-TDP32		
EDG-MAI-MA-EDG32					
		FB-T1			
270	1.4392E-08	AC4-RCK-NO-BCH37	AFW-AOV-CC-P1139		
AFW-MAI-MA-PM31					
271	1.4288E-08	AFW-CCF-FS-AFWPM	AFW-MAI-MA-TDP32	FB-T2	
		SL-T2-SUCC	IE-T2		
272	1.4280E-08	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-64	FB-T1	
273	1.4280E-08	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-6	FB-T1	
274	1.4100E-08	AFV-MOD-CC-IL314	NR-AFBV		
PPR-CCF-CC-PORVS					
275	1.3950E-08	AC4-RCI-FE-U1-6A	LHR-XHE-RE-PM31		
OLR-S2-SUCC					
		PPR-AOV-OO-455C	PPR-PHN-CC-DMOTR	IE-T3	
276	1.3950E-08	AC4-RCI-FE-U1-5A	LHR-XHE-RE-PM32		
OLR-S2-SUCC					
		PPR-AOV-OO-456	PPR-PHN-CC-DMOTR	IE-T3	
277	1.3926E-08	AFW-MAI-MA-PM31	AFW-XHE-RE-AFW32		
EDG-GEN-HW-EDG32					
		FB-T1			
278	1.3737E-08	AFW-RLY-NO-312-1	AFW-XHE-RE-AFW33		
DC1-MAI-MA-BCC31					
279	1.3737E-08	AFW-RLY-NO-332-1	AFW-XHE-RE-AFW31		
DC1-MAI-MA-BCC31					
280	1.3679E-08	AFW-MAI-MA-PM31	AFW-TDP-FS-TDP32		
EDG-MAI-MA-EDG32					
		FB-T1			
281	1.3664E-08	AFW-MAI-MA-TDP32	AFW-XHE-RE-AFW33		

EDG-GEN-HW-EDG31

FB-T1

282 1.3664E-08 AFW-MAI-MA-TDP32 AFW-XHE-RE-AFW31
EDG-GEN-HW-EDG32

FB-T1

283 1.3457E-08 AFW-CCF-FS-AFWPM AFW-XHE-RE-AFW32 FB-T2

SL-T2-SUCC IE-T2

284 1.3300E-08 AC4-RCK-NO-BCH37 AFW-AOV-CC-P1139
AFW-XHE-RE-AFW31

285 1.3254E-08 AFW-CRB-DN-52AF1 AFW-MAI-MA-PM33
DC1-MAI-MA-BCC31

286 1.3230E-08 AFW-XHE-FO-HC405 CCW-PUMP
DC1-MAI-MA-BCC32

IE-SWS

287 1.3230E-08 AFW-XHE-FO-HC405 CCW-PUMP
CWRHR-TCCW-SUCC

DC1-MAI-MA-BCC32 IE-SWS

288 1.3138E-08 AFW-MAI-MA-PM33 AFW-MDP-FS-PM31 IE-TDC31

289 1.3125E-08 AC4-RCK-NO-BCH37 AFW-RCK-NO-PM31
AFW-XHE-FO-HC405

290 1.3125E-08 AC4-RCK-NO-BCH37 AFW-RCK-NO-TDP32 CCW-PUMP

CWRHR-TCCW-SUCC IE-SWS

291 1.3125E-08 AC4-RCK-NO-BCH37 AFW-RCK-NO-TDP32 CCW-PUMP

IE-SWS

292 1.3074E-08 AFW-TDP-FS-TDP32 AFW-XHE-RE-AFW33
EDG-MAI-MA-EDG31

FB-T1

293 1.3050E-08 AC4-RCK-NO-BCH39 DC1-MAI-MA-BCC33 IE-TDC32

294 1.3050E-08 AFW-RCK-NO-PM33 DC1-MAI-MA-BCC33 IE-TDC31

295 1.3050E-08 AC4-RCK-NO-BCH37 DC1-MAI-MA-BCC33 IE-TDC31

296 1.3050E-08 AFW-RCK-NO-TDP32 DC1-MAI-MA-BCC33 IE-TDC32

297 1.3050E-08 AC4-RCK-NO-BCH37 AFW-TDP-FS-TDP32
EDG-GEN-HW-EDG31

OHR-T2 IE-T3

298 1.3037E-08 AFW-MAI-MA-PM33 AFW-MDP-FR-PM31
DC1-MAI-MA-BCC31

299 1.2872E-08 AFW-CCF-FS-AFWPM AFW-MAI-MA-TDP32 FB-T1

300 1.2869E-08 AFW-XHE-RE-AFW31 AFW-XHE-RE-AFW32
EDG-GEN-HW-EDG32

FB-T1

301 1.2869E-08 AFW-XHE-RE-AFW32 AFW-XHE-RE-AFW33
EDG-GEN-HW-EDG31

FB-T1

302	1.2730E-08	AC4-RCI-FE-U1-6A	AFW-MDP-FS-PM31	IE-TDC31	
303	1.2723E-08	AFW-RCK-NO-PM31	AFW-TDP-FR-TDP32		
EDG-GEN-HW-EDG32					
		FB-T1			
304	1.2723E-08	AFW-RCK-NO-PM33	AFW-TDP-FR-TDP32		
EDG-GEN-HW-EDG31					
		FB-T1			
305	1.2641E-08	AFW-TDP-FS-TDP32	AFW-XHE-RE-AFW31		
EDG-MAI-MA-EDG32					
		FB-T1			
306	1.2349E-08	AFW-CRB-DN-52AF1	DC1-MAI-MA-BCC31	IE-TDC32	
307	1.2349E-08	AC4-CRB-OO-2AT3A	DC1-MAI-MA-BCC31	IE-TDC32	
308	1.2328E-08	AFW-TDP-FR-TDP32	DC1-MAI-MA-BCC32		
EDG-MAI-MA-EDG31					
		OHR-T2	IE-T2		
309	1.2257E-08	DC1-MAI-MA-BCC31	FLAG-SI		
LHR-PHN-PE-DECAY					
		OLR-S2-SUCC	SWS-MAI-MA-PM33		
AC4-RCI-FE-U1-6A					
		PPR-AOV-OO-455C	PPR-PHN-CC-DMOTR	IE-T3	
310	1.2257E-08	DC1-MAI-MA-BCC31	FLAG-SI		
LHR-PHN-PE-DECAY					
		OLR-S2-SUCC	SWS-MAI-MA-PM33		
AC4-RCI-FE-U1-5A					
		PPR-AOV-OO-456	PPR-PHN-CC-DMOTR	IE-T3	
311	1.2240E-08	AFW-MDP-FS-PM31	DC1-MAI-MA-BCC32	IE-TDC31	
312	1.2182E-08	AFW-RCK-NO-TDP32	DC1-BDC-ST-PP-32	IE-T2	
313	1.2146E-08	AFW-MDP-FR-PM31	DC1-MAI-MA-BCC31	IE-TDC32	
314	1.2123E-08	AFW-CCF-FS-AFWPM	AFW-XHE-RE-AFW32	FB-T1	
315	1.2080E-08	AC4-CRB-OO-2AT3A	AFW-TDP-FR-TDP32	IE-TDC32	
316	1.2080E-08	AFW-CRB-DN-52AF1	AFW-TDP-FR-TDP32		
DC1-MAI-MA-BCC32					
317	1.2080E-08	AFW-CRB-DN-52AF1	AFW-TDP-FR-TDP32	IE-TDC32	
318	1.2039E-08	AFW-MAI-MA-PM31	AFW-TDP-FS-TDP32		
EDG-GEN-HW-EDG32					
		FB-T1			
319	1.1882E-08	AFW-MDP-FR-PM31	AFW-TDP-FR-TDP32		
DC1-MAI-MA-BCC32					
320	1.1882E-08	AFW-MDP-FR-PM31	AFW-TDP-FR-TDP32	IE-TDC32	
321	1.1785E-08	DC1-MAI-MA-BCC31	FLAG-SI		

LHR-PHN-PE-DECAY
OLR-S2-SUCC SWS-MAI-MA-PM33
PPR-AOV-OO-456
PPR-MOV-OO-RC536 PPR-PHN-CC-DMOTR IE-T3

322 1.1785E-08 DC1-MAI-MA-BCC31 FLAG-SI
LHR-PHN-PE-DECAY
OLR-S2-SUCC SWS-MAI-MA-PM33
PPR-AOV-OO-455C
PPR-MOV-OO-RC535 PPR-PHN-CC-DMOTR IE-T3

323 1.1634E-08 AFW-CCF-FS-AFWPM AFW-TDP-FS-TDP32 FB-T2

SL-T2-SUCC IE-T2
324 1.1433E-08 AC4-RCI-FE-U1-6A AFW-MAI-MA-PM31
AFW-TDP-FR-TDP32
FB-T2 SL-T2-SUCC IE-T3

325 1.1259E-08 AFW-TDP-FR-TDP32 CCW-PUMP
DC1-MAI-MA-BCC32
IE-CCW
326 1.1259E-08 AFW-TDP-FR-TDP32 CCW-PUMP
CWRHR-TCCW-SUCC
DC1-MAI-MA-BCC32 IE-CCW
327 1.1259E-08 AFW-TDP-FR-TDP32 CCW-PIPE
DC1-MAI-MA-BCC32
IE-CCW
328 1.1126E-08 AFW-TDP-FS-TDP32 AFW-XHE-RE-AFW33
EDG-GEN-HW-EDG31
FB-T1
329 1.1126E-08 AFW-TDP-FS-TDP32 AFW-XHE-RE-AFW31
EDG-GEN-HW-EDG32
FB-T1
330 1.1025E-08 AC4-RCK-NO-BCH37 AFW-XHE-FO-HC405 CCW-PUMP

CWRHR-TCCW-SUCC IE-SWS
331 1.1025E-08 AC4-RCK-NO-BCH37 AFW-XHE-FO-HC405 CCW-PUMP

IE-SWS
332 1.0962E-08 AFW-XHE-FO-HC405 DC1-MAI-MA-BCC33 IE-TDC32

333 1.0948E-08 AC4-RCK-NO-BCH39 AFW-MAI-MA-PM33
AFW-MDP-FS-PM31
334 1.0904E-08 AFW-MAI-MA-PM33 AFW-TDP-FR-TDP32
AFW-XHE-RE-AFW31
FB-T2 SL-T2-SUCC IE-T3

335 1.0715E-08 AC4-RCI-FE-U1-5A LHR-MOV-CC-1802B
OLR-S2-SUCC
PPR-AOV-OO-456 PPR-PHN-CC-DMOTR IE-T3

336 1.0715E-08 AC4-RCI-FE-U1-6A LHR-MDP-FS-PM31

OLR-S2-SUCC

PPR-AOV-OO-455C PPR-PHN-CC-DMOTR IE-T3

337 1.0715E-08 AC4-RCI-FE-U1-6A LHR-MOV-CC-1802A
OLR-S2-SUCC

PPR-AOV-OO-455C PPR-PHN-CC-DMOTR IE-T3

338 1.0715E-08 AC4-RCI-FE-U1-5A LHR-MDP-FS-PM32
OLR-S2-SUCC

PPR-AOV-OO-456 PPR-PHN-CC-DMOTR IE-T3

339 1.0600E-08 AFW-RCK-NO-TDP32 DC1-MAI-MA-BCC32
EDG-MAI-MA-EDG31

OHR-T2 IE-T3

340 1.0565E-08 AC4-RCI-FE-U1-6A AFW-TDP-FR-TDP32
AFW-XHE-RE-AFW31

FB-T2 SL-T2-SUCC IE-T3

341 1.0565E-08 AC4-RCI-FE-U1-3A AFW-TDP-FR-TDP32
AFW-XHE-RE-AFW33

FB-T2 SL-T2-SUCC IE-T3

342 1.0532E-08 AFW-MAI-MA-33VLV AFW-XHE-RE-AFW31
DC1-MAI-MA-BCC31

343 1.0491E-08 AFW-TDP-FR-TDP32 DC1-MAI-MA-BCC32
EDG-GEN-HW-EDG31

OHR-T2 IE-T2

344 1.0481E-08 AFW-CCF-FS-AFWPM AFW-TDP-FS-TDP32 FB-T1

345 1.0453E-08 AFW-XHE-FO-CITYW AFW-XVM-PG-CT-6
PPR-PRV-CC-455C

SL-T2-SUCC IE-T3

346 1.0453E-08 AFW-XHE-FO-CITYW AFW-XVM-PG-CT-6
PPR-PRV-CC-456

SL-T2-SUCC IE-T3

347 1.0453E-08 AFW-XHE-FO-CITYW AFW-XVM-PG-CT-64
PPR-PRV-CC-456

SL-T2-SUCC IE-T3

348 1.0453E-08 AFW-XHE-FO-CITYW AFW-XVM-PG-CT-64
PPR-PRV-CC-455C

SL-T2-SUCC IE-T3

349 1.0291E-08 AFW-CRB-DN-52AF3 AFW-RCK-NO-PM31
DC1-MAI-MA-BCC31

350 1.0291E-08 AFW-CRB-DN-52AF1 AFW-RCK-NO-PM33
DC1-MAI-MA-BCC31

351 1.0274E-08 AC4-RCK-NO-BCH37 AFW-TDP-FR-TDP32
EDG-MAI-MA-EDG31

OHR-T2 IE-T2

352 1.0251E-08 AFW-MAI-MA-PM33 AFW-XHE-RE-AFW32
EDG-MAI-MA-EDG31

FB-T1

353 1.0233E-08 AFW-XHE-FO-HC405 DC1-BDC-ST-PP-32 IE-T2

354	1.0200E-08	AFW-MDP-FS-PM33	AFW-RCK-NO-PM31	IE-TDC31
355	1.0200E-08	AC4-RCK-NO-BC36C	AFW-MDP-FS-PM33	IE-TDC31
356	1.0200E-08	AFW-MDP-FS-PM31	AFW-RCK-NO-TDP32	IE-TDC32
357	1.0200E-08	AFW-MDP-FS-PM31	AFW-RCK-NO-PM33	IE-TDC31
358	1.0200E-08	AC4-RCK-NO-BCH39	AFW-MDP-FS-PM31	IE-TDC32
359	1.0200E-08	AC4-RCK-NO-BCH37	AFW-MDP-FS-PM31	IE-TDC31
360	1.0200E-08	AFW-MDP-FS-PM31	AFW-RCK-NO-TDP32	
DC1-MAI-MA-BCC32				
361	1.0122E-08	AFW-MDP-FR-PM31	AFW-RCK-NO-PM33	
DC1-MAI-MA-BCC31				
362	1.0122E-08	AFW-MDP-FR-PM33	AFW-RCK-NO-PM31	
DC1-MAI-MA-BCC31				
363	1.0067E-08	AC4-RCK-NO-BCH37	AFW-CRB-DN-52AF1	
AFW-TDP-FR-TDP32				
364	9.9015E-09	AC4-RCK-NO-BCH37	AFW-MDP-FR-PM31	
AFW-TDP-FR-TDP32				
365	9.8212E-09	DC1-MAI-MA-BCC31	FLAG-SI	
LHR-PHN-PE-DECAY				
		OLR-S2-SUCC	SWS-MAI-MA-PM33	
PPR-AOV-OO-455C				
		PPR-PHN-CC-DMOTR	PPR-RCK-NO-RC535	IE-T3
366	9.8212E-09	DC1-MAI-MA-BCC31	FLAG-SI	
LHR-PHN-PE-DECAY				
		OLR-S2-SUCC	SWS-MAI-MA-PM33	
PPR-AOV-OO-456				
		PPR-PHN-CC-DMOTR	PPR-RCK-NO-RC536	IE-T3
367	9.8124E-09	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-6	OHR-T2
		SL-T2-SUCC	IE-T2	
368	9.8124E-09	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-64	OHR-T2
		SL-T2-SUCC	IE-T2	
369	9.7373E-09	AFW-AOV-CC-P1139	AFW-CCF-FS-AFWPM	FB-T2
		SL-T2-SUCC	IE-T3	
370	9.5921E-09	AC4-RCI-FE-U1-5A	LHR-CRB-DN-PM32	
OLR-S2-SUCC				
		PPR-AOV-OO-456	PPR-PHN-CC-DMOTR	IE-T3
371	9.5921E-09	AC4-RCI-FE-U1-6A	LHR-CRB-DN-PM31	
OLR-S2-SUCC				
		PPR-AOV-OO-455C	PPR-PHN-CC-DMOTR	IE-T3

372	9.4223E-09	AFW-CCF-FS-AFWPM	AFW-MAI-MA-TDP32	
PPR-PRV-CC-456				
		SL-T2-SUCC	IE-T3	
373	9.4223E-09	AFW-CCF-FS-AFWPM	AFW-MAI-MA-TDP32	
PPR-PRV-CC-455C				
		SL-T2-SUCC	IE-T3	
374	9.3829E-09	AC4-RCK-NO-BCH37	AFW-TDP-FR-TDP32	CCW-PUMP
		CWRHR-TCCW-SUCC	IE-CCW	
375	9.3829E-09	AC4-RCK-NO-BCH37	AFW-TDP-FR-TDP32	CCW-PIPE
		IE-CCW		
376	9.3829E-09	AC4-RCK-NO-BCH37	AFW-TDP-FR-TDP32	CCW-PUMP
		IE-CCW		
377	9.3122E-09	AFW-MAI-MA-PM33	AFW-RLY-NO-312-1	
DC1-MAI-MA-BCC31				
378	9.2658E-09	AFW-MAI-MA-PM31	AFW-XHE-RE-AFW32	
AFW-XHE-RE-AFW33				
		FB-T2	SL-T2-SUCC	IE-T3
379	9.1609E-09	AFW-MAI-MA-PM31	AFW-RCK-NO-PM33	
AFW-TDP-FR-TDP32				
		FB-T2	SL-T2-SUCC	IE-T3
380	9.0915E-09	AFW-MAI-MA-TDP32	AFW-XHE-RE-AFW31	
AFW-XHE-RE-AFW33				
		FB-T2	SL-T2-SUCC	IE-T3
381	9.0207E-09	AFW-RCK-NO-TDP32	DC1-MAI-MA-BCC32	
EDG-GEN-HW-EDG31				
		OHR-T2	IE-T3	
382	8.9042E-09	AFW-XHE-FO-HC405	DC1-MAI-MA-BCC32	
EDG-MAI-MA-EDG31				
		OHR-T2	IE-T3	
383	8.8743E-09	AFW-CCF-FS-AFWPM	AFW-XHE-RE-AFW32	
PPR-PRV-CC-456				
		SL-T2-SUCC	IE-T3	
384	8.8743E-09	AFW-CCF-FS-AFWPM	AFW-XHE-RE-AFW32	
PPR-PRV-CC-455C				
		SL-T2-SUCC	IE-T3	
385	8.8628E-09	AFW-MAI-MA-PM33	AFW-TDP-FS-TDP32	
EDG-MAI-MA-EDG31				
		FB-T1		
386	8.8449E-09	AFW-CCF-FS-AFWPM	AFW-MAI-MA-TDP32	OHR-T2
		SL-T2-SUCC	IE-T2	
387	8.8335E-09	AC4-RCK-NO-BCH37	AFW-RCK-NO-TDP32	
EDG-MAI-MA-EDG31				
		OHR-T2	IE-T3	
388	8.7912E-09	AFV-MOD-CC-IL314	CCW-CCF-CC-822	
LHR-PHN-PE-DECAY				

		NR-AFBV	OHR-T2-SUCC	
SL-T2-SUCC				
		IE-T2		
389	8.7428E-09	AC4-RCK-NO-BCH37	AFW-TDP-FR-TDP32	
EDG-GEN-HW-EDG31				
		OHR-T2	IE-T2	
390	8.7239E-09	AFW-MAI-MA-PM33	AFW-XHE-RE-AFW32	
EDG-GEN-HW-EDG31				
		FB-T1		
391	8.6940E-09	AC1-BAC-ST-LP324	FB-T2	NR-AFBV
		SL-T2-SUCC	IE-T3	
392	8.6940E-09	AC1-BAC-ST-LB33	FB-T2	NR-AFBV
		SL-T2-SUCC	IE-T3	
393	8.6760E-09	AC4-RCS-OO-U3AX2	DC1-MAI-MA-BCC31	IE-TDC32
394	8.6760E-09	AFW-RLY-NO-312-1	DC1-MAI-MA-BCC31	IE-TDC32
395	8.5680E-09	AFW-MDP-FS-PM31	AFW-XHE-FO-HC405	
DC1-MAI-MA-BCC32				
396	8.5680E-09	AFW-MDP-FS-PM31	AFW-XHE-FO-HC405	IE-TDC32
397	8.5646E-09	AFW-AOV-OO-11581	AFW-AOV-OO-11582	
AFW-XHE-FO-CITYW				
		FB-T2	SL-T2-SUCC	IE-T3
398	8.5627E-09	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW32	
AFW-XHE-RE-AFW33				
		FB-T2	SL-T2-SUCC	IE-T3
399	8.5000E-09	AC4-RCK-NO-BCH39	AFW-MDP-FS-PM31	
AFW-RCK-NO-PM33				
400	8.5000E-09	AC4-RCK-NO-BCH37	AFW-MDP-FS-PM31	
AFW-RCK-NO-TDP32				
401	8.5000E-09	AC4-RCK-NO-BCH39	AFW-MDP-FS-PM33	
AFW-RCK-NO-PM31				
402	8.4870E-09	AFW-RLY-NO-312-1	AFW-TDP-FR-TDP32	IE-TDC32
403	8.4870E-09	AFW-RLY-NO-312-1	AFW-TDP-FR-TDP32	
DC1-MAI-MA-BCC32				
404	8.4870E-09	AC4-RCS-OO-U3AX2	AFW-TDP-FR-TDP32	IE-TDC32
405	8.4658E-09	AFW-RCK-NO-PM31	AFW-TDP-FR-TDP32	
AFW-XHE-RE-AFW33				
		FB-T2	SL-T2-SUCC	IE-T3
406	8.4658E-09	AFW-RCK-NO-PM33	AFW-TDP-FR-TDP32	
AFW-XHE-RE-AFW31				
		FB-T2	SL-T2-SUCC	IE-T3
407	8.4658E-09	AC4-RCK-NO-BC36C	AFW-TDP-FR-TDP32	

		AFW-XHE-RE-AFW33			
			FB-T2	SL-T2-SUCC	IE-T3
408	8.4507E-09	AFW-MAI-MA-TDP32	AFW-RCK-NO-PM33		
EDG-MAI-MA-EDG31					
			FB-T1		
409	8.4000E-09	AFW-AOV-CC-P1139	AFW-RCK-NO-PM31	IE-TDC32	
410	8.4000E-09	AC4-RCK-NO-BC36C	AFW-AOV-CC-P1139	IE-TDC32	
411	8.4000E-09	AFW-AOV-CC-P1139	AFW-RCK-NO-PM31		
DC1-MAI-MA-BCC32					
412	8.3304E-09	AFW-CCF-FS-AFWPM	AFW-XHE-RE-AFW32	OHR-T2	
			SL-T2-SUCC	IE-T2	
413	8.1709E-09	AFW-MAI-MA-TDP32	AFW-RCK-NO-PM31		
EDG-MAI-MA-EDG32					
			FB-T1		
414	8.1335E-09	AFW-MDP-FS-PM33	AFW-TDP-FR-TDP32		
EDG-MAI-MA-EDG31					
			FB-T1		
415	8.0341E-09	CCW-MAI-MA-PM33	DC1-MAI-MA-BCC31	FLAG-SI	
			LHR-PHN-PE-DECAY	OLR-S2-SUCC	
AC4-RCI-FE-U1-6A					
			PPR-AOV-OO-455C	PPR-PHN-CC-DMOTR	IE-T3
416	8.0341E-09	CCW-MAI-MA-PM33	DC1-MAI-MA-BCC31	FLAG-SI	
			LHR-PHN-PE-DECAY	OLR-S2-SUCC	
AC4-RCI-FE-U1-5A					
			PPR-AOV-OO-456	PPR-PHN-CC-DMOTR	IE-T3
417	8.0107E-09	AFW-MAI-MA-PM31	AFW-TDP-FS-TDP32		
AFW-XHE-RE-AFW33					
			FB-T2	SL-T2-SUCC	IE-T3
418	7.9592E-09	AFW-RCK-NO-PM33	AFW-XHE-RE-AFW32		
EDG-MAI-MA-EDG31					
			FB-T1		
419	7.8796E-09	AFW-MAI-MA-PM31	AFW-RCK-NO-TDP32		
EDG-MAI-MA-EDG32					
			FB-T1		
420	7.8642E-09	AFW-MDP-FS-PM31	AFW-TDP-FR-TDP32		
EDG-MAI-MA-EDG32					
			FB-T1		
421	7.7251E-09	CCW-MAI-MA-PM33	DC1-MAI-MA-BCC31	FLAG-SI	
			LHR-PHN-PE-DECAY	OLR-S2-SUCC	
PPR-AOV-OO-455C					
			PPR-MOV-OO-RC535	PPR-PHN-CC-DMOTR	IE-T3

422	7.7251E-09	CCW-MAI-MA-PM33	DC1-MAI-MA-BCC31	FLAG-SI
		LHR-PHN-PE-DECAY	OLR-S2-SUCC	
PPR-AOV-OO-456				
		PPR-MOV-OO-RC536	PPR-PHN-CC-DMOTR	IE-T3
423	7.6957E-09	AFW-RCK-NO-PM31	AFW-XHE-RE-AFW32	
EDG-MAI-MA-EDG32				
		FB-T1		
424	7.6892E-09	AFW-TDP-FR-TDP32	DC1-MAI-MA-BCC32	
EDG-MAI-MA-EDG31				
		LHR-RCK-NO-PM31	OHR-T2-SUCC	IE-T3
425	7.6722E-09	AFW-CCF-FS-AFWPM	AFW-TDP-FS-TDP32	
PPR-PRV-CC-456				
		SL-T2-SUCC	IE-T3	
426	7.6722E-09	AFW-CCF-FS-AFWPM	AFW-TDP-FS-TDP32	
PPR-PRV-CC-455C				
		SL-T2-SUCC	IE-T3	
427	7.5774E-09	AFW-XHE-FO-HC405	DC1-MAI-MA-BCC32	
EDG-GEN-HW-EDG31				
		OHR-T2	IE-T3	
428	7.5422E-09	AFW-MAI-MA-PM33	AFW-TDP-FS-TDP32	
EDG-GEN-HW-EDG31				
		FB-T1		
429	7.5311E-09	AFW-RCK-NO-TDP32	AFW-XHE-RE-AFW33	
EDG-MAI-MA-EDG31				
		FB-T1		
430	7.5172E-09	AC4-RCK-NO-BCH37	AFW-RCK-NO-TDP32	
EDG-GEN-HW-EDG31				
		OHR-T2	IE-T3	
431	7.4201E-09	AC4-RCK-NO-BCH37	AFW-XHE-FO-HC405	
EDG-MAI-MA-EDG31				
		OHR-T2	IE-T3	
432	7.4028E-09	AFW-TDP-FS-TDP32	AFW-XHE-RE-AFW31	
AFW-XHE-RE-AFW33				
		FB-T2	SL-T2-SUCC	IE-T3
433	7.2817E-09	AFW-RCK-NO-TDP32	AFW-XHE-RE-AFW31	
EDG-MAI-MA-EDG32				
		FB-T1		
434	7.2300E-09	AFW-RCK-NO-PM33	AFW-RLY-NO-312-1	
DC1-MAI-MA-BCC31				
435	7.2300E-09	AFW-RCK-NO-PM31	AFW-RLY-NO-332-1	
DC1-MAI-MA-BCC31				
436	7.2020E-09	AFW-CCF-FS-AFWPM	AFW-TDP-FS-TDP32	OHR-T2
		SL-T2-SUCC	IE-T2	
437	7.1915E-09	AFW-MAI-MA-TDP32	AFW-RCK-NO-PM31	
EDG-GEN-HW-EDG32				
		FB-T1		
438	7.1915E-09	AFW-MAI-MA-TDP32	AFW-RCK-NO-PM33	

EDG-GEN-HW-EDG31

		FB-T1		
439	7.1622E-09	AC4-RCI-FE-U1-3A	AFW-MAI-MA-PM33	
AFW-TDP-FR-TDP32				
		FB-T2	SL-T2-SUCC	IE-T3
440	7.1400E-09	AC4-RCK-NO-BCH37	AFW-MDP-FS-PM31	
AFW-XHE-FO-HC405				
441	7.0992E-09	AFW-MDP-FS-PM33	DC1-MAI-MA-BCC33	IE-TDC31
442	7.0725E-09	AC4-RCK-NO-BCH37	AFW-RLY-NO-312-1	
AFW-TDP-FR-TDP32				
443	7.0560E-09	AFW-AOV-CC-P1139	CCW-PUMP	
DC1-MAI-MA-BCC32				
		IE-SWS		
444	7.0560E-09	AFW-AOV-CC-P1139	CCW-PUMP	
CWRHR-TCCW-SUCC				
		DC1-MAI-MA-BCC32	IE-SWS	
445	7.0000E-09	AC4-RCK-NO-BCH37	AFW-AOV-CC-P1139	
AFW-RCK-NO-PM31				
446	6.9682E-09	AFW-MAI-MA-TDP32	DC1-MAI-MA-BCC32	
EDG-MAI-MA-EDG31				
		OHR-T2	IE-T2	
447	6.9351E-09	AFW-MAI-MA-PM31	AFW-RCK-NO-TDP32	
EDG-GEN-HW-EDG32				
		FB-T1		
448	6.9215E-09	AFW-MDP-FS-PM33	AFW-TDP-FR-TDP32	
EDG-GEN-HW-EDG31				
		FB-T1		
449	6.9215E-09	AFW-MDP-FS-PM31	AFW-TDP-FR-TDP32	
EDG-GEN-HW-EDG32				
		FB-T1		
450	6.8811E-09	AFW-RCK-NO-PM33	AFW-TDP-FS-TDP32	
EDG-MAI-MA-EDG31				
		FB-T1		
451	6.8277E-09	AC4-CRB-OO-2AT3A	AFW-MAI-MA-TDP32	IE-TDC32
452	6.8277E-09	AFW-CRB-DN-52AF1	AFW-MAI-MA-TDP32	
DC1-MAI-MA-BCC32				
453	6.8277E-09	AFW-CRB-DN-52AF1	AFW-MAI-MA-TDP32	IE-TDC32
454	6.8040E-09	AFV-MOD-CC-ED311	AFV-MOD-CC-ED312	FB-T2
		NR-AFBV	SL-T2-SUCC	IE-T3
455	6.7732E-09	AFW-RCK-NO-PM31	AFW-XHE-RE-AFW32	
EDG-GEN-HW-EDG32				
		FB-T1		
456	6.7732E-09	AFW-RCK-NO-PM33	AFW-XHE-RE-AFW32	
EDG-GEN-HW-EDG31				
		FB-T1		
457	6.7392E-09	AC4-RCI-FE-U1-6A	FLAG-SI	

LHR-PHN-PE-DECAY
OLR-S2-SUCC SAS-RCS-OO-SI1
PPR-AOV-OO-455C
PPR-PHN-CC-DMOTR IE-T3
458 6.7392E-09 OLR-S2 AC4-RCI-FE-U1-6A
PPR-AOV-OO-455C
PPR-PHN-CC-DMOTR IE-T3
459 6.7392E-09 OLR-S2 AC4-RCI-FE-U1-5A
PPR-AOV-OO-456
PPR-PHN-CC-DMOTR IE-T3
460 6.7392E-09 AC4-RCI-FE-U1-5A FLAG-SI
LHR-PHN-PE-DECAY
OLR-S2-SUCC SAS-RCS-OO-SI2
PPR-AOV-OO-456
PPR-PHN-CC-DMOTR IE-T3
461 6.7158E-09 AFW-MAI-MA-TDP32 AFW-MDP-FR-PM31 IE-TDC32
462 6.7158E-09 AFW-MAI-MA-TDP32 AFW-MDP-FR-PM31
DC1-MAI-MA-BCC32
463 6.7016E-09 AFW-CCF-FS-AFWPM AFW-RCK-NO-TDP32 FB-T2
SL-T2-SUCC IE-T2
464 6.6532E-09 AFW-RCK-NO-PM31 AFW-TDP-FS-TDP32
EDG-MAI-MA-EDG32
FB-T1
465 6.6189E-09 AFW-MAI-MA-PM31 AFW-XHE-FO-HC405
EDG-MAI-MA-EDG32
FB-T1
466 6.5843E-09 AFW-CRB-DN-52AF3 AFW-MAI-MA-PM31 IE-TDC31
467 6.5629E-09 AFW-XHE-RE-AFW32 DC1-MAI-MA-BCC32
EDG-MAI-MA-EDG31
OHR-T2 IE-T2
468 6.5552E-09 AFW-XHE-FO-CITYW AFW-XVM-PG-CT-64
DC1-MAI-MA-BCC31
469 6.5552E-09 AFW-XHE-FO-CITYW AFW-XVM-PG-CT-6
DC1-MAI-MA-BCC31
470 6.5435E-09 AFW-TDP-FR-TDP32 DC1-MAI-MA-BCC32
EDG-GEN-HW-EDG31
LHR-RCK-NO-PM31 OHR-T2-SUCC IE-T3
471 6.4800E-09 OLR-S2 PPR-AOV-OO-455C
PPR-MOV-OO-RC535
PPR-PHN-CC-DMOTR IE-T3
472 6.4800E-09 OLR-S2 PPR-AOV-OO-456
PPR-MOV-OO-RC536
PPR-PHN-CC-DMOTR IE-T3
473 6.4800E-09 AFV-FAN-FR-EF312 AFV-MOD-CC-ED311 IE-TDC31
474 6.4800E-09 AFV-FAN-FR-EF312 AFV-MOD-CC-ED311 IE-TDC32
475 6.4764E-09 AFW-MAI-MA-PM31 AFW-MDP-FR-PM33 IE-TDC31

476	6.4376E-09	CCW-MAI-MA-PM33	DC1-MAI-MA-BCC31	FLAG-SI	
		LHR-PHN-PE-DECAY	OLR-S2-SUCC		
PPR-AOV-OO-455C					
		PPR-PHN-CC-DMOTR	PPR-RCK-NO-RC535	IE-T3	
477	6.4376E-09	CCW-MAI-MA-PM33	DC1-MAI-MA-BCC31	FLAG-SI	
		LHR-PHN-PE-DECAY	OLR-S2-SUCC		
PPR-AOV-OO-456					
		PPR-PHN-CC-DMOTR	PPR-RCK-NO-RC536	IE-T3	
478	6.4306E-09	AFW-CRB-DN-52AF1	AFW-XHE-RE-AFW32	IE-TDC32	
479	6.4306E-09	AC4-CRB-OO-2AT3A	AFW-XHE-RE-AFW32	IE-TDC32	
480	6.4306E-09	AFW-CRB-DN-52AF1	AFW-XHE-RE-AFW32		
DC1-MAI-MA-BCC32					
481	6.4089E-09	AFW-RCK-NO-TDP32	AFW-XHE-RE-AFW31		
EDG-GEN-HW-EDG32					
		FB-T1			
482	6.4089E-09	AFW-RCK-NO-TDP32	AFW-XHE-RE-AFW33		
EDG-GEN-HW-EDG31					
		FB-T1			
483	6.4077E-09	AC4-RCK-NO-BCH37	AFW-TDP-FR-TDP32		
EDG-MAI-MA-EDG31					
		LHR-RCK-NO-PM31	OHR-T2-SUCC	IE-T3	
484	6.3640E-09	AFW-MAI-MA-TDP32	CCW-PIPE		
DC1-MAI-MA-BCC32					
		IE-CCW			
485	6.3640E-09	AFW-MAI-MA-TDP32	CCW-PUMP		
CWRHR-TCCW-SUCC					
		DC1-MAI-MA-BCC32	IE-CCW		
486	6.3640E-09	AFW-MAI-MA-TDP32	CCW-PUMP		
DC1-MAI-MA-BCC32					
		IE-CCW			
487	6.3261E-09	AFW-XHE-FO-HC405	AFW-XHE-RE-AFW33		
EDG-MAI-MA-EDG31					
		FB-T1			
488	6.3252E-09	AFW-MDP-FR-PM31	AFW-XHE-RE-AFW32		
DC1-MAI-MA-BCC32					
489	6.3252E-09	AFW-MDP-FR-PM31	AFW-XHE-RE-AFW32	IE-TDC32	
490	6.3145E-09	AC4-RCK-NO-BCH37	AFW-XHE-FO-HC405		
EDG-GEN-HW-EDG31					
		OHR-T2	IE-T3		
491	6.2790E-09	AFW-CCF-FS-AFWPM	FLAG-SI		
SWS-MAI-MA-PM36					
		IE-TDC31			
492	6.2445E-09	AFW-CCF-FS-AFWPM	CFC-PND-CC-32DPD	IE-TDC31	

493	6.2445E-09	AFW-CCF-FS-AFWPM	CFC-PND-CC-34DPD	IE-TDC31
494	6.2445E-09	AFW-CCF-FS-AFWPM	CFC-PND-CC-35DPD	IE-TDC31
495	6.1697E-09	AFW-TDP-FR-TDP32	DC1-MAI-MA-BCC32	EDG-ENG-FR-DG31R
		OHR-T2	IE-T3	
496	6.1600E-09	AC4-XHE-RE-MCC6C	DC1-MAI-MA-BCC31	IE-TDC32
497	6.1514E-09	AFW-TDP-FR-TDP32	DC1-MAI-MA-BCC32	EDG-MAI-MA-EDG31
		LHR-PHN-PE-DECAY	OHR-T2-SUCC	SWS-FCV-OO-1112
		IE-T3		
498	6.1167E-09	AFW-XHE-FO-HC405	AFW-XHE-RE-AFW31	EDG-MAI-MA-EDG32
		FB-T1		
499	6.0862E-09	AC4-RCI-FE-U1-6A	AFW-MAI-MA-PM31	AFW-XHE-RE-AFW32
		FB-T2	SL-T2-SUCC	IE-T3
500	6.0847E-09	AFW-CRB-DN-52AF3	AFW-XHE-RE-AFW31	IE-TDC31
501	6.0847E-09	AFW-CRB-DN-52AF1	AFW-XHE-RE-AFW33	IE-TDC31
502	6.0435E-09	AFW-MAI-MA-PM31	AFW-TDP-FR-TDP32	EDG-MAI-MA-EDG32
		PPR-PRV-CC-455C		
503	6.0435E-09	AFW-MAI-MA-PM31	AFW-TDP-FR-TDP32	EDG-MAI-MA-EDG32
		PPR-PRV-CC-456		
504	6.0375E-09	AFW-CCF-FS-AFWPM	AFW-RCK-NO-TDP32	FB-T1
505	6.0258E-09	AC4-XHE-RE-MCC6C	AFW-TDP-FR-TDP32	IE-TDC32
506	5.9939E-09	AFW-XHE-RE-AFW32	CCW-PUMP	DC1-MAI-MA-BCC32
		IE-CCW		
507	5.9939E-09	AFW-XHE-RE-AFW32	CCW-PUMP	CWRHR-TCCW-SUCC
		DC1-MAI-MA-BCC32	IE-CCW	
508	5.9939E-09	AFW-XHE-RE-AFW32	CCW-PIPE	DC1-MAI-MA-BCC32
		IE-CCW		
509	5.9850E-09	AFW-MDP-FR-PM31	AFW-XHE-RE-AFW33	IE-TDC31
510	5.9850E-09	AFW-MDP-FR-PM33	AFW-XHE-RE-AFW31	IE-TDC31
511	5.9717E-09	AC4-RCI-FE-U1-3A	AFW-MAI-MA-TDP32	AFW-XHE-RE-AFW33
		FB-T2	SL-T2-SUCC	IE-T3

512	5.9717E-09	AC4-RCI-FE-U1-6A	AFW-MAI-MA-TDP32	
AFW-XHE-RE-AFW31				
		FB-T2	SL-T2-SUCC	IE-T3
513	5.9299E-09	AFW-MAI-MA-TDP32	DC1-MAI-MA-BCC32	
EDG-GEN-HW-EDG31				
		OHR-T2	IE-T2	
514	5.8922E-09	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW33	
DC1-MAI-MA-BCC33				
		FB-T2	SL-T2-SUCC	IE-T3
515	5.8800E-09	AC4-RCK-NO-BCH37	AFW-AOV-CC-P1139	CCW-PUMP
		CWRHR-TCCW-SUCC	IE-SWS	
516	5.8800E-09	AC4-RCK-NO-BCH37	AFW-AOV-CC-P1139	CCW-PUMP
		IE-SWS		
517	5.8557E-09	AFW-RCK-NO-PM31	AFW-TDP-FS-TDP32	
EDG-GEN-HW-EDG32				
		FB-T1		
518	5.8557E-09	AFW-RCK-NO-PM33	AFW-TDP-FS-TDP32	
EDG-GEN-HW-EDG31				
		FB-T1		
519	5.8464E-09	AFW-AOV-CC-P1139	DC1-MAI-MA-BCC33	IE-TDC32
520	5.8320E-09	C	CVC-CKV-CC-CH374	IE-T3
521	5.8320E-09	C	CVC-CKV-CC-210B	IE-T3
522	5.8320E-09	C	CVC-CKV-CC-210D	IE-T3
523	5.8255E-09	AFW-MAI-MA-PM31	AFW-XHE-FO-HC405	
EDG-GEN-HW-EDG32				
		FB-T1		
524	5.8068E-09	AC4-RCK-NO-BCH37	AFW-MAI-MA-TDP32	
EDG-MAI-MA-EDG31				
		OHR-T2	IE-T2	
525	5.8046E-09	AFW-MAI-MA-PM33	AFW-XHE-RE-AFW31	
AFW-XHE-RE-AFW32				
		FB-T2	SL-T2-SUCC	IE-T3
526	5.7762E-09	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW33	
EDG-MAI-MA-EDG31				
		PPR-PRV-CC-455C		
527	5.7762E-09	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW33	
EDG-MAI-MA-EDG31				
		PPR-PRV-CC-456		
528	5.7389E-09	AC4-RCK-NO-BC36C	AFW-MAI-MA-PM33	
AFW-TDP-FR-TDP32				
		FB-T2	SL-T2-SUCC	IE-T3

529	5.7389E-09	AFW-MAI-MA-PM33	AFW-RCK-NO-PM31	
AFW-TDP-FR-TDP32				
		FB-T2	SL-T2-SUCC	IE-T3
530	5.6898E-09	AC4-RCK-NO-BCH37	AFW-CRB-DN-52AF1	
AFW-MAI-MA-TDP32				
531	5.6739E-09	AFW-TDP-FS-TDP32	DC1-MAI-MA-BCC32	
EDG-MAI-MA-EDG31				
		OHR-T2	IE-T2	
532	5.6294E-09	AFW-CCF-FS-AFWPM	AFW-XHE-FO-HC405	FB-T2
		SL-T2-SUCC	IE-T2	
533	5.6244E-09	AC4-RCI-FE-U1-3A	AFW-XHE-RE-AFW32	
AFW-XHE-RE-AFW33				
		FB-T2	SL-T2-SUCC	IE-T3
534	5.6244E-09	AC4-RCI-FE-U1-6A	AFW-XHE-RE-AFW31	
AFW-XHE-RE-AFW32				
		FB-T2	SL-T2-SUCC	IE-T3
535	5.5981E-09	AFW-CRB-DN-52AF3	AFW-MDP-FS-PM31	
DC1-MAI-MA-BCC31				
536	5.5981E-09	AFW-CRB-DN-52AF1	AFW-MDP-FS-PM33	
DC1-MAI-MA-BCC31				
537	5.5965E-09	AC4-RCK-NO-BCH37	AFW-MAI-MA-TDP32	
AFW-MDP-FR-PM31				
538	5.5850E-09	AFW-XHE-RE-AFW32	DC1-MAI-MA-BCC32	
EDG-GEN-HW-EDG31				
		OHR-T2	IE-T2	
539	5.5849E-09	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW31	
EDG-MAI-MA-EDG32				
		PPR-PRV-CC-455C		
540	5.5849E-09	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW31	
EDG-MAI-MA-EDG32				
		PPR-PRV-CC-456		
541	5.5607E-09	AC4-RCI-FE-U1-3A	AFW-RCK-NO-PM33	
AFW-TDP-FR-TDP32				
		FB-T2	SL-T2-SUCC	IE-T3
542	5.5607E-09	AC4-RCI-FE-U1-6A	AFW-RCK-NO-PM31	
AFW-TDP-FR-TDP32				
		FB-T2	SL-T2-SUCC	IE-T3
543	5.5595E-09	AFW-CRB-DN-52AF1	AFW-TDP-FS-TDP32	IE-TDC32
544	5.5595E-09	AC4-CRB-OO-2AT3A	AFW-TDP-FS-TDP32	IE-TDC32
545	5.5595E-09	AFW-CRB-DN-52AF1	AFW-TDP-FS-TDP32	
DC1-MAI-MA-BCC32				
546	5.5488E-09	AFW-MDP-FS-PM31	AFW-MDP-FS-PM33	IE-TDC31
547	5.5430E-09	AFW-MAI-MA-33VLV	AFW-RCK-NO-PM31	

DC1-MAI-MA-BCC31				
548	5.5064E-09	AFW-MDP-FR-PM33	AFW-MDP-FS-PM31	
DC1-MAI-MA-BCC31				
549	5.5064E-09	AFW-MDP-FR-PM31	AFW-MDP-FS-PM33	
DC1-MAI-MA-BCC31				
550	5.4870E-09	AC4-RCK-NO-BCH39	AFW-CRB-DN-52AF3	
AFW-MAI-MA-PM31				
551	5.4691E-09	AC4-RCK-NO-BCH37	AFW-XHE-RE-AFW32	
EDG-MAI-MA-EDG31				
		OHR-T2	IE-T2	
552	5.4684E-09	AFW-MDP-FR-PM31	AFW-TDP-FS-TDP32	
DC1-MAI-MA-BCC32				
553	5.4684E-09	AFW-MDP-FR-PM31	AFW-TDP-FS-TDP32	IE-TDC32
554	5.4576E-09	AFW-AOV-CC-P1139	DC1-BDC-ST-PP-32	IE-T2
555	5.4529E-09	AC4-RCK-NO-BCH37	AFW-TDP-FR-TDP32	
EDG-GEN-HW-EDG31				
		LHR-RCK-NO-PM31	OHR-T2-SUCC	IE-T3
556	5.4000E-09	OLR-S2	PPR-AOV-OO-456	
PPR-PHN-CC-DMOTR				
		PPR-RCK-NO-RC536	IE-T3	
557	5.4000E-09	OLR-S2	PPR-AOV-OO-455C	
PPR-PHN-CC-DMOTR				
		PPR-RCK-NO-RC535	IE-T3	
558	5.3970E-09	AC4-RCK-NO-BCH39	AFW-MAI-MA-PM31	
AFW-MDP-FR-PM33				
559	5.3835E-09	AFW-XHE-FO-HC405	AFW-XHE-RE-AFW33	
EDG-GEN-HW-EDG31				
		FB-T1		
560	5.3835E-09	AFW-XHE-FO-HC405	AFW-XHE-RE-AFW31	
EDG-GEN-HW-EDG32				
		FB-T1		
561	5.3667E-09	AFW-MAI-MA-PM31	AFW-TDP-FR-TDP32	
AFW-XHE-RE-AFW33				
		FB-T2	SL-T2-SUCC	IE-T2
562	5.3588E-09	AC4-RCK-NO-BCH37	AFW-CRB-DN-52AF1	
AFW-XHE-RE-AFW32				
563	5.3191E-09	AFW-MAI-MA-PM31	AFW-TDP-FR-TDP32	
EDG-GEN-HW-EDG32				
		PPR-PRV-CC-455C		
564	5.3191E-09	AFW-MAI-MA-PM31	AFW-TDP-FR-TDP32	
EDG-GEN-HW-EDG32				
		PPR-PRV-CC-456		
565	5.3100E-09	AFV-MOD-CC-IL314	FLAG-SI	
SWS-MDP-FR-PM35				
		IE-TDC31		
566	5.3100E-09	AFV-MOD-CC-IL314	FLAG-SI	
SWS-MDP-FR-PM36				
		IE-TDC31		

567	5.3033E-09	AC4-RCK-NO-BCH37	AFW-MAI-MA-TDP32	CCW-PUMP
		IE-CCW		
568	5.3033E-09	AC4-RCK-NO-BCH37	AFW-MAI-MA-TDP32	CCW-PUMP
		CWRHR-TCCW-SUCC	IE-CCW	
569	5.3033E-09	AC4-RCK-NO-BCH37	AFW-MAI-MA-TDP32	CCW-PIPE
		IE-CCW		
570	5.2710E-09	AC4-RCK-NO-BCH37	AFW-MDP-FR-PM31	
AFW-XHE-RE-AFW32				
571	5.2617E-09	AC4-RCI-FE-U1-6A	AFW-MAI-MA-PM31	
AFW-TDP-FS-TDP32				
		FB-T2	SL-T2-SUCC	IE-T3
572	5.2348E-09	AFW-TDP-FR-TDP32	DC1-MAI-MA-BCC32	
EDG-GEN-HW-EDG31				
		LHR-PHN-PE-DECAY	OHR-T2-SUCC	
SWS-FCV-OO-1112				
		IE-T3		
573	5.1892E-09	AC4-RCI-FE-U1-6A	LHR-CCF-FS-PUMPS	
OLR-S2-SUCC				
		PPR-AOV-OO-455C	PPR-PHN-CC-DMOTR	IE-T3
574	5.1892E-09	AC4-RCI-FE-U1-5A	LHR-CCF-FS-PUMPS	
OLR-S2-SUCC				
		PPR-AOV-OO-456	PPR-PHN-CC-DMOTR	IE-T3
575	5.1820E-09	AFW-TDP-FS-TDP32	CCW-PUMP	
CWRHR-TCCW-SUCC				
		DC1-MAI-MA-BCC32	IE-CCW	
576	5.1820E-09	AFW-TDP-FS-TDP32	CCW-PIPE	
DC1-MAI-MA-BCC32				
		IE-CCW		
577	5.1820E-09	AFW-TDP-FS-TDP32	CCW-PUMP	
DC1-MAI-MA-BCC32				
		IE-CCW		
578	5.1414E-09	AC4-RCK-NO-BCH37	AFW-TDP-FR-TDP32	
EDG-ENG-FR-DG31R				
		OHR-T2	IE-T3	
579	5.1400E-09	AFW-CCF-FS-AFWPM	AFW-TDP-FR-TDP32	
PPR-PRV-CC-456				
		SL-T2-SUCC	IE-T2	
580	5.1400E-09	AFW-CCF-FS-AFWPM	AFW-TDP-FR-TDP32	
PPR-PRV-CC-455C				
		SL-T2-SUCC	IE-T2	
581	5.1261E-09	AC4-RCK-NO-BCH37	AFW-TDP-FR-TDP32	
EDG-MAI-MA-EDG31				
		LHR-PHN-PE-DECAY	OHR-T2-SUCC	
SWS-FCV-OO-1112				
		IE-T3		
582	5.1053E-09	AFW-MAI-MA-PM33	AFW-RCK-NO-TDP32	

EDG-MAI-MA-EDG31

		FB-T1		
583	5.0715E-09	AFW-CCF-FS-AFWPM	AFW-XHE-FO-HC405	FB-T1
584	5.0706E-09	AC4-RCK-NO-BCH39	AFW-CRB-DN-52AF1	
AFW-XHE-RE-AFW33				
585	5.0706E-09	AC4-RCK-NO-BCH39	AFW-CRB-DN-52AF3	
AFW-XHE-RE-AFW31				
586	5.0184E-09	AFW-MAI-MA-PM33	AFW-TDP-FS-TDP32	
AFW-XHE-RE-AFW31				
		FB-T2	SL-T2-SUCC	IE-T3
587	4.9949E-09	AC4-RCK-NO-BCH37	AFW-XHE-RE-AFW32	CCW-PUMP
		CWRHR-TCCW-SUCC	IE-CCW	
588	4.9949E-09	AC4-RCK-NO-BCH37	AFW-XHE-RE-AFW32	CCW-PUMP
		IE-CCW		
589	4.9949E-09	AC4-RCK-NO-BCH37	AFW-XHE-RE-AFW32	CCW-PIPE
		IE-CCW		
590	4.9875E-09	AC4-RCK-NO-BCH39	AFW-MDP-FR-PM33	
AFW-XHE-RE-AFW31				
591	4.9875E-09	AC4-RCK-NO-BCH39	AFW-MDP-FR-PM31	
AFW-XHE-RE-AFW33				
592	4.9870E-09	AC4-RCI-FE-U1-5A	LHR-MDP-FR-PM32	
OLR-S2-SUCC				
		PPR-AOV-OO-456	PPR-PHN-CC-DMOTR	IE-T2
593	4.9870E-09	AC4-RCI-FE-U1-6A	LHR-MDP-FR-PM31	
OLR-S2-SUCC				
		PPR-AOV-OO-455C	PPR-PHN-CC-DMOTR	IE-T2
594	4.9835E-09	AFW-MAI-MA-PM31	AFW-MDP-FS-PM33	
AFW-TDP-FR-TDP32				
		FB-T2	SL-T2-SUCC	IE-T3
595	4.9595E-09	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW31	
AFW-XHE-RE-AFW33				
		FB-T2	SL-T2-SUCC	IE-T2
596	4.9416E-09	AC4-RCK-NO-BCH37	AFW-MAI-MA-TDP32	
EDG-GEN-HW-EDG31				
		OHR-T2	IE-T2	
597	4.9155E-09	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW33	
EDG-GEN-HW-EDG31				
		PPR-PRV-CC-456		
598	4.9155E-09	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW31	
EDG-GEN-HW-EDG32				
		PPR-PRV-CC-455C		
599	4.9155E-09	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW33	
EDG-GEN-HW-EDG31				

		PPR-PRV-CC-455C		
600	4.9155E-09	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW31	
EDG-GEN-HW-EDG32				
		PPR-PRV-CC-456		
601	4.8767E-09	AFW-MAI-MA-PM31	AFW-RCK-NO-PM33	
AFW-XHE-RE-AFW32				
		FB-T2	SL-T2-SUCC	IE-T3
602	4.8625E-09	AC4-RCI-FE-U1-6A	AFW-TDP-FS-TDP32	
AFW-XHE-RE-AFW31				
		FB-T2	SL-T2-SUCC	IE-T3
603	4.8625E-09	AC4-RCI-FE-U1-3A	AFW-TDP-FS-TDP32	
AFW-XHE-RE-AFW33				
		FB-T2	SL-T2-SUCC	IE-T3
604	4.8611E-09	AC1-SBR-CO-LP324	FB-T2	NR-AFBV
		SL-T2-SUCC	IE-T3	
605	4.8349E-09	AFW-MAI-MA-PM31	AFW-TDP-FR-TDP32	
AFW-XHE-RE-AFW33				
		FB-T1		
606	4.8285E-09	AFW-TDP-FS-TDP32	DC1-MAI-MA-BCC32	
EDG-GEN-HW-EDG31				
		OHR-T2	IE-T2	
607	4.7970E-09	AC4-RCS-OO-U3AX2	AFW-MAI-MA-TDP32	IE-TDC32
608	4.7970E-09	AFW-MAI-MA-TDP32	AFW-RLY-NO-312-1	
DC1-MAI-MA-BCC32				
609	4.7970E-09	AFW-MAI-MA-TDP32	AFW-RLY-NO-312-1	IE-TDC32
610	4.7850E-09	AFW-MAI-MA-TDP32	AFW-RCK-NO-PM33	
AFW-XHE-RE-AFW31				
		FB-T2	SL-T2-SUCC	IE-T3
611	4.7850E-09	AFW-MAI-MA-TDP32	AFW-RCK-NO-PM31	
AFW-XHE-RE-AFW33				
		FB-T2	SL-T2-SUCC	IE-T3
612	4.7850E-09	AC4-RCK-NO-BC36C	AFW-MAI-MA-TDP32	
AFW-XHE-RE-AFW33				
		FB-T2	SL-T2-SUCC	IE-T3
613	4.7848E-09	AC4-RCI-FE-U1-5A	AC4-XHE-RE-MCC6B	
OLR-S2-SUCC				
		PPR-AOV-OO-455C	PPR-PHN-CC-DMOTR	IE-T3
614	4.7848E-09	AC4-RCI-FE-U1-5A	AC4-XHE-RE-MCC6B	
OLR-S2-SUCC				
		PPR-AOV-OO-456	PPR-PHN-CC-DMOTR	IE-T3
615	4.7848E-09	AC4-RCI-FE-U1-6A	AC4-XHE-RE-MCC6A	

OLR-S2-SUCC

		PPR-AOV-OO-456	PPR-PHN-CC-DMOTR	IE-T3
616	4.7848E-09	AC4-RCI-FE-U1-6A	AC4-XHE-RE-MCC6A	

OLR-S2-SUCC

		PPR-AOV-OO-455C	PPR-PHN-CC-DMOTR	IE-T3
617	4.7489E-09	AFW-AOV-CC-P1139	DC1-MAI-MA-BCC32	

EDG-MAI-MA-EDG31

		OHR-T2	IE-T3	
618	4.7433E-09	AFW-MAI-MA-PM31	AFW-TDP-FR-TDP32	

EDG-ENG-FR-DG32R

		FB-T1		
619	4.7412E-09	AFW-RLY-NO-BFPL	DC1-BDC-ST-PP-32	IE-T3
620	4.7283E-09	AC4-RCK-NO-BCH37	AFW-TDP-FS-TDP32	

EDG-MAI-MA-EDG31

		OHR-T2	IE-T2	
621	4.6542E-09	AC4-RCK-NO-BCH37	AFW-XHE-RE-AFW32	

EDG-GEN-HW-EDG31

		OHR-T2	IE-T2	
622	4.6330E-09	AC4-RCK-NO-BCH37	AFW-CRB-DN-52AF1	

AFW-TDP-FS-TDP32

623	4.6306E-09	AFW-CCF-FS-AFWPM	AFW-TDP-FR-TDP32	

PPR-PRV-CC-456

624	4.6306E-09	AFW-CCF-FS-AFWPM	AFW-TDP-FR-TDP32	

PPR-PRV-CC-455C

625	4.6260E-09	AFW-MAI-MA-PM31	AFW-RLY-NO-332-1	IE-TDC31
626	4.6260E-09	AFW-MAI-MA-PM31	AFW-RLY-NO-BFPL	IE-TDC32
627	4.6260E-09	AFW-MAI-MA-PM31	AFW-RLY-NO-BFPL	

DC1-MAI-MA-BCC32

628	4.6240E-09	AC4-RCK-NO-BCH39	AFW-MDP-FS-PM31	

AFW-MDP-FS-PM33

629	4.6144E-09	AFW-MAI-MA-PM31	AFW-RCK-NO-TDP32	

AFW-XHE-RE-AFW33

		FB-T2	SL-T2-SUCC	IE-T3
630	4.6054E-09	AFW-MDP-FS-PM31	AFW-TDP-FR-TDP32	

AFW-XHE-RE-AFW33

		FB-T2	SL-T2-SUCC	IE-T3
631	4.6054E-09	AFW-MDP-FS-PM33	AFW-TDP-FR-TDP32	

AFW-XHE-RE-AFW31

		FB-T2	SL-T2-SUCC	IE-T3
632	4.6008E-09	AC4-XHE-RE-MCC6A	DC1-MAI-MA-BCC32	FLAG-SI
		LHR-PHN-PE-DECAY	OLR-S2-SUCC	

PPR-AOV-OO-456

	PPR-PHN-CC-DMOTR	IE-T3

633	4.5972E-09	AFW-MAI-MA-TDP32	AFW-MDP-FS-PM33	
EDG-MAI-MA-EDG31				
		FB-T1		
634	4.5696E-09	AFW-AOV-CC-P1139	AFW-MDP-FS-PM31	
DC1-MAI-MA-BCC32				
635	4.5696E-09	AFW-AOV-CC-P1139	AFW-MDP-FS-PM31	IE-TDC32
636	4.5602E-09	AC4-RCI-FE-U1-6A	LHR-CCF-CC-LPRVL	
OLR-S2-SUCC				
		PPR-AOV-OO-455C	PPR-PHN-CC-DMOTR	IE-T3
637	4.5602E-09	AC4-RCI-FE-U1-5A	LHR-CCF-CC-LPRVL	
OLR-S2-SUCC				
		PPR-AOV-OO-456	PPR-PHN-CC-DMOTR	IE-T3
638	4.5570E-09	AC4-RCK-NO-BCH37	AFW-MDP-FR-PM31	
AFW-TDP-FS-TDP32				
639	4.5180E-09	AFW-RLY-NO-312-1	AFW-XHE-RE-AFW32	
DC1-MAI-MA-BCC32				
640	4.5180E-09	AFW-RLY-NO-312-1	AFW-XHE-RE-AFW32	IE-TDC32
641	4.5180E-09	AC4-RCS-OO-U3AX2	AFW-XHE-RE-AFW32	IE-TDC32
642	4.5067E-09	AFW-RCK-NO-PM31	AFW-XHE-RE-AFW32	
AFW-XHE-RE-AFW33				
		FB-T2	SL-T2-SUCC	IE-T3
643	4.5067E-09	AFW-RCK-NO-PM33	AFW-XHE-RE-AFW31	
AFW-XHE-RE-AFW32				
		FB-T2	SL-T2-SUCC	IE-T3
644	4.5067E-09	AC4-RCK-NO-BC36C	AFW-XHE-RE-AFW32	
AFW-XHE-RE-AFW33				
		FB-T2	SL-T2-SUCC	IE-T3
645	4.4681E-09	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW31	
AFW-XHE-RE-AFW33				
		FB-T1		
646	4.4557E-09	AC4-RCK-NO-BC36C	AFW-RCK-NO-PM33	
AFW-TDP-FR-TDP32				
		FB-T2	SL-T2-SUCC	IE-T3
647	4.4557E-09	AFW-RCK-NO-PM31	AFW-RCK-NO-PM33	
AFW-TDP-FR-TDP32				
		FB-T2	SL-T2-SUCC	IE-T3
648	4.4450E-09	AFW-MAI-MA-TDP32	AFW-MDP-FS-PM31	
EDG-MAI-MA-EDG32				
		FB-T1		
649	4.4194E-09	AFW-CCF-FS-AFWPM	AFW-RCK-NO-TDP32	
PPR-PRV-CC-456				
		SL-T2-SUCC	IE-T3	

650	4.4194E-09	AFW-CCF-FS-AFWPM	AFW-RCK-NO-TDP32		
PPR-PRV-CC-455C					
		SL-T2-SUCC	IE-T3		
651	4.3834E-09	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW33		
EDG-ENG-FR-DG31R					
		FB-T1			
652	4.3834E-09	AFW-TDP-FR-TDP32	AFW-XHE-RE-AFW31		
EDG-ENG-FR-DG32R					
		FB-T1			
653	4.3670E-09	C	IAS-CCF-FR-IACMP	MRI-SUCC	
		IE-T3			
654	4.3623E-09	AC4-RCK-NO-BCH37	AFW-TDP-FR-TDP32		
EDG-GEN-HW-EDG31					
		LHR-PHN-PE-DECAY	OHR-T2-SUCC		
SWS-FCV-OO-1112					
		IE-T3			
655	4.3461E-09	AFW-MAI-MA-TDP32	DC1-MAI-MA-BCC32		
EDG-MAI-MA-EDG31					
		LHR-RCK-NO-PM31	OHR-T2-SUCC	IE-T3	
656	4.3446E-09	AFW-MAI-MA-PM33	AFW-RCK-NO-TDP32		
EDG-GEN-HW-EDG31					
		FB-T1			
657	4.3298E-09	AFW-MDP-FS-PM33	AFW-XHE-RE-AFW32		
EDG-MAI-MA-EDG31					
		FB-T1			
658	4.3183E-09	AC4-RCK-NO-BCH37	AFW-TDP-FS-TDP32	CCW-PUMP	
		CWRHR-TCCW-SUCC	IE-CCW		
659	4.3183E-09	AC4-RCK-NO-BCH37	AFW-TDP-FS-TDP32	CCW-PUMP	
		IE-CCW			
660	4.3183E-09	AC4-RCK-NO-BCH37	AFW-TDP-FS-TDP32	CCW-PIPE	
		IE-CCW			
661	4.3013E-09	AC4-RCI-FE-U1-6A	LHR-XHE-RE-PM31		
OLR-S2-SUCC					
		PPR-AOV-OO-455C	PPR-PHN-CC-DMOTR	IE-T2	
662	4.3013E-09	AC4-RCI-FE-U1-5A	LHR-XHE-RE-PM32		
OLR-S2-SUCC					
		PPR-AOV-OO-456	PPR-PHN-CC-DMOTR	IE-T2	
663	4.2885E-09	AFW-MAI-MA-PM33	AFW-XHE-FO-HC405		
EDG-MAI-MA-EDG31					
		FB-T1			
664	4.2750E-09	AFW-RLY-NO-BFPL	AFW-XHE-RE-AFW31	IE-TDC32	
665	4.2750E-09	AFW-RLY-NO-BFPL	AFW-XHE-RE-AFW31		
DC1-MAI-MA-BCC32					
666	4.2750E-09	AFW-RLY-NO-332-1	AFW-XHE-RE-AFW31	IE-TDC31	

667	4.2750E-09	AFW-RLY-NO-312-1	AFW-XHE-RE-AFW33	IE-TDC31
668	4.2643E-09	AFW-RCK-NO-TDP32	AFW-XHE-RE-AFW31	AFW-XHE-RE-AFW33
		FB-T2	SL-T2-SUCC	IE-T3
669	4.2315E-09	AFW-CKV-CC-BFD39	AFW-MAI-MA-PM31	DC1-MAI-MA-BCC31
670	4.2161E-09	AFW-MAI-MA-PM31	AFW-RCK-NO-PM33	AFW-TDP-FS-TDP32
		FB-T2	SL-T2-SUCC	IE-T3
671	4.2081E-09	AFW-MAI-MA-31VLV	AFW-XHE-RE-AFW33	DC1-MAI-MA-BCC31
672	4.1864E-09	AFW-MDP-FS-PM31	AFW-XHE-RE-AFW32	EDG-MAI-MA-EDG32
		FB-T1		
673	4.1486E-09	AFW-CCF-FS-AFWPM	AFW-RCK-NO-TDP32	OHR-T2
		SL-T2-SUCC	IE-T2	
674	4.1248E-09	AFW-CRB-DN-52AF1	AFW-MAI-MA-PM33	IE-TDC31
675	4.0933E-09	AFW-XHE-RE-AFW32	DC1-MAI-MA-BCC32	EDG-MAI-MA-EDG31
		LHR-RCK-NO-PM31	OHR-T2-SUCC	IE-T3
676	4.0572E-09	AFW-MAI-MA-PM33	AFW-MDP-FR-PM31	IE-TDC31
677	4.0413E-09	AFW-AOV-CC-P1139	DC1-MAI-MA-BCC32	EDG-GEN-HW-EDG31
		OHR-T2	IE-T3	
678	4.0237E-09	AC4-RCK-NO-BCH37	AFW-TDP-FS-TDP32	EDG-GEN-HW-EDG31
		OHR-T2	IE-T2	
679	3.9975E-09	AC4-RCK-NO-BCH37	AFW-MAI-MA-TDP32	AFW-RLY-NO-312-1
680	3.9967E-09	AC4-RCI-FE-U1-6A	AFW-CRB-DN-52AF1	IE-TDC31
681	3.9943E-09	AFW-MAI-MA-PM33	AFW-TDP-FR-TDP32	DC1-MAI-MA-BCC33
		FB-T2	SL-T2-SUCC	IE-T3
682	3.9638E-09	AFW-RCK-NO-PM33	AFW-RCK-NO-TDP32	EDG-MAI-MA-EDG31
		FB-T1		
683	3.9574E-09	AC4-RCK-NO-BCH37	AFW-AOV-CC-P1139	EDG-MAI-MA-EDG31
		OHR-T2	IE-T3	
684	3.9331E-09	AFW-MDP-FS-PM33	AFW-RLY-NO-312-1	DC1-MAI-MA-BCC31
685	3.9331E-09	AFW-MDP-FS-PM31	AFW-RLY-NO-332-1	

DC1-MAI-MA-BCC31				
686	3.9312E-09	AC4-RCI-FE-U1-6A	AFW-MDP-FR-PM31	IE-TDC31
687	3.9156E-09	AFW-MAI-MA-PM33	AFW-TDP-FR-TDP32	
EDG-MAI-MA-EDG31				
		PPR-PRV-CC-455C		
688	3.9156E-09	AFW-MAI-MA-PM33	AFW-TDP-FR-TDP32	
EDG-MAI-MA-EDG31				
		PPR-PRV-CC-456		
689	3.9122E-09	AFW-MAI-MA-TDP32	AFW-MDP-FS-PM33	
EDG-GEN-HW-EDG31				
		FB-T1		
690	3.9122E-09	AFW-MAI-MA-TDP32	AFW-MDP-FS-PM31	
EDG-GEN-HW-EDG32				
		FB-T1		
691	3.9105E-09	AFW-CKV-CC-BFD39	AFW-XHE-RE-AFW31	
DC1-MAI-MA-BCC31				
692	3.9105E-09	AFW-CKV-CC-BFD34	AFW-XHE-RE-AFW33	
DC1-MAI-MA-BCC31				
693	3.9060E-09	AC4-RCS-OO-U3AX2	AFW-TDP-FS-TDP32	IE-TDC32
694	3.9060E-09	AFW-RLY-NO-312-1	AFW-TDP-FS-TDP32	IE-TDC32
695	3.9060E-09	AFW-RLY-NO-312-1	AFW-TDP-FS-TDP32	
DC1-MAI-MA-BCC32				
696	3.8962E-09	AFW-RCK-NO-PM33	AFW-TDP-FS-TDP32	
AFW-XHE-RE-AFW31				
		FB-T2	SL-T2-SUCC	IE-T3
697	3.8962E-09	AC4-RCK-NO-BC36C	AFW-TDP-FS-TDP32	
AFW-XHE-RE-AFW33				
		FB-T2	SL-T2-SUCC	IE-T3
698	3.8962E-09	AFW-RCK-NO-PM31	AFW-TDP-FS-TDP32	
AFW-XHE-RE-AFW33				
		FB-T2	SL-T2-SUCC	IE-T3
699	3.8761E-09	AFW-MAI-MA-PM31	AFW-XHE-FO-HC405	
AFW-XHE-RE-AFW33				
		FB-T2	SL-T2-SUCC	IE-T3
700	3.8550E-09	AC4-RCK-NO-BCH39	AFW-MAI-MA-PM31	
AFW-RLY-NO-332-1				
701	3.8550E-09	AC4-RCK-NO-BCH37	AFW-MAI-MA-PM31	
AFW-RLY-NO-BFPL				
702	3.8430E-09	AC4-CRB-OO-2AT3A	AFV-MOD-CC-IL314	IE-TDC32
703	3.8430E-09	AFW-CRB-DN-52AF1	DC1-MAI-MA-BCC32	IE-TDC31
704	3.8430E-09	AC4-CRB-OO-2AT3A	DC1-MAI-MA-BCC32	IE-TDC31
705	3.8430E-09	AFV-MOD-CC-IL314	FLAG-SI	

SWS-CRB-DN-52SW6
IE-TDC31

706 3.8340E-09 AC4-XHE-RE-MCC6B LHR-RCK-NO-1802A
OLR-S2-SUCC
PPR-AOV-OO-455C PPR-PHN-CC-DMOTR IE-T3

707 3.8340E-09 AC4-XHE-RE-MCC6A LHR-RCK-NO-1802B
OLR-S2-SUCC
PPR-AOV-OO-456 PPR-PHN-CC-DMOTR IE-T3

708 3.8340E-09 AC4-RCK-NO-BCH37 AC4-XHE-RE-MCC6A FLAG-SI

LHR-PHN-PE-DECAY OLR-S2-SUCC
PPR-AOV-OO-456
PPR-PHN-CC-DMOTR IE-T3

709 3.8325E-09 AFW-RCK-NO-PM31 AFW-RCK-NO-TDP32
EDG-MAI-MA-EDG32
FB-T1

710 3.8127E-09 AC4-RCI-FE-U1-3A AFW-MAI-MA-PM33
AFW-XHE-RE-AFW32
FB-T2 SL-T2-SUCC IE-T3

711 3.8080E-09 AC4-RCK-NO-BCH37 AFW-AOV-CC-P1139
AFW-MDP-FS-PM31

712 3.7800E-09 AFW-MDP-FR-PM31 DC1-MAI-MA-BCC32 IE-TDC31

713 3.7650E-09 AC4-RCK-NO-BCH37 AFW-RLY-NO-312-1
AFW-XHE-RE-AFW32

714 3.7433E-09 AFW-MDP-FS-PM33 AFW-TDP-FS-TDP32
EDG-MAI-MA-EDG31
FB-T1

715 3.7123E-09 AFW-CCF-FS-AFWPM AFW-XHE-FO-HC405
PPR-PRV-CC-455C
SL-T2-SUCC IE-T3

716 3.7123E-09 AFW-CCF-FS-AFWPM AFW-XHE-FO-HC405
PPR-PRV-CC-456
SL-T2-SUCC IE-T3

717 3.6985E-09 AFW-MAI-MA-TDP32 DC1-MAI-MA-BCC32
EDG-GEN-HW-EDG31
LHR-RCK-NO-PM31 OHR-T2-SUCC IE-T3

718 3.6846E-09 AFW-MDP-FS-PM33 AFW-XHE-RE-AFW32
EDG-GEN-HW-EDG31
FB-T1

719 3.6846E-09 AFW-MDP-FS-PM31 AFW-XHE-RE-AFW32
EDG-GEN-HW-EDG32
FB-T1

720 3.6495E-09 AFW-MAI-MA-PM33 AFW-XHE-FO-HC405
EDG-GEN-HW-EDG31
FB-T1

721 3.6217E-09 AC4-RCK-NO-BCH37 AFW-MAI-MA-TDP32
EDG-MAI-MA-EDG31

		LHR-RCK-NO-PM31	OHR-T2-SUCC	IE-T3
722	3.6194E-09	AFW-MDP-FS-PM31	AFW-TDP-FS-TDP32	
EDG-MAI-MA-EDG32				
		FB-T1		
723	3.5625E-09	AC4-RCK-NO-BCH37	AFW-RLY-NO-BFPL	
AFW-XHE-RE-AFW31				
724	3.5625E-09	AC4-RCK-NO-BCH39	AFW-RLY-NO-312-1	
AFW-XHE-RE-AFW33				
725	3.5625E-09	AC4-RCK-NO-BCH39	AFW-RLY-NO-332-1	
AFW-XHE-RE-AFW31				
726	3.5301E-09	AFW-AOV-CC-P1139	AFW-MAI-MA-PM31	
EDG-MAI-MA-EDG32				
		FB-T1		
727	3.5251E-09	AC4-RCI-FE-U1-6A	AFW-MAI-MA-PM31	
AFW-TDP-FR-TDP32				
		FB-T2	SL-T2-SUCC	IE-T2
728	3.4848E-09	AFW-CCF-FS-AFWPM	AFW-XHE-FO-HC405	OHR-T2
		SL-T2-SUCC	IE-T2	
729	3.4373E-09	AC4-RCK-NO-BCH39	AFW-CRB-DN-52AF1	
AFW-MAI-MA-PM33				
730	3.4059E-09	AC4-XHE-RE-MCC6C	AFW-MAI-MA-TDP32	IE-TDC32
731	3.4047E-09	DC1-MAI-MA-BCC31	FLAG-SI	
LHR-PHN-PE-DECAY				
		OLR-S2-SUCC	SWS-MAI-MA-PM33	
AC4-RCI-FE-U1-5A				
		PPR-AOV-OO-456	PPR-PHN-CC-DMOTR	
732	3.4047E-09	DC1-MAI-MA-BCC31	FLAG-SI	
LHR-PHN-PE-DECAY				
		OLR-S2-SUCC	SWS-MAI-MA-PM33	
AC4-RCI-FE-U1-6A				
		PPR-AOV-OO-455C	PPR-PHN-CC-DMOTR	
733	3.3810E-09	AC4-RCK-NO-BCH39	AFW-MAI-MA-PM33	
AFW-MDP-FR-PM31				
734	3.3739E-09	AFW-AOV-CC-P1139	AFW-XHE-RE-AFW33	
EDG-MAI-MA-EDG31				
		FB-T1		
735	3.3731E-09	AFW-RCK-NO-PM33	AFW-RCK-NO-TDP32	
EDG-GEN-HW-EDG31				
		FB-T1		
736	3.3731E-09	AFW-RCK-NO-PM31	AFW-RCK-NO-TDP32	
EDG-GEN-HW-EDG32				
		FB-T1		
737	3.3620E-09	AFW-MAI-MA-PM33	AFW-TDP-FR-TDP32	
AFW-XHE-RE-AFW31				
		FB-T2	SL-T2-SUCC	IE-T2
738	3.3322E-09	AFW-MAI-MA-PM33	AFW-TDP-FR-TDP32	
EDG-GEN-HW-EDG31				

		PPR-PRV-CC-456		
739	3.3322E-09	AFW-MAI-MA-PM33	AFW-TDP-FR-TDP32	
EDG-GEN-HW-EDG31				
		PPR-PRV-CC-455C		
740	3.3295E-09	AFW-RCK-NO-PM33	AFW-XHE-FO-HC405	
EDG-MAI-MA-EDG31				
		FB-T1		
741	3.3258E-09	AFW-CCF-FS-AFWPM	DC1-MAI-MA-BCC31	IE-TDC32
742	3.3223E-09	AFW-MAI-MA-PM31	AFW-TDP-FR-TDP32	
AFW-XHE-RE-AFW33				
		OHR-T2	SL-T2-SUCC	IE-T2
743	3.3039E-09	AC4-RCI-FE-U1-5A	LHR-MOV-CC-1802B	
OLR-S2-SUCC				
		PPR-AOV-OO-456	PPR-PHN-CC-DMOTR	IE-T2
744	3.3039E-09	AC4-RCI-FE-U1-6A	LHR-MDP-FS-PM31	
OLR-S2-SUCC				
		PPR-AOV-OO-455C	PPR-PHN-CC-DMOTR	IE-T2
745	3.3039E-09	AC4-RCI-FE-U1-5A	LHR-MDP-FS-PM32	
OLR-S2-SUCC				
		PPR-AOV-OO-456	PPR-PHN-CC-DMOTR	IE-T2
746	3.3039E-09	AC4-RCI-FE-U1-6A	LHR-MOV-CC-1802A	
OLR-S2-SUCC				
		PPR-AOV-OO-455C	PPR-PHN-CC-DMOTR	IE-T2
747	3.2775E-09	AFW-MAI-MA-33VLV	AFW-XHE-RE-AFW31	IE-TDC31
748	3.2737E-09	DC1-MAI-MA-BCC31	FLAG-SI	
LHR-PHN-PE-DECAY				
		OLR-S2-SUCC	SWS-MAI-MA-PM33	
PPR-AOV-OO-455C				
		PPR-MOV-OO-RC535	PPR-PHN-CC-DMOTR	
749	3.2737E-09	DC1-MAI-MA-BCC31	FLAG-SI	
LHR-PHN-PE-DECAY				
		OLR-S2-SUCC	SWS-MAI-MA-PM33	
PPR-AOV-OO-456				
		PPR-MOV-OO-RC536	PPR-PHN-CC-DMOTR	
750	3.2684E-09	AFW-RCK-NO-TDP32	DC1-MAI-MA-BCC32	
EDG-MAI-MA-EDG31				
		OHR-T2	IE-T2	
751	3.2648E-09	AFW-MAI-MA-TDP32	AFW-XHE-RE-AFW33	
EDG-MAI-MA-EDG31				
		PPR-PRV-CC-456		
752	3.2648E-09	AFW-MAI-MA-TDP32	AFW-XHE-RE-AFW33	
EDG-MAI-MA-EDG31				
		PPR-PRV-CC-455C		
753	3.2622E-09	AFW-AOV-CC-P1139	AFW-XHE-RE-AFW31	
EDG-MAI-MA-EDG32				

		FB-T1		
754	3.2576E-09	AC4-RCI-FE-U1-6A	AFW-TDP-FR-TDP32	
AFW-XHE-RE-AFW31				
		FB-T2	SL-T2-SUCC	IE-T2
755	3.2576E-09	AC4-RCI-FE-U1-3A	AFW-TDP-FR-TDP32	
AFW-XHE-RE-AFW33				
		FB-T2	SL-T2-SUCC	IE-T2
756	3.2550E-09	AC4-RCK-NO-BCH37	AFW-RLY-NO-312-1	
AFW-TDP-FS-TDP32				
757	3.2534E-09	AFW-CCF-FS-AFWPM	AFW-TDP-FR-TDP32	IE-TDC32
758	3.2534E-09	AFW-CCF-FS-AFWPM	AFW-TDP-FR-TDP32	
DC1-MAI-MA-BCC32				
759	3.2230E-09	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-64	
PPR-PRV-CC-456				
		SL-T2-SUCC	IE-T2	
760	3.2230E-09	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-6	
PPR-PRV-CC-455C				
		SL-T2-SUCC	IE-T2	
761	3.2230E-09	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-6	
PPR-PRV-CC-456				
		SL-T2-SUCC	IE-T2	
762	3.2230E-09	AFW-XHE-FO-CITYW	AFW-XVM-PG-CT-64	
PPR-PRV-CC-455C				
		SL-T2-SUCC	IE-T2	
763	3.2193E-09	AFW-RCK-NO-PM31	AFW-XHE-FO-HC405	
EDG-MAI-MA-EDG32				
		FB-T1		
764	3.2172E-09	AFW-MAI-MA-PM31	AFW-XHE-RE-AFW32	
EDG-MAI-MA-EDG32				
		PPR-PRV-CC-456		
765	3.2172E-09	AFW-MAI-MA-PM31	AFW-XHE-RE-AFW32	
EDG-MAI-MA-EDG32				
		PPR-PRV-CC-455C		
766	3.2078E-09	AC4-XHE-RE-MCC6C	AFW-XHE-RE-AFW32	IE-TDC32
767	3.2025E-09	AC4-RCK-NO-BC36C	AFW-CRB-DN-52AF3	IE-TDC31
768	3.2025E-09	AFW-CRB-DN-52AF1	AFW-RCK-NO-TDP32	
DC1-MAI-MA-BCC32				
769	3.2025E-09	AC4-CRB-OO-2AT3A	AC4-RCK-NO-BCH37	IE-TDC31
770	3.2025E-09	AC4-CRB-OO-2AT3A	AC4-RCK-NO-BCH39	IE-TDC32
771	3.2025E-09	AC4-CRB-OO-2AT3A	AFW-RCK-NO-TDP32	IE-TDC32
772	3.2025E-09	AC4-RCK-NO-BCH37	AFW-CRB-DN-52AF1	IE-TDC31
773	3.2025E-09	AC4-RCK-NO-BCH39	AFW-CRB-DN-52AF1	IE-TDC32

774	3.2025E-09	AFW-CRB-DN-52AF3	AFW-RCK-NO-PM31	IE-TDC31
775	3.2025E-09	AFW-CRB-DN-52AF1	AFW-RCK-NO-PM33	IE-TDC31
776	3.2025E-09	AFW-CRB-DN-52AF1	AFW-RCK-NO-TDP32	IE-TDC32
777	3.1855E-09	AFW-MDP-FS-PM33	AFW-TDP-FS-TDP32	EDG-GEN-HW-EDG31
778	3.1855E-09	AFW-MDP-FS-PM31	AFW-TDP-FS-TDP32	EDG-GEN-HW-EDG32
779	3.1567E-09	AFW-MAI-MA-TDP32	AFW-XHE-RE-AFW31	EDG-MAI-MA-EDG32
780	3.1567E-09	AFW-MAI-MA-TDP32	AFW-XHE-RE-AFW31	EDG-MAI-MA-EDG32
781	3.1500E-09	AC4-RCK-NO-BCH37	AFW-MDP-FR-PM31	IE-TDC31
782	3.1500E-09	AFW-MDP-FR-PM31	AFW-RCK-NO-TDP32	IE-TDC32
783	3.1500E-09	AFW-MDP-FR-PM33	AFW-RCK-NO-PM31	IE-TDC31
784	3.1500E-09	AFW-MDP-FR-PM31	AFW-RCK-NO-PM33	IE-TDC31
785	3.1500E-09	AFW-MDP-FR-PM31	AFW-RCK-NO-TDP32	DC1-MAI-MA-BCC32
786	3.1500E-09	AC4-RCK-NO-BC36C	AFW-MDP-FR-PM33	IE-TDC31
787	3.1500E-09	AC4-RCK-NO-BCH39	AFW-MDP-FR-PM31	IE-TDC32

PDS 3- LOCA Plant Damage State Group

Term Number	Probability of Term	Cutset Listing		
1	3.8841E-06	C	MRI-SUCC	PR1
		IE-T2		
2	2.0988E-06	OLR-A	IE-A	
3	1.6903E-06	C	MRI	PR2
		IE-T2		
4	2.7420E-07	OLR-S1	IE-S1	
5	2.7420E-07	OLR-S2	IE-S2	
6	1.7738E-07	DC1-MAI-MA-BCC31	FLAG-SG31SLB	RV-T4
		IE-T4		
7	1.7738E-07	DC1-MAI-MA-BCC31	FLAG-SG34SLB	RV-T4
		IE-T4		
8	1.7738E-07	DC1-MAI-MA-BCC31	FLAG-SG33SLB	RV-T4
		IE-T4		
9	1.7738E-07	DC1-MAI-MA-BCC31	FLAG-SG32SLB	RV-T4
		IE-T4		
10	1.4882E-07	AC4-RCI-FE-U1-6A	NR-BORON-CORE	IE-A
11	1.4882E-07	AC4-RCI-FE-U1-5A	NR-BORON-CORE	IE-A
12	7.1695E-08	DC1-MAI-MA-BCC31	FLAG-SI	
LHR-PHN-PE-DECAY				
		OLR-S2-SUCC	SWS-MAI-MA-PM33	SL-T3
		IE-T3		
13	6.6877E-08	AC4-RCK-NO-BCH37	DC1-MAI-MA-BCC31	
CCW-RCK-NO-625				
		IE-T2		
14	5.3502E-08	AC4-RCK-NO-BCH37	DC1-MAI-MA-BCC31	
SWS-FCV-OO-1112				
		IE-T2		
15	4.6994E-08	CCW-MAI-MA-PM33	DC1-MAI-MA-BCC31	FLAG-SI
		LHR-PHN-PE-DECAY	OLR-S2-SUCC	SL-T3
		IE-T3		
16	4.6000E-08	AC4-RCK-NO-BCH39	FLAG-SG34SLB	RV-T4
		IE-T4		
17	4.6000E-08	AC4-RCK-NO-BCH39	FLAG-SG33SLB	RV-T4
		IE-T4		

18	4.6000E-08	AC4-RCK-NO-BCH39	FLAG-SG32SLB	RV-T4
		IE-T4		
19	4.6000E-08	AC4-RCK-NO-BCH39	FLAG-SG31SLB	RV-T4
		IE-T4		
20	4.3857E-08	C	CDS-AOV-OO-518	MRI-SUCC
		PR2	IE-T3	
21	4.3792E-08	AFW-AOV-OO-406A	FLAG-SG31SLB	RV-T4
		IE-T4		
22	4.3792E-08	AFW-AOV-OO-406D	FLAG-SG34SLB	RV-T4
		IE-T4		
23	4.3792E-08	AFW-AOV-OO-406B	FLAG-SG32SLB	RV-T4
		IE-T4		
24	4.3792E-08	AFW-AOV-OO-406C	FLAG-SG33SLB	RV-T4
		IE-T4		
25	3.7762E-08	C	CVC-XHE-FO-BORAT	IE-T2
26	2.7086E-08	AC4-RCI-FE-U1-5A	SWS-MAI-MA-PM36	IE-A
27	2.6937E-08	AC4-RCI-FE-U1-5A	CFC-PND-CC-32DPD	IE-A
28	2.6937E-08	AC4-RCI-FE-U1-5A	CFC-PND-CC-34DPD	IE-A
29	2.6937E-08	AC4-RCI-FE-U1-5A	CFC-PND-CC-35DPD	IE-A
30	2.6751E-08	AC4-RCK-NO-BCH37	DC1-MAI-MA-BCC31	
SWS-CKV-OO-SW1-2				
		IE-T2		
31	2.6751E-08	AC4-RCK-NO-BCH37	DC1-MAI-MA-BCC31	
CCW-CKV-OO-761B				
		IE-T2		
32	2.6751E-08	AC4-RCK-NO-BCH37	DC1-MAI-MA-BCC31	
CCW-FCV-CC-625				
		IE-T2		
33	2.0812E-08	AC4-RCK-NO-BCH39	DC1-MAI-MA-BCC32	
CCW-RCK-NO-625				
		IE-T2		
34	1.9533E-08	AC4-RCK-NO-BCH39	FLAG-SI	
LHR-PHN-PE-DECAY				
		OLR-S2-SUCC	SWS-MAI-MA-PM33	GAC4-EDG
		IE-T1		
35	1.8593E-08	AC4-RCK-NO-BCH39	FLAG-SI	
LHR-PHN-PE-DECAY				
		OLR-S2-SUCC	SWS-MAI-MA-PM33	SL-T3

		IE-T3			
36	1.7344E-08	AC4-RCK-NO-BCH37	AC4-RCK-NO-BCH39		
CCW-RCK-NO-625					
		IE-T2			
37	1.6650E-08	AC4-RCK-NO-BCH39	DC1-MAI-MA-BCC32		
SWS-FCV-OO-1112					
		IE-T2			
38	1.5783E-08	AC4-RCK-NO-BCH37	DC1-MAI-MA-BCC31		
SWS-MDP-FR-PM31					
		IE-T2			
39	1.5141E-08	AC4-RCK-NO-BCH37	DC1-MAI-MA-BCC31		
CCW-MDP-FR-PM31					
		IE-T2			
40	1.4025E-08	DC1-MAI-MA-BCC31	HHI-MOV-CC-856G	IE-A	
41	1.3875E-08	AC4-RCK-NO-BCH37	AC4-RCK-NO-BCH39		
SWS-FCV-OO-1112					
		IE-T2			
42	1.2803E-08	AC4-RCK-NO-BCH39	CCW-MAI-MA-PM33	FLAG-SI	
		LHR-PHN-PE-DECAY	OLR-S2-SUCC	GAC4-EDG	
		IE-T1			
43	1.2187E-08	AC4-RCK-NO-BCH39	CCW-MAI-MA-PM33	FLAG-SI	
		LHR-PHN-PE-DECAY	OLR-S2-SUCC	SL-T3	
		IE-T3			
44	1.1496E-08	DC1-MAI-MA-BCC31	HHI-RCK-NO-856G	IE-A	
45	1.1496E-08	DC1-MAI-MA-BCC31	HHI-RCK-NO-856C	IE-A	
46	1.1496E-08	DC1-MAI-MA-BCC31	HHI-RCK-NO-856E	IE-A	
47	1.1496E-08	DC1-MAI-MA-BCC31	HHI-RCK-NO-SI33	IE-A	
48	1.1122E-08	AC4-RCI-FE-U1-5A	FLAG-SI		
LHR-PHN-PE-DECAY					
		OLR-S2-SUCC	SAS-XLF-TE-SASB	IE-S2	
49	9.8953E-09	AC4-RCI-FE-U1-6A	FLAG-SI		
LHR-PHN-PE-DECAY					
		OLR-S2-SUCC	SAS-XLF-TE-SASA	IE-S2	
50	8.3855E-09	CCW-MOV-CC-822B	DC1-MAI-MA-BCC31	FLAG-SI	
		LHR-PHN-PE-DECAY	OLR-S2-SUCC	SL-T3	
		IE-T3			

PDS 4- V-Sequence Plant Damage State Group

Term Number	Probability of Term	Cutset Listing	
1	5.6400E-07	CCWS-ISLOCA-4	VISO
2	5.6400E-07	CCWS-ISLOCA-5	VISO
3	5.2300E-07	CCWS-ISLOCA-8	VISO
4	3.2900E-07	CCWS-ISLOCA-6	VISO
5	1.0200E-07	CVCS-ISLOCA-2	VISO
6	2.2600E-08	SIS-ISLOCA-3	VISO
7	3.7300E-09	CCWS-ISLOCA-1	VISO

PDS 5- SGTR Plant Damage State Group

Term Number	Probability of Term	Cutset Listing		
1	3.8078E-07	DC1-MAI-MA-BCC31	ORCS-L-SUCC	
SGISO-SGOVRFILL				
		IE-T7		
2	3.2500E-07	ORCS-L-SGISOSUCC	IE-T7	
3	3.0000E-07	ORCS-MSLB	TSGTR-1	
MS-RUPTURE-OC				
		IE-T5		
4	1.2324E-07	AC4-RCI-FE-U1-6A	ORCS-L-SUCC	
SGISO-SGOVRFILL				
		IE-T7		
5	9.8750E-08	AC4-RCK-NO-BCH39	ORCS-L-SUCC	
SGISO-SGOVRFILL				
		IE-T7		
6	6.4050E-08	DC1-MAI-MA-BCC32	ORCS-L-SUCC	
PPR-PRV-CC-456				
		SGISO-SUCC	IE-T7	
7	5.3375E-08	AC4-RCK-NO-BCH37	ORCS-L-SUCC	
PPR-PRV-CC-456				
		SGISO-SUCC	IE-T7	
8	4.7100E-08	ORCS-MSLB	TSGTR-2	
MS-RUPTURE-OC				
		IE-T5		
9	3.7500E-08	DC1-MAI-MA-BCC32	ORCS-L-SUCC	
PPR-PHN-CC-RC536				
		PPR-RCK-NO-RC536	SGISO-SUCC	IE-T7
10	3.1250E-08	AC4-RCK-NO-BCH37	ORCS-L-SUCC	
PPR-PHN-CC-RC536				
		PPR-RCK-NO-RC536	SGISO-SUCC	IE-T7
11	2.1546E-08	ORCS-MSLB-SUCC	RCS-XHE-MC-PT403	TSGTR-1
		MS-RUPTURE-OC	IE-T5	
12	2.1546E-08	ORCS-MSLB-SUCC	RCS-XHE-MC-PT402	TSGTR-1
		MS-RUPTURE-OC	IE-T5	
13	1.7010E-08	ORCS-MSLB-SUCC	RHR-SD	TSGTR-1
		MS-RUPTURE-OC	IE-T5	
14	8.4780E-09	ORCS-MSLB	TSGTR-2	WRWST
		MS-RUPTURE-OC	IE-T5	
15	8.4240E-09	AC4-RCI-FE-U1-5A	ORCS-MSLB-SUCC	TSGTR-1
		MS-RUPTURE-OC	IE-T5	
16	8.4240E-09	AC4-RCI-FE-U1-6A	ORCS-MSLB-SUCC	TSGTR-1
		MS-RUPTURE-OC	IE-T5	

APPENDIX J

IMPORTANCE VALUES FOR DOMINANT CUT SET EVENTS

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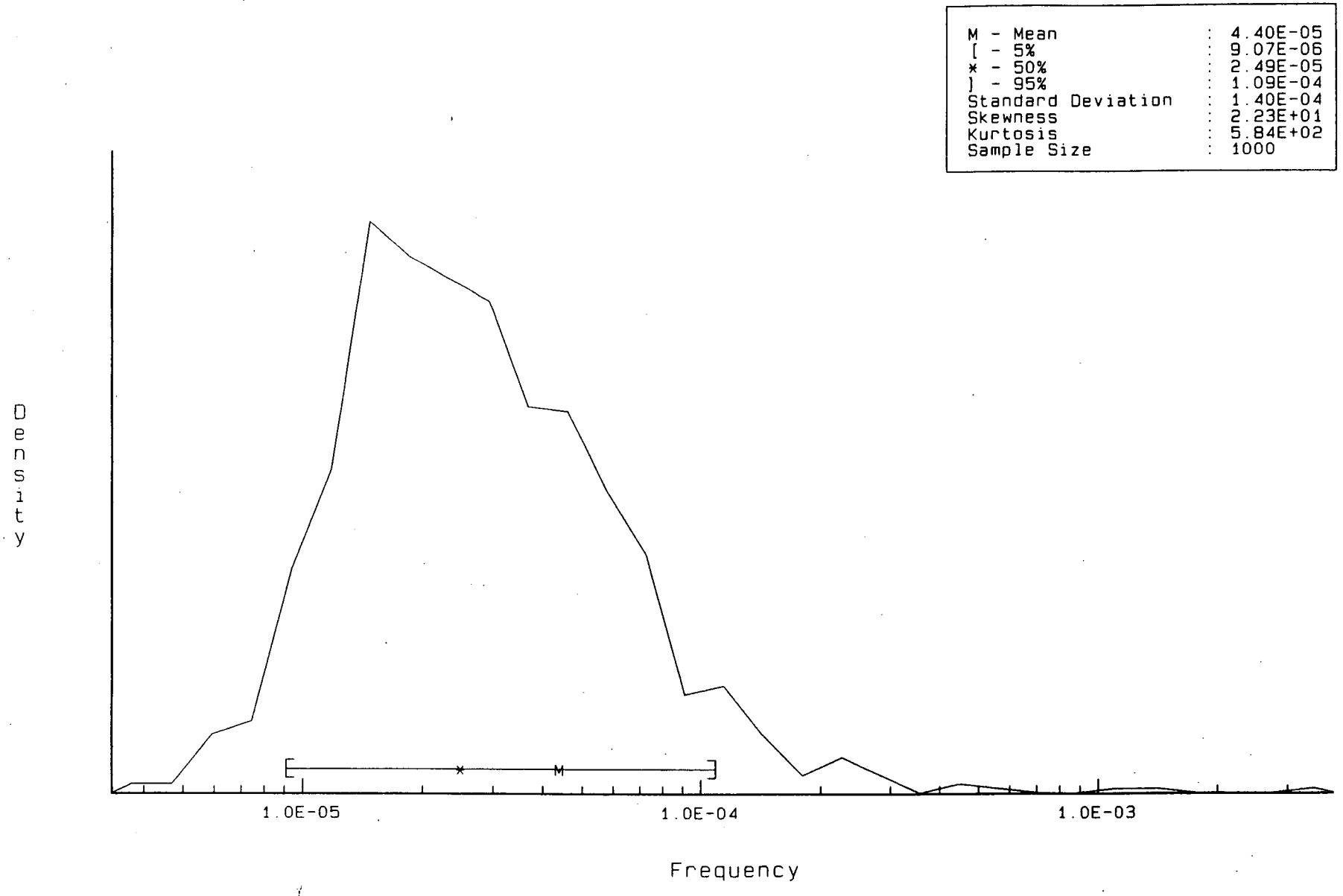
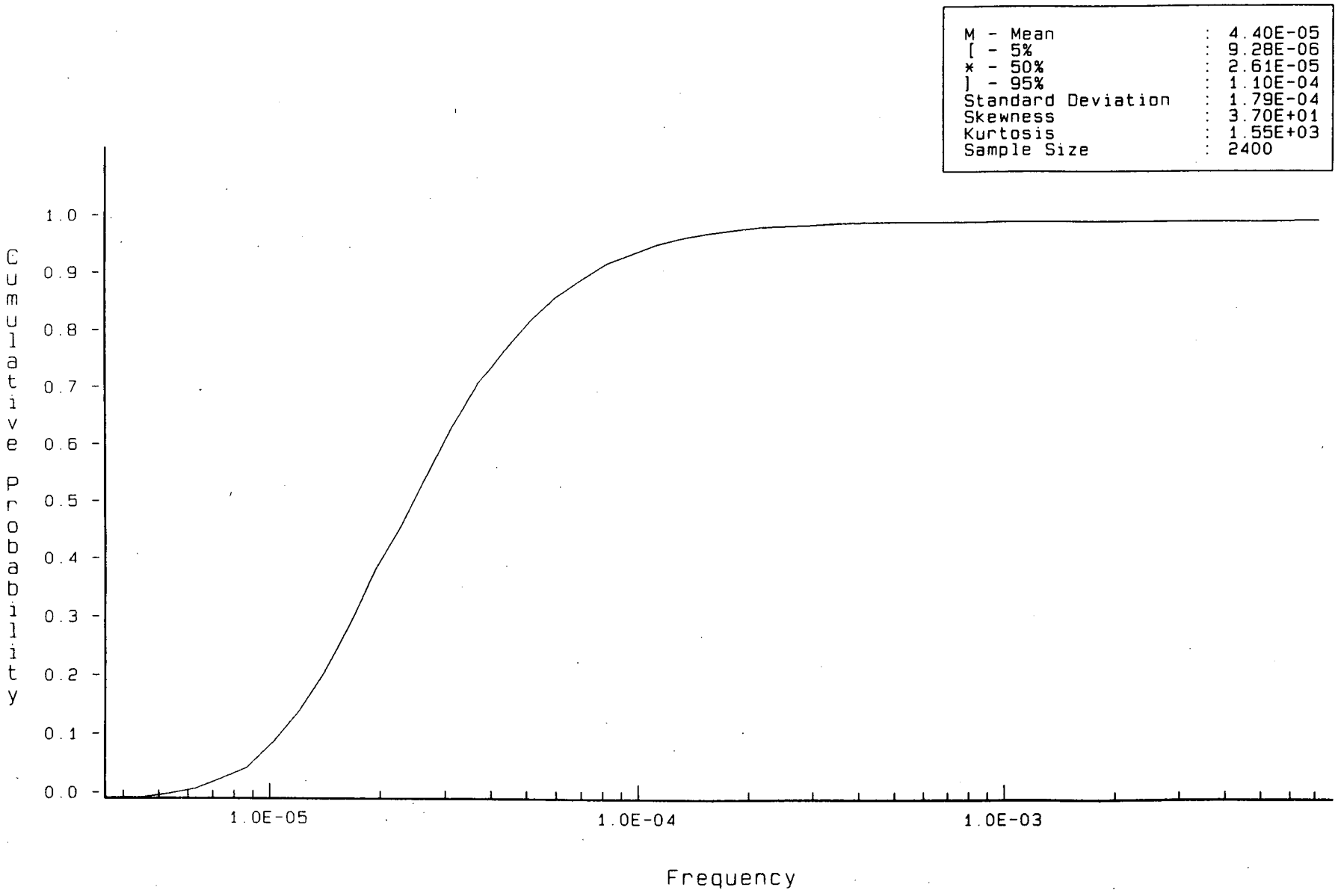
J1.1.1 Total Core Damage Frequency
Probability Density Function

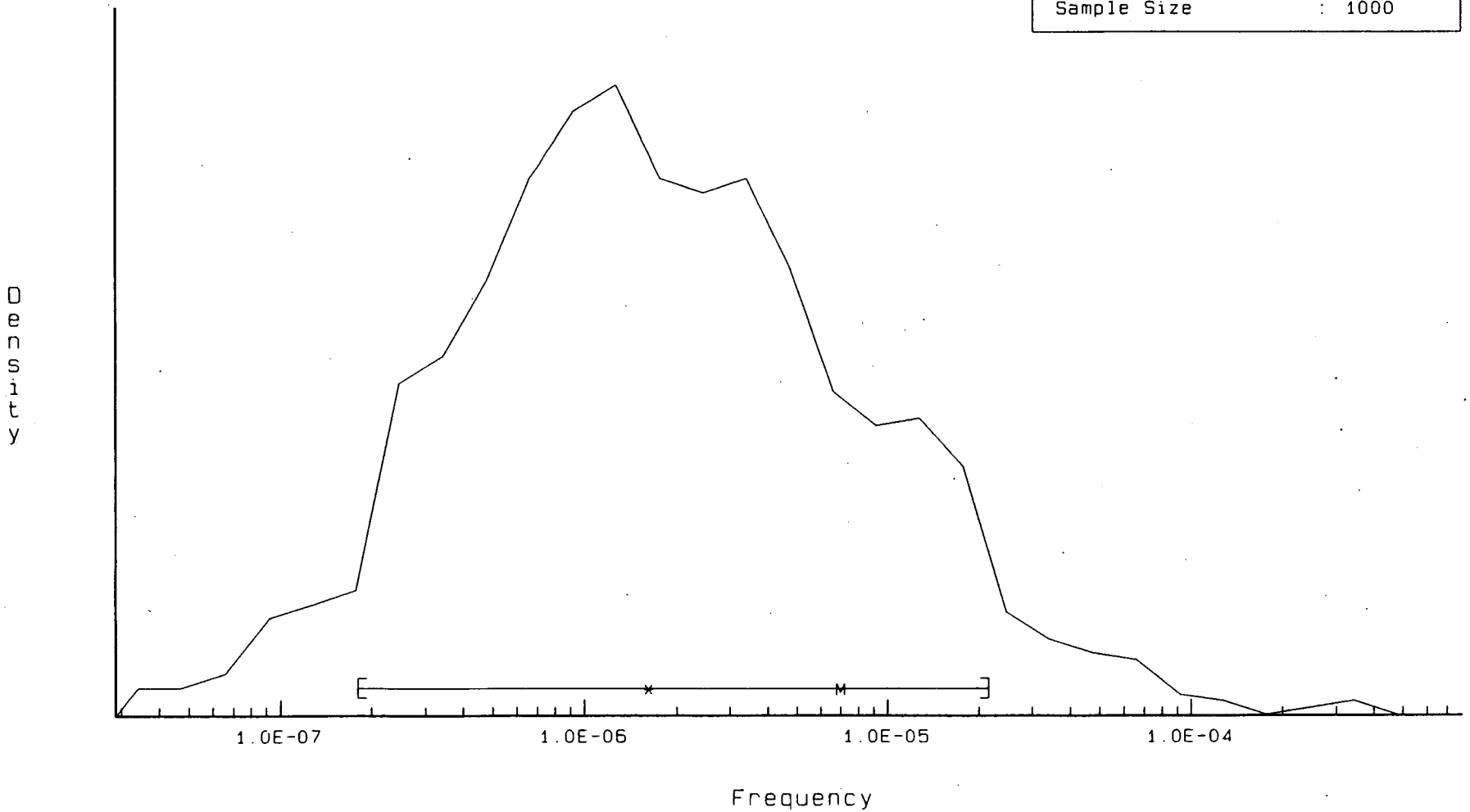


J1.1.2 Total Core Damage Frequency
Cumulative Probability Distribution Function

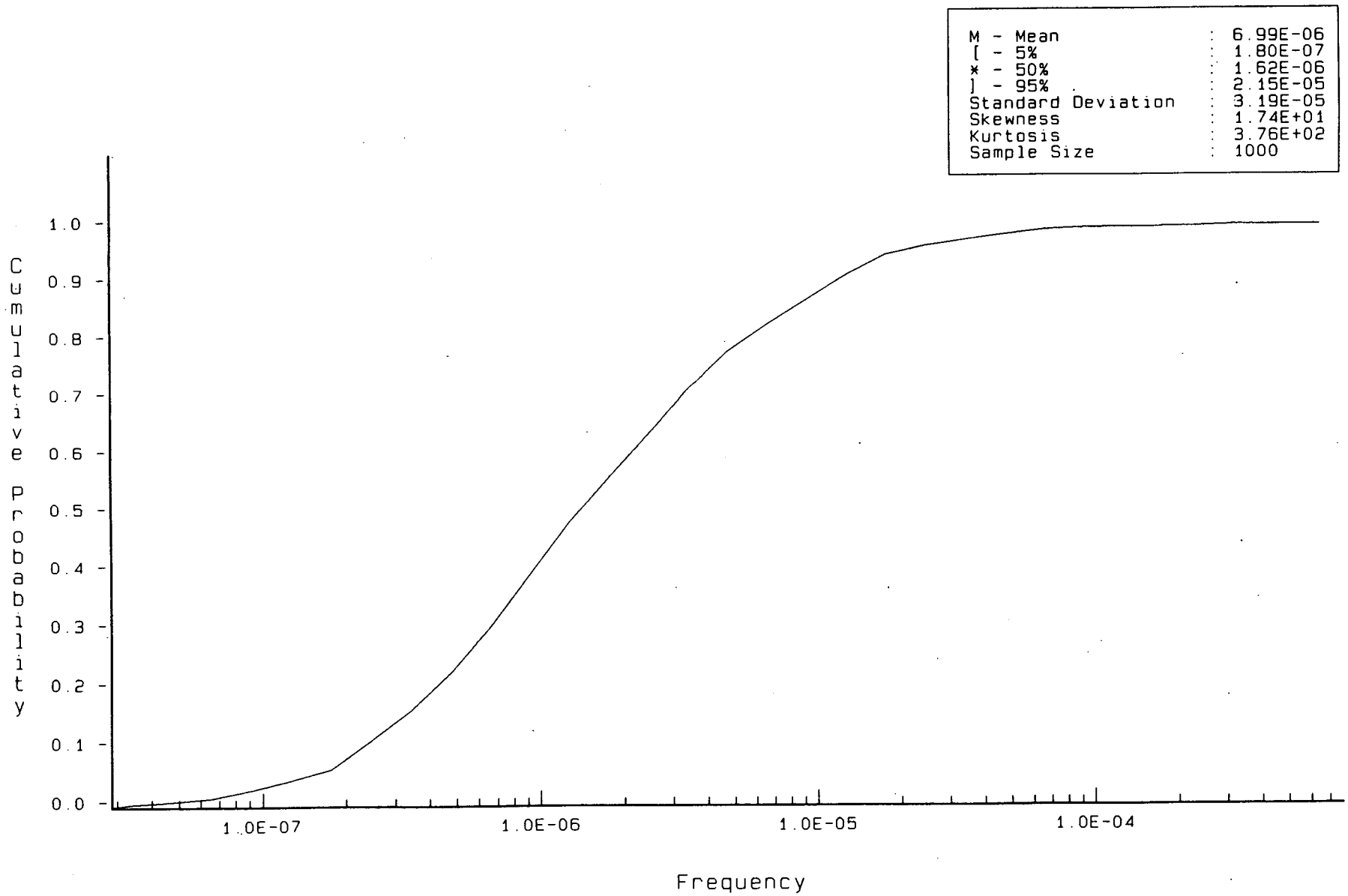


J1.2.1 Transients
Probability Density Function

M	- Mean	: 6.99E-06
[	- 5%	: 1.80E-07
*	- 50%	: 1.62E-06
]	- 95%	: 2.15E-05
Standard Deviation		: 3.19E-05
Skewness		: 1.74E+01
Kurtosis		: 3.76E+02
Sample Size		: 1000

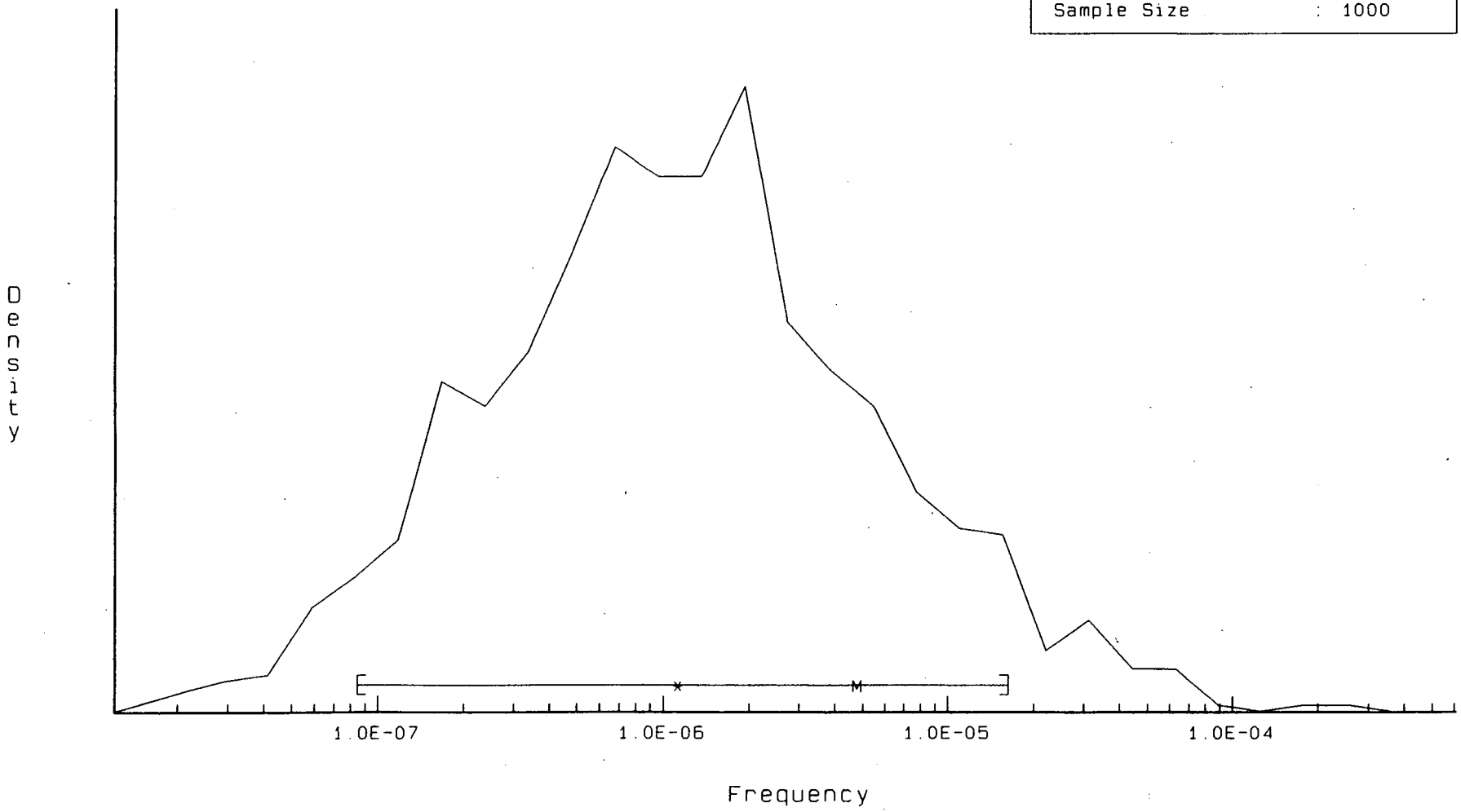


J1.2.2 Transients
Cumulative Probability Distribution Function

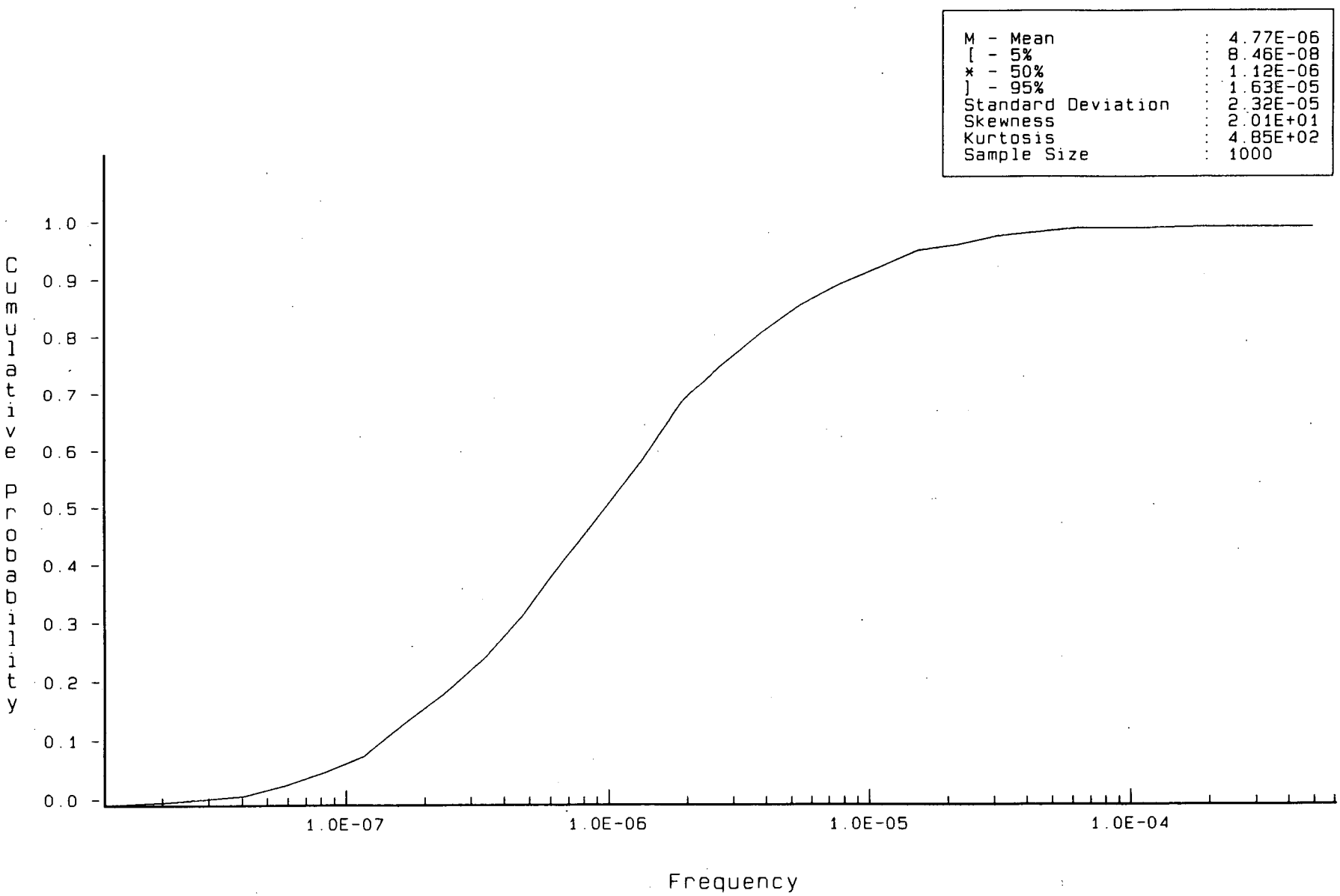


J1.3.1 Station Blackout
Probability Density Function

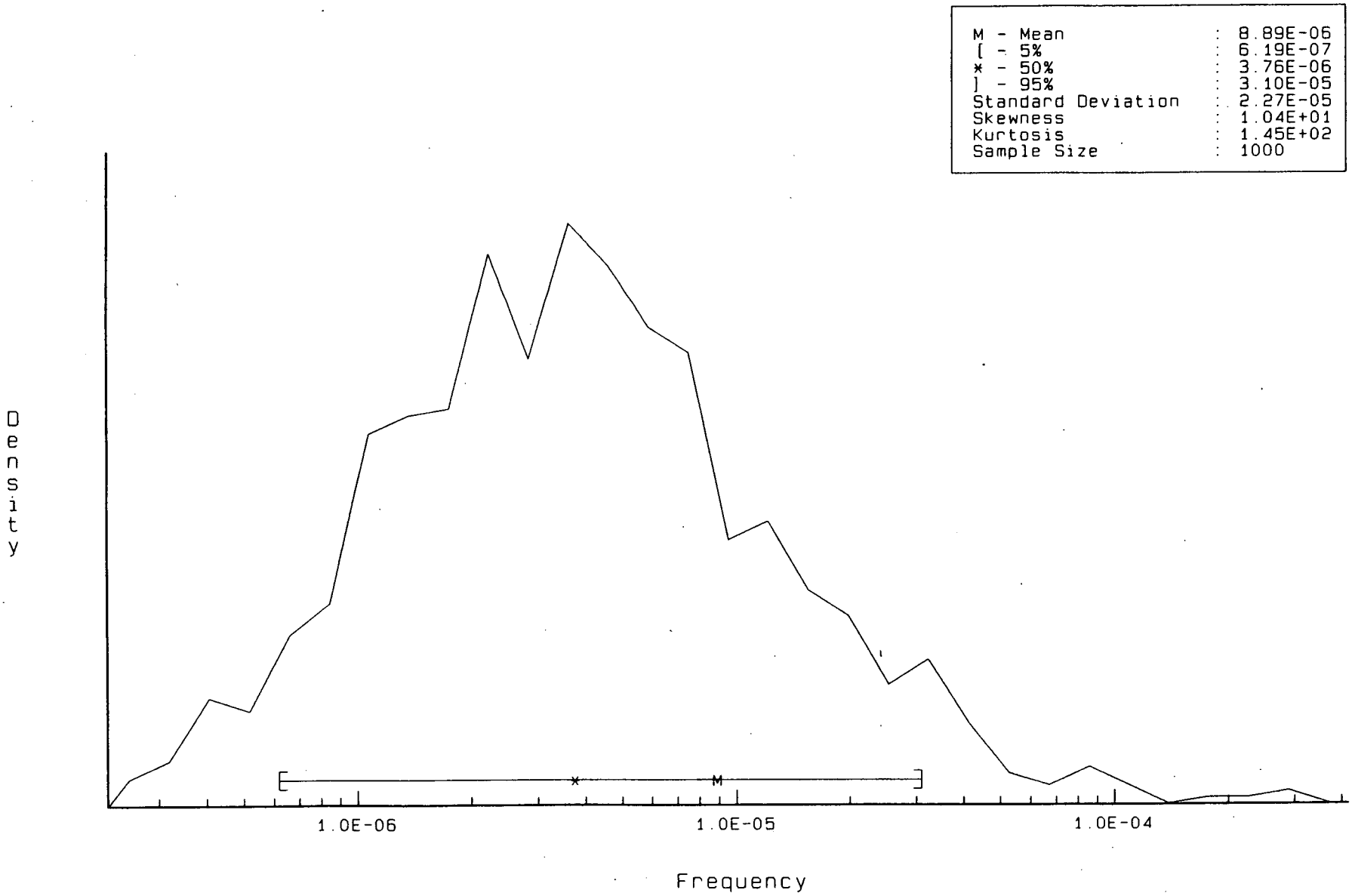
M - Mean	:	4.77E-06
[- 5%	:	8.46E-08
* - 50%	:	1.12E-06
] - 95%	:	1.63E-05
Standard Deviation	:	2.32E-05
Skewness	:	2.01E+01
Kurtosis	:	4.85E+02
Sample Size	:	1000



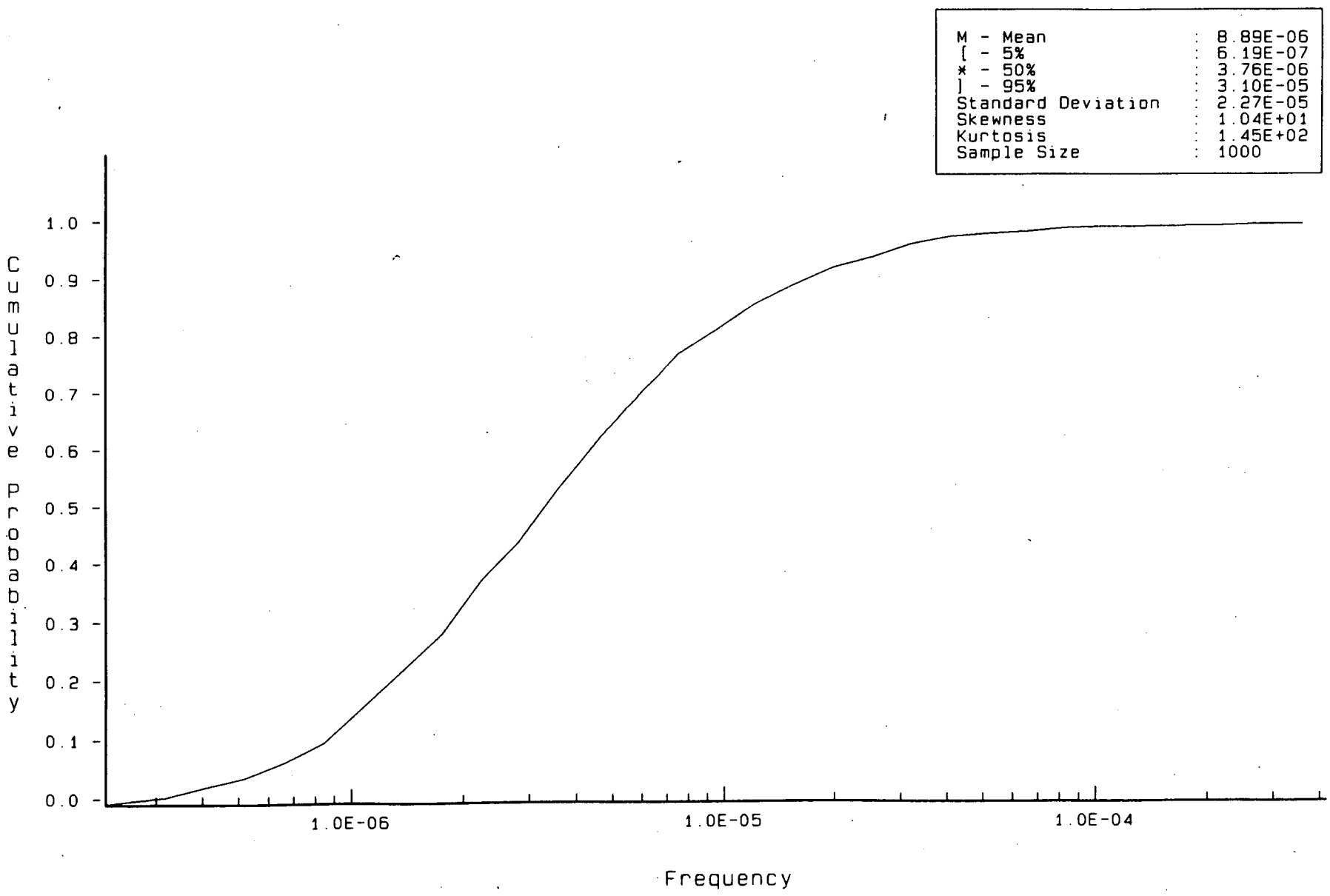
J1.3.2 Station Blackout
Cumulative Probability Distribution Function



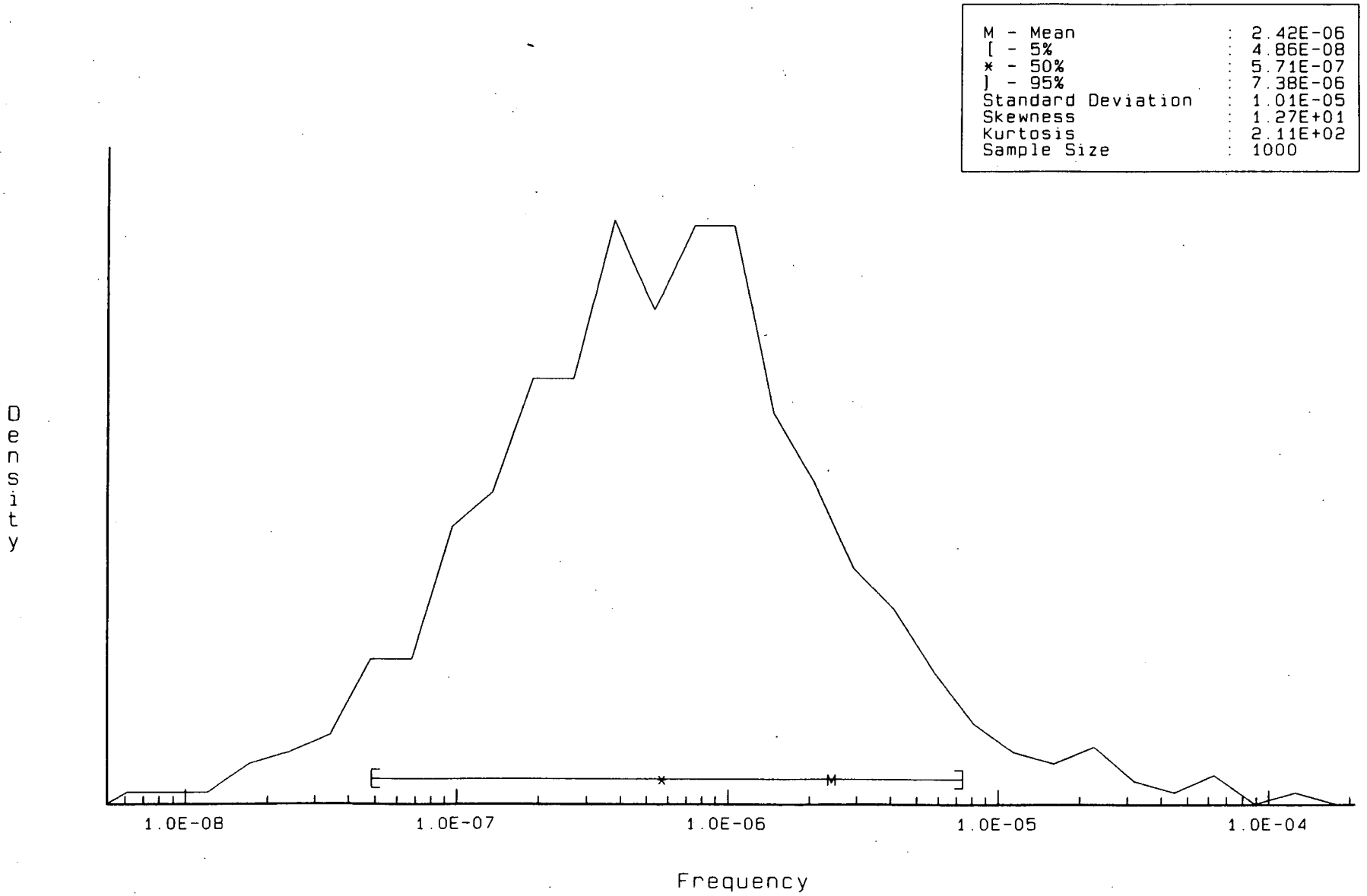
J1.4.1 Loss of Coolant Accidents
Probability Density Function



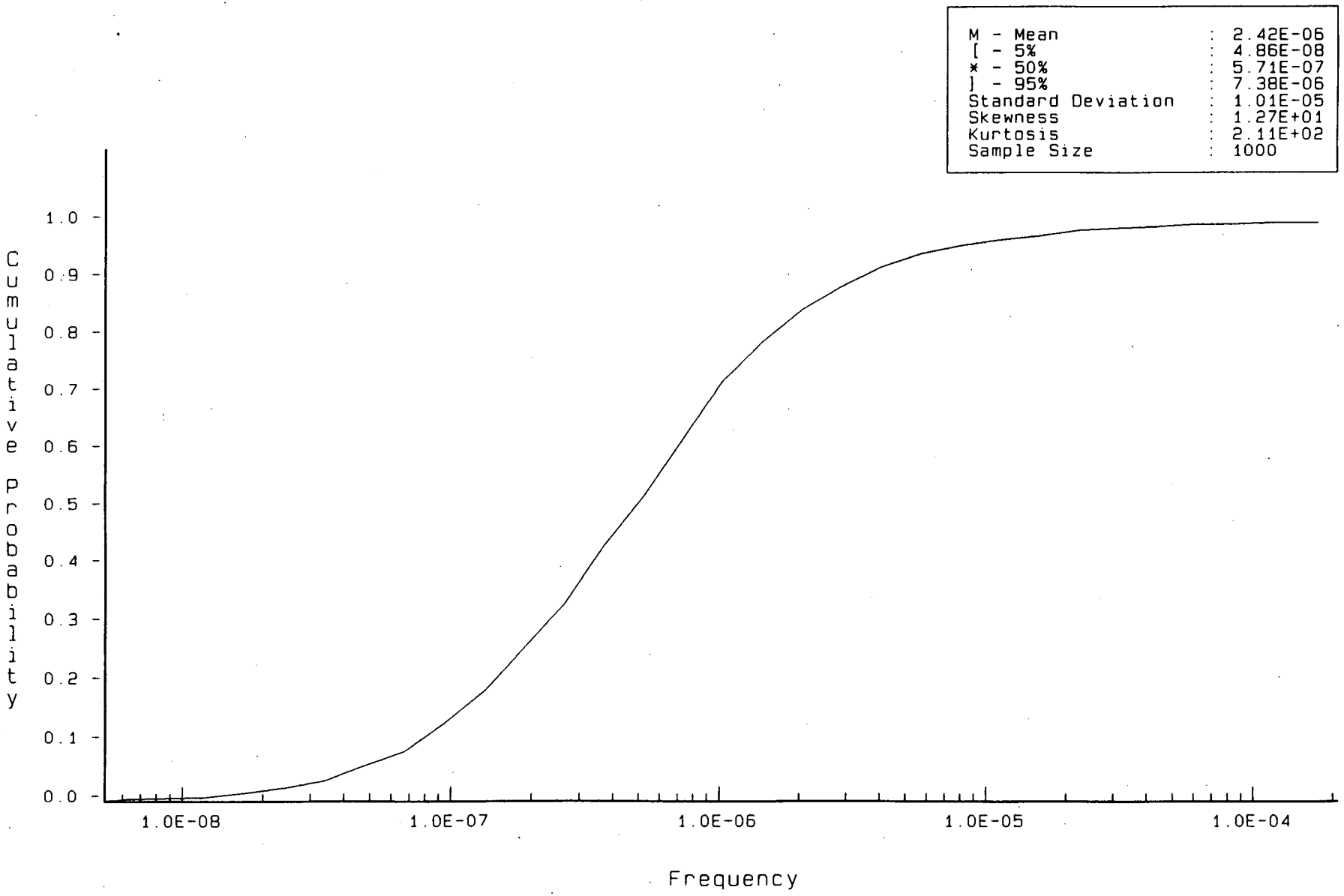
J1.4.2 Loss of Coolant Accidents
Cumulative Probability Distribution Function



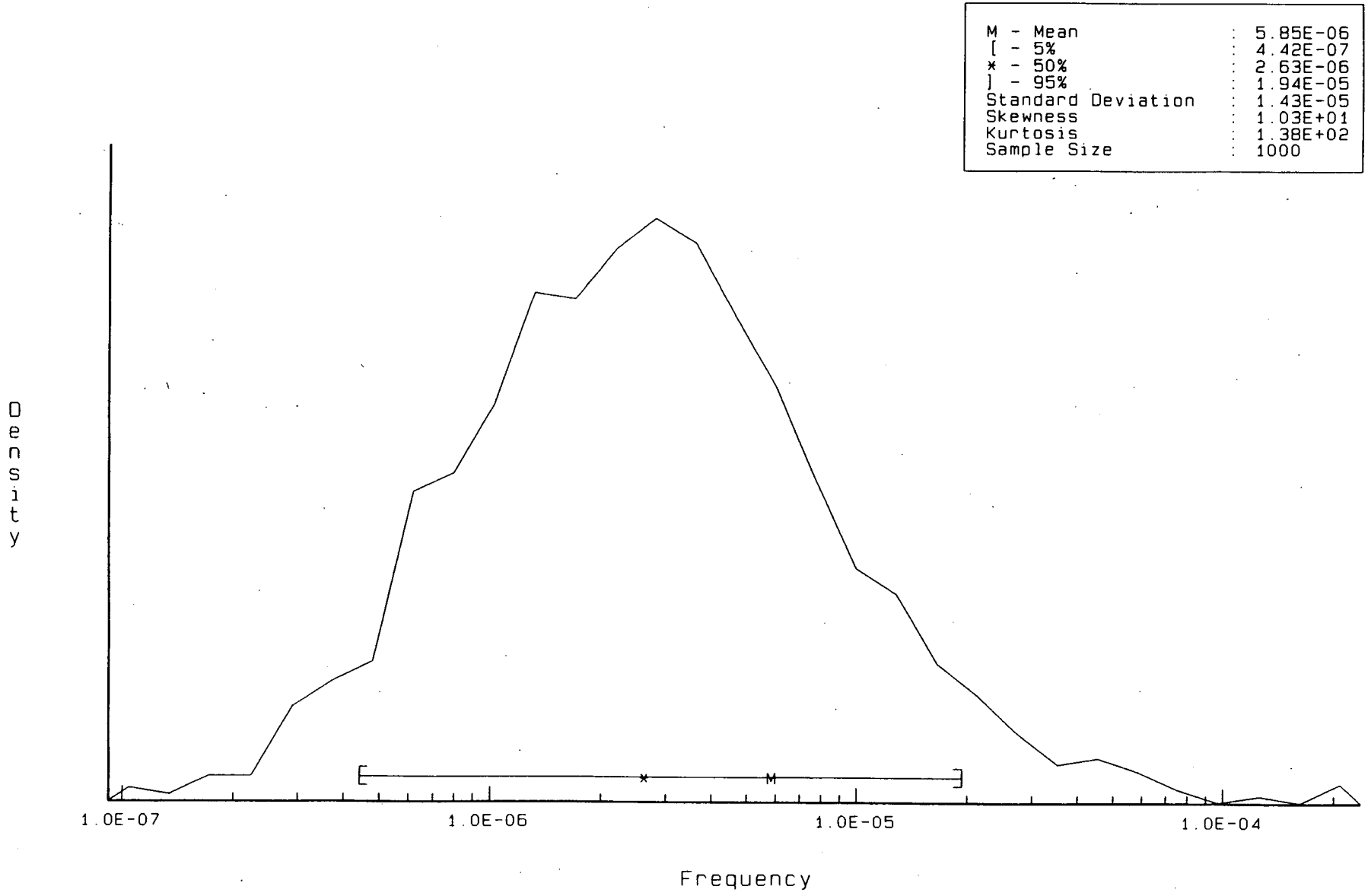
J1.5.1 Steam Generator Tube Rupture
Probability Density Function



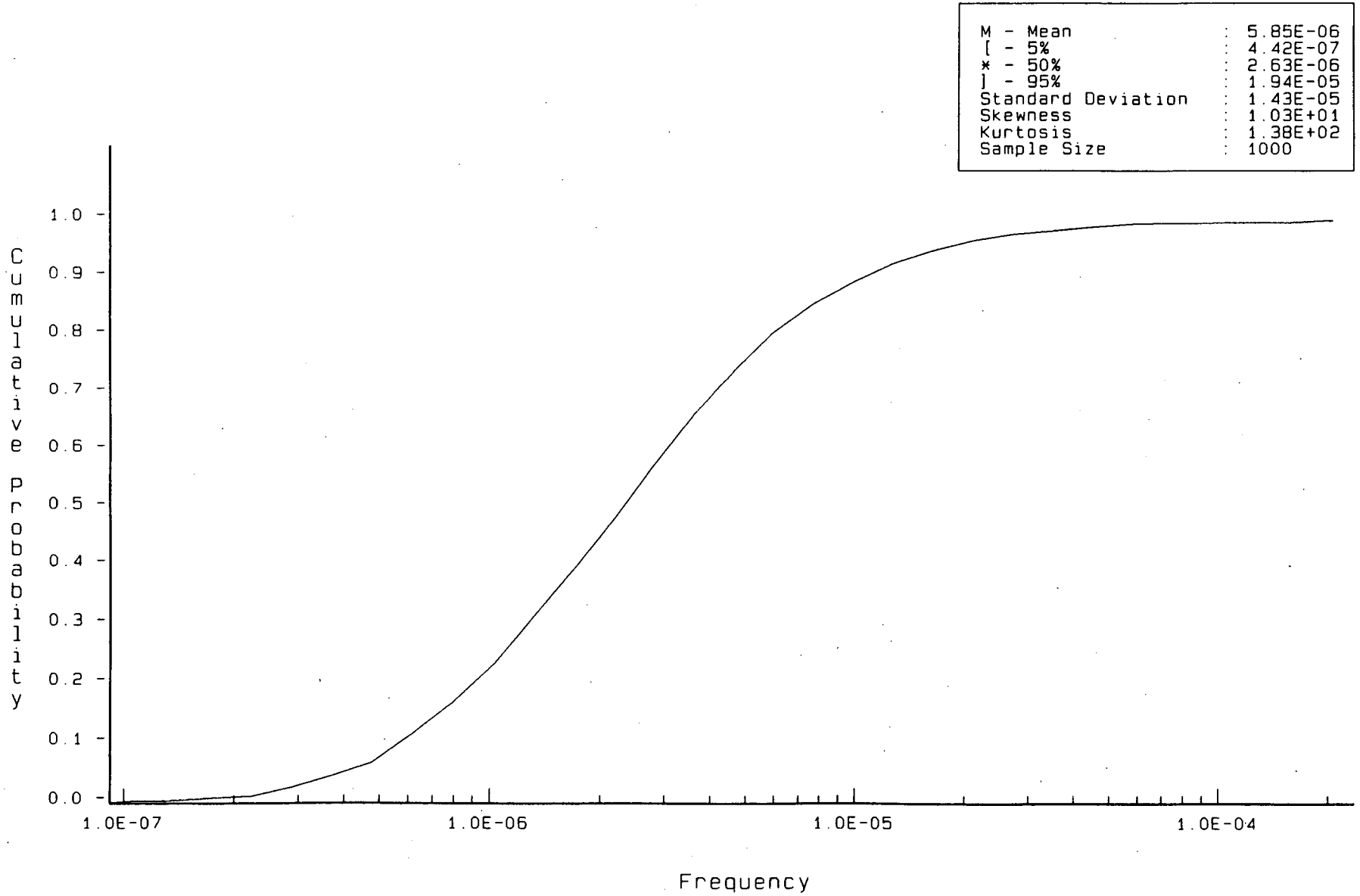
J1.5.2 Steam Generator Tube Rupture
Cumulative Probability Distribution Function



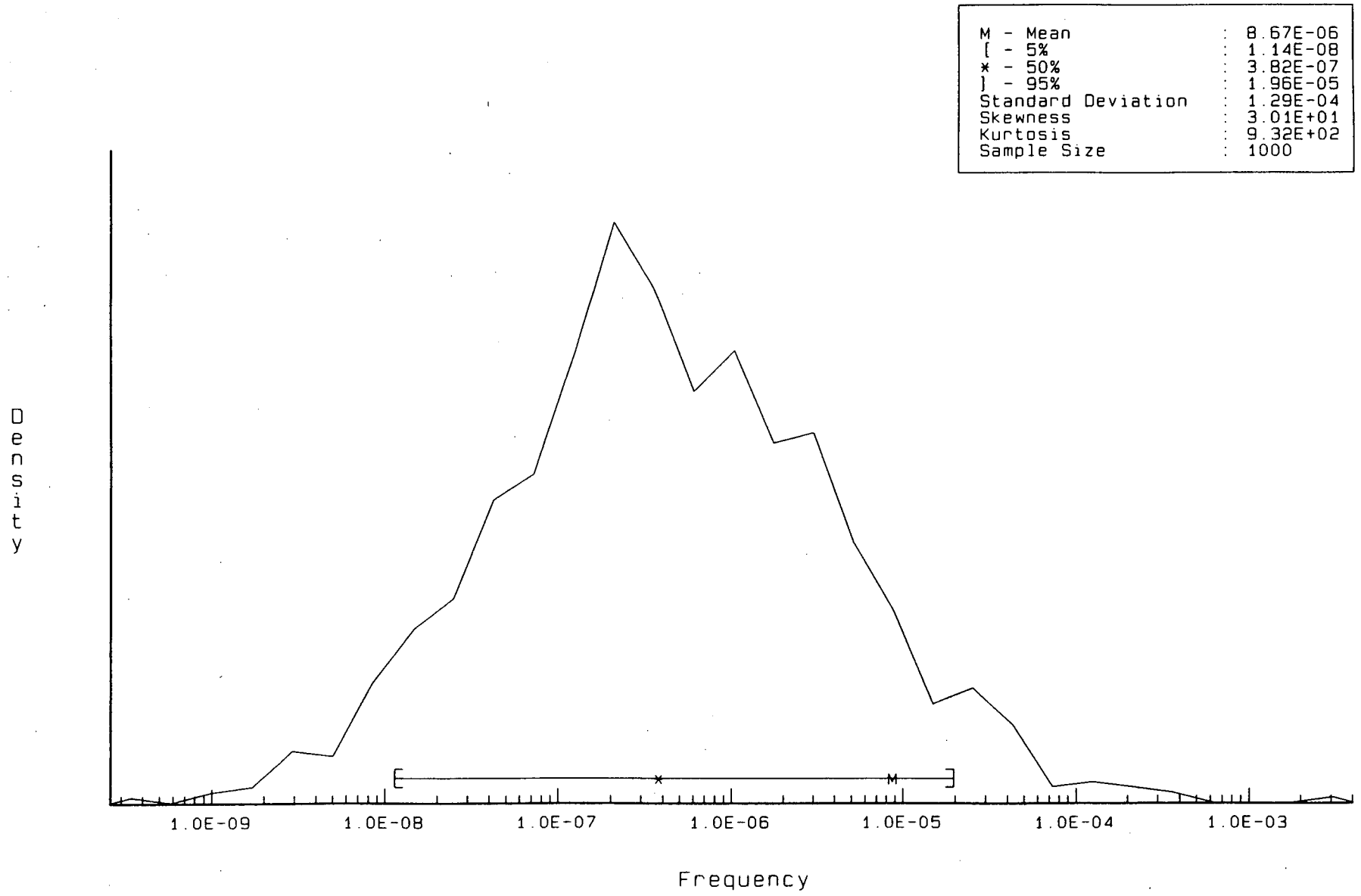
J1.6.1 Special Initiators
Probability Density Function



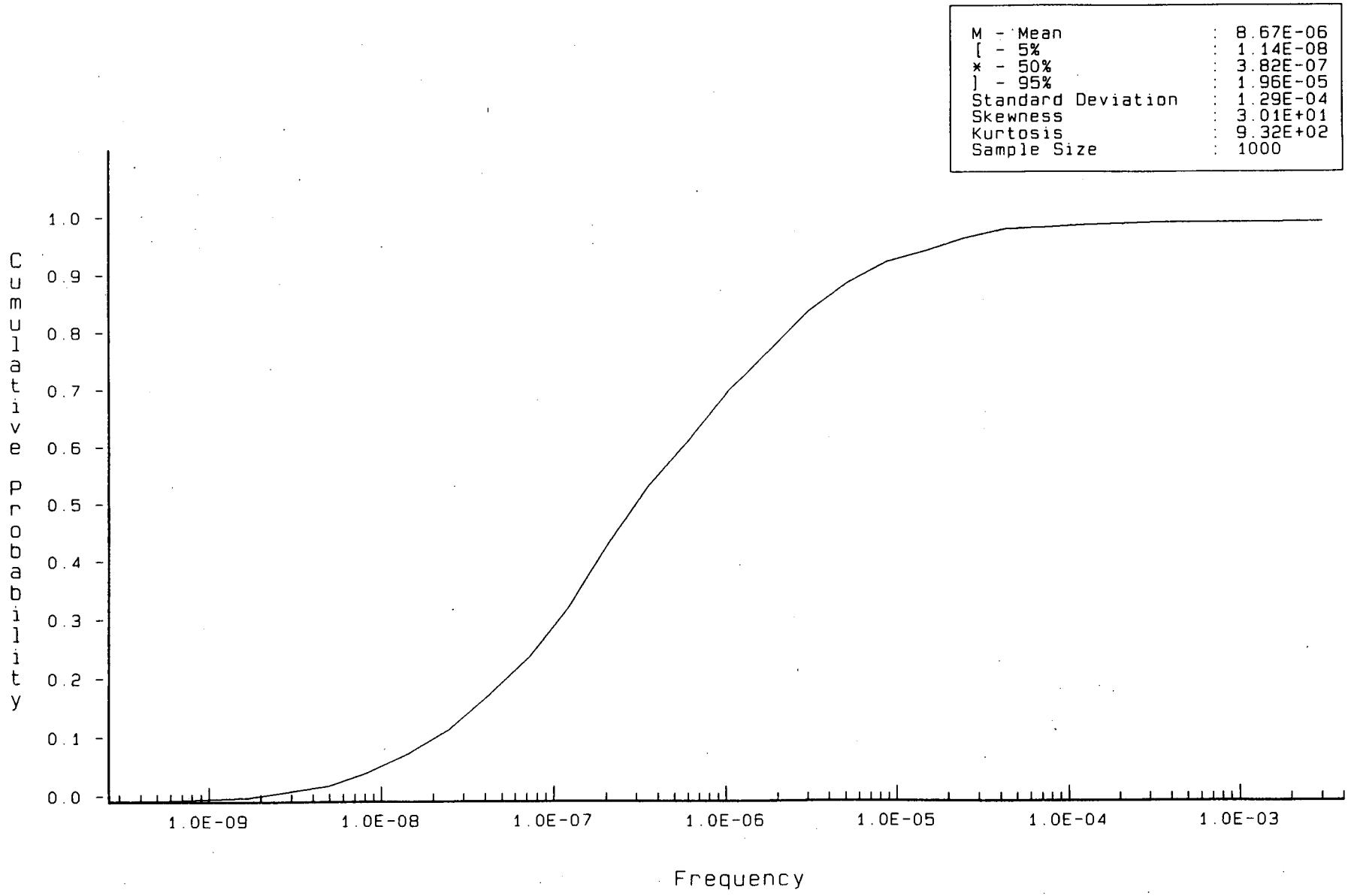
J1.6.2 Special Initiators
Cumulative Probability Distribution Function



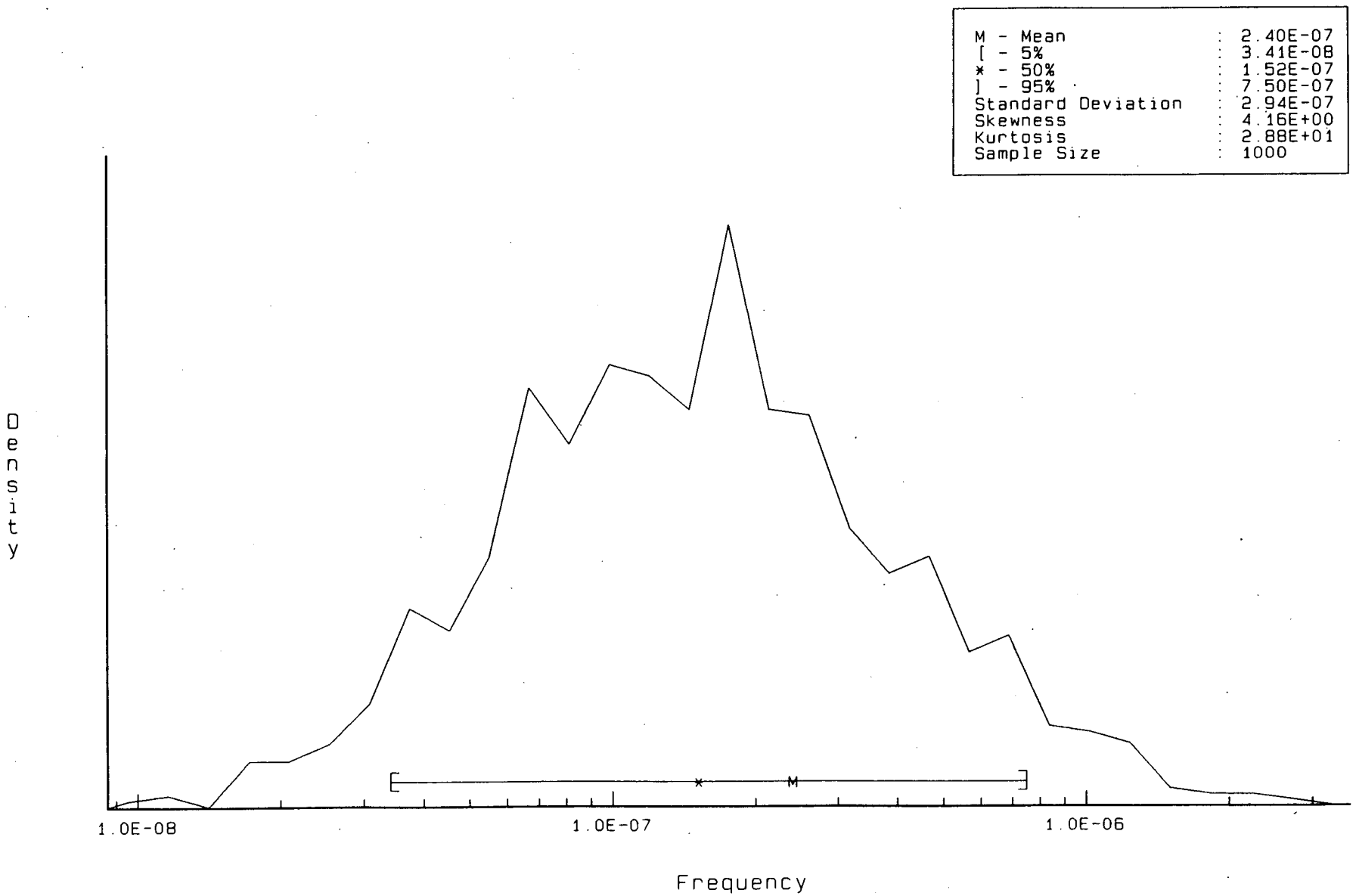
J1.7.1 Anticipated Transients Without Scram
Probability Density Function



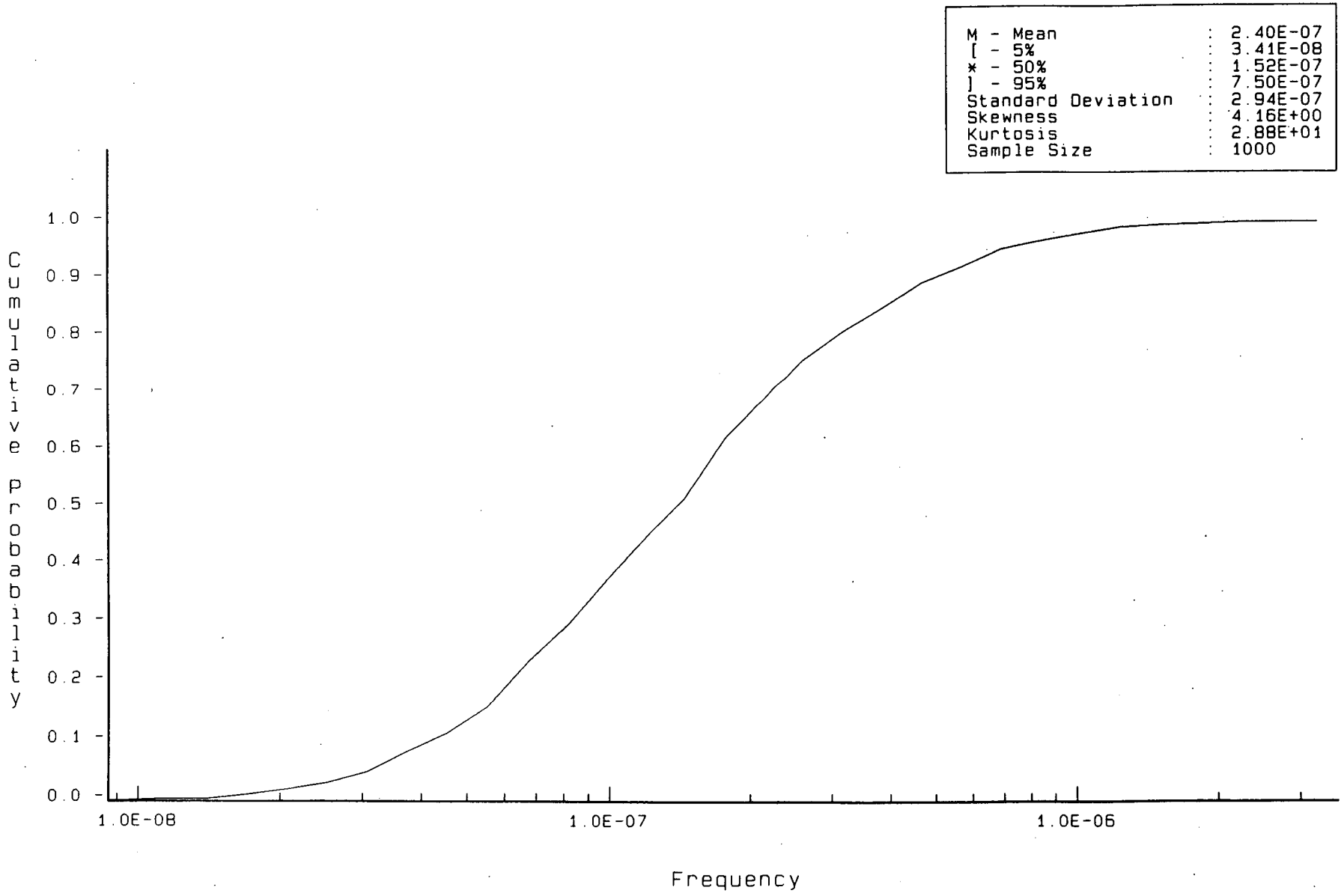
J1.7.2 Anticipated Transients Without Scram
Cumulative Probability Distribution Function



J1.8.1 Interfacing Loss of Coolant Accidents
Probability Density Function

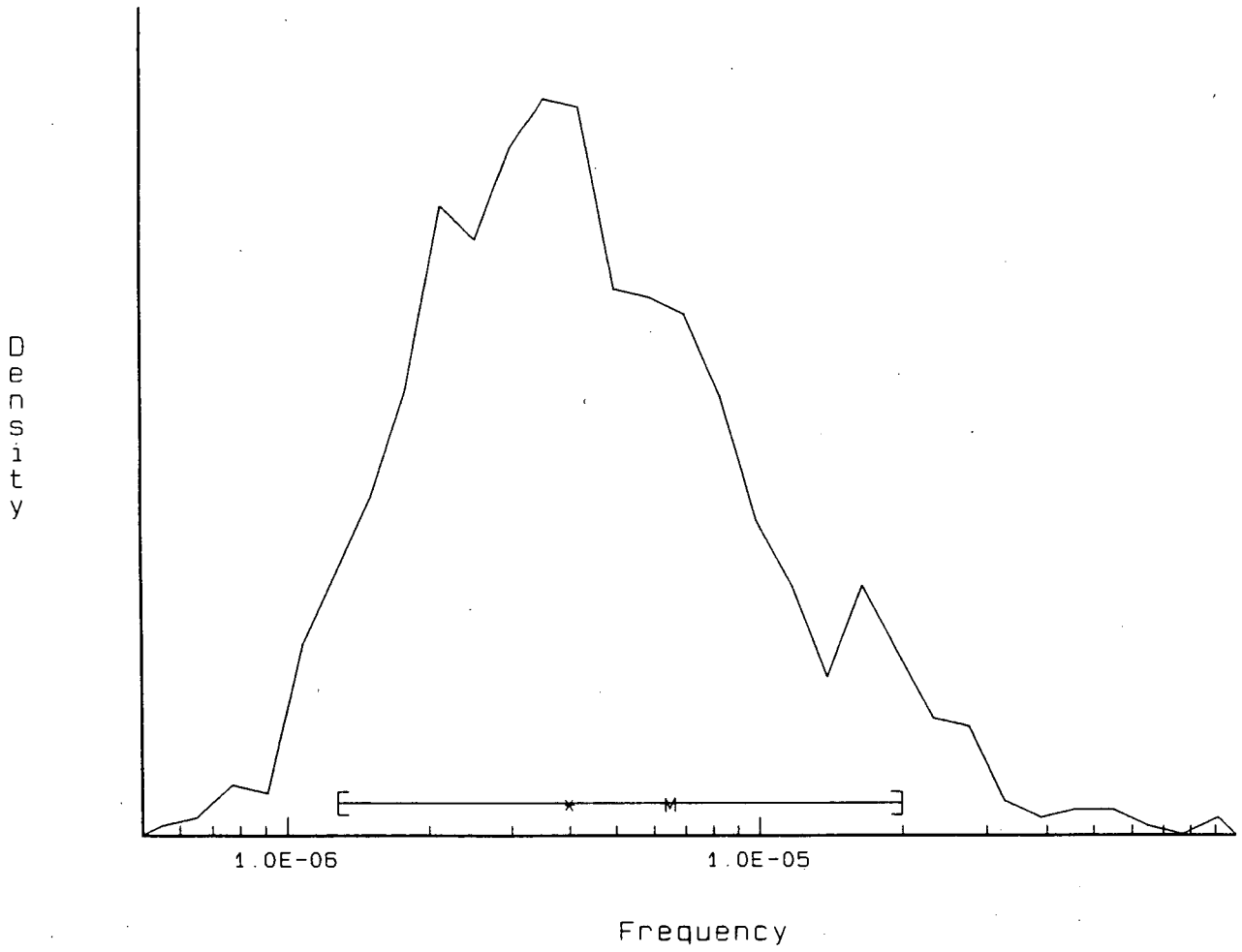


J1.8.2 Interfacing Loss of Coolant Accidents
Cumulative Probability Distribution Function



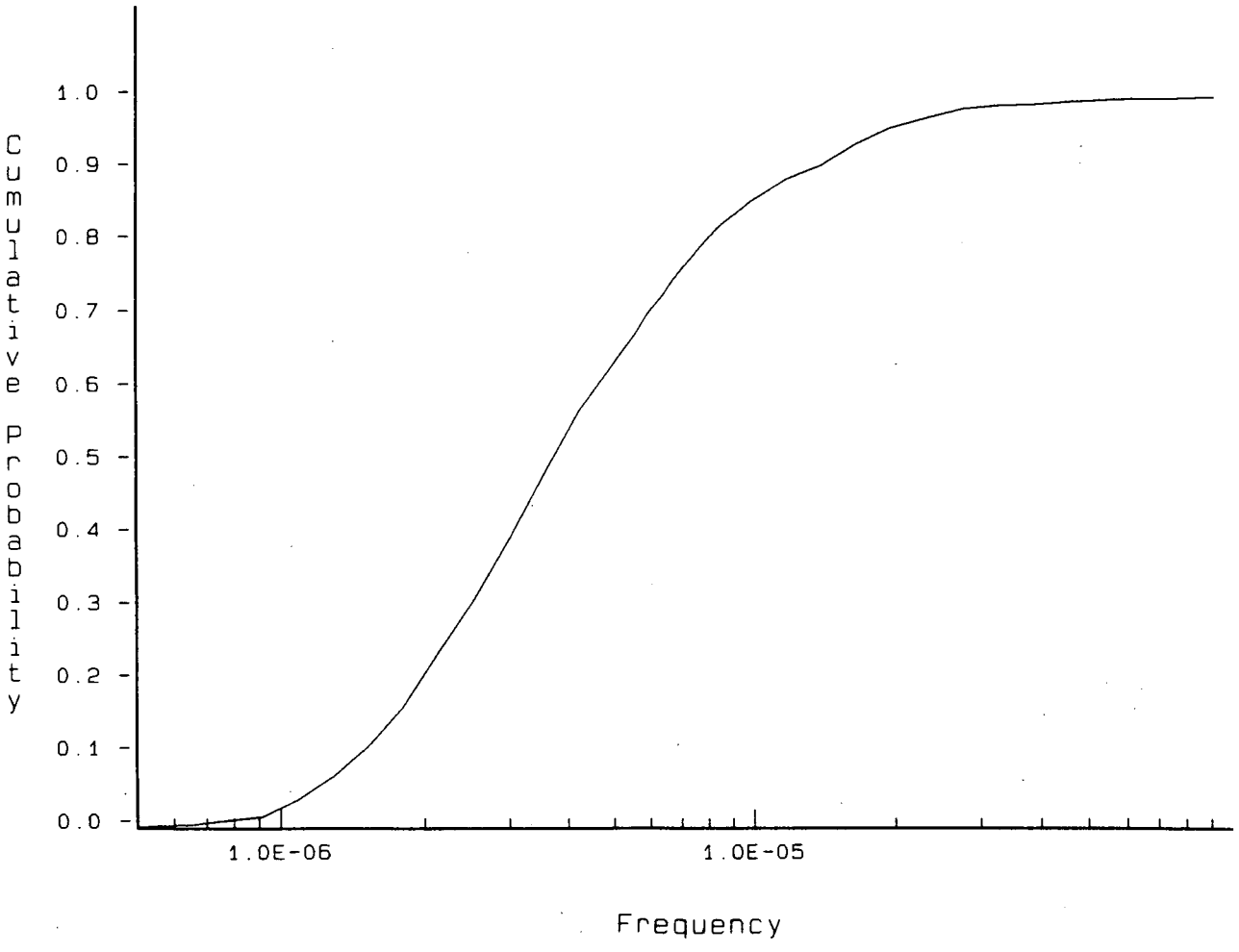
J1.9.1 Internal Flooding
Probability Density Function

M - Mean	: 6.51E-06
[- 5%	: 1.28E-06
* - 50%	: 3.99E-06
] - 95%	: 1.99E-05
Standard Deviation	: 8.02E-06
Skewness	: 4.87E+00
Kurtosis	: 3.74E+01
Sample Size	: 1000



J1.9.2 Internal Flooding
Cumulative Probability Distribution Function

M - Mean	:	6.51E-06
[- 5%	:	1.28E-06
* - 50%	:	3.99E-06
] - 95%	:	1.99E-05
Standard Deviation	:	8.02E-06
Skewness	:	4.87E+00
Kurtosis	:	3.74E+01
Sample Size	:	1000



J2.1 Risk Increase Importance Basic Events

Sorted by Risk Increase Meas

Event	Description	Probability	Risk Increase Measure	Risk Reduction Measure
C	REACTOR PROTECTION SYSTEM FAILURE	1.62E-05	3.36E-01	5.97E-06
DC1-BDC-ST-PP-32	PANEL FAULTS AT DC PWR PNL 32	4.39E-06	1.59E-01	7.56E-07
AC4-CCF-HW-480VS	COMMON CAUSE FAILURE OF 480V SWGR 31&32	1.06E-06	2.56E-02	2.71E-08
AFW-CCF-FS-AFWPM	CCF OF AFW MOTOR DRIVEN PUMPS	1.15E-04	8.50E-03	9.81E-07
SL-T3	RANDOM FAILURE SEAL LOCA	3.65E-05	5.39E-03	1.97E-07
ORCS-L-SGISOSUCC	FAILURE TO DEPRESSURIZE EARLY/LATE COUPLE	6.50E-05	5.00E-03	3.25E-07
AFW-XVM-PG-CT-64	ISOLATION VALVE CT-64 FAIL CLS (PLUGGED)	3.40E-05	3.82E-03	1.30E-07
AFW-XVM-PG-CT-6	STOP VALVE CT-6 FAIL CLOSED (PLUGGED)	3.40E-05	3.82E-03	1.30E-07
MSS-CCF-OO-MSIV	COMMON CAUSE FAILURE OF 2 OR MORE MSIVS	5.65E-05	2.10E-03	1.19E-07
AFV-MOD-CC-IL314	AFW ROOM INLET LOUVER L-314 FAILS TO OPN	3.00E-03	2.06E-03	6.20E-06
SWS-XHE-RE-SWN29	SWN-29/SWN-30 SWAPPED DURING HDR ALIGNMT	2.56E-04	1.95E-03	5.01E-07
SWS-CCF-CC-EDGS	CCF OF EDG FLOW CONTROL VALVES	1.10E-04	1.94E-03	2.14E-07
EDG-CCF-HW-3EDGS	COMMON CAUSE FAILURE OF ALL THREE EDG'S	4.70E-05	1.94E-03	9.10E-08
SWS-CCF-FR-ESSPM	CCF OF 2 RUNNING SWS MOTOR DRIVEN PUMPS	5.90E-05	1.94E-03	1.14E-07

J2.1 Risk Increase Importance Basic Events

Sorted by Risk Increase Meas

Event	Description	Probability	Risk Increase Measure	Risk Reduction Measure
SWS-XVM-OC-29	EDG SW COMMON SUPPLY HDR ISO VLV XFER CL	3.16E-05	1.90E-03	6.02E-08
SWS-XVM-OC-55	EDG COMMON DISCHARGE METER VLV XFER CLOS	3.16E-05	1.90E-03	6.02E-08
AC1-BAC-ST-LB33	FAULT ON LIGHTING BUS 33	1.15E-05	1.25E-03	1.44E-08
AC1-BAC-ST-LP324	FAULTS IN LIGHTING PANEL 324	1.15E-05	1.25E-03	1.44E-08
OLR-S2	PERATOR FAILS TO INITIATE LOW HEAD RECIRC -S	3.00E-04	1.17E-03	3.51E-07
DC1-BAT-HW-BAT31	FAILURE OF BATTERY 31	2.19E-05	1.04E-03	2.27E-08
AC1-SBR-CO-LP324	LP324 FEEDER BRKR FLS TO RMN CLOSED	6.43E-06	9.89E-04	6.36E-09
HHI-ASL-HI-LT920	RWST LEVEL TRANSMITTER LT-920 FAILS HIGH	5.52E-06	9.14E-04	5.05E-09
OLR-S1	PERATOR FAILS TO INITIATE LOW HEAD RECIRC -S	3.00E-04	9.14E-04	2.74E-07
AC4-RCI-FE-U1-6A	UV REL 27-1/6A DOES NOT ENERGIZE	3.12E-03	8.51E-04	2.67E-06
NR-AFBV	NON-RECOVERY OF AUX FW BLDG VENTILATION	1.00E-02	5.97E-04	6.03E-06
DC1-BDC-ST-PP-31	PANEL FAULTS AT DC PWR PNL 31	4.39E-06	5.82E-04	2.55E-09
DC1-SBR-CO-BAT31	CKT BRKR FROM BATT 31 FLS TO RMN CLOSED	5.02E-06	5.82E-04	2.92E-09
DC1-FUS-NO-BAT31	FUSES ON BATTERY 31 BLOWN	2.50E-06	5.82E-04	1.45E-09

J2.1 Risk Increase Importance Basic Events

Sorted by Risk Increase Meas

Event	Description	Probability	Risk Increase Measure	Risk Reduction Measure
AC4-RCK-NO-BCH37	FAULTS AT MCC37 TO BATT CHGR 32	2.50E-03	5.37E-04	1.35E-06
AC6-RLY-NO-LSTBU	LO RELAY 86/STBU FAILS TO OPERATE	3.00E-04	4.99E-04	1.50E-07
AC6-RLY-NO-85-L1	PIL WIRE REL 85L1/138 DOES NOT OPER	3.00E-04	4.99E-04	1.50E-07
AC6-RLY-NO-85-L2	PIL WIRE REL 85L2/138 DOES NOT OPER	3.00E-04	4.99E-04	1.50E-07
AC6-RLY-NO-86STP	LO RELAY 86/STP DOES NOT OPERATE	3.00E-04	4.99E-04	1.50E-07
AC6-RCI-FE-U6-62	UV RELAY 27-6/62 DOES NOT ENERGIZE	1.30E-04	4.85E-04	6.31E-08
SWS-CKV-OC-100-1	CHECK VLV SWN-100-1 FAILS TO REMAIN OPEN	2.50E-06	4.83E-04	1.21E-09
SWS-XVM-OC-99	SWS MAN VALVE SWN-99 FAIL TO REMAIN OPEN	2.11E-06	4.83E-04	1.02E-09
DC1-MAI-MA-BCC31	BATT CHGR 31 IN MAINTENANCE	9.64E-03	4.80E-04	4.67E-06
OLR-A	PERATOR FAILS TO INITIATE LOW HEAD RECIRC -	4.40E-03	4.75E-04	2.10E-06
DC1-MAI-MA-BCC32	BATT CHGR 32 IN MAINTENANCE	3.00E-03	3.71E-04	1.12E-06
AFW-XHE-RE-AFW31	FAIL TO RESTORE PM 31 PATH COMPS AFT MAI	4.75E-03	3.68E-04	1.76E-06
AFW-TDP-FR-TDP32	AFW TDP 32 FAILS TO CONTINUE TO RUN	9.43E-03	3.66E-04	3.48E-06
AC4-RCI-FE-U1-5A	UV REL 27-1/5A DOES NOT ENERGIZE	3.12E-03	3.47E-04	1.09E-06

J2.1 Risk Increase Importance Basic Events

Sorted by Risk Increase Meas

Event	Description	Probability	Risk Increase Measure	Risk Reduction Measure
AFW-RCK-NO-PM31	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	3.45E-04	8.66E-07
AFW-XHE-RE-AFW32	FAIL TO RESTORE PM 32 PATH COMPS AFT MAI	5.02E-03	3.45E-04	1.74E-06
AFW-TDP-FS-TDP32	AFW TDP 32 FAILS TO START ON DEMAND	4.34E-03	3.43E-04	1.50E-06
AFW-MDP-FS-PM31	AFW PUMP 31 FAILS TO START ON DEMAND	1.36E-03	3.23E-04	4.40E-07
AFW-RCK-NO-TDP32	AFW TDP 32 CONTROL CIRCUIT FAILURE	2.50E-03	3.22E-04	8.07E-07
AFW-XHE-FO-HC405	OPERATOR FAILS TO OPERATE HC-405A,B,C&D	2.10E-03	3.18E-04	6.70E-07
AFW-MAI-MA-PM31	AFW MOTOR-DRIVEN PUMP 31 IN TEST & MAINT	5.14E-03	3.05E-04	1.58E-06
PPR-AOV-OO-455C	PORV RC-PCV-455C FAILS TO CLOSE	2.00E-03	3.05E-04	6.12E-07
AFW-MAI-MA-TDP32	AFW TURBINE-DRIVEN PUMP 32 IN TEST & MAI	5.33E-03	2.99E-04	1.60E-06
AFW-MDP-FR-PM31	AFW PUMP 31 FAILS TO CONTINUE TO RUN	4.20E-04	2.92E-04	1.23E-07
AFW-CRB-DN-52AF1	MDP 31 CIRCUIT BRKER 52/AF1 DOESN'T OPER	4.27E-04	2.92E-04	1.25E-07
AC4-RCK-NO-BCH39	FAULTS AT MCC39 TO BATT CHGR 31	2.50E-03	2.89E-04	7.25E-07
AFW-RLY-NO-312-1	AFW PM 31 RLY 2-1/TDC NO OUTPUT	3.00E-04	2.80E-04	8.41E-08
PPR-AOV-OO-456	PORV RC-PCV-456 FAILS TO CLOSE	2.00E-03	2.74E-04	5.49E-07

J2.1 Risk Increase Importance Basic Events

Sorted by Risk Increase Meas

Event	Description	Probability	Risk Increase Measure	Risk Reduction Measure
AC4-RCK-NO-BC36C	FAULTS AT MCC36C TO BATT CHGR 33	2.50E-03	2.65E-04	6.64E-07
AC4-XHE-RE-MCC6C	FAILURE TO RESTORE MCC36C AFTER MAINT	2.13E-04	2.41E-04	5.13E-08
PPR-PRV-CC-456	PORV RC-PCV-456 DOES NOT OPEN	4.27E-03	2.24E-04	9.63E-07
PPR-CCF-CC-PORVS	COMMON CAUSE FAILURE OF PORVs TO OPEN	4.70E-04	2.21E-04	1.04E-07
AFW-AOV-CC-P1139	STEAM CNTRL VLV PCV-1139 DOES NOT OPEN	1.12E-03	2.10E-04	2.35E-07
PPR-PRV-CC-455C	PORV RC-PCV-455C DOES NOT OPEN	4.27E-03	1.97E-04	8.46E-07
AC4-XHE-RE-MCC6A	FAILURE TO RESTORE MCC36A AFTER MAINT	2.13E-04	1.92E-04	4.08E-08
AFW-CKV-CC-BFD34	PM 31 DISC CHECK VLV BFD-34 FAIL TO OPEN	8.54E-05	1.91E-04	1.63E-08
ORCS-L	OPER FAILS TO INITIATE LONG TERM RCS DEPR	5.20E-03	1.84E-04	9.59E-07
FB-T2	BLEED AND FEED INITIATION	2.10E-02	1.83E-04	3.93E-06
DC1-MAI-MA-BCC33	BATT CHGR 33 IN MAINTENANCE	1.74E-03	1.65E-04	2.88E-07
AFW-MAI-MA-31VLV	PM 31 PATH VALVE IN TEST & MAINTENANCE	9.19E-05	1.58E-04	1.45E-08
AC4-CRB-OO-2AT3A	480V CKT BRKR 2AT3A FAILS TO CLOSE	4.27E-04	1.51E-04	6.47E-08
AFW-RLY-NO-BFPL	AFW PM 32 RLY BFPL NO OUTPUT	3.00E-04	1.45E-04	4.36E-08

J2.1 Risk Increase Importance Basic Events

Sorted by Risk Increase Meas

Event	Description	Probability	Risk Increase Measure	Risk Reduction Measure
AC4-RCS-OO-U3AX2	UV AUX REL 27-3A/X2 CONT FAIL TO CL	3.00E-04	1.42E-04	4.27E-08
AC4-RCI-FE-U1-3A	UV REL 27-1/3A DOES NOT ENERGIZE	3.12E-03	1.29E-04	4.03E-07
AC6-RCI-FE-U5-62	UV RELAY 27-5/62 DOES NOT ENERGIZE	1.30E-04	1.21E-04	1.57E-08
RV-T4	REACTOR VESSEL RUPTURE	9.20E-03	1.17E-04	1.09E-06
AFW-XHE-RE-AFW33	FAIL TO RESTORE PM 33 PATH COMPS AFT MAI	4.75E-03	1.13E-04	5.41E-07
AC4-XHE-RE-MCC6B	FAILURE TO RESTORE MCC36B AFTER MAINT	2.13E-04	1.12E-04	2.39E-08
SGB-CCF-OO-SGBIV	COMMON CAUSE FAILURE OF 2 SG BWDN VALVES	2.09E-04	1.04E-04	2.17E-08
SGISO-SGOVRFILL	SG OVERFILL AFTER ISOLATION	7.90E-03	1.02E-04	8.13E-07
AC4-CRB-CC-2AT5A	480V BRKR 52/2AT5A FAILS TO TRIP	4.27E-04	9.63E-05	4.12E-08
AFW-RCK-NO-PM33	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	8.87E-05	2.22E-07
OHR-T2	OPER FAILS TO INIT HIGH HEAD RECIRC -T2	1.30E-02	8.49E-05	1.12E-06
APP-R-CBF	FAILURE TO ALIGN APP R SWGR DURING CB FLOOD	2.30E-02	8.34E-05	1.96E-06
SWS-MDP-RS-PM35	SW PUMP 35 FAILS TO RESTART	1.50E-03	8.30E-05	1.25E-07
HHR-CCF-CC-888AB	COMMON CAUSE FAILURE OF VL SI-MOV-888A&B	4.40E-05	8.10E-05	3.56E-09

J2.1 Risk Increase Importance Basic Events

Sorted by Risk Increase Meas

Event	Description	Probability	Risk Increase Measure	Risk Reduction Measure
SL-DEP	SEAL LOCA OCCURS AFTER DEPRESSURIZATION	7.10E-03	7.80E-05	5.58E-07
SL-CBF	SEAL LOCA DURING CONTROL BUILDING FLOOD	7.10E-03	7.65E-05	5.47E-07
B-BATT-DEP	BATTERY DEPLETION	5.70E-03	7.08E-05	4.06E-07
PPR-RCK-NO-RC536	BLK VLV RC-MOV-536 CONTROL CKT NO OUTPUT	2.50E-03	7.01E-05	1.76E-07
SWS-FCV-OO-1112	NON-ESSEN ISO VLV FAILS TO CLOSE	2.00E-03	6.98E-05	1.40E-07
SWS-MDP-FR-PM35	SWN PUMP 35 FAILS TO CONTINUE TO RUN	5.90E-04	6.96E-05	4.11E-08
AC4-XHE-RE-MCC39	FAILURE TO RESTORE MCC39 AFTER MAINT	2.13E-04	6.78E-05	1.45E-08
AFW-MDP-FS-PM33	AFW PUMP 33 FAILS TO START ON DEMAND	1.36E-03	6.65E-05	9.06E-08
AFW-MAI-MA-32VLV	TDP 32 PATH VALVE IN TEST & MAINTENANCE	1.61E-04	6.63E-05	1.07E-08
AFW-MAI-MA-PM33	AFW MOTOR-DRIVEN PUMP 33 IN TEST & MAINT	3.22E-03	6.43E-05	2.08E-07
AFW-CCF-CC-TDPDV	CCF OF ALL FOUR PM 32 FCVs TO OPEN	1.10E-04	6.05E-05	6.66E-09
AFW-CKV-CC-BFD5O	CHECK VALVE BFD-50 DOES NOT OPEN	8.54E-05	6.05E-05	5.17E-09
AFW-CKV-CC-BFD31	CHECK VALVE BFD-31 FAILS TO OPEN	8.54E-05	6.05E-05	5.17E-09
SWS-CCF-FR-NESPM	CCF OF RUNNING NON-ESSEN SWS PUMPS	5.90E-05	6.00E-05	3.54E-09

J2.1 Risk Increase Importance Basic Events

Sorted by Risk Increase Meas

Event	Description	Probability	Risk Increase Measure	Risk Reduction Measure
PPR-CCF-CC-BLKVS	COMMON CAUSE FAILURE OF BLKVs TO OPEN	4.40E-05	6.00E-05	2.64E-09
CCW-RCK-NO-625	FCV 625 CONTROL CIRCUIT NO OUTPUT	2.50E-03	5.94E-05	1.49E-07
LHR-CCF-CC-LPRVL	COMMON CAUSE FAIL OF VLV SI-MOV-1802A&B	2.03E-04	5.88E-05	1.19E-08
LHR-CCF-FS-PUMPS	COMMON CAUSE FAILURE OF LO HEAD REC PUMP	2.31E-04	5.88E-05	1.36E-08
CVC-CKV-CC-210B	CHECK VLV CH-210B FAILS TO OPEN	1.00E-04	5.83E-05	5.83E-09
CVC-CKV-CC-210D	CHECK VLV CH-210D FAILS TO OPEN	1.00E-04	5.83E-05	5.83E-09
CVC-CKV-CC-CH374	CHECK VALVE CH-374 FAILS TO OPEN	1.00E-04	5.83E-05	5.83E-09
CVC-XHE-FO-BORAT	OPER FAIL TO INITIA EMERGENCY BORATION	2.10E-03	5.82E-05	1.23E-07
DC1-BCC-HW-BCC31	FAILURE OF BATT CHGR 31	2.19E-05	5.82E-05	1.27E-09
PPR-MOV-CC-RC536	BLOCK VALVE RC-MOV-536 DOES NOT OPEN	5.00E-04	5.75E-05	2.88E-08
SWS-MAI-MA-PM36	SWS MOTOR DRIVEN PUMP 36 IN MAINTENANCE	1.82E-02	5.70E-05	1.06E-06
CCW-FCV-CC-625	FCV-625 FAIL TO OPEN	1.00E-03	5.67E-05	5.67E-08
SWS-CKV-OO-SW1-2	SW PM 32 DIS CKV SWN-1-2 FAIL TO CLOSE	1.00E-03	5.67E-05	5.67E-08
CCW-CKV-OO-761B	CHECK VLV AC-761B STUCK OPEN	1.00E-03	5.67E-05	5.67E-08

J2.1 Risk Increase Importance Basic Events

Sorted by Risk Increase Meas

Event	Description	Probability	Risk Increase Measure	Risk Reduction Measure
SWS-STR-PG-35	PUMP 35 DISCHARGE STRAINER PLUGGED	1.64E-04	5.56E-05	9.13E-09
EDG-CCF-HW-DG312	COMMON CAUSE FAILURE OF DG'S 31 AND 32	1.00E-04	5.44E-05	5.44E-09
AFW-RLY-NO-332-1	AFW PM 33 RLY 2-1/TDC NO OUTPUT	3.00E-04	5.40E-05	1.62E-08
AFW-CRB-DN-52AF3	MDP 33 CIRCUIT BRKR 52/AF3 DOESN'T OPERA	4.27E-04	5.39E-05	2.30E-08
AFW-MDP-FR-PM33	AFW PUMP 33 FAILS TO CONTINUE TO RUN	4.20E-04	5.39E-05	2.27E-08
LHR-RCK-NO-PM31	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	5.17E-05	1.30E-07
SWS-MDP-RS-PM34	SW PUMP 34 FAILS TO RESTART	1.50E-03	5.01E-05	7.52E-08
IAS-AOV-CC-633	DYR OUTLET DIVERTER VLV FAILS TO OPERATE	1.00E-03	4.90E-05	4.90E-08
IAS-AOV-CC-632	DYR INLET VLV ASSMBLY FAILS TO OPERATE	1.00E-03	4.90E-05	4.90E-08
IAS-RCK-NO-NHDYR	HEATLESS DRYER CONTROL CIRCUIT NO OUTPUT	2.50E-03	4.89E-05	1.23E-07
SWS-MDP-FR-PM31	SWN PUMP 31 FAILS TO CONTINUE TO RUN	5.90E-04	4.77E-05	2.82E-08
CCW-MDP-FR-PM31	CCW PUMP 31 FAILS TO CONTINUE TO RUN	5.66E-04	4.77E-05	2.70E-08
HHI-CCF-FS-3PMPS	3 SAFETY INJEC PMS COMMON CAUSE FAILURES	3.18E-05	4.77E-05	1.52E-09
LHR-MSW-DN-43RS5	SW 43/RS-5 DOES NOT OPERATE	2.99E-05	4.77E-05	1.43E-09

J2.1 Risk Increase Importance Basic Events

Sorted by Risk Increase Meas

Event	Description	Probability	Risk Increase Measure	Risk Reduction Measure
SWS-RCK-NO-PM36	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	4.71E-05	1.18E-07
SWS-STR-PG-36	PMP 36 DISC STRAINER PLUGGED	2.47E-03	4.71E-05	1.17E-07
IAS-CCF-FR-IACMP	CCF OF INSTRUMENT AIR COMPRESSORS	9.36E-05	4.67E-05	4.37E-09
AFW-FLC-DN-405A	AFW HC-405A DOES NOT OPERATE CORRECTLY	1.25E-04	4.44E-05	5.55E-09
AFW-FLC-DN-406A	AFW HC-406A DOES NOT OPERATE CORRECTLY	1.25E-04	4.44E-05	5.55E-09
AFW-FLC-DN-405D	AFW HC-405D DOES NOT OPERATE CORRECTLY	1.25E-04	4.44E-05	5.55E-09
AFW-FLC-DN-405B	AFW HC-405B DOES NOT OPERATE CORRECTLY	1.25E-04	4.44E-05	5.55E-09
AFW-FLC-DN-406D	AFW HC-406D DOES NOT OPERATE CORRECTLY	1.25E-04	4.44E-05	5.55E-09
AFW-FLC-DN-405C	AFW HC-405C DOES NOT OPERATE CORRECTLY	1.25E-04	4.44E-05	5.55E-09
AFW-FLC-DN-406B	AFW HC-406B DOES NOT OPERATE CORRECTLY	1.25E-04	4.44E-05	5.55E-09
AFW-FLC-DN-406C	AFW HC-406C DOES NOT OPERATE CORRECTLY	1.25E-04	4.44E-05	5.55E-09
AFW-AOV-OO-406D	AFW-FCV-406D FAIL TO CLOSE ON DEMAND	2.38E-03	4.43E-05	1.06E-07
AFW-AOV-OO-406B	AFW-FCV-406B FAIL TO CLOSE ON DEMAND	2.38E-03	4.43E-05	1.06E-07
AFW-AOV-OO-406A	AFW-FCV-406A FAIL TO CLOSE ON DEMAND	2.38E-03	4.43E-05	1.06E-07

J2.1 Risk Increase Importance Basic Events

Sorted by Risk Increase Meas

Event	Description	Probability	Risk Increase Measure	Risk Reduction Measure
AFW-AOV-OO-406C	AFW-FCV-406C FAIL TO CLOSE ON DEMAND	2.38E-03	4.43E-05	1.06E-07
PPR-RCK-NO-RC535	BLK VLV RC-MOV-535 CONTROL CKT NO OUTPUT	2.50E-03	4.27E-05	1.07E-07
SWS-STR-PG-31	PUMP 31 DISCHARGE STRAINER PLUGGED	1.64E-04	4.20E-05	6.89E-09
SWS-MDP-FS-PMP36	SWP 36 FAILS TO START ON DEMAND	1.58E-03	4.17E-05	6.60E-08
SWS-CRB-DN-52SW6	SW PUMP 36 BKR 52/SW6 DOES NOT OPERATE	4.27E-04	3.98E-05	1.70E-08
SWS-MDP-FR-PM36	SWN PUMP 36 FAILS TO CONTINUE TO RUN	5.90E-04	3.98E-05	2.35E-08
TSGTR-2	MULTIPLE SGTR INDUCED BY MS LINE BREAK	1.57E-03	3.90E-05	6.13E-08
EDG-CCF-HW-DG323	COMMON CAUSE FAILURE OF DG'S 33 AND 32	1.00E-04	3.87E-05	3.87E-09
TSGTR-1	SGTR INDUCED BY MS LINE BREAK	1.00E-02	3.87E-05	3.90E-07
EDG-CCF-HW-DG313	COMMON CAUSE FAILURE OF DG'S 31 AND 33	1.00E-04	3.78E-05	3.78E-09
LHR-RCK-NO-1802B	SI-MOV-1802B CONTROL CIRCUIT NO OUTPUT	2.50E-03	3.70E-05	9.27E-08
LHR-RCK-NO-1802A	SI-MOV-1802A CONTROL CIRCUIT NO OUTPUT	2.50E-03	3.70E-05	9.27E-08
FB-TSWS	BLEED AND FEED INITIATION	1.20E-02	3.68E-05	4.47E-07
SAS-XLF-TE-SASA	SAS TRAIN A IN FUNCTIONAL TEST	3.47E-03	3.65E-05	1.27E-07

J2.1 Risk Increase Importance Basic Events

Sorted by Risk Increase Meas

Event	Description	Probability	Risk Increase Measure	Risk Reduction Measure
LHR-MDP-FS-PM31	RECIR PUMP 31 FAILS TO START ON DEMAND	4.77E-04	3.51E-05	1.67E-08
LHR-MOV-CC-1802B	SI-MOV-1802B DOES NOT OPEN ON DEMAND	4.77E-04	3.51E-05	1.67E-08
LHR-MOV-CC-1802A	SI-MOV-1802A DOES NOT OPEN ON DEMAND	4.77E-04	3.51E-05	1.67E-08
LHR-MDP-FS-PM32	RECIR PUMP 32 FAILS TO START ON DEMAND	4.77E-04	3.51E-05	1.67E-08
LHR-CRB-DN-PM31	RECIC PM 31 CIRC BKR 52/R1 DOESN'T OPER	4.27E-04	3.51E-05	1.50E-08
LHR-CRB-DN-PM32	RECIR PM 32 CIRC BKR 52/R2 DOESN'T OPER	4.27E-04	3.51E-05	1.50E-08
LHR-XHE-RE-PM32	FAIL TO RESTO PM 32 PATH COMPS AFT MAINT	6.21E-04	3.51E-05	2.18E-08
LHR-XHE-RE-PM31	FAIL TO RESTO PM 31 PATH COMPS AFT MAINT	6.21E-04	3.51E-05	2.18E-08
LHR-MDP-FR-PM32	RECIC PUMP 32 FAILS TO CONTINUE TO RUN	7.20E-04	3.51E-05	2.53E-08
LHR-MDP-FR-PM31	RECIR PUMP 31 FAILS TO CONTINUE TO RUN	7.20E-04	3.51E-05	2.53E-08
LHR-RCK-NO-PM32	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	3.50E-05	8.77E-08
SWS-CKV-OO-SW1-4	SW PM 34 DIS CKV SWN-1-4 FAIL TO CLOSE	1.00E-03	3.50E-05	3.50E-08
AFW-MAI-MA-33VLV	PM 33 PATH VALVE IN TEST & MAINTENANCE	2.30E-04	3.45E-05	7.93E-09
CCW-CCF-CC-822	CCF OF MOV AC-822A&B	2.64E-04	3.33E-05	8.79E-09

J2.1 Risk Increase Importance Basic Events

Sorted by Risk Increase Meas

Event	Description	Probability	Risk Increase Measure	Risk Reduction Measure
AFW-CKV-CC-29-2	CHECK VALVE CT-29-2 FAILS TO OPEN	8.54E-05	3.09E-05	2.64E-09
SWS-CKV-CC-SW1-6	PMP 36 DISC CHK VLV SWN-1-6 FAIL TO OPEN	1.00E-04	3.08E-05	3.08E-09
SWS-XHE-RE-PMP36	FAIL TO RESTORE PMP 36 AFTER MAINTENANCE	4.97E-04	3.08E-05	1.53E-08
PPR-MOV-CC-RC535	BLOCK VALVE RC-MOV-535 DOES NOT OPEN	5.00E-04	3.00E-05	1.50E-08
SWS-MDP-FR-PM34	SWN PUMP 34 FAILS TO CONTINUE TO RUN	5.90E-04	2.99E-05	1.76E-08
AFW-CKV-CC-BFD39	PM 33 DISC CHECK VLV BFD-39 FAIL TO OPEN	8.54E-05	2.97E-05	2.53E-09
SAS-RCS-OO-SI1	SAS RELAY SI1 CONT FAIL TO CLOSE ON SI	3.00E-04	2.94E-05	8.82E-09
SAS-RCS-OO-SI2	SAS RELAY SI2 CONT FAIL TO CLOSE ON SI	3.00E-04	2.94E-05	8.82E-09
AFV-MOD-CC-ED311	WALL EXH FAN 311 DAMPER FLS TO OPEN	3.00E-03	2.78E-05	8.36E-08
AFW-SKV-OO-MS-42	ABFPT SUPPLY VLV MS-42 FAIL TO CLOSE	8.74E-04	2.60E-05	2.27E-08
AFW-SKV-OO-MS-41	ABFPT SUPPLY VLV MS-41 FAIL TO CLOSE	8.74E-04	2.60E-05	2.27E-08
MSS-MSV-OO-MS131	MSIV MS1-31 FAILS TO CLOSE ON DEMAND	9.42E-04	2.60E-05	2.45E-08
MSS-MSV-OO-MS134	MSIV MS1-34 FAILS TO CLOSE ON DEMAND	9.42E-04	2.60E-05	2.45E-08
MSS-MSV-OO-MS133	MSIV MS1-33 FAILS TO CLOSE ON DEMAND	9.42E-04	2.60E-05	2.45E-08

J2.1 Risk Increase Importance Basic Events

Sorted by Risk Increase Meas

Event	Description	Probability	Risk Increase Measure	Risk Reduction Measure
MSS-MSV-OO-MS132	MSIV MS1-32 FAILS TO CLOSE ON DEMAND	9.42E-04	2.60E-05	2.45E-08
MSS-ADV-OO-1135	SG 32 MS-PCV-1135 FAIL TO CLOSE	1.95E-03	2.60E-05	5.07E-08
MSS-ADV-OO-1134	SG 31 MS-PCV-1134 FAIL TO CLOSE	1.95E-03	2.60E-05	5.07E-08
MSS-ADV-OO-1137	SG 34 MS-PCV-1137 FAIL TO CLOSE	1.95E-03	2.60E-05	5.07E-08
MSS-ADV-OO-1136	SG 33 MS-PCV-1136 FAIL TO CLOSE	1.95E-03	2.60E-05	5.07E-08
AFV-MOD-CC-ED312	WALL EXH FAN 312 DAMPER FLS TO OPEN	3.00E-03	2.35E-05	7.07E-08
CDS-AOV-OO-518	AOV 518 FAIL TO CLOSE ON DEMAND	2.00E-03	2.19E-05	4.39E-08
EDG-GEN-HW-EDG31	DG31 GENERATOR FAILURE	2.57E-02	1.94E-05	5.12E-07
VISO	OPERATOR FAILS TO ISOLATE DURING ISLOCA	1.00E-01	1.91E-05	2.12E-06
GAC4-EDG	RANDOM FAILURE OF EDG LEADING TO SBO	2.03E-03	1.81E-05	3.69E-08
AFV-FAN-FR-EF312	WALL EXH FAN 312 FAILS TO CONT TO RUN	7.20E-04	1.80E-05	1.30E-08
AFV-FAN-FS-EF311	WALL EXH FAN 311 FAILS TO START	3.00E-04	1.80E-05	5.40E-09
AFV-FAN-FS-EF312	WALL EXH FAN 312 FAILS TO START	3.00E-04	1.80E-05	5.40E-09
SWS-STR-PG-34	PMP 34 DISC STRAINER PLUGGED	1.64E-04	1.58E-05	2.60E-09

J2.1 Risk Increase Importance Basic Events

Sorted by Risk Increase Meas

Event	Description	Probability	Risk Increase Measure	Risk Reduction Measure
EDG-MAI-MA-EDG31	DG31 IN MAINTENANCE	3.02E-02	1.57E-05	4.88E-07
NR-CHGR35	FAILURE TO PROPERLY ALIGN BACKUP CHARGER	1.00E-01	1.46E-05	1.62E-06
SAS-XLF-TE-SASB	SAS TRAIN B IN FUNCTIONAL TEST	3.90E-03	1.44E-05	5.62E-08
AFW-XHE-FO-CITYW	OPER FAILS TO OPEN CITY WATER SUPPLY VLV	2.00E-02	1.35E-05	2.74E-07
HHI-MDP-FR-SI31	PUMP SI 31 FAILS TO CONTINUE TO RUN	6.82E-04	1.15E-05	7.87E-09
HHI-XHE-RE-SI31	FAIL TO RESTOE MDP 31 PATH COMPS AFT MAI	1.38E-03	1.15E-05	1.59E-08
HHI-MAI-MA-MDP31	SAFETY INJECT PUMP 31 IN TEST & MAINTENA	1.73E-03	1.15E-05	2.00E-08
HHI-RCK-NO-SI31	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	1.15E-05	2.89E-08
PR1	ATWS PRESSURE RELIEF	2.70E-01	1.05E-05	3.88E-06
SAS-RCI-FE-SI1OP	SAS RELAY SI1 OPER COIL DOES NOT ENERG	1.30E-04	9.00E-06	1.17E-09
AC4-RCI-FE-U1-2A	UV REL 27-1/2A DOES NOT ENERGIZE	3.12E-03	8.97E-06	2.81E-08
PPR-MOV-OO-RC536	BLK VLV RC-MOV-536 FAILS TO CLOSE	3.00E-03	8.64E-06	2.60E-08
PPR-MOV-OO-RC535	BLK VLV RC-MOV-535 FAILS TO CLOSE	3.00E-03	8.64E-06	2.60E-08
EDG-ENG-FR-DG31R	DG31 FAILS TO RUN	4.66E-03	8.03E-06	3.76E-08

J2.1 Risk Increase Importance Basic Events

Sorted by Risk Increase Meas

Event	Description	Probability	Risk Increase Measure	Risk Reduction Measure
EDG-GEN-HW-EDG32	DG32 GENERATOR FAILURE	2.57E-02	7.80E-06	2.06E-07
HHI-XHE-RE-SI33	FAIL TO RESTOE MDP 33 PATH COMPS AFT MAI	1.01E-03	7.27E-06	7.35E-09
HHI-MAI-MA-MDP33	SAFETY INJECT PUMP 33 IN TEST & MAINTEN	1.09E-03	7.27E-06	7.93E-09
HHI-RCK-NO-SI33	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	7.26E-06	1.82E-08
MRI	FAILURE OF MANUAL ROD INSERTION	2.00E-01	6.76E-06	1.69E-06
HHI-MDP-FR-SI33	PUMP SI 33 FAILS TO CONTINUE TO RUN	6.82E-04	6.08E-06	4.15E-09
AFW-AOV-OO-11581	AOV LCV-1158-1 DOES NOT CLOSE	2.38E-03	5.95E-06	1.42E-08
AFW-AOV-OO-11582	AOV LCV-1158-2 DOES NOT CLOSE	2.38E-03	5.95E-06	1.42E-08
HHI-RCK-NO-856G	SI-MOV-856G CONTROL CIRCUIT NO OUTPUT	2.50E-03	5.78E-06	1.45E-08
HHI-RCK-NO-856E	SI-MOV-856E CONTROL CIRCUIT NO OUTPUT	2.50E-03	5.78E-06	1.45E-08
HHI-RCK-NO-856C	SI-MOV-856C CONTROL CIRCUIT NO OUTPUT	2.50E-03	5.78E-06	1.45E-08
HHI-MOV-CC-856G	SI-MOV-856G DOES NOT OPEN	3.05E-03	5.77E-06	1.77E-08
HHI-CRB-DN-SI31	PM SI 31 CIRCUIT BKR 52/SI1 DOESN'T OPER	4.27E-04	5.48E-06	2.34E-09
EDG-GEN-HW-EDG33	DG33 GENERATOR FAILURE	2.57E-02	4.84E-06	1.28E-07

J2.1 Risk Increase Importance Basic Events

Sorted by Risk Increase Meas

Event	Description	Probability	Risk Increase Measure	Risk Reduction Measure
HHI-RLY-NO-856C	SI-MOV-856C RELAY VX NO OUTPUT	3.00E-04	4.60E-06	1.38E-09
HHI-RLY-NO-856E	SI-MOV-856E RELAY VX NO OUTPUT	3.00E-04	4.60E-06	1.38E-09
HHI-CRB-DN-SI33	PM SI 33 CIRCUIT BKR 52/SI3 DOESN'T OPER	4.27E-04	4.60E-06	1.96E-09
AC4-RCS-OO-U6AX2	UV RELAY 27-6A/X2 CT FAIL TO CLOSE	7.20E-03	4.58E-06	3.32E-08
EDG-MAI-MA-EDG32	DG32 IN MAINTENANCE	2.92E-02	3.79E-06	1.14E-07
B-BATT-NDEP	BATTERY DEPLETION	6.40E-03	3.73E-06	2.40E-08
EDG-ENG-FR-DG32R	DG32 FAILS TO RUN	4.66E-03	3.71E-06	1.74E-08
SWS-MAI-MA-PM33	SWS MOTOR DRIVEN PUMP 33 IN MAINTENANCE	5.66E-02	3.16E-06	1.90E-07
CCW-MAI-MA-PM33	CCMO DRIVEN PUMP 33 IN MAINTENANCE	3.71E-02	3.14E-06	1.21E-07
ORCS-MSLB	OPER FAILS TO INITIATE LONG TERM RCS DEPR	1.00E-01	3.12E-06	3.47E-07
LHI-RCK-NO-731	AC-MOV-731 CONTROL CIRCUIT NO OUTPUT	2.50E-03	3.12E-06	7.81E-09
LHI-RCK-NO-730	AC-MOV-730 CONTROL CIRCUIT NO OUTPUT	2.50E-03	3.12E-06	7.81E-09
RHR-SD	FAILURE OF RHR SYSTEM	6.30E-03	3.10E-06	1.97E-08
RCS-XHE-MC-PT403	RCS PRE XTMER PT-403 MISCALIBRATION	7.98E-03	3.10E-06	2.49E-08

J2.1 Risk Increase Importance Basic Events

Sorted by Risk Increase Meas

Event	Description	Probability	Risk Increase Measure	Risk Reduction Measure
RCS-XHE-MC-PT402	RCS PRE XTMER PT-402 MISCALIBRATION	7.98E-03	3.10E-06	2.49E-08
HHI-MDP-FR-SI32	PUMP SI 32 FAILS TO CONTINUE TO RUN	6.82E-04	2.97E-06	2.03E-09
HHI-XHE-RE-SI32	FAIL TO RESTOE MDP 32 PATH COMPS AFT MAI	1.10E-03	2.97E-06	3.27E-09
HHI-MAI-MA-MDP32	SAFETY INJECT PUMP 32 IN TEST & MAINTENA	1.85E-03	2.97E-06	5.51E-09
HHI-RCK-NO-SI32	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	2.97E-06	7.44E-09
NR-BORON-CORE	RCENTAGE OF BORON PRECIPITATION DURING HL	1.00E-01	2.84E-06	3.15E-07
OHR-S2	OPERATOR FAILS TO INITIATE HIGH HEAD RECI	4.80E-04	2.83E-06	1.36E-09
OHR-S1	OPERATOR FAILS TO INITIATE HIGH HEAD RECI	8.60E-04	2.83E-06	2.44E-09
SWS-CKV-OO-SW1-5	SW PM 35 DIS CKV SWN-1-5 FAIL TO CLOSE	1.00E-03	2.71E-06	2.72E-09
B-1HR	FAILURE TO RESTORE OSP IN 1 HOUR	4.70E-01	2.63E-06	2.34E-06
MS-RUPTURE-OC	IN STEAM LINE PPG RUPTURE FRACTION OUTSIDE	1.50E-01	2.56E-06	4.52E-07
AC4-RCS-OO-U5AX2	UV AUX REL 27-5A/X2 CT FL TO CLOSE	7.20E-03	2.54E-06	1.85E-08
OHR-T1	OPER FAILS TO INIT HIGH HEAD RECIRC -T1	1.30E-02	2.53E-06	3.33E-08
EDG-ENG-FR-DG33R	DG33 FAILS TO RUN	4.66E-03	2.35E-06	1.10E-08

J2.1 Risk Increase Importance Basic Events

Sorted by Risk Increase Meas

Event	Description	Probability	Risk Increase Measure	Risk Reduction Measure
PR2	ATWS PRESSURE RELIEF	4.70E-01	1.96E-06	1.73E-06
CCW-MOV-CC-822B	MOV AC-822B FAIL TO OPEN	6.62E-03	1.82E-06	1.21E-08
EDG-RCK-NO-FOT32	FUEL OIL PMP 32 CNTL CKT NO OUTPT	2.50E-03	1.72E-06	4.31E-09
EDG-RCK-NO-FOT31	FUEL OIL PMP 31 CNTL CKT NO OUTPT	2.50E-03	1.69E-06	4.23E-09
CSS-XHE-RE-PM32	FAIL TO RESTO PM 32 PATH COMPS AFT MAINT	7.17E-03	1.64E-06	1.18E-08
SL-TBF-B	SEAL LOCA DURING TB FLOODING	1.30E-01	1.62E-06	2.42E-07
EDG-MAI-MA-EDG33	DG33 IN MAINTENANCE	2.31E-02	1.62E-06	3.82E-08
CFC-PND-CC-34DPD	FCU 34 DAMPER D FAILS TO OPEN	1.81E-02	1.59E-06	2.94E-08
CFC-PND-CC-32DPD	FCU 32 DAMPER D FAILS TO OPEN	1.81E-02	1.52E-06	2.81E-08
CFC-PND-CC-35DPD	FCU 35 DAMPER D FAILS TO OPEN	1.81E-02	1.52E-06	2.81E-08
CFC-XHE-RE-FCU34	FCU 34 FAILS TO RESTORE AFT T & M	8.69E-04	1.49E-06	1.29E-09
CFC-XHE-RE-FCU32	FCU 32 FAILS TO RESTORE AFT T & M	8.69E-04	1.49E-06	1.29E-09
CFC-XHE-RE-FCU35	FCU 35 FAILS TO RESTORE AFT T & M	8.69E-04	1.49E-06	1.29E-09
CFC-SOV-HW-1297	SOLENOID VALVE 1297 FAILS TO FUNCTION	2.00E-03	1.49E-06	2.98E-09

J2.1 Risk Increase Importance Basic Events

Sorted by Risk Increase Meas

Event	Description	Probability	Risk Increase Measure	Risk Reduction Measure
CFC-SOV-HW-1307	SOLENOID VALVE 1307 FAILS TO FUNCTION	2.00E-03	1.49E-06	2.98E-09
CFC-SOV-HW-1306	SOLENOID VALVE 1306 FAILS TO FUNCTION	2.00E-03	1.49E-06	2.98E-09
CFC-SOV-HW-1304	SOLENOID VALVE 1304 FAILS TO FUNCTION	2.00E-03	1.49E-06	2.98E-09
CFC-SOV-HW-1303	SOLENOID VALVE 1303 FAILS TO FUNCTION	2.00E-03	1.49E-06	2.98E-09
CFC-SOV-HW-1298	SOLENOID VALVE 1298 FAILS TO FUNCTION	2.00E-03	1.49E-06	2.98E-09
CFC-RCK-NO-FCU34	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	1.48E-06	3.72E-09
HHI-MOV-CC-1835B	SI-MOV-1835B DOES NOT OPEN	3.05E-03	1.48E-06	4.54E-09
CFC-RCK-NO-FCU32	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	1.48E-06	3.72E-09
HHI-RCK-NO-1852B	SI-MOV-1852B CONTROL CIRCUIT NO OUTPUT	2.50E-03	1.48E-06	3.72E-09
CFC-MAI-MA-FCU35	FAN COOLING UNIT 35 UNAVIL DUE TO T & M	2.67E-03	1.48E-06	3.97E-09
CFC-MAI-MA-FCU34	FAN COOLING UNIT 34 UNAVIL DUE TO T & M	2.86E-03	1.48E-06	4.26E-09
HHI-RCK-NO-1835B	SI-MOV-1835B CONTROL CIRCUIT NO OUTPUT	2.50E-03	1.48E-06	3.72E-09
HHI-MOV-CC-1852B	SI-MOV-1852B DOES NOT OPEN	3.05E-03	1.48E-06	4.54E-09
CFC-RCK-NO-FCU35	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	1.48E-06	3.72E-09

J2.1 Risk Increase Importance Basic Events

Sorted by Risk Increase Meas

Event	Description	Probability	Risk Increase Measure	Risk Reduction Measure
CFC-MAI-MA-FCU32	FAN COOLING UNIT 32 UNAVA DUE TO T & M	3.96E-03	1.48E-06	5.89E-09
MRI-SUCC	SUCCESS OF MANUAL ROD INSERTION	8.00E-01	1.04E-06	4.14E-06
CSS-RCK-NO-PM32	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	9.95E-07	2.49E-09
CSS-RCK-NO-866B	SI-MOV-866B CONTROL CIRCUIT NO OUTPUT	2.50E-03	9.95E-07	2.49E-09
DOEPR-S1	FAIL TO DEPRESS DURING POST LOCA COOLDN	3.10E-03	7.84E-07	2.44E-09
CCW-MOV-CC-822A	MOV AC-822A FAIL TO OPEN	6.62E-03	7.29E-07	4.86E-09
FB-TAC6A	BLEED AND FEED INITIATION	2.10E-02	6.89E-07	1.48E-08
ODPR-S2	OPERATOR DEPRESSURIZES RCS DURING SMALL B	3.10E-03	4.37E-07	1.36E-09
B1-TBF	TBF SPRAY DAMAGE FAILS 6.9KV SWGR	5.00E-01	2.42E-07	2.42E-07
CFC-MAI-MA-FCU31	FAN COOLING UNIT 31 UNAVA DUE TO T & M	8.13E-03	1.62E-07	1.32E-09
B-25HR	FAILURE TO RESTORE OSP IN 2.5 HOURS	3.00E-01	1.34E-07	5.74E-08
NR-CBV	ONTROL BUILDING VENTILATION NON-RECOVER	1.00E-01	8.92E-08	9.91E-09
B1-TBF-SUCC	TBF SPRAY DAMAGE DOES NOT FAIL 6 .9KV SWGR	5.00E-01	3.67E-08	3.67E-08
ORCS-MSLB-SUCC	SUCCESSFUL LONG TERM DEPRESS DURING MSLB	9.00E-01	1.16E-08	1.05E-07

J2.1 Risk Increase Importance Basic Events

Sorted by Risk Increase Meas

Event	Description	Probability	Risk Increase Measure	Risk Reduction Measure
B-BATT-SUCC	SUCC RESTORATION OF CHARGERS AFTER SBO	1.00E+00	5.23E-17	5.58E-07
OHR-T2-SUCC	SUCCESSFUL INIT HIGH HEAD RECIRC -T2	1.00E+00	4.91E-17	7.75E-08
CCW-PIPE	FLAG-CCW PIPE BREAK	1.00E+00	4.47E-17	6.53E-08
OLR-S2-SUCC	SUCCESSFUL INITIATION LOW HEAD RECIRC -S2	1.00E+00	4.27E-17	1.05E-06
PPR-PHN-CC-RC535	BLK VLV RC-MOV-535 SHUT DUE TO LEAK PORV	1.00E+00	4.01E-17	2.10E-06
SGISO-SUCC	SUCCESSFUL SG ISOLATION DURING SGTR	1.00E+00	3.57E-17	2.62E-07
CCW-PUMP	FLAG- CCW PUMP FAILURE	1.00E+00	3.22E-17	4.96E-07
SL-TBF-A-SUCC	NO SEAL LOCA	1.00E+00	2.29E-17	3.67E-08
ARDG-TBF-SUCC	UCCESSFUL ALIGNMENT OF APP R DG DURING TB	1.00E+00	2.29E-17	3.67E-08
OLR-S1-SUCC	SUCCESSFUL INITIATION LOW HEAD RECIRC -S1	1.00E+00	1.38E-17	7.35E-08
RV-T5	REACTOR VESSEL RUPTURE	1.00E+00	1.34E-17	1.13E-07
ARSW-TBF	FAILURE TO ALIGN APP R SWGR DURING TB FLOOD	1.00E+00	9.60E-18	1.21E-07
ARSW-TBF-SUCC	CCESSFUL ALIGNMENT OF APP R SWGR DURING T	1.00E+00	9.60E-18	1.21E-07
LHR-PHN-PE-DECAY	RECIRCULATION ON DECAY HEAT REMOVAL MOD	1.00E+00	2.06E-18	5.64E-07

J2.1 Risk Increase Importance Basic Events

Sorted by Risk Increase Meas

Event	Description	Probability	Risk Increase Measure	Risk Reduction Measure
ORCS-L-SUCC	SUCCESSFUL LONG TERM RCS DEPRESS	1.00E+00	-8.40E-18	8.38E-07
PPR-PHN-CC-RC536	BLK VLV RC-MOV-536 SHUT DUE TO LEAK PORV	1.00E+00	-9.22E-18	3.44E-07
SL-T2-SUCC	SEAL LOCA SUCCESS T2	1.00E+00	-2.54E-17	5.95E-06
PPR-PHN-CC-DMOTR	PORV DEMAND TO OPEN DURING TRANSIENT	1.00E+00	-3.13E-17	1.16E-06
SWS-BRK-ESS	FLAG - BREAK IN ESSENTIAL SW PIPING	1.00E+00	-4.22E-17	3.24E-06
ODEP-S2-SUCC	SUCCESSFUL DEPRESS DURING S2	1.00E+00	-5.31E-17	3.28E-08
ODEP-TB-SUCC	SUCCESSFUL DEPRESS DURING SBO	1.00E+00	-5.52E-17	9.64E-07

J2.2 Risk Increase Importance Initiating Events

Sorted by Risk Increase Meas

Event	Description	Frequency/yr	Risk Increase Measure	Risk Reduction Measure
IE-TBF	TURBINE BUILDING FLOOD INITIATOR	1.86E-06	1.43E-01	2.79E-07
CCWS-ISLOCA-5	CCW LINE 658 SI CHK VLV ISLOCA	5.64E-06	1.00E-01	5.64E-07
SIS-ISLOCA-858A	ISLOCA OCCURS AT CHK VLV 858A	3.38E-08	1.00E-01	3.38E-09
CCWS-ISLOCA-4	CCW LINE 336 SI CHK VLV ISLOCA	5.64E-06	1.00E-01	5.64E-07
CCWS-ISLOCA-6	CCW LN 149 OPRESS OF NR HX ISLOCA	3.29E-06	1.00E-01	3.29E-07
CCWS-ISLOCA-8	CCW SAMPLE HX ISLOCA	5.23E-06	1.00E-01	5.23E-07
CVCS-ISLOCA-2	CVCS EXCESS LETDOWN LINE ISLOCA	1.02E-06	1.00E-01	1.02E-07
RHR-ISLOCA-6	RHR LINE 337 ISLOCA	3.45E-08	1.00E-01	3.45E-09
RHR-ISLOCA-7	RHR LINE 3042 ISLOCA	3.45E-08	1.00E-01	3.45E-09
RHR-ISLOCA-8	RHR LINE 3043 ISLOCA	3.45E-08	1.00E-01	3.45E-09
SIS-ISLOCA-3	SI LINE 16 ISLOCA	2.26E-07	1.00E-01	2.26E-08
CCWS-ISLOCA-1	CCW LINE 52A RCP THERMAL BARRIER ISLOCA	3.73E-08	1.00E-01	3.73E-09
IE-IACCW	RUPTURE OF IACCW LINE IN THE CONTROL BLDG	2.11E-05	7.03E-02	1.53E-06
IE-4FP	BREAK IN 4-IN FIRE PROT LINE INIT	2.29E-05	7.03E-02	1.66E-06
IE-10FP	BREAK IN 10-IN FIRE PROT LINE INIT	2.62E-05	7.03E-02	1.90E-06

J2.2 Risk Increase Importance Initiating Events

Sorted by Risk Increase Meas

Event	Description	Frequency/yr	Risk Increase Measure	Risk Reduction Measure
IE-4FP-A	BREAK IN 4-IN FIRE PROT LINE INIT	6.88E-06	6.66E-02	4.71E-07
IE-3SW-AC	BREAK IN 3-IN SW AC LINE INIT	2.91E-06	5.99E-02	1.79E-07
IE-3SW	BREAK IN 3-IN SW LINE INIT	5.36E-06	5.99E-02	3.29E-07
IE-A	LARGE BREAK LOCA INITIATOR	4.77E-04	5.77E-03	2.76E-06
IE-TDC32	LOSS OF 125V DC PP 32 INIT	3.00E-03	8.87E-04	2.67E-06
IE-TDC31	LOSS OF 125V DC PP 31 INIT	3.00E-03	6.03E-04	1.82E-06
IE-T4	MAIN STEAM LINE BREAK INSIDE INIT	2.00E-03	5.42E-04	1.09E-06
IE-S2	SMALL BREAK LOCA INITIATOR	9.14E-04	4.61E-04	4.22E-07
IE-S1	INTERMEDIATE BREAK LOCA INITIATOR	9.14E-04	4.56E-04	4.18E-07
IE-T7	STEAM GEN TUBE RUPTURE INITIATOR	5.00E-03	4.22E-04	2.12E-06
IE-CCW	LOSS OF CCW SYSTEM INITIATOR	3.98E-04	3.28E-04	1.31E-07
IE-T5	MAIN STEAM LINE BREAK OUTSIDE VC INIT	2.00E-03	2.82E-04	5.65E-07
IE-SWS	LOSS OF SERVICE WATER SYSTEM INITIATOR	2.10E-03	2.05E-04	4.31E-07
IE-T1	LOSS OF OFFSITE POWER INITIATOR	6.80E-02	4.61E-05	3.36E-06
IE-TAC6A	LOSS OF 480V BUS 6A INITIATOR	3.00E-03	4.91E-06	1.48E-08

J2.2 Risk Increase Importance Initiating Events

Sorted by Risk Increase Meas

Event	Description	Frequency/yr	Risk Increase Measure	Risk Reduction Measure
IE-T3	TURBINE TRIP W/ FW AVAIL INITIATOR	3.60E+00	4.64E-06	6.42E-06
IE-T2	LOSS OF MAIN FW INITIATOR	1.11E+00	8.29E-07	8.37E-06

J3.1 Risk Reduction Importance Basic Events

Sorted by Risk Reduction Meas.

Event	Description	Probability	Risk Reduction Measure	Risk Increase Measure
AFV-MOD-CC-IL314	AFW ROOM INLET LOUVER L-314 FAILS TO OPN	3.00E-03	6.20E-06	2.06E-03
NR-AFBV	NON-RECOVERY OF AUX FW BLDG VENTILATION	1.00E-02	6.03E-06	5.97E-04
C	REACTOR PROTECTION SYSTEM FAILURE	1.62E-05	5.97E-06	3.36E-01
SL-T2-SUCC	SEAL LOCA SUCCESS T2	1.00E+00	5.95E-06	-2.54E-17
DC1-MAI-MA-BCC31	BATT CHGR 31 IN MAINTENANCE	9.64E-03	4.67E-06	4.80E-04
MRI-SUCC	SUCCESS OF MANUAL ROD INSERTION	8.00E-01	4.14E-06	1.04E-06
FB-T2	BLEED AND FEED INITIATION	2.10E-02	3.93E-06	1.83E-04
PR1	ATWS PRESSURE RELIEF	2.70E-01	3.88E-06	1.05E-05
AFW-TDP-FR-TDP32	AFW TDP 32 FAILS TO CONTINUE TO RUN	9.43E-03	3.48E-06	3.66E-04
SWS-BRK-ESS	FLAG - BREAK IN ESSENTIAL SW PIPING	1.00E+00	3.24E-06	-4.22E-17
AC4-RCI-FE-U1-6A	UV REL 27-1/6A DOES NOT ENERGIZE	3.12E-03	2.67E-06	8.51E-04
B-1HR	FAILURE TO RESTORE OSP IN 1 HOUR	4.70E-01	2.34E-06	2.63E-06
VISO	OPERATOR FAILS TO ISOLATE DURING ISLOCA	1.00E-01	2.12E-06	1.91E-05
PPR-PHN-CC-RC535	BLK VLV RC-MOV-535 SHUT DUE TO LEAK PORV	1.00E+00	2.10E-06	4.01E-17
OLR-A	OPERATOR FAILS TO INITIATE LOW HEAD RECIRC -A	4.40E-03	2.10E-06	4.75E-04

J3.1 Risk Reduction Importance Basic Events

Sorted by Risk Reduction Meas.

Event	Description	Probability	Risk Reduction Measure	Risk Increase Measure
APP-R-CBF	FAILURE TO ALIGN APP R SWGR DURING CB FLOOD	2.30E-02	1.96E-06	8.34E-05
AFW-XHE-RE-AFW31	FAIL TO RESTORE PM 31 PATH COMPS AFT MAI	4.75E-03	1.76E-06	3.68E-04
AFW-XHE-RE-AFW32	FAIL TO RESTORE PM 32 PATH COMPS AFT MAI	5.02E-03	1.74E-06	3.45E-04
PR2	ATWS PRESSURE RELIEF	4.70E-01	1.73E-06	1.96E-06
MRI	FAILURE OF MANUAL ROD INSERTION	2.00E-01	1.69E-06	6.76E-06
NR-CHGR35	FAILURE TO PROPERLY ALIGN BACKUP CHARGER	1.00E-01	1.62E-06	1.46E-05
AFW-MAI-MA-TDP32	AFW TURBINE-DRIVEN PUMP 32 IN TEST & MAI	5.33E-03	1.60E-06	2.99E-04
AFW-MAI-MA-PM31	AFW MOTOR-DRIVEN PUMP 31 IN TEST & MAINT	5.14E-03	1.58E-06	3.05E-04
AFW-TDP-FS-TDP32	AFW TDP 32 FAILS TO START ON DEMAND	4.34E-03	1.50E-06	3.43E-04
AC4-RCK-NO-BCH37	FAULTS AT MCC37 TO BATT CHGR 32	2.50E-03	1.35E-06	5.37E-04
PPR-PHN-CC-DMOTR	PORV DEMAND TO OPEN DURING TRANSIENT	1.00E+00	1.16E-06	-3.13E-17
OHR-T2	OPER FAILS TO INIT HIGH HEAD RECIRC -T2	1.30E-02	1.12E-06	8.49E-05
DC1-MAI-MA-BCC32	BATT CHGR 32 IN MAINTENANCE	3.00E-03	1.12E-06	3.71E-04
AC4-RCI-FE-U1-5A	UV REL 27-1/5A DOES NOT ENERGIZE	3.12E-03	1.09E-06	3.47E-04
RV-T4	REACTOR VESSEL RUPTURE	9.20E-03	1.09E-06	1.17E-04

J3.1 Risk Reduction Importance Basic Events

Sorted by Risk Reduction Meas.

Event	Description	Probability	Risk Reduction Measure	Risk Increase Measure
SWS-MAI-MA-PM36	SWS MOTOR DRIVEN PUMP 36 IN MAINTENANCE	1.82E-02	1.06E-06	5.70E-05
OLR-S2-SUCC	SUCCESSFUL INITIATION LOW HEAD RECIRC -S2	1.00E+00	1.05E-06	4.27E-17
AFW-CCF-FS-AFWPM	CCF OF AFW MOTOR DRIVEN PUMPS	1.15E-04	9.81E-07	8.50E-03
ODEP-TB-SUCC	SUCCESSFUL DEPRESS DURING SBO	1.00E+00	9.64E-07	-5.52E-17
PPR-PRV-CC-456	PORV RC-PCV-456 DOES NOT OPEN	4.27E-03	9.63E-07	2.24E-04
ORCS-L	OPER FAILS TO INITIATE LONG TERM RCS DEPR	5.20E-03	9.59E-07	1.84E-04
AFW-RCK-NO-PM31	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	8.66E-07	3.45E-04
PPR-PRV-CC-455C	PORV RC-PCV-455C DOES NOT OPEN	4.27E-03	8.46E-07	1.97E-04
ORCS-L-SUCC	SUCCESSFUL LONG TERM RCS DEPRESS	1.00E+00	8.38E-07	-8.40E-18
SGISO-SGOVRFILL	SG OVERFILL AFTER ISOLATION	7.90E-03	8.13E-07	1.02E-04
AFW-RCK-NO-TDP32	AFW TDP 32 CONTROL CIRCUIT FAILURE	2.50E-03	8.07E-07	3.22E-04
DC1-BDC-ST-PP-32	PANEL FAULTS AT DC PWR PNL 32	4.39E-06	7.56E-07	1.59E-01
AC4-RCK-NO-BCH39	FAULTS AT MCC39 TO BATT CHGR 31	2.50E-03	7.25E-07	2.89E-04
AFW-XHE-FO-HC405	OPERATOR FAILS TO OPERATE HC-405A,B,C&D	2.10E-03	6.70E-07	3.18E-04
AC4-RCK-NO-BC36C	FAULTS AT MCC36C TO BATT CHGR 33	2.50E-03	6.64E-07	2.65E-04

J3.1 Risk Reduction Importance Basic Events

Sorted by Risk Reduction Meas.

Event	Description	Probability	Risk Reduction Measure	Risk Increase Measure
PPR-AOV-OO-455C	PORV RC-PCV-455C FAILS TO CLOSE	2.00E-03	6.12E-07	3.05E-04
LHR-PHN-PE-DECAY	RECIRCULATION ON DECAY HEAT REMOVAL MODE	1.00E+00	5.64E-07	2.06E-18
B-BATT-SUCC	SUCC RESTORATION OF CHARGERS AFTER SBO	1.00E+00	5.58E-07	5.23E-17
SL-DEP	SEAL LOCA OCCURS AFTER DEPRESSURIZATION	7.10E-03	5.58E-07	7.80E-05
PPR-AOV-OO-456	PORV RC-PCV-456 FAILS TO CLOSE	2.00E-03	5.49E-07	2.74E-04
SL-CBF	SEAL LOCA DURING CONTROL BUILDING FLOOD	7.10E-03	5.47E-07	7.65E-05
AFW-XHE-RE-AFW33	FAIL TO RESTORE PM 33 PATH COMPS AFT MAI	4.75E-03	5.41E-07	1.13E-04
EDG-GEN-HW-EDG31	DG31 GENERATOR FAILURE	2.57E-02	5.12E-07	1.94E-05
SWS-XHE-RE-SWN29	SWN-29/SWN-30 SWAPPED DURING HDR ALIGNMT	2.56E-04	5.01E-07	1.95E-03
CCW-PUMP	FLAG- CCW PUMP FAILURE	1.00E+00	4.96E-07	3.22E-17
EDG-MAI-MA-EDG31	DG31 IN MAINTENANCE	3.02E-02	4.88E-07	1.57E-05
MS-RUPTURE-OC	AIN STEAM LINE PPG RUPTURE FRACTION OUTSIDE	1.50E-01	4.52E-07	2.56E-06
FB-TSWS	BLEED AND FEED INITIATION	1.20E-02	4.47E-07	3.68E-05
AFW-MDP-FS-PM31	AFW PUMP 31 FAILS TO START ON DEMAND	1.36E-03	4.40E-07	3.23E-04
B-BATT-DEP	BATTERY DEPLETION	5.70E-03	4.06E-07	7.08E-05

J3.1 Risk Reduction Importance Basic Events

Sorted by Risk Reduction Meas.

Event	Description	Probability	Risk Reduction Measure	Risk Increase Measure
AC4-RCI-FE-U1-3A	UV REL 27-1/3A DOES NOT ENERGIZE	3.12E-03	4.03E-07	1.29E-04
TSGTR-1	SGTR INDUCED BY MS LINE BREAK	1.00E-02	3.90E-07	3.87E-05
OLR-S2	OPERATOR FAILS TO INITIATE LOW HEAD RECIRC -S2	3.00E-04	3.51E-07	1.17E-03
ORCS-MSLB	OPER FAILS TO INITIATE LONG TERM RCS DEPR	1.00E-01	3.47E-07	3.12E-06
PPR-PHN-CC-RC536	BLK VLV RC-MOV-536 SHUT DUE TO LEAK PORV	1.00E+00	3.44E-07	-9.22E-18
ORCS-L-SGISOSUCC	FAILURE TO DEPRESSURIZE EARLY/LATE COUPLE	6.50E-05	3.25E-07	5.00E-03
NR-BORON-CORE	ERCENTAGE OF BORON PRECIPITATION DURING HL	1.00E-01	3.15E-07	2.84E-06
DC1-MAI-MA-BCC33	BATT CHGR 33 IN MAINTENANCE	1.74E-03	2.88E-07	1.65E-04
AFW-XHE-FO-CITYW	OPER FAILS TO OPEN CITY WATER SUPPLY VLV	2.00E-02	2.74E-07	1.35E-05
OLR-S1	OPERATOR FAILS TO INITIATE LOW HEAD RECIRC -S1	3.00E-04	2.74E-07	9.14E-04
SGISO-SUCC	SUCCESSFUL SG ISOLATION DURING SGTR	1.00E+00	2.62E-07	3.57E-17
SL-TBF-B	SEAL LOCA DURING TB FLOODING	1.30E-01	2.42E-07	1.62E-06
B1-TBF	TBF SPRAY DAMAGE FAILS 6.9KV SWGR	5.00E-01	2.42E-07	2.42E-07
AFW-AOV-CC-P1139	STEAM CNTRL VLV PCV-1139 DOES NOT OPEN	1.12E-03	2.35E-07	2.10E-04
AFW-RCK-NO-PM33	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	2.22E-07	8.87E-05

J3.1 Risk Reduction Importance Basic Events

Sorted by Risk Reduction Meas.

Event	Description	Probability	Risk Reduction Measure	Risk Increase Measure
SWS-CCF-CC-EDGS	CCF OF EDG FLOW CONTROL VALVES	1.10E-04	2.14E-07	1.94E-03
AFW-MAI-MA-PM33	AFW MOTOR-DRIVEN PUMP 33 IN TEST & MAINT	3.22E-03	2.08E-07	6.43E-05
EDG-GEN-HW-EDG32	DG32 GENERATOR FAILURE	2.57E-02	2.06E-07	7.80E-06
SL-T3	RANDOM FAILURE SEAL LOCA	3.65E-05	1.97E-07	5.39E-03
SWS-MAI-MA-PM33	SWS MOTOR DRIVEN PUMP 33 IN MAINTENANCE	5.66E-02	1.90E-07	3.16E-06
PPR-RCK-NO-RC536	BLK VLV RC-MOV-536 CONTROL CKT NO OUTPUT	2.50E-03	1.76E-07	7.01E-05
AC6-RLY-NO-85-L1	PIL WIRE REL 85L1/138 DOES NOT OPER	3.00E-04	1.50E-07	4.99E-04
AC6-RLY-NO-85-L2	PIL WIRE REL 85L2/138 DOES NOT OPER	3.00E-04	1.50E-07	4.99E-04
AC6-RLY-NO-86STP	LO RELAY 86/STP DOES NOT OPERATE	3.00E-04	1.50E-07	4.99E-04
AC6-RLY-NO-LSTBU	LO RELAY 86/STBU FAILS TO OPERATE	3.00E-04	1.50E-07	4.99E-04
CCW-RCK-NO-625	FCV 625 CONTROL CIRCUIT NO OUTPUT	2.50E-03	1.49E-07	5.94E-05
SWS-FCV-OO-1112	NON-ESSEN ISO VLV FAILS TO CLOSE	2.00E-03	1.40E-07	6.98E-05
AFW-XVM-PG-CT-64	ISOLATION VALVE CT-64 FAIL CLS (PLUGGED)	3.40E-05	1.30E-07	3.82E-03
AFW-XVM-PG-CT-6	STOP VALVE CT-6 FAIL CLOSED (PLUGGED)	3.40E-05	1.30E-07	3.82E-03
LHR-RCK-NO-PM31	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	1.30E-07	5.17E-05

J3.1 Risk Reduction Importance Basic Events

Sorted by Risk Reduction Meas.

Event	Description	Probability	Risk Reduction Measure	Risk Increase Measure
EDG-GEN-HW-EDG33	DG33 GENERATOR FAILURE	2.57E-02	1.28E-07	4.84E-06
SAS-XLF-TE-SASA	SAS TRAIN A IN FUNCTIONAL TEST	3.47E-03	1.27E-07	3.65E-05
SWS-MDP-RS-PM35	SW PUMP 35 FAILS TO RESTART	1.50E-03	1.25E-07	8.30E-05
AFW-CRB-DN-52AF1	MDP 31 CIRCUIT BRKER 52/AF1 DOESN'T OPER	4.27E-04	1.25E-07	2.92E-04
IAS-RCK-NO-NHDYR	HEATLESS DRYER CONTROL CIRCUIT NO OUTPUT	2.50E-03	1.23E-07	4.89E-05
AFW-MDP-FR-PM31	AFW PUMP 31 FAILS TO CONTINUE TO RUN	4.20E-04	1.23E-07	2.92E-04
CVC-XHE-FO-BORAT	OPER FAIL TO INITIA EMERGENCY BORATION	2.10E-03	1.23E-07	5.82E-05
CCW-MAI-MA-PM33	CCMO DRIVEN PUMP 33 IN MAINTENANCE	3.71E-02	1.21E-07	3.14E-06
ARSW-TBF	FAILURE TO ALIGN APP R SWGR DURING TB FLOOD	1.00E+00	1.21E-07	9.60E-18
ARSW-TBF-SUCC	UCCESSFUL ALIGNMENT OF APP R SWGR DURING TB	1.00E+00	1.21E-07	9.60E-18
MSS-CCF-OO-MSIV	COMMON CAUSE FAILURE OF 2 OR MORE MSIVS	5.65E-05	1.19E-07	2.10E-03
SWS-RCK-NO-PM36	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	1.18E-07	4.71E-05
SWS-STR-PG-36	PMP 36 DISC STRAINER PLUGGED	2.47E-03	1.17E-07	4.71E-05
SWS-CCF-FR-ESSPM	CCF OF 2 RUNNING SWS MOTOR DRIVEN PUMPS	5.90E-05	1.14E-07	1.94E-03
EDG-MAI-MA-EDG32	DG32 IN MAINTENANCE	2.92E-02	1.14E-07	3.79E-06

J3.1 Risk Reduction Importance Basic Events

Sorted by Risk Reduction Meas.

Event	Description	Probability	Risk Reduction Measure	Risk Increase Measure
RV-T5	REACTOR VESSEL RUPTURE	1.00E+00	1.13E-07	1.34E-17
PPR-RCK-NO-RC535	BLK VLV RC-MOV-535 CONTROL CKT NO OUTPUT	2.50E-03	1.07E-07	4.27E-05
AFW-AOV-OO-406D	AFW-FCV-406D FAIL TO CLOSE ON DEMAND	2.38E-03	1.06E-07	4.43E-05
AFW-AOV-OO-406B	AFW-FCV-406B FAIL TO CLOSE ON DEMAND	2.38E-03	1.06E-07	4.43E-05
AFW-AOV-OO-406C	AFW-FCV-406C FAIL TO CLOSE ON DEMAND	2.38E-03	1.06E-07	4.43E-05
AFW-AOV-OO-406A	AFW-FCV-406A FAIL TO CLOSE ON DEMAND	2.38E-03	1.06E-07	4.43E-05
ORCS-MSLB-SUCC	SUCCESSFUL LONG TERM DEPRESS DURING MSLB	9.00E-01	1.05E-07	1.16E-08
PPR-CCF-CC-PORVS	COMMON CAUSE FAILURE OF PORVs TO OPEN	4.70E-04	1.04E-07	2.21E-04
LHR-RCK-NO-1802A	SI-MOV-1802A CONTROL CIRCUIT NO OUTPUT	2.50E-03	9.27E-08	3.70E-05
LHR-RCK-NO-1802B	SI-MOV-1802B CONTROL CIRCUIT NO OUTPUT	2.50E-03	9.27E-08	3.70E-05
EDG-CCF-HW-3EDGS	COMMON CAUSE FAILURE OF ALL THREE EDG'S	4.70E-05	9.10E-08	1.94E-03
AFW-MDP-FS-PM33	AFW PUMP 33 FAILS TO START ON DEMAND	1.36E-03	9.06E-08	6.65E-05
LHR-RCK-NO-PM32	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	8.77E-08	3.50E-05
AFW-RLY-NO-312-1	AFW PM 31 RLY 2-1/TDC NO OUTPUT	3.00E-04	8.41E-08	2.80E-04
AFV-MOD-CC-ED311	WALL EXH FAN 311 DAMPER FLS TO OPEN	3.00E-03	8.36E-08	2.78E-05

J3.1 Risk Reduction Importance Basic Events

Sorted by Risk Reduction Meas.

Event	Description	Probability	Risk Reduction Measure	Risk Increase Measure
OHR-T2-SUCC	SUCCESSFUL INIT HIGH HEAD RECIRC -T2	1.00E+00	7.75E-08	4.91E-17
SWS-MDP-RS-PM34	SW PUMP 34 FAILS TO RESTART	1.50E-03	7.52E-08	5.01E-05
OLR-S1-SUCC	SUCCESSFUL INITIATION LOW HEAD RECIRC -S1	1.00E+00	7.35E-08	1.38E-17
AFV-MOD-CC-ED312	WALL EXH FAN 312 DAMPER FLS TO OPEN	3.00E-03	7.07E-08	2.35E-05
SWS-MDP-FS-PMP36	SWP 36 FAILS TO START ON DEMAND	1.58E-03	6.60E-08	4.17E-05
CCW-PIPE	FLAG-CCW PIPE BREAK	1.00E+00	6.53E-08	4.47E-17
AC4-CRB-OO-2AT3A	480V CKT BRKR 2AT3A FAILS TO CLOSE	4.27E-04	6.47E-08	1.51E-04
AC6-RCI-FE-U6-62	UV RELAY 27-6/62 DOES NOT ENERGIZE	1.30E-04	6.31E-08	4.85E-04
TSGTR-2	MULTIPLE SGTR INDUCED BY MS LINE BREAK	1.57E-03	6.13E-08	3.90E-05
SWS-XVM-OC-29	EDG SW COMMON SUPPLY HDR ISO VLV XFER CL	3.16E-05	6.02E-08	1.90E-03
SWS-XVM-OC-55	EDG COMMON DISCHARGE METER VLV XFER CLOS	3.16E-05	6.02E-08	1.90E-03
B-25HR	FAILURE TO RESTORE OSP IN 2.5 HOURS	3.00E-01	5.74E-08	1.34E-07
CCW-CKV-OO-761B	CHECK VLV AC-761B STUCK OPEN	1.00E-03	5.67E-08	5.67E-05
CCW-FCV-CC-625	FCV-625 FAIL TO OPEN	1.00E-03	5.67E-08	5.67E-05
SWS-CKV-OO-SW1-2	SW PM 32 DIS CKV SWN-1-2 FAIL TO CLOSE	1.00E-03	5.67E-08	5.67E-05

J3.1 Risk Reduction Importance Basic Events

Sorted by Risk Reduction Meas.

Event	Description	Probability	Risk Reduction Measure	Risk Increase Measure
SAS-XLF-TE-SASB	SAS TRAIN B IN FUNCTIONAL TEST	3.90E-03	5.62E-08	1.44E-05
AC4-XHE-RE-MCC6C	FAILURE TO RESTORE MCC36C AFTER MAINT	2.13E-04	5.13E-08	2.41E-04
MSS-ADV-OO-1135	SG 32 MS-PCV-1135 FAIL TO CLOSE	1.95E-03	5.07E-08	2.60E-05
MSS-ADV-OO-1136	SG 33 MS-PCV-1136 FAIL TO CLOSE	1.95E-03	5.07E-08	2.60E-05
MSS-ADV-OO-1134	SG 31 MS-PCV-1134 FAIL TO CLOSE	1.95E-03	5.07E-08	2.60E-05
MSS-ADV-OO-1137	SG 34 MS-PCV-1137 FAIL TO CLOSE	1.95E-03	5.07E-08	2.60E-05
IAS-AOV-CC-632	DYR INLET VLV ASSMBLY FAILS TO OPERATE	1.00E-03	4.90E-08	4.90E-05
IAS-AOV-CC-633	DYR OUTLET DIVERTER VLV FAILS TO OPERATE	1.00E-03	4.90E-08	4.90E-05
CDS-AOV-OO-518	AOV 518 FAIL TO CLOSE ON DEMAND	2.00E-03	4.39E-08	2.19E-05
AFW-RLY-NO-BFPL	AFW PM 32 RLY BFPL NO OUTPUT	3.00E-04	4.36E-08	1.45E-04
AC4-RCS-OO-U3AX2	UV AUX REL 27-3A/X2 CONT FAIL TO CL	3.00E-04	4.27E-08	1.42E-04
AC4-CRB-CC-2AT5A	480V BRKR 52/2AT5A FAILS TO TRIP	4.27E-04	4.12E-08	9.63E-05
SWS-MDP-FR-PM35	SWN PUMP 35 FAILS TO CONTINUE TO RUN	5.90E-04	4.11E-08	6.96E-05
AC4-XHE-RE-MCC6A	FAILURE TO RESTORE MCC36A AFTER MAINT	2.13E-04	4.08E-08	1.92E-04
EDG-MAI-MA-EDG33	DG33 IN MAINTENANCE	2.31E-02	3.82E-08	1.62E-06

J3.1 Risk Reduction Importance Basic Events

Sorted by Risk Reduction Meas.

Event	Description	Probability	Risk Reduction Measure	Risk Increase Measure
EDG-ENG-FR-DG31R	DG31 FAILS TO RUN	4.66E-03	3.76E-08	8.03E-06
GAC4-EDG	RANDOM FAILURE OF EDG LEADING TO SBO	2.03E-03	3.69E-08	1.81E-05
SL-TBF-A-SUCC	NO SEAL LOCA	1.00E+00	3.67E-08	2.29E-17
ARDG-TBF-SUCC	SUCCESSFUL ALIGNMENT OF APP R DG DURING TBF	1.00E+00	3.67E-08	2.29E-17
B1-TBF-SUCC	TBF SPRAY DAMAGE DOES NOT FAIL 6 .9KV SWGR	5.00E-01	3.67E-08	3.67E-08
SWS-CKV-OO-SW1-4	SW PM 34 DIS CKV SWN-1-4 FAIL TO CLOSE	1.00E-03	3.50E-08	3.50E-05
OHR-T1	OPER FAILS TO INIT HIGH HEAD RECIRC -T1	1.30E-02	3.33E-08	2.53E-06
AC4-RCS-OO-U6AX2	UV RELAY 27-6A/X2 CT FAIL TO CLOSE	7.20E-03	3.32E-08	4.58E-06
ODEP-S2-SUCC	SUCCESSFUL DEPRESS DURING S2	1.00E+00	3.28E-08	-5.31E-17
CFC-PND-CC-34DPD	FCU 34 DAMPER D FAILS TO OPEN	1.81E-02	2.94E-08	1.59E-06
HHI-RCK-NO-SI31	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	2.89E-08	1.15E-05
PPR-MOV-CC-RC536	BLOCK VALVE RC-MOV-536 DOES NOT OPEN	5.00E-04	2.88E-08	5.75E-05
SWS-MDP-FR-PM31	SWN PUMP 31 FAILS TO CONTINUE TO RUN	5.90E-04	2.82E-08	4.77E-05
AC4-RCI-FE-U1-2A	UV REL 27-1/2A DOES NOT ENERGIZE	3.12E-03	2.81E-08	8.97E-06
CFC-PND-CC-35DPD	FCU 35 DAMPER D FAILS TO OPEN	1.81E-02	2.81E-08	1.52E-06

J3.1 Risk Reduction Importance Basic Events

Sorted by Risk Reduction Meas.

Event	Description	Probability	Risk Reduction Measure	Risk Increase Measure
CFC-PND-CC-32DPD	FCU 32 DAMPER D FAILS TO OPEN	1.81E-02	2.81E-08	1.52E-06
AC4-CCF-HW-480VS	COMMON CAUSE FAILURE OF 480V SWGR 31&32	1.06E-06	2.71E-08	2.56E-02
CCW-MDP-FR-PM31	CCW PUMP 31 FAILS TO CONTINUE TO RUN	5.66E-04	2.70E-08	4.77E-05
PPR-MOV-OO-RC535	BLK VLV RC-MOV-535 FAILS TO CLOSE	3.00E-03	2.60E-08	8.64E-06
PPR-MOV-OO-RC536	BLK VLV RC-MOV-536 FAILS TO CLOSE	3.00E-03	2.60E-08	8.64E-06
LHR-MDP-FR-PM31	RECIR PUMP 31 FAILS TO CONTINUE TO RUN	7.20E-04	2.53E-08	3.51E-05
LHR-MDP-FR-PM32	RECIC PUMP 32 FAILS TO CONTINUE TO RUN	7.20E-04	2.53E-08	3.51E-05
RCS-XHE-MC-PT402	RCS PRE XTMER PT-402 MISCALIBRATION	7.98E-03	2.49E-08	3.10E-06
RCS-XHE-MC-PT403	RCS PRE XTMER PT-403 MISCALIBRATION	7.98E-03	2.49E-08	3.10E-06
MSS-MSV-OO-MS133	MSIV MS1-33 FAILS TO CLOSE ON DEMAND	9.42E-04	2.45E-08	2.60E-05
MSS-MSV-OO-MS131	MSIV MS1-31 FAILS TO CLOSE ON DEMAND	9.42E-04	2.45E-08	2.60E-05
MSS-MSV-OO-MS132	MSIV MS1-32 FAILS TO CLOSE ON DEMAND	9.42E-04	2.45E-08	2.60E-05
MSS-MSV-OO-MS134	MSIV MS1-34 FAILS TO CLOSE ON DEMAND	9.42E-04	2.45E-08	2.60E-05
B-BATT-NDEP	BATTERY DEPLETION	6.40E-03	2.40E-08	3.73E-06
AC4-XHE-RE-MCC6B	FAILURE TO RESTORE MCC36B AFTER MAINT	2.13E-04	2.39E-08	1.12E-04

J3.1 Risk Reduction Importance Basic Events

Sorted by Risk Reduction Meas.

Event	Description	Probability	Risk Reduction Measure	Risk Increase Measure
SWS-MDP-FR-PM36	SWN PUMP 36 FAILS TO CONTINUE TO RUN	5.90E-04	2.35E-08	3.98E-05
AFW-CRB-DN-52AF3	MDP 33 CIRCUIT BRKR 52/AF3 DOESN'T OPERA	4.27E-04	2.30E-08	5.39E-05
DC1-BAT-HW-BAT31	FAILURE OF BATTERY 31	2.19E-05	2.27E-08	1.04E-03
AFW-SKV-OO-MS-42	ABFPT SUPPLY VLV MS-42 FAIL TO CLOSE	8.74E-04	2.27E-08	2.60E-05
AFW-SKV-OO-MS-41	ABFPT SUPPLY VLV MS-41 FAIL TO CLOSE	8.74E-04	2.27E-08	2.60E-05
AFW-MDP-FR-PM33	AFW PUMP 33 FAILS TO CONTINUE TO RUN	4.20E-04	2.27E-08	5.39E-05
LHR-XHE-RE-PM32	FAIL TO RESTO PM 32 PATH COMPS AFT MAINT	6.21E-04	2.18E-08	3.51E-05
LHR-XHE-RE-PM31	FAIL TO RESTO PM 31 PATH COMPS AFT MAINT	6.21E-04	2.18E-08	3.51E-05
SGB-CCF-OO-SGBIV	COMMON CAUSE FAILURE OF 2 SG BWDN VALVES	2.09E-04	2.17E-08	1.04E-04
HHI-MAI-MA-MDP31	SAFETY INJECT PUMP 31 IN TEST & MAINTENA	1.73E-03	2.00E-08	1.15E-05
RHR-SD	FAILURE OF RHR SYSTEM	6.30E-03	1.97E-08	3.10E-06
AC4-RCS-OO-U5AX2	UV AUX REL 27-5A/X2 CT FL TO CLOSE	7.20E-03	1.85E-08	2.54E-06
HHI-RCK-NO-SI33	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	1.82E-08	7.26E-06
HHI-MOV-CC-856G	SI-MOV-856G DOES NOT OPEN	3.05E-03	1.77E-08	5.77E-06
SWS-MDP-FR-PM34	SWN PUMP 34 FAILS TO CONTINUE TO RUN	5.90E-04	1.76E-08	2.99E-05

J3.1 Risk Reduction Importance Basic Events

Sorted by Risk Reduction Meas.

Event	Description	Probability	Risk Reduction Measure	Risk Increase Measure
EDG-ENG-FR-DG32R	DG32 FAILS TO RUN	4.66E-03	1.74E-08	3.71E-06
SWS-CRB-DN-52SW6	SW PUMP 36 BKR 52/SW6 DOES NOT OPERATE	4.27E-04	1.70E-08	3.98E-05
LHR-MDP-FS-PM31	RECIR PUMP 31 FAILS TO START ON DEMAND	4.77E-04	1.67E-08	3.51E-05
LHR-MOV-CC-1802B	SI-MOV-1802B DOES NOT OPEN ON DEMAND	4.77E-04	1.67E-08	3.51E-05
LHR-MDP-FS-PM32	RECIR PUMP 32 FAILS TO START ON DEMAND	4.77E-04	1.67E-08	3.51E-05
LHR-MOV-CC-1802A	SI-MOV-1802A DOES NOT OPEN ON DEMAND	4.77E-04	1.67E-08	3.51E-05
AFW-CKV-CC-BFD34	PM 31 DISC CHECK VLV BFD-34 FAIL TO OPEN	8.54E-05	1.63E-08	1.91E-04
AFW-RLY-NO-332-1	AFW PM 33 RLY 2-1/TDC NO OUTPUT	3.00E-04	1.62E-08	5.40E-05
HHI-XHE-RE-SI31	FAIL TO RESTOE MDP 31 PATH COMPS AFT MAI	1.38E-03	1.59E-08	1.15E-05
AC6-RCI-FE-U5-62	UV RELAY 27-5/62 DOES NOT ENERGIZE	1.30E-04	1.57E-08	1.21E-04
SWS-XHE-RE-PMP36	FAIL TO RESTORE PMP 36 AFTER MAINTENANCE	4.97E-04	1.53E-08	3.08E-05
PPR-MOV-CC-RC535	BLOCK VALVE RC-MOV-535 DOES NOT OPEN	5.00E-04	1.50E-08	3.00E-05
LHR-CRB-DN-PM31	RECIC PM 31 CIRC BKR 52/R1 DOESN'T OPER	4.27E-04	1.50E-08	3.51E-05
LHR-CRB-DN-PM32	RECIR PM 32 CIRC BKR 52/R2 DOESN'T OPER	4.27E-04	1.50E-08	3.51E-05
FB-TAC6A	BLEED AND FEED INITIATION	2.10E-02	1.48E-08	6.89E-07

J3.1 Risk Reduction Importance Basic Events

Sorted by Risk Reduction Meas.

Event	Description	Probability	Risk Reduction Measure	Risk Increase Measure
AFW-MAI-MA-31VLV	PM 31 PATH VALVE IN TEST & MAINTENANCE	9.19E-05	1.45E-08	1.58E-04
HHI-RCK-NO-856E	SI-MOV-856E CONTROL CIRCUIT NO OUTPUT	2.50E-03	1.45E-08	5.78E-06
HHI-RCK-NO-856C	SI-MOV-856C CONTROL CIRCUIT NO OUTPUT	2.50E-03	1.45E-08	5.78E-06
HHI-RCK-NO-856G	SI-MOV-856G CONTROL CIRCUIT NO OUTPUT	2.50E-03	1.45E-08	5.78E-06
AC4-XHE-RE-MCC39	FAILURE TO RESTORE MCC39 AFTER MAINT	2.13E-04	1.45E-08	6.78E-05
AC1-BAC-ST-LB33	FAULT ON LIGHTING BUS 33	1.15E-05	1.44E-08	1.25E-03
AC1-BAC-ST-LP324	FAULTS IN LIGHTING PANEL 324	1.15E-05	1.44E-08	1.25E-03
AFW-AOV-OO-11581	AOV LCV-1158-1 DOES NOT CLOSE	2.38E-03	1.42E-08	5.95E-06
AFW-AOV-OO-11582	AOV LCV-1158-2 DOES NOT CLOSE	2.38E-03	1.42E-08	5.95E-06
LHR-CCF-FS-PUMPS	COMMON CAUSE FAILURE OF LO HEAD REC PUMP	2.31E-04	1.36E-08	5.88E-05
AFV-FAN-FR-EF312	WALL EXH FAN 312 FAILS TO CONT TO RUN	7.20E-04	1.30E-08	1.80E-05
CCW-MOV-CC-822B	MOV AC-822B FAIL TO OPEN	6.62E-03	1.21E-08	1.82E-06
LHR-CCF-CC-LPRVL	COMMON CAUSE FAIL OF VLV SI-MOV-1802A&B	2.03E-04	1.19E-08	5.88E-05
CSS-XHE-RE-PM32	FAIL TO RESTO PM 32 PATH COMPS AFT MAINT	7.17E-03	1.18E-08	1.64E-06
EDG-ENG-FR-DG33R	DG33 FAILS TO RUN	4.66E-03	1.10E-08	2.35E-06

J3.1 Risk Reduction Importance Basic Events

Sorted by Risk Reduction Meas.

Event	Description	Probability	Risk Reduction Measure	Risk Increase Measure
AFW-MAI-MA-32VLV	TDP 32 PATH VALVE IN TEST & MAINTENANCE	1.61E-04	1.07E-08	6.63E-05
NR-CBV	CONTROL BUILDING VENTILATION NON-RECOVERY	1.00E-01	9.91E-09	8.92E-08
SWS-STR-PG-35	PUMP 35 DISCHARGE STRAINER PLUGGED	1.64E-04	9.13E-09	5.56E-05
SAS-RCS-OO-SI1	SAS RELAY SI1 CONT FAIL TO CLOSE ON SI	3.00E-04	8.82E-09	2.94E-05
SAS-RCS-OO-SI2	SAS RELAY SI2 CONT FAIL TO CLOSE ON SI	3.00E-04	8.82E-09	2.94E-05
CCW-CCF-CC-822	CCF OF MOV AC-822A&B	2.64E-04	8.79E-09	3.33E-05
HHI-MAI-MA-MDP33	SAFETY INJECT PUMP 33 IN TEST & MAINTEN	1.09E-03	7.93E-09	7.27E-06
AFW-MAI-MA-33VLV	PM 33 PATH VALVE IN TEST & MAINTENANCE	2.30E-04	7.93E-09	3.45E-05
HHI-MDP-FR-SI31	PUMP SI 31 FAILS TO CONTINUE TO RUN	6.82E-04	7.87E-09	1.15E-05
LHI-RCK-NO-731	AC-MOV-731 CONTROL CIRCUIT NO OUTPUT	2.50E-03	7.81E-09	3.12E-06
LHI-RCK-NO-730	AC-MOV-730 CONTROL CIRCUIT NO OUTPUT	2.50E-03	7.81E-09	3.12E-06
HHI-RCK-NO-SI32	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	7.44E-09	2.97E-06
HHI-XHE-RE-SI33	FAIL TO RESTOE MDP 33 PATH COMPS AFT MAI	1.01E-03	7.35E-09	7.27E-06
SWS-STR-PG-31	PUMP 31 DISCHARGE STRAINER PLUGGED	1.64E-04	6.89E-09	4.20E-05
AFW-CCF-CC-TDPDV	CCF OF ALL FOUR PM 32 FCVs TO OPEN	1.10E-04	6.66E-09	6.05E-05

J3.1 Risk Reduction Importance Basic Events

Sorted by Risk Reduction Meas.

Event	Description	Probability	Risk Reduction Measure	Risk Increase Measure
AC1-SBR-CO-LP324	LP324 FEEDER BRKR FLS TO RMN CLOSED	6.43E-06	6.36E-09	9.89E-04
CFC-MAI-MA-FCU32	FAN COOLING UNIT 32 UNAVA DUE TO T & M	3.96E-03	5.89E-09	1.48E-06
CVC-CKV-CC-CH374	CHECK VALVE CH-374 FAILS TO OPEN	1.00E-04	5.83E-09	5.83E-05
CVC-CKV-CC-210D	CHECK VLV CH-210D FAILS TO OPEN	1.00E-04	5.83E-09	5.83E-05
CVC-CKV-CC-210B	CHECK VLV CH-210B FAILS TO OPEN	1.00E-04	5.83E-09	5.83E-05
AFW-FLC-DN-406D	AFW HC-406D DOES NOT OPERATE CORRECTLY	1.25E-04	5.55E-09	4.44E-05
AFW-FLC-DN-406A	AFW HC-406A DOES NOT OPERATE CORRECTLY	1.25E-04	5.55E-09	4.44E-05
AFW-FLC-DN-405D	AFW HC-405D DOES NOT OPERATE CORRECTLY	1.25E-04	5.55E-09	4.44E-05
AFW-FLC-DN-405C	AFW HC-405C DOES NOT OPERATE CORRECTLY	1.25E-04	5.55E-09	4.44E-05
AFW-FLC-DN-406B	AFW HC-406B DOES NOT OPERATE CORRECTLY	1.25E-04	5.55E-09	4.44E-05
AFW-FLC-DN-405B	AFW HC-405B DOES NOT OPERATE CORRECTLY	1.25E-04	5.55E-09	4.44E-05
AFW-FLC-DN-405A	AFW HC-405A DOES NOT OPERATE CORRECTLY	1.25E-04	5.55E-09	4.44E-05
AFW-FLC-DN-406C	AFW HC-406C DOES NOT OPERATE CORRECTLY	1.25E-04	5.55E-09	4.44E-05
HHI-MAI-MA-MDP32	SAFETY INJECT PUMP 32 IN TEST & MAINTENA	1.85E-03	5.51E-09	2.97E-06
EDG-CCF-HW-DG312	COMMON CAUSE FAILURE OF DG'S 31 AND 32	1.00E-04	5.44E-09	5.44E-05

J3.1 Risk Reduction Importance Basic Events

Sorted by Risk Reduction Meas.

Event	Description	Probability	Risk Reduction Measure	Risk Increase Measure
AFV-FAN-FS-EF311	WALL EXH FAN 311 FAILS TO START	3.00E-04	5.40E-09	1.80E-05
AFV-FAN-FS-EF312	WALL EXH FAN 312 FAILS TO START	3.00E-04	5.40E-09	1.80E-05
AFW-CKV-CC-BFD31	CHECK VALVE BFD-31 FAILS TO OPEN	8.54E-05	5.17E-09	6.05E-05
AFW-CKV-CC-BFD5O	CHECK VALVE BFD-50 DOES NOT OPEN	8.54E-05	5.17E-09	6.05E-05
HHI-ASL-HI-LT920	RWST LEVEL TRANSMITTER LT-920 FAILS HIGH	5.52E-06	5.05E-09	9.14E-04
CCW-MOV-CC-822A	MOV AC-822A FAIL TO OPEN	6.62E-03	4.86E-09	7.29E-07
HHI-MOV-CC-1835B	SI-MOV-1835B DOES NOT OPEN	3.05E-03	4.54E-09	1.48E-06
HHI-MOV-CC-1852B	SI-MOV-1852B DOES NOT OPEN	3.05E-03	4.54E-09	1.48E-06
IAS-CCF-FR-IACMP	CCF OF INSTRUMENT AIR COMPRESSORS	9.36E-05	4.37E-09	4.67E-05
EDG-RCK-NO-FOT32	FUEL OIL PMP 32 CNTL CKT NO OUTPT	2.50E-03	4.31E-09	1.72E-06
CFC-MAI-MA-FCU34	FAN COOLING UNIT 34 UNAVIL DUE TO T & M	2.86E-03	4.26E-09	1.48E-06
EDG-RCK-NO-FOT31	FUEL OIL PMP 31 CNTL CKT NO OUTPT	2.50E-03	4.23E-09	1.69E-06
HHI-MDP-FR-SI33	PUMP SI 33 FAILS TO CONTINUE TO RUN	6.82E-04	4.15E-09	6.08E-06
CFC-MAI-MA-FCU35	FAN COOLING UNIT 35 UNAVIL DUE TO T & M	2.67E-03	3.97E-09	1.48E-06
EDG-CCF-HW-DG323	COMMON CAUSE FAILURE OF DG'S 33 AND 32	1.00E-04	3.87E-09	3.87E-05

J3.1 Risk Reduction Importance Basic Events

Sorted by Risk Reduction Meas.

Event	Description	Probability	Risk Reduction Measure	Risk Increase Measure
EDG-CCF-HW-DG313	COMMON CAUSE FAILURE OF DG'S 31 AND 33	1.00E-04	3.78E-09	3.78E-05
HHI-RCK-NO-1852B	SI-MOV-1852B CONTROL CIRCUIT NO OUTPUT	2.50E-03	3.72E-09	1.48E-06
CFC-RCK-NO-FCU35	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	3.72E-09	1.48E-06
HHI-RCK-NO-1835B	SI-MOV-1835B CONTROL CIRCUIT NO OUTPUT	2.50E-03	3.72E-09	1.48E-06
CFC-RCK-NO-FCU34	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	3.72E-09	1.48E-06
CFC-RCK-NO-FCU32	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	3.72E-09	1.48E-06
HHR-CCF-CC-888AB	COMMON CAUSE FAILURE OF VL SI-MOV-888A&B	4.40E-05	3.56E-09	8.10E-05
SWS-CCF-FR-NESPM	CCF OF RUNNING NON-ESSEN SWS PUMPS	5.90E-05	3.54E-09	6.00E-05
HHI-XHE-RE-SI32	FAIL TO RESTOE MDP 32 PATH COMPS AFT MAI	1.10E-03	3.27E-09	2.97E-06
SWS-CKV-CC-SW1-6	PMP 36 DISC CHK VLV SWN-1-6 FAIL TO OPEN	1.00E-04	3.08E-09	3.08E-05
CFC-SOV-HW-1307	SOLENOID VALVE 1307 FAILS TO FUNCTION	2.00E-03	2.98E-09	1.49E-06
CFC-SOV-HW-1306	SOLENOID VALVE 1306 FAILS TO FUNCTION	2.00E-03	2.98E-09	1.49E-06
CFC-SOV-HW-1304	SOLENOID VALVE 1304 FAILS TO FUNCTION	2.00E-03	2.98E-09	1.49E-06
CFC-SOV-HW-1303	SOLENOID VALVE 1303 FAILS TO FUNCTION	2.00E-03	2.98E-09	1.49E-06
CFC-SOV-HW-1298	SOLENOID VALVE 1298 FAILS TO FUNCTION	2.00E-03	2.98E-09	1.49E-06

J3.1 Risk Reduction Importance Basic Events

Sorted by Risk Reduction Meas.

Event	Description	Probability	Risk Reduction Measure	Risk Increase Measure
CFC-SOV-HW-1297	SOLENOID VALVE 1297 FAILS TO FUNCTION	2.00E-03	2.98E-09	1.49E-06
DC1-SBR-CO-BAT31	CKT BRKR FROM BATT 31 FLS TO RMN CLOSED	5.02E-06	2.92E-09	5.82E-04
SWS-CKV-OO-SW1-5	SW PM 35 DIS CKV SWN-1-5 FAIL TO CLOSE	1.00E-03	2.72E-09	2.71E-06
PPR-CCF-CC-BLKVS	COMMON CAUSE FAILURE OF BLKVs TO OPEN	4.40E-05	2.64E-09	6.00E-05
AFW-CKV-CC-29-2	CHECK VALVE CT-29-2 FAILS TO OPEN	8.54E-05	2.64E-09	3.09E-05
SWS-STR-PG-34	PMP 34 DISC STRAINER PLUGGED	1.64E-04	2.60E-09	1.58E-05
DC1-BDC-ST-PP-31	PANEL FAULTS AT DC PWR PNL 31	4.39E-06	2.55E-09	5.82E-04
AFW-CKV-CC-BFD39	PM 33 DISC CHECK VLV BFD-39 FAIL TO OPEN	8.54E-05	2.53E-09	2.97E-05
CSS-RCK-NO-PM32	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	2.49E-09	9.95E-07
CSS-RCK-NO-866B	SI-MOV-866B CONTROL CIRCUIT NO OUTPUT	2.50E-03	2.49E-09	9.95E-07
DOEPR-S1	FAIL TO DEPRESS DURING POST LOCA COOLDN	3.10E-03	2.44E-09	7.84E-07
OHR-S1	OPERATOR FAILS TO INITIATE HIGH HEAD RECI	8.60E-04	2.44E-09	2.83E-06
HHI-CRB-DN-SI31	PM SI 31 CIRCUIT BKR 52/SI1 DOESN'T OPER	4.27E-04	2.34E-09	5.48E-06
HHI-MDP-FR-SI32	PUMP SI 32 FAILS TO CONTINUE TO RUN	6.82E-04	2.03E-09	2.97E-06
HHI-CRB-DN-SI33	PM SI 33 CIRCUIT BKR 52/SI3 DOESN'T OPER	4.27E-04	1.96E-09	4.60E-06

J3.1 Risk Reduction Importance Basic Events

Sorted by Risk Reduction Meas.

Event	Description	Probability	Risk Reduction Measure	Risk Increase Measure
HHI-CCF-FS-3PMPS	3 SAFETY INJEC PMS COMMON CAUSE FAILURES	3.18E-05	1.52E-09	4.77E-05
DC1-FUS-NO-BAT31	FUSES ON BATTERY 31 BLOWN	2.50E-06	1.45E-09	5.82E-04
LHR-MSW-DN-43RS5	SW 43/RS-5 DOES NOT OPERATE	2.99E-05	1.43E-09	4.77E-05
HHI-RLY-NO-856E	SI-MOV-856E RELAY VX NO OUTPUT	3.00E-04	1.38E-09	4.60E-06
HHI-RLY-NO-856C	SI-MOV-856C RELAY VX NO OUTPUT	3.00E-04	1.38E-09	4.60E-06
ODPR-S2	OPERATOR DEPRESSURIZES RCS DURING SMALL B	3.10E-03	1.36E-09	4.37E-07
OHR-S2	OPERATOR FAILS TO INITIATE HIGH HEAD RECI	4.80E-04	1.36E-09	2.83E-06
CFC-MAI-MA-FCU31	FAN COOLING UNIT 31 UNAVA DUE TO T & M	8.13E-03	1.32E-09	1.62E-07
CFC-XHE-RE-FCU32	FCU 32 FAILS TO RESTORE AFT T & M	8.69E-04	1.29E-09	1.49E-06
CFC-XHE-RE-FCU35	FCU 35 FAILS TO RESTORE AFT T & M	8.69E-04	1.29E-09	1.49E-06
CFC-XHE-RE-FCU34	FCU 34 FAILS TO RESTORE AFT T & M	8.69E-04	1.29E-09	1.49E-06
DC1-BCC-HW-BCC31	FAILURE OF BATT CHGR 31	2.19E-05	1.27E-09	5.82E-05
SWS-CKV-OC-100-1	CHECK VLV SWN-100-1 FAILS TO REMAIN OPEN	2.50E-06	1.21E-09	4.83E-04
SAS-RCI-FE-SI1OP	SAS RELAY SI1 OPER COIL DOES NOT ENERG	1.30E-04	1.17E-09	9.00E-06
SWS-XVM-OC-99	SWS MAN VALVE SWN-99 FAIL TO REMAIN OPEN	2.11E-06	1.02E-09	4.83E-04

J3.2 Risk Reduction Importance Initiating Events

Sorted by Risk Reduction Meas.

Event	Description	Frequency/yr	Risk Reduction Measure	Risk Increase Measure
IE-T2	LOSS OF MAIN FW INITIATOR	1.11E+00	8.37E-06	8.29E-07
IE-T3	TURBINE TRIP W/ FW AVAIL INITIATOR	3.60E+00	6.42E-06	4.64E-06
IE-T1	LOSS OF OFFSITE POWER INITIATOR	6.80E-02	3.36E-06	4.61E-05
IE-A	LARGE BREAK LOCA INITIATOR	4.77E-04	2.76E-06	5.77E-03
IE-TDC32	LOSS OF 125V DC PP 32 INIT	3.00E-03	2.67E-06	8.87E-04
IE-T7	STEAM GEN TUBE RUPTURE INITIATOR	5.00E-03	2.12E-06	4.22E-04
IE-10FP	BREAK IN 10-IN FIRE PROT LINE INIT	2.62E-05	1.90E-06	7.03E-02
IE-TDC31	LOSS OF 125V DC PP 31 INIT	3.00E-03	1.82E-06	6.03E-04
IE-4FP	BREAK IN 4-IN FIRE PROT LINE INIT	2.29E-05	1.66E-06	7.03E-02
IE-IACCW	RUPTURE OF IACCW LINE IN THE CONTROL BLDG	2.11E-05	1.53E-06	7.03E-02
IE-T4	MAIN STEAM LINE BREAK INSIDE INIT	2.00E-03	1.09E-06	5.42E-04
IE-T5	MAIN STEAM LINE BREAK OUTSIDE VC INIT	2.00E-03	5.65E-07	2.82E-04
CCWS-ISLOCA-4	CCW LINE 336 SI CHK VLV ISLOCA	5.64E-06	5.64E-07	1.00E-01
CCWS-ISLOCA-5	CCW LINE 658 SI CHK VLV ISLOCA	5.64E-06	5.64E-07	1.00E-01
CCWS-ISLOCA-8	CCW SAMPLE HX ISLOCA	5.23E-06	5.23E-07	1.00E-01

J3.2 Risk Reduction Importance Initiating Events

Sorted by Risk Reduction Meas.

Event	Description	Frequency/yr	Risk Reduction Measure	Risk Increase Measure
IE-4FP-A	BREAK IN 4-IN FIRE PROT LINE INIT	6.88E-06	4.71E-07	6.66E-02
IE-SWS	LOSS OF SERVICE WATER SYSTEM INITIATOR	2.10E-03	4.31E-07	2.05E-04
IE-S2	SMALL BREAK LOCA INITIATOR	9.14E-04	4.22E-07	4.61E-04
IE-S1	INTERMEDIATE BREAK LOCA INITIATOR	9.14E-04	4.18E-07	4.56E-04
CCWS-ISLOCA-6	CCW LN 149 OPRESS OF NR HX ISLOCA	3.29E-06	3.29E-07	1.00E-01
IE-3SW	BREAK IN 3-IN SW LINE INIT	5.36E-06	3.29E-07	5.99E-02
IE-TBF	TURBINE BUILDING FLOOD INITIATOR	1.86E-06	2.79E-07	1.43E-01
IE-3SW-AC	BREAK IN 3-IN SW AC LINE INIT	2.91E-06	1.79E-07	5.99E-02
IE-CCW	LOSS OF CCW SYSTEM INITIATOR	3.98E-04	1.31E-07	3.28E-04
CVCS-ISLOCA-2	CVCS EXCESS LETDOWN LINE ISLOCA	1.02E-06	1.02E-07	1.00E-01
SIS-ISLOCA-3	SI LINE 16 ISLOCA	2.26E-07	2.26E-08	1.00E-01
IE-TAC6A	LOSS OF 480V BUS 6A INITIATOR	3.00E-03	1.48E-08	4.91E-06
CCWS-ISLOCA-1	CCW LINE 52A RCP THERMAL BARRIER ISLOCA	3.73E-08	3.73E-09	1.00E-01
RHR-ISLOCA-6	RHR LINE 337 ISLOCA	3.45E-08	3.45E-09	1.00E-01
RHR-ISLOCA-7	RHR LINE 3042 ISLOCA	3.45E-08	3.45E-09	1.00E-01

J3.2 Risk Reduction Importance Initiating Events

Sorted by Risk Reduction Meas.

Event	Description	Frequency/yr	Risk Reduction Measure	Risk Increase Measure
RHR-ISLOCA-8	RHR LINE 3043 ISLOCA	3.45E-08	3.45E-09	1.00E-01
SIS-ISLOCA-858A	ISLOCA OCCURS AT CHK VLV 858A	3.38E-08	3.38E-09	1.00E-01

J4.1 Uncertainty Importance Basic Events

Sorted by Uncertainty Importance

Event	Description	Probability	Uncertainty Importance
C	REACTOR PROTECTION SYSTEM FAILURE	1.62E-05	4.70E-01
DC1-BDC-ST-PP-32	PANEL FAULTS AT DC PWR PNL 32	4.39E-06	2.23E-01
AC4-CCF-HW-480VS	COMMON CAUSE FAILURE OF 480V SWGR 31&32	1.06E-06	3.58E-02
AFW-CCF-FS-AFWPM	CCF OF AFW MOTOR DRIVEN PUMPS	1.15E-04	1.19E-02
SL-T3	RANDOM FAILURE SEAL LOCA	3.65E-05	7.55E-03
ORCS-L-SGISOSUCC	FAILURE TO DEPRESSURIZE EARLY/LATE COUPLE	6.50E-05	7.00E-03
AFW-XVM-PG-CT-6	STOP VALVE CT-6 FAIL CLOSED (PLUGGED)	3.40E-05	5.35E-03
AFW-XVM-PG-CT-64	ISOLATION VALVE CT-64 FAIL CLS (PLUGGED)	3.40E-05	5.35E-03
MSS-CCF-OO-MSIV	COMMON CAUSE FAILURE OF 2 OR MORE MSIVS	5.65E-05	2.95E-03
AFV-MOD-CC-IL314	AFW ROOM INLET LOUVER L-314 FAILS TO OPN	3.00E-03	2.89E-03
SWS-XHE-RE-SWN29	SWN-29/SWN-30 SWAPPED DURING HDR ALIGNMT	2.56E-04	2.74E-03
SWS-CCF-CC-EDGS	CCF OF EDG FLOW CONTROL VALVES	1.10E-04	2.72E-03
EDG-CCF-HW-3EDGS	COMMON CAUSE FAILURE OF ALL THREE EDG'S	4.70E-05	2.71E-03
SWS-CCF-FR-ESSPM	CCF OF 2 RUNNING SWS MOTOR DRIVEN PUMPS	5.90E-05	2.71E-03
SWS-XVM-OC-29	EDG SW COMMON SUPPLY HDR ISO VLV XFER CL	3.16E-05	2.67E-03

J4.1 Uncertainty Importance Basic Events

Sorted by Uncertainty Importance

Event	Description	Probability	Uncertainty Importance
SWS-XVM-OC-55	EDG COMMON DISCHARGE METER VLV XFER CLOS	3.16E-05	2.67E-03
AC1-BAC-ST-LP324	FAULTS IN LIGHTING PANEL 324	1.15E-05	1.75E-03
AC1-BAC-ST-LB33	FAULT ON LIGHTING BUS 33	1.15E-05	1.75E-03
OLR-S2	OPERATOR FAILS TO INITIATE LOW HEAD RECIRC -S2	3.00E-04	1.64E-03
DC1-BAT-HW-BAT31	FAILURE OF BATTERY 31	2.19E-05	1.45E-03
AC1-SBR-CO-LP324	LP324 FEEDER BRKR FLS TO RMN CLOSED	6.43E-06	1.38E-03
OLR-S1	OPERATOR FAILS TO INITIATE LOW HEAD RECIRC -S1	3.00E-04	1.28E-03
HHI-ASL-HI-LT920	RWST LEVEL TRANSMITTER LT-920 FAILS HIGH	5.52E-06	1.28E-03
AC4-RCI-FE-U1-6A	UV REL 27-1/6A DOES NOT ENERGIZE	3.12E-03	1.20E-03
NR-AFBV	NON-RECOVERY OF AUX FW BLDG VENTILATION	1.00E-02	8.44E-04
DC1-SBR-CO-BAT31	CKT BRKR FROM BATT 31 FLS TO RMN CLOSED	5.02E-06	8.14E-04
DC1-BDC-ST-PP-31	PANEL FAULTS AT DC PWR PNL 31	4.39E-06	8.14E-04
DC1-FUS-NO-BAT31	FUSES ON BATTERY 31 BLOWN	2.50E-06	8.14E-04
AC4-RCK-NO-BCH37	FAULTS AT MCC37 TO BATT CHGR 32	2.50E-03	7.53E-04
AC6-RLY-NO-85-L1	PIL WIRE REL 85L1/138 DOES NOT OPER	3.00E-04	6.99E-04

J4.1 Uncertainty Importance Basic Events

Sorted by Uncertainty Importance

Event	Description	Probability	Uncertainty Importance
AC6-RLY-NO-LSTBU	LO RELAY 86/STBU FAILS TO OPERATE	3.00E-04	6.99E-04
AC6-RLY-NO-85-L2	PIL WIRE REL 85L2/138 DOES NOT OPER	3.00E-04	6.99E-04
AC6-RLY-NO-86STP	LO RELAY 86/STP DOES NOT OPERATE	3.00E-04	6.99E-04
AC6-RCI-FE-U6-62	UV RELAY 27-6/62 DOES NOT ENERGIZE	1.30E-04	6.80E-04
DC1-MAI-MA-BCC31	BATT CHGR 31 IN MAINTENANCE	9.64E-03	6.78E-04
SWS-XVM-OC-99	SWS MAN VALVE SWN-99 FAIL TO REMAIN OPEN	2.11E-06	6.76E-04
SWS-CKV-OC-100-1	CHECK VLV SWN-100-1 FAILS TO REMAIN OPEN	2.50E-06	6.76E-04
OLR-A	OPERATOR FAILS TO INITIATE LOW HEAD RECIRC -A	4.40E-03	6.68E-04
DC1-MAI-MA-BCC32	BATT CHGR 32 IN MAINTENANCE	3.00E-03	5.20E-04
AFW-XHE-RE-AFW31	FAIL TO RESTORE PM 31 PATH COMPS AFT MAI	4.75E-03	5.18E-04
AFW-TDP-FR-TDP32	AFW TDP 32 FAILS TO CONTINUE TO RUN	9.43E-03	5.17E-04
AC4-RCI-FE-U1-5A	UV REL 27-1/5A DOES NOT ENERGIZE	3.12E-03	4.88E-04
AFW-XHE-RE-AFW32	FAIL TO RESTORE PM 32 PATH COMPS AFT MAI	5.02E-03	4.85E-04
AFW-RCK-NO-PM31	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	4.85E-04
AFW-TDP-FS-TDP32	AFW TDP 32 FAILS TO START ON DEMAND	4.34E-03	4.82E-04

J4.1 Uncertainty Importance Basic Events

Sorted by Uncertainty Importance

Event	Description	Probability	Uncertainty Importance
AFW-MDP-FS-PM31	AFW PUMP 31 FAILS TO START ON DEMAND	1.36E-03	4.52E-04
AFW-RCK-NO-TDP32	AFW TDP 32 CONTROL CIRCUIT FAILURE	2.50E-03	4.52E-04
AFW-XHE-FO-HC405	OPERATOR FAILS TO OPERATE HC-405A,B,C&D	2.10E-03	4.46E-04
AFW-MAI-MA-PM31	AFW MOTOR-DRIVEN PUMP 31 IN TEST & MAINT	5.14E-03	4.30E-04
PPR-AOV-OO-455C	PORV RC-PCV-455C FAILS TO CLOSE	2.00E-03	4.28E-04
AFW-MAI-MA-TDP32	AFW TURBINE-DRIVEN PUMP 32 IN TEST & MAI	5.33E-03	4.21E-04
AFW-CRB-DN-52AF1	MDP 31 CIRCUIT BRKER 52/AF1 DOESN'T OPER	4.27E-04	4.08E-04
AFW-MDP-FR-PM31	AFW PUMP 31 FAILS TO CONTINUE TO RUN	4.20E-04	4.08E-04
AC4-RCK-NO-BCH39	FAULTS AT MCC39 TO BATT CHGR 31	2.50E-03	4.06E-04
AFW-RLY-NO-312-1	AFW PM 31 RLY 2-1/TDC NO OUTPUT	3.00E-04	3.92E-04
PPR-AOV-OO-456	PORV RC-PCV-456 FAILS TO CLOSE	2.00E-03	3.84E-04
AC4-RCK-NO-BC36C	FAULTS AT MCC36C TO BATT CHGR 33	2.50E-03	3.72E-04
AC4-XHE-RE-MCC6C	FAILURE TO RESTORE MCC36C AFTER MAINT	2.13E-04	3.37E-04
PPR-PRV-CC-456	PORV RC-PCV-456 DOES NOT OPEN	4.27E-03	3.16E-04
PPR-CCF-CC-PORVS	COMMON CAUSE FAILURE OF PORVs TO OPEN	4.70E-04	3.10E-04

J4.1 Uncertainty Importance Basic Events

Sorted by Uncertainty Importance

Event	Description	Probability	Uncertainty Importance
AFW-AOV-CC-P1139	STEAM CNTRL VLV PCV-1139 DOES NOT OPEN	1.12E-03	2.94E-04
PPR-PRV-CC-455C	PORV RC-PCV-455C DOES NOT OPEN	4.27E-03	2.77E-04
AC4-XHE-RE-MCC6A	FAILURE TO RESTORE MCC36A AFTER MAINT	2.13E-04	2.68E-04
AFW-CKV-CC-BFD34	PM 31 DISC CHECK VLV BFD-34 FAIL TO OPEN	8.54E-05	2.67E-04
FB-T2	BLEED AND FEED INITIATION	2.10E-02	2.62E-04
ORCS-L	OPER FAILS TO INITIATE LONG TERM RCS DEPR	5.20E-03	2.58E-04
DC1-MAI-MA-BCC33	BATT CHGR 33 IN MAINTENANCE	1.74E-03	2.32E-04
AFW-MAI-MA-31VLV	PM 31 PATH VALVE IN TEST & MAINTENANCE	9.19E-05	2.21E-04
AC4-CRB-OO-2AT3A	480V CKT BRKR 2AT3A FAILS TO CLOSE	4.27E-04	2.12E-04
AFW-RLY-NO-BFPL	AFW PM 32 RLY BFPL NO OUTPUT	3.00E-04	2.03E-04
AC4-RCS-OO-U3AX2	UV AUX REL 27-3A/X2 CONT FAIL TO CL	3.00E-04	1.99E-04
AC4-RCI-FE-U1-3A	UV REL 27-1/3A DOES NOT ENERGIZE	3.12E-03	1.81E-04
AC6-RCI-FE-U5-62	UV RELAY 27-5/62 DOES NOT ENERGIZE	1.30E-04	1.69E-04
RV-T4	REACTOR VESSEL RUPTURE	9.20E-03	1.65E-04
AFW-XHE-RE-AFW33	FAIL TO RESTORE PM 33 PATH COMPS AFT MAI	4.75E-03	1.59E-04

J4.1 Uncertainty Importance Basic Events

Sorted by Uncertainty Importance

Event	Description	Probability	Uncertainty Importance
AC4-XHE-RE-MCC6B	FAILURE TO RESTORE MCC36B AFTER MAINT	2.13E-04	1.57E-04
SGB-CCF-OO-SGBIV	COMMON CAUSE FAILURE OF 2 SG BWDN VALVES	2.09E-04	1.46E-04
SGISO-SGOVRFILL	SG OVERFILL AFTER ISOLATION	7.90E-03	1.44E-04
AC4-CRB-CC-2AT5A	480V BRKR 52/2AT5A FAILS TO TRIP	4.27E-04	1.35E-04
AFW-RCK-NO-PM33	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	1.25E-04
OHR-T2	OPER FAILS TO INIT HIGH HEAD RECIRC -T2	1.30E-02	1.20E-04
APP-R-CBF	FAILURE TO ALIGN APP R SWGR DURING CB FLOOD	2.30E-02	1.20E-04
SWS-MDP-RS-PM35	SW PUMP 35 FAILS TO RESTART	1.50E-03	1.16E-04
HHR-CCF-CC-888AB	COMMON CAUSE FAILURE OF VL SI-MOV-888A&B	4.40E-05	1.13E-04
SL-DEP	SEAL LOCA OCCURS AFTER DEPRESSURIZATION	7.10E-03	1.10E-04
SL-CBF	SEAL LOCA DURING CONTROL BUILDING FLOOD	7.10E-03	1.08E-04
B-BATT-DEP	BATTERY DEPLETION	5.70E-03	9.97E-05
PPR-RCK-NO-RC536	BLK VLV RC-MOV-536 CONTROL CKT NO OUTPUT	2.50E-03	9.84E-05
SWS-FCV-OO-1112	NON-ESSEN ISO VLV FAILS TO CLOSE	2.00E-03	9.80E-05
SWS-MDP-FR-PM35	SWN PUMP 35 FAILS TO CONTINUE TO RUN	5.90E-04	9.75E-05

J4.1 Uncertainty Importance Basic Events

Sorted by Uncertainty Importance

Event	Description	Probability	Uncertainty Importance
AC4-XHE-RE-MCC39	FAILURE TO RESTORE MCC39 AFTER MAINT	2.13E-04	9.50E-05
AFW-MDP-FS-PM33	AFW PUMP 33 FAILS TO START ON DEMAND	1.36E-03	9.33E-05
AFW-MAI-MA-32VLV	TDP 32 PATH VALVE IN TEST & MAINTENANCE	1.61E-04	9.29E-05
AFW-MAI-MA-PM33	AFW MOTOR-DRIVEN PUMP 33 IN TEST & MAINT	3.22E-03	9.03E-05
AFW-CKV-CC-BFD5O	CHECK VALVE BFD-50 DOES NOT OPEN	8.54E-05	8.47E-05
AFW-CCF-CC-TDPDV	CCF OF ALL FOUR PM 32 FCVs TO OPEN	1.10E-04	8.47E-05
AFW-CKV-CC-BFD31	CHECK VALVE BFD-31 FAILS TO OPEN	8.54E-05	8.47E-05
SWS-CCF-FR-NESPM	CCF OF RUNNING NON-ESSEN SWS PUMPS	5.90E-05	8.41E-05
PPR-CCF-CC-BLKVS	COMMON CAUSE FAILURE OF BLKVs TO OPEN	4.40E-05	8.40E-05
CCW-RCK-NO-625	FCV 625 CONTROL CIRCUIT NO OUTPUT	2.50E-03	8.34E-05
LHR-CCF-FS-PUMPS	COMMON CAUSE FAILURE OF LO HEAD REC PUMP	2.31E-04	8.23E-05
LHR-CCF-CC-LPRVL	COMMON CAUSE FAIL OF VLV SI-MOV-1802A&B	2.03E-04	8.23E-05
CVC-XHE-FO-BORAT	OPER FAIL TO INITIA EMERGENCY BORATION	2.10E-03	8.16E-05
CVC-CKV-CC-210D	CHECK VLV CH-210D FAILS TO OPEN	1.00E-04	8.16E-05
CVC-CKV-CC-210B	CHECK VLV CH-210B FAILS TO OPEN	1.00E-04	8.16E-05

J4.1 Uncertainty Importance Basic Events

Sorted by Uncertainty Importance

Event	Description	Probability	Uncertainty Importance
CVC-CKV-CC-CH374	CHECK VALVE CH-374 FAILS TO OPEN	1.00E-04	8.16E-05
DC1-BCC-HW-BCC31	FAILURE OF BATT CHGR 31	2.19E-05	8.14E-05
SWS-MAI-MA-PM36	SWS MOTOR DRIVEN PUMP 36 IN MAINTENANCE	1.82E-02	8.13E-05
PPR-MOV-CC-RC536	BLOCK VALVE RC-MOV-536 DOES NOT OPEN	5.00E-04	8.05E-05
CCW-CKV-OO-761B	CHECK VLV AC-761B STUCK OPEN	1.00E-03	7.94E-05
SWS-CKV-OO-SW1-2	SW PM 32 DIS CKV SWN-1-2 FAIL TO CLOSE	1.00E-03	7.94E-05
CCW-FCV-CC-625	FCV-625 FAIL TO OPEN	1.00E-03	7.94E-05
SWS-STR-PG-35	PUMP 35 DISCHARGE STRAINER PLUGGED	1.64E-04	7.79E-05
EDG-CCF-HW-DG312	COMMON CAUSE FAILURE OF DG'S 31 AND 32	1.00E-04	7.61E-05
AFW-RLY-NO-332-1	AFW PM 33 RLY 2-1/TDC NO OUTPUT	3.00E-04	7.55E-05
AFW-CRB-DN-52AF3	MDP 33 CIRCUIT BRKR 52/AF3 DOESN'T OPERA	4.27E-04	7.55E-05
AFW-MDP-FR-PM33	AFW PUMP 33 FAILS TO CONTINUE TO RUN	4.20E-04	7.55E-05
LHR-RCK-NO-PM31	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	7.26E-05
SWS-MDP-RS-PM34	SW PUMP 34 FAILS TO RESTART	1.50E-03	7.02E-05
IAS-RCK-NO-NHDYR	HEATLESS DRYER CONTROL CIRCUIT NO OUTPUT	2.50E-03	6.86E-05

J4.1 Uncertainty Importance Basic Events

Sorted by Uncertainty Importance

Event	Description	Probability	Uncertainty Importance
IAS-AOV-CC-633	DYR OUTLET DIVERTER VLV FAILS TO OPERATE	1.00E-03	6.86E-05
IAS-AOV-CC-632	DYR INLET VLV ASSMBLY FAILS TO OPERATE	1.00E-03	6.86E-05
CCW-MDP-FR-PM31	CCW PUMP 31 FAILS TO CONTINUE TO RUN	5.66E-04	6.69E-05
SWS-MDP-FR-PM31	SWN PUMP 31 FAILS TO CONTINUE TO RUN	5.90E-04	6.69E-05
HHI-CCF-FS-3PMPS	3 SAFETY INJEC PMS COMMON CAUSE FAILURES	3.18E-05	6.68E-05
LHR-MSW-DN-43RS5	SW 43/RS-5 DOES NOT OPERATE	2.99E-05	6.68E-05
SWS-STR-PG-36	PMP 36 DISC STRAINER PLUGGED	2.47E-03	6.61E-05
SWS-RCK-NO-PM36	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	6.61E-05
IAS-CCF-FR-IACMP	CCF OF INSTRUMENT AIR COMPRESSORS	9.36E-05	6.53E-05
AFW-FLC-DN-405D	AFW HC-405D DOES NOT OPERATE CORRECTLY	1.25E-04	6.22E-05
AFW-FLC-DN-406C	AFW HC-406C DOES NOT OPERATE CORRECTLY	1.25E-04	6.22E-05
AFW-FLC-DN-405B	AFW HC-405B DOES NOT OPERATE CORRECTLY	1.25E-04	6.22E-05
AFW-FLC-DN-406D	AFW HC-406D DOES NOT OPERATE CORRECTLY	1.25E-04	6.22E-05
AFW-FLC-DN-405A	AFW HC-405A DOES NOT OPERATE CORRECTLY	1.25E-04	6.22E-05
AFW-AOV-OO-406C	AFW-FCV-406C FAIL TO CLOSE ON DEMAND	2.38E-03	6.22E-05

J4.1 Uncertainty Importance Basic Events

Sorted by Uncertainty Importance

Event	Description	Probability	Uncertainty Importance
AFW-FLC-DN-405C	AFW HC-405C DOES NOT OPERATE CORRECTLY	1.25E-04	6.22E-05
AFW-FLC-DN-406B	AFW HC-406B DOES NOT OPERATE CORRECTLY	1.25E-04	6.22E-05
AFW-AOV-OO-406D	AFW-FCV-406D FAIL TO CLOSE ON DEMAND	2.38E-03	6.22E-05
AFW-FLC-DN-406A	AFW HC-406A DOES NOT OPERATE CORRECTLY	1.25E-04	6.22E-05
AFW-AOV-OO-406A	AFW-FCV-406A FAIL TO CLOSE ON DEMAND	2.38E-03	6.22E-05
AFW-AOV-OO-406B	AFW-FCV-406B FAIL TO CLOSE ON DEMAND	2.38E-03	6.22E-05
PPR-RCK-NO-RC535	BLK VLV RC-MOV-535 CONTROL CKT NO OUTPUT	2.50E-03	5.99E-05
SWS-STR-PG-31	PUMP 31 DISCHARGE STRAINER PLUGGED	1.64E-04	5.88E-05
SWS-MDP-FS-PMP36	SWP 36 FAILS TO START ON DEMAND	1.58E-03	5.85E-05
SWS-MDP-FR-PM36	SWN PUMP 36 FAILS TO CONTINUE TO RUN	5.90E-04	5.57E-05
SWS-CRB-DN-52SW6	SW PUMP 36 BKR 52/SW6 DOES NOT OPERATE	4.27E-04	5.57E-05
TSGTR-1	SGTR INDUCED BY MS LINE BREAK	1.00E-02	5.47E-05
TSGTR-2	MULTIPLE SGTR INDUCED BY MS LINE BREAK	1.57E-03	5.47E-05
EDG-CCF-HW-DG323	COMMON CAUSE FAILURE OF DG'S 33 AND 32	1.00E-04	5.42E-05
EDG-CCF-HW-DG313	COMMON CAUSE FAILURE OF DG'S 31 AND 33	1.00E-04	5.29E-05

J4.1 Uncertainty Importance Basic Events

Sorted by Uncertainty Importance

Event	Description	Probability	Uncertainty Importance
FB-TSWS	BLEED AND FEED INITIATION	1.20E-02	5.21E-05
LHR-RCK-NO-1802B	SI-MOV-1802B CONTROL CIRCUIT NO OUTPUT	2.50E-03	5.19E-05
LHR-RCK-NO-1802A	SI-MOV-1802A CONTROL CIRCUIT NO OUTPUT	2.50E-03	5.19E-05
SAS-XLF-TE-SASA	SAS TRAIN A IN FUNCTIONAL TEST	3.47E-03	5.12E-05
LHR-MDP-FS-PM32	RECIR PUMP 32 FAILS TO START ON DEMAND	4.77E-04	4.91E-05
LHR-XHE-RE-PM32	FAIL TO RESTO PM 32 PATH COMPS AFT MAINT	6.21E-04	4.91E-05
LHR-MDP-FR-PM31	RECIR PUMP 31 FAILS TO CONTINUE TO RUN	7.20E-04	4.91E-05
LHR-CRB-DN-PM32	RECIR PM 32 CIRC BKR 52/R2 DOESN'T OPER	4.27E-04	4.91E-05
LHR-CRB-DN-PM31	RECIC PM 31 CIRC BKR 52/R1 DOESN'T OPER	4.27E-04	4.91E-05
LHR-MDP-FR-PM32	RECIC PUMP 32 FAILS TO CONTINUE TO RUN	7.20E-04	4.91E-05
LHR-MOV-CC-1802A	SI-MOV-1802A DOES NOT OPEN ON DEMAND	4.77E-04	4.91E-05
LHR-MOV-CC-1802B	SI-MOV-1802B DOES NOT OPEN ON DEMAND	4.77E-04	4.91E-05
LHR-RCK-NO-PM32	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	4.91E-05
LHR-MDP-FS-PM31	RECIR PUMP 31 FAILS TO START ON DEMAND	4.77E-04	4.91E-05
LHR-XHE-RE-PM31	FAIL TO RESTO PM 31 PATH COMPS AFT MAINT	6.21E-04	4.91E-05

J4.1 Uncertainty Importance Basic Events

Sorted by Uncertainty Importance

Event	Description	Probability	Uncertainty Importance
SWS-CKV-OO-SW1-4	SW PM 34 DIS CKV SWN-1-4 FAIL TO CLOSE	1.00E-03	4.90E-05
AFW-MAI-MA-33VLV	PM 33 PATH VALVE IN TEST & MAINTENANCE	2.30E-04	4.83E-05
CCW-CCF-CC-822	CCF OF MOV AC-822A&B	2.64E-04	4.66E-05
AFW-CKV-CC-29-2	CHECK VALVE CT-29-2 FAILS TO OPEN	8.54E-05	4.32E-05
SWS-CKV-CC-SW1-6	PMP 36 DISC CHK VLV SWN-1-6 FAIL TO OPEN	1.00E-04	4.31E-05
SWS-XHE-RE-PMP36	FAIL TO RESTORE PMP 36 AFTER MAINTENANCE	4.97E-04	4.31E-05
PPR-MOV-CC-RC535	BLOCK VALVE RC-MOV-535 DOES NOT OPEN	5.00E-04	4.20E-05
SWS-MDP-FR-PM34	SWN PUMP 34 FAILS TO CONTINUE TO RUN	5.90E-04	4.18E-05
AFW-CKV-CC-BFD39	PM 33 DISC CHECK VLV BFD-39 FAIL TO OPEN	8.54E-05	4.15E-05
SAS-RCS-OO-SI1	SAS RELAY SI1 CONT FAIL TO CLOSE ON SI	3.00E-04	4.11E-05
SAS-RCS-OO-SI2	SAS RELAY SI2 CONT FAIL TO CLOSE ON SI	3.00E-04	4.11E-05
AFV-MOD-CC-ED311	WALL EXH FAN 311 DAMPER FLS TO OPEN	3.00E-03	3.90E-05
MSS-ADV-OO-1134	SG 31 MS-PCV-1134 FAIL TO CLOSE	1.95E-03	3.64E-05
MSS-MSV-OO-MS131	MSIV MS1-31 FAILS TO CLOSE ON DEMAND	9.42E-04	3.64E-05
MSS-ADV-OO-1135	SG 32 MS-PCV-1135 FAIL TO CLOSE	1.95E-03	3.64E-05

J4.1 Uncertainty Importance Basic Events

Sorted by Uncertainty Importance

Event	Description	Probability	Uncertainty Importance
AFW-SKV-OO-MS-42	ABFPT SUPPLY VLV MS-42 FAIL TO CLOSE	8.74E-04	3.64E-05
MSS-ADV-OO-1137	SG 34 MS-PCV-1137 FAIL TO CLOSE	1.95E-03	3.64E-05
MSS-MSV-OO-MS132	MSIV MS1-32 FAILS TO CLOSE ON DEMAND	9.42E-04	3.64E-05
MSS-MSV-OO-MS133	MSIV MS1-33 FAILS TO CLOSE ON DEMAND	9.42E-04	3.64E-05
MSS-MSV-OO-MS134	MSIV MS1-34 FAILS TO CLOSE ON DEMAND	9.42E-04	3.64E-05
AFW-SKV-OO-MS-41	ABFPT SUPPLY VLV MS-41 FAIL TO CLOSE	8.74E-04	3.64E-05
MSS-ADV-OO-1136	SG 33 MS-PCV-1136 FAIL TO CLOSE	1.95E-03	3.64E-05
AFV-MOD-CC-ED312	WALL EXH FAN 312 DAMPER FLS TO OPEN	3.00E-03	3.30E-05
CDS-AOV-OO-518	AOV 518 FAIL TO CLOSE ON DEMAND	2.00E-03	3.07E-05
EDG-GEN-HW-EDG31	DG31 GENERATOR FAILURE	2.57E-02	2.79E-05
GAC4-EDG	RANDOM FAILURE OF EDG LEADING TO SBO	2.03E-03	2.55E-05
AFV-FAN-FR-EF312	WALL EXH FAN 312 FAILS TO CONT TO RUN	7.20E-04	2.52E-05
AFV-FAN-FS-EF311	WALL EXH FAN 311 FAILS TO START	3.00E-04	2.52E-05
AFV-FAN-FS-EF312	WALL EXH FAN 312 FAILS TO START	3.00E-04	2.52E-05
NR-CHGR35	FAILURE TO PROPERLY ALIGN BACKUP CHARGER	1.00E-01	2.27E-05

J4.1 Uncertainty Importance Basic Events

Sorted by Uncertainty Importance

Event	Description	Probability	Uncertainty Importance
EDG-MAI-MA-EDG31	DG31 IN MAINTENANCE	3.02E-02	2.26E-05
SWS-STR-PG-34	PMP 34 DISC STRAINER PLUGGED	1.64E-04	2.22E-05
VISO	OPERATOR FAILS TO ISOLATE DURING ISLOCA	1.00E-01	2.12E-05
SAS-XLF-TE-SASB	SAS TRAIN B IN FUNCTIONAL TEST	3.90E-03	2.02E-05
PR1	ATWS PRESSURE RELIEF	2.70E-01	2.01E-05
AFW-XHE-FO-CITYW	OPER FAILS TO OPEN CITY WATER SUPPLY VLV	2.00E-02	1.92E-05
HHI-RCK-NO-SI31	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	1.62E-05
HHI-MAI-MA-MDP31	SAFETY INJECT PUMP 31 IN TEST & MAINTENA	1.73E-03	1.62E-05
HHI-MDP-FR-SI31	PUMP SI 31 FAILS TO CONTINUE TO RUN	6.82E-04	1.62E-05
HHI-XHE-RE-SI31	FAIL TO RESTOE MDP 31 PATH COMPS AFT MAI	1.38E-03	1.62E-05
SAS-RCI-FE-SI1OP	SAS RELAY SI1 OPER COIL DOES NOT ENERG	1.30E-04	1.26E-05
AC4-RCI-FE-U1-2A	UV REL 27-1/2A DOES NOT ENERGIZE	3.12E-03	1.26E-05
PPR-MOV-OO-RC535	BLK VLV RC-MOV-535 FAILS TO CLOSE	3.00E-03	1.21E-05
PPR-MOV-OO-RC536	BLK VLV RC-MOV-536 FAILS TO CLOSE	3.00E-03	1.21E-05
MRI	FAILURE OF MANUAL ROD INSERTION	2.00E-01	1.18E-05

J4.1 Uncertainty Importance Basic Events

Sorted by Uncertainty Importance

Event	Description	Probability	Uncertainty Importance
EDG-ENG-FR-DG31R	DG31 FAILS TO RUN	4.66E-03	1.13E-05
EDG-GEN-HW-EDG32	DG32 GENERATOR FAILURE	2.57E-02	1.12E-05
HHI-XHE-RE-SI33	FAIL TO RESTOE MDP 33 PATH COMPS AFT MAI	1.01E-03	1.02E-05
HHI-RCK-NO-SI33	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	1.02E-05
HHI-MAI-MA-MDP33	SAFETY INJECT PUMP 33 IN TEST & MAINTEN	1.09E-03	1.02E-05
HHI-MDP-FR-SI33	PUMP SI 33 FAILS TO CONTINUE TO RUN	6.82E-04	8.52E-06
AFW-AOV-OO-11581	AOV LCV-1158-1 DOES NOT CLOSE	2.38E-03	8.35E-06
AFW-AOV-OO-11582	AOV LCV-1158-2 DOES NOT CLOSE	2.38E-03	8.35E-06
HHI-RCK-NO-856C	SI-MOV-856C CONTROL CIRCUIT NO OUTPUT	2.50E-03	8.10E-06
HHI-MOV-CC-856G	SI-MOV-856G DOES NOT OPEN	3.05E-03	8.10E-06
HHI-RCK-NO-856G	SI-MOV-856G CONTROL CIRCUIT NO OUTPUT	2.50E-03	8.10E-06
HHI-RCK-NO-856E	SI-MOV-856E CONTROL CIRCUIT NO OUTPUT	2.50E-03	8.10E-06
HHI-CRB-DN-SI31	PM SI 31 CIRCUIT BKR 52/SI1 DOESNT OPER	4.27E-04	7.68E-06
MRI-SUCC	SUCCESS OF MANUAL ROD INSERTION	8.00E-01	7.25E-06
B-1HR	FAILURE TO RESTORE OSP IN 1 HOUR	4.70E-01	6.95E-06

J4.1 Uncertainty Importance Basic Events

Sorted by Uncertainty Importance

Event	Description	Probability	Uncertainty Importance
EDG-GEN-HW-EDG33	DG33 GENERATOR FAILURE	2.57E-02	6.95E-06
AC4-RCS-OO-U6AX2	UV RELAY 27-6A/X2 CT FAIL TO CLOSE	7.20E-03	6.46E-06
HHI-RLY-NO-856E	SI-MOV-856E RELAY VX NO OUTPUT	3.00E-04	6.44E-06
HHI-CRB-DN-SI33	PM SI 33 CIRCUIT BKR 52/SI3 DOESN'T OPER	4.27E-04	6.44E-06
HHI-RLY-NO-856C	SI-MOV-856C RELAY VX NO OUTPUT	3.00E-04	6.44E-06
SL-T2-SUCC	SEAL LOCA SUCCESS T2	1.00E+00	5.95E-06
EDG-MAI-MA-EDG32	DG32 IN MAINTENANCE	2.92E-02	5.47E-06
B-BATT-NDEP	BATTERY DEPLETION	6.40E-03	5.25E-06
EDG-ENG-FR-DG32R	DG32 FAILS TO RUN	4.66E-03	5.21E-06
PR2	ATWS PRESSURE RELIEF	4.70E-01	5.16E-06
ORCS-MSLB	OPER FAILS TO INITIATE LONG TERM RCS DEPR	1.00E-01	4.86E-06
SWS-MAI-MA-PM33	SWS MOTOR DRIVEN PUMP 33 IN MAINTENANCE	5.66E-02	4.69E-06
CCW-MAI-MA-PM33	CCMO DRIVEN PUMP 33 IN MAINTENANCE	3.71E-02	4.57E-06
NR-BORON-CORE	ERCENTAGE OF BORON PRECIPITATION DURING HL	1.00E-01	4.41E-06
RCS-XHE-MC-PT402	RCS PRE XTMER PT-402 MISCALIBRATION	7.98E-03	4.37E-06

J4.1 Uncertainty Importance Basic Events

Sorted by Uncertainty Importance

Event	Description	Probability	Uncertainty Importance
RCS-XHE-MC-PT403	RCS PRE XTMER PT-403 MISCALIBRATION	7.98E-03	4.37E-06
RHR-SD	FAILURE OF RHR SYSTEM	6.30E-03	4.37E-06
LHI-RCK-NO-730	AC-MOV-730 CONTROL CIRCUIT NO OUTPUT	2.50E-03	4.37E-06
LHI-RCK-NO-731	AC-MOV-731 CONTROL CIRCUIT NO OUTPUT	2.50E-03	4.37E-06
MS-RUPTURE-OC	AIN STEAM LINE PPG RUPTURE FRACTION OUTSIDE	1.50E-01	4.22E-06
HHI-XHE-RE-SI32	FAIL TO RESTOE MDP 32 PATH COMPS AFT MAI	1.10E-03	4.17E-06
HHI-RCK-NO-SI32	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	4.17E-06
HHI-MDP-FR-SI32	PUMP SI 32 FAILS TO CONTINUE TO RUN	6.82E-04	4.17E-06
HHI-MAI-MA-MDP32	SAFETY INJECT PUMP 32 IN TEST & MAINTENA	1.85E-03	4.17E-06
OHR-S2	OPERATOR FAILS TO INITIATE HIGH HEAD RECI	4.80E-04	3.97E-06
OHR-S1	OPERATOR FAILS TO INITIATE HIGH HEAD RECI	8.60E-04	3.97E-06
SWS-CKV-OO-SW1-5	SW PM 35 DIS CKV SWN-1-5 FAIL TO CLOSE	1.00E-03	3.80E-06
AC4-RCS-OO-U5AX2	UV AUX REL 27-5A/X2 CT FL TO CLOSE	7.20E-03	3.59E-06
OHR-T1	OPER FAILS TO INIT HIGH HEAD RECIRC -T1	1.30E-02	3.58E-06
EDG-ENG-FR-DG33R	DG33 FAILS TO RUN	4.66E-03	3.31E-06

J4.1 Uncertainty Importance Basic Events

Sorted by Uncertainty Importance

Event	Description	Probability	Uncertainty Importance
SWS-BRK-ESS	FLAG - BREAK IN ESSENTIAL SW PIPING	1.00E+00	3.24E-06
SL-TBF-B	SEAL LOCA DURING TB FLOODING	1.30E-01	2.60E-06
CCW-MOV-CC-822B	MOV AC-822B FAIL TO OPEN	6.62E-03	2.57E-06
EDG-RCK-NO-FOT32	FUEL OIL PMP 32 CNTL CKT NO OUTPT	2.50E-03	2.41E-06
EDG-RCK-NO-FOT31	FUEL OIL PMP 31 CNTL CKT NO OUTPT	2.50E-03	2.37E-06
EDG-MAI-MA-EDG33	DG33 IN MAINTENANCE	2.31E-02	2.32E-06
CSS-XHE-RE-PM32	FAIL TO RESTO PM 32 PATH COMPS AFT MAINT	7.17E-03	2.31E-06
CFC-PND-CC-34DPD	FCU 34 DAMPER D FAILS TO OPEN	1.81E-02	2.27E-06
CFC-PND-CC-32DPD	FCU 32 DAMPER D FAILS TO OPEN	1.81E-02	2.17E-06
CFC-PND-CC-35DPD	FCU 35 DAMPER D FAILS TO OPEN	1.81E-02	2.17E-06
PPR-PHN-CC-RC535	BLK VLV RC-MOV-535 SHUT DUE TO LEAK PORV	1.00E+00	2.10E-06
CFC-RCK-NO-FCU32	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	2.08E-06
CFC-XHE-RE-FCU32	FCU 32 FAILS TO RESTORE AFT T & M	8.69E-04	2.08E-06
CFC-SOV-HW-1307	SOLENOID VALVE 1307 FAILS TO FUNCTION	2.00E-03	2.08E-06
CFC-SOV-HW-1306	SOLENOID VALVE 1306 FAILS TO FUNCTION	2.00E-03	2.08E-06

J4.1 Uncertainty Importance Basic Events

Sorted by Uncertainty Importance

Event	Description	Probability	Uncertainty Importance
CFC-SOV-HW-1304	SOLENOID VALVE 1304 FAILS TO FUNCTION	2.00E-03	2.08E-06
CFC-SOV-HW-1303	SOLENOID VALVE 1303 FAILS TO FUNCTION	2.00E-03	2.08E-06
CFC-SOV-HW-1298	SOLENOID VALVE 1298 FAILS TO FUNCTION	2.00E-03	2.08E-06
CFC-SOV-HW-1297	SOLENOID VALVE 1297 FAILS TO FUNCTION	2.00E-03	2.08E-06
CFC-RCK-NO-FCU34	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	2.08E-06
HHI-MOV-CC-1835B	SI-MOV-1835B DOES NOT OPEN	3.05E-03	2.08E-06
CFC-XHE-RE-FCU34	FCU 34 FAILS TO RESTORE AFT T & M	8.69E-04	2.08E-06
CFC-XHE-RE-FCU35	FCU 35 FAILS TO RESTORE AFT T & M	8.69E-04	2.08E-06
CFC-MAI-MA-FCU35	FAN COOLING UNIT 35 UNAVIL DUE TO T & M	2.67E-03	2.08E-06
CFC-MAI-MA-FCU34	FAN COOLING UNIT 34 UNAVIL DUE TO T & M	2.86E-03	2.08E-06
CFC-MAI-MA-FCU32	FAN COOLING UNIT 32 UNAVA DUE TO T & M	3.96E-03	2.08E-06
HHI-RCK-NO-1852B	SI-MOV-1852B CONTROL CIRCUIT NO OUTPUT	2.50E-03	2.08E-06
HHI-RCK-NO-1835B	SI-MOV-1835B CONTROL CIRCUIT NO OUTPUT	2.50E-03	2.08E-06
HHI-MOV-CC-1852B	SI-MOV-1852B DOES NOT OPEN	3.05E-03	2.08E-06
CFC-RCK-NO-FCU35	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	2.08E-06

J4.1 Uncertainty Importance Basic Events

Sorted by Uncertainty Importance

Event	Description	Probability	Uncertainty Importance
CSS-RCK-NO-866B	SI-MOV-866B CONTROL CIRCUIT NO OUTPUT	2.50E-03	1.40E-06
CSS-RCK-NO-PM32	SWGR CONTROL CIRCUIT NO OUTPUT	2.50E-03	1.40E-06
PPR-PHN-CC-DMOTR	PORV DEMAND TO OPEN DURING TRANSIENT	1.00E+00	1.16E-06
DOEPR-S1	FAIL TO DEPRESS DURING POST LOCA COOLDN	3.10E-03	1.10E-06
OLR-S2-SUCC	SUCCESSFUL INITIATION LOW HEAD RECIRC -S2	1.00E+00	1.05E-06
CCW-MOV-CC-822A	MOV AC-822A FAIL TO OPEN	6.62E-03	1.03E-06
FB-TAC6A	BLEED AND FEED INITIATION	2.10E-02	9.86E-07
ODEP-TB-SUCC	SUCCESSFUL DEPRESS DURING SBO	1.00E+00	9.64E-07
ORCS-L-SUCC	SUCCESSFUL LONG TERM RCS DEPRESS	1.00E+00	8.38E-07
B1-TBF	TBF SPRAY DAMAGE FAILS 6.9KV SWGR	5.00E-01	6.77E-07
ODPR-S2	OPERATOR DEPRESSURIZES RCS DURING SMALL B	3.10E-03	6.14E-07
LHR-PHN-PE-DECAY	RECIRCULATION ON DECAY HEAT REMOVAL MODE	1.00E+00	5.64E-07
B-BATT-SUCC	SUCC RESTORATION OF CHARGERS AFTER SBO	1.00E+00	5.58E-07
CCW-PUMP	FLAG- CCW PUMP FAILURE	1.00E+00	4.96E-07
PPR-PHN-CC-RC536	BLK VLV RC-MOV-536 SHUT DUE TO LEAK PORV	1.00E+00	3.44E-07

J4.1 Uncertainty Importance Basic Events

Sorted by Uncertainty Importance

Event	Description	Probability	Uncertainty Importance
B-25HR	FAILURE TO RESTORE OSP IN 2.5 HOURS	3.00E-01	2.68E-07
SGISO-SUCC	SUCCESSFUL SG ISOLATION DURING SGTR	1.00E+00	2.62E-07
CFC-MAI-MA-FCU31	FAN COOLING UNIT 31 UNAVA DUE TO T & M	8.13E-03	2.28E-07
ORCS-MSLB-SUCC	SUCCESSFUL LONG TERM DEPRESS DURING MSLB	9.00E-01	1.63E-07
NR-CBV	CONTROL BUILDING VENTILATION NON-RECOVERY	1.00E-01	1.39E-07
ARSW-TBF	FAILURE TO ALIGN APP R SWGR DURING TB FLOOD	1.00E+00	1.21E-07
ARSW-TBF-SUCC	UCCESSFUL ALIGNMENT OF APP R SWGR DURING TB	1.00E+00	1.21E-07
RV-T5	REACTOR VESSEL RUPTURE	1.00E+00	1.13E-07
B1-TBF-SUCC	TBF SPRAY DAMAGE DOES NOT FAIL 6 .9KV SWGR	5.00E-01	1.03E-07
OHR-T2-SUCC	SUCCESSFUL INIT HIGH HEAD RECIRC -T2	1.00E+00	7.75E-08
OLR-S1-SUCC	SUCCESSFUL INITIATION LOW HEAD RECIRC -S1	1.00E+00	7.35E-08
CCW-PIPE	FLAG-CCW PIPE BREAK	1.00E+00	6.53E-08
ARDG-TBF-SUCC	SUCCESSFUL ALIGNMENT OF APP R DG DURING TBF	1.00E+00	3.67E-08
SL-TBF-A-SUCC	NO SEAL LOCA	1.00E+00	3.67E-08
ODEP-S2-SUCC	SUCCESSFUL DEPRESS DURING S2	1.00E+00	3.28E-08

J4.2 Uncertainty Importance Initiating Events

Sorted by Uncertainty Importance

Event	Description	Frequency	Uncertainty Importance
IE-TBF	TURBINE BUILDING FLOOD INITIATOR	1.86E-06	2.00E-01
CCWS-ISLOCA-8	CCW SAMPLE HX ISLOCA	5.23E-06	1.40E-01
CCWS-ISLOCA-5	CCW LINE 658 SI CHK VLV ISLOCA	5.64E-06	1.00E-01
SIS-ISLOCA-858A	ISLOCA OCCURS AT CHK VLV 858A	3.38E-08	1.00E-01
CCWS-ISLOCA-4	CCW LINE 336 SI CHK VLV ISLOCA	5.64E-06	1.00E-01
CCWS-ISLOCA-6	CCW LN 149 OPRESS OF NR HX ISLOCA	3.29E-06	1.00E-01
CVCS-ISLOCA-2	CVCS EXCESS LETDOWN LINE ISLOCA	1.02E-06	1.00E-01
RHR-ISLOCA-6	RHR LINE 337 ISLOCA	3.45E-08	1.00E-01
RHR-ISLOCA-7	RHR LINE 3042 ISLOCA	3.45E-08	1.00E-01
RHR-ISLOCA-8	RHR LINE 3043 ISLOCA	3.45E-08	1.00E-01
SIS-ISLOCA-3	SI LINE 16 ISLOCA	2.26E-07	1.00E-01
CCWS-ISLOCA-1	CCW LINE 52A RCP THERMAL BARRIER ISLOCA	3.73E-08	1.00E-01
IE-IACCW	RUPTURE OF IACCW LINE IN THE CONTROL BLDG	2.11E-05	9.84E-02
IE-4FP	BREAK IN 4-IN FIRE PROT LINE INIT	2.29E-05	9.84E-02
IE-10FP	BREAK IN 10-IN FIRE PROT LINE INIT	2.62E-05	9.84E-02

J4.2 Uncertainty Importance Initiating Events

Sorted by Uncertainty Importance

Event	Description	Frequency	Uncertainty Importance
IE-4FP-A	BREAK IN 4-IN FIRE PROT LINE INIT	6.88E-06	9.32E-02
IE-3SW-AC	BREAK IN 3-IN SW AC LINE INIT	2.91E-06	8.38E-02
IE-3SW	BREAK IN 3-IN SW LINE INIT	5.36E-06	8.38E-02
IE-A	LARGE BREAK LOCA INITIATOR	4.77E-04	8.08E-03
IE-TDC32	LOSS OF 125V DC PP 32 INIT	3.00E-03	1.25E-03
IE-TDC31	LOSS OF 125V DC PP 31 INIT	3.00E-03	8.47E-04
IE-T4	MAIN STEAM LINE BREAK INSIDE INIT	2.00E-03	7.61E-04
IE-S2	SMALL BREAK LOCA INITIATOR	9.14E-04	6.45E-04
IE-S1	INTERMEDIATE BREAK LOCA INITIATOR	9.14E-04	6.39E-04
IE-T7	STEAM GEN TUBE RUPTURE INITIATOR	5.00E-03	5.94E-04
IE-CCW	LOSS OF CCW SYSTEM INITIATOR	3.98E-04	4.59E-04
IE-T5	MAIN STEAM LINE BREAK OUTSIDE VC INIT	2.00E-03	3.95E-04
IE-SWS	LOSS OF SERVICE WATER SYSTEM INITIATOR	2.10E-03	2.87E-04
IE-T1	LOSS OF OFFSITE POWER INITIATOR	6.80E-02	6.92E-05
IE-T2	LOSS OF MAIN FW INITIATOR	1.11E+00	1.06E-05

J4.2 Uncertainty Importance Initiating Events

Sorted by Uncertainty Importance

Event	Description	Frequency	Uncertainty Importance
IE-TAC6A	LOSS OF 480V BUS 6A INITIATOR	3.00E-03	6.90E-06
IE-T3	TURBINE TRIP W/ FW AVAIL INITIATOR	3.60E+00	2.50E-06

APPENDIX K

SEVERE ACCIDENT RESPONSE PREDICTIONS

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Section K1

INTRODUCTION

This appendix describes the results of the analyses performed to predict the progression of severe accident sequences determined to be dominant contributors to core damage. These analyses sought to predict the containment pressure profile and the time at which the containment fails to help characterize source term releases.

The thermal-hydraulic behavior of IP3 was analyzed using version 3.0B, Revision 16, of the Modular Accident Analysis Program for Pressurized Water Reactors (MAAP/PWR)[1].

The following scenarios were analyzed to provide insight into the phenomena and mechanisms pertinent to a severe accident progression.

[1] A long-term station blackout scenario in which sufficient dc power is available to operate the AFW steam-turbine-driven pump and atmospheric dump valves for 4 hours. No RCP seal LOCA occurs. After 4 hours, battery depletion is assumed to occur, stopping AFW flow to the steam generators.

[2] A short-term station blackout scenario in which the AFW steam-turbine-driven pump is unavailable for secondary-side cooling.

[3] A large LOCA scenario in which ECCS injection is successful until switch-over to long-term recirculation core cooling is attempted.

[4] A long-term station blackout scenario with RCP seal failure after 30 minutes. The AFW system steam-turbine-driven pump is assumed to fail after 4 hours because of battery depletion.

[5] A long-term station blackout scenario in which dc power is available to operate the AFW steam-turbine-driven pump and atmospheric dump valves for 4 hours and in which no RCP seal LOCA occurs. After 4 hours, battery depletion is assumed to stop AFW flow to the steam generators. AC power is restored 90 minutes after vessel breach.

[6] A large LOCA scenario in which ECCS injection is successful until switch-over to long-term recirculation core cooling is attempted. No containment heat is removed by the containment fan coolers, containment spray system, or RHR heat exchangers.

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[1]Fauske & Associates, Inc., "MAAP 3.0B Users manual," prepared for The Electric Power Research Institute, March 16, 1990.

[7] A small LOCA scenario in which ECCS injection and recirculation core cooling are unavailable. No containment heat is removed by containment fan coolers or RHR heat exchangers. However, containment sprays operate.

[8] A long-term station blackout scenario in which dc power is available to operate the AFW steam-turbine-driven pump and atmospheric dump valves for 4 hours and in which no RCP seal LOCA occurs. After 4 hours, battery depletion is assumed to occur, stopping AFW flow to the steam generators. AC power is restored 90 minutes after vessel breach. To provide a more realistic coolant heat flux, the MAAP/PWR default parameter for flat plate critical heat flux was lowered from 0.14 to 0.015. This change reduces heat loss to the coolant and so allows core-concrete interaction to occur.

[9] A short-term station blackout scenario in which the AFW steam-turbine-driven pump is unavailable for secondary-side cooling. No RCP seal LOCA occurs. After steam generator dryout, RCS boiloff results in core melt and vessel breach, followed by core-concrete interactions that will slowly pressurize the containment until it fails. Containment depressurization through a containment rupture area of 1 ft^2 follows.

[10] A long-term station blackout scenario in which dc power is available to operate the AFW steam-turbine-driven pump and atmospheric dump valves for 4 hours. No RCP seal occurs. After 4 hours, battery depletion occurs, stopping AFW flow to the steam generators. Subsequent RCS boiloff results in core melt and vessel breach, followed by core-concrete interactions that will slowly pressurize the containment until it fails. Containment depressurization through a containment rupture area of 1 ft^2 follows. AC power is restored 90 minutes after vessel breach.

Section K2

RESULTS

K2.1 ACCIDENT SCENARIO 1 -- LONG-TERM STATION BLACKOUT WITHOUT AC POWER RECOVERY

This accident scenario is initiated by a loss of offsite power. Subsequently, onsite emergency power is also lost. RCS integrity remains intact because no RCP seal LOCA occurs. AFW flow to the steam generators is initially provided by the steam-turbine-driven AFW pump. Make-up to the steam generators continues until, after 240 minutes, the dc batteries are completely depleted. Subsequently, the steam generators boil dry at 370 minutes (Figure K2.1.1). Because no heat can be removed from the RCS to the secondary-side, RCS pressure increases from slightly below 2250 psia to 2470 psia (Figure K2.1.2). At an RCS pressure of 2470 psia, further RCS pressure increases are limited by steam flow through the pressurizer safety relief valves. With RCS pressure cycling about the PORV setpoint, rapid RCS boil-off ensues (Figure K2.1.3) and the core is uncovered at 433 minutes. Once uncovered, the core starts to heat up and the metals within it interact with steam, producing hydrogen.

Debris from the core melt progression will relocate and accumulate on the core support plate until, at 585 minutes, the plate fails. Subsequently, continued debris relocation into the lower region of the reactor vessel leads to vessel failure via a failed instrument penetration at 593 minutes.

The containment pressure during this accident sequence is shown in Figure K2.1.4. The containment pressure rises after the primary relief tank disk ruptures at 386 minutes. A second containment pressure rise occurs after vessel breach, a rapid containment rise from 35.1 psia to 51.2 psia being predicted by MAAP/PWR. Sustained core-concrete interactions from decay heat will then slowly pressurize the containment until containment failure results at 47 hours. Containment depressurization through a containment leak area of 0.1 ft^2 follows.

Hydrogen production history is depicted in Figure K2.1.5: about 1140 lbs of hydrogen are produced in-vessel and about 1260 lbs is produced ex-vessel (during core-concrete interactions). However, the hydrogen does not burn because the containment atmosphere is steam inerted and, in the absence of ac power, no ignition sources are present.

Figure K2.1.1 Accident Scenario 1 -- Steam Generator Water Level

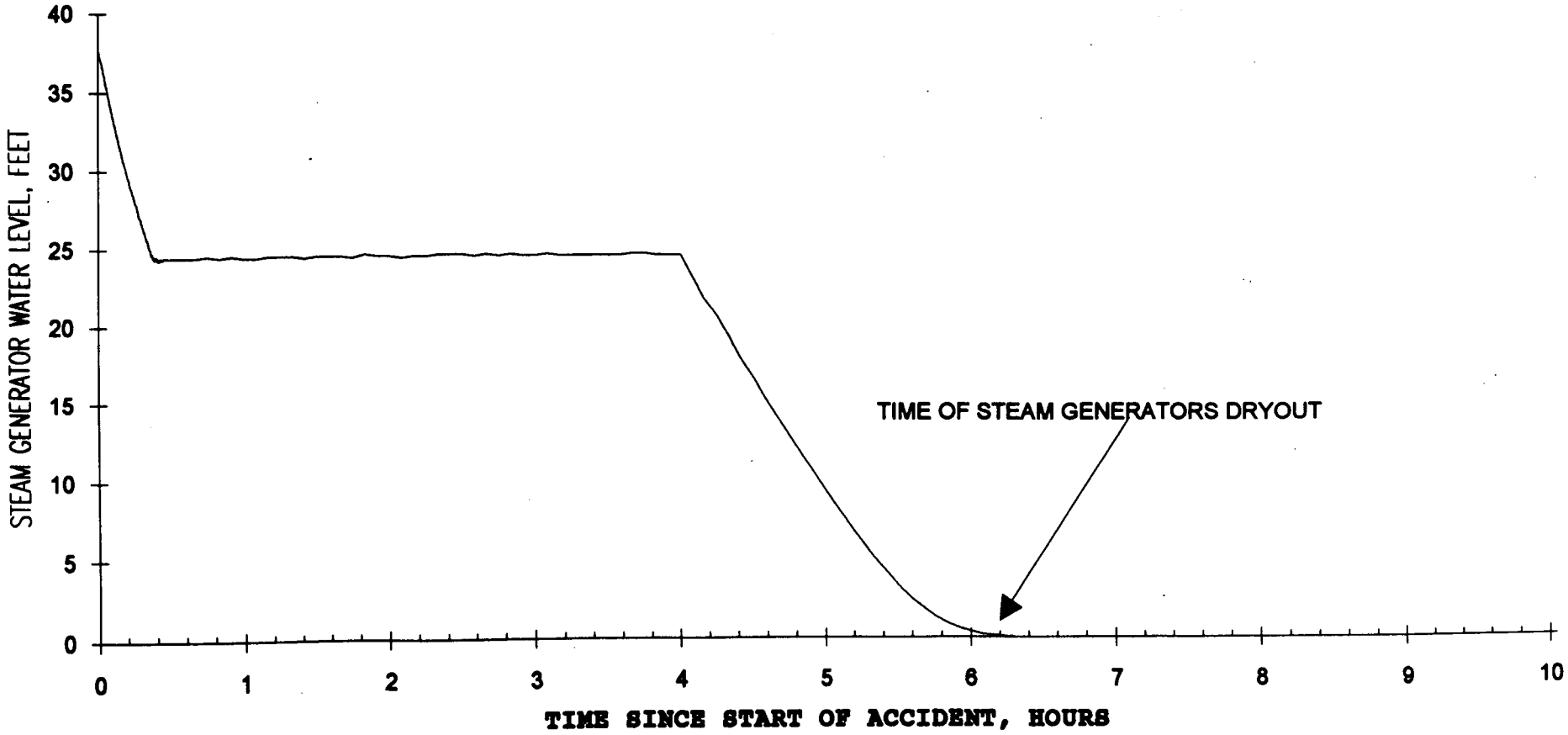


Figure K2.1.2 Accident Scenario 1 -- RCS Pressure

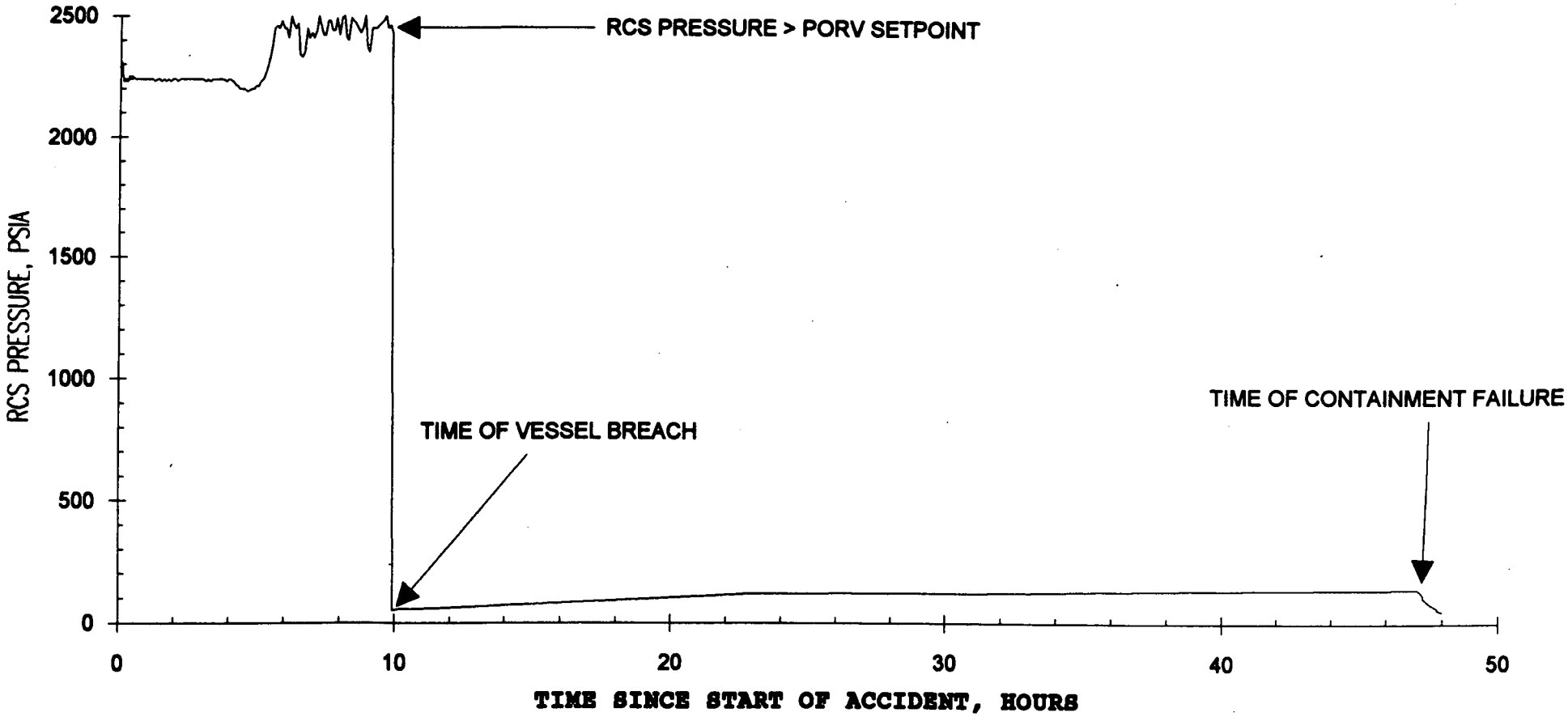


Figure K2.1.3 Accident Scenario 1 -- RCS Water Level

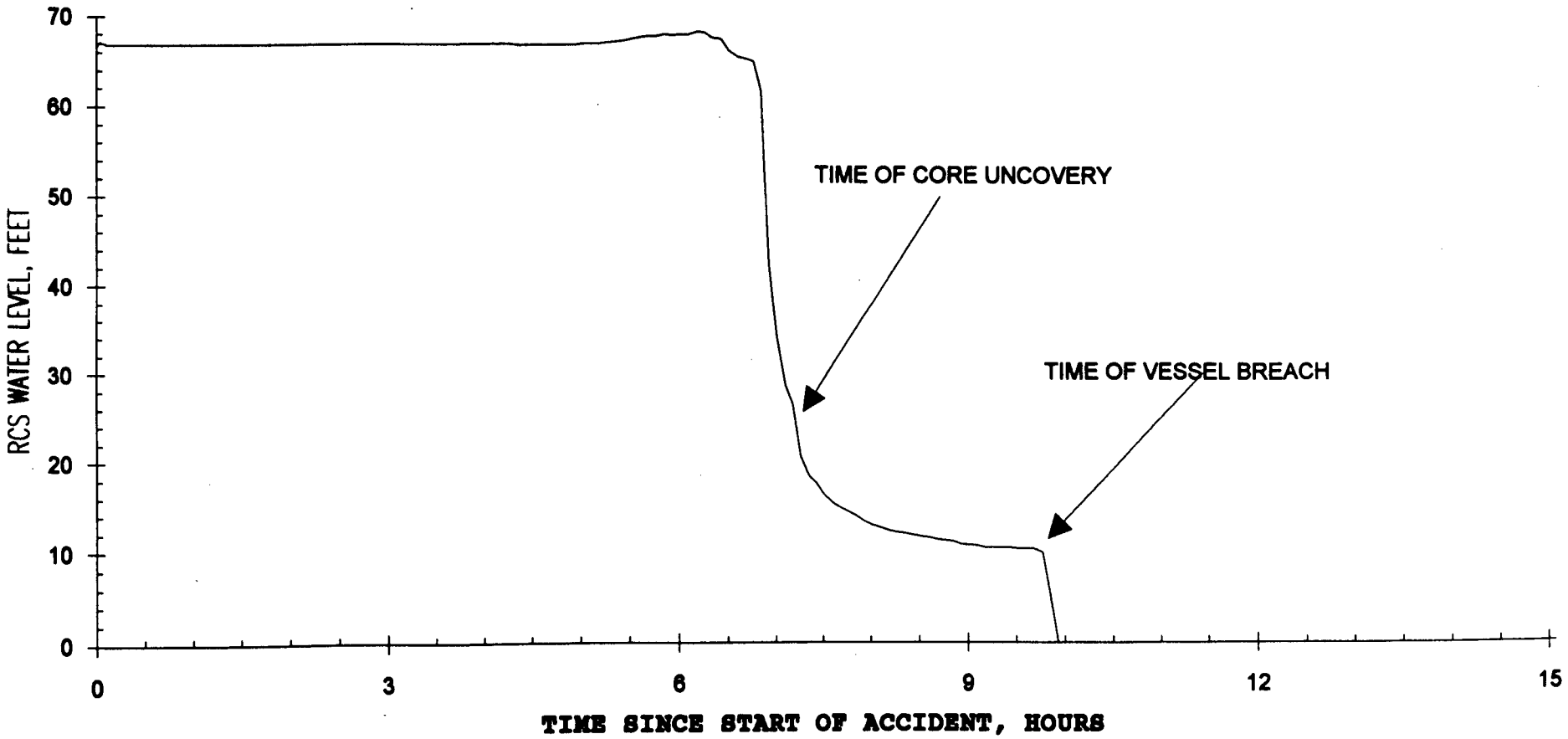


Figure K2.1.4 Accident Scenario 1 -- Containment Pressure

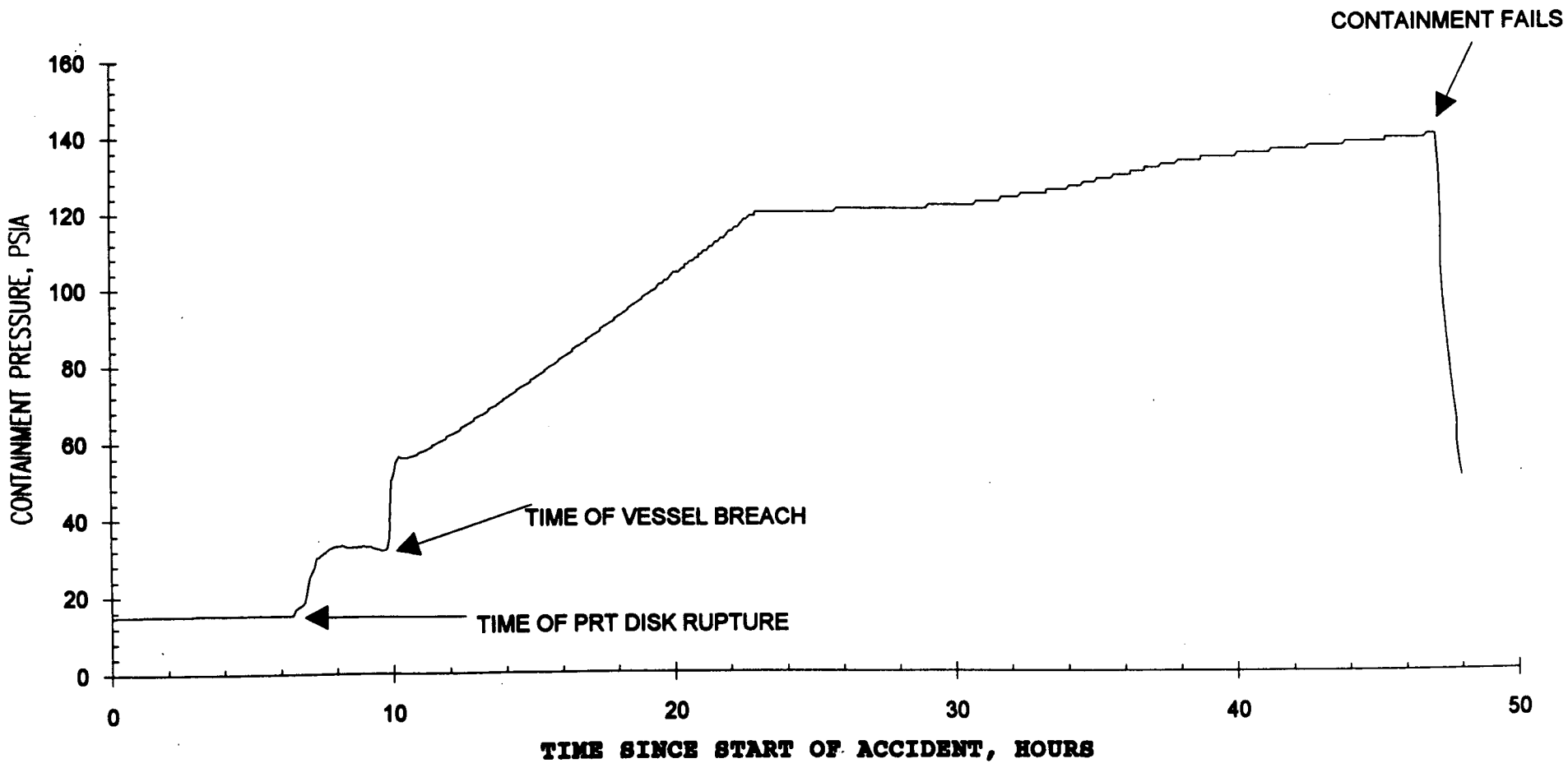
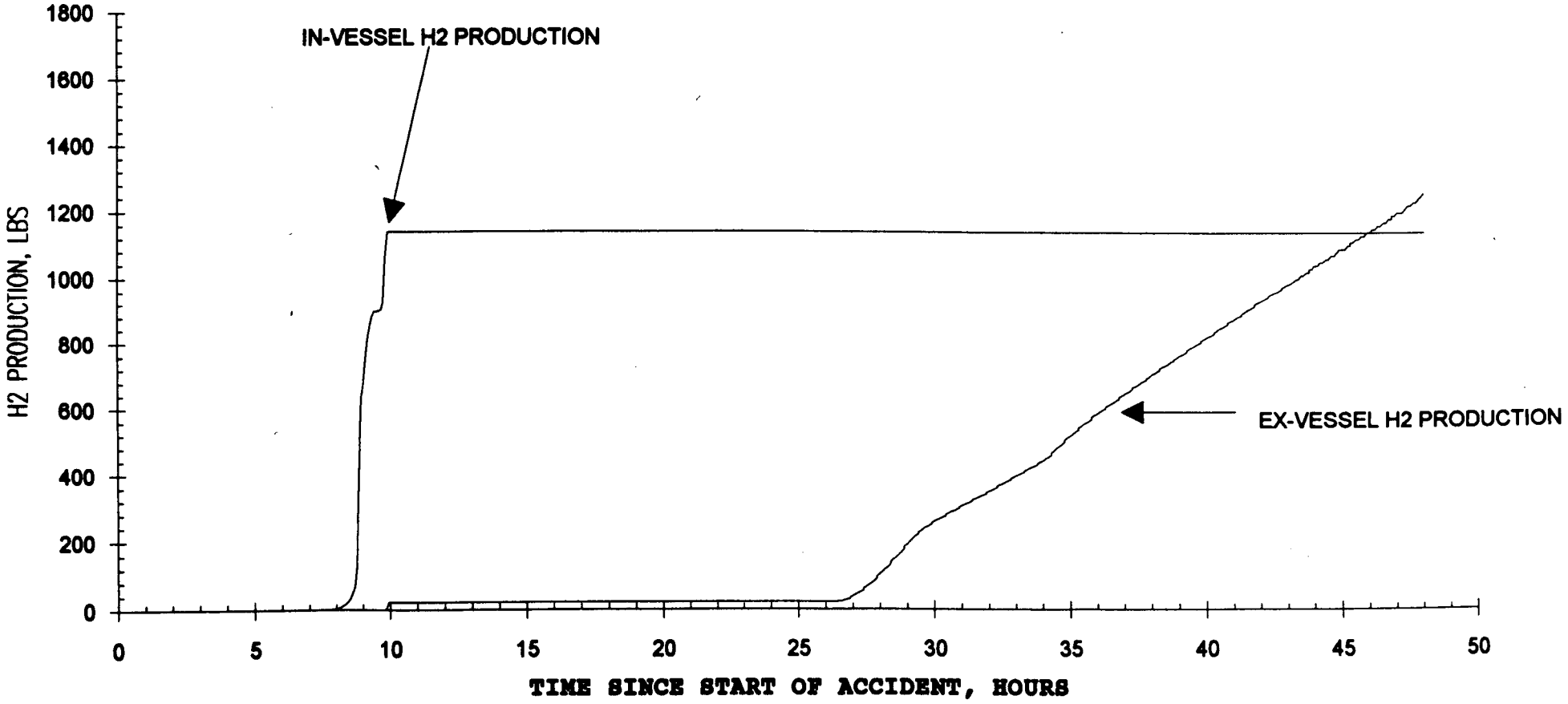


Figure K2.1.5 Accident Scenario 1 -- Hydrogen Production



K2.2 ACCIDENT SCENARIO 2 -- SHORT-TERM STATION BLACKOUT WITHOUT AC POWER RECOVERY

In terms of steam generator, RCS and containment behavior, this accident scenario differs from Accident Scenario 1 only in event timing. Steam generator level, RCS pressure and water level, containment pressure, and hydrogen production history are shown in Figures K2.2.1 - K2.2.5.

Figure K2.2.1 Accident Scenario 2 -- Steam Generator Water Level

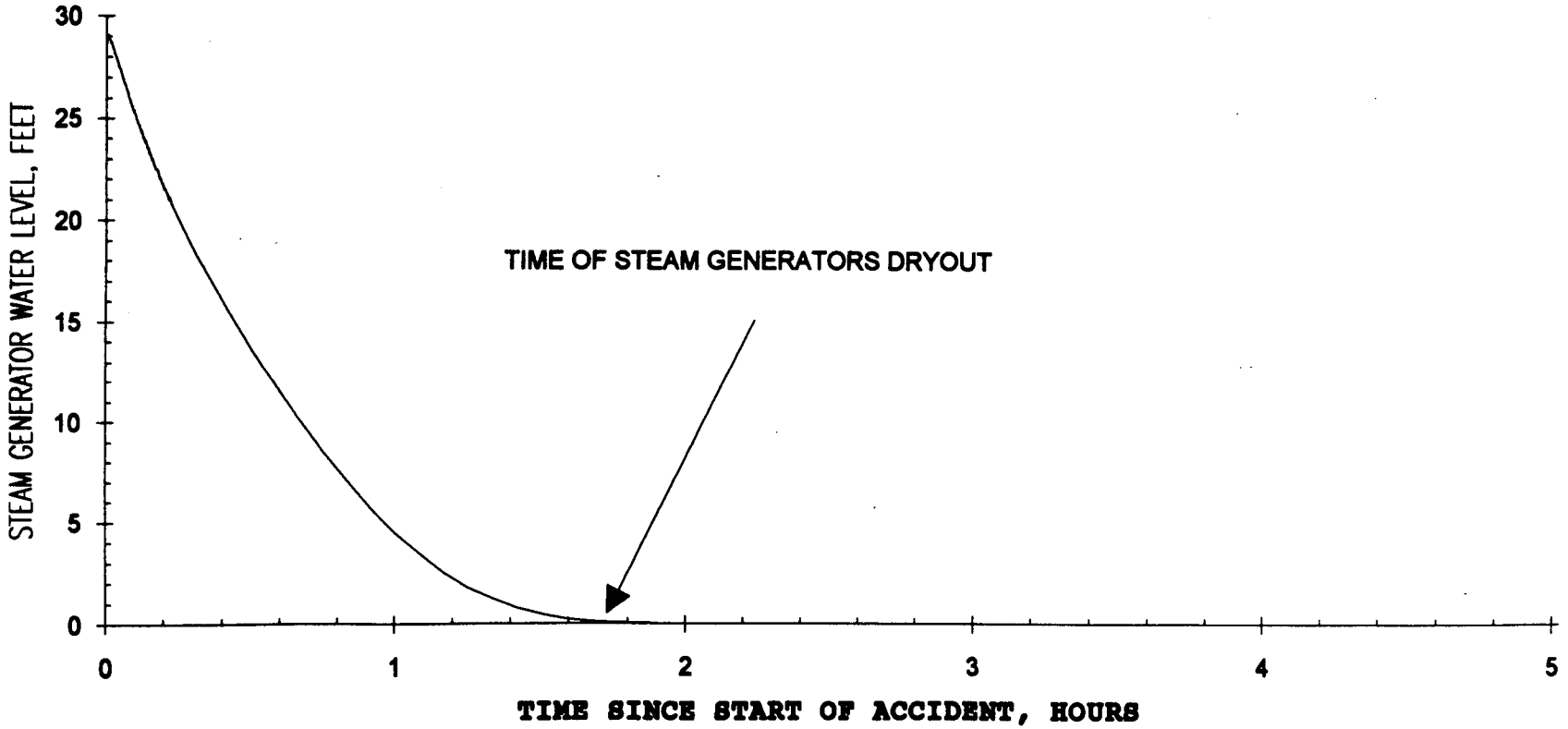


Figure K2.2.2 Accident Scenario 2 -- RCS Pressure

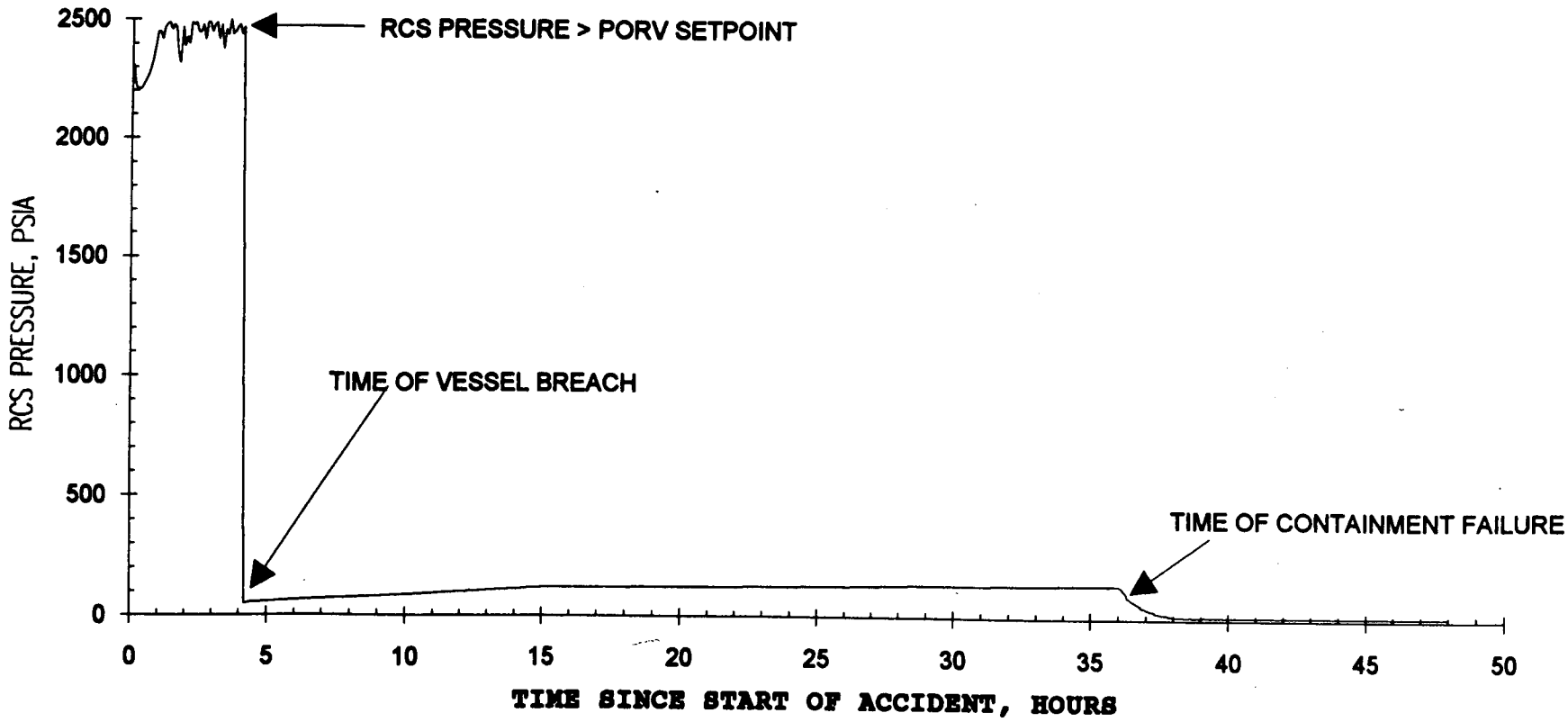


Figure K2.2.3 Accident Scenario 2 -- RCS Water Level

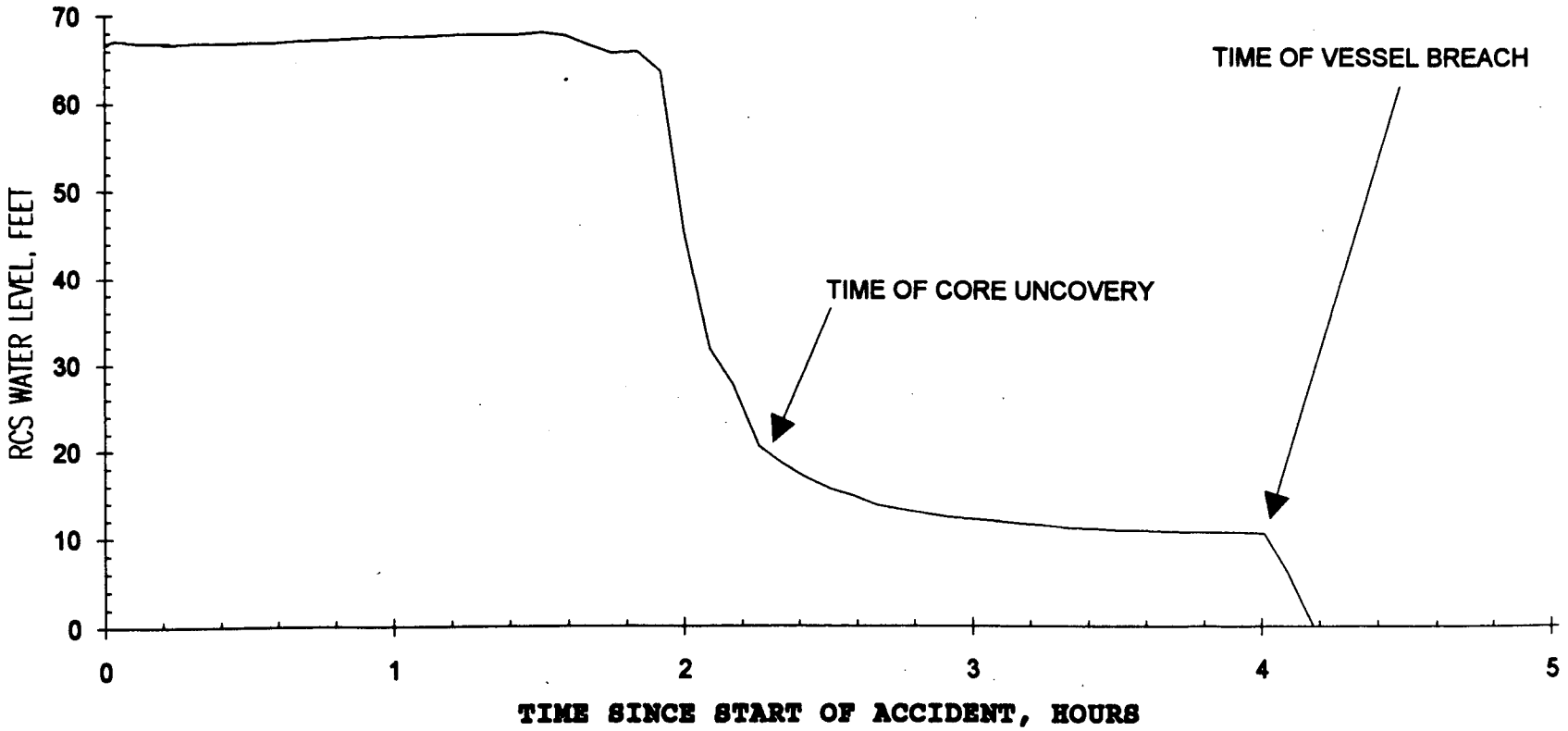


Figure K2.2.4 Accident Scenario 2 -- Containment Pressure

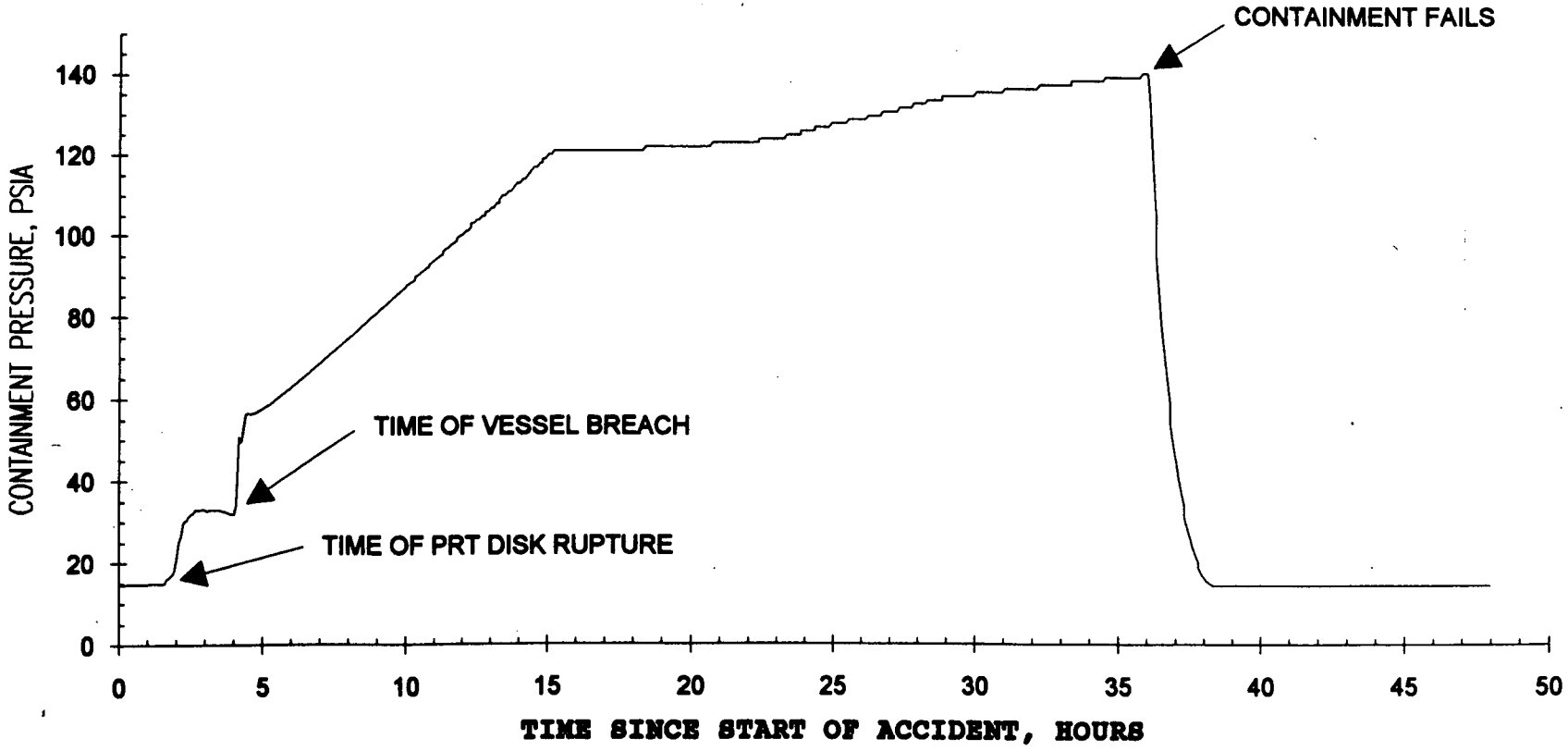
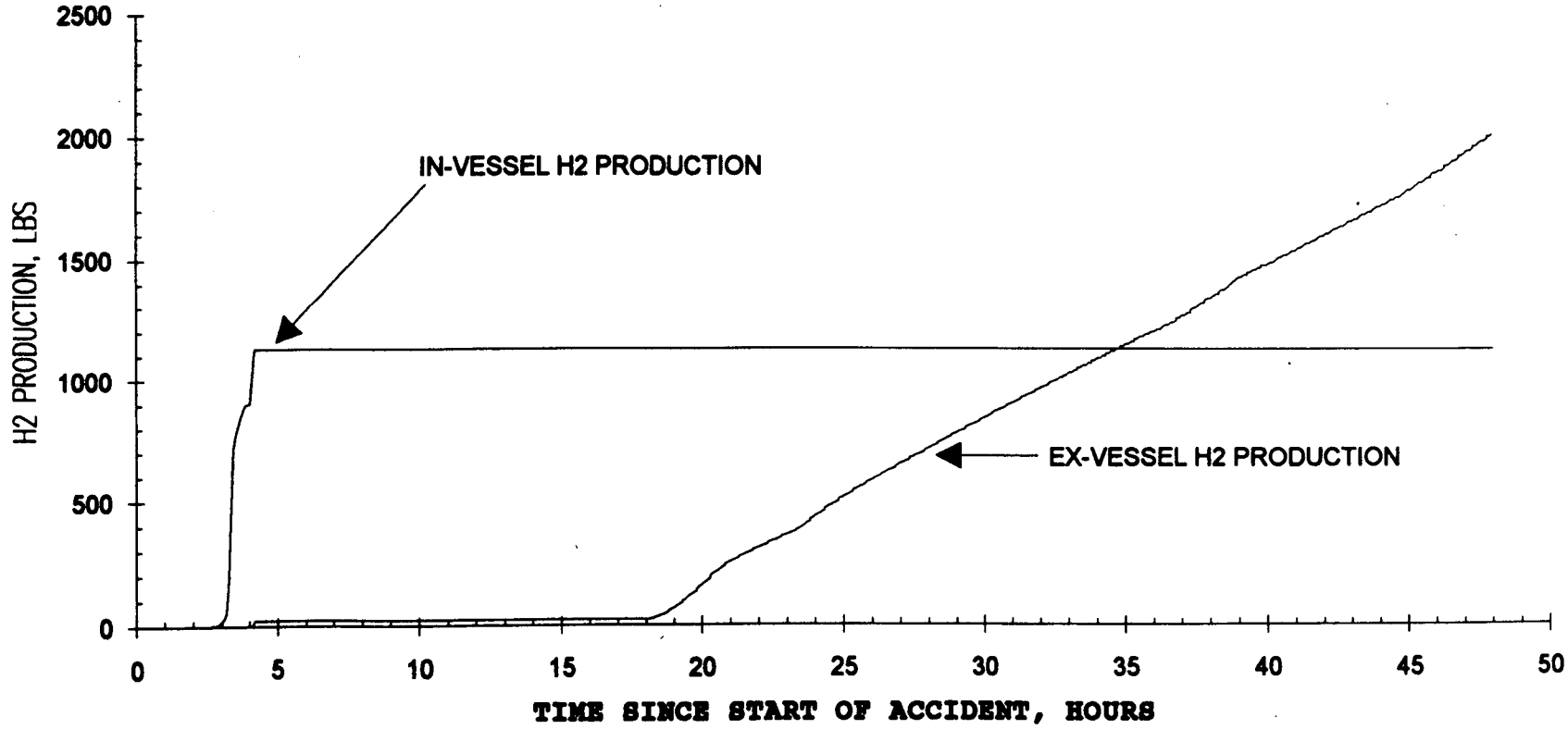


Figure K2.2.5 Accident Scenario 2 -- Hydrogen Production



K2.3 ACCIDENT SCENARIO 3 -- LARGE LOCA WITH RECIRCULATION CORE COOLING FAILURE

A large LOCA is initiated by a reactor coolant hot leg pipe rupture at the 67-ft elevation (34 feet from the bottom of the reactor vessel head). Because of the size of rupture, the RCS depressurizes very rapidly (Figure K2.3.1). Low RCS pressure (<675 psia) causes the accumulators to discharge, the accumulators emptying in 54 seconds. Because pressurizer water level decreases rapidly, both high- and low-head safety injection systems initiate to provide adequate core cooling, maintaining RCS water level at the break elevation. Upon RWST depletion, switch-over to long-term recirculation fails and is considered non-recoverable. The ensuing RCS boil-off (Figure K2.3.2) leads to the core being uncovered and core damage. Because of metal-water reactions, hydrogen is produced.

Support plate failure is predicted to occur at 273 minutes because of debris relocation and accumulation on the core support plate. Lower head vessel failure occurs 8 minutes later.

Containment pressure to this accident sequence is shown in Figure K2.3.3. The containment pressure rises to 42 psia after the initial RCS blowdown and then decreases to 17 psia, because of containment fan cooler and spray operation and steam condensation on the containment concrete structures. After the failure of recirculation core cooling at 59 minutes, the ensuing core boil-off generates sufficient steam and hydrogen to raise the containment pressure to 23 psia. After RCS boil-off, steam and hydrogen generation rates decrease, allowing the containment fan coolers to lower the containment pressure to 20 psia. A final containment pressure rise from 20 psia to 28 psia occurs at vessel breach as the core debris reacts with water in the reactor pit. The reactor pit water level drops rapidly from 25 feet to 0.12 feet over a 5 minute period after vessel breach (Figure K2.3.4).

The hydrogen production history predicted by MAAP/PWR is depicted in Figure K2.3.5. The total amount of hydrogen produced in-vessel is about 872 lbs. Ex-vessel hydrogen production, however, is only about 15 lbs because the core debris inside the reactor pit is quenched by water present at the time of vessel breach. MAAP/PWR also predicts that no hydrogen burns will occur at vessel breach.

Figure K2.3.1 Accident Scenario 3 -- RCS Pressure

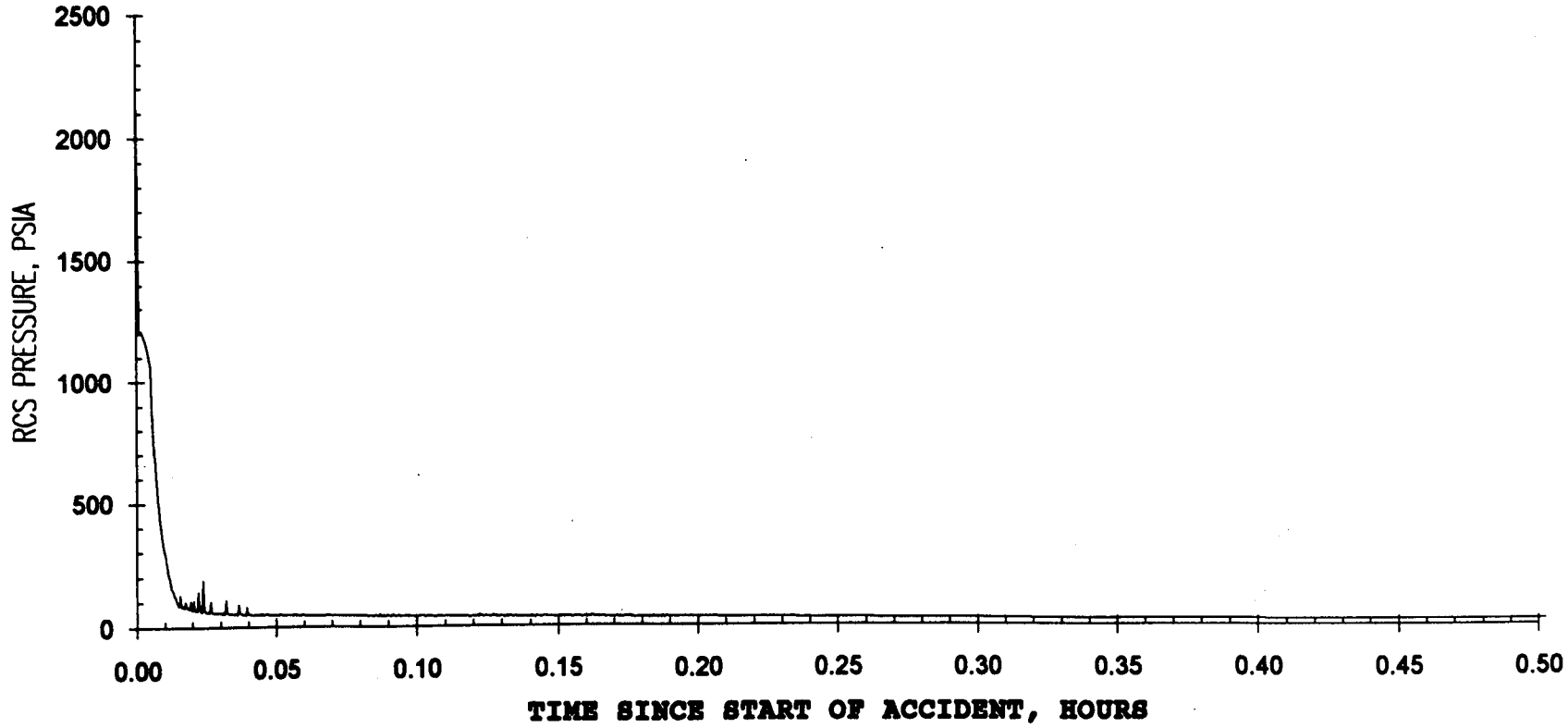


Figure K2.3.2 Accident Scenario 3 -- RCS Water Level

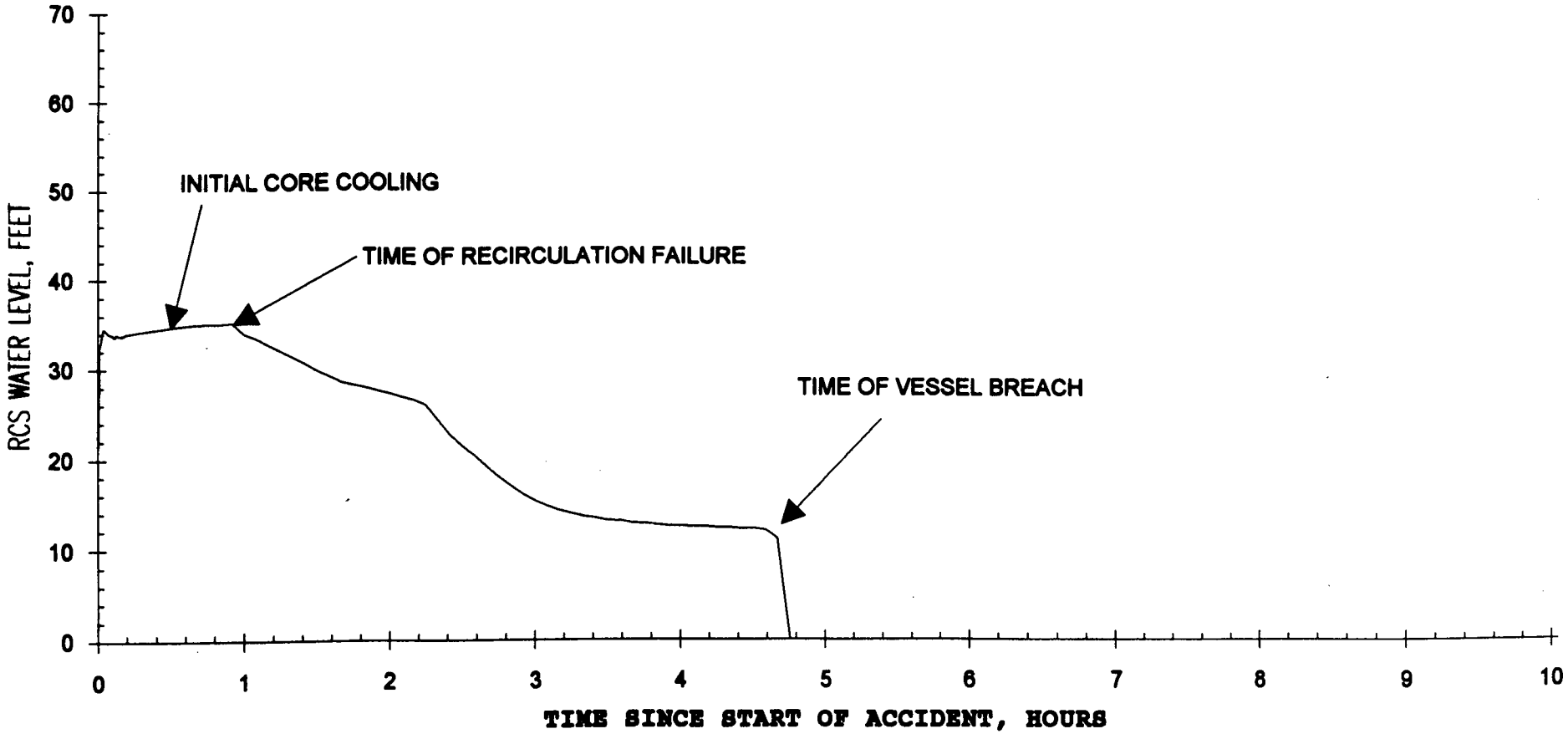


Figure K2.3.3 Accident Scenario 3 -- Containment Pressure

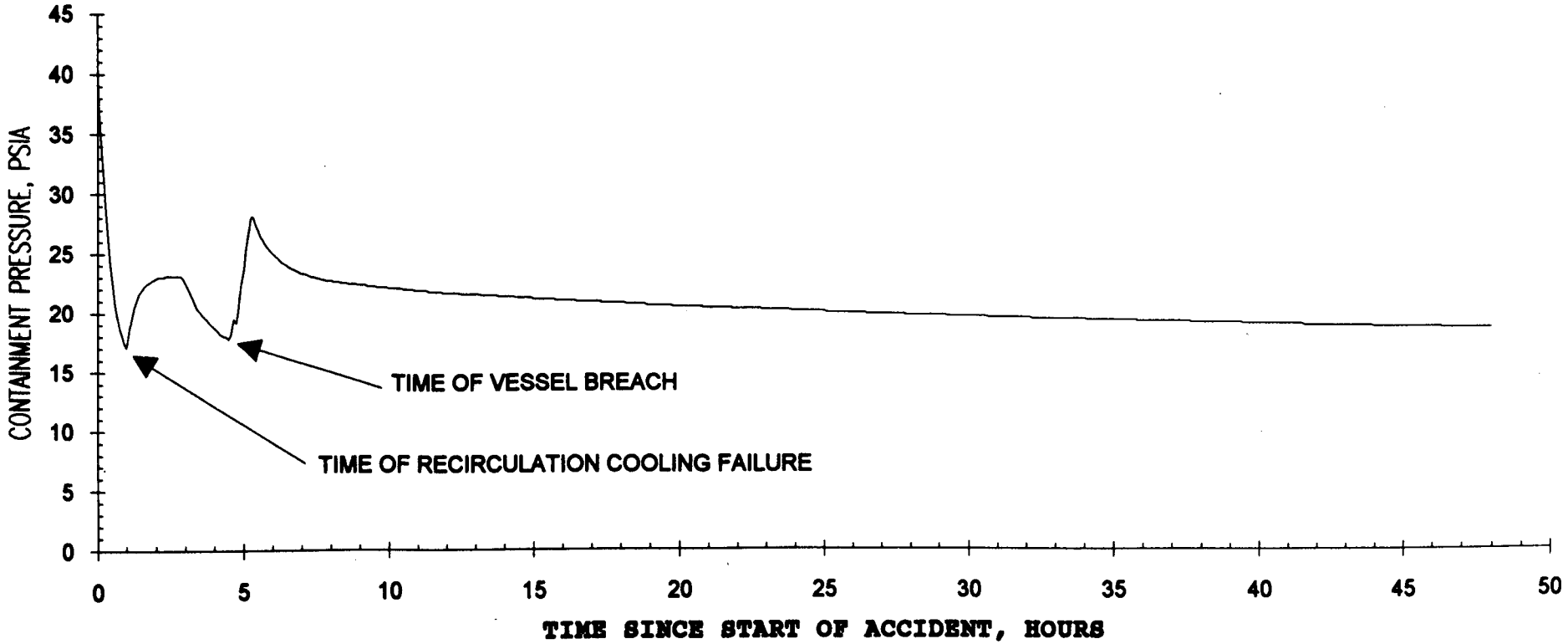


Figure K2.3.4 Accident Scenario 3 -- Reactor Pit Water Level

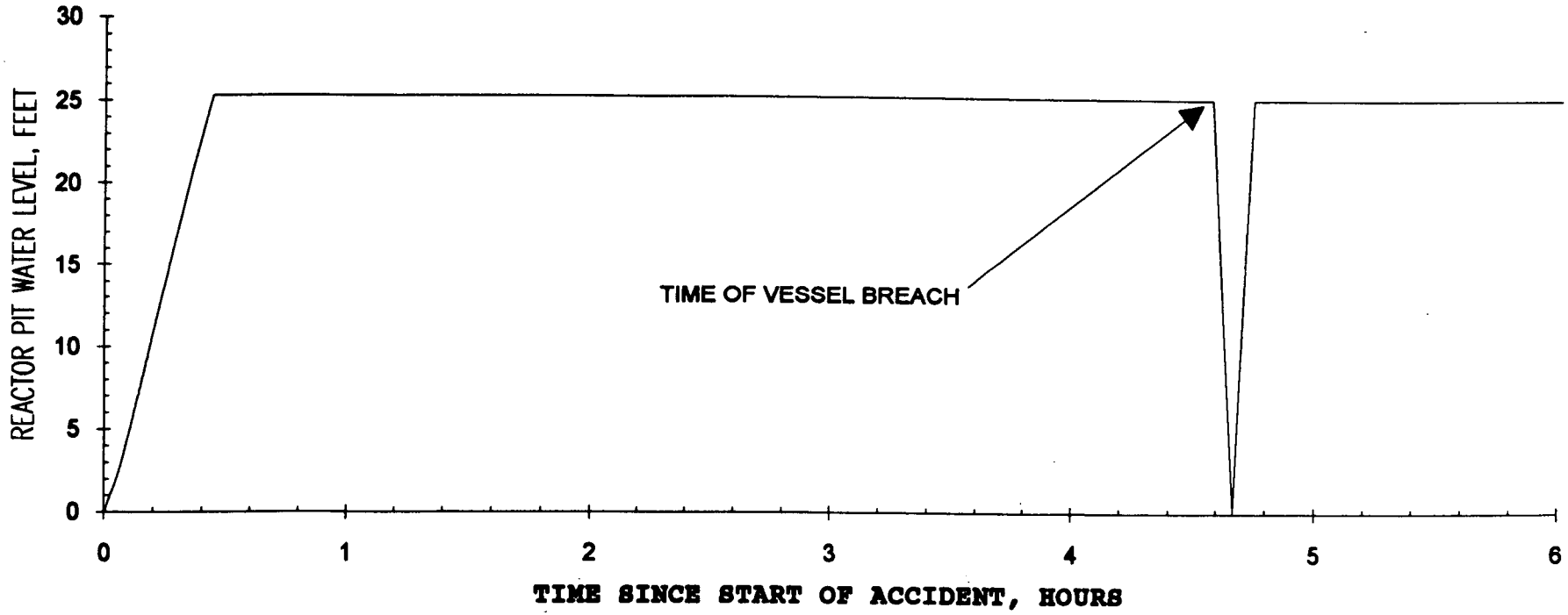
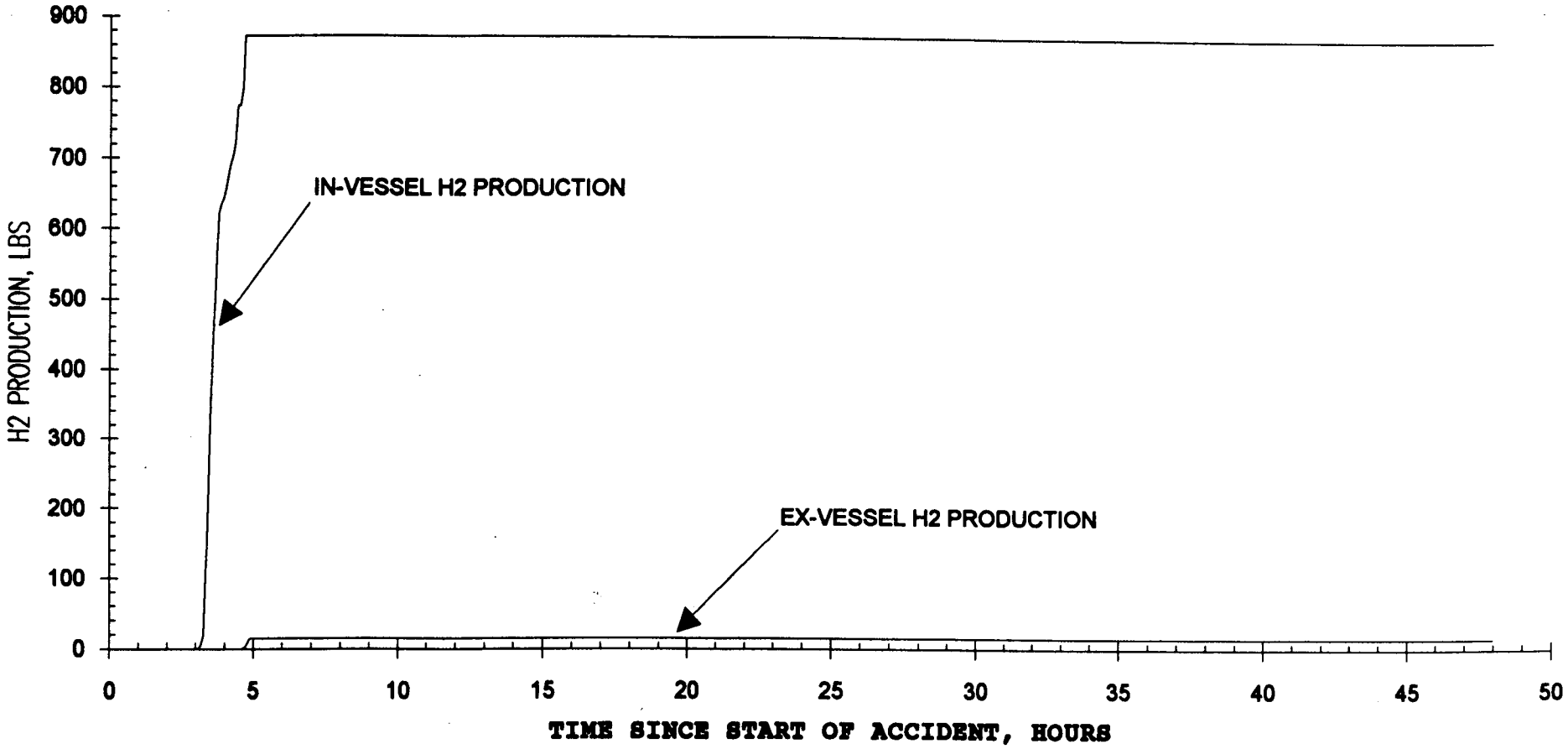


Figure K2.3.5 Accident Scenario 3 -- Hydrogen Production



K2.4 ACCIDENT SCENARIO 4 – LONG-TERM STATION BLACKOUT WITH RCP SEAL LOCA AND NO AC POWER RECOVERY

This accident scenario is initiated by loss of offsite power with a subsequent loss of onsite emergency power. AFW flow to the steam generators is provided by the steam-turbine-driven AFW pump. RCS integrity is breached because of RCP seal failure after 30 minutes. Make-up to the steam generators continues until, after 240 minutes, the dc batteries are completely depleted. For the first 30 minutes, RCS pressure is similar to that predicted for Accident Scenario 1. After RCP seal failure, however, RCS pressure falls to 700 psia. (Figure K2.4.1). Because the SBO renders all core make-up systems unavailable, RCS inventory will decrease (Figure K2.4.2) and the core is uncovered at 165 minutes (or 135 minutes after RCP seal failure). Once the core is uncovered, it starts to heat up and the metals within it interact with the steam, producing hydrogen.

Debris from the core melt progression will accumulate on the core support plate such that, at 326 minutes, the plate fails. Upon plate failure, RCS pressure increases from 700 psia to 1050 psia. Continued debris relocation into the lower region of the reactor vessel leads to vessel failure, via a failed instrument penetration, at 335 minutes.

The steam generator water level response is depicted in Figure K2.4.3. Although the AFW steam-turbine-driven pump is assumed to fail upon battery depletion, rapid steam generator boil-off does not occur because the RCP seal LOCA removes sufficient heat from the RCS to lessen heat transfer from the primary to secondary-side. MAAP/PWR predicts steam generator dryout after 41.8 hours.

Containment pressure during this accident sequence is shown in Figure K2.2.4. Containment pressure slowly increases from the onset of the SBO event until vessel breach, at which time a pressure spike from 30.9 psia to 42.0 psia is predicted by MAAP/PWR. Sustained core-concrete interactions from decay heat will slowly pressurize the containment until containment failure results at 40 hours. Containment depressurization follows through a containment leak area of 0.1 ft^2.

The hydrogen production history is depicted in Figure K2.4.5. About 942 lbs of hydrogen is produced in-vessel and about 680 lbs of hydrogen is produced ex-vessel during core-concrete interactions. However, the hydrogen does not burn because the containment atmosphere is steam inerted and, without ac power, no ignition sources are present.

Figure K2.4.1 Accident Scenario 4 -- RCS Pressure

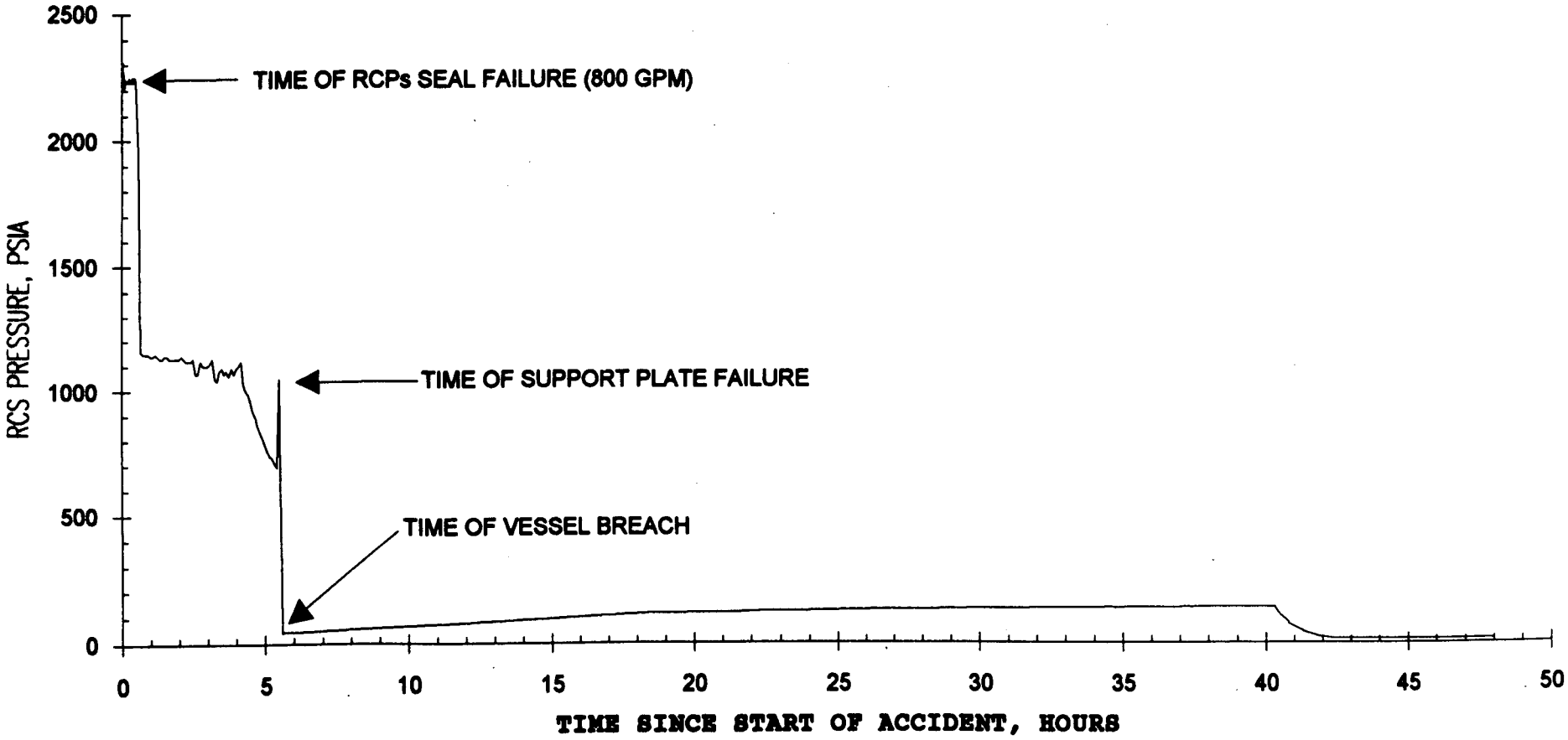


Figure K2.4.2 Accident Scenario 4 -- RCS Water Level

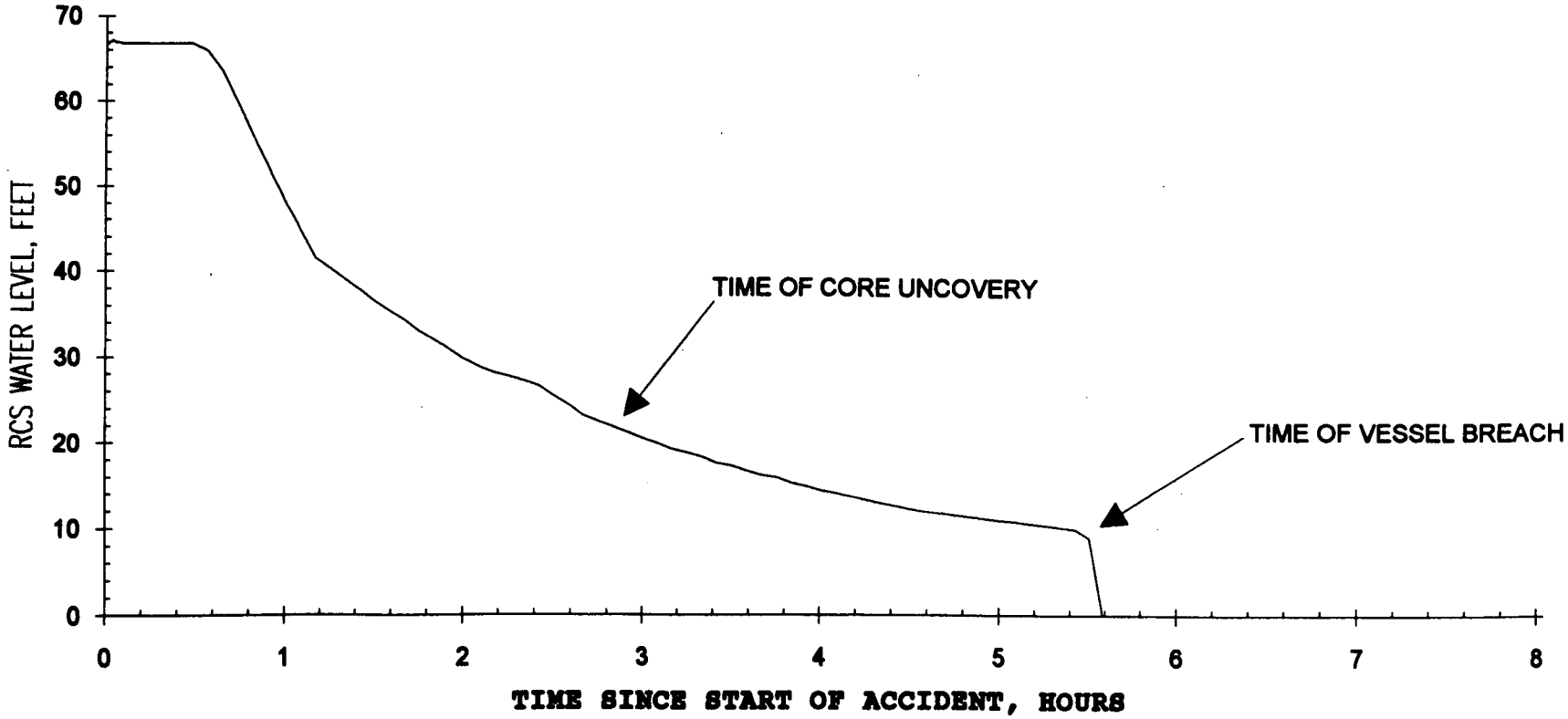


Figure K2.4.3 Accident Scenario 4 -- Steam Generator Water Level

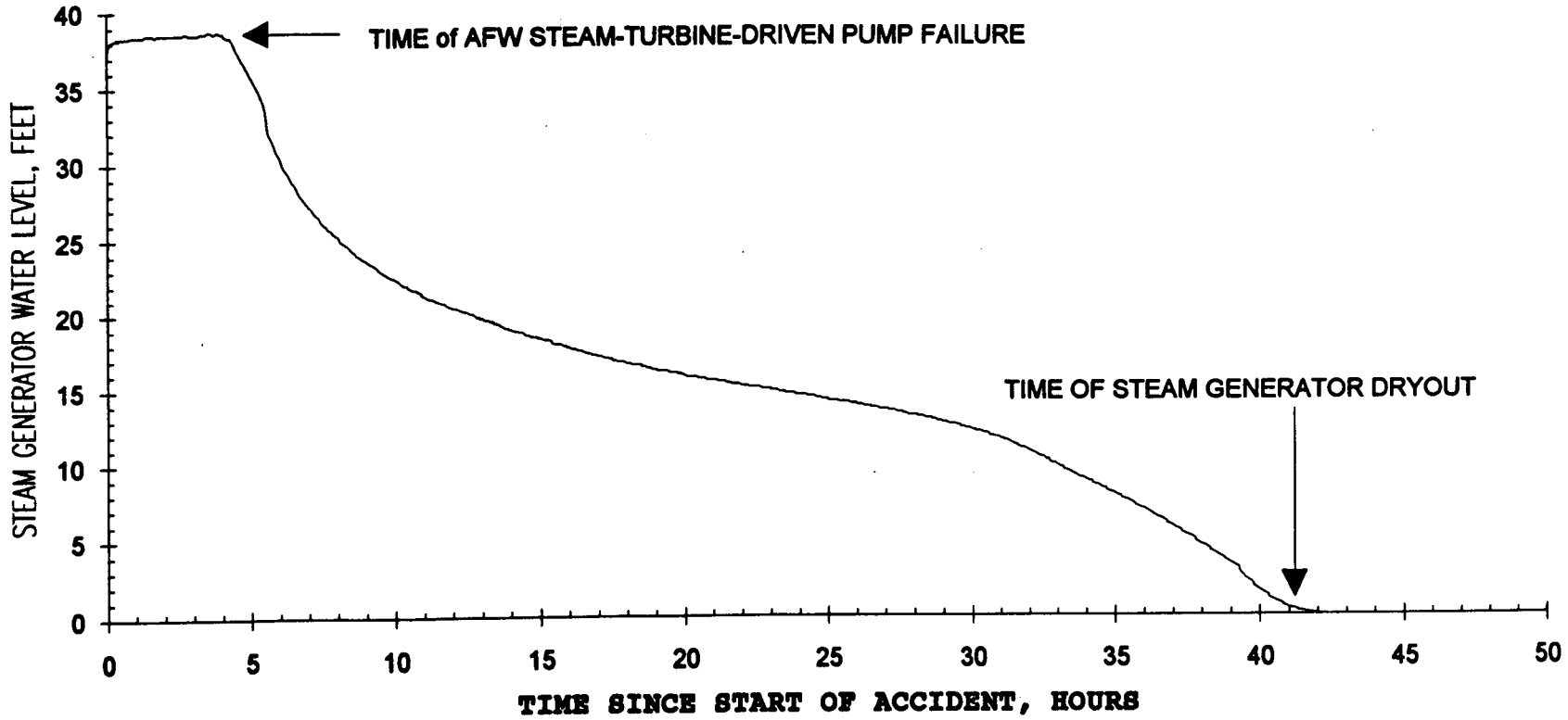


Figure K2.4.4 Accident Scenario 4 -- Containment Pressure

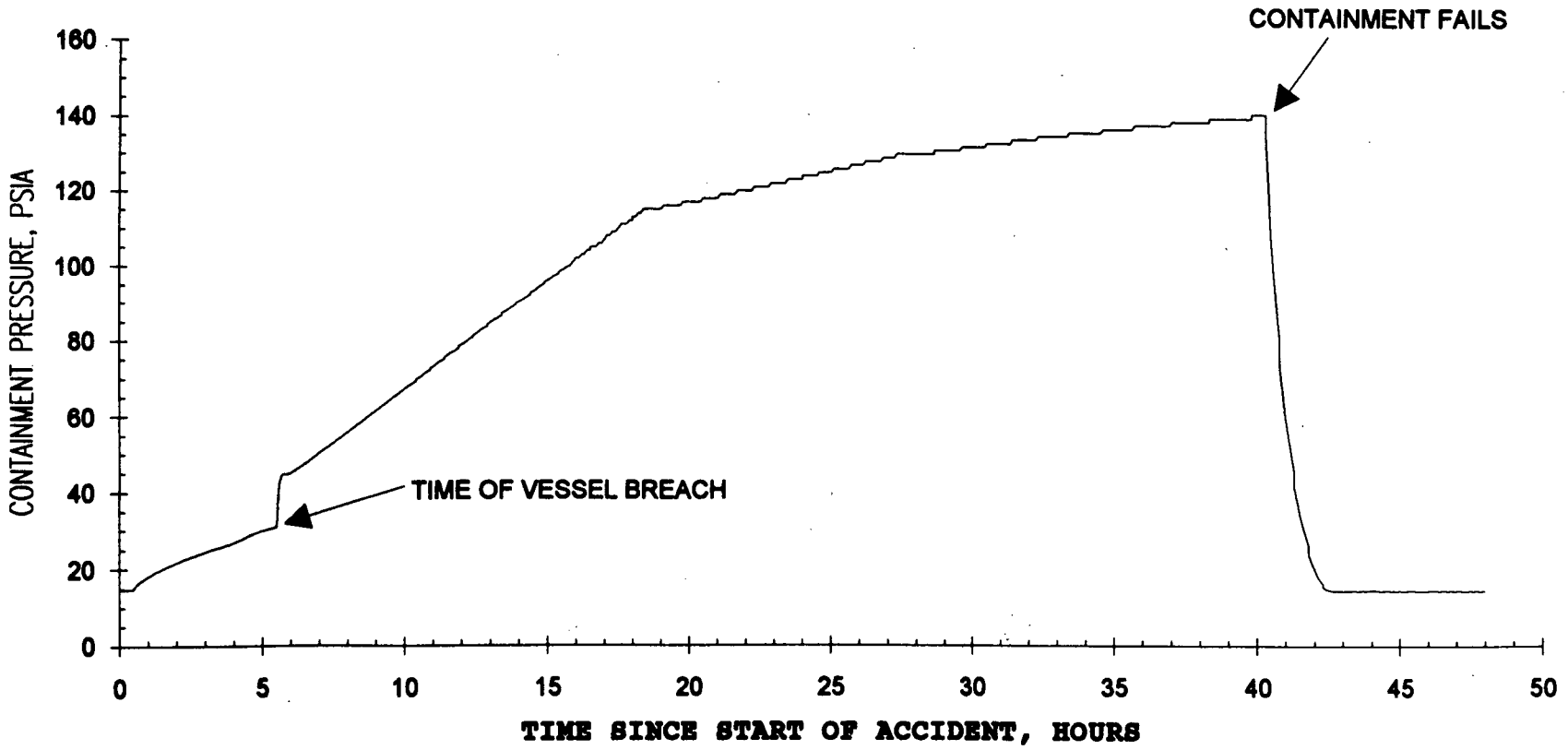
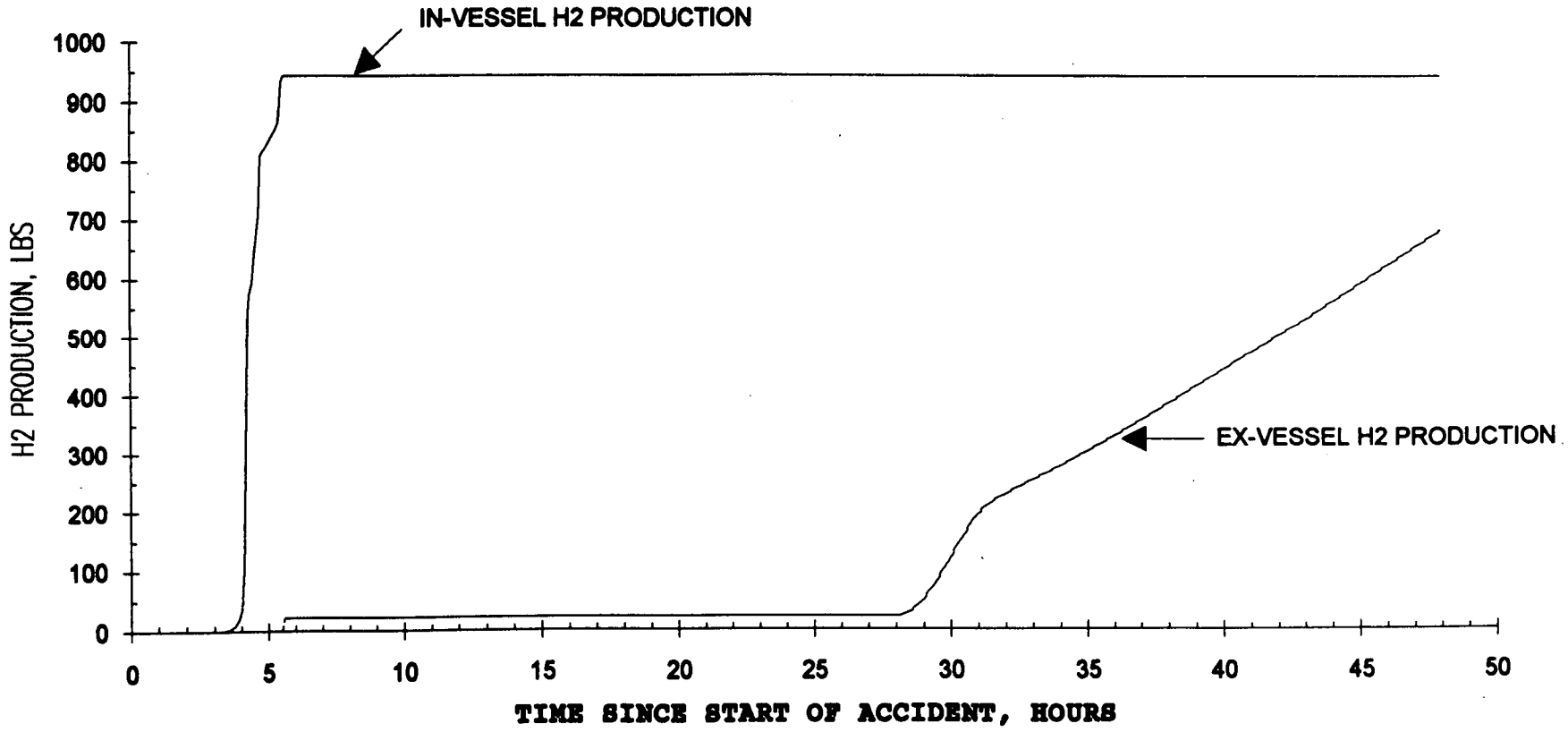


Figure K2.4.5 Accident Scenario 4 -- Hydrogen Production

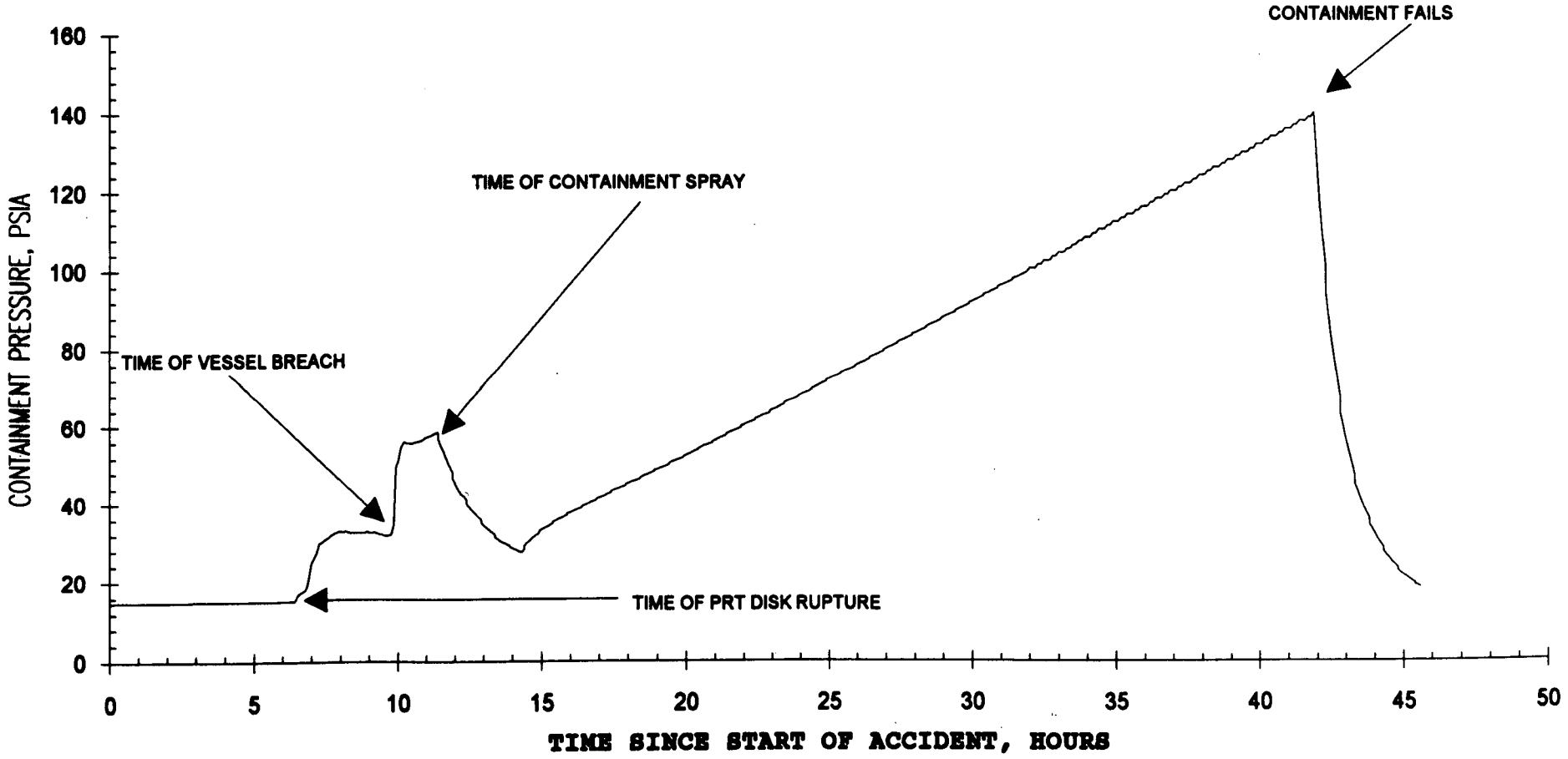


K2.5 ACCIDENT SCENARIO 5 -- LONG-TERM STATION BLACKOUT WITH AC POWER RECOVERY AFTER VESSEL BREACH

In terms of RCS and containment behavior, this accident scenario is essentially identical to Accident Scenario 1 until after vessel breach. However, 90 minutes after vessel breach (712 minutes from accident initiation), ac power is restored and containment sprays start to operate in their injection mode. Initially, the RWST provides the water inventory; after RWST depletion, containment recirculation spray is aligned through the RHR heat exchangers with the containment sumps as the source of water. Other ECC or containment heat removal systems are not restored, however.

Containment pressure during this accident sequence is shown in Figure K2.5.1. The containment pressure rises after the primary relief tank disk ruptures at 417 minutes. A second rapid containment pressure rise from 35.1 to 51.2 psia occurs after vessel breach. After restoration of ac power and actuation of the containment spray system at 712 minutes, containment pressure decreases to 27.4 psia. Following RWST depletion, containment spray recirculation is aligned by 843 minutes. However, without containment heat removal (no RHR heat exchangers or fan coolers are available), containment pressure increases until containment failure results at 43 hours. Containment depressurization through a containment leak area of 0.1 ft^2 follows.

Figure K2.5.1 Accident Scenario 5 -- Containment Pressure

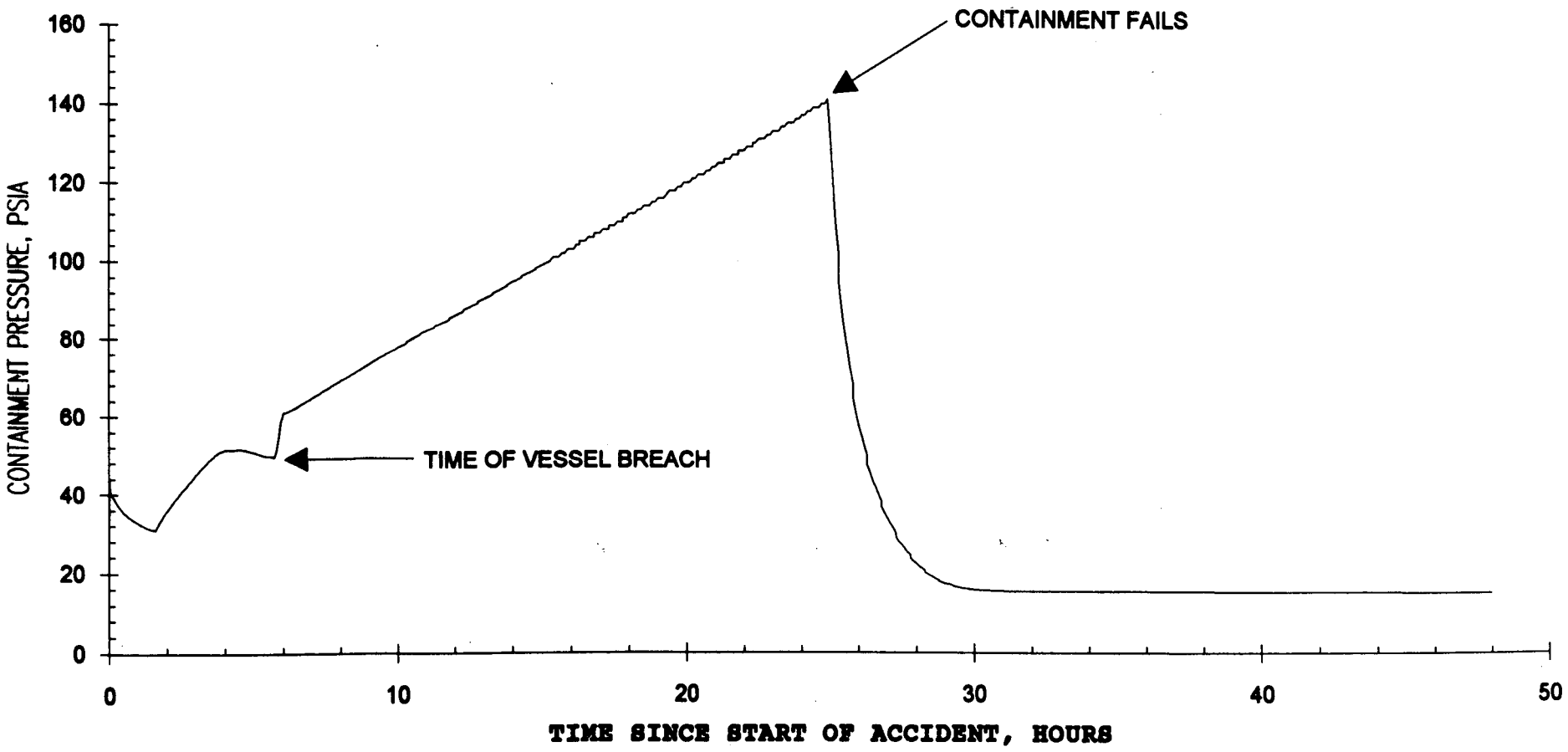


K2.6 ACCIDENT SCENARIO 6 -- LARGE LOCA WITH RECIRCULATION CORE COOLING AND CONTAINMENT HEAT REMOVAL FAILURES

In terms of early RCS and containment behavior, this accident scenario is similar to Accident Scenario 3 (Section K2.3), except that containment heat removal is unavailable. Thus, unlike Accident Scenario 3, late containment overpressurization failure occurs.

Containment pressure during this accident sequence is shown in Figure K2.6.1. Containment pressure rises to 44 psia after the initial RCS blowdown and then decreases to 31 psia, because of steam condensation on the containment concrete structures. After recirculation core cooling failure at 88 minutes, the ensuing reactor coolant boil-off and core melt generates sufficient steam and hydrogen to raise the containment pressure and cause it to fail at 25 hours. Containment depressurization through a containment leak area of 0.1 ft^2 follows.

Figure K2.6.1 Accident Scenario 6 -- Containment Pressure



K2.7 ACCIDENT SCENARIO 7 -- SMALL LOCA WITH ECCS FAILURE

A small LOCA is initiated by a reactor coolant hot leg pipe break at the 67-ft elevation. The RCS depressurizes slowly (Figure K2.7.1). Operation of the AFW system provides secondary-side cooling (Figure K2.7.2) and augments RCS depressurization. As pressurizer pressure decreases, both high- and low-head safety injection systems receive an initiation signal for core cooling. However, no injection or recirculation core cooling is available. The ensuing boil-off of reactor coolant leads to the core being uncovered at 49 minutes (Figure K2.7.3) and subsequent core damage. Because of metal-water reactions, hydrogen is produced.

Support plate failure is predicted to occur at 137 minutes because of debris relocation and accumulation on the core support plate. The lower head of the vessel fails 8 minutes later.

The containment response during this accident sequence is shown in Figure K2.7.4. Containment pressure rises slowly because of the evolution of steam and hydrogen that accompany the leakage of reactor coolant into the containment and reactor coolant boil-off in the core. At vessel breach, containment pressure is 36 psia. Following vessel breach, as the core debris reacts with water in the reactor pit, containment pressure rises to 39 psia. The resulting pressure spike will actuate the containment spray system (containment pressure >37.6 psia), which will lower containment pressure to 26 psia. After RWST depletion, containment recirculation spray is aligned, but, because the RHR heat exchangers are unavailable for decay heat removal, continued steam and hydrogen generation will raise the containment pressure until containment failure results at 29 hours. Containment depressurization through a containment leak area of 0.1 ft^2 follows.

The hydrogen production history predicted by MAAP/PWR is depicted in Figure K2.7.4. About 799 lbs of hydrogen is produced in-vessel and about 486 lbs of hydrogen is produced ex-vessel during core-concrete interactions.

Figure K2.7.1 Accident Scenario 7 -- RCS Pressure

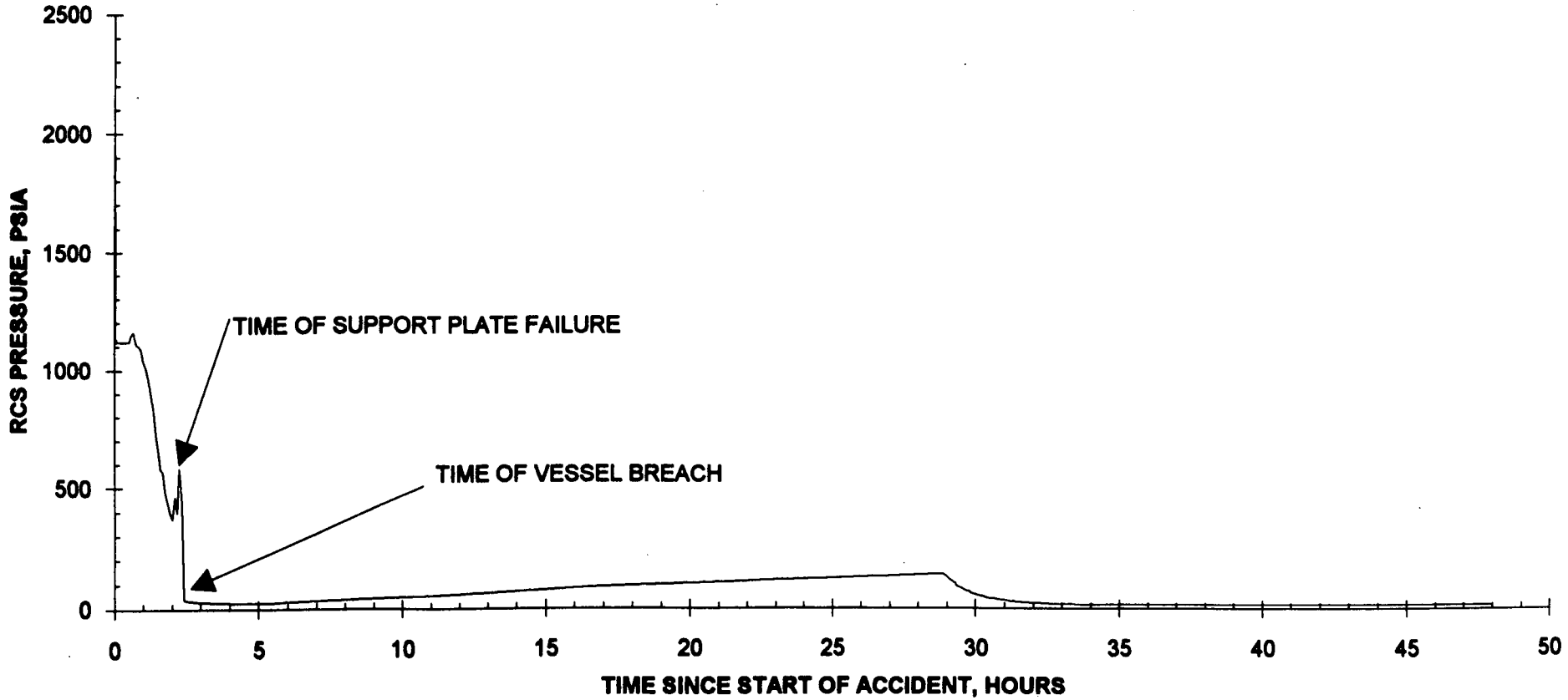


Figure K2.7.2 Accident Scenario 7 -- Steam Generator Water Level

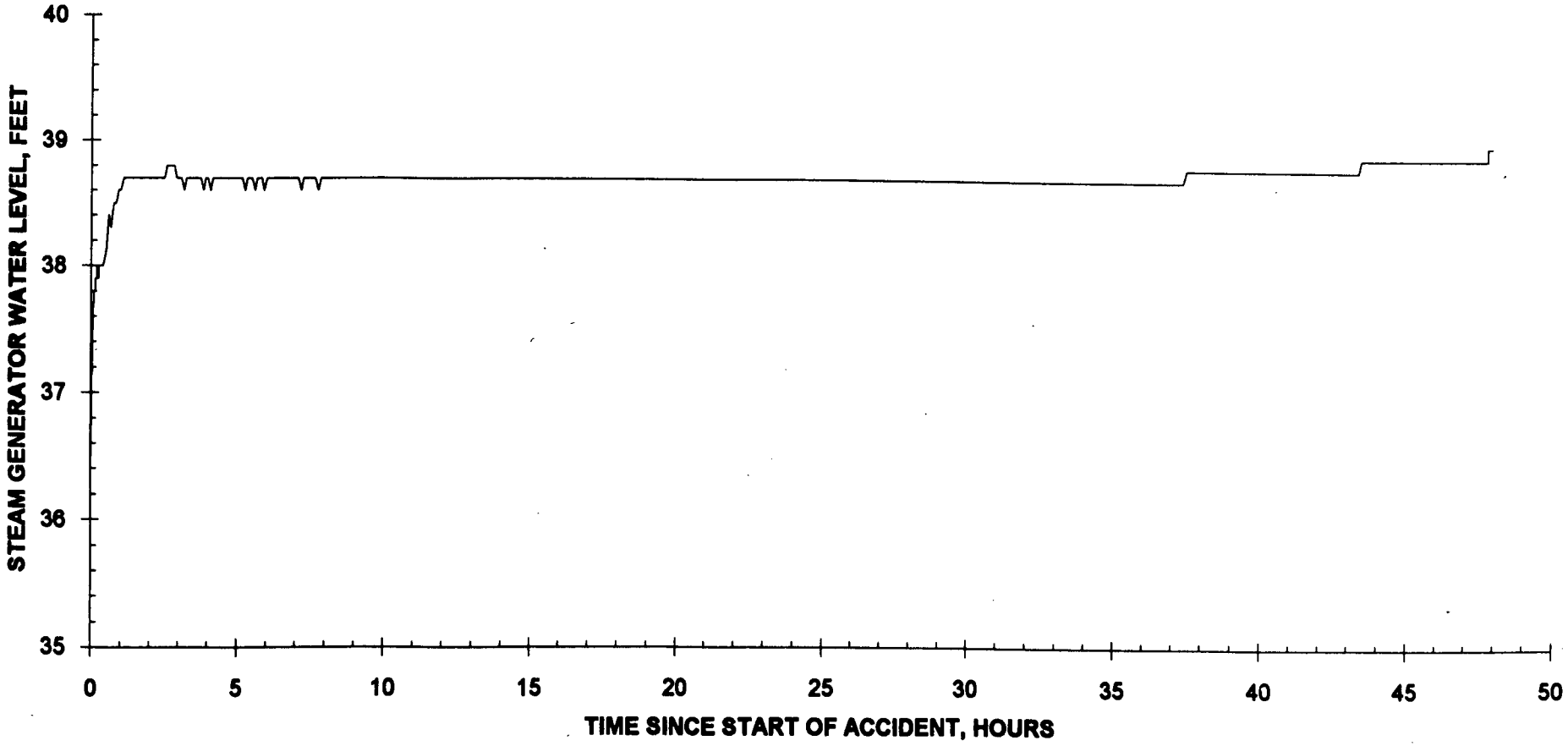


Figure K2.7.3 Accident Scenario 7 -- RCS Water Level

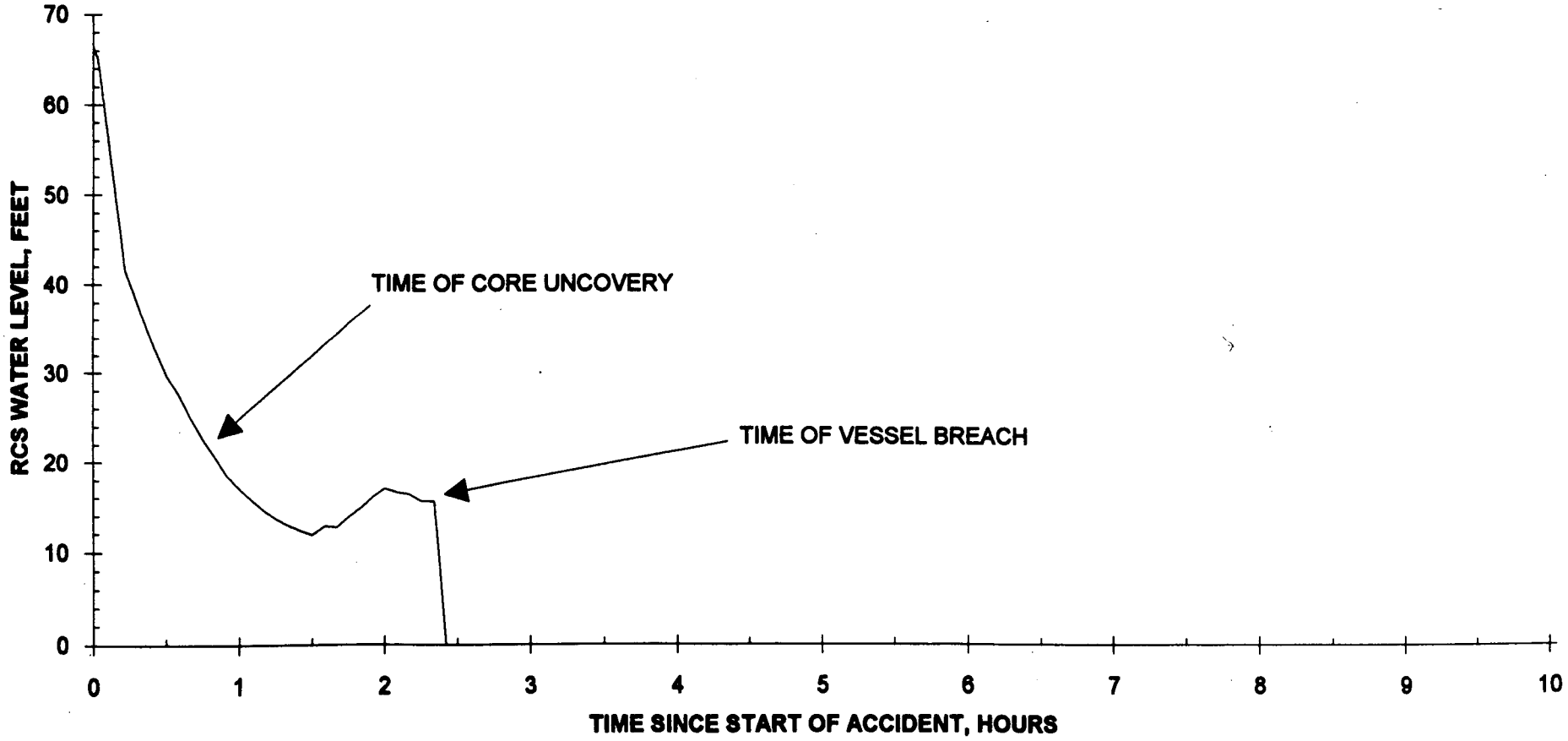


Figure K2.7.4 Accident Scenario 7 -- Containment Pressure

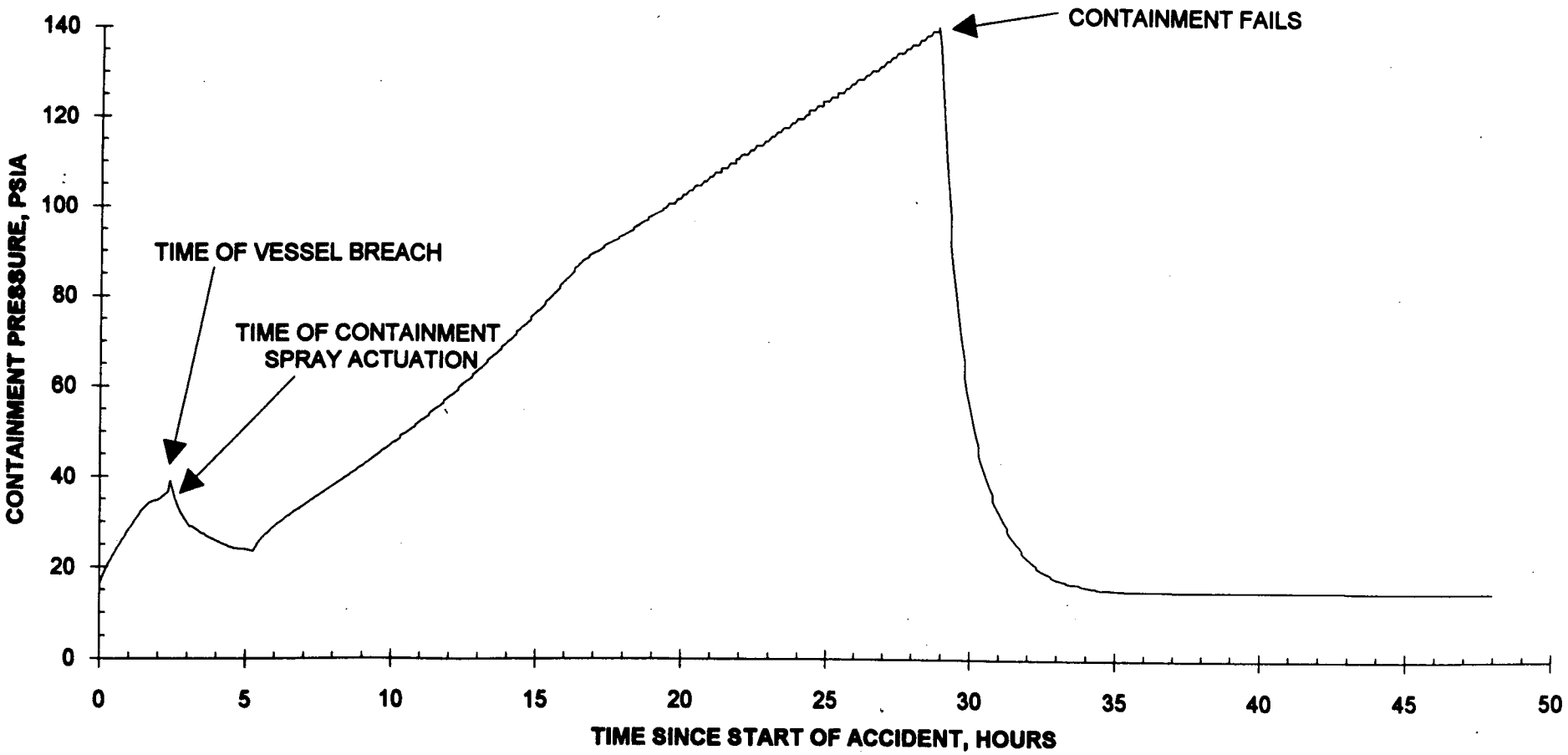
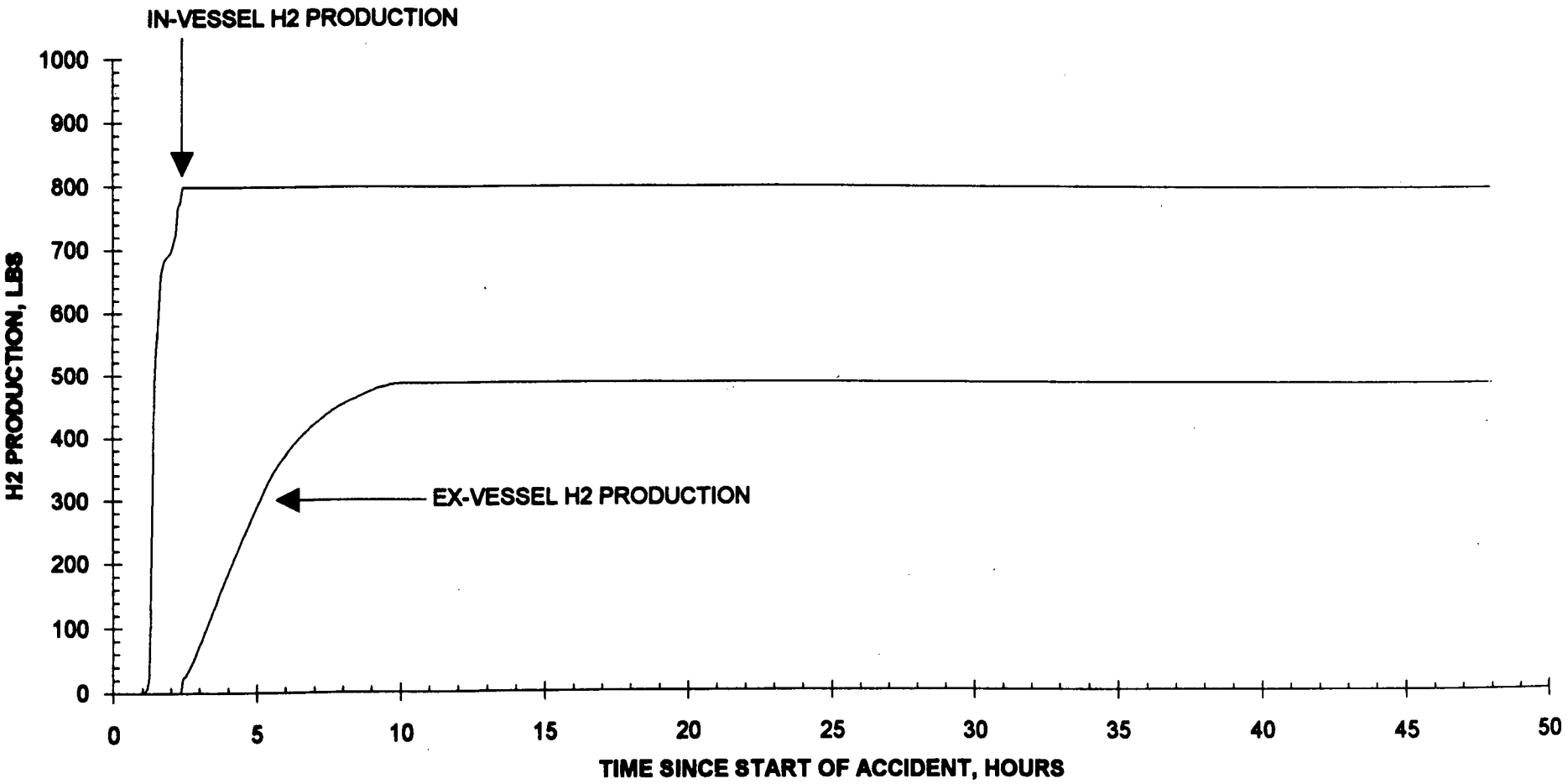


Figure K2.7.5 Accident Scenario 7 -- Hydrogen Production



K2.8 ACCIDENT SCENARIO 8 -- LONG-TERM STATION BLACKOUT WITH AC POWER RECOVERY AFTER VESSEL BREACH AND LOWER FLAT PLATE CRITICAL HEAT FLUX

This accident scenario differs from Accident Scenario 5 only in that the coolant heat flux parameter for flat plat critical heat flux (FCHF) is reduced from 0.14 for Accident Scenario 5 to a more realistic 0.015 here. This change reduces heat loss to the coolant and so allows core-concrete interactions to occur. The occurrence of core-concrete interactions impacts fission product release. However, the overlaying water pool provided by containment spray operation will provide some decontamination.

K2.9 ACCIDENT SCENARIO 9 -- SHORT-TERM STATION BLACKOUT WITHOUT AC POWER RECOVERY AND CONTAINMENT RUPTURE FAILURE

This accident scenario is essentially identical to Accident Scenario 2 until containment failure. However, this accident scenario postulates a rupture containment failure mode with a leak area of 1.0 ft^2. The resulting containment depressurization is depicted in Figure K2.9.1.

K2.10 ACCIDENT SCENARIO 10 -- LONG-TERM STATION BLACKOUT WITH AC POWER RECOVERY AFTER VESSEL BREACH AND CONTAINMENT RUPTURE FAILURE

This accident scenario is essentially identical to Accident Scenario 5 until containment failure. However, this accident scenario postulates rupture as the containment failure mode with a leak area of 1.0 ft^2. The resulting containment depressurization is depicted in Figure K2.10.1.

Figure K2.9.1 Accident Scenario 9 -- Containment Pressure

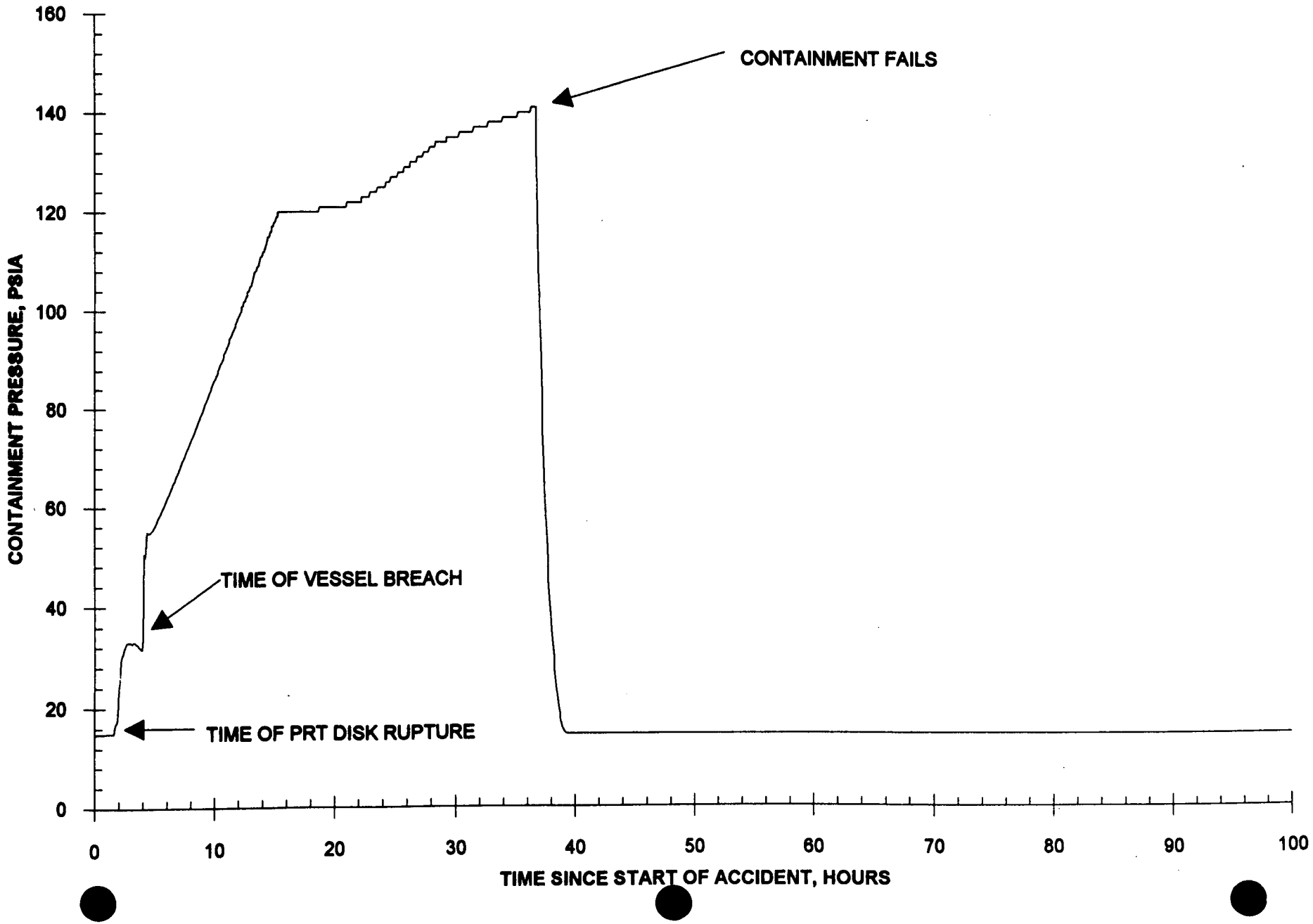
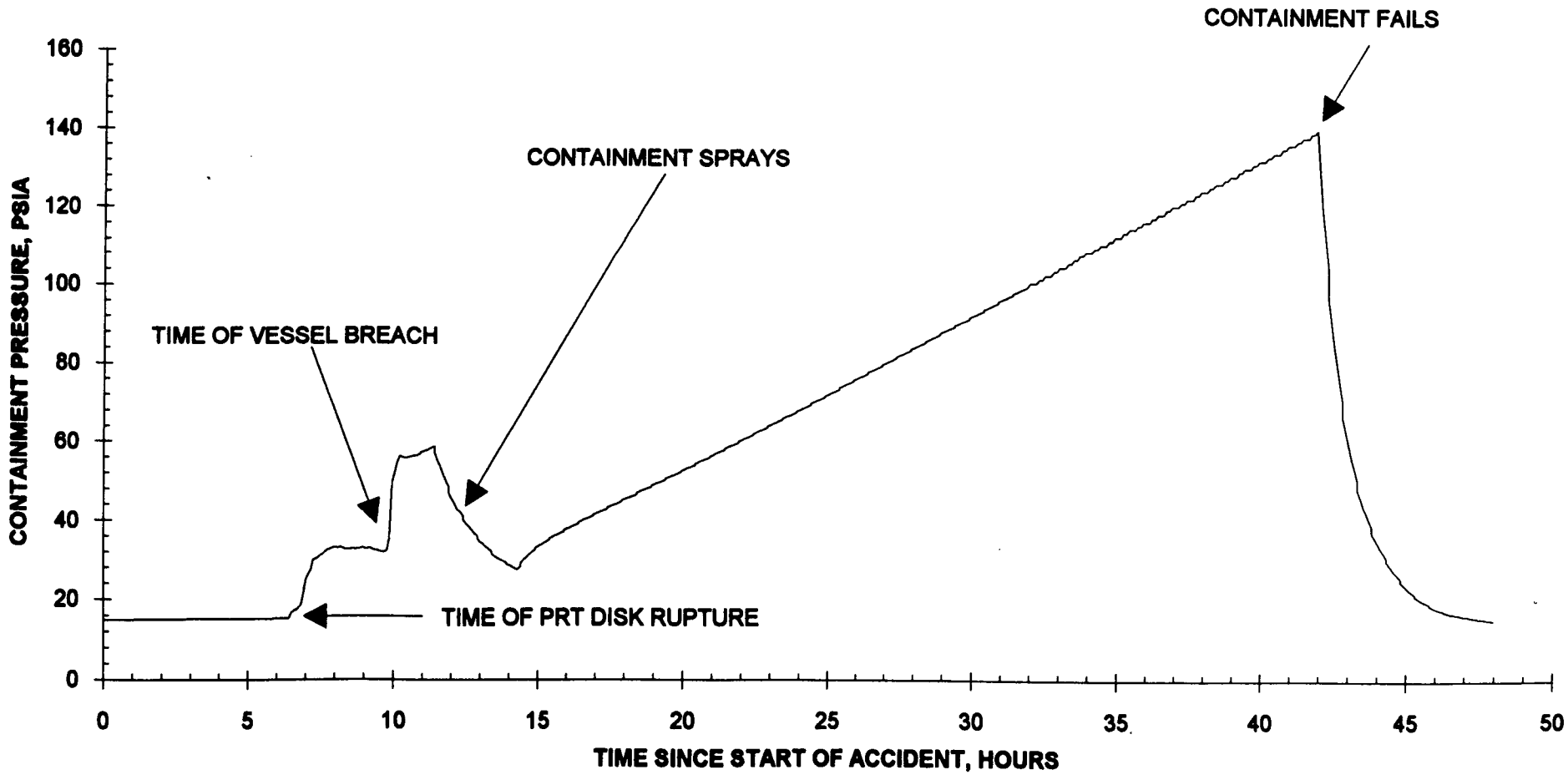


Figure K2.10.1 - Accident Scenario 10 -- Containment Pressure



K2.11 SUMMARY OF RESULTS

The predicted response to postulated accident scenarios determined to be significant contributors to the core damage frequency is summarized in Tables K2.11.1 and K2.11.2.

Table K2.11.1

Summary of Events Timing for Accident Scenarios

Accident Scenario	Time Core Uncovered (mins)	Fuel Temp. > 2200°F (mins)	Support Plate Failure (mins)	Reactor Vessel Breach (mins)	Containment Pressure > 115 psia (mins)	Containment Pressure > 140 psia (mins)	Zr Reacted In Vessel (%)
1	433	516	585	593	1326	2802	58
2	134	187	241	249	858	2058	47
3	0.47	193	273	281	NA	NA	43
4	165	240	326	335	1146	2388	48
5	433	516	585	593	2136	2508	58
6	0.47	239	324	332	1134	1488	45
7	49	76	137	145	1368	1716	42
8	434	516	589	598	2136	2514	48
9	134	187	241	249	858	2058	47
10	433	516	585	593	2136	2508	58

Table K2.11.2

Summary of Predicted Quantities for Accident Scenarios

Accident Scenario	In-Vessel H_2 Production (lbs)	Ex-Vessel H_2 Production (lbs)	RCS Pressure at Vessel Breach (psia)	Containment Pressure Before Vessel Breach (psia)	Peak Containment Pressure After Vessel Breach (psia)	Containment Pressure Rise at Vessel Breach (psia)
1	1140	1260	2430	35.1	51.2	16.1
2	1130	2020	2470	34.2	50.7	16.5
3	872	15	20	19.5	28.1	8.6
4	942	680	1050	30.9	42.0	11.1
5	1140	23	2430	35.1	51.2	16.1
6	879	10	50	50.0	61.0	11.0
7	799	486	440	36	39	3
8	937	32	2470	33.4	46.1	12.7
9	1130	2020	2470	34.2	50.7	16.5
10	1140	23	2430	35.1	51..2	16.1

APPENDIX L

CALCULATION OF SOURCE TERM PARAMETERS FROM MAAP CALCULATIONS

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L3	Assumptions	L-4
L4	Analysis Methods and Calculations	L-5
L5	Results and Conclusions	L-8

Section L1

INTRODUCTION

The methodology and terms used in the source term algorithm are described in Section 4.8. In this appendix, the calculation of source term parameter values from MAAP calculations is described.

Section L2

INPUT DATA

The input data for the calculation of the source term algorithm parameter values are the output files from the MAAP runs [1,2]. The specific runs are as follows:

Scenario #2

- Station blackout
- High RCS pressure at the onset of core damage
- AC power not recovered
- Sprays unavailable
- Containment heat removal unavailable.
- Leak failure of containment.

Scenario #5

- Station blackout
- Auxiliary feedwater available
- High RCS pressure at the onset of core damage
- AC power recovered before containment failure
- Sprays available.
- Containment heat removal unavailable.
- Leak failure of containment.

Scenario #6

- Large break LOCA
- Low RCS pressure at the onset of core damage
- Sprays unavailable
- Containment heat removal unavailable
- Leak failure of containment.

Scenario #7

- Small break LOCA
- Low-high RCS pressure at the onset of core damage
- Sprays available
- Containment heat removal unavailable
- Leak failure of containment
- Critical heat flux (FCHF) above the debris in the cavity

lowered to 0.015 MW/m^2.

Scenario #8

- As scenario #5 except that critical heat flux (FCHF) above the debris in the cavity lowered to 0.015 MW/m^2.

Scenario #9

- Short term station blackout
- High RCS pressure at the onset of core damage
- AC power not recovered
- Sprays unavailable
- Containment heat removal unavailable
- Containment ruptures (i.e., a break of 1 ft^2 area).

Scenario #10

- As scenario #5 except that containment fails by rupture (i.e., break of 1 ft^2).

Section L3

ASSUMPTIONS

The assumptions made in calculating the source term algorithm parameter values are:

- The release of in-vessel fission products is complete before vessel failure.
- The DF for most aerosols is not specific to fission product (i.e., the DF for tellurium is applicable to cesium, etc.).
- Late and early events are defined relative to the time of vessel failure. Containment failure or spray operation at or before vessel failure is defined as an early event. Containment failure or spray operation after vessel failure is defined as a late event. No absolute time references are used.
- Consequences of natural deposition and sprays decontamination mechanisms are very difficult to distinguish. Therefore, approximations must be made to determine the range of the values possible for a given calculation.

Section L4

ANALYSIS METHODS AND CALCULATIONS

RFs and DFs are calculated in a manner consistent with their definitions: RFs are calculated by dividing the release by the initial mass; DFs are calculated by dividing the mass entering a volume by the mass leaving that volume (e.g., DF_{VSL} is the ratio of released mass in-vessel to the mass in the containment at vessel failure). This method for calculating RFs and DFs from the MAAP output data is described for each source term algorithm parameter.

In-vessel Release Fraction (RF_{IV})

$$RF_{IV} = \frac{\text{Inv Rel}_f}{\text{Initial}_f}$$

where,

Inv Rel_f = The final isotope mass in-vessel release,

Initial_f = The initial isotope.

Decontamination Factor for the RCS (DF_{VSL})

$$DF_{VSL} = \frac{\text{Inv Rel}_v}{\text{Cont}_v}$$

where,

Inv Rel_v = The isotope mass in-vessel release at vessel failure,

Cont_v = The isotope mass in the containment at vessel failure.

Ex-vessel Release Fraction (RF_{CCI})

$$RF_{CCI} = \frac{\text{Exv Rel}_f}{\text{Initial}_f}$$

where,

Exv Rel_f = The final isotope mass ex-vessel release.

Revolatilization Release Fraction (RF_{IV})

$$RF_{REV} = \frac{Ps_v - Ps_f}{Ps_v}$$

where,

Ps_f = The final isotope mass in the primary system,

Ps_v = The isotope mass in the primary system at vessel failure.

Decontamination Factor for the Overlying Pool (DF_{POOL})

$$DF_{POOL} = \frac{\sum \text{Exv Rel}_f}{\sum \text{Exv Rel}_f - \text{Total FP in pool}}$$

where,

total FP in pool = The total fission product removal for the containment water pool.

Decontamination Factor for Containment and Sprays for Ex-vessel Releases (DF_{LCON} and DF_{LSPY})

$$DF_{LCONTANDLSPRY} = \frac{\text{Exv Rel}_f}{\text{From Ct}_f}$$

where,

from Ct_f = The final isotope mass released to the environment.

Decontamination Factor for Containment and Sprays for In-vessel Releases (DF_{ECON} and DF_{ESPY})

If no ex-vessel release has occurred:

$$DF_{ECONTANDESPRY} = \frac{Inv\ Rel_f}{From\ Ct_f}$$

If ex-vessel release has occurred:

[1] Calculate the revolatilization release to the environment (R_{REV}).

[2] Calculate the ex-vessel release to the environment (R_{cci}).

[3] Calculate the in-vessel release to the environment as follows:

$$R_{IV} = \frac{From\ Ct_f}{Initial_f} - R_{REV} - R_{CCI}$$

[4] Calculate the combined DF due to sprays and the containment as follows:

$$DF_{ECONTANDESPY} = \frac{RF_{IV}}{DF_{VSL} * R_{IV}}$$

Section L5

RESULTS AND CONCLUSIONS

For each MAAP run, a description of the accident scenario, a summary of the key events, and an excerpt of results from the MAAP output are presented. Following this, the calculations of the RFs and DFs for each MAAP run are presented. All RFs were calculated for the fission product species represented in the CET. The DFs were calculated using several fission product species, but predominately CsI and CsOH. The values of the source term algorithm parameters, estimated for each accident scenario modeled using MAAP, were used to quantify the CET.

Caculation of RF's and DF's for IP3 MAAP Runs
Accident Progression Scenario # 2

Description of Sequence

- Station Blackout event
- High RCS pressureat the onset of core damage
- AC power is not recovered
- Containment sprays are unavailable
- Containment heat removal is unavailable

Key Results of Calculation

- Steam generators dryout 96 min
- Core uncovery 134 min
- Support plate failure 241 min
- Reactor vessel failure 249 min
- Containment failure (Leak) 36 hrs

Fission Product Mass After Vessel Failure

PS/PZR CONDITIONS: TIME= 15635.7500 SECONDS
4.34326500 HOURS

FISSION PRODUCT MASS BALANCES:

BALANCE 1 = TOTAL MASS AS USED BY MAAP
BALANCE 2 = IN FUEL + INTEGRATED RELEASE FROM FUEL

	NOBLES	CSI	TEO2	SRO	MOO2	CSOH
BAL. 1:	336.49980	29.82664	0.00000	71.19073	260.64260	196.20710
BAL. 2:	336.49880	29.82650	0.00000	71.19073	260.64260	196.20680
INITIAL:	336.50000	29.82595	-0.00103	71.18863	260.63540	196.20220
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	0.00000	2.91176	0.00000	70.91673	215.43130	19.15427
PS:	20.63262	24.41388	0.00000	0.24955	41.60079	163.38130
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	315.86300	2.50095	0.00000	0.02446	3.61047	13.67131
INV REL:	336.49880	26.91473	0.00000	0.27401	45.21129	177.05250
EXV REL:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
FROM CT:	0.00415	0.00004	0.00000	0.00000	0.00004	0.00021

	BAO	LA2O3	CEO2	SB	TE2	UO2
BAL. 1:	85.23715	500.38050	203.66330	1.04101	31.04145	101205.40000
BAL. 2:	85.23715	500.38050	203.66330	1.04101	31.04145	101205.40000
INITIAL:	85.23479	500.36570	203.65720	1.04098	31.04062	101205.50000
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	81.73388	500.06610	203.53540	0.61169	31.04145	101205.40000
PS:	3.18078	0.26177	0.10655	0.27585	0.00000	0.00000
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	0.32249	0.05258	0.02140	0.15348	0.00000	0.00000
INV REL:	3.50327	0.31435	0.12794	0.42932	0.00000	0.00000
EXV REL:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
FROM CT:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Fission Product Mass at Run Termination

PS/PZR CONDITIONS: TIME= 172800.0000 SECONDS
48.00001000 HOURS

FISSION PRODUCT MASS BALANCES:

BALANCE 1 = TOTAL MASS AS USED BY MAAP
BALANCE 2 = IN FUEL + INTEGRATED RELEASE FROM FUEL

	NOBLES	CSI	TEO2	SRO	MOO2	CSOH
BAL. 1:	336.51200	29.82640	20.89896	71.19114	260.63120	196.20490
BAL. 2:	336.49880	29.82650	20.89902	71.19115	260.63170	196.20690
INITIAL:	336.50000	29.82595	20.90330	71.18863	260.63540	196.20220
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	0.00000	1.19890	0.00000	70.90581	215.42040	0.78141
PS:	0.01210	23.96885	2.12691	0.24962	41.59998	158.35570
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	26.56261	3.73915	14.46414	0.03469	3.59457	28.29259
INV REL:	336.49880	26.91473	0.00000	0.27401	45.21129	177.05250
EXV REL:	75.71734	1.71286	20.89902	0.01134	0.00002	18.37296
FROM CT:	309.93730	0.91950	4.30790	0.00102	0.01621	8.77516

	BAO	LA2O3	CEO2	SB	TE2	UO2
BAL. 1:	85.23653	500.37670	203.66430	1.04083	14.29202	101205.40000
BAL. 2:	85.23674	500.37670	203.66430	1.04083	14.29201	101205.40000
INITIAL:	85.23479	500.36570	203.65720	1.04098	14.29550	101205.50000
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	81.72594	500.06140	203.52530	0.59242	14.18925	101205.30000
PS:	3.18093	0.26178	0.10664	0.21130	0.00000	0.00500
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	0.32456	0.05314	0.03130	0.19058	0.08782	0.05759
INV REL:	3.50327	0.31435	0.12794	0.42932	0.00000	0.00000
EXV REL:	0.00753	0.00093	0.01105	0.01909	0.10277	0.07480
FROM CT:	0.00510	0.00033	0.00105	0.04652	0.01494	0.01220

FRACTION OF DECAY HEAT IN CORIUM & FISSION PRODUCTS

IN CORE	:	0.00000000
IN RELEASED FISSION PRODUCTS	:	0.29198810
CORIUM IN PRIMARY SYSTEM	:	0.00000000
CORIUM IN COMPARTMENT A	:	0.00000000
B	:	0.16663790
C	:	0.54137750
TOTAL FRACTION	:	1.00000300

0ADDITIONAL FIGURES-OF-MERIT OF THIS RUN
FRACTION OF CLAD REACTED IN-VESSEL IS 0.546
0TOTAL H2 BURNED IN CAVITY (KG): 9.
0TOTAL H2 BURNED IN CONTMT. OUTSIDE CAVITY (KG): 449.
0INTEGRATED CONCRETE AEROSOL PRODUCTION IS 7.5717E+01 KG
0SUMMARY OF FISSION PRODUCT REMOVAL MECHANISM EFFICIENCIES IN PRIMARY SYSTEM, CONTMT, AND AUX BLDG:
TOTAL FP REMOVAL (KG) DUE TO GRAV. SETL. IS 1.0541E+03 1.2894E+02 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO STEAM CONDENSATION IS 0.0000E+00 2.2772E+01 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO IMPACTION IS 0.0000E+00 3.3722E+00 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO THERMOPHORESIS IS 1.8097E+00 1.0945E+01 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO DECONTAMINATION IN CONTMT WATER POOLS IS 0.0000E+00
0SUMMARY OF FISSION PRODUCT REMOVAL IN ICE CONDENSER:
TOTAL FP REMOVAL DUE TO GRAV. SET. IN ICE COND. IS 0.0000E+00 KG; REMOVAL DUE TO CONDENSATION IS 0.0000E+00 KG
TOTAL FP REMOVAL DUE TO IMPACTION IN ICE COND. IS 0.0000E+00 KG

Caculation of RF's and DF's

RF_{iv}

Results:

NG $\frac{336.4988}{336.5000} = 1$ CsI $\frac{26.91473}{29.82595} = 0.902$ TeO2 $\frac{0}{20.9033} = 0$

CsOH $\frac{177.0525}{196.2022} = 0.902$ SRO $\frac{0.27401}{71.18863} = 0.004$

DF_{vsl}

After Vessel Failure:

CsI $\frac{26.91473}{2.50095} = 10.762$ CsOH $\frac{177.0525}{13.67131} = 12.951$ SRO $\frac{0.2741}{0.02446} = 11.206$

RF_{mcci}

Results:

CsI $\frac{1.71286}{(29.82595 - 26.91473)} = 0.588$ TeO2 $\frac{20.899}{(20.9033 - 0.0)} = 1$

CsOH $\frac{18.37296}{(196.2022 - 177.0525)} = 0.959$ SRO $\frac{0.01134}{(71.1886 - 0.27401)} = 1.599 \cdot 10^{-4}$

RF_{rev}

From final results and results immediately after vessel failure:

CsI $\frac{24.41388 - 23.96885}{24.41388} = 0.018$ CsOH $\frac{163.3813 - 158.3557}{163.3813} = 0.031$

DF_{pool}

Results:

No fission product removal due to overlying pool.

$DF_{Lcont\ and\ Lspry}$

Finally:

No late sprays, so spray DF = 1.0

TE02 $\frac{20.89902}{4.3079} = 4.851$ UO2 $\frac{0.07480}{0.0122} = 6.131$

DF_{econt} and espry

Assume DF_{Icont} applies to CsI and CsOH

No early sprays so spray DF = 1.0

CSI

$$Rrev := \left[0.902 \cdot \left(1 - \frac{1}{10.762}\right)\right] \cdot \frac{0.018}{(4.851 \cdot 1 \cdot 1)} \qquad Rrev = 0.003$$

$$Rmcci := (1 - 0.902) \cdot \frac{0.588}{(4.851 \cdot 1 \cdot 1)} \qquad Rmcci = 0.012$$

$$Riv := \frac{0.9195}{29.82595} - 0.003 - 0.012 \qquad Riv = 0.016$$

$$DFiv := \frac{0.902}{0.016} \qquad DFiv = 56.375$$

$$DFecont := \frac{56.375}{(10.762 \cdot 1)} \qquad DFecont = 5.238$$

CSOH

$$Rrev := \left[0.902 \cdot \left(1 - \frac{1}{12.951}\right)\right] \cdot \frac{0.031}{(4.851 \cdot 1 \cdot 1)} \qquad Rrev = 0.005$$

$$Rmcci := (1 - 0.902) \cdot \frac{0.959}{(4.851 \cdot 1 \cdot 1)} \qquad Rmcci = 0.019$$

$$Riv := \frac{8.77516}{196.2022} - 0.005 - 0.019 \qquad Riv = 0.021$$

$$DFiv := \frac{0.902}{0.021} \qquad DFiv = 42.952$$

$$DFecont := \frac{42.952}{(12.951 \cdot 1)} \qquad DFecont = 3.317$$

Caculation of RF's and DF's for IP3 MAAP Runs
Accident Progression Scenario # 5

Description of Sequence

- Long Term Station Blackout event
- High RCS pressureat the onset of core damage
- AC power is not recovered
- Containment sprays are available late
- Containment heat removal is not available

Key Results of Calculation

- Aux feedwater off 240 min
- Core uncovery 433 min
- Support plate failure 585 min
- Reactor vessel failure 593 min
- Sprays on 608 min
- Containment failure (Leak) 42 hrs

Fission Product Mass After Vessel Failure

PS/PZR CONDITIONS: TIME= 36069.4500 SECONDS
10.01929000 HOURS

FISSION PRODUCT MASS BALANCES:

BALANCE 1 = TOTAL MASS AS USED BY MAAP
BALANCE 2 = IN FUEL + INTEGRATED RELEASE FROM FUEL

	NOBLES	CSI	TEO2	SRO	MOO2	CSOH
BAL. 1:	336.50020	29.82596	0.00000	71.19406	260.65190	196.20250
BAL. 2:	336.49970	29.82586	0.00000	71.19406	260.65200	196.20170
INITIAL:	336.50000	29.82595	-0.00282	71.18863	260.63540	196.20220
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	0.00000	4.56327	0.00000	70.91327	213.92300	30.01847
PS:	27.06237	23.65815	0.00000	0.23930	40.66981	156.58870
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	309.43530	1.60452	0.00000	0.04149	6.05902	9.59516
INV REL:	336.49970	25.26259	0.00000	0.28079	46.72891	166.18320
EXV REL:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
FROM CT:	0.00248	0.00002	0.00000	0.00000	0.00002	0.00012

	BAO	LA2O3	CEO2	SB	TE2	UO2
BAL. 1:	85.24090	500.40340	203.67220	1.04103	31.04289	101205.40000
BAL. 2:	85.24091	500.40340	203.67220	1.04103	31.04289	101205.40000
INITIAL:	85.23479	500.36570	203.65720	1.04098	31.04062	101205.50000
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	81.72973	500.12850	203.56030	0.61354	31.04289	101205.40000
PS:	2.98773	0.23104	0.09404	0.23208	0.00000	0.00000
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	0.52343	0.04380	0.01783	0.19541	0.00000	0.00000
INV REL:	3.51117	0.27484	0.11186	0.42750	0.00000	0.00000
EXV REL:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
FROM CT:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Fission Product Mass at Problem Termination

PS/PZR CONDITIONS: TIME= 172800.0000 SECONDS
48.00001000 HOURS

FISSION PRODUCT MASS BALANCES:

BALANCE 1 = TOTAL MASS AS USED BY MAAP
BALANCE 2 = IN FUEL + INTEGRATED RELEASE FROM FUEL

	NOBLES	CSI	TEO2	SRO	MOO2	CSOH
BAL. 1:	336.50100	29.82624	0.00000	71.19405	260.65030	196.21120
BAL. 2:	336.49970	29.82586	0.00000	71.19406	260.65200	196.20170
INITIAL:	336.50000	29.82595	-0.00282	71.18863	260.63540	196.20220
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	0.00000	4.56327	0.00000	70.91327	213.92300	30.01847
PS:	10.25396	23.52735	0.00000	0.23928	40.66652	155.51200
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	2.27625	1.73546	0.00000	0.04150	6.06031	10.67813
INV REL:	336.49970	25.26259	0.00000	0.28079	46.72891	166.18320
EXV REL:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
FROM CT:	323.97080	0.00016	0.00000	0.00000	0.00044	0.00253

	BAO	LA2O3	CEO2	SB	TE2	UO2
BAL. 1:	85.24075	500.40340	203.67220	1.04103	31.04289	101205.40000
BAL. 2:	85.24091	500.40340	203.67220	1.04103	31.04289	101205.40000
INITIAL:	85.23479	500.36570	203.65720	1.04098	31.04062	101205.50000
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	81.72973	500.12850	203.56030	0.61354	31.04289	101205.40000
PS:	2.98744	0.23102	0.09403	0.21726	0.00000	0.00000
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	0.52354	0.04381	0.01783	0.21021	0.00000	0.00000
INV REL:	3.51117	0.27484	0.11186	0.42750	0.00000	0.00000
EXV REL:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
FROM CT:	0.00004	0.00000	0.00000	0.00003	0.00000	0.00000

FRACTION OF DECAY HEAT IN CORIUM & FISSION PRODUCTS

IN CORE	:	0.00000000
IN RELEASED FISSION PRODUCTS	:	0.24981250
CORIUM IN PRIMARY SYSTEM	:	0.00000000
CORIUM IN COMPARTMENT A	:	0.00000000
B	:	0.21244200
C	:	0.53775990
TOTAL FRACTION	:	1.00001400

0ADDITIONAL FIGURES-OF-MERIT OF THIS RUN
FRACTION OF CLAD REACTED IN-VESSEL IS 0.489
0TOTAL H2 BURNED IN CAVITY (KG): 0.
0TOTAL H2 BURNED IN CONTMT. OUTSIDE CAVITY (KG): 0.
0INTEGRATED CONCRETE AEROSOL PRODUCTION IS 0.0000E+00 KG
0SUMMARY OF FISSION PRODUCT REMOVAL MECHANISM EFFICIENCIES IN PRIMARY SYSTEM, CONTMT, AND AUX BLDG:
TOTAL FP REMOVAL (KG) DUE TO GRAV. SETL. IS 9.7807E+02 9.8335E+00 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO STEAM CONDENSATION IS 0.0000E+00 1.8554E+01 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO IMPACTION IS 0.0000E+00 2.7402E-01 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO THERMOPHORESIS IS 9.0142E-01 6.6688E-01 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO DECONTAMINATION IN CONTMT WATER POOLS IS 0.0000E+00
0SUMMARY OF FISSION PRODUCT REMOVAL IN ICE CONDENSER:
TOTAL FP REMOVAL DUE TO GRAV. SET. IN ICE COND. IS 0.0000E+00 KG; REMOVAL DUE TO CONDENSATION IS 0.0000E+00 KG
TOTAL FP REMOVAL DUE TO IMPACTION IN ICE COND. IS 0.0000E+00 KG

Caculation of RFs and DFs

RF_{iv}

Results:

NG $\frac{336.499}{336.5000} = 1$ CsI $\frac{25.26259}{29.82595} = 0.847$ TeO2 $\frac{0}{20.9033} = 0$

CsOH $\frac{166.1832}{196.2022} = 0.847$ SRO $\frac{0.28079}{71.18863} = 0.004$

DF_{vsl}

After Vessel Failure:

CsI $\frac{25.26259}{1.60452} = 15.745$ CsOH $\frac{166.1832}{9.59516} = 17.319$ SRO $\frac{0.28079}{0.04149} = 6.768$

RF_{mcci}

Results:

CsI $\frac{0.0}{(29.82595 - 25.26259)} = 0$ TeO2 $\frac{0.0}{(20.9033 - 0.0)} = 0$

CsOH $\frac{0.0}{(196.2022 - 166.1832)} = 0$ SRO $\frac{0.0}{(71.1886 - 0.28079)} = 0$

RF_{rev}

From final results and results immediately after vessel failure:

CsI $\frac{23.65815 - 23.52735}{23.65815} = 0.006$ CsOH $\frac{156.5887 - 155.512}{156.5887} = 0.007$

DF_{pool}

No fission product removal due to overlying pool.

$DF_{Lcont\ and\ Lspry}$

Finally:

Late CCI releases, therefore late DFs cannot be calculated.

DF_{econt} and espry

Finally:

The values represent the multiplication of DF_{econt} and DF_{espry}

CsI $\frac{25.26259 - 23.52735}{0.00016} = 1.085 \cdot 10^4$ CsOH $\frac{166.1832 - 155.512}{0.00253} = 4.218 \cdot 10^3$

To seperate out the DFs the value of one of the DFs must be assumed. Based on the results from scenario #2, the value for DF_{econt} for a late containment failure with a leak is approximately 5 but may be as high as 100.

Therefore;

CsI DFespry $\frac{1.085 \cdot 10^4}{5} = 2.17 \cdot 10^3$ to $\frac{1.085 \cdot 10^4}{100} = 108.5$

CsOH DEespry $\frac{4.218 \cdot 10^3}{5} = 843.6$ to $\frac{4.218 \cdot 10^3}{100} = 42.18$

Calculation of RF's and DF's for IP3 MAAP Runs
Accident Progression Scenario # 6

Description of Sequence

- Large LOCA event
- Low RCS pressure at the onset of core damage
- Containment sprays are unavailable
- Containment heat removal is unavailable

Key Results of Calculation

- Reactor vessel failure 5.5 hrs
- Containment failure 25 hrs

Fission Product Mass After Vessel Failure

PS/PZR CONDITIONS: TIME= 21619.4100 SECONDS
6.00539200 HOURS

FISSION PRODUCT MASS BALANCES:

BALANCE 1 = TOTAL MASS AS USED BY MAAP
BALANCE 2 = IN FUEL + INTEGRATED RELEASE FROM FUEL

	NOBLES	CSI	TEO2	SRO	MOO2	CSOH
BAL. 1:	336.50110	29.82604	0.00000	71.22374	260.70480	196.20290
BAL. 2:	336.50070	29.82602	0.00000	71.22374	260.70480	196.20310
INITIAL:	336.50000	29.82595	-0.01931	71.18863	260.63540	196.20220
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	0.00000	0.27069	0.00000	70.16565	147.62170	1.50777
PS:	15.75784	7.43940	0.00000	0.37260	40.86353	48.69029
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	320.71750	22.11554	0.00000	0.68549	72.21843	146.00220
INV REL:	336.50070	29.53941	0.00000	1.02664	113.08310	194.31770
EXV REL:	23.14375	0.01592	0.00000	0.03145	0.00000	0.37766
FROM CT:	0.02572	0.00041	0.00000	0.00001	0.00110	0.00268

	BAO	LA2O3	CEO2	SB	TE2	UO2
BAL. 1:	85.26920	500.60790	203.75600	1.04104	31.05610	101205.70000
BAL. 2:	85.26921	500.60780	203.75590	1.04104	31.05610	101205.70000
INITIAL:	85.23479	500.36570	203.65720	1.04098	31.04062	101205.50000
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	70.66022	487.91160	198.51890	0.18507	29.13721	101205.50000
PS:	5.31388	4.29350	1.74753	0.23602	0.00000	0.00000
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	9.29496	8.40265	3.48948	0.61995	1.91889	0.16963
INV REL:	14.59527	12.67332	5.15825	0.85462	0.00000	0.00000
EXV REL:	0.01372	0.02291	0.07878	0.00136	1.91889	0.16963
FROM CT:	0.00013	0.00010	0.00004	0.00001	0.00000	0.00000

Fission Product Mass at Problem Termination

PS/PZR CONDITIONS: TIME= 172800.0000 SECONDS
48.00001000 HOURS

FISSION PRODUCT MASS BALANCES:

BALANCE 1 = TOTAL MASS AS USED BY MAAP
BALANCE 2 = IN FUEL + INTEGRATED RELEASE FROM FUEL

	NOBLES	CSI	TEO2	SRO	MOO2	CSOH
BAL. 1:	336.47730	29.82597	0.00000	71.22372	260.70310	196.20090
BAL. 2:	336.50070	29.82602	0.00000	71.22374	260.70480	196.20310
INITIAL:	336.50000	29.82595	-0.01937	71.18863	260.63540	196.20220
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	0.00000	0.27069	0.00000	70.16565	147.62170	1.50777
PS:	0.14266	5.81199	0.00000	0.37262	40.86566	35.09732
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	0.01468	22.32587	0.00000	0.68531	72.20158	147.91510
INV REL:	336.50070	29.53941	0.00000	1.02664	113.08310	194.31770
EXV REL:	23.14375	0.01592	0.00000	0.03145	0.00000	0.37766
FROM CT:	336.32000	1.41741	0.00000	0.00014	0.01413	11.68070

	BAO	LA2O3	CEO2	SB	TE2	UO2
BAL. 1:	85.26899	500.60760	203.75580	1.04104	31.05615	101205.70000
BAL. 2:	85.26921	500.60780	203.75590	1.04104	31.05610	101205.70000
INITIAL:	85.23479	500.36570	203.65720	1.04098	31.04062	101205.50000
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	70.66022	487.91160	198.51890	0.18507	29.13721	101205.50000
PS:	5.31422	4.29396	1.74770	0.12738	0.00000	0.00000
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	9.29248	8.39959	3.48827	0.64341	1.91875	0.16962
INV REL:	14.59527	12.67332	5.15825	0.85462	0.00000	0.00000
EXV REL:	0.01372	0.02291	0.07878	0.00136	1.91889	0.16963
FROM CT:	0.00207	0.00239	0.00097	0.08518	0.00019	0.00000

FRACTION OF DECAY HEAT IN CORIUM & FISSION PRODUCTS

IN CORE	:	0.00000000
IN RELEASED FISSION PRODUCTS	:	0.30067280
CORIUM IN PRIMARY SYSTEM	:	0.00000000
CORIUM IN COMPARTMENT A	:	0.00000000
B	:	0.00000539
C	:	0.69937160
TOTAL FRACTION	:	1.00005000

0ADDITIONAL FIGURES-OF-MERIT OF THIS RUN
FRACTION OF CLAD REACTED IN-VESSEL IS 0.475
0TOTAL H2 BURNED IN CAVITY (KG): 0.
0TOTAL H2 BURNED IN CONTMT. OUTSIDE CAVITY (KG): 0.
0INTEGRATED CONCRETE AEROSOL PRODUCTION IS 2.3144E+01 KG
0SUMMARY OF FISSION PRODUCT REMOVAL MECHANISM EFFICIENCIES IN PRIMARY SYSTEM, CONTMT, AND AUX BLDG:
TOTAL FP REMOVAL (KG) DUE TO GRAV. SETL. IS 2.0154E+02 8.7648E+02 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO STEAM CONDENSATION IS 0.0000E+00 3.6941E+01 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO IMPACTION IS 0.0000E+00 2.7774E+00 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO THERMOPHORESIS IS 8.4508E-03 4.9719E+00 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO DECONTAMINATION IN CONTMT WATER POOLS IS 2.5769E+01
0SUMMARY OF FISSION PRODUCT REMOVAL IN ICE CONDENSER:
TOTAL FP REMOVAL DUE TO GRAV. SET. IN ICE COND. IS 0.0000E+00 KG; REMOVAL DUE TO CONDENSATION IS 0.0000E+00 KG
TOTAL FP REMOVAL DUE TO IMPACTION IN ICE COND. IS 0.0000E+00 KG

Caculation of RF's and DF's

RF_{iv}

Results:

NG $\frac{336.5007}{336.5000} = 1$ CsI $\frac{29.53941}{29.82595} = 0.99$ TeO2 $\frac{0}{20.9033} = 0$

CsOH $\frac{194.3177}{196.2022} = 0.99$ SRO $\frac{1.02664}{71.18863} = 0.014$

DF_{vsl}

After Vessel Failure:

CsI $\frac{29.53941}{22.1155} = 1.336$ CsOH $\frac{194.3177}{146.0022} = 1.331$ SRO $\frac{1.02664}{0.68549} = 1.498$

RF_{mcci}

Results:

CsI $\frac{0.01592}{(29.82595 - 29.53941)} = 0.056$ TeO2 $\frac{0.0}{(20.9033 - 0.0)} = 0$

CsOH $\frac{0.37766}{(196.2022 - 194.3177)} = 0.2$ SRO $\frac{0.03145}{(71.1886 - 1.02664)} = 4.482 \cdot 10^{-4}$

RF_{rev}

From final results and results after vessel failure:

CsI $\frac{7.4394 - 5.81199}{7.4494} = 0.218$ CsOH $\frac{48.69029 - 35.09732}{48.69029} = 0.279$

DF_{pool}

Final fission product mass released ex-vessel:

$23.144 + .016 + 0.031 + 0.378 + 0.014 + 0.023 + 0.079 + 1.919 + 0.170 = 25.774$

$DFpool := \frac{25.774}{(25.774 - 25.769)}$ $DFpool = 5.155 \cdot 10^{3}$

DF_{Lcont} and Lspry

From final results:

No late sprays so spray DF = 1.0

Total Late DF based on Te2 $\frac{1.91889}{0.00019} = 1.01 \cdot 10^{4}$

DFlcont $\frac{1.01 \cdot 10^{4}}{\left[1 \cdot \left(5.155 \cdot 10^{3}\right)\right]} = 1.959$

DF_{econt} and espry

Assume DF_{Icont} applies to CsI and CsOH

No early sprays so spray DF = 1.0

CSI $Rrev := \left[0.99 \cdot \left(1 - \frac{1}{1.336}\right)\right] \cdot \frac{0.218}{(1.959 \cdot 1 \cdot 1)}$ $Rrev = 0.028$

$Rmcci := (1 - 0.99) \cdot \frac{0.056}{(1.959 \cdot 5155 \cdot 1)}$ $Rmcci = 5.545 \cdot 10^{-8}$

$Riv := \frac{1.41741}{29.82602} - 0.028 - 0.0$ $Riv = 0.02$

$DFiv := \frac{0.99}{0.02}$ $DFiv = 49.5$

$DFecont := \frac{49.5}{(1.336 \cdot 1)}$ $DFecont = 37.051$

CSOH $Rrev := \left[0.99 \cdot \left(1 - \frac{1}{1.331}\right)\right] \cdot \frac{0.279}{(1.959 \cdot 1 \cdot 1)}$ $Rrev = 0.035$

$Rmcci := (1 - 0.99) \cdot \frac{0.2}{(1.959 \cdot 5155 \cdot 1)}$ $Rmcci = 1.98 \cdot 10^{-7}$

$Riv := \frac{11.6807}{196.2022} - 0.035 - 0.0$ $Riv = 0.025$

$DFiv := \frac{0.99}{0.025}$ $DFiv = 39.6$

$DFecont := \frac{39.6}{(1.331 \cdot 1)}$ $DFecont = 29.752$

Caculation of RF's and DF's for IP3 MAAP Runs
Accident Progression Scenario # 7

Description of Sequence

- Small LOCA event
- Low-high RCS pressure at the onset of core damage
- Containment sprays are available
- Containment heat removal is unavailable
- CHF of overlying pool reduced to 0.015 MW/m2

Key Results of Calculation

- Reactor vessel failure 145 min
- Containment failure 28 hrs

Fission Product Mass After Vessel Failure

PS/PZR CONDITIONS: TIME= 9615.2800 SECONDS
2.67091100 HOURS

FISSION PRODUCT MASS BALANCES:

BALANCE 1 = TOTAL MASS AS USED BY MAAP
BALANCE 2 = IN FUEL + INTEGRATED RELEASE FROM FUEL

	NOBLES	CSI	TEO2	SRO	MOO2	CSOH
BAL. 1:	336.50130	29.82612	0.00000	71.18887	260.63630	196.20310
BAL. 2:	336.49980	29.82598	0.00000	71.18887	260.63610	196.20220
INITIAL:	336.50000	29.82595	0.00008	71.18863	260.63540	196.20220
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	0.00000	1.23503	0.00000	70.53561	182.36520	5.49512
PS:	5.29617	9.51957	0.00000	0.14959	20.09779	63.18160
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	331.18700	19.07114	0.00000	0.50367	58.17244	127.52390
INV REL:	336.49980	28.40982	0.00000	0.58754	78.27091	186.88640
EXV REL:	32.97577	0.18113	0.00000	0.06573	0.00000	3.82067
FROM CT:	0.01813	0.00039	0.00000	0.00001	0.00089	0.00253

	BAO	LA2O3	CEO2	SB	TE2	UO2
BAL. 1:	85.23497	500.36670	203.65780	1.04099	31.04056	101205.60000
BAL. 2:	85.23499	500.36670	203.65780	1.04098	31.04056	101205.60000
INITIAL:	85.23479	500.36570	203.65720	1.04098	31.04062	101205.50000
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	77.11815	496.69560	202.04370	0.35864	27.29675	101205.40000
PS:	2.05943	1.10733	0.45071	0.07576	0.00023	0.00002
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	6.05731	2.56376	1.16345	0.60657	3.74359	0.26805
INV REL:	8.08554	3.63586	1.47986	0.67735	0.00000	0.00000
EXV REL:	0.03130	0.03525	0.13431	0.00499	3.74382	0.26807
FROM CT:	0.00009	0.00003	0.00001	0.00001	0.00000	0.00000

Fission Product Mass at Problem Termination

PS/PZR CONDITIONS:

TIME= 172800.0000 SECONDS
48.00001000 HOURS

FISSION PRODUCT MASS BALANCES:

BALANCE 1 = TOTAL MASS AS USED BY MAAP
BALANCE 2 = IN FUEL + INTEGRATED RELEASE FROM FUEL

	NOBLES	CSI	TEO2	SRO	MOO2	CSOH
BAL. 1:	336.48380	29.82607	0.00000	71.18905	260.63270	196.20210
BAL. 2:	336.49980	29.82599	0.00000	71.18906	260.63160	196.20220
INITIAL:	336.50000	29.82595	0.00045	71.18863	260.63540	196.20220
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	0.00000	0.01205	0.00000	69.53021	182.36070	0.00488
PS:	0.61131	9.23803	0.00000	0.14955	20.09277	61.07836
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	0.00145	20.57557	0.00000	1.50928	58.17833	135.11350
INV REL:	336.49980	28.40982	0.00000	0.58754	78.27091	186.88640
EXV REL:	1661.69600	1.40412	0.00000	1.07131	0.00002	9.31091
FROM CT:	335.87100	0.00043	0.00000	0.00001	0.00095	0.00530

	BAO	LA2O3	CEO2	SB	TE2	UO2
BAL. 1:	85.23549	500.36230	203.65810	1.04095	31.04026	101206.50000
BAL. 2:	85.23560	500.36230	203.65790	1.04098	31.04010	101206.50000
INITIAL:	85.23479	500.36570	203.65720	1.04098	31.04062	101205.50000
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	76.63276	495.85540	198.29880	0.23416	3.10883	101200.00000
PS:	2.05891	1.10703	0.45058	0.07530	0.00003	0.00001
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	6.54373	3.39981	4.90871	0.73148	27.93115	6.46242
INV REL:	8.08554	3.63586	1.47986	0.67735	0.00000	0.00000
EXV REL:	0.51730	0.87105	3.87926	0.12947	27.93127	6.46372
FROM CT:	0.00009	0.00004	0.00001	0.00002	0.00025	0.00000

FRACTION OF DECAY HEAT IN CORIUM & FISSION PRODUCTS

IN CORE		: 0.00000000
IN RELEASED FISSION PRODUCTS		: 0.31285290
CORIUM IN PRIMARY SYSTEM		: 0.00000000
CORIUM IN COMPARTMENT	A	: 0.00000000
	B	: 0.07117156
	C	: 0.61597410
TOTAL FRACTION		: 0.99999860

0ADDITIONAL FIGURES-OF-MERIT OF THIS RUN
FRACTION OF CLAD REACTED IN-VESSEL IS 0.421
0TOTAL H2 BURNED IN CONTMT. OUTSIDE CAVITY (KG): 426.
0INTEGRATED CONCRETE AEROSOL PRODUCTION IS 1.6617E+03 KG
0SUMMARY OF FISSION PRODUCT REMOVAL MECHANISM EFFICIENCIES IN PRIMARY SYSTEM, CONTMT, AND AUX BLDG:
TOTAL FP REMOVAL (KG) DUE TO GRAV. SETL. IS 5.0673E+02 4.5809E+02 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO STEAM CONDENSATION IS 0.0000E+00 2.2671E+02 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO IMPACTION IS 0.0000E+00 2.6513E+00 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO THERMOPHORESIS IS 1.1330E-01 1.3156E+01 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO DECONTAMINATION IN CONTMT WATER POOLS IS 1.7120E+03
0SUMMARY OF FISSION PRODUCT REMOVAL IN ICE CONDENSER:
TOTAL FP REMOVAL DUE TO GRAV. SET. IN ICE COND. IS 0.0000E+00 KG; REMOVAL DUE TO CONDENSATION IS 0.0000E+00 KG
TOTAL FP REMOVAL DUE TO IMPACTION IN ICE COND. IS 0.0000E+00 KG

Caculation of RF's and DF's

RF_{iv}

From final results:

NG $\frac{336.4998}{336.5000} = 1$ CsI $\frac{28.4098}{29.82595} = 0.953$ TeO2 $\frac{0}{20.9033} = 0$

CsOH $\frac{186.8864}{196.2022} = 0.953$ SRO $\frac{0.58754}{71.18863} = 0.008$

DF_{vsl}

After Vessel Failure:

CsI $\frac{28.4098}{19.07114} = 1.49$ CsOH $\frac{186.8864}{127.52390} = 1.466$ SRO $\frac{0.58754}{0.50367} = 1.167$

RF_{mcci}

From final results:

CsI $\frac{1.40412}{(29.82595 - 28.4098)} = 0.992$ Te2 $\frac{27.93127}{(31.04062 - 0.0)} = 0.9$

CsOH $\frac{9.31091}{(196.2022 - 186.8864)} = 0.999$ SRO $\frac{1.07131}{(71.1886 - 0.58754)} = 0.015$

RF_{rev}

From final results and results after vessel failure:

CsI $\frac{9.51957 - 9.23803}{9.51957} = 0.03$ CsOH $\frac{63.1816 - 61.07836}{63.1816} = 0.033$

DF_{pool}

Total final fission product mass released ex-vessel:

$1661.696 + 1.404 + 1.071 + 9.31 + 0.517 + 0.871 + 3.879 + 013 + 27.931 + 6.463 = 1.726 \cdot 10^3$

$DFpool := \frac{1.726 \cdot 10^3}{\left(1.726 \cdot 10^3 - 1.712 \cdot 10^3\right)}$ $DFpool = 123.286$

$DF_{Lcont\ and\ Lspry}$

From final results:

Total Late DF based on Te2 $\frac{27.93127}{0.00025} = 1.117 \cdot 10^5$

$DF_{lcont\text{-}lspry} = \frac{1.117 \cdot 10^5}{((123.286))} = 906.023$

The value for the late DF of the containment varies between 5 and 100

Therefore;

DFspry $\frac{906.023}{5} = 181.205$ to $\frac{906.023}{100} = 9.06$

DF_{econt} and espry

Assume DF_{Icont} applies to CsI and CsOH

CSI $\quad Rrev := \left[0.953 \cdot \left(1 - \frac{1}{1.49}\right)\right] \cdot \frac{0.03}{(906.023)} \qquad Rrev = 1.038 \cdot 10^{-5}$

$$Rmcci := (1 - 0.953) \cdot \frac{0.992}{\left(1.117 \cdot 10^{5}\right)} \qquad Rmcci = 4.174 \cdot 10^{-7}$$

$$Riv := \frac{0.00043}{29.82602} - 1.038 \cdot 10^{-5} - 4.174 \cdot 10^{-7} \qquad Riv = 3.62 \cdot 10^{-6}$$

$$DFiv := \frac{0.953}{3.62 \cdot 10^{-6}} \qquad DFiv = 2.633 \cdot 10^{5}$$

$$DFecont\_espy := \frac{2.633 \cdot 10^{5}}{(1.49 \cdot 1)} \qquad DFecont\_espy = 1.767 \cdot 10^{5}$$

The value for the early DF of the containment varies between 5 and 100

Therefore;

DFspry $\quad \frac{1.767 \cdot 10^{5}}{5} = 3.534 \cdot 10^{4}$ to $\frac{1.767 \cdot 10^{5}}{100} = 1.767 \cdot 10^{3}$

The higher value for DF_{Icont} is more probable, suggesting that the DFspry has a value near 1000.

Caculation of RF's and DF's for IP3 MAAP Runs
Accident Progression Scenario # 8

Description of Sequence

- Long Term Station Blackout event
- High RCS pressureat the onset of core damage
- AC power is not recovered
- Containment sprays are available late
- Containment heat removal is unavailable
- CHF reduced to 0.015 MW/m2

Key Results of Calculation

- Aux feedwater off 240 min
- Core uncovery 434 min
- Reactor vessel failure 598 min
- Sprays on 688 min
- Containment failure 42 hrs

Fission Product Mass After Vessel Failure

PS/PZR CONDITIONS: TIME= 36068.6500 SECONDS
10.01907000 HOURS

FISSION PRODUCT MASS BALANCES:

BALANCE 1 = TOTAL MASS AS USED BY MAAP
BALANCE 2 = IN FUEL + INTEGRATED RELEASE FROM FUEL

	NOBLES	CSI	TEO2	SRO	MOO2	CSOH
BAL. 1:	336.50030	29.82600	0.00000	71.18919	260.63750	196.20250
BAL. 2:	336.49910	29.82591	0.00000	71.18919	260.63700	196.20130
INITIAL:	336.50000	29.82595	-0.00017	71.18863	260.63540	196.20220
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	0.00000	4.55873	0.00000	70.90606	213.50840	29.98841
PS:	8.86926	23.55668	0.00000	0.25086	42.29465	156.72200
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	327.62880	1.71057	0.00000	0.03227	4.83449	9.49203
INV REL:	336.49910	25.26717	0.00000	0.28313	47.12864	166.21280
EXV REL:	0.00231	0.00000	0.00000	0.00000	0.00000	0.00000
FROM CT:	0.00221	0.00002	0.00000	0.00000	0.00001	0.00012

	BAO	LA2O3	CEO2	SB	TE2	UO2
BAL. 1:	85.23524	500.36930	203.65850	1.04099	31.04076	101205.40000
BAL. 2:	85.23520	500.36930	203.65850	1.04099	31.04076	101205.40000
INITIAL:	85.23479	500.36570	203.65720	1.04098	31.04062	101205.50000
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	81.69741	500.09350	203.54630	0.61072	31.04056	101205.40000
PS:	3.13619	0.24521	0.09980	0.24895	0.00000	0.00000
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	0.40163	0.03056	0.01244	0.18131	0.00020	0.00000
INV REL:	3.53779	0.27577	0.11224	0.43026	0.00000	0.00000
EXV REL:	0.00000	0.00000	0.00000	0.00000	0.00020	0.00000
FROM CT:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Fission Product Mass at Problem Termination

PS/PZR CONDITIONS: TIME= 172800.0000 SECONDS
48.00001000 HOURS

FISSION PRODUCT MASS BALANCES:

BALANCE 1 = TOTAL MASS AS USED BY MAAP
BALANCE 2 = IN FUEL + INTEGRATED RELEASE FROM FUEL

	NOBLES	CSI	TEO2	SRO	MOO2	CSOH
BAL. 1:	336.50190	29.82649	0.00000	71.18959	260.63570	196.21010
BAL. 2:	336.49910	29.82590	0.00000	71.18960	260.63700	196.20130
INITIAL:	336.50000	29.82595	-0.00006	71.18863	260.63540	196.20220
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	0.00000	4.49262	0.00000	70.90388	213.50840	28.45062
PS:	4.11432	23.32722	0.00000	0.25079	42.28400	155.12190
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	0.99562	2.00650	0.00000	0.03491	4.84298	12.63483
INV REL:	336.49910	25.26717	0.00000	0.28313	47.12864	166.21280
EXV REL:	32.65797	0.06612	0.00000	0.00258	0.00000	1.53779
FROM CT:	331.39190	0.00015	0.00000	0.00000	0.00032	0.00271

	BAO	LA2O3	CEO2	SB	TE2	UO2
BAL. 1:	85.23554	500.36920	203.65880	1.04099	31.04068	101205.30000
BAL. 2:	85.23562	500.36920	203.65880	1.04098	31.04067	101205.30000
INITIAL:	85.23479	500.36570	203.65720	1.04098	31.04062	101205.50000
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	81.69632	500.09340	203.54580	0.61043	30.52974	101205.30000
PS:	3.13534	0.24514	0.09978	0.22746	0.00001	0.00000
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	0.40386	0.03065	0.01321	0.20307	0.51074	0.00048
INV REL:	3.53779	0.27577	0.11224	0.43026	0.00000	0.00000
EXV REL:	0.00151	0.00003	0.00075	0.00028	0.51093	0.00048
FROM CT:	0.00003	0.00000	0.00000	0.00002	0.00019	0.00000

FRACTION OF DECAY HEAT IN CORIUM & FISSION PRODUCTS

IN CORE	:	0.00000000
IN RELEASED FISSION PRODUCTS	:	0.25137050
CORIUM IN PRIMARY SYSTEM	:	0.00000000
CORIUM IN COMPARTMENT A	:	0.00000000
B	:	0.08764043
C	:	0.66099780
TOTAL FRACTION	:	1.00000900

0ADDITIONAL FIGURES-OF-MERIT OF THIS RUN
FRACTION OF CLAD REACTED IN-VESSEL IS 0.481
0INTEGRATED CONCRETE AEROSOL PRODUCTION IS 3.2658E+01 KG
0SUMMARY OF FISSION PRODUCT REMOVAL MECHANISM EFFICIENCIES IN PRIMARY SYSTEM, CONTMT, AND AUX BLDG:
TOTAL FP REMOVAL (KG) DUE TO GRAV. SETL. IS 9.7827E+02 9.7829E+00 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO STEAM CONDENSATION IS 0.0000E+00 1.9423E+01 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO IMPACTION IS 0.0000E+00 2.1490E-01 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO THERMOPHORESIS IS 8.6169E-01 6.9578E-01 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO DECONTAMINATION IN CONTMT WATER POOLS IS 3.3353E+01
0SUMMARY OF FISSION PRODUCT REMOVAL IN ICE CONDENSER:
TOTAL FP REMOVAL DUE TO GRAV. SET. IN ICE COND. IS 0.0000E+00 KG; REMOVAL DUE TO CONDENSATION IS 0.0000E+00 KG
TOTAL FP REMOVAL DUE TO IMPACTION IN ICE COND. IS 0.0000E+00 KG

Caculation of RF's and DF's

RF_{iv}

From final results:

NG $\frac{336.499}{336.5000} = 1$ CsI $\frac{25.26717}{29.82595} = 0.847$ TeO2 $\frac{0}{20.9033} = 0$

CsOH $\frac{166.21280}{196.2022} = 0.847$ SRO $\frac{0.28313}{71.18863} = 0.004$

DF_{vsl}

After Vessel Failure:

CsI $\frac{25.26717}{1.71057} = 14.771$ CsOH $\frac{166.2128}{9.4920} = 17.511$ SRO $\frac{0.28313}{0.03227} = 8.774$.

RF_{mcci}

From final results:

CsI $\frac{0.06612}{(29.82595 - 25.26717)} = 0.015$ Te2 $\frac{0.51093}{(31.0406 - 0.0)} = 0.016$

CsOH $\frac{1.53779}{(196.2022 - 166.2128)} = 0.051$ SRO $\frac{0.00258}{(71.1886 - 0.28313)} = 3.639 \cdot 10^{-5}$

RF_{rev}

From final results and results after vessel failure:

CsI $\frac{23.5567 - 23.3272}{23.5567} = 0.01$ CsOH $\frac{156.722 - 155.1219}{156.722} = 0.01$

DF_{pool}

Total final fission product mass released ex-vessel:

$32.658 + 0.066 + 0.003 + 1.538 + 0.002 + 0.001 + 0.511 = 34.779$

$DFpool := \frac{34.779}{(34.779 - 33.353)}$ $DFpool = 24.389$

$DF_{lcont\ and\ lspry}$

From final results:

Total Late DF based on Te2 $\frac{0.51093}{0.00019} = 2.689 \cdot 10^{3}$

$DF_{lcont\text{-}lspry} = \frac{2.689 \cdot 10^{3}}{24.389} = 110.255$

The value for the late DF of the containment varies between 5 and 100
Therefore;

DFspry $\frac{110.255}{5} = 22.051$ to $\frac{110.255}{100} = 1.103$

DF_{econt} and espry

Assume DF_{Icont} applies to CsI and CsOH

CSI $Rrev := \left[0.847 \cdot \left(1 - \frac{1}{14.771}\right)\right] \cdot \frac{0.01}{(110.255)}$ $Rrev = 7.162 \cdot 10^{-5}$

$Rmcci := (1 - 0.847) \cdot \frac{0.015}{(110.255 \cdot 24.389)}$ $Rmcci = 8.535 \cdot 10^{-7}$

$Riv := \frac{0.00015}{29.82595} - 7.162 \cdot 10^{-5} - 8.535 \cdot 10^{-7}$ $Riv = -6.744 \cdot 10^{-5}$

A negative value is non-physical, therefore it must be assumed that using the late DF of TE2 for CsI was a bad approximation.

Caculation of RF's and DF's for IP3 MAAP Runs
Accident Progression Scenario # 9

Description of Sequence

- Station Blackout event
- High RCS pressureat the onset of core damage
- AC power is not recovered
- Containment sprays are unavailable
- Containment heat removal is unavailable
- Containment failure size increase to 1 ft2 (i.e rupture)

Key Results of Calculation (Assumed the same as scenario #2)

- Steam generators dryout 103 min
- Core uncovery 134 min
- Support plate failure 241 min
- Reactor vessel failure 249 min
- Containment failure 36 hrs

Fission Product Mass After Vessel Failure

PS/PZR CONDITIONS: TIME= 15627.4800 SECONDS
4.34096800 HOURS

FISSION PRODUCT MASS BALANCES:

BALANCE 1 = TOTAL MASS AS USED BY MAAP
BALANCE 2 = IN FUEL + INTEGRATED RELEASE FROM FUEL

	NOBLES	CSI	TEO2	SRO	MOO2	CSOH
BAL. 1:	336.50010	29.82598	0.00000	71.18878	260.63590	196.20230
BAL. 2:	336.49910	29.82593	0.00000	71.18878	260.63590	196.20230
INITIAL:	336.50000	29.82595	-0.00003	71.18863	260.63540	196.20220
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	0.00000	2.62617	0.00000	70.89783	213.47610	17.27546
PS:	15.30096	23.67512	0.00000	0.26421	43.48602	164.59670
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	321.19560	3.52466	0.00000	0.02674	3.67373	14.33001
INV REL:	336.49910	27.19976	0.00000	0.29095	47.15976	178.92680
EXV REL:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
FROM CT:	0.00348	0.00003	0.00000	0.00000	0.00004	0.00015

	BAO	LA2O3	CEO2	SB	TE2	UO2
BAL. 1:	85.23499	500.36610	203.65740	1.04099	31.04065	101205.50000
BAL. 2:	85.23500	500.36600	203.65740	1.04098	31.04065	101205.50000
INITIAL:	85.23479	500.36570	203.65720	1.04098	31.04062	101205.50000
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	81.47387	500.05400	203.53040	0.58495	31.04065	101205.50000
PS:	3.39425	0.25292	0.10294	0.30859	0.00000	0.00000
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	0.36686	0.05911	0.02406	0.14745	0.00000	0.00000
INV REL:	3.76113	0.31203	0.12700	0.45604	0.00000	0.00000
EXV REL:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
FROM CT:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Fission Product Mass at Problem Termination

PS/PZR CONDITIONS: TIME= 246071.8000 SECONDS
68.35327000 HOURS

FISSION PRODUCT MASS BALANCES:

BALANCE 1 = TOTAL MASS AS USED BY MAAP
BALANCE 2 = IN FUEL + INTEGRATED RELEASE FROM FUEL

	NOBLES	CSI	TEO2	SRO	MOO2	CSOH
BAL. 1:	336.49650	29.82532	27.16250	71.18888	260.63940	196.20160
BAL. 2:	336.49910	29.82592	27.16289	71.18890	260.64000	196.20200
INITIAL:	336.50000	29.82595	27.16872	71.18863	260.63540	196.20220
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	0.00000	0.64709	0.00000	70.87629	213.48020	0.14043
PS:	0.01465	23.06483	2.24568	0.26431	43.48557	156.76480
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	15.55155	4.89646	19.16809	0.04669	3.65926	29.85520
INV REL:	336.49910	27.19976	0.00000	0.29095	47.15976	178.92680
EXV REL:	135.95310	1.97908	27.16289	0.02166	0.00003	17.13473
FROM CT:	320.93030	1.21693	5.74873	0.00159	0.01437	9.44124

	BAO	LA2O3	CEO2	SB	TE2	UO2
BAL. 1:	85.23347	500.35940	203.65830	1.04066	9.27190	101206.10000
BAL. 2:	85.23370	500.35940	203.65830	1.04065	9.27190	101206.10000
INITIAL:	85.23479	500.36570	203.65720	1.04098	9.27688	101205.50000
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	81.45911	500.04470	203.50460	0.55766	9.01500	101206.00000
PS:	3.39455	0.25294	0.10311	0.21495	0.00000	0.00516
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	0.32516	0.06135	0.04863	0.20978	0.22914	0.09841
INV REL:	3.76113	0.31203	0.12700	0.45604	0.00000	0.00000
EXV REL:	0.01346	0.00270	0.02667	0.02696	0.25690	0.12446
FROM CT:	0.05465	0.00042	0.00192	0.05827	0.02776	0.02089

FRACTION OF DECAY HEAT IN CORIUM & FISSION PRODUCTS

IN CORE		:	0.00000000
IN RELEASED FISSION PRODUCTS		:	0.29873050
CORIUM IN PRIMARY SYSTEM		:	0.00000000
CORIUM IN COMPARTMENT	A	:	0.00000000
	B	:	0.12413200
	C	:	0.57713170
TOTAL FRACTION		:	0.99999410

0ADDITIONAL FIGURES-OF-MERIT OF THIS RUN
FRACTION OF CLAD REACTED IN-VESSEL IS 0.466
0TOTAL H2 BURNED IN CAVITY (KG): 10.
0TOTAL H2 BURNED IN CONTMT. OUTSIDE CAVITY (KG): 493.
0INTEGRATED CONCRETE AEROSOL PRODUCTION IS 1.3595E+02 KG
0SUMMARY OF FISSION PRODUCT REMOVAL MECHANISM EFFICIENCIES IN PRIMARY SYSTEM, CONTMT, AND AUX BLDG:
TOTAL FP REMOVAL (KG) DUE TO GRAV. SETL. IS 1.0916E+03 1.5884E+02 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO STEAM CONDENSATION IS 0.0000E+00 1.7711E+01 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO IMPACTION IS 0.0000E+00 4.9976E+00 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO THERMOPHORESIS IS 9.7116E-01 1.8348E+01 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO DECONTAMINATION IN CONTMT WATER POOLS IS 0.0000E+00
0SUMMARY OF FISSION PRODUCT REMOVAL IN ICE CONDENSER:
TOTAL FP REMOVAL DUE TO GRAV. SET. IN ICE COND. IS 0.0000E+00 KG; REMOVAL DUE TO CONDENSATION IS 0.0000E+00 KG
TOTAL FP REMOVAL DUE TO IMPACTION IN ICE COND. IS 0.0000E+00 KG

Caculation of RF's and DF's

RF_{iv}

From final results:

NG $\frac{336.4991}{336.5000} = 1$ CsI $\frac{27.1998}{29.82595} = 0.912$ TeO2 $\frac{0}{20.9033} = 0$

CsOH $\frac{178.9268}{196.2022} = 0.912$ SRO $\frac{0.29095}{71.18863} = 0.004$

DF_{vsl}

After Vessel Failure:

CsI $\frac{27.1998}{3.52466} = 7.717$ CsOH $\frac{178.9268}{14.3300} = 12.486$ SRO $\frac{0.29095}{0.02674} = 10.881$

RF_{mcci}

From final results:

CsI $\frac{1.97908}{(29.82595 - 27.1998)} = 0.754$ TeO2 $\frac{27.16289}{(27.16872 - 0.0)} = 1$

CsOH $\frac{17.13473}{(196.2022 - 178.9268)} = 0.992$ SRO $\frac{0.02166}{(71.1886 - 0.29095)} = 3.055 \cdot 10^{-4}$

RF_{rev}

From final results and results after vessel failure:

CsI $\frac{23.6751 - 23.0648}{23.6751} = 0.026$ CsOH $\frac{164.5967 - 156.7648}{164.5967} = 0.048$

DF_{pool}

No fission product removal due to overlying pool.

$DF_{Lcont\ and\ Lspry}$

From final results:

No late sprays so spray DF = 1.0

TE02 $\frac{27.1629}{5.7487} = 4.725$ UO2 $\frac{0.12446}{0.02089} = 5.958$

DF_{econt} and espry

Assume DF_{Lcont} applies to CsI and CsOH

No early sprays so spray DF = 1.0

CSI $Rrev := \left[0.912 \cdot \left(1 - \frac{1}{7.717}\right)\right] \cdot \frac{0.026}{(4.725 \cdot 1 \cdot 1)}$ $Rrev = 0.004$

$Rmcci := (1 - 0.912) \cdot \frac{0.754}{(4.725 \cdot 1 \cdot 1)}$ $Rmcci = 0.014$

$Riv := \frac{1.2169}{29.82595} - 0.004 - 0.014$ $Riv = 0.023$

$DFiv := \frac{0.912}{0.023}$ $DFiv = 39.652$

$DFecont := \frac{39.652}{(7.717 \cdot 1)}$ $DFecont = 5.138$

CSOH $Rrev := \left[0.912 \cdot \left(1 - \frac{1}{12.486}\right)\right] \cdot \frac{0.048}{(4.725 \cdot 1 \cdot 1)}$ $Rrev = 0.009$

$Rmcci := (1 - 0.912) \cdot \frac{0.992}{(4.725 \cdot 1 \cdot 1)}$ $Rmcci = 0.018$

$Riv := \frac{9.44124}{196.2022} - 0.009 - 0.018$ $Riv = 0.021$

$DFiv := \frac{0.912}{0.021}$ $DFiv = 43.429$

$DFecont := \frac{43.429}{(12.486 \cdot 1)}$ $DFecont = 3.478$

Caculation of RF's and DF's for IP3 MAAP Runs
Accident Progression Scenario # 10

Description of Sequence

- Long Term Station Blackout event
- High RCS pressureat the onset of core damage
- AC power is not recovered
- Containment sprays are available late
- Containment heat removal is unavailable
- Containment failure size = 1 ft2 (rupture)

Key Results of Calculation

- Aux feedwater off	240 min
- Core uncovery	433 min
- Reactor vessel failure	593 min
- Sprays on	683 min
- Containment failure	42 hrs

Fission Product Mass After Vessel Failure

PS/PZR CONDITIONS: TIME= 41456.1900 SECONDS
11.51561000 HOURS

FISSION PRODUCT MASS BALANCES:

BALANCE 1 = TOTAL MASS AS USED BY MAAP
BALANCE 2 = IN FUEL + INTEGRATED RELEASE FROM FUEL

	NOBLES	CSI	TEO2	SRO	MOO2	CSOH
BAL. 1:	336.50020	29.82601	0.00000	71.18887	260.63620	196.20240
BAL. 2:	336.49790	29.82589	0.00000	71.18887	260.63610	196.20250
INITIAL:	336.50000	29.82595	-0.00003	71.18863	260.63540	196.20220
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	0.00000	2.18877	0.00000	70.82728	200.76450	14.39828
PS:	5.61925	24.77893	0.00000	0.33816	56.31689	169.09380
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	330.87190	2.85828	0.00000	0.02343	3.55485	12.71012
INV REL:	336.49790	27.63712	0.00000	0.36158	59.87166	181.80420
EXV REL:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
FROM CT:	0.00914	0.00004	0.00000	0.00000	0.00005	0.00019

	BAO	LA2O3	CEO2	SB	TE2	UO2
BAL. 1:	85.23492	500.36810	203.65780	1.04099	31.04065	101205.30000
BAL. 2:	85.23495	500.36810	203.65780	1.04099	31.04065	101205.30000
INITIAL:	85.23479	500.36570	203.65720	1.04098	31.04062	101205.50000
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	80.76794	500.20720	203.59230	0.50056	31.04065	101205.30000
PS:	4.17512	0.14549	0.05921	0.32502	0.00000	0.00000
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	0.29186	0.01551	0.00631	0.21540	0.00000	0.00000
INV REL:	4.46701	0.16099	0.06553	0.54043	0.00000	0.00000
EXV REL:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
FROM CT:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Fission Product Mass at Problem Termination

PS/PZR CONDITIONS: TIME= 172800.0000 SECONDS
48.00001000 HOURS

FISSION PRODUCT MASS BALANCES:

BALANCE 1 = TOTAL MASS AS USED BY MAAP
BALANCE 2 = IN FUEL + INTEGRATED RELEASE FROM FUEL

	NOBLES	CSI	TEO2	SRO	MOO2	CSOH
BAL. 1:	336.50040	29.82467	0.00000	71.18886	260.63530	196.19430
BAL. 2:	336.49790	29.82589	0.00000	71.18887	260.63610	196.20250
INITIAL:	336.50000	29.82595	-0.00003	71.18863	260.63540	196.20220
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	0.00000	2.18877	0.00000	70.82728	200.76450	14.39828
PS:	3.22218	24.49337	0.00000	0.33815	56.31565	166.96650
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	2.60827	3.14249	0.00000	0.02343	3.55511	14.82910
INV REL:	336.49790	27.63712	0.00000	0.36158	59.87166	181.80420
EXV REL:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
FROM CT:	330.67000	0.00004	0.00000	0.00000	0.00005	0.00043

	BAO	LA2O3	CEO2	SB	TE2	UO2
BAL. 1:	85.23486	500.36810	203.65780	1.04096	31.04065	101205.30000
BAL. 2:	85.23495	500.36810	203.65780	1.04099	31.04065	101205.30000
INITIAL:	85.23479	500.36570	203.65720	1.04098	31.04062	101205.50000
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	80.76794	500.20720	203.59230	0.50056	31.04065	101205.30000
PS:	4.17502	0.14548	0.05921	0.31164	0.00000	0.00000
S/G:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CONT:	0.29190	0.01551	0.00631	0.22875	0.00000	0.00000
INV REL:	4.46701	0.16099	0.06553	0.54043	0.00000	0.00000
EXV REL:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
FROM CT:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

FRACTION OF DECAY HEAT IN CORIUM & FISSION PRODUCTS

IN CORE	:	0.00000000
IN RELEASED FISSION PRODUCTS	:	0.27237040
CORIUM IN PRIMARY SYSTEM	:	0.00000000
CORIUM IN COMPARTMENT A	:	0.00000000
B	:	0.17300850
C	:	0.55461170
TOTAL FRACTION	:	0.99999060

0ADDITIONAL FIGURES-OF-MERIT OF THIS RUN
FRACTION OF CLAD REACTED IN-VESSEL IS 0.502
0TOTAL H2 BURNED IN CAVITY (KG): 0.
0TOTAL H2 BURNED IN CONTMT. OUTSIDE CAVITY (KG): 0.
0INTEGRATED CONCRETE AEROSOL PRODUCTION IS 0.0000E+00 KG
0SUMMARY OF FISSION PRODUCT REMOVAL MECHANISM EFFICIENCIES IN PRIMARY SYSTEM, CONTMT, AND AUX BLDG:
TOTAL FP REMOVAL (KG) DUE TO GRAV. SETL. IS 1.0833E+03 4.4978E+00 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO STEAM CONDENSATION IS 0.0000E+00 3.8872E+01 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO IMPACTION IS 0.0000E+00 8.1760E-02 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO THERMOPHORESIS IS 9.4679E-01 2.2989E-01 0.0000E+00
TOTAL FP REMOVAL (KG) DUE TO DECONTAMINATION IN CONTMT WATER POOLS IS 0.0000E+00
0SUMMARY OF FISSION PRODUCT REMOVAL IN ICE CONDENSER:
TOTAL FP REMOVAL DUE TO GRAV. SET. IN ICE COND. IS 0.0000E+00 KG; REMOVAL DUE TO CONDENSATION IS 0.0000E+00 KG
TOTAL FP REMOVAL DUE TO IMPACTION IN ICE COND. IS 0.0000E+00 KG

Caculation of RF's and DF's

RF_{iv}

From final results:

NG $\frac{336.498}{336.5000} = 1$ CsI $\frac{27.6371}{29.82595} = 0.927$ TeO2 $\frac{0}{20.9033} = 0$

CsOH $\frac{181.8042}{196.2022} = 0.927$ SRO $\frac{0.36158}{71.18863} = 0.005$

DF_{vsl}

After Vessel Failure:

CsI $\frac{27.6371}{2.858828} = 9.667$ CsOH $\frac{181.8042}{12.71012} = 14.304$ SRO $\frac{0.36158}{0.02343} = 15.432$

RF_{mcci}

From final results:

CsI $\frac{0.0}{(29.82595 - 25.26259)} = 0$ TeO2 $\frac{0.0}{(20.9033 - 0.0)} = 0$

CsOH $\frac{0.0}{(196.2022 - 166.1832)} = 0$ SRO $\frac{0.0}{(71.1886 - 0.28079)} = 0$

RF_{rev}

From final results and results after vessel failure:

CsI $\frac{24.77893 - 24.49337}{24.77893} = 0.012$ CsOH $\frac{169.0938 - 166.9665}{169.0938} = 0.013$

DF_{pool}

No fission product removal due to overlying pool.

$DF_{lcont\ and\ lspry}$

From final results:

No late MCCI releases, therefore late DFs cannot be calculated.

DF_{econt} and espry

From final results:

The values represent the multiplication of DF_{econt} and DF_{espry}

CsI $\frac{27.63712 - 24.49337}{0.00004} = 7.859 \cdot 10^4$ CsOH $\frac{181.8042 - 166.9665}{0.00043} = 3.451 \cdot 10^4$

To seperate out the DFs the value of one of the DFs must be assumed. Based on the results from scenario #2 the value for DF_{econt} for a late containment failure with a leak is approximately 5 but may be as high as 100.

Therefore;

CsI DFespry $\frac{7.859 \cdot 10^4}{5} = 1.572 \cdot 10^4$ to $\frac{7.859 \cdot 10^4}{100} = 785.9$

CsOH DEespry $\frac{3.451 \cdot 10^4}{5} = 6.902 \cdot 10^3$ to $\frac{3.451 \cdot 10^4}{100} = 345.1$

APPENDIX M

CONTAINMENT EVENT TREE QUANTIFICATION

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Acronyms and Symbols

AICC	Adiabatic Isochoric Complete Combustion (AICC)
CCI	Core-Concrete Interaction (sometimes abbreviated MCCI)
CET	Containment Event Tree
CHR	Containment Heat Removal
DCH	Direct Containment Heating
FCI	Fuel-Coolant Interaction
HEP	Human Error Probability
HPME	High Pressure Melt Ejection
IP3	Indian Point 3
IPE	Individual Plant Examination
EPRI	Electric Power Research Institute
MAAP	Modular Accident Analysis Program
PDS	Plant Damage State
PORV	Power-Operated Relief Valve
PWR	Pressurized Water Reactor
RCS	Reactor Coolant System
SBO	Station Blackout
SERG	Steam Explosion Review Group

Section M1

INTRODUCTION

A major objective of an IPE is the quantitative evaluation of containment performance by estimating fission product source terms for a wide range of postulated severe accidents. Because the stochastic behavior of system performance in response to postulated accident initiating events and numerous uncertainties related to severe accident behavior require a probabilistic treatment, a probabilistic logic model for containment performance assessment was used--a containment event tree (CET).

The CET is an event tree with top events (or questions) that represent the principal factors influencing the magnitude and timing of fission product release to the environment. These questions are rather complex and require an elaborate supporting logic structure to consider the wide spectrum of factors that can contribute to their answers. The CET includes two types of top events:

- Logical events: where the answer to a question is certain given the specific conditions represented by the question.

- Basic events: where the answer is uncertain due to stochastic behavior or inadequate knowledge of the governing phenomena.

In this appendix, the basic events are examined and a probability (i.e. split fraction) is asigned to each possibility.

Several information sources were used in the quantification (or assignment) of probabilities to basic events. These include:

- Human error probability (HEP) quantification

- System fault trees used in the Level 1 analysis

- Industry and published data

- Plant-specific thermal hydraulic analyses.

When examining industry and published data and plant-specific thermal hydraulic analyses, a systematic and consistent method was established to translate quantitative data (such as numerical probabilities) as well as qualitative information (event descriptions such as likely and possible) into probabilities. These guidelines for quantification are presented in Appendix M-B. They indicate the appropriate split fractions assigned to a basic event for varying levels

of confidence in a particular outcome.

Section M2

QUANTIFICATION OF BASIC EVENTS

For each basic event, a short description of the event is given, and the evaluation of the probability follows. All assumptions that were made with respect to the individual basic events are noted in the calculation.

BASIC EVENT: AC_POWER_E

CET QUESTION NUMBER: 23

DESCRIPTION: AC power recovered prior to vessel failure in station blackout scenarios

This basic event addresses whether AC power will be recovered after the onset of core damage, but prior to vessel breach in Station Blackout (SBO) scenarios.

QUANTIFICATION:

The probability of ac power recovery can be determined directly from an ac power recovery (or non-recovery) probability curve for IP3. Quantification of all ac power recovery basic events for IP3 were based on the offsite ac power recovery probability curve provided in Appendix H. This curve provides the probability of off-site ac power recovery as a function of time for up to 9 hours. For the purposes of basic event quantification, it was assumed that the curve is "flat" beyond 9 hours. This assumption is conservative and will only affect late ac power recovery basic events.

Because level 1 PDSs are defined at the onset of core damage, the probability of off-site ac power recovery prior to core uncovery is already considered in the frequency of the SBO PDSs. Therefore, quantification of this basic event is performed by normalising the probability of offsite ac power recovery at vessel failurewith respect to the ac power non-recovery probability at the time the core is uncovered. This prevents double counting of the frequency already considered in the level 1 analysis. Basic event AC_POWER_E1 represents the early ac power recovery probability for short term SBOs while AC_POWER_E2 represents the early AC power recovery probability for long term SBOs.

Based on calculations using the Modular Accident Analysis Program (MAAP), performed as part of accident progression model development, the times associated with uncovering the core and vessel failure were determined to be approximately 2 and 4 hours respectively for short-term SBOs. The offsite ac power recovery probability at these times are:

Time (hr)	Cumulative Offsite AC Power Recovery Probability
2	0.75
4	0.87

Therefore, the value for basic event AC_POWER_E1 is

AC_POWER_E1 = (0.87-0.75) / (1.0-0.75)

or

AC_POWER_E1: E_Ac = 0.48, nE_AC = 0.52

Based on MAAP calculations, the time associated with uncovering the core and vessel failure were determined to be approximately 7.75 and 10 hours respectively for long-term SBOs. The offsite ac power recovery probability at these times are:

Time (hr)	Cumulative Offsite AC Power Recovery Probability
7.75	0.92
10	0.93

Therefore, the value for basic event AC_POWER_E2 is

AC_POWER_E2 = (0.93-0.92) / (1.0-0.92)

or

AC_POWER_E2: E_AC = 0.13, nE_AC = 0.87

BASIC EVENT: AC_POWER_L

CET QUESTION NUMBER: 60

DESCRIPTION: AC power recovered after vessel failure, but prior to the onset of mcci in station blackout scenarios

This basic event addresses whether ac power will be recovered after vessel failure, but prior to the onset of MCCI in station blackout scenarios.

QUANTIFICATION:

This basic event was quantified in a manner similar to that used in the quantification of basic event AC_POWER_E: quantification was performed by evaluating the probability of off-site ac power recovery at the onset of core-concrete unteractions (CCIs), and normalising the value by dividing by the ac power non-recovery probability at vessel failure. The onset of MCCI represents a significant time late in the accident progression because of its impact on the evolution of fission products. Basic event AC_POWER_L1 represents the late ac power recovery probability for short-term SBOs while AC_POWER_L2 represents the late ac power recovery probability for long-term SBOs.

Based on MAAP calculations, the times associated with vessel failure and the onset of MCCI in the short-term SBO scenarios were determined to be approximately 4 and 18 hours respectively. The off-site ac power recovery probability at these times are:

Time (hr)	Cumulative Offsite AC Power Recovery Probability
4	0.87
18	0.93

Therefor the value for basic event AC_POWER_L1 is

AC_POWER_L1 = (0.93-0.87) / (1.0-0.87)

or

AC_POWER_L1: L_AC = 0.46, nL_AC = 0.54

Because the offsite ac power recovery probability curve is assumed to be flat beyond the time of 9 hours, the quantification of the basic event AC_POWER_L2 results in a value of 0.0. The time of vessel failure in long-term station blackout scenarios is approximately 10 hours and the onset of CCI occurs some time later.

AC_POWER_L2: L_AC = 0.0, nL_AC = 1.0

BASIC EVENT: ALPHA

CET QUESTION NUMBER: 43

DESCRIPTION: Does alpha mode failure occur?

This basic event addresses whether, given an in-vessel fuel-coolant interaction, the vessel and the containment will fail (i.e., alpha mode failure).

QUANTIFICATION:

The logic structure of the CET precludes alpha mode failure unless an in-vessel fuel-coolant interaction (FCI) occurrs. In the NUREG-1150 studies for Surry [1] and Zion [2], the values for alpha mode failure were based on the work of the Steam Explosion Review Group (SERG). The probability of alpha mode failure at low pressure was 0.008. As this value includes the probability of having in-vessel FCIs, and we consider an FCI probability in a separate question, this value must be corrected to give only the alpha mode failure probability, given that an FCI has occurred.

Using the quantification guidelines described in Appendix M-A, the NUREG-1150 results indicate that the entire alpha mode failure process (FCI to VF to CF) at low RCS pressure is considered to be extremely unlikely (i.e. 0.01). The probability of a low pressure fuel-coolant interaction was quantified here as 0.1 (see basic event FCI_IV). Therefore, the probability of an alpha mode failure is 0.1.

ALPHA: Alpha = 0.1, nAlpha = 0.9

BASIC EVENT: BURN_EARLY

CET QUESTION NUMBER: 37

DESCRIPTION: Does an early h2 burn occur?

This basic event addresses whether an early hydrogen burn will occur.

QUANTIFICATION:

A low hydrogen concentration (see basic event H2_EARLY) was defined as being below the lower flammability limit. Therefore, low hydrogen concentrations are precluded from burning. For medium and high hydrogen concentrations, two types of burns are considered:

- E_Def - Large deflagration burns, that will challenge the containment.
- E_Diff - Small deflagration burns, a series of small deflagrations, or diffusion burns. These burns represent no containment challenge.

Detonations were considered in a separate question.

In the Surry and Zion NUREG-1150 studies, early hydrogen burns were not considered; however, they were considered in the Grand Gulf study [3]. The results indicate that if ignition sources or ac power are available, then hydrogen burns always occur.

In the Grand Gulf study [3], several probabilities for burns without ignition sources are provided for hydrogen concentrations that vary from 4 percent to 16 percent. The probabilities that a burn will occur vary from 0.21 to 0.38. Based on the quantification guidelines, the probability of a burn occurring with a medium or high hydrogen concentration and no ignition sources was assigned a value of 0.5.

The type of burn needs also to be considered. It was assumed that if ac power is available, small deflagrations and diffusion burns will be considered likely (probability = 0.9). If no ignition sources are available, an intermediate split between the two cases was assumed (probability = 0.5). The final probabilities for burns are obtained by multiplying the base probability of having a burn by the probability of the burn type. Basic event BURN_EARLY_1 represents the burn probability for sequences where ignition sources are available.

BURN_EARLY_1: nE_Burn = 0.0, E_Def = 0.1, E_Diff = 0.9

Basic event BURN_EARLY_2 represents the burn probability for sequences where ignition sources are not available.

BASIC EVENT: BURN_LATE

CET QUESTION NUMBER: 71

DESCRIPTION: Is there a late h2 burn?

This basic event addresses whether a late hydrogen burn will occur in the containment.

QUANTIFICATION:

The following assumptions were used in the quantification of late burns:

- If a burn occurred early or at vessel breach, then an ignition source is available to ignite any hydrogen produced late (by CCI). Late burns were assumed to be diffusion burns that will not challenge the containment.
- If ac power is available early, all late burns will be diffusion burns.
- If debris is not coolable (CCIs occur), high concentrations of combustible gases (i.e. H_2, CO) will occur (i.e., equivalent to 2200 lbm H_2 or greater).

The results of BURN_EARLY and DETONATION_EARLY were used to quantify BURN_LATE. The cases to be examined for BURN_LATE are as follows:

Case 4) High hydrogen or CCIs, ac power is recovered late in SBO scenarios (BURN_LATE_1).

Case 5) High hydrogen or CCI, ac power is not recovered in SBO scenarios (BURN_LATE_2).

Case 6) Medium hydrogen, no CCI, ac power is recovered late in SBO scenarios (BURN_LATE_3).

Case 7) Medium hydrogen, no CCI, ac power is not recovered in SBO scenarios (BURN_LATE_4).

Case 4

Because ac power is recovered late with a high combustible gas concentration in containment, it was assumed that the burn will either be a deflagration or a detonation. The quantification of the DETONATION_EARLY basic event indicated a probability of 0.1 (for detonation) for this same scenario should it occur early. Therefore the same probability will be assigned for this case (detonation 0.1, deflagration 0.9, diffusion burn 0.0).

BURN_LATE_1: L_Det = 0.1, L_Def = 0.9, nL_Diff = 0.0

Case 5

The probability of ignition when no ac power is present was 0.5. Since there is a high combustible gas concentration in the containment, all of these burns are large deflagrations or detonations-- based on the probabilities from DETONATION_EARLY, 10 percent will be detonations. Thus, the overall probability of detonation will be 0.05, of deflagration 0.45, and of diffusion/no burn 0.50.

BURN_LATE_2: L_Det = 0.05, L_Def = 0.45, nL_Diff = 0.5

Case 6

Because ac power is recovered late with a deflagrable (not detonable) concentration of hydrogen in the containment, it was assumed that a deflagration will occur. Therefore, the probabilities are: detonation 0.0, deflagration 1.0, diffusion burn 0.0

BURN_LATE_3: L_Det = 0.0, L_Def = 1.0, nL_Diff = 0.0

Case 7

Case 7 is like case 5, except that detonations are precluded since the hydrogen level is only medium. Therefore the probabilities are; detonation 0.0, deflagration 0.5, diffusion burn/no burns 0.5.

BURN_LATE_4: L_Det = 0.0, L_Def = 0.5, nL_Diff = 0.5

BASIC EVENT: BURN_VF

CET QUESTION NUMBER: 51

DESCRIPTION: Does an H_2 burn occur at vessel failure?

This basic event addresses whether a hydrogen burn will occur at vessel failure.

QUANTIFICATION:

The following assumptions are taken when quantifying this basic event:

- No burns occur prior to vessel failure
- Medium or high hydrogen levels are present in the containment (combustible concentrations)
- If ignition sources are available (i.e., ac power is available), then hydrogen burns always occur.

Detonations are considered in a separate question.

Basic event BURN_VF_1 addresses whether a burn occurs at vessel failure, given a medium hydrogen concentration early, no early burns, and DCH. As DCH will cause ignition at vessel failure, the split fraction simply indicates the likelihood that the burn will be a deflagration rather than a diffusion burn. Just as with the early burn basic events (BURN_EARLY_2), an even split between deflagrations and diffusion burns was assumed.

BURN_VF_1: nE_Burn = 0.0, E_Def = 0.5, E_Diff = 0.5

Basic event BURN_VF_2 addresses whether no burn, a deflagration, or a diffusion burn occur at vessel failure given that the early hydrogen concentration is high and DCH does not occur. Just as with the early burn basic events, an even split was assumed between burn and no burn, and, should a burn occur, it was assumed to be a deflagration.

BURN_VF_2: nE_Burn = 0.5, E_Def = 0.5, E_Diff = 0.0

Basic event BURN_VF_3 addresses whether a burn will occur at vessel failure, given a medium hydrogen concentration and no DCH. Once again, an even split is assumed between burn and no burn, and just as with the early burn basic events, an event split was assumed between deflagrations and diffusion burns for the medium hydrogen concentration cases.

BURN_VF_3: nE_Burn = 0.5, E_Def = 0.25, E_Diff = 0.25

BASIC EVENT: CFE_BURN

CET QUESTION NUMBER: 39

DESCRIPTION: Does the containment fail due to an early H_2 burn?

This basic event addresses whether an early hydrogen burn will fail the containment due to overpressure.

QUANTIFICATION:

The probability of containment failure as a result of a hydrogen burn depends on the type of burn (e.g., diffusion burn, deflagration, or detonation) and the resulting containment pressure. It was assumed that if a detonation occurs, then the containment will fail. For deflagrations, the pressure rise resulting from the burn is calculated. Once the pressure is known, the probability of containment failure can be calculated using the curve for static overpressurization failure in Appendix B. The adiabatic isochoric complete combustion (AICC) correlation was used to estimate the pressure increase for deflagrations. The pressure estimate using the AICC correlation is shown in below.

Given:

Containment free volume:	$V = 2.61E6\ ft^3$
Universal gas constant:	R = 1545.3 ft-lbf/lbmole/R [4]
Molecular weight of air	M_a = 28.964 lbm/lbmole [5]
Molecular weight of hydrogen	M_b = 2.016 lbm/lbmole [5]
Heat of combustion (hydrogen)	q = 104,084 Btu/lbmole [6]
Specific heat of air	C_v = 0.173 Btu/lbm/R [4]
Nominal containment O_2 concentration	X_{O2} = 0.20946 [5]

Assumed:

Initial containment pressure	P = 14.7 psia or 37.7 psia
Initial containment temperature	T = 90 F = 550 R
Containment atmosphere is ideal gas	PV = NRT
Complete combustion at constant vol.	AICC correlation

Calculations:

Using the assumptions that the atmosphere is an ideal gas, and noting that the combustion process is at constant volume, the following equation can be written:

where,

$$P_f = P_o * \frac{N_f}{N_o} * \frac{T_f}{T_o}$$

P_f = containment pressure following combustion.
P_o = containment pressure prior to combustion.
N_f = total moles of gas following combustion.
N_o = total moles of gas prior to combustion.
T_f = containment temperature following combustion.
T_o = containment temperature prior to combustion.

Let:

N_a = number of moles of air in the containment prior to combustion.
N_b = number of moles of hydrogen in the containment prior to combustion.

Therefore, $N_o = N_a + N_b$

Assuming complete combustion, the following equation applies:

$$O_2 + 2H_2 \text{ --> } 2H_2O$$

From this, it can be seen that $N_f = N_a + N_b/2$.

The AICC Correlation gives the temperature response to combustion:

$$T_f = T_o + \frac{N_b * q}{C_v * N_a * M_a}$$

To account for increase in containment pressure due to the generation of non-condensible gas prior to combustion, a weighting fraction of (N_o/N_a) is multiplied into the equation for P_f. In addition, Reference [6] shows that the pressure rise from a hydrogen deflagration as calculated using the AICC correlation is approximately a factor of two greater than that shown by experimental data becxause the assumption that the combustion process is complete is overly-conservative. Therefore, the final temperature as calculated by the AICC correlation will be corrected using a weighing factor of two to account for this discrepancy. Hence:

$$P_f = P_o * \frac{N_o}{N_a} * \frac{N_a + \frac{N_b}{2}}{N_a + N_b} * \frac{T_o + \frac{N_b * q}{2C_v * N_a * M_a}}{T_o}$$

Four cases were examined:

- High hydrogen, base containment pressure 37.7 psia
- Medium hydrogen, base containment pressure 37.7 psia
- High hydrogen, base containment pressure 14.7 psia
- Medium hydrogen, base containment pressure 14.7 psia.

High Hydrogen

The definition of high hydrogen is 2200 lbm (representing 112 percent core oxidation). Using this mass and the above equation, P_f can be determined. The probability of containment failure can then be obtained from Appendix B.

high base containment pressure,

P_o = 37.7 psia
P_f = 140.3 psia (or 125.6 psig)
Containment failure probability = 0.30

CFE_BURN_1: H2_CFE = 0.30, H2nCFE = 0.70

low base containment pressure,

P_o = 14.7 psia
P_f = 127.0 psia, 112.3 psig
Containment failure probability = 0.07

CFE_BURN_2: H2_CFE = 0.07, H2nCFE = 0.93

Medium Hydrogen

Since medium hydrogen concentrations refer to a mass of between 600 lbm to 2200 lbm (i.e. 31 to 112 perecent core oxidation), a range of probabilities must be determined. First the probability at midpoint of the range (1400 lbm) is determined.

low base containment pressure,
P_o = 14.7 psia
P_f = 82.5 psia (or 67.8 psig)
Containment failure probability = 0.001

CFE_BURN_3: H2_CFE = 0.001, H2nCFE = 0.999

high base containment pressure,
P_o = 37.7 psia
P_f = 101.6 psia (or 86.9 psig)
Containment failure probability = 0.001

CFE_BURN_4: H2_CFE = 0.001, H2nCFE = 0.999

The amount of hydrogen generation necessary to raise the probability of containment failure to 0.01 with medium hydrogen concentrations was also investigated.

low base containment pressure,
From Appendix B, $P_f \approx$ 102 psig (or or 116.7 psia)
Solving N_b for by trial and error, hydrogen mass $\approx$ 2020 lbm represening 103 percent oxidation.

high base containment pressure,
From Appendix B, $P_f \approx$ 102 psig (or 116.7 psia)
Solving N_b for by trial and error, Hydrogen Mass $\approx$ 1720 lbm represnting 88 percent oxidation.

From reference [7], Table 5-6, (and basic event H2_EARLY), an expert elicitation on core oxidation provides a distribution for the oxidation of zirconium in the core. This distribution indicates that zirconium oxidation in the range from 88 to 103 percent oxidation is extremely unlikely. Therefore, no credit was given to the possibility that medium hydrogen will be sufficiently large to have a containment failure probability exceeding the value calculated at the midpoint of the medium hydrogen range.

BASIC EVENT: CFE@VF

CET QUESTION NUMBER: 54

DESCRIPTION: Containment failure results from pressure rise at vessel failure

There are ten possible combinations of events at vessel failure that may cause a significant pressure rise in containment. The probability that each of these event combinations will produce containment failure must be quantified for both high and low containment base pressures. Thus, twenty basic events are quantified below.

QUANTIFICATION:

BASIC EVENT CFE@VF_1

This basic event addresses whether containment failure occurs, given that, at vessel failure:

- The containment base pressure is high (23 psig, 37.7 psia)
- DCH occurs
- The hydrogen concentration in containment is high (See H2_EARLY)
- A hydrogen deflagration occurs in containment.

From the quantification of CFE_BURN_1, it can be seen that the containment pressure reaches 140.3 psia (125.6 psig) given the deflagration of high hydrogen concentrations and a high base pressure. Assuming an additional containment pressure increase of approximately 100 psi [8] from DCH, the final containment pressure given the above conditions is approximately 240.3 psia (225.6 psig). From Appendix B, this pressure corresponds to a containment failure probability of 0.999.

CFE@VF_1: VF_CFE = 0.999, nVF_CFE = 0.001

BASIC EVENT CFE@VF_2

This basic event addresses whether containment failure occurs given that, at vessel failure:

- The containment base pressure is high (23 psig, 37.7 psia)
- The reactor pit is dry
- DCH occurs
- The hydrogen concentration in containment is Medium (See H2_EARLY)
- A hydrogen deflagration occurs in containment.

The quantification of CFE_BURN_2 shows that the containment pressure reaches 101.6 psia (86.9 psig) given hydrogen deflagration in the presence of medium hydrogen concentrations and a high base pressure. Assuming an additional containment pressure increase of approximately 100 psi [8] because of DCH, the final containment pressure for the above conditions is approximately 201.6 psia (186.9 psig). From Appendix B, this pressure corresponds to a containment failure probability of 0.997.

CFE@VF_2: VF_CFE = 0.997, nVF_CFE = 0.003

BASIC EVENT CFE@VF_3

This basic event addresses whether containment failure occurs given that, at vessel failure:

- The containment base pressure is low (0 psig, 14.7 psia)
- DCH occurs
- The hydrogen concentration in containment is High (See H2_EARLY)
- A hydrogen deflagration occurs in containment.

The quantification of CFE_BURN_3 predicts that the containment pressure reaches 127.0 psia (112.3 psig) given hydrogen deflagration in the presence of high hydrogen concentrations and a low base pressure. Assuming an additional containment pressure increase of approximately 100 psi [8] because of DCH, the final containment pressure for the above conditions is approximately 227.0 psia (212.3 psig). From Appendix B, this pressure corresponds to a containment failure probability of 0.999.

CFE@VF_3: VF_CFE = 0.999, nVF_CFE = 0.001

BASIC EVENT CFE@VF_4

This basic event addresses whether containment failure occurs given that, at vessel failure:

- The containment base pressure is low (0 psig, 14.7 psia)
- The reactor pit is dry
- DCH occurs
- The hydrogen concentration in containment is Medium (See H2_EARLY)
- A hydrogen deflagration occurs in containment.

The quantification of CFE_BURN_4 predicts that the containment pressure reaches 82.5 psia (67.8 psig), given hydrogen deflagration in the presence of medium hydrogen concentrations and a low base pressure. Assuming an additional containment pressure increase of approximately 100 psi [8] because of DCH, the final containment pressure given the above conditions is approximately 182.5 psia (167.8 psig). From Appendix B, this pressure corresponds to a containment failure probability of 0.97.

CFE@VF_4: VF_CFE = 0.97, nVF_CFE = 0.03

BASIC EVENT CFE@VF_5

This basic event addresses whether containment failure occurs, given that, at vessel failure:

- The containment base pressure is high (23 psig, 37.7 psia)
- High pressure blowdown occurs
- The hydrogen concentration in containment is High (See H2_EARLY)
- A hydrogen deflagration occurs in containment.

The quantification of CFE_BURN_1 predicts that the containment pressure reaches 140.3 psia (125.6 psig) given hydrogen deflagration in the presence of high hydrogen concentrations and a high base pressure. There is an additional pressure increase in containment caused by high pressure blowdown from the vessel. This pressure increase would be similar to the pressure spike in containment associated with a large-break LOCA and is approximately 50 psi [9]. With this additional containment pressure increase, the final containment pressure is approximately 190.3 psia (175.6 psig). From Appendix B, this pressure corresponds to a containment failure probability of 0.99.

CFE@VF_5: VF_CFE = 0.99, nVF_CFE = 0.01

BASIC EVENT CFE@VF_6

This basic event addresses whether containment failure occurs, given that, at vessel failure:

- High pressure blowdown occurs :
- The containment base pressure is high (23 psig, 37.7 psia)
- The hydrogen concentration in containment is medium (See H2_EARLY)
- A hydrogen deflagration occurs in containment.

The quantification of CFE_BURN_2 predicts that the containment pressure reaches 101.6 psia (86.9 psig) given hydrogen deflagration in the presence of medium hydrogen concentrations and a high base pressure. An additional 50-psi pressure increase in containment results from high pressure blowdown from the vessel. The final containment pressure given the above conditions is approximately 151.6 psia (136.9 psig). From Appendix B, this pressure corresponds to a containment failure probability of 0.57.

CFE@VF_6: VF_CFE = 0.57, nVF_CFE = 0.43

BASIC EVENT CFE@VF_7

This basic event addresses whether containment failure occurs, given that, at vessel failure:

- The containment base pressure is low (0 psig, 14.7 psia)
- High pressure blowdown occurs
- The hydrogen concentration in containment is High (See H2_EARLY)
- A hydrogen deflagration occurs in containment.

The quantification of CFE_BURN_3 predicts that the containment pressure reaches 127.0 psia (112.3 psig) given hydrogen deflagration in the presence of high hydrogen concentrations and a low base pressure. An additional 50-psi pressure increase in containment results from high pressure blowdown from the vessel. The final containment pressure given the above conditions is approximately 177.0 psia (162.3 psig). From Appendix B, this pressure corresponds to a containment failure probability of 0.95.

CFE@VF_7: VF_CFE = 0.95, nVF_CFE = 0.05

BASIC EVENT CFE@VF_8

This basic event addresses whether containment failure occurs, given that, at vessel failure:

- The containment base pressure is low (0 psig, 14.7 psia)
- High pressure blowdown occurs
- The hydrogen concentration in containment is Medium (See H2_EARLY)
- A hydrogen deflagration occurs in containment.

The quantification of CFE_BURN_4 predicts that the containment pressure reaches 82.5 psia (67.8 psig) given hydrogen deflagration in the presence of medium hydrogen concentrations and a low base pressure. An additional 50-psi pressure increase in containment results from high pressure blowdown from the vessel. The final containment pressure is approximately 132.5 psia (117.8 psig). From Appendix B, this pressure corresponds to a containment failure probability of 0.15.

CFE@VF_8: VF_CFE = 0.15, nVF_CFE = 0.85

BASIC EVENT CFE@VF_9

This basic event addresses whether containment failure occurs, given that, at vessel failure:

- The containment base pressure is high (23 psig, 37.7 psia)
- The reactor pit is dry
- DCH occurs.

Assuming a containment pressure increase of approximately 100 psi [8] from DCH, the final containment pressure is approximately 137.7 psia (123 psig). From Appendix B, this pressure corresponds to a containment failure probability of 0.24.

CFE@VF_9: VF_CFE = 0.24, nVF_CFE = 0.76

BASIC EVENT CFE@VF_10

This basic event addresses whether containment failure occurs, given that, at vessel failure:

- The containment base pressure is low (0 psig, 14.7 psia)

- The reactor pit is dry
- DCH occurs.

Assuming a containment pressure increase of approximately 100 psi [8] from DCH, the final containment pressure is approximately 114.7 psia (100 psig). From Appendix B, this pressure corresponds to a containment failure probability of 0.01.

CFE@VF_10: VF_CFE = 0.01, nVF_CFE = 0.99

BASIC EVENT CFE@VF_11

This basic event addresses whether containment failure occurs, given that, at vessel failure:

- The containment base pressure is high (23 psig, 37.7 psia)
- The hydrogen concentration in containment is high (See H2_EARLY)
- A hydrogen deflagration occurs in containment.

The quantification of CFE_BURN_1 predicts that the containment pressure reaches 140.3 psia (125.6 psig). From Appendix B, this pressure corresponds to a containment failure probability of 0.30.

CFE@VF_11: VF_CFE = 0.30, nVF_CFE = 0.70

BASIC EVENT CFE@VF_12

This basic event addresses whether containment failure occurs, given that, at vessel failure:

- The containment base pressure is high (23 psig, 37.7 psia)
- The hydrogen concentration in containment is medium (See H2_EARLY)
- A hydrogen deflagration occurs in containment.

The quantification of CFE_BURN_2 predicts that the containment pressure reaches 101.6 psia (86.9 psig). From Appendix B, this pressure corresponds to a containment failure probability of 0.001.

CFE@VF_12: VF_CFE = 0.001, nVF_CFE = 0.999

BASIC EVENT CFE@VF_13

This basic event addresses whether containment failure occurs, given that, at vessel failure:

- The containment base pressure is low (0 psig, 14.7 psia)
- The hydrogen concentration in containment is high (See H2_EARLY)
- A hydrogen deflagration occurs in containment.

The quantification of CFE_BURN_3 predicts that the containment pressure reaches 127.0 psia (112.3 psig). From Appendix B, this pressure corresponds to a containment failure probability of 0.07.

CFE@VF_13: VF_CFE = 0.07, nVF_CFE = 0.93

BASIC EVENT CFE@VF_14

This basic event addresses whether containment failure occurs, given that, at vessel failure:

- The containment base pressure is low (0 psig, 14.7 psia)
- The hydrogen concentration in containment is Medium (See H2_EARLY)
- A hydrogen deflagration occurs in containment.

The quantification of CFE_BURN_4 predicts that the containment pressure reaches 82.5 psia (67.8 psig). From Appendix B, this pressure corresponds to a containment failure probability

of 0.001.

CFE@VF_14: VF_CFE = 0.001, nVF_CFE = 0.999

BASIC EVENT CFE@VF_15

This basic event addresses whether containment failure occurs, given that, at vessel failure:

- The containment base pressure is high (23 psig, 37.7 psia)
- High pressure blowdown occurs.

Assuming a 50-psi pressure increase in containment due to high pressure blowdown, the final containment pressure is approximately 87.7 psia (73 psig). From Appendix B, this pressure corresponds to a containment failure probability of 0.001.

CFE@VF_15: VF_CFE = 0.001, nVF_CFE = 0.999

BASIC EVENT CFE@VF_16

This basic event addresses whether containment failure occurs, given that, at vessel failure

- The containment base pressure is low (0 psig, 14.7 psia)
- High pressure blowdown occurs.

Assuming a 50-psi containment pressure increase from high pressure blowdown, the final containment pressure is approximately 73.7 psia (50 psig). From Appendix B, this pressure corresponds to a containment failure probability of 0.001.

CFE@VF_16: VF_CFE = 0.001, nVF_CFE = 0.999

BASIC EVENT CFE@VF_17

This basic event addresses whether containment failure occurs, given that, at vessel failure:

- The containment base pressure is high (23 psig, 37.7 psia)
- The reactor pit contains water
- DCH occurs
- The hydrogen concentration in containment is medium (See H2_EARLY)

- A hydrogen deflagration occurs in containment.

The quantification of CFE_BURN_2 predicts that the containment pressure reaches 101.6 psia (86.9 psig). Assuming an additional containment pressure increase of approximately 120 psi [8] from DCH with water in the pit, the final containment pressure is approximately 221.6 psia (206.9 psig). From Appendix B, this pressure corresponds to a containment failure probability of 0.999.

CFE@VF_17: VF_CFE = 0.999, nVF_CFE = 0.001

BASIC EVENT CFE@VF_18

This basic event addresses whether containment failure occurs, given that, at vessel failure:

- The containment base pressure is low (0 psig, 14.7 psia)
- The reactor pit contains water
- DCH occurs
- The hydrogen concentration in containment is Medium (See H2_EARLY)
- A hydrogen deflagration occurs in containment.

The quantification of CFE_BURN_4 predicts that the containment pressure reaches 82.5 psia (67.8 psig). Assuming an additional containment pressure increase of approximately 120 psi from DCH with water in the pit [8], the final containment pressure is approximately 202.5 psia (187.8 psig). From Appendix B, this pressure corresponds to a containment failure probability of 0.997.

CFE@VF_18: VF_CFE = 0.997, nVF_CFE = 0.003

BASIC EVENT CFE@VF_19

This basic event addresses whether containment failure occurs, given that, at vessel failure:

- The containment base pressure is high (23 psig, 37.7 psia)
- The reactor pit contains water
- DCH occurs.

Assuming a containment pressure increase of approximately 120 psi from DCH with water in the pit [8], the final containment pressure is approximately 157.7 psia (143 psig). From Appendix B, this pressure corresponds to a containment failure probability of 0.70.

CFE@VF_19: VF_CFE = 0.70, nVF_CFE = 0.30

BASIC EVENT CFE@VF_20

This basic event addresses whether containment failure occurs, given that, at vessel failure:

- The containment base pressure is low (0 psig, 14.7 psia)
- The reactor pit contains water
- DCH occurs .

Assuming a containment pressure increase of approximately 120 psi [14] from DCH with water in the reactor pit, the final containment pressure is approximately 134.7 psia (120 psig). From Appendix B, this pressure corresponds to a containment failure probability of 0.18.

CFE@VF_20: VF_CFE = 0.18, nVF_CFE = 0.82

BASIC EVENT: CFE_EX_FCI

CET QUESTION NUMBER: 55

DESCRIPTION: Do ex-vessel FCIs fail containment?

This basic event addresses whether the containment will fail, given an ex-vessel fuel-coolant interaction has occurred.

QUANTIFICATION:

The Surry and Zion studies [1, 2] both calculated a probability of containment failure using a fast pressure rise algorithm embedded into a user function; therefore, actual numbers could not be obtained. Furthermore, other steam explosion studies are, in general, too specific to be applied to IP3. However, this event is typically considered to be almost impossible because of the strength of large dry containments and the cavity configuration of Pressurized Water Reactors (PWRs). Therefore, based on the quantification guidelines in Appendix A, this probability was assumed to be 0.001.

CFE_EX_FCI: FCI_CFE = 0.001, FCInCFE = 0.999

BASIC EVENT: CFL_BMMT

CET QUESTION NUMBER: 73

DESCRIPTION: Does the core melt through the basemat?

Given that CCIs occur and the debris is not dispersed, this basic event addresses whether core debris in the reactor cavity will melt-through the concrete containment basemat.

QUANTIFICATION:

This basic event considers two possible accident scenarios:

1) A wet cavity with water above the debris (CFL_BMMT_1)

2) A dry cavity (CFL_BMMT_2).

The Surry containment has a 10 ft. thick basemat that is largely siliceous in composition [1]; at Zion the containment has a 9 ft. thick basemat. At Surry [1], the probabilities for these case were 0.25 and a 0.4, respectively. At Zion [2], 0.4 and 0.8, respectively.

Current industry thinking on the probability of basemat melt-through is that the values used for Surry and Zion are overly conservative, and that melt-through is unlikely, even in a dry cavity. Furthermore,, the large floor area in the cavity and keywayat IP3 provides for relatively shallow debris bed depths. Based on the quantification guidelines in Appendix A, a value of 0.1 was assigned to the case where water is present above the debris bed.

CFL_BMMT_1: BMMT = 0.1, nBMMT = 0.9

While current thinking is that basemat melt-through is unlikely, there is considerable uncertainty associated with the case where the cavity is dry. Therefore, based on quantification guidelines, this basic event was assigned a value of 0.5.

CFL_BMMT_2: BMMT = 0.5, nBMMT = 0.5

BASIC EVENT: CFL_BURN

CET QUESTION NUMBER: 72

DESCRIPTION: Does the containment fail late due to a burn?

This basic event addresses whether a late combustible gas burn will fail the containment.

QUANTIFICATION:

The quantification of this basic event is similar to quantifying basic event CFE_BURN. Late containment failures from combustible gas burns can only result from a detonation or deflagration. Late burns are precluded if there is a high steam concentration in containment. Therefore, all late burn pressure rise calculations assume that the containment base pressure is low (i.e., 14.7 psia). However, three cases are examined for late burn failures:

- Deflagrations where CCIs are the source of combustible gas
- Deflagrations from high hydrogen sources
- Deflagrations from medium hydrogen sources.

Detonations were assumed to alays result in containment failure.

Deflagrations following CCI

CCIs were assumed to produce the highest combustible gas concentrations. Using the distribution of hydrogen generation from [7], the maximum amount of hydrogen possible is approximately 125 percent of that derived from the core zirconium inventory (see basic event H2_EARLY). This represents approximately 2456 lbm of hydrogen equivalent combustible gases. Using a base pressure of, P_o = 14.7 psia, the pressure calculated by the AICC curve is, P_f = 142.2 psia or 127.5 psig. This produces a containment failure probability of 0.33.

CFL_BURN_1: L_CGCFL = 0.33, nL_CGCFL = 0.67

Deflagrations with High Hydrogen

This case is identical to CFE_BURN_2.

CFL_BURN_2: L_CGCFL = 0.07, nL_CGCFL = 0.93

Deflagrations with Medium Hydrogen

This case is identical to CFE_BURN_3.

CFL_BURN_3: L_CGCFL = 0.001, nL_CGCFL = 0.999

BASIC EVENT: CFL_SOP

CET QUESTION NUMBER: 74

DESCRIPTION: DOES THE CONTAINMENT FAIL LATE DUE TO STATIC OVERPRESSURIZATION?

This basic event represents the probability that late steam/non-condensible gas production will cause static overpressurization of the containment.

QUANTIFICATION:

Four cases are considered for this basic event and are as follows:

1) Debris cooled and no containment heat removal.
2) Debris cooled and containment heat removal.
3) CCI and containment heat removal.
4) CCI and no containment heat removal.

The overpressurization of the containment late is viewed essentially as problem of energy balance. Energy is added to the containment atmosphere from decay heat and potentially from CCI. A hand calculation was performed to determine the amount of steam necessary to fail the containment. The hand calculation is based on the equation of state for ideal gases (i.e PV=nRT). Basic values for the hand calculation are taken from the data in basic event H2_EARLY. The hand calculation is as follows:

From containment fragility curve failure at 0.999 probability = 195 psig or 210 psia
Saturation temperature @ 210 psia = 385 F or 845 R
lbmols = [(210 psia) (144 in2/ft2) (2.61E6 ft3)]/(1545.3 ft-lbf/lbmole/R * 845 R)
lbmols = 60,433
lbmass = 60,433 * 18 lbs/lbmole = 1,087,974 lbs
volume = 1,087,974 / 8.33 lb/gal ≈ 130,600 gals or 37% of RWST inventory

Only 37% of the RWST inventory must be boiled away and remain non-condensed to cause almost certain containment failure. The integrated decay heat necessary to boil this inventory away is easily obtained in time frames less than 24 hours. Therefore in the absence of containment heat removal, containment failure is almost certain. Thus, both cases with no containment heat removal, cases 1 and 4, are given a 0.999 probability of failing containment.

CFL_SOP_1: CFL = 0.999, nCFL = 0.001
CFL_SOP_4: CFL = 0.999, nCFL = 0.001

If containment heat removal is present, it can remove approximately 112 MW of energy. This value is far greater than the decay energy generated late (less than 20 MW). Therefore, it will be assumed that if the debris is cooled and decay heat is the only heat source to the containment, that the containment will not failed. Thus the probability for failing containment for case 2 is given a value of 0.0.

CFL_SOP_2: CFL = 0.0, nCFL = 1.0

If CCI is occurring late, this may add up to twice the energy of decay heat due to the chemical energy generated during CCI. The total energy added to the containment is still less than the capacity of containment heat removal. Therefore, this basic event is given an extremely unlikely chance of failing containment and the containment failure probability for case 3 is assigned a value of 0.01.

CFL_SOP_3: CFL = 0.01, nCFL = 0.090

EVENT: CHR_EARLY

CET QUESTION NUMBER: 40

DESCRIPTION: Operator fails to operate fan coolers:

This basic event addresses whether the operator fails to initiate operation of the fan coolers in recovered blackouts.

QUANTIFICATION:

Quantification of this event includes two elements. One element is failure of the operator to initiate operation of the fan coolers once ac power is recovered. This human error probability is 0.052 as discussed in the quantification of SPRAY_LATE. The other element is the probability that the fan coolers would fail to operate due to a hardware failure should the operator attempt to initiate operation. This probability, 6.3×10^{-7}, is negligible compared to the human error probability and was therefore ignored.

CHR_EARLY: E_CHR = 0.948, nE_CHR = 0.052

BASIC EVENT: CM>20%

CET QUESTION NUMBER: 35

DESCRIPTION: CORE MELT GREATER THAN 20%

This basic event represents the probability that core melt will be greater than 20% given that AC power has been recovered, the vessel can be depressurized.

QUANTIFICATION:

The definition of this basic event has changed from it's earlier definition. It is now assumed that only station blackouts can have core melt less than 20%. This assumption is less conservative than NUREG-1150 in which it was assumed that all initiators would proceed to full core melt.

For a station blackout to have less that 20% core melt, it is assumed that; 1) AC power has been recovered; and 2) there is sufficient time left before 20% of the core has melted for the reactor vessel to be depressurized. Two MAAP cases were important in determining the probability for this basic event, MAAP run No. 1 and MAAP run No. 5.

For some SBO sequences, AC power was recovered prior to the onset of core damage (but not in time to completely prevent core damage). In these cases, the probability that less than 20% of the core melted is assumed to be 1.0.

CM<20% = 1.0, CM>20% = 0.0 (Case 3)

MAAP run No. 1 was a short term station blackout. Core uncovery occurs at approximately 2.2 hours and vessel failure occurs at approximately 4.2 hours. It is estimated from the MAAP results that severe core melting (i.e. greater than 20% core melt) has occurred in less than one hour after core uncovery. Therefore, the reactor vessel must be depressurized in this sequence in less than one hour for the sequence to be considered recoverable. However, at approximately 3 hours from scram, the steaming rate from the core is only slightly less than the flow rate out of the PORVs. Thus all short term blackouts are considered unrecoverable.

CM<20% = 0.0, CM>20% = 1.0 (Case 6)

MAAP run No. 5 was a long term station blackout. Core uncovery occurs at approximately 7.2 hours and vessel failure occurs at approximately 10 hours. It is estimated that the time from core uncovery to severe core melting is approximately 1.5 hours. The PORVs are more than adequate to depressurize the vessel at the decay heat levels at 7 hours from scram.

Two basic events were defined for long term SBOs:

- Given AC power recovery, a long term sequence, and medium to low RCS pressure, what is the probability of core melt proceeding to full core melt (i.e. greater than 20%).
- Given AC power recovery, a long term sequence, and high RCS pressure, what is the probability of core melt proceeding to full core melt (i.e. greater than 20%).

For the first case all the criteria have been met for core melt progression to be stopped. However, some uncertainty exists as to whether this will occur. Based on the criteria for quantification, CM>20% is considered unlikely and is therefore given a probability of 0.1.

CM<20% = 0.9, CM>20% = 0.1 (Case 4)

The second case meets all the criteria, except the vessel is at high pressure, and must be depressurized. Therefore, for this event the analysis is inconclusive and it is assigned a probability of 0.5.

CM<20% = 0.5, CM>20% = 0.5 (Case 5)

BASIC EVENT: CTMT_BASE_PRESS

CET QUESTION NUMBER: 30

DESCRIPTION: Containment base pressure at vessel failure

This basic event addresses whether the containment base pressure will have reached the containment spray actuation setpoint of 23 psig after the onset of core damage, but prior to vessel failure.

QUANTIFICATION:

It was assumed that if the base pressure meets or exceeds 23 psig, a containment spray actuation signal will be sent. The MAAP calculations performed for accident progression model development were analyzed to identify wht accident scenarios that might lead to a high containment base pressure after the onset of core damage, but prior to vessel breach. Few of the scenarios analyzed indicated a high containment base pressure--vaporizing the entire RCS inventory over 1 to 2 hours is insufficient to increase the containment pressure to the spray initiation set point. While the large break LOCA scenario did result in a high containment pressure prior to core damage, this initiator was considered in basic event SPRAY_VE).

The only accident scenario that could be postulated that might result in a high containment base pressure is one in which the RCS inventory was vaporized along with a substantial fraction of the RWST inventory. (Non-condensible gas generation is too low to significantly increase containment base pressure). To achieve this, the accident scenario would have no containment fan coolers, some sort of RCS breach or leak where the initial RCS inventory was lost, and successful (and controlled) RWST injection to the RCS after the onset of core damage and before vessel breach. Recovery of injection after the onset of core damage, but before vessel breach is considered only for SBOs with early ac power recovery and transients where the operator depressurizes during core damage. For the SBO scenarios, both fan coolers and auxiliary feedwater will likely be recovered with the recovery of AC power. If fan coolers are recovered, the steam challenge to the containment will be alleviated; if auxiliary feedwater is recovered, the need to relieve pressure through the PORVs (for transients) will be eliminated. For these reasons, this basic event was assigned a value of 0.0.

CTMT_BASE_PRESS: CP>23 = 0.0, CP<23 = 1.0

BASIC EVENT: DCH

CET QUESTION NUMBER: 50

DESCRIPTION: Does DCH occur?

This basic event addresses whether direct containment heating occurs, given that high pressure melt ejection has occurred previously.

QUANTIFICATION:

Given high pressure melt ejection (HPME) has occurred, DCH may follow resulting in a significant pressure rise in containment. As the data available in the literature regarding DCH are minimal and significant uncertainty exists, this basic event was assigned a value of 0.5.

DCH: DCH = 0.5, nDCH = 0.5

BASIC EVENT: DISPERSAL

CET QUESTION NUMBER: 57

DESCRIPTION: IS THE DEBRIS DISPERSED?

This basic event represents the probability that debris is dispersed and cooled following an alpha, HPME or ex-vessel steam explosion event.

QUANTIFICATION:

For this basic event, dispersal is defined to be debris that is dispersed to such an extent that it is coolable by radiative and natural convection only. To evaluate this basic event, the depth of the debris bed given full core melt is calculated as follows.

Given:

Mass of UO2 in core	221,600 lbs [8]
Mass of zircaloy in core	44,450 lbs [8]
Mass of other core components (assumed to be steel)	17,950 [8]
Density of UO2	684 lbs/ft^3 [9]
Density of zircaloy	406 lbs/ft^3 [9]
Density of steel	495 lbs/ft^3 [9]
Area of cavity	477 ft^2 [8]

$$\text{Depth} = [(221{,}600/684) + (44{,}450/406) + (17{,}950/495)]/477 \approx 1 \text{ ft}$$

Typically, calculations for debris coolability by radiation and convection with an adiabatic lower surface have debris bed maximum thicknesses of approximately 1 to 2 inches. Therefore, this basic event represents the probability that debris is dispered such that the maximum debris bed thiskness is less than 2 inches. As this would require a substantial fraction of the core to be ejected from the reactor cavity, it is considered unlikely that dispersal wil occur.

DISPERSAL: Disp = 0.1, nDisp = 0.9

BASIC EVENT: DETONATION_EARLY

CET QUESTION NUMBER: 38

DESCRIPTION: Does an early H_2 detonation occur?

This basic event addresses whether an early hydrogen deflagration, in the presence of a detonable concentration, is actually a detonation.

QUANTIFICATION:

Based on the definitions of low, medium and high hydrogen concentrations, (see basic event H2_EARLY), a detonation can only occur for high hydrogen concentrations. It was also assumed that a detonation can only occur if the criteria for an early burn (see basic event BURN_EARLY) have also been met.

The early detonation of hydrogen was considered in the Grand Gulf study [3]. The probability of hydrogen detonation with hydrogen concentrations between 12 and 16 percent was 0.22; for concentrations above 16 percent, it was 0.25. Based on these values, the probability of a hydrogen detonation is relatively unlikely. Therefore, based on our quantification guidelines, this basic event is assigned a value of 0.1 for a detonation and 0.9 for a deflagration.

DETONATION_EARLY: E_DET = 0.1, nE_DET = 0.9

BASIC EVENT: DETONATION_VF

CET QUESTION NUMBER: 52

DESCRIPTION: Is the H_2 burn at vessel failure a detonation?

This basic event addresses whether a hydrogen burn at vessel failure will be a detonation.

QUANTIFICATION:

This basic event was assumed to be very similar to basic event DETONATION_EARLY. The following assumptions were made:

- A deflagration burn occurrs at vessel failure
- A high concentration of hydrogen exists in the containment
- Sprays do not operate.

As with basic event DETONATION_EARLY, this basic event was considered unlikely and is assigned a value of 0.1.

DETONATION_VF: VF_DET = 0.1, nVF_DET = 0.9

BASIC EVENT: DP_PORV

CET QUESTION NUMBER: 24

DESCRIPTION: The rcs is depressurized during core damage by opening the PORVS

This basic event addresses whether the RCS can be depressurized prior to vessel breach by opening the PORVs.

QUANTIFICATION:

This basic event has two cases:

- Short-term sequences, in which the time to core damage is less than approximately 2 hours.
- Long-term sequences, in which the time to core damage is much greater than 2 hours.

There are three sources of information available to quantify this event: a MAAP calculation; a hand calculation; and data from the NUREG-1150 study. The hand calculation applies to the short term sequences; the MAAP calculation and NUREG-1150 data apply to the long-term sequences.

Short-Term Sequences

Since data were not available to indicate the time when it is physically possible to have the PORVs depressurize the vessel, a hand calculation was made to estimate this value. The calculation assumes that the RCS is at the PORV setpoint and that the coolant is saturated.

Known Values

Normal reactor power		3025 MW [6]
PORV setpoint	2325 psia	16.1 MPa
PORV capacity (single PORV)	179,000 lb/hr	22.55 kg/s
Heat of vaporization H_{fg} @ 2325 psia		925,990 J/kg [5]

Energy Removal Rate for 2 PORVs

E_{rem} = 925900 J/kg * 2 * 22.55 kg/s = 4.176E7 J/s = 41.76 MW

Energy Removal Rate as a Fraction of Total Power

E_{rem} / P_o = 41.76 MW / 3025 MW = 0.0138

Time at Which Decay Heat Equals Energy Removal Rate

The decay heat of the reactor as a fraction of total power is given as follows:

$$\frac{P}{P_o} = 0.1[(\tau - T_o + 10)^{-0.2} - 0.87(\tau - T_o + 2x10^7)^{-0.2}]$$

where,

$\tau - T_o$ = the time from scram in seconds

By iteration, the time at which the decay heat equals the heat removal rate is approximaely 2 hours. Therefore, the minimum time at which the PORVs could begin to depressurize the RCS is also approximately 2 hours. This indicates that the likelihood of depressurizing the RCS using two PORVs is low for short-term sequences. Based on the quantification guidelines, the hand calculation results indicates that a value of 0.1 be assigned to successful depressurization for short term events.

DP_PORV_1: DP_PORV = 0.1, nDP_PORV = 0.9

Long Term Sequences

A single MAAP calculation applies to this case. Scenario 4 described in Appendix K is a long term station blackout that has ac power restored after the core is uncovered, but prior to vessel breach. The calculation indicates that the PORVs, which were opened approximately 8 hours after scram, would depressurize the RCS before the vessel failure.

Different values were obtained for this probability for the Surry and Zion plants. While neither analysis indicated whether the data applied to long- or short-term sequences, it was assumed that the values were meant for longer term sequences. The probability for Surry is from pg A.1.1-23 [1] and is 0.9 for successful depressurization of the RCS. The value for Zion is from pg. A-14 [2] and is 0.5 for successful depressurization of the RCS.

There are uncertainties in this event, since the time at which the operator will reach this step in the procedures, and the time available for depressurization before vessel breach are not clearly defined. The Surry value is in better agreement with the MAAP value (i.e unity), but

a value of unity cannot be justified given the uncertainties. This event is therefore considered likely, and using the quantification guidelines, a value of 0.9 is assigned to successful depressurization.

DP_PORV_2: DP_PORV = 0.9, nDP_PORV = 0.1

BASIC EVENT: FCI_EX

CET QUESTION NUMBER: 55

DESCRIPTION: Do ex-vessel FCIs occur?

This basic event addresses whether an ex-vessel fuel-coolant interaction will occur at vessel failure.

QUANTIFICATION:

The conditions under which ex-vessel FCIs can occur are:

- There is water in the containment cavity
- The debris is highly molten (see basic event SLUMP)
- The debris leaves the failed reactor vessel by gravity pour (i.e. this can be through a penetration or gross failure, but not by HPME).

These conditions are similar to those under which FCI was considered in the Surry and Zion studies. Given the high degree of uncertainty with regard to ex-vessel FCIs, using the quantification guidelines in Appendix A, this basic event was assigned a value of 0.5.

FCI_EX: Ex_FCI = 0.5, nEx_FCI = 0.5

BASIC EVENT: FCI_IV

CET QUESTION NUMBER: 42

DESCRIPTION: Do in-vessel fuel-coolant interactions occur?

This basic event addresses whether a fuel-coolant interaction will occur inside the reactor vessel.

QUANTIFICATION:

The primary assumption when quantifying this basic event is that water exists in the lower head of the reactor vessel. It is further assumed that steam explosions are only possible should the debris be highly molten and slump into the lower head (i.e., a large amount of molten debris relocating simultaneously as opposed to a small amount of melt "trickling down" into the lower head). Therefore, it was assumed that the basic event SLUMP must be true, before an in-vessel FCI can occur.

Basic event FCI_IV directly impacts the alpha mode failure (see basic event ALPHA) in which an in-vessel steam explosion causes vessel failure that in turn causes containment failure.

The NUREG-1150 study did not consider steam explosions separately from the complete process of alpha mode failure. Therefore, this basic event was quantified in conjunction with the quantification of alpha mode failure. The values used by the Surry [1] and Zion [2] studies are based on the work of the SERG. The probability of alpha mode failure (the complete process) at low pressure was 0.008. The probability of alpha mode failure at high pressure was 0.0008 (i.e. 1 order of magnitude smaller).

The probabilities from NUREG-1150 were divided between the fuel-coolant interaction basic event and the alpha mode failure basic event for the IP3 CET. Three cases were examined for this basic event: low, medium and high RCS pressure.

Low RCS Pressure

The NUREG-1150 results indicate that the alpha mode failure (FCI to VF to CF) at low RCS pressure is considered to be extremely unlikely (i.e. 0.01). Since, alpha mode failure was quantified with a probability of 0.1, then low pressure fuel-coolant interactions will be assigned a probability of 0.1.

FCI_IV_3: IV_FCI = 0.10, nIV_FCI = 0.90

High RCS Pressure

Consistent with NUREG-1150, the probability of fuel-coolant interactions occurring at high pressure are considered to be an order of magnitude lower than at low pressure. Therefore, the probability is 0.01.

FCI_IV_1: IV_FCI = 0.01, nIV_FCI = 0.99

Medium RCS Pressure

The value for medium pressure was chosen to fall in between the values for high and low pressure. It was given a value of 0.05.

FCI_IV_2: IV_FCI = 0.05, nIV_FCI = 0.95

BASIC EVENT: H2_EARLY

CET QUESTION NUMBER: 36

DESCRIPTION: Amount of early hydrogen production

This basic event addresses whether in-vessel hydrogen production will be high, medium or low.

QUANTIFICATION:

To quantify this basic event, the low, medium and high hydrogen production values must be defined. Historically, the amount of hydrogen produced is expressed in terms of the fraction of total zirconium oxidized in the core.

Hydrogen from Core

The total zirconium mass at IP3 is 44,450 lbm. Using the chemical reaction for zirconium,

$$Zr + 2H_2O \text{ --> } 2H_2 + ZrO_2$$

the total amount of hydrogen produced if all the zirconium is oxidized is as follows:

Molecular weight of zirconium = 91.22 lbm/lbmole [10]
Molecular weight of hydrogen = 2.016 lbm/lbmole [10]

Number of lbmoles of Zr = 44,450 lbm / 91.22 lbm/lbmole = 487.3 lbmole
Number of lbmoles of H_2 (using chemical reaction) = 487.3 * 2 = 974.6 lbmole
Mass of hydrogen produced = 974.6 lbmoles * 2.016 lbm/lbmole = 1964.8 lbmole

Therefore, the fraction of hydrogen is based on 1964.8 lbm.

Low Hydrogen

The low hydrogen production upper bound is defined as the minimum amount required to achieve a burn. Based on analytical burn calculations [6], the amount of H_2 needed to achieve burn is 4.1 percent by mole fraction. Therefore minimum hydrogen is calculated as follows:

Definitions:

H_2 frac = N_b / (N_b + N_a)

where,

N_b = Number of moles of hydrogen
N_a = Moles of air in containment

Given:

Containment free volume:	V = 2.61E6 ft^3 [6]
Universal gas constant:	R = 1545.3 ft-lbf/lbmole/R [12]

Assumed:

Initial containment pressure	P = 14.7 psia
Initial containment temperature	T = 90°F or 550 R
Containment atmosphere is ideal gas	PV = NRT

Calculations:

N_a = [(14.7 psi)*(144 in^2/ft^2)*(2.61E6 ft^3)] / [(1545.3 ft-lbf/lbmole/R)*(550 R)]
N_a = 6500 lbmole

If H_2 frac = 0.041, then

N_b = 0.041/(1 - 0.041) * N_a
N_b = 0.041/(1 - 0.041) * 6500 lbmole = 278 lbmole

Mass of H_2 = 278 lbmole * 2.016 lbm/lbmole = 560 lbm
For simplicity, this value was rounded up to 600 lbm
As a fraction of the core, 600 lbm / 1964.8 lbm = 31%

Therefore, 600 lbm is the upper limit of low hydrogen production for IP3. This mass represents the oxidation of 31 percent of the zirconium in the core.

High Hydrogen

High hydrogen production is defined to be the amount of hydrogen needed for detonation--a mole fraction of 13.8 percent [6]. Using the same equations as for low hydrogen, the mass is calculated as follows:

Calculations:

If H_2 frac = 0.138, then

$N_b = 0.138/(1 - 0.138) * N_a$
$N_b = 0.138/(1 - 0.138) * 6500$ lbmole = 1041 lbmole

Mass of H_2 = 1041 lbmole * 2.016 lbm/lbmole = 2098 lbm
For simplicity, this value was rounded up to 2200 lbm
As a fraction of the core, 2200 lbm / 1964.8 lbm = 112%

Therefore, the 2200 lbm lower limit of high hydrogen production for IP3 represents 112 percent of the hydrogen drived from zirconium in the core. It is possible to have hydrogen generation that exceeds 100 percent of core zirconium oxidation, since steel structures in the core may also be oxidized.

Medium Hydrogen

Medium hydrogen is defined as any amount of hydrogen between 600 lbm and 2200 lbm (i.e. between 31% and 112% of zirconium oxidized).

Quantification

MAAP calculations performed for IP3 and the results of the NUREG-1150 study were used to quantify the amount of hydrogen produced during a core melt: . The MAAP calculations included several station blackouts (cases #1, #5, #1', #5' and #5''), a small LOCA (case #2), and a large LOCA (case #12) (Appendix...) and covered a wide range of pressures inside the vessel during core damage. None of the calculations considered had injection or recirculation to the core during core damage. The results for the cases were all very consistent, and range from 42 to 55 percent of the core zirconium oxidized.

The values for NUREG-1150 for Surry [1] and Zion [2] used the mean value of the aggregate distribution from the expert elicitation [7]. The experts examined 10 cases, that had various ranges of pressure and some had injection (in this case the discharge of the accumulators) before, after, or during core melt. The mean values for the cases used by Surry and Zion were closely grouped together and ranged from 32 to 52 percent. Pressure did not seem to be as important to the amount of zirconium oxidized as did the time of accumulator discharge. Accumulator discharge during core melt produced the highest values of oxidation. These are only the mean values for the distributions produced by the experts. The range of values varied from a low value of 6% at the cumulative 1% probability level to a high value of 125% at the 99% probability level.

Full core melt, all pressures, with early injection or recirc

Based on the MAAP and NUREG-1150 data, once a full core melt has occurred, the most likely amount of zirconium oxidation will be in the medium range (i.e. between 31% and 112%). However, the high range of zirconium production cannot be completely ruled out, although it is considered almost impossible. The low range of hydrogen production (after the probabilities for high and medium are subtracted from unity) must therefore be considered unlikely. This produces value of 0.9 for medium, 0.001 for high and 0.099 for low. These values were assumed to have no dependence on the system pressure.

H2_EARLY_1: 0.099 LOW, 0.9 MEDIUM, 0.001 HIGH

Full core melt, all pressures, no early injection or recirc

The amount of hydrogen produced here will be less than in those sequences where injection or recirculation is available. However, no data are readily available to quantify this basic event (MAAP calculations were injection is recovered always quench the debris and terminate core melt progression). Therefore, based on the quantification guidelines in Appendix A, an even split will be assigned between low and medium hydrogen production values.

H2_EARLY_2: 0.5 LOW, 0.5 MEDIUM, 0.0 HIGH

BASIC EVENT: H2O_PIT

CET QUESTION NUMBER: 45

DESCRIPTION: Water in the reactor vessel cavity

This basic event addresses whether water will flow to the reactor vessel cavity given: (1) the RWST inventory is within the containment, and (2) the RWST contents were injected to the containment by some means other than containment sprays.

QUANTIFICATION:

This basic event addresses whether the RWST inventory, if located in the sumps at the 46-ft level, will flow to the reactor vessel cavity. The presence of water in the cavity may impact severe accident progression significantly by cooling molten debris within the vessel via ex-vessel heat transfer, terminating the accident progression. Shoild the vessel fail, the water my quench the debris or cause ex-vessel FCIs or exacerbate the effects of DCH.

Given some breach of the RCS and successful injection of the RWST inventory to the containment, the ultimate location of the water may affect the accident progression. If the RWST inventory is injected to the containment by containment sprays, it was assumed that water will fill the reactor pit, as the annulus between the RCS and the shield wall would create a direct flow path from the spray header to the pit. However, if the RWST inventory is injected to the containment and fills the sumps at the 46-ft level, some flow path from that level to the reactor pit is required for the water to fill the pit [2]. Two possibilities are the man-way hatch that provides worker access from the 46-ft level to the pit, and backflow from the containment sump via the waste disposal system piping [8]. Investigation of the both possibilities has been inconclusive. It is not clear whether the man-way hatch is water tight (or if not water tight, what the leakage flow rate would be around it), or if the waste disposal system piping has isolation or check valves that would prohibit backflow. Based on the quantification guidelines listed in Appendix M-A, the value assigned to this basic event is 0.5.

H2O_PIT: H2O_PIT = 0.5, H2OnPIT = 0.5

BASIC EVENT: HEAT_TRANS_EX

CET QUESTION NUMBER: 46

DESCRIPTION: Does ex-vessel heat transfer cool the debris?

This basic event addresses whether ex-vessel heat transfer will cool the debris in the lower head, thereby preventing vessel failure.

QUANTIFICATION:

Experimental and analytical investigations into the cooling of core debris inside the lower head has been conducted by Fauske and Associates [3]. The basic assumption to this work is that if the water in the containment cavity is higher than the bottom of the reactor vessel, then nucleate boiling heat transfer on the outside of the lower head may be sufficient to cool the debris. This work is relatively new and has been criticized. Therefore, this event should be considered possible, since no data exists to indicate its likelihood. Thus, a probability of 0.5 is used to quantify this event.

HEAT_TRANS_EX: Ex_Hx = 0.5, nEx_Hx = 0.5

BASIC EVENT: HLSL

CET QUESTION NUMBER: 27

DESCRIPTION: The hot leg/surge line remains intact

This basic event addresses whether the hot leg/surge line will remain intact during the accident.

QUANTIFICATION:

After much of the core is uncovered, the upper portion of the vessel and the piping connected to it will be subjected to temperatures well above the design temperature. The core will be above 2000°F, so temperatures higher than 1000°F are possible in the vicinity of the hot leg nozzles and the surge line. Should the RCS remain at high pressure during degradation, the hoop stress on the hot leg and the surge line will be high, and the elevated temperatures will weaken the metal considerably. It is possible, therefore, that the piping may fail before vessel breach.

Several experts were consulted for the NUREG-1150 study of this phenomenon. The experts examined three cases:

- A high pressure case (i.e. at the PORV setpoint)
- A medium pressure case (pressure between 1200 and the PORV setpoint)
- A low pressure case (pressure less than 1200 psia).

The mean value of the distribution for the three cases was used to quantify this basic event for both Surry and Zion. The probability of the hot leg/surge line remaining intact for each case are as follows:

high pressure	0.28
medium pressure	0.966
low pressure	1.0 (failure impossible)

Using the NUREG-1150 data and the guidelines for quantification this, basic event was quantified as follows:

medium pressure -- failure is unlikely, value = 0.1

HLSL_1: HLSLOK = 0.9, nHLSLOK = 0.1

high pressure -- failure is possible, value = 0.5

HLSL_2: HLSLOK = 0.5, nHLSLOK = 0.5

BASIC EVENT: HPME

CET QUESTION NUMBER: 49

DESCRIPTION: Does high pressure melt ejection occur?

This basic event addresses whether HPME will occur.

QUANTIFICATION:

Three conditions are necessary for HPME to occur:

- The vessel pressure must exceed 200 psi [7]. In this IPE, this corresponds to a low, medium or high pressure.
- The debris must have a high molten fraction (see basic event SLUMP).
- The vessel failure mode must be a penetration failure (see basic event VF_SIZE).

The occurrence of HPME was discussed in the NUREG-1150 study [7], Issue 6, of the in-vessel expert elicitations. The aggregate results assuming an RCS pressure of 2500 psi were that HPME occurred 91 percent of the time (i.e. 79 out of 87 percent penetration failures, see basic event VF_SIZE). The aggregate results assuming an RCS pressure of 2000 psi were that HPME occurred 69 percent of the time. These results indicate that for the medium or high pressure conditions, HPME is considered likely. Thus for medium or high pressure, this basic event is given a probability of 0.9.

HPME_2: HPME = 0.9, nHPME = 0.1

The results for pressure's between 200 psi and 1200 psi were identical to 2000 psi, 69% of the failures were HPME. However, for IP3, the upper end of the low pressure range is 600 psi. As the lower pressure range overlaps the "cutoff" pressure for HPME, it is uncertain whether or not HPME will occur. Based on the quantification guidelines provided in Appendix A, this basic event was assigned a value of 0.5.

HPME_1: HPME = 0.5, nHPME = 0.5

BASIC EVENT: INJ_EARLY

CET QUESTION NUMBER: 29

DESCRIPTION: Is injection initiated early?

These basic events address whether injection will fail to initiate early given AC power is available and the RCS pressure is sufficiently low to avoid pump deadheading.

QUANTIFICATION:

The quantification for INJ_EARLY_1 assumes that the RCS is at medium pressure, but that is below the high-head injection shutoff head. The scenario considered is recovery from a blackout, so the injection systems were not previously challenged. Since the LHF system is needed to draw suction from the RWST, the probability of failure to inject is equal to the probability that either HHF or LHF fail.

From [13], this probability is:

$$P_f = P_f(HHF) + P_f(LHF) - [P_f(HHF) * P_f(LHF)]$$

The probabilities of failure to initiate low- and high-head injection are supplied by Level 1 type fault trees, which model the systems and their associated automatic initiation logic. These probabilities are 0.003 and 0,00018 for low- and high-head flow, respectively [8]. Therefore, the total failure probability of injection for INJ_EARLY_1 is 0.00318.

INJ_EARLY_1: INJ = 0.9968, nINJ = 0.0032

The quantification for INJ_EARLY_2 assumes that the RCS is at low pressure. The scenario considered is recovery from a blackout, so the injection systems were not previously challenged. Since the LHF system is needed to draw suction from the RWST, no credit was taken for HHF availability. Therefore the probability of failure to inject is equal to the probability that LHF fails. As stated above, this probability is 0.003.

INJ_EARLY_2: INJ = 0.997, nINJ = 0.003

BASIC EVENT: INJ_LATE

CET QUESTION NUMBER: 61

DESCRIPTION: Is injection initiated late?

This basic event addresses whether injection will fail to initiate late given ac power is available and the injection systems were not challenged early.

QUANTIFICATION:

The quantification for INJ_LATE assumes that the RCS is at low pressure (by definition, vessel failure has occurred). The scenario considered is late recovery from a blackout, so the injection systems were not previously challenged. Since the LHF system is needed to draw suction from the RWST, no credit was taken for HHF availability. Therefore the probability of failure to inject is equal to the probability that LHF fails.

The probability of failure to initiate low head injection is supplied by Level 1 type fault trees, which model the system and its associated automatic initiation logic. This probability is 0.003 [8].

INJ_LATE: L_INJ = 0.997, nL_INJ = 0.003

BASIC EVENT: QUENCH

CET QUESTION NUMBER: 63

DESCRIPTION: IS THE DEBRIS QUENCHED?

This basic event represents the probability that debris is quenched immediately after vessel failure.

QUANTIFICATION:

Two cases are considered in the basic event quench and are examined below:

- Debris falls into a cavity full of water;
- Debris falls into a dry cavity and then water is added.

Case 1 - Cavity Full of Water

When molten core debris initially contacts water, rapid steam generation at the debris/coolant interface causes course debris fragmentation. This, is turn, exposes a greater debris surface area to coolant which further enhances heat transfer. The confidence one can have that debris fragmentation will result in fully-quenched debris increases as the depth of the pool increases. In particular, experiments and analyses performed at Argonne National Laboratory to address the issue of steam spike [10] indicate highly efficient melt quenching in pools deeper than approx. 0.5 m if particle sizes are sufficiently small (i.e., nominal diameter less than 1 mm). Deeper pools (3 to 5 m) were required to fully quench larger melt particles (up to 10 mm). Based on a review of several international research programs, the Swedish Nuclear Power Inspectorate concluded that "water depths of no less than 4 to 5 meters should be sufficient to make sure that the melt will fragment and quench before reaching the containment floor" [11]. Based on this data and that water in the IP3 cavity will produce deep pools, this basic event is considered likely and given a probability of 0.9.

QUENCH_1: Quench = 0.9, nQuench = 0.1

Case 2 - Water Added to Debris in Dry Cavity

There is no data directly applicable to this case. But it is not believed that fragmentation will be as large for this case, as for the cavity full of water case and therefore may not be as likely to quench. Therefore the probability of this basic event should be lower than for case 1 and was assigned a value of 0.5

QUENCH_2: Quench = 0.5, nQuench = 0.5

BASIC EVENT: RECIRC_EARLY

CET QUESTION NUMBER: 34

DESCRIPTION: Does the operator initiate recirculation early?

This basic event addresses whether the operator fails to initiate recirculation to the RCS prior to vessel failure given that there is water in the containment and recirculation sumps and that power is available.

QUANTIFICATION:

The probability of failure to initiate recirculation prior to vessel failure, given the above conditions, is dominated by the failure of the operator to correctly perform the action under high stress conditions. Using the HEP methodology discussed in the quantification of SPRAY_LATE, the human error probability is 0.052.

RECIRC_EARLY: E_Recrc = 0.948, nE_Recrc = 0.052

BASIC EVENT: RECIRC_FAIL

CET QUESTION NUMBER: 64

DESCRIPTION: Are the recirculation pumps or piping failed by severe accident phenomena?

QUANTIFICATION:

No data exist to quantify this basic event. Detonations in containment, high pressure melt ejection (HPME), and ruptures of the containment were each assigned indeterminate probabilities of failing the recirculation pumps.

Detonations and HPME

RECIRC_FAIL_1: RCRC_Fl = 0.5, RCRCnFl = 0.5

CFE Ruptures

RECIRC_FAIL_2: RCRC_Fl = 0.5, RCRCnFl = 0.5

HPME Event

RECIRC_FAIL_3: RCRC_Fl = 0.5, RCRCnFl = 0.5

BASIC EVENT: RECIRC_LATE

CET QUESTION NUMBER: 65

DESCRIPTION: Does the operator initiate recirculation late?

This basic event addresses whether the operator fails to initiate recirculation to the RCS late, given that power is available, water is in the containment and recirculation sumps, and it was not possible for the operator to initiate recirculation early.

QUANTIFICATION:

The probability of failure to initiate recirculation following vessel failure, given the above conditions, is dominated by the failure of the operator to correctly perform the action under high stress conditions. Using the HEP methodology discussed in the quantification of SPRAY_LATE, the human error probability is 0.052.

RECIRC_LATE: L_Recrc = 0.948, nL_Recrc = 0.052

BASIC EVENT: ROCKET

CET QUESTION NUMBER: 53

DESCRIPTION: Does the vessel act as a rocket and fail the containment?

This basic event addresses whether the vessel will act like a rocket at vessel failure and fail the containment.

QUANTIFICATION:

The conditions necessary for the vessel to act like a rocket include gross failure of the vessel lower head at a high vessel pressure. Both the Surry [1] and the Zion [2] studies assigned a probability of 0.001 to this event. This results indicates that the event is almost impossible, but cannot be ruled out. The same probability was used here.

ROCKET: ROCKET = 0.001, nROCKET = 0.999

BASIC EVENT: SGTR_EARLY

CET QUESTION NUMBER: 26

DESCRIPTION: Do high temperatures induce SGTR?

This basic event addresses whether high gas temperatures in the steam generator will induce a tube rupture.

QUANTIFICATION:

Steam generator tube ruptures can occur in high pressure sequences where hot gases enter the steam generator. Several experts were consulted for the NUREG-1150 study [7]. The experts examined sequences where the RCS pressure was at or near the PORV setpoint and the secondary side of the steam generators was dry. The experts assumed defective tubes in the steam generator were very likely.

The NUREG-1150 results for the probability of an SGTR have a distribution that ranges from 10^{-5} to 0.1208 with a mean value of 0.018. This value was used in both the Zion [2] and Surry [2] PRAs for the probability of tube ruptures occurring, suggesting that an SGTR is extremely unlikely. Therefore, based on our quantification guidelines, a value of 0.01 is assigned to the probability of an SGTR.

SGTR_EARLY_2: E_SGTR = 0.01, nE_SGTR = 0.99

For station blackout scenarios where ac power is recovered early, there is a high likelihood that the operator will initiate auxiliary feedwater, thus precluding an SGTR. For this basic event, the likelihood of the operator failing to initiate auxiliary feedwater is considered with the likelihood of an SGTR occurring. The probability is simply the product of the HEP (see basic event SPRAY_EARLY) of 0.052and the probability of an SGTR, (i.e., 0.052 * 0.01 = 0.0005).

SGTR_EARLY_1: E_SGTR = 0.0005, nE_SGTR = 0.9995

BASIC EVENT: SLUMP

CET QUESTION NUMBER: 41

DESCRIPTION: Does the core slump to the lower head?

This basic event addresses whether the core will slump to the lower head as a large mass, instead of smaller amounts relocating at different times.

QUANTIFICATION:

A basic assumption of the IPE is that if core damage is greater than 20 percent, then all of the core becomes degraded and eventually relocates to the lower head. This basic event describes how the core is relocated to the lower head. A slump of the core implies that the core relocates as a single mass almost simultaneously, with an implicit assumption that the core debris has a high molten fraction. Conversely, no core slump means that the core relocates in a piece-wise fashion and has a low molten fraction.

The way in which the core relocates has a significant impact on other events in the CET. In-vessel steam explosions and HPME were assumed to occur only if the core slumps, since both phenomena are very dependent on the existence of high core molten fractions.

The NUREG-1150 study for the Surry, Zion or Seqouyah PWRs did not address this question completely. The question is only partially addressed by the Peach Bottom study. The Grand Gulf study [3] contains a similar question that asks whether the debris in the lower head has high or low molten fraction. The probability that the debris would have a high molten fraction for situations where injection was provided to the vessel was 0.025. The probability that the debris would have a high molten fraction with no injection was 0.10.

This basic event is divided into three cases, one that has recirculation (SLUMP_1), one that has injection (SLUMP_2), and one that has neither (SLUMP_3). The probabilities for all cases were based on the Grand Gulf data. Core slump with injection or recirculation is assumed to be extremely unlikely. Core slump without injection or recirculation was assumed to be unlikely. Therefore the IPE values are quantified using the Appendix A guidelines as:

Early Recirculation

SLUMP_1: SLUMP = 0.01, nSLUMP = 0.99

Early Injection

SLUMP_2: SLUMP = 0.01, nSLUMP = 0.99

SLUMP_3: SLUMP = 0.1, nSLUMP = 0.9

BASIC EVENT: SORV_EARLY

CET QUESTION NUMBER: 25

DESCRIPTION: Does a PORV stick open while cycling prior to vessel breach?

This basic event addresses whether a PORV will stick open while cycling prior to the breach of the reactor vessel.

QUANTIFICATION:

The primary assumption for this basic event is that the RCS pressure is at the PORV setpoint. Sequences that have either medium or low RCS pressures, or that have the RCS depressurized, or already have a stuck-open PORV were assumed not to challenge (i.e., cycle) the PORVs.

The probability of a PORV sticking open assumed to be 0.025 per challenge. MAAP calculations were examined to determine the number of times the PORVs cycle during blackouts and high pressure transients. This is somewhat difficult, since the plot timestep is not fine enough to always capture the cycling of a PORV. However, the number of cycles is believed to be in the range from about 5 to 50 cycles during most high pressure sequences. This would give a failure probability of approximately 0.1 to 0.5. Since the number of cycles is difficult to determine, and therefore introduces a significant uncertainty, this event was assigned a value of 0.5.

SORV_EARLY: E_SORV = 0.5, nE_SORV = 0.5

EVENT: SPRAY_EARLY

CET QUESTION NUMBER: 31

DESCRIPTION: Do the containment sprays initiate early?

This basic event addresses whether containment sprays initiate during the in-vessel phase of the accident given that containment pressure exceeds the automatic initiation setpoint of 23 psig, ac power is available, and containment spray actuation was not required prior to core damage.

QUANTIFICATION:

The probability of failure to initiate sprays is supplied by a Level 1 type fault tree, which models the containment spray system and its associated automatic initiation logic. This probability is 3.6×10^{-5} [8].

SPRAY_EARLY: E_Spry = 0.999964, nE_Spry = 3.6×10^{-5}

EVENT: SPRAY_LATE

CET QUESTION NUMBER: 69

DESCRIPTION: Operator fails to initiate containment sprays late:

These basic events address whether containment sprays fail to actuate late because of operator error or equipment failure are occasioned by severe accident phenomena. It is assumed that containment pressure exceeds the automatic initiation setpoint of 23 psig and ac power is available.

QUANTIFICATION:

It was assumed that containment sprays following vessel failure would only be available in recirculation mode. This is a modeling assumption, since late injection was given precedence over containment sprays if the RWST inventory was still in the tank. Therefore, operator action would be required to initiate containment sprays.

The probability of failure to initiate is obtained through a human error probability (HEP) calculation using the NUREG/CR-4772 methodology [14]. Following this methodology, and conservatively ignoring credit for operator shift changes, advice from the emergency director, etc., an HEP can be calculated using the following equation:

$$HEP_{TOT} = HEP_D * M_D + \{HEP_{RO} * M_{RO} * HEP_{SRO} * M_{SRO}\}$$

where:

HEPD	Probability of failure to diagnose
HEPRO	Probability of failure to originally complete the task
HEPSRO	Probability of failure of SRO to verify completion of task
M	Multipliers based on error factors corresponding to the above failure probabilities. These multipliers are bases on values suggested in the methodology reference. The multipliers convert failure probabilities from median values to mean values.

For Level 2 analyses, all HEP calculations assume that the operator is under high stress, since core damage has occurred. For step-by-step actions, such as those an operator would perform when following a procedure, the values for HEP_{RO}, M_{RO}, HEP_{SRO}, and M_{SRO} are 0.05, 1.65, 0.5, and 1.25, respectively [14]. In addition, the values for HEP_D and M_D create "Failure to Diagnose" probabilities that are one to two orders of magnitude lower than are created by the

failure of the operator to perform the required action. Therefore, for simplicity, the "Failure to Diagnose" term was ignored. Thus, a constant HEP will be used for all Level 2 analyses. This value is:

HEP = 0.05 * 1.65 * 0.5 * 1.25 = 0.052

The quantification of SPRAY_LATE_1 is for sequences in which the containment reaches 23 psig, which is the level for which spray initiation is required. In addition, either no containment failure occurred or the containment failure was only a leak. Since containment pressure/temperature did not rupture the containment, it was assumed that the containment spray piping and recirculation pumps were not affected by severe accident phenomena. Therefore the probability of failure to initiate sprays is simply the HEP.

SPRAY_LATE_1: L_Spry = 0.948, nL_Spry = 0.052

The quantification of SPRAY_LATE_2 considers the probability that the containment spray piping was ruptured at the same time a containment rupture occurred. Therefore, either a human error or rupture of the piping could prevent spray initiation. It is our judgement that spray piping rupture due to an early containment failure is unlikely. However, since there are no supporting calculations, the quantification guidelines suggest a failure probability of 0.1. Since there are two trains leading to the spray headers, the total failure probability occasioned by containment rupture is the product of the failure probability for each individual train. That is:

0.1 * 0.1 = 0.01.

Since either a human error failure or a "phenomena" failure could cause failure to initiate the sprays, the total failure probability is:

0.052 + 0.01 - (0.052 * 0.01) = 0.061

SPRAY_LATE_2: L_Spry = 0.939, nL_Spry = 0.061

BASIC EVENT: VF

CET QUESTION NUMBER: 47

DESCRIPTION: Does the reactor vessel fail?

This basic event addresses whether the core debris is not cooled in-vessel, and fails the lower head.

QUANTIFICATION:

This basic event can be divided into three cases:

- Injection is provided to the core and less than 20 percent of the core has been degraded.
- In excess of 20 percent of the core has been degraded and ex-vessel heat transfer and containment heat removal occurs.
- In excess of 20 percent of the core has been degraded and either no ex-vessel heat transfer or containment heat removal occurs.

Core Melt < 20%, Injection

No data exits for this case. However, the fact that less than 20 percent of the core has been melted indicates that most of the core has been cooled. Therefore, only a small portion of the core is available to attack the lower head. It was assumed therefore that the likelihood of vessel failure is very low and the probability of failure was assigned a value of 0.05.

VF_1: VF = 0.05, nVF = 0.95

Core Melt > 20%, Ex-vessel heat transfer and containment heat removal

VF_2: VF = 0.0, nVF = 1.0

Core Melt > 20%, no Ex-vessel heat transfer or containment heat removal

VF_2: VF = 1.0, nVF = 0.0

BASIC EVENT: VF_SIZE

CET QUESTION NUMBER: 48

DESCRIPTION: Is vessel failure a gross or penetration failure?

This basic event addresses whether if the vessel fails the failure will either be a gross failure of the lower head or the failure will be in a single lower head penetration.

QUANTIFICATION:

The primary assumption for this question is that vessel failure (if not caused by an alpha mode failure) is due to molten core debris attacking the lower head.

Lower head failure was the subject of expert eliciation in the NUREG-1150 study [3], Issue 6. There was a wide difference of opinion among the experts on the mode of vessel breach. One expert was certain that vessel failure would always be by failure of a penetration. Another expert was the only one who thought that gross bottom head failure was possible. The aggregate results were that gross lower head failure occurred only 13% of the time. Therefore for this basic event, gross failure is considered unlikely and penetration failure likely.

VF_SIZE: VF_Gr = 0.1, VF_Pen = 0.9, nVF = 0.0

Section M3

SUMMARY TABLE OF BASIC EVENT VALUES

BASIC EVENT	VALUES
AC_POWER_E1	E_AC = 0.48, nE_AC = 0.52
AC_POWER_E2	E_AC = 0.13, nE_AC = 0.87
AC_POWER_L1	L_AC = 0.46, nL_AC = 0.54
AC_POWER_L2	L_AC = 0.0, nL_AC = 1.00
ALPHA	Alpha = 0.1, nAlpha = 0.9
BURN_EARLY_1	nE_BURN = 0.0, E_Def = 0.1, E_diff = 0.9
BURN_EARLY_2	nE_BURN = 0.5, E_Def = 0.25, E_diff = 0.25
BURN_LATE_1	L_Det = 0.1, L_Def = 0.9, nL_Diff = 0.0
BURN_LATE_2	L_Det = 0.05, L_Def = 0.45, nL_Diff = 0.5
BURN_LATE_3	L_Det = 0.0, L_Def = 1.0, nL_Diff = 0.0
BURN_LATE_4	L_Det = 0.0, L_Def = 0.5, nL_Diff = 0.5
BURN_VF_1	VFH2Def = 0.5, VFH2Dif = 0.5, nVFH2Brn = 0.0
BURN_VF_2	VFH2Def = 0.0, VFH2Dif = 0.5, nVFH2Brn = 0.5
BURN_VF_3	VFH2Def = 0.25, VFH2Dif = 0.25, nVFH2Brn = 0.5
CFE_BURN_1	H2_CFE = 0.30, H2nCFE = 0.70
CFE_BURN_2	H2_CFE = 0.07, H2nCFE = 0.93
CFE_BURN_3	H2_CFE = 0.001, H2nCFE = 0.999
CFE_BURN_4	H2_CFE = 0.001, H2nCFE = 0.999
CFE@VF_1	VF_CFE = 0.999, nVF_CFE = 0.001
CFE@VF_2	VF_CFE = 0.997, nVF_CFE = 0.003
CFE@VF_3	VF_CFE = 0.999, nVF_CFE = 0.001
CFE@VF_4	VF_CFE = 0.97, nVF_CFE = 0.03

CFE@VF_5	VF_CFE = 0.99, nVF_CFE = 0.01
CFE@VF_6	VF_CFE = 0.57, nVF_CFE = 0.43
CFE@VF_7	VF_CFE = 0.95, nVF_CFE = 0.05
CFE@VF_8	VF_CFE = 0.15, nVF_CFE = 0.85
CFE@VF_9	VF_CFE = 0.24, nVF_CFE = 0.76
CFE@VF_10	VF_CFE = 0.01, nVF_CFE = 0.99
CFE@VF_11	VF_CFE = 0.30, nVF_CFE = 0.70
CFE@VF_12	VF_CFE = 0.001, nVF_CFE = 0.999
CFE@VF_13	VF_CFE = 0.07, nVF_CFE = 0.93
CFE@VF_14	VF_CFE = 0.001, nVF_CFE = 0.999
CFE@VF_15	VF_CFE = 0.001, nVF_CFE = 0.999
CFE@VF_16	VF_CFE = 0.001, nVF_CFE = 0.999
CFE_EX_FCI	FCI_CFE = 0.001, FCInCFE = 0.999
CFL_BMMT_1	BMMT = 0.1, nBMMT = 0.9
CFL_BMMT_2	BMMT = 0.5, nBMMT = 0.5
CFL_BURN_1	L_CGCFL = 0.33, nL_CGCFL = 0.67
CFL_BURN_2	L_CGCFL = 0.07, nL_CGCFL = 0.93
CFL_BURN_3	L_CGCFL = 0.001, nL_CGCFL = 0.999
CFL_SOP_1	CFL = 0.999, nCFL = 0.001
CFL_SOP_2	CFL = 0.001, nCFL = 0.999
CFL_SOP_3	CFL = 0.999, nCFL = 0.001
CHR_EARLY	E_CHR = 0.948, nE_CHR = 0.052
CM<20%	CM<20% = 0.5, CM>20% = 0.5
CTMT_BASE_PRESS	CP>23 = 0.0, CP<23 1.0
DCH	DCH = 0.5, nDCH = 0.5
DCOOL_1	DCOOL = 0.99, nDCOOL = 0.01

DCOOL_2	DCOOL = 0.9, nDCOOL = 0.1
DCOOL_3	DCOOL = 0.5, nDCOOL = 0.5
DCOOL_4	DCOOL = 0.5, nDCOOL = 0.5
DCOOL_5	DCOOL = 0.9, nDCOOL = 0.1
DCOOL_6	DCOOL = 0.5, nDCOOL = 0.5
DETONATION_EARLY	E_Det = 0.1, nE_Det = 0.9
DETONATION_VF	VF_Det = 0.1, nVF_Det = 0.9
DISPERSAL	Disp = 0.1, nDisp = 0.9
DP_PORV_1	DP_PORV = 0.1, nDP_PORV = 0.9
DP_PORV_2	DP_PORV = 0.9, nDP_PORV = 0.1
FCI_EX	Ex_FCI = 0.5, nEx_FCI = 0.5
FCI_IV_1	IV_FCI = 0.1, nIV_FCI = 0.9
FCI_IV_2	IV_FCI = 0.05, nIV_FCI = 0.95
FCI_IV_3	IV_FCI = 0.01, nIV_FCI = 0.99
H2_EARLY_1	Low = 0.099, Medium = 0.9, High = 0.001
H2_EARLY_2	Low = 0.5, Medium = 0.5, High = 0.0
H2O_PIT	H2O_PIT = 0.5, nH2O_PIT = 0.5
HEAT_TRANS_EX	Ex_Hx = 0.5, nEx_Hx = 0.5
HLSL_1	HLSLOK = 0.9, nHLSLOK = 0.1
HLSL_2	HLSLOK = 0.5, nHLSLOK = 0.5
HPME_1	HPME = 0.5, nHPME = 0.5
HPME_2	HPME = 0.9, nHPME = 0.1
INJ_EARLY_1	INJ = 0.9968, nINJ = 3.2E-3
INJ_EARLY_2	INJ = 0.997, nINJ = 3.0E-3
INJ_LATE	L_INJ = 0.997, nL_INJ = 3.0E-3
QUENCH_1	Quench = 0.9, nQuench = 0.1

QUENCH_2	Quench = 0.5, nQuench = 0.5
RECIRC_EARLY	E_Recrc = 0.948, nE_Recrc = 0.052
RECIRC_FAIL_1	RCRC_Fl = 0.5, nRCRC_Fl = 0.5
RECIRC_FAIL_2	RCRC_Fl = 0.5, nRCRC_Fl = 0.5
RECIRC_LATE	L_Recrc = 0.948, nL_Recrc = 0.052
ROCKET	ROCKET = 0.001, nROCKET = 0.999
SGTR_EARLY_1	E_SGTR = 0.0005, nE_SGTR = 0.9995
SGTR_EARLY_2	E_SGTR = 0.01, nE_SGTR = 0.99
SLUMP_1	SLUMP = 0.01, nSLUMP = 0.99
SLUMP_2	SLUMP = 0.01, nSLUMP = 0.99
SLUMP_3	SLUMP = 0.1, nSLUMP = 0.9
SORV_EARLY	E_SORV = 0.5, nE_SORV = 0.5
SPRAY_EARLY_1	E_Spry = 0.999964, nE_Spry = 3.6E-5
SPRAY_LATE_1	L_Spry = 0.948, nL_Spry = 0.052
SPRAY_LATE_2	L_Spry = 0.939, nE_Spry = 0.061
VF_1	VF = 0.05, nVF = 0.95
VF_2	VF = 0.0, nVF = 1.0
VF_3	VF=1.0, nVF = 0.0
VF_SIZE	VF_Gr = 0.1, VF_Pen = 0.9, nVF = 0.0

Section M4

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APPENDIX M-A

IP3 Containment Event Tree Model

```
INDIAN POINT STATION, UNIT 3: CONTAINMENT EVENT TREE
   92
   NQ
   1                    3.90E-05
   27 MAY 1994
1  What is the initiating event? (PDS)
     5          SBO        Trans         LOCA        V_Sequ         SGTR
     1            1            2            3            4            5
             0.2491       0.3887       0.3092       0.0063       0.0467
2  Is the reactor successfully scrammed?
     2         ATWS       nATWS
     2            1            2
     3
     1            1
                  2
               Trans
             0.0190       0.9810                                  $Case    1
     1            1
                  3
               LOCA
             0.4706       0.5294                                  $Case    2
        Otherwise - Reactor is successfully scrammed
             0.0          1.0                                     $Case    3
3  Is AC power recoverable for SBO sequences? (PDS)
     2     SBO_Rec      nSBO_Rec
     2            1            2
     3
     1            1              $Internal flooding SBOs are not recoverable
                  1
               SBO
             0.3986       0.6014                                  $Case    1
     1            1              $Question is irrelevant for non-SBO sequences
                 -1
              /SBO
             0.0          1.0                                     $Case    2
        Otherwise - No Path
             0.0          1.0                                     $Case    3
4  Does gross vessel lower head failure occur prior to core damage?
     2       PCD-VF      nPCD-VF
     2            1            2
     2
     2            1            2
                  3            2
               LOCA       nATWS
             0.1969       0.8031                                  $Case    1
        Otherwise - No vessel rupture
             0.0          1.0                                     $Case    2
```

5 What is the RCS break size? (PDS)

```
3          Large          Md       SM/nBrk
2              1           2             3
5
3              1           2             4
               3          (1       +     1)
           LOCA        ATWS        PCD-VF
            1.0         0.0           0.0                    $Case    1
1              1
               3
           LOCA
         0.5876      0.1391        0.2733                    $Case    2
1              1
               4
         V_Sequ
         0.1391         0.0        0.8609                    $Case    3
1              1
               5
           SGTR
            0.0         0.0           1.0                    $Case    4
   Otherwise - No Break
            0.0         0.0           1.0                    $Case    5
```

6 Is any safety or power-operated relief valve (PORV) stuck open? (PDS)

```
2          SORV       nSORV
2              1           2
4
2              1           3
               1           1
           SBO       SBO_Rec
        0.0221        0.9779                                 $Case    1
2              1           3
               1           2
           SBO      nSBO_Rec
        0.0481        0.9519                                 $Case    2
2              1           2
               2           2
         Trans       nATWS
        0.0577        0.9423                                 $Case    3
   Otherwise - No stuck-open relief valve
            0.0         1.0                                  $Case    4
```

7 Is DC power available? (PDS)

```
2          DC         nDC
2              1           2
4
3              1           3           6
               1           1           1
           SBO       SBO_Rec        SORV
```

```
                1.0         0.0                                     $Case  1
  3             1           3           6
                1           1           2
              SBO       SBO_Rec     nSORV
              0.8789      0.1211                                    $Case  2
  2             1           3
                1           2
              SBO       nSBO_Rec
              0.0         1.0                                       $Case  3
        Otherwise - DC available
                1.0         0.0                                     $Case  4
8 What is the status of auxiliary feedwater? (PDS)
    3       aAUX_FW     pAUX_FW     fAUX_FW
    2           1           2           3
    9
    3           1           3           6
                1           1           1
              SBO       SBO_Rec     SORV
              1.0         0.0         0.0                           $Case  1
    4           1           3           6           7
                1           1           2           1
              SBO       SBO_Rec     nSORV       DC
              0.8154      0.1846      0.0                           $Case  2
    4           1           3           6           7
                1           1           2           2
              SBO       SBO_Rec     nSORV       nDC
              1.0         0.0         0.0                           $Case  3
    3           1           3           6
                1           2           1
              SBO       nSBO_Rec    SORV
              0.0         0.6740      0.3260                        $Case  4
    3           1           3           6
                1           2           2
              SBO       nSBO_Rec    nSORV
              0.0         0.5019      0.4981                        $Case  5
    2           1           5
                3           3
              LOCA      SM/nBrk
              0.0         0.6152      0.3848                        $Case  6
    3           1           2           6
                2           2           2
              Trans     nATWS       nSORV
              0.0         0.0         1.0                           $Case  7
    1           1
                5
              SGTR
              0.0         0.9945      0.0055                        $Case  8
```

```
        Otherwise - Aux FW operating
              0.0          1.0          0.0                                  $Case   9
 9  Is there a stuck-open steam generator safety valve? (PDS)
    2     SOSGSV    nSOSGSV
    2          1          2
    2
    2          1          8
               5          2
            SGTR    pAUX_FW
          0.3374     0.6626                                                  $Case   1
        Otherwise - No stuck-open steam generator safety valve
              0.0          1.0                                               $Case   2
10  Is the secondary system depressurized? (PDS)
    2     Sec_DP    nSec_DP
    2          1          2
    2
    1          8
               2
       opAUX_FW
             1.0          0.0                                               $Case   1
        Otherwise - No secondary system depressurization
              0.0          1.0                                               $Case   2
11  What is the time to core damage? (PDS)
    2     S_Term     L_Term
    2          1          2
    7
    3          1          6          8
               1        (1       + 2)
             SBO       SORV    pAUX_FW
             0.0          1.0                                               $Case   1
    4          1          3          6          7
               1          1          2          2
             SBO    SBO_Rec      nSORV       nDC
             0.0          1.0                                               $Case   2
    2          1          5
               3          3
            LOCA     SM/nBrk
             0.0          1.0                                               $Case   3
    2          1          2
               2          2
           Trans     nATWS
             0.0          1.0                                               $Case   4
    1          1
               5
            SGTR
             0.0          1.0                                               $Case   5
    2          1          5
```

```
                4          3
             V_Sequ     SM/nBrk
                0.0        1.0                                        $Case   6
      Otherwise - Short term
                1.0        0.0                                        $Case   7
12  Is high head "flow" available to the RCS? (PDS)
    3        aHHF       opHHF       fHHF
    2           1           2          3
    5
    2           1           8
                1           1
              SBO    aAUX_FW
              1.0         0.0        0.0                             $Case   1
    2           1           3
                1           2
              SBO    nSBO_Rec
              0.0         0.0        1.0                             $Case   2
    4           1           2          4          5
                3           2          2          1
             LOCA      nATWS     nPCD-VF      Large
              0.0      0.8720     0.1280                             $Case   3
    3           1           2          6
                2           2          2
            Trans      nATWS      nSORV
              0.0      0.9888     0.0112                             $Case   4
      Otherwise - HHF operates
              0.0         1.0        0.0                             $Case   5
13  Is low head "flow" available to the RCS? (PDS)
    5        aLHF       opLHF     LH_Inj    LH_Recrc       fLHF
    2           1           2          3          4          5
    9
    2           1          12
                1           1
              SBO        aHHF
              1.0         0.0        0.0        0.0        0.0      $Case   1
    2           1          12
                1           3
              SBO        fHHF
              0.0         0.0        0.0        0.0        1.0      $Case   2
    5           1           2          4          5         12
                3           2          2          1          2
             LOCA      nATWS     nPCD-VF      Large      opHHF
              0.0      0.9856        0.0        0.0     0.0144      $Case   3
    5           1           2          4          5         12
                3           2          2          1          3
             LOCA      nATWS     nPCD-VF      Large       fHHF
              0.0      0.7155        0.0     0.1638     0.1207      $Case   4
```

```
 2        1        5
          3        2
        LOCA       Md
         0.0   0.8268      0.0      0.0   0.1732          $Case  5
 3        1        5        8
          3        3        2
        LOCA   SM/nBrk pAUX_FW
         0.0   0.6065      0.0      0.0   0.3935          $Case  6
 3        1        2        6
          2        2        1
       Trans    nATWS     SORV
         0.0      0.0      0.0      0.0      1.0          $Case  7
 4        1        2        6       12
          2        2        2        2
       Trans    nATWS    nSORV    opHHF
         0.0   0.9655      0.0      0.0   0.0345          $Case  8
    Otherwise - LHF operates
         0.0      1.0      0.0      0.0      0.0          $Case  9
14 What is the status of containment heat removal? (PDS)
 5      aCHR   FC/RHR       FC      RHR     fCHR
 2        1        2        3        4        5
22
 2        1       12
          1        1
       SBO     aHHF
         1.0      0.0      0.0      0.0      0.0          $Case  1
 2        1       12
          1        3
       SBO     fHHF
         0.0      0.0      0.0      0.0      1.0          $Case  2
 2        1       12
          1        2
       SBO    opHHF
         0.0      1.0      0.0      0.0      0.0          $Case  3
 2        1        2
          3        1
       LOCA     ATWS
         0.0      1.0      0.0      0.0      0.0          $Case  4
 3        1        2        4
          3        2        1
       LOCA    nATWS   PCD-VF
         0.0   0.2026      0.0   0.7974      0.0          $Case  5
 6        1        2        4        5       12       13
          3        2        2        1        2        2
       LOCA    nATWS  nPCD-VF    Large   opHHF   opLHF
         0.0   0.9704      0.0   0.0296      0.0          $Case  6
 6        1        2        4        5       12       13
```

```
                3         2         2         1         2         5
             LOCA     nATWS   nPCD-VF     Large    opHHF     fLHF
              0.0       0.0    0.8212       0.0    0.1788           $Case  7
6               1         2         4         5        12        13
                3         2         2         1         3         2
             LOCA     nATWS   nPCD-VF     Large     fHHF    opLHF
              0.0    0.3207       0.0    0.6793       0.0           $Case  8
6               1         2         4         5        12        13
                3         2         2         1         3         4
             LOCA     nATWS   nPCD-VF     Large     fHHF  LH_Recrc
              0.0    0.4515       0.0    0.5485       0.0           $Case  9
6               1         2         4         5        12        13
                3         2         2         1         3         5
             LOCA     nATWS   nPCD-VF     Large     fHHF     fLHF
              0.0       0.0       0.0       0.0      1.0           $Case 10
3               1         5        13
                3         2         2
             LOCA        Md    opLHF
              0.0    0.7487       0.0    0.2513       0.0           $Case 11
3               1         5        13
                3         2         5
             LOCA        Md     fLHF
              0.0       0.0    0.4797       0.0    0.5203           $Case 12
4               1         5         8        13
                3         3         2         2
             LOCA    SM/nBrk  pAUX_FW    opLHF
              0.0    0.8417       0.0    0.1583       0.0           $Case 13
4               1         5         8        13
                3         3         2         5
             LOCA    SM/nBrk  pAUX_FW     fLHF
              0.0       0.0    0.1803       0.0    0.8197           $Case 14
3               1         5         8
                3         3         3
             LOCA    SM/nBrk  fAUX_FW
              0.0       0.0       0.0       1.0       0.0           $Case 15
2               1         2
                2         1
            Trans      ATWS
              0.0       1.0       0.0       0.0       0.0           $Case 16
3               1         2         6
                2         2         1
            Trans     nATWS      SORV
              0.0       0.0    0.6435       0.0    0.3565           $Case 17
5               1         2         6        12        13
                2         2         2         2         2
            Trans     nATWS     nSORV    opHHF     opLHF
              0.0    0.6949       0.0    0.3051       0.0           $Case 18
```

```
 5          1          2          6         12         13
            2          2          2          2          5
        Trans     nATWS      nSORV     opHHF      fLHF
          0.0        0.0     0.0889     0.9111       0.0          $Case  19
 4          1          2          6         12
            2          2          2          3
        Trans     nATWS      nSORV     fHHF
          0.0        0.0        0.0        1.0       0.0          $Case  20
 2          1          8
            5          3
       SGTR  fAUX_FW
          0.0        1.0        0.0        0.0       0.0          $Case  21
    Otherwise - Only fan coolers operate
          0.0        0.0        1.0        0.0       0.0          $Case  22
15  What is containment status before onset of core damage? (PDS)
 3      nCI_Lk     nCI_Rp         CI
 1           1          2          3
        3.04E-04        0.0   0.999696                           $Case   1
16  Is containment venting available? (PDS)
 2       aVent      fVent
 1           1          2
             0.0        1.0
17  What is the RCS pressure at the onset of core damage? (PDS)
 3  CS@CD_H CS@CD_M  CS@CD_L
 2          1          2          3
 7
 3          5          6          8
            3          2         -2
       SM/nBrk      nSORV  pAUX_FW
         1.000      0.000      0.000                            $Case   1
 3          5          5          6
            1     + (2          1)
        Large         Md       SORV
        0.000      0.000      1.000                            $Case   2
 3          5          6          8
           (2     + 1)          2
           Md       SORV  pAUX_FW
        0.000      0.000      1.000                            $Case   3
 2          8         10
            2          1
   opAUX_FW     Sec_DP
        0.000      0.000      1.000                            $Case   4
 3          5          6          8
           (2     + 1)         -2
           Md       SORV  pAUX_FW
        0.000      1.000      0.000                            $Case   5
 2          8         10
```

```
                2           2
    opAUX_FW    nSec_DP
       0.000    1.000       0.000                                   $Case   6
  Otherwise - No path
       1.000    0.000       0.000                                   $Case   7
18 Is the containment bypassed prior to core damage? (PDS)
  2     Bypass    nBypass
  2        1          2
  3
  2        1          1
           4        + 5
       V_Sequ       SGTR
         1.0        0.0                                             $Case   1
  2        1          1
          -4         -5
      /V_Sequ      /SGTR
         0.0        1.0                                             $Case   2
  Otherwise - No Path
         0.0        1.0                                             $Case   3
19 Is AC power available at the onset of core damage? (PDS)
  2    AC@CD   nAC@CD
  2        1          2
  3
  2        1          3
           1          2
       SBO    nSBO_Rec
         0.0        1.0                                             $Case   1
  2        1          8
           1          1
       SBO    aAUX_FW
         0.0        1.0                                             $Case   2
  Otherwise - Power available
         1.0        0.0                                             $Case   3
20 Do the sprays operate in injection mode prior to core damage? (PDS)
  2    VE_Spry   nVE_Spry
  2        1          2                    $ Failure of CFC causes
 16                                         $ spray demand. Operation split fracti
  4        1          2          4     14   $ are derived from PDS bins
           3          2          1      4
       LOCA      nATWS      PCD-VF    RHR
      0.8971     0.1029                                              $Case   1
  7        1          2          4      5         12        13        14
           3          2          2      1          2         2         4
       LOCA      nATWS     nPCD-VF   Large     opHHF     opLHF       RHR
      0.1273     0.8727                                              $Case   2
  7        1          2          4      5         12        13        14
           3          2          2      1          2         5         5
```

```
        LOCA      nATWS     nPCD-VF      Large      opHHF       fLHF      fCHR
         1.0        0.0                                                $Case    3
7          1          2           4          5         12         13        14
           3          2           2          1          3          2         4
        LOCA      nATWS     nPCD-VF      Large       fHHF     opLHF       RHR
       0.6806     0.3194                                               $Case    4
7          1          2           4          5         12         13        14
           3          2           2          1          3          4         4
        LOCA      nATWS     nPCD-VF      Large       fHHF   LH_Recrc      RHR
       0.7741     0.2259                                               $Case    5
6          1          2           4          5         12         13
           3          2           2          1          3          5
        LOCA      nATWS     nPCD-VF      Large       fHHF       fLHF
       0.0215     0.9785                                               $Case    6
3          1          5          14
           3          2           4
        LOCA         Md         RHR
         1.0        0.0                                                $Case    7
3          1          5          14
           3          2           5
        LOCA         Md        fCHR
       0.2274     0.7726                                               $Case    8
5          1          5           8         13         14
           3          3           2          2          4
        LOCA     SM/nBrk   pAUX_FW      opLHF        RHR
         1.0        0.0                                                $Case    9
5          1          5           8         13         14
           3          3           2          5          5
        LOCA     SM/nBrk   pAUX_FW       fLHF       fCHR
       0.8142     0.1858                                               $Case   10
3          1          5           8
           3          3           3
        LOCA     SM/nBrk   fAUX_FW
       0.2433     0.7567                                               $Case   11
4          1          2           6         14
           2          2           1          5
       Trans      nATWS        SORV       fCHR
       0.4800     0.5200                                               $Case   12
6          1          2           6         12         13         14
           2          2           2          2          2          4
       Trans      nATWS       nSORV      opHHF      opLHF        RHR
       0.6683     0.3317                                               $Case   13
6          1          2           6         12         13         14
           2          2           2          2          5          4
       Trans      nATWS       nSORV      opHHF       fLHF        RHR
         1.0        0.0                                                $Case   14
4          1          2           6         12
```

```
              2          2          2          3
          Trans     nATWS      nSORV       fHHF
         0.4534     0.5466                                  $Case  15
    Otherwise - No Sprays Prior to Core Damage
            0.0        1.0                                  $Case  16
21  Does the RCS repressurize due to H2 production @ core damage?
    2    RCS_Rep   nRCS_Rep
    2          1          2
    3
    4          8          5          5          6
              -2         + 1        + (2         1)
      /opAUX_FW      Large         Md       SORV
            0.000      1.000                                  $Case   1
    1          8
               2
      opAUX_FW
            1.000      0.000                                  $Case   2
    Otherwise - No Path
            0.000      1.000                                  $Case   3
22  What is the RCS pressure following repressurization?
    3   CS@RP_H   CS@RP_M   CS@RP_L
    2          1          2          3
    7
    1         17
               1
      RCS@CD_H
            1.000      0.000      0.000                       $Case   1
    2         21         17
               2          2
      nRCS_Rep CS@CD_M
            0.000      1.000      0.000                       $Case   2
    2         21         17
               2          3
      nRCS_Rep  CS@CD_L
            0.000      0.000      1.000                       $Case   3
    1         17
               2
     RCS@CD_M
            1.000      0.000      0.000                       $Case   4
    2          6          5
               1         + 2
          SORV         Md
            0.000      1.000      0.000                       $Case   5
    2          5          6
               3          2
        SM/nBrk      nSORV
            1.000      0.000      0.000                       $Case   6
```

```
      Otherwise - No Path
          1.000       0.000       0.000                                  $Case   7
23 Is AC power available or recovered early?
   2       E_AC       nE_AC
   2          1           2
   5
   1         19
              1
          AC@CD
          1.000       0.000                                              $Case   1
   3         19           1           3
              2           1           2
         nAC@CD         SBO    nSBO_Rec
          0.000       1.000                                              $Case   2
   3         19           1          11
              2           1           1
         nAC@CD         SBO      S_Term
          0.480       0.520                  $AC_POWER_E1                $Case   3
   3         19           1          11
              2           1           2
         nAC@CD         SBO      L_Term
          0.130       0.870                  $AC_POWER_E2                $Case   4
      Otherwise - No Path
          0.000       1.000                                              $Case   5
24 Is the RCS depressurized during core damage by opening the PORVs?
   2    DP_PORV    nDP_PORV
   2          1           2                 $Really need DC for depressurization.
   5                                        $However, Batteries will deplete if AC
   3         22          22          23      $Power is not recovered.
              2         + 3         + 2      $DC will be available for
        RCS@RP_M    CS@RP_L       nE_AC      $all non blackout sequences.
          0.000       1.000                                              $Case   1
   2          8           2
              3         + 1
        fAUX_FW        ATWS
          0.000       1.000                                              $Case   2
   1         11
              1
         S_Term
          0.100       0.900                  $DP_PORV_1                  $Case   3
   1         11
              2
         L_Term
          0.900       0.100                  $DP_PORV_2                  $Case   4
      Otherwise - No Path
          0.000       1.000                                              $Case   5
```

```
25 Does a PORV stick open while cycling prior to vessel breach?
    2     E_SORV   nE_SORV
    2          1         2
    4
    2         22        22
              2       + 3
      RCS@RP_M  CS@RP_L
         0.000     1.000                                   $Case  1
  1         24
               1
       DP_PORV
         0.000     1.000                                   $Case  2
  1         24
               2
     nDP_PORV
         0.500     0.500          $SORV_EARLY              $Case  3
     Otherwise - No Path
         0.000     1.000                                   $Case  4
26 Is there a temperature induced SGTR?
    2     E_SGTR   nE_SGTR
    2          1         2
    7
    2         22        22     $Must be high pressure to induce SGTR.
              2       + 3
      RCS@RP_M  CS@RP_L
         0.000     1.000                                   $Case  1
  1          8               $Auxilliary Feedwater will cool SG tube
               2
     opAUX_FW
         0.000     1.000                                   $Case  2
  1         24
               1
       DP_PORV
         0.000     1.000                                   $Case  3
  1         25
               1
       E_SORV
         0.000     1.000                                   $Case  4
  2          8        23     $Probability includes failure to
               1         1     $re-initiate following AC recovery.
     aAUX_FW      E_AC
         0.0005    0.9995          $SGTR_EARLY_1          $Case  5
  1         22
               1
     RCS@RP_H
         0.010     0.990          $SGTR_EARLY_2          $Case  6
     Otherwise - No Path
```

```
          1.000       0.000                                        $Case   7
27 Does hot leg/surge line remain intact?
   2    HLSLOK  nHLSLOK
   2         1         2
   5
   1        22
            3
      RCS@RP_L
          1.000       0.000                                        $Case   1
   1        24
            1
      DP_PORV
          1.000       0.000                                        $Case   2
   3         6         5        25
             1       + 2      + 1
          SORV        Md   E_SORV          $RCS @ Med Press
          0.900       0.100                $HLSL_1                 $Case   3
   1         5
             3
        SM/nBrk                            $RCS @ Hi Press
          0.500       0.500                $HLSL_2                 $Case   4
     Otherwise - No Path
          0.000       1.000                                        $Case   5
28 Is the RCS depressurized prior to vessel breach?
   $This logic assumes:
   $   High:  >2350 psia
   $   Med:   >675 psia
   $   HLSL, DP_PORV:  "A" break
   $   SORV:  "S2" break
   $   SGTR:  "S3" break
   $   "A" break will depress. from High->Low or Med->Low RCS press
   $   "S2" break will depress. from High->Med or Med->Low RCS press
   $   2 "S2" breaks = "A" break
   $   "S3" breaks are ignored
     3  CS@VF_H CS@VF_M  CS@VF_L
     2         1         2         3
     4
     3        22        27        24
              3       + 2       + 1
        RCS@RP_L  nHLSLOK  DP_PORV
          0.000     0.000     1.000                                 $Case   1
     3         6         5        25
               1       + 2      + 1
            SORV        Md   E_SORV          $RCS @ Md Press
            0.000     1.000     0.000                               $Case   2
     1         5
               3
```

```
          SM/nBrk                                   $RCS @ Hi Press
            1.000       0.000       0.000                          $Case   3
       Otherwise - No Path
            0.000       1.000       0.000                          $Case   4
29  Is injection recovered early (in-vessel)?
     2        INJ      nE_INJ
     2          1           2
     8
     1         23
                2
           nE_AC
            0.000       1.000                                      $Case   1
     2         13          13   $Must have LHF to draw suction
                5         + 4   $on RWST
           fLHF      LH_Recrc
            0.000       1.000                                      $Case   2
     3         28          12          28
                1       + (3           2)
        RCS@VF_H        fHHF   CS@VF_M
            0.000       1.000                                      $Case   3
     2         28          11   $Only way to end up at Med Press at VF
                2           1   $is with an S2 break.  This will not
        RCS@VF_M      S_Term   $depressurize to HHF shutoff before VF
            0.000       1.000                                      $Case   4
     2         13          13
                2         + 3
           opLHF      LH_Inj
            1.000       0.000                                      $Case   5
     3         13          28          11   $Probability that HHF or LHF fails
                1           2           2   $(Need LHF to draw suction from RWST)
           aLHF    CS@VF_M       L_Term
          0.9968      0.0032                      $INJ_EARLY_1     $Case   6
     2         13          28                $Probability that HHF or LHF fails
                1           3                $(Either can inject at low pressure,
           aLHF    CS@VF_L                  $ but LHF must work - see above)
           0.997      0.003                      $INJ_EARLY_2     $Case   7
       Otherwise - No Path
            0.000       1.000                                      $Case   8
30  What is the containment base pressure at vessel failure?
     2       CP>23       CP<23
     2           1           2
     4
     3          14          14          20
                (4         + 5)         2   $Fan Coolers not operating and
              RHR        fCHR    nVE_Spry   $Sprays failed before core damage
            1.000       0.000                      $CTMT_BASE_PRESS $Case   1
     2          14          23
```

```
                1           2                 $Fan Coolers not operating
              aCHR       nE_AC
             1.000       0.000                                          $Case   2
    5          14          23          14          14          20 $Either fan coolers opera
              (1           1)       + 2         + 3         + 1 $Sprays reduced pressur
              aCHR       E_AC     FC/RHR          FC      VE_Spry
             0.000       1.000                                          $Case   3
        Otherwise - No Path
             1.000       0.000                                          $Case   4
31  Do the containment sprays operate early?
    2       E_Spry     nE_Spry
    2            1           2
    6
    1           23
                 2
             nE_AC
            0.000       1.000                                          $Case   1
    1           20                 $RWST depleted.  VE sprays should lower ctmt
                 1                 $pressure, so will not transfer to recirc.
          VE_Spry
            0.000       1.000                                          $Case   2
    3           14          14          20
               (4        + 5)           2 $Sprays failed before CD
              RHR        fCHR    nVE_Spry
            0.000       1.000                                          $Case   3
    1           30
                 1
            CP>23
          0.999964     3.6E-05                    $SPRAY_EARLY        $Case   4
    1           30
                 2
            CP<23
            0.000       1.000                                          $Case   5
        Otherwise - No Path
            0.000       1.000                                          $Case   6
32  Does the operator manually transfer RWST inventory to sump?
    3       OpSpry     OpDrain   nOpRWST
    2            1           2           3
    3
    4           23          20          31          29
                 2        + 1         + 1         + 1
             nE_AC     VE_Spry       E_Spry         INJ
            0.000       0.000       1.000                              $Case   1
    1           23
                 1
             E_AC
            0.000       0.000       1.000                              $Case   2
```

```
      Otherwise - No Path
            0.000       0.000       1.000                                   $Case   3
33  Where is the RWST inventory located?
    3    H2O_VC  H2O_Tank H2O_ExVC
    2         1         2         3
$
$  Logic says:  if any portion is ex-ctmt, then all is
$  assumed to be ex-ctmt
$
    4
    4        20        29        31        32
                2         2         2         3
          nVE_Spry   nE_INJ  nE_Spry nOpRWST
            0.000     1.000     0.000                                   $Case   1
    3        29        18        26
                1       (1      + 1)
               INJ    Bypass  E_SGTR
            0.000     0.000     1.000                                   $Case   2
    5        20        29        31        32        32
                1     + 1       + 1       + 1       + 2
          VE_Spry       INJ   E_Spry    OpSpry   OpDrain
            1.000     0.000     0.000                                   $Case   3
      Otherwise - No Path
            0.000     0.000     1.000                                   $Case   4
34  Is recirculation flow established to vessel early?
    2    E_Recrc   nE_Recrc
    2         1         2
    5
    6        13        13        23        28        28        11
                3     + 5       + 2       + 1       + (2        1)
          LH_Inj      fLHF    nE_AC  CS@VF_H  CS@VF_M    S_Term
            0.000     1.000                                           $Case   1
    2        33        33
                2     + 3
       H2O_Tank  H2O_ExVC
            0.000     1.000                                           $Case   2
    2        28        12
                2         3
        RCS@VF_M      fHHF
            0.000     1.000                                           $Case   3
    1        33
                1
           H2O_VC
            0.948     0.052                 $RECIRC_EARLY             $Case   4
      Otherwise - No Path
            0.000     1.000                                           $Case   5
```

```
35 Does less than 20% of the core melt before recirculation is recovered?
    2    CM<20%    CM>20%
    2       1         2
    7
    1       1
           -1
          /SBO
          0.000     1.000                                             $Case  1
    3       1         3         23
            1        (2       + 2)
          SBO  nSBO_Rec      nE_AC
          0.000     1.000                                             $Case  2
    2       1        19
            1         1
          SBO     AC@CD
          1.000     0.000                                 $ CM>20%_1  $Case  3
    4       1        11         17          17
            1         2         (2        + 3)
          SBO    L_Term  CS@CD_M   CS@CD_L
          0.900     0.100                                 $ CM>20%_2  $Case  4
    3       1        11         17
            1         2          1
          SBO    L_Term  CS@CD_H
          0.500     0.500                                 $ CM>20%_3  $Case  5
    2       1        11
            1         1
          SBO    S_Term
          0.000     1.000                                             $Case  6
      Otherwise - No Path
          0.000     1.000                                             $Case  7
36 Is early hydrogen production high?
    3    E_H2Hi    E_H2Md    E_H2Lo
    2       1         2         3
  $$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$       $$
  $$                                                                          $$
  $$    HYDROGEN LEVEL DEFINITIONS  (Reference Quant Doc)                     $$
  $$                                                                          $$
  $$  HIGH H2:   >112% Zirc Oxidation (>2200 lbm)                             $$
  $$                  14.8% by Volume (Detonable limit)                       $$
  $$                                                                          $$
  $$  MEDIUM H2:  31->112% Zirc Oxidation (600->2200 lbm)                     $$
  $$                                                                          $$
  $$  LOW H2:    <31% Zirc Oxidation (<600 lbm)                               $$
  $$                  4.1% by Volume (Flammability limit)                     $$
  $$                                                                          $$
  $$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$       $$
    4
```

```
    1       35
             1
          CM<20%
          0.000      0.000      1.000                          $Case   1
    2       29         34
             1        + 1
           INJ      E_Recrc
          0.001      0.900      0.099      $H2_EARLY_1         $Case   2
    3       35         29         34
             2          2          2
          CM>20%      nE_INJ   nE_Recrc
          0.000      0.500      0.500      $H2_EARLY_2         $Case   3
       Otherwise - No Path
          1.000      0.000      0.000                          $Case   4
37  Does an early H2 burn occur?
    3      E_Def      E_Diff     nE_Burn
    2        1          2          3
    4
    1       36
             3
          E_H2Lo
          0.000      0.000      1.000                          $Case   1
    1       23
             1
          E_AC
          0.100      0.900      0.000      $BURN_EARLY_1       $Case   2
    1       23
             2
          nE_AC
          0.250      0.250      0.500      $BURN_EARLY_2       $Case   3
       Otherwise - No Path
          1.000      0.000      0.000                          $Case   4
38  Is the early hydrogen burn a detonation?
    2      E_Det     nE_Det
    2        1          2
    4
    1       37
             -1
          /E_Def
          0.000      1.000                                     $Case   1
    4       31         32         36         36
             1        + 1        + 2        + 3
          E_Spry     OpSpry     E_H2Md     E_H2Lo
          0.000      1.000                                     $Case   2
    1       36
             1                  $ Deflagration with High Hydrogen Concentration
          E_H2Hi
```

```
          0.100       0.900                          $DETONATION_EARL  $Case  3
     Otherwise - No Path
          0.000       1.000                                            $Case  4
39 Does the containment fail due to an early hydrogen burn?
     2    H2_CFE      H2nCFE
     2         1           2
     7
     1        38
                1
            E_Det
            1.000       0.000                                            $Case  1
     3        36          37          30
                1           1           1
            E_H2Hi      E_Def       CP>23
            0.300       0.700                          $CFE_BURN_1       $Case  2
     3        36          37          30
                2           1           1
            E_H2Md      E_Def       CP>23
            0.070       0.930                          $CFE_BURN_2       $Case  3
     3        36          37          30
                1           1           2
            E_H2Hi      E_Def       CP<23
            0.001       0.999                          $CFE_BURN_3       $Case  4
     3        36          37          30
                2           1           2
            E_H2Md      E_Def       CP<23
            0.001       0.999                          $CFE_BURN_4       $Case  5
     2        38          37
                2          -1
            nE_Det      /E_Def
            0.000       1.000                                            $Case  6
     Otherwise - No Path
          0.000       1.000                                            $Case  7
40 Does containment heat removal occur early?
     2     E_CHR      nE_CHR
     2         1           2
     6
     2        14          23
                5         + 2
            fCHR       nE_AC
            0.000       1.000                                            $Case  1
     1        14
                1
            aCHR
            0.948       0.052                          $CHR_EARLY        $Case  2
     2        14          14.
                2         + 3
```

```
            FC/RHR          FC
             1.000       0.000                                        $Case   3
         3     14          31          32
                4           (1          + 1)
              RHR       E_Spry      OpSpry
             1.000       0.000                                        $Case   4
         3     14          31          32
               -4          + (2        -1)
             /RHR       nE_Spry     /OpSpry
             0.000       1.000                                        $Case   5
       Otherwise - No Path
             0.000       1.000                                        $Case   6
41  Does the core collapse en masse?
         2    SLUMP      nSLUMP
         2        1           2
         5
         1       35
                  1
              CM<20%
             0.000       1.000                                        $Case   1
         2       35          34
                  2           1
              CM>20%      E_Recrc
             0.010       0.990                  $SLUMP_1              $Case   2
         2       35          29
                  2           1
              CM>20%         INJ
             0.010       0.990                  $SLUMP_2              $Case   3
         3       35          29          34
                  2           2           2
              CM>20%      nE_INJ     nE_Recrc
             0.100       0.900                  $SLUMP_3              $Case   4
       Otherwise - No Path
             1.000       0.000                                        $Case   5
42  Does an in-vessel fuel-coolant interaction (FCI) occur?
         2     IV_FCI     nIV_FCI
         2        1           2
         6
         1        4
                  1
             PCD-VF
             0.000       1.000                                        $Case   1
         2       41          28
                  1           1
             SLUMP      CS@VF_H
             0.010       0.990                  $FCI_IV_1             $Case   2
         2       41          28
```

```
                1           2
            SLUMP      CS@VF_M
            0.050       0.950                   $FCI_IV_2          $Case   3
    2          41          28
                1           3
            SLUMP      CS@VF_L
            0.100       0.900                   $FCI_IV_3          $Case   4
    1          41
                2
           nSLUMP
            0.000       1.000                                      $Case   5
       Otherwise - No Path
            1.000       0.000                                      $Case   6
43  Does an ALPHA mode failure occur (i.e., FCI -> VF -> CFE)?
    2         Alpha      nAlpha
    2             1           2
    3
    1          42
                2
           nIV_FCI
            0.000       1.000                                      $Case   1
    1          42
                1
           IV_FCI
            0.100       0.900                   $ALPHA             $Case   2
       Otherwise - No Path
            1.000       0.000                                      $Case   3
44  Does the water-tight door separating the sump & pit fail under pressure?
    2      Door-Op     Door-Cl
    2             1           2
    3
    1          33
                3              $ Question is irrelevant
      H2O_ExVC
            0.000       1.000                                      $Case   1
    1          33
               -3              $ Question is relevant for VC, may
     /H2O_ExVC                 $ be relevant late for tank
            0.500       0.500             $H2O_PIT                 $Case   2
       Otherwise - No Path
            0.000       1.000                                      $Case   3
45  Is there water in the reactor pit prior to vessel failure?
    2      H2O_Pit    H2OnPit
    2             1           2
    6
    2          33          33
                2         + 3
```

```
          H2O_Tank  H2O_ExVC
            0.000     1.000                                        $Case  1
      4       33        20          31          32
              1         (1        + 1         + 1)
           H2O_VC    VE_Spry     E_Spry      OpSpry
            1.000     0.000                                        $Case  2
      2       33         4
              1         1                 $Injection with no lower head
           H2O_VC    PCD-VF
            1.000     0.000                                        $Case  3
      3       33         4          44
              1         2           1
           H2O_VC   nPCD-VF    Door-Op
            1.000     0.000                                        $Case  4
      3       33         4          44
              1         2           2
           H2O_VC   nPCD-VF    Door-Cl
            0.000     1.000                                        $Case  5
    Otherwise - No Path
            0.000     1.000                                        $Case  6
46  Is ex-vessel heat transfer established?
      2      Ex_Hx     nEx_Hx
      2        1         2
      3
      2       45         4
               2       + 1
           H2OnPit    PCD-VF
            0.000     1.000                                        $Case  1
      1       45
               1
           H2O_Pit
            0.500     0.500                  $HEAT_TRANS_EX        $Case  2
    Otherwise - No Path
            0.000     1.000                                        $Case  3
47  Is core melt arrested in-vessel? (i.e., Vessel breach @ lower head?)
      2       VF        nVF
      2        1         2
      5
      2       43         4
               1       + 1
            Alpha     PCD-VF
            1.000     0.000                                        $Case  1
      3       35        46          40
               2        (2        + 2)
         CM>20%     nEx_Hx      nE_CHR
            1.000     0.000                                        $Case  2
      1       35
```

```
                1
            CM<20%
            0.050       0.950                       $VF             $Case   3
      3       35          46          40
              2           1           1
            CM>20%      Ex_Hx       E_CHR
            0.000       1.000                                       $Case   4
         Otherwise - No Path
            1.000       0.000                                       $Case   5
48  Is vessel failure a gross or penetration failure?
      3     VF_Gr       VF_Pen        nVF
      2       1           2           3
      4
      1      47
              2
            nVF
            0.000       0.000       1.000                           $Case   1
      2      43           4
              1         + 1
            Alpha       PCD-VF
            1.000       0.000       0.000                           $Case   2
      1      47
              1
            VF
            0.100       0.900       0.000       $VF_SIZE            $Case   3
         Otherwise - No Path
            1.000       0.000       0.000                           $Case   4
49  Does High Pressure Melt Ejection occur?
      2     HPME        nHPME
      2       1           2
      4
      3      48          48          41
              1         + 3         + 2
            VF_Gr         nVF     nSLUMP
            0.000       1.000                                       $Case   1
      2       2          28
              1           3
            SLUMP      CS@VF_L
            0.500       0.500                       $HPME_1         $Case   2
      1      41
              1
            SLUMP
            0.900       0.100                       $HPME_2         $Case   3
         Otherwise - No Path
            1.000       0.000                                       $Case   4
50  Does DCH occur?
      2     DCH         nDCH
```

```
    2          1          2
    3
    1         49
               2
           nHPME
           0.000      1.000                                        $Case   1
    1         49
               1
           HPME
           0.500      0.500                          $DCH          $Case   2
      Otherwise - No Path
           1.000      0.000                                        $Case   3
51  Is there an H2 burn at vessel failure?
    3     VFH2Def    VFH2Dif   nVFH2Brn
    2          1          2          3
   10
    1         48
               3
           nVF
           0.000      0.000      1.000                             $Case   1
    2         36         50
               3          1
         E_H2Lo        DCH
           0.000      1.000      0.000                             $Case   2
    2         36         50
               3          2
         E_H2Lo       nDCH
           0.000      0.000      1.000                             $Case   3
    2         37         50
              -3          1
        /nE_Burn        DCH
           0.000      1.000      0.000                             $Case   4
    2         37         50
              -3          2
        /nE_Burn       nDCH
           0.000      0.000      1.000                             $Case   5
    3         36         37         50
               1          3          1
         E_H2Hi     nE_Burn        DCH
           1.000      0.000      0.000                             $Case   6
    3         36         37         50
               2          3          1
         E_H2Md     nE_Burn        DCH
           0.500      0.500      0.000          $BURN_VF_1         $Case   7
    3         36         37         50
               1          3          2
         E_H2Hi     nE_Burn       nDCH
```

```
          0.500       0.000       0.500              $BURN_VF_2          $Case   8
   3        36          37          50
             2           3           2
         E_H2Md      nE_Burn      nDCH
          0.250       0.250       0.500              $BURN_VF_3          $Case   9
      Otherwise - No Path
          1.000       0.000       0.000                                  $Case  10
52 Is the vessel failure hydrogen burn a detonation?
    2      VF_Det     nVF_Det
    2           1           2
    4
    1          51
              -1
       /VFH2Def
          0.000       1.000                                              $Case   1
    5          31          32          36          36          37
               1         + 1         + 2         + 3         + -3
         E_Spry      OpSpry    E_H2Md      E_H2Lo      /nE_Burn
          0.000       1.000                                              $Case   2
    1          36
               1                $ Deflagration with High Hydrogen Concentration
         E_H2Hi
          0.100       0.900                          $DETONATION_VF      $Case   3
      Otherwise - No Path
          0.000       1.000                                              $Case   4
53 Does the vessel act as a rocket and fail containment?
    2      Rocket     nRocket
    2           1           2
    4
    4          28          28          43          48
               3         + 2         + 1         + 3
     RCS@VF_L  CS@VF_M     Alpha       nVF
          0.000       1.000                                              $Case   1
    1          48
               2
         VF_Pen
          0.000       1.000                                              $Case   2
    1          28
               1
      RCS@VF_H
          0.001       0.999                          $ROCKET             $Case   3
      Otherwise - No Path
          1.000       0.000                                              $Case   4
54 Does the containment fail from the pressure rise at vessel failure?
    2      VF_CFE     VFnCFE
    2           1           2
   24
```

```
1       52
          1
      VF_Det
      1.000     0.000                                          $Case   1
3       43        53        39
          1       + 1       + 1
      Alpha     Rocket    H2_CFE
      0.000     1.000                                          $Case   2
4       30        50        51        36
          1         1         1         1
      CP>23       DCH    VFH2Def    E_H2Hi
      0.999     0.001                       $CFE@VF_1          $Case   3
5       30        50        51        36        45
          1         1         1         2         1
      CP>23       DCH    VFH2Def    E_H2Md    H2O_Pit
      0.999     0.001                       $CFE@VF_17         $Case   4
5       30        50        51        36        45
          1         1         1         2         2
      CP>23       DCH    VFH2Def    E_H2Md    H2OnPit
      0.997     0.003                       $CFE@VF_2          $Case   5
4       30        50        51        36
          2         1         1         1
      CP<23       DCH    VFH2Def    E_H2Hi
      0.999     0.001                       $CFE@VF_3          $Case   6
5       30        50        51        36        45
          2         1         1         2         1
      CP<23       DCH    VFH2Def    E_H2Md    H2O_Pit
      0.997     0.003                       $CFE@VF_18         $Case   7
5       30        50        51        36        45
          2         1         1         2         2
      CP<23       DCH    VFH2Def    E_H2Md    H2OnPit
      0.970     0.030                       $CFE@VF_4          $Case   8
4       30        51        36        28
          1         1         1         1
      CP>23    VFH2Def    E_H2Hi  CS@VF_H
      0.990     0.010                       $CFE@VF_5          $Case   9
4       30        51        36        28
          1         1         2         1
      CP>23    VFH2Def    E_H2Md  CS@VF_H
      0.570     0.430                       $CFE@VF_6          $Case  10
4       30        51        36        28
          2         1         1         1
      CP<23    VFH2Def    E_H2Hi  CS@VF_H
      0.950     0.050                       $CFE@VF_7          $Case  11
4       30        51        36        28
          2         1         2         1
      CP<23    VFH2Def    E_H2Md  CS@VF_H
```

```
        0.150       0.850                       $CFE@VF_8          $Case  12
3         30          50          45
           1           1           1
        CP>23         DCH      H2O_Pit
        0.700       0.300                       $CFE@VF_19         $Case  13
3         30          50          45
           1           1           2
        CP>23         DCH     H2OnPit
        0.240       0.760                       $CFE@VF_9          $Case  14
3         30          50          45
           2           1           1
        CP<23         DCH      H2O_Pit
        0.180       0.820                       $CFE@VF_20         $Case  15
3         30          50          45
           2           1           2
        CP<23         DCH     H2OnPit
        0.010       0.990                       $CFE@VF_10         $Case  16
3         30          51          36
           1           1           1
        CP>23     VFH2Def      E_H2Hi
        0.300       0.700                       $CFE@VF_11         $Case  17
3         30          51          36
           1           1           2
        CP>23     VFH2Def      E_H2Md
        0.001       0.999                       $CFE@VF_12         $Case  18
3         30          51          36
           2           1           1
        CP<23     VFH2Def      E_H2Hi
        0.070       0.930                       $CFE@VF_13         $Case  19
3         30          51          36
           2           1           2
        CP<23     VFH2Def      E_H2Md
        0.001       0.999                       $CFE@VF_14         $Case  20
2         30          28
           1           1
        CP>23     CS@VF_H
        0.001       0.999                       $CFE@VF_15         $Case  21
2         30          28
           2           1
        CP<23     CS@VF_H
        0.001       0.999                       $CFE@VF_16         $Case  22
3         50          51          28
           2          -1          -1
        nDCH     /VFH2Def     CS@VF_H
        0.000       1.000                                          $Case  23
   Otherwise - No Path
        1.000       0.000                                          $Case  24
```

55 Does an ex-vessel FCI occur?

2	Ex_FCI	nEx_FCI				
2	1	2				
5						
2	48	45				
	3	+ 2				
	nVF	H2OnPit				
	0.000	1.000			$Case	1
3	43	49	53			
	1	+ 1	+ 1			
	Alpha	HPME	Rocket			
	0.000	1.000			$Case	2
2	41	42				
	2	+ 1				
	nSLUMP	IV_FCI				
	0.000	1.000			$Case	3
2	41	42				
	1	2				
	SLUMP	nIV_FCI				
	0.500	0.500		$FCI_EX	$Case	4
	Otherwise - No Path					
	1.000	0.000			$Case	5

56 Does an ex-vessel FCI fail containment?

2	FCI_CFE	FCInCFE			
2	1	2			
3					
1	55				
	2				
	nEx_FCI				
	0.000	1.000		$Case	1
1	55				
	1				
	Ex_FCI				
	0.001	0.999		$CFE_EX_FCI	$Case 2
	Otherwise - No Path				
	1.000	0.000			$Case 3

57 Is the debris dispersed?

2	Disp	nDisp				
2	1	2				
3						
3	43	49	55			
	1	+ 1	+ 1			
	Alpha	HPME	Ex_FCI			
	0.100	0.900		$DISPERSAL	$Case	1
3	43	49	55			
	2	2	2			
	nAlpha	nHPME	nEx_FCI			

```
          0.000     1.000                                          $Case  2
    Otherwise - No Path
          1.000     0.000                                          $Case  3
58  Does early containment failure occur?
    2     CFE       nCFE
    2       1         2
    4
    5     43        53        54        39        56
            1       + 1       + 1       + 1       + 1
          Alpha     Rocket    VF_CFE    H2_CFE    FCI_CFE
          1.000     0.000                                          $Case  1
    4     18        15        15        26
            1       + 1       + 2       + 1
          Bypass    nCI_Lk    nCI_Rp    E_SGTR
          1.000     0.000                                          $Case  2
    5     43        53        54        39        56
            2         2         2         2         2
          nAlpha    nRocket   VFnCFE    H2nCFE    FCInCFE
          0.000     1.000                                          $Case  3
    Otherwise - No Path
          1.000     0.000                                          $Case  4
59  Is the early containment failure a rupture or a leak?
    3   CFE_Lk    CFE_Rp      nCFE
    2     1         2         3
    9
    1     58
            2
          nCFE
          0.000     0.000     1.000                                $Case  1
    3     43        53        15
            1       + 1       + 2
          Alpha     Rocket    nCI_Rp
          0.000     1.000     0.000                                $Case  2
    2     39        56
            1       + 1
          H2_CFE    FCI_CFE
          0.000     1.000     0.000                                $Case  3
    4     54        50        51        52
            1       ((1         1)      + 1)
          VF_CFE    DCH       VFH2Def   VF_Det
          0.000     1.000     0.000                                $Case  4
    3     18        1         5
            1       4         1
          Bypass    V_Sequ    Large
          0.000     1.000     0.000                                $Case  5
    3     18        1         5
            1       4         3
```

```
                Bypass      V_Sequ      SM/nBrk
                1.000       0.000       0.000                                   $Case   6
        4         18           1           5          26
                  (1           5           3)       + 1          $The break is "S3"
                Bypass        SGTR      SM/nBrk     E_SGTR
                1.000       0.000       0.000                                   $Case   7
        2         54          15
                   1        + 1
               VF_CFE      nCI_Lk
                1.000       0.000       0.000                                   $Case   8
          Otherwise - No Path
                1.000       0.000       0.000                                   $Case   9
60  Is AC power available late?
        2       L_AC        nL_AC
        2          1           2
        5
        1         23
                   1
                E_AC
                1.000       0.000                                               $Case   1
        2         23           3
                   2           2
               nE_AC     nSBO_Rec
               0.000       1.000                                               $Case   2
        2         23          11
                   2           1
               nE_AC      S_Term
               0.460       0.540                    $AC_POWER_L1               $Case   3
        2         23          11
                   2           2
               nE_AC      L_Term
               0.000       1.000                    $AC_POWER_L2               $Case   4
          Otherwise - No Path
               0.000       1.000                                               $Case   5
61  Is injection initiated following vessel failure?
        2       L_INJ       nL_INJ
        2          1           2
       10
        4         60          12          13          13
                   2        + (3           (4       + 5))
               nL_AC        fHHF     LH_Recrc        fLHF
               0.000       1.000                                               $Case   1
        2         43          53
                   1        + 1    $Assume gross vessel & system piping failures
               Alpha       Rocket
               0.000       1.000                                               $Case   2
        2         33          33
```

```
            1          + 3  $RWST depleted
       H2O_VC  H2O_ExVC
        0.000       1.000                                        $Case   3
  2         1           23
            1            2  $SBO recovered late - LHF system failure prob.
          SBO        nE_AC
        0.997       0.003                    $INJ_LATE           $Case   4
  2         1           28
            1            1  $SBO recovered early - High pressure precludes
          SBO   CS@VF_H    $operation early - LHF system failure prob.
       !61,4,1    !61,4,2                                        $Case   5
  3         1           28          11
            1            2           1  $Same conditions as previous case -
          SBO   CS@VF_M     S_Term      $Early press. above HHF shutoff head
       !61,4,1    !61,4,2                                        $Case   6
  3         1           28          28
            1          (2          + 3) $Injection initiation demanded early
          SBO   CS@VF_M     CS@VF_L     $and failed.
        0.000       1.000                                        $Case   7
  1        12  $Did not inject early due to high pressure, or would
            2  $be caught in Case 3.  High pressure condition removed
       opHHF   $by vessel failure.
        1.000       0.000                                        $Case   8
  2        13          13
            2          + 3  $Same comment as Case 8.
       opLHF       LH_Inj
        1.000       0.000                                        $Case   9
    Otherwise - No Path
        0.000       1.000                                        $Case  10
 62 Is water supplied to the debris late?
    2      L_H2O      nL_H2O
    2          1           2
    8
    1         33
              3                      $Water outside ctmt
      H2O_ExVC
        0.000       1.000                                        $Case   1
    1         45
              1                      $Water in pit early
       H2O_Pit
        1.000       0.000                                        $Case   2
    4         33          34          18          26
              1           1          (1        + 1) $Water pumped outside vc by recirc
       H2O_VC      E_Recrc      Bypass     E_SGTR
        0.000       1.000                                        $Case   3
    4         33          34          18          26
              1           1           2           2  $Water provided to pit by recirc
```

```
          H2O_VC      E_Recrc     nBypass    nE_SGTR
            1.000       0.000                                  $Case   4
    1         33
              1                  $Water @ 46' level - Prob. of moving to pit
          H2O_VC                 $Considered in H2O_Pit question
            0.000       1.000                                  $Case   5
    2         33          61
              2           1      $Water injected from RWST to pit via vessel
        H2O_Tank        L_INJ    $after vessel failure
            1.000       0.000                                  $Case   6
    1         33
              2                  $Water still in RWST
        H2O_Tank
            0.000       1.000                                  $Case   7
      Otherwise - No Path
            0.000       1.000                                  $Case   8
63  Is the core debris quenched?
      2       Quench     nQuench
      2         1           2
      6
      1         48
                3                $ Debris quenched in-vessel
              nVF
            1.000       0.000                                  $Case   1
      1         57
                1                $ Debris cools in absense of water
             Disp
            1.000       0.000                                  $Case   2
      2         45          62
                1           1
          H2O_Pit       L_H2O
            0.900       0.100    $QUENCH-1                     $Case   3
      2         45          62
                2           1
          H2OnPit       L_H2O
            0.500       0.500    $QUENCH-2                     $Case   4
      2         45          62
                2           2
          H2OnPit      nL_H2O
            0.000       1.000                                  $Case   5
      Otherwise - No Path
            0.000       1.000                                  $Case   6
64  Are recirc pumps/pipes failed by severe accident phenomena?
      2     RCRC_Fl    RCRCnFl
      2         1           2
      6
      2         43          53
```

```
                1          + 1
             Alpha       Rocket
             1.000       0.000                                        $Case   1
        3       59          14          60
                 2         (5          + 2)
           CFE_Rp        fCHR        nL_AC
             1.000       0.000                                        $Case   2
        3       38          52          49
                 1          + 1         + 1
            E_Det       VF_Det        HPME
             0.500       0.500              $Recirc_Fail_1           $Case   3
        1       59
                 2
           CFE_Rp
             0.500       0.500              $Recirc_Fail_2           $Case   4
        5       43          53          38          52          59
                 2           2           2           2          -2
           nAlpha      nRocket      nE_Det     nVF_Det     /CFE_Rp
             0.000       1.000                                        $Case   5
      Otherwise - No Path
             1.000       0.000                                        $Case   6
65  Is recirculation flow established late?
        2     L_Recrc    nL_Recrc
        2           1           2
       10
        5          60          64          13          13          33
                    2          + 1         + 3         + 5         + 3
              nL_AC      RCRC_Fl      LH_Inj        fLHF    H2O_ExVC
             0.000       1.000                                        $Case   1
        2          18          26
                    1          + 1
             Bypass      E_SGTR
             0.000       1.000                                        $Case   2
        2          33          62
                    2           2          $ No water for recirc
          H2O_Tank      nL_H2O
             0.000       1.000                                        $Case   3
        2          33          62          $ No water in VC early -
                    2           1          $ but water in sump late
          H2O_Tank       L_H2O
             0.948       0.052                        $RECIRC_LATE    $Case   4
        5          12          12          28          11          34
                  (1          + 2)          2           2           2  $Failed early
             aHHF       opHHF     CS@VF_M       L_Term      nE_Recrc
             0.000       1.000                                        $Case   5
        2          28          34
                    3           2  $Failed early
```

```
    RCS@VF_L   nE_Recrc
       0.000     1.000                                          $Case  6
  2      28       34
         3         1          $ Recirc operates early
    RCS@VF_L    E_Recrc
       1.000     0.000                                          $Case  7
  5      12       12        28        11        34
        (1       + 2)        2         2         1  $ Recirc operates early
       aHHF     opHHF  CS@VF_M    L_Term    E_Recrc
       1.000     0.000                                          $Case  8
  1      33
         1          $ RCS pressure above pump head early
     H2O_VC
      !65,4,1   !65,4,2                 $RECIRC_LATE            $Case  9
    Otherwise - No Path
       0.000     1.000                                          $Case 10
66 Is there containment heat removal late? (FC or Recirc & RHR)
  2    L_CHR    nL_CHR
  2      1        2
  6
  2     14       60
         5       + 2
       fCHR     nL_AC
       0.000     1.000                                          $Case  1
  1     40
         1
      E_CHR
       1.000     0.000                                          $Case  2
  3     14       14        14
         1       + 2       + 3
       aCHR    FC/RHR      FC
       1.000     0.000                                          $Case  3
  2     65       14
         1        4
     L_Recrc     RHR
       1.000     0.000                                          $Case  4
  1     14
         4
       RHR
       0.000     1.000                                          $Case  5
    Otherwise - No Path
       0.000     1.000                                          $Case  6
67 Is the debris bed coolable?
  2    DCOOL   nDCOOL
  2      1        2
  7
  1     48
```

```
            3
          nVF
         1.000       0.000                                        $Case   1
  1       57
            1
         Disp
         1.000       0.000                                        $Case   2
  2       62          63
            2         + 2
       nL_H2O      nQuench
        0.000       1.000                                        $Case   3
  3       65          66          44
            2          (2        + 2)
      nL_Recrc     nL_CHR      Door-Cl
        0.000       1.000                                        $Case   4
  2       65          66
            1           2
      L_Recrc     nL_CHR
        0.000       1.000                                        $Case   5
  1       66
            1
       L_CHR
       1.000        0.000                                        $Case   6
    Otherwise - No Path
        0.000       1.000                                        $Case   7
68 Is there a late spray demand? ( Peak CP>23)
    2     LCP>23     LCP<23
    2          1          2
    8
    2         59         15
              2          2  $ CFE-RUPT is isolation failure
          CFE_Rp     nCI_Rp
        0.000       1.000                                        $Case   1
    2         59         15
              2         -2  $ Energetic event caused CFE-RUPT
          CFE_Rp     /nCI_Rp
        1.000       0.000                                        $Case   2
    2         59         15
              1          3  $ SOP causes spray demand
          CFE_Lk         CI
        1.000       0.000                                        $Case   3
    3         37         50          51
              1        + 1         + 1  $ Energetic event causes spray demand
           E_Def        DCH    VFH2Def
        1.000       0.000                                        $Case   4
    2         59         15
              1         -3  $ Hole in ctmt prevent SOP demand
```

```
        CFE_Lk          /CI
         0.000         1.000                                          $Case   5
   3       59            67            66
            3             (2            + 2)  $CCI produces NCG or Lack of CHR causes steam
          nCFE         nDCOOL        nL_CHR
         1.000         0.000                                          $Case   6
   1       59
            3
          nCFE
         0.000         1.000                                          $Case   7
      Otherwise - No Path
         0.000         1.000                                          $Case   8
69 Do the containment sprays operate late (recirc mode)?
   2     L_Spry       nL_Spry
   2          1             2
   6
   3          68            65            60
              2           + 2           + 2
        LCP<23        nL_Recrc       nL_AC
         0.000         1.000                                          $Case   1
   2          43            53
              1           + 1  $Assumed spray headers damaged
         Alpha         Rocket
         0.000         1.000                                          $Case   2
   6          14            14            20            30            31            23
             ((4           + 5)          2)          + ((1           2)          1)  $ Should ha
          RHR           fCHR       nVE_Spry        CP>23        nE_Spry        E_AC
         0.000         1.000                                          $Case   3
   1       59                  $Pressure high enough to fail ctmt will require sprays
            2                  $Manual init failure probability (HEP) + prob that
        CFE_Rp                 $rupture will knock out sprays
         0.939         0.061                        $SPRAY_LATE_2     $Case   4
   1       59                  $Pressure high enough to fail ctmt will require sprays
           -2                  $Manual init failure probability (HEP)
       /CFE_Rp
         0.948         0.052                        $SPRAY_LATE_1     $Case   5
      Otherwise - No Path
         0.000         1.000                                          $Case   6
70 Is there a high containment steam concentration late?
   2     L_Steam      nL_Steam
   2          1             2
   5
   3          18            62            65
              1           + (2            2)
         Bypass        nL_H2O       nL_Recrc
         0.000         1.000                                          $Case   1
   1       66
```

```
                1
            L_CHR
            0.000       1.000                                       $Case   2
        2     69          14
              1           4
            L_Spry      RHR
            0.000       1.000       $Sprays (Recirc) Plus RHR       $Case   3
    1       18
            2
          nBypass
          1.000         0.000                                       $Case   4
      Otherwise - No Path
          1.000         0.000                                       $Case   5
71  Is there a late hydrogen burn in containment?
    3       L_Det       L_Def       nL_Diff     $ Branch 3 is No Late Burn
    2         1           2           3         $ or a Late Diffusion Burn
    8                                           $ See quant document for
    3        37          51          70         $ definition of "Diffusion
            -3        + -3        + 1           $ Burn"
          /nE_Burn   /nVFH2Brn    L_Steam
          0.000       0.000       1.000                               $Case   1
        2   36          67
            3           1
          E_H2Lo      DCOOL
          0.000       0.000       1.000                               $Case   2
        3   36          67          23
            3           2           1
          E_H2Lo      nDCOOL      E_AC
          0.000       0.000       1.000                               $Case   3
        4   67          36          23          60
            (2        + 1)          2           1
          nDCOOL      E_H2Hi      nE_AC       L_AC
          0.100   -   0.900       0.000               $BURN_LATE_1    $Case   4
        4   67          36          23          60
            (2        + 1)          2           2
          nDCOOL      E_H2Hi      nE_AC       nL_AC
          0.050       0.450       0.500               $BURN_LATE_2    $Case   5
        4   36          67          23          60
            2           1           2           1
          E_H2Md      DCOOL       nE_AC       L_AC
          0.000       1.000       0.000               $BURN_LATE_3    $Case   6
        4   36          67          23          60
            2           1           2           2
          E_H2Md      DCOOL       nE_AC       nL_AC
          0.000       0.500       0.500               $BURN_LATE_4    $Case   7
      Otherwise - No Path
          1.000       0.000       0.000                               $Case   8
```

72 Does the containment fail late due to a hydrogen burn?

2	L_CGCFL	nL_CGCFL			
2	1	2			
7					
1	59				
	2				
	CFE_Rp				
	0.000	1.000		$Case	1
1	71				
	1				
	L_Det				
	1.000	0.000		$Case	2
2	71	67			
	2	2			
	L_Def	nDCOOL			
	0.330	0.670	$CFL_BURN_1	$Case	3
2	71	36			
	2	1			
	L_Def	E_H2Hi			
	0.070	0.930	$CFL_BURN_2	$Case	4
2	71	36			
	2	2			
	L_Def	E_H2Md			
	0.001	0.999	$CFL_BURN_3	$Case	5
1	71				
	3				
	nL_Diff				
	0.000	1.000		$Case	6
	Otherwise - No Path				
	1.000	0.000		$Case	7

73 Does the core melt through the basemat?

2	BMMT	nBMMT			
2	1	2			
4					
2	67	57			
	1	+ 1			
	DCOOL	Disp			
	0.000	1.000		$Case	1
2	67	62			
	2	1			
	nDCOOL	L_H2O			
	0.100	0.900	$CFL_BMMT_1	$Case	2
2	67	62			
	2	2			
	nDCOOL	nL_H2O			
	0.500	0.500	$CFL_BMMT_2	$Case	3
	Otherwise - No Path				

```
          1.000          0.000                                          $Case   4
74 Does late containment failure occur?
   2          CFL          nCFL
   2            1             2
   8
   1           59
               2
         CFE_Rp
          0.000          1.000                                          $Case   1
   2           59            72
               1             2
         CFE_Lk nL_CGCFL
          0.000          1.000                                          $Case   2
   2           72            73
               1           + 1
       L_CGCFL          BMMT
          1.000          0.000                                          $Case   3
   2           67            66
               1             2
        DCOOL          nL_CHR
          0.999          0.001          $CFL_SOP_1                      $Case   4
   2           67            66
               1             1
        DCOOL          L_CHR
          0.000          1.000          $CFL_SOP_2                      $Case   5
   2           67            66
               2             1
       nDCOOL          L_CHR
          0.010          0.990          $CFL_SOP_3                      $Case   6
   2           67            66
               2             2
       nDCOOL          nL_CHR
          0.999          0.001          $CFL_SOP_4                      $Case   7
     Otherwise - No Path
          1.000          0.000                                          $Case   8
75 Is the late containment failure a leak or a rupture?
   3       CFL_Lk         CFL_Rp          nCFL
   2            1              2             3
   4
   1           74
               2
         nCFL
          0.000          0.000          1.000                           $Case   1
   2           74            72
               1             1
          CFL          L_CGCFL
          0.000          1.000          0.000                           $Case   2
```

```
1          74
              1
           CFL
         1.000        0.000        0.000                                  $Case   3
      Otherwise - No Path
         0.000        1.000        0.000                                  $Case   4
76 What is the RF for the in-vessel release from fuel?
   2  CM<20_RF  CM>20_RF
   4         1           2
   3
   1         35
              1
        CM<20%
           1.000        0.000                                             $Case   1
   5
   1       0.190        0.950          $Noble gas
   2       0.160        0.800          $Iodine
   3       0.150        0.750          $Cesium
   4       0.070        0.350          $Tellurium
   5       0.001        0.005          $Strontium
   1         35
              2
        CM>20%
           0.000        1.000                                             $Case   2
   5
   1       0.190        0.950          $Noble gas
   2       0.160        0.800          $Iodine
   3       0.150        0.750          $Cesium
   4       0.070        0.350          $Tellurium
   5       0.001        0.005          $Strontium
      Otherwise - No Path
           0.000        1.000                                             $Case   3
   5
   1       0.190        0.950          $Noble gas
   2       0.160        0.800          $Iodine
   3       0.150        0.750          $Cesium
   4       0.070        0.350          $Tellurium
   5       0.001        0.005          $Strontium
77 What is the DF of the vessel?
   4     nVF_DF  VFnLo_DF   VFLo_DF     PCD_VF
   4          1         2          3          4
   7
   1          4
              1
        PCD-VF
           0.000        0.000        0.000        1.000                   $Case   1
   1
```

```
    6        100          5          2          1
    3          1          1          5
                       (4       + 5)          3
               V_Sequ       SGTR     SM/nBrk
                0.000      1.000      0.000      0.000                    $Case    2
    1
    6        100          5          2          1
    2          1          1
                       4       + 5
               V_Sequ       SGTR
                0.000      0.000      1.000      0.000                    $Case    3
    1
    6        100          5          2          1
    1         47
                       2
                    nVF
                1.000      0.000      0.000      0.000                    $Case    4
    1
    6        100          5          2          1
    3         47         28         28
                       1        (1       + 2)
                      VF  CS@VF_H  CS@VF_M
                0.000      1.000      0.000      0.000                    $Case    5
    1
    6        100          5          2          1
    2         47         28
                       1          3
                      VF  CS@VF_L
                0.000      0.000      1.000      0.000                    $Case    6
    1
    6        100          5          2          1
          Otherwise - No Path
                0.000      0.000      1.000      0.000                    $Case    7
    1
    6        100          5          2          1
78  What is the RF and DF for SGTRs?
    3       nSGTR     HiSGTR     LoSGTR
    4           1          2          3
    4
    1           1
                       -5
                   /SGTR
                1.000      0.000      0.000                               $Case    1
    2
   23         0.0       0.27       0.29
   24         1.0        1.0       1.89
    1           9
```

```
                1
          SOSGSV
             0.000      1.000      0.000                              $Case  2
  2
 23           0.0        0.27       0.29
 24           1.0         1.0       1.89
  1             9
                2
         nSOSGSV
             0.000      0.000      1.000                              $Case  3
  2
 23           0.0        0.27       0.29
 24           1.0         1.0       1.89
       Otherwise - No Path
             1.000      0.000      0.000                              $Case  4
  2
 23           0.0        0.27       0.29
 24           1.0         1.0       1.89
79 What is the containment DF for in-vessel releases?
  5     nCFE_DF    ERup_DF    ELk_DF    LRup_DF    LLk_DF
  4           1          2         3          4         5
  6
  2          59         75
                3          3
             nCFE       nCFL
            1.000      0.000      0.000      0.000      0.000          $Case  1
  1
  7       10000        1.8          6         30        50
  1          59
                2
          CFE_Rp
            0.000      1.000      0.000      0.000      0.000          $Case  2
  1
  7       10000        1.8          6         30        50
  1          59
                1
          CFE_Lk
            0.000      0.000      1.000      0.000      0.000          $Case  3
  1
  7       10000        1.8          6         30        50
  1          75
                2
          CFL_Rp
            0.000      0.000      0.000      1.000      0.000          $Case  4
  1
  7       10000        1.8          6         30        50
  1          75
```

```
                1
            CFL_Lk
             0.000       0.000       0.000       0.000       1.000          $Case   5
    1
    7       10000         1.8           6          30          50
        Otherwise - No Path
             0.000       1.000       0.000       0.000       0.000          $Case   6
    1
    7       10000         1.8           6          30          50
80  What is the DF of the sprays for in-vessel releases?
    5      nSpr_DF    ELSpr_DF    ESpr1DF    ESpr2DF     Lspr_DF
    4            1           2           3           4           5
    7
    1            1
                 4
            V_Sequ
             1.000       0.000       0.000       0.000       0.000          $Case   1
    1
    8            1          40           2          25          25
    2           31          69
                 2           2
            nE_Spry     nL_Spry
             1.000       0.000       0.000       0.000       0.000          $Case   2
    1
    8            1          40           2          25          25
    2           31          69
                 1           1
            E_Spry      L_Spry
             0.000       1.000       0.000       0.000       0.000          $Case   3
    1
    8            1          40           2          25          25
    6           31          69           1           5          25             6
                 1           2        ((3          -3)       + 1          + 1)
            E_Spry      nL_Spry        LOCA     /SM/nBrk    E_SORV       SORV
             0.000       0.000       0.000       1.000       0.000          $Case   4
    1
    8            1          40           2          25          25
    2           31          69
                 1           2
            E_Spry      nL_Spry
             0.000       0.000       1.000       0.000       0.000          $Case   5
    1
    8            1          40           2          25          25
    2           31          69
                 2           1
            nE_Spry      L_Spry
             0.000       0.000       0.000       0.000       1.000          $Case   6
```

```
    1
    8          1          40           2          25          25
       Otherwise - No Path
               0.000      0.000       1.000      0.000       0.000          $Case   7
    1
    8          1          40           2          25          25
81  What is the CCI RF?
    2     nCCI_RF    CCI_RF
    4           1         2
    3
    1          67
                1
           DCOOL
            1.000      0.000                                                 $Case   1
    5
    9       0.00       1.00          $Noble Gas
   10       0.00       1.00          $Iodine
   11       0.00       1.00          $Cesium
   12       0.00       0.60          $Tellurium
   13       0.00       0.01          $Strontium
    1          67
                2
          nDCOOL
            0.000      1.000                                                 $Case   2
    5
    9       0.00       1.00          $Noble Gas
   10       0.00       1.00          $Iodine
   11       0.00       1.00          $Cesium
   12       0.00       0.60          $Tellurium
   13       0.00       0.01          $Strontium
       Otherwise - No Path
               0.000      1.000                                                 $Case   3
    5
    9       0.00       1.00          $Noble Gas
   10       0.00       1.00          $Iodine
   11       0.00       1.00          $Cesium
   12       0.00       0.60          $Tellurium
   13       0.00       0.01          $Strontium
82  What is the DF of the pool above the debris during CCI?
    2     H2O_DF    nH2O_DF
    4           1         2
    3
    2          65         66
                1          1          $Water in pit and does not boil off
          L_Recrc    L_CHR
            1.000      0.000                                                 $Case   1
    1
```

```
 14          30          1
  2          65         66
              2        + 2                $Either no water in pit, or water
          nL_Recrc    nL_CHR               $boils off because no CHR
             0.000       1.000                                        $Case   2
  1
 14          30          1
      Otherwise - No Path
             0.000       1.000                                        $Case   3
  1
 14          30          1
83 What is the revolatilization RF (in-vessel)?
  2     LRev_RF   nLRev_RF
  4           1          2
  3
  1          65
              2
      nL_Recrc
             1.000       0.000                                        $Case   1
  5
 15        0.00        0.00          $NG
 16        0.10        0.05          $I
 17        0.10        0.05          $Cs
 18        0.00        0.00          $Te
 19        0.00        0.00          $Sr
  1          65
              1
      nL_Recrc
             0.000       1.000                                        $Case   2
  5
 15        0.00        0.00          $NG
 16        0.10        0.05          $I
 17        0.10        0.05          $Cs
 18        0.00        0.00          $Te
 19        0.00        0.00          $Sr
      Otherwise - No Path
             1.000       0.000                                        $Case   3
  5
 15        0.00        0.00          $NG
 16        0.10        0.05          $I
 17        0.10        0.05          $Cs
 18        0.00        0.00          $Te
 19        0.00        0.00          $Sr
84 What is the containment DF for ex-vessel releases?
  5    nCFE_DF   ERup_DF   ELk_DF   LRup_DF   LLk_DF
  4          1         2        3         4        5
  6
```

```
 2        59        75
           3         3
       nCFE      nCFL
       1.000     0.000     0.000     0.000     0.000      $Case   1
 1
20     10000       1.7       5.5        10        20
 1        59
           2
       CFE_Rp
       0.000     1.000     0.000     0.000     0.000      $Case   2
 1
20     10000       1.7       5.5        10        20
 1        59
           1
       CFE_Lk
       0.000     0.000     1.000     0.000     0.000      $Case   3
 1
20     10000       1.7       5.5        10        20
 1        75
           2
       CFL_Rp
       0.000     0.000     0.000     1.000     0.000      $Case   4
 1
20     10000       1.7       5.5        10        20
 1        75
           1
       CFL_Lk
       0.000     0.000     0.000     0.000     1.000      $Case   5
 1
20     10000       1.7       5.5        10        20
    Otherwise - No Path
       0.000     1.000     0.000     0.000     0.000      $Case   6
 1
20     10000       1.7       5.5        10        20
85 What is the DF of the sprays for ex-vessel releases?
 2   nLSpr_DF  Lspr_DF
 4          1         2
 3
 1        69
           2
       nL_Spry
       1.000     0.000                                    $Case   1
 1
21          1        30
 1        69
           1
       L_Spry
```

```
          0.000       1.000                                          $Case   2
   1
  21          1          30
     Otherwise - No Path
          1.000       0.000                                          $Case   3
   1
  21          1          30
86 What is the DF of the PAB?
   2     PAB_DF   nPAB_DF
   3          1          2
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
$$                                                                     $$
$$ SINCE THE LIMITING CONTAINMENT FAILURE MODE IS THE                  $$
$$ LINER TEAR AT CTMT PENETRATIONS, RELEASES ARE ALWAYS                $$
$$ ASSUMED TO PASS THROUGH THE PAB.  (SEE QUANT REPORT                 $$
$$ APPENDIX C)                                                         $$
$$                                                                     $$
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
          1.000       0.000
   1
  22          2          1
87 What is the noble gas group release?
   5          1        0.5        0.1      1.0e-3     <1.0e-3
   5          1          2          3           4           5
   1          1
     Noble_Gas_Group_Release
          fun-ng
        gethresh          4       0.99        0.5        0.1      1.0e-3
     Noble_Gas_Group_Release
88 What is the I2 group release?
   5        0.1       0.01      0.001     1.0e-4     <1.0e-4
   5          1          2          3           4           5
   1          1
     Iodine_Group_Release
          fun-i2
        gethresh          4        0.1       0.01      0.001      1.0e-4
     Iodine_Group_Release
89 What is the Cs group release?
   5        0.1       0.01      0.001     1.0e-4     <1.0e-4
   5          1          2          3           4           5
   1          1
     Cesium_Group_Release
          fun-cs
        gethresh          4        0.1       0.01      0.001      1.0e-4
     Cesium_Group_Release
90 What is the Te group release?
   5        0.1       0.01      0.001     1.0e-4     <1.0e-4
```

```
    5          1          2          3          4          5
    1          1
                Tellurium_Group_Release
                   fun-te
                gethresh          4        0.1       0.01      0.001     1.0e-4
                Tellurium_Group_Release
91  What is the Sr group release?
    5       0.01      0.001     0.0001    1.0e-05   <1.0e-05
    5          1          2          3          4          5
    1          1
                Strontium_Group_Release
                   fun-sr
                gethresh          4       0.01      0.001     0.0001    1.0e-05
                Strontium_Group_Release
92  What is the release category?
    11      L_Low     L_mLow     L_Med     L_mHi      L_Hi
              E_Low     E_mLow     E_Med     E_mHi      E_Hi
                NCF
    2      1/6/11       2/7       3/8       4/9      5/10
    16
    2          59         75
                3          3
              nCFE       nCFL
             0.000      0.000     0.000     0.000     0.000
             0.000      0.000     0.000     0.000     0.000        $Case   1
             1.000
    4          59         59        89        90
                (1       + 2)       1         1
            CFE_Lk     CFE_Rp      0.1       0.1
             0.000      0.000     0.000     0.000     0.000
             0.000      0.000     0.000     0.000     1.000        $Case   2
             0.000
    5          59         59        89        90        90
                (1       + 2)       1       (2        + 3)
            CFE_Lk     CFE_Rp      0.1      0.01     0.001
             0.000      0.000     0.000     0.000     0.000
             0.000      0.000     0.000     1.000     0.000        $Case   3
             0.000
    5          59         59        89        89        90
                (1       + 2)     (2        + 3)       1
            CFE_Lk     CFE_Rp     0.01     0.001       0.1
             0.000      0.000     0.000     0.000     0.000
             0.000      0.000     0.000     1.000     0.000        $Case   4
             0.000
    6          59         59        89        89        90        90
                (1       + 2)     (2        + 3)      (2        + 3)
            CFE_Lk     CFE_Rp     0.01     0.001      0.01      0.001
```

```
        0.000     0.000     0.000     0.000     0.000
        0.000     0.000     1.000     0.000     0.000          $Case    5
        0.000
6         59        59        89        89        90        90
        (1      + 2)      (2      + 3)      (4      + 5)
    CFE_Lk    CFE_Rp      0.01     0.001    1.0e-4   <1.0e-4
        0.000     0.000     0.000     0.000     0.000
        0.000     1.000     0.000     0.000     0.000          $Case    6
        0.000
6         59        59        89        89        90        90
        (1      + 2)      (4      + 5)      (2      + 3)
    CFE_Lk    CFE_Rp    1.0e-4   <1.0e-4      0.01     0.001
        0.000     0.000     0.000     0.000     0.000
        0.000     1.000     0.000     0.000     0.000          $Case    7
        0.000
6         59        59        89        89        90        90
        (1      + 2)      (4      + 5)      (4      + 5)
    CFE_Lk    CFE_Rp    1.0e-4   <1.0e-4    1.0e-4   <1.0e-4
        0.000     0.000     0.000     0.000     0.000
        1.000     0.000     0.000     0.000     0.000          $Case    8
        0.000
4         75        75        89        90
        (1      + 2)         1         1
    CFL_Lk    CFL_Rp       0.1       0.1
        0.000     0.000     0.000     0.000     1.000
        0.000     0.000     0.000     0.000     0.000          $Case    9
        0.000
5         75        75        89        90        90
        (1      + 2)         1      (2      + 3)
    CFL_Lk    CFL_Rp       0.1      0.01     0.001
        0.000     0.000     0.000     1.000     0.000
        0.000     0.000     0.000     0.000     0.000          $Case   10
        0.000
5         75        75        89        89        90
        (1      + 2)      (2      + 3)         1
    CFL_Lk    CFL_Rp      0.01     0.001       0.1
        0.000     0.000     0.000     1.000     0.000
        0.000     0.000     0.000     0.000     0.000          $Case   11
        0.000
6         75        75        89        89        90        90
        (1      + 2)      (2      + 3)      (2      + 3)
    CFL_Lk    CFL_Rp      0.01     0.001      0.01     0.001
        0.000     0.000     1.000     0.000     0.000
        0.000     0.000     0.000     0.000     0.000          $Case   12
        0.000
6         75        75        89        89        90        90
        (1      + 2)      (2      + 3)      (4      + 5)
```

	CFL_Lk	CFL_Rp	0.01	0.001	1.0e-4	<1.0e-4	
	0.000	1.000	0.000	0.000	0.000		
	0.000	0.000	0.000	0.000	0.000		$Case 13
	0.000						
6	75	75	89	89	90	90	
	(1	+ 2)	(4	+ 5)	(2	+ 3)	
	CFL_Lk	CFL_Rp	1.0e-4	<1.0e-4	0.01	0.001	
	0.000	1.000	0.000	0.000	0.000		
	0.000	0.000	0.000	0.000	0.000		$Case 14
	0.000						
6	75	75	89	89	90	90	
	(1	+ 2)	(4	+ 5)	(4	+ 5)	
	CFL_Lk	CFL_Rp	1.0e-4	<1.0e-4	1.0e-4	<1.0e-4	
	1.000	0.000	0.000	0.000	0.000		
	0.000	0.000	0.000	0.000	0.000		$Case 15
	0.000						
	Otherwise - No Path						
	0.000	0.000	0.000	0.000	0.000		
	0.000	0.000	0.000	0.000	1.000		$Case 16
	0.000						

APPENDIX M-B

Guidelines for Assigning Conditional Probabilities to CET Events

VALUE	DESCRIPTION
1.	The indicated outcome is certain given the conditions defined for the case in question. Usually this value is reserved for logical outcomes not requiring analysis to support them. Analysis or calculations that are needed to support a certain outcome use only methods appearing in textbooks or peer-reviewed journals. The results of the analysis demonstrate the indicated outcome to be appropriate considering all relevant uncertainties. Other analytical approaches have been considered and these yield the same result or are not applicable. No debate as to the outcome would be expected from individuals who are informed as to the specifics of the case and the associated phenomena.
(1. - 0.001) i.e., 0.999	The indicated outcome is almost certain. Detailed analysis has been performed which addresses all relevant phenomena and has been subjected to independent review. At least one other independent reviewer who has analyzed the situation agrees that the outcome is almost certain. Separate analysis exists that supports this outcome. Consideration of all identified uncertainties has been made and none has been found to have a credible effect on the outcome.
(1. - 0.01) i.e. , 0.99	The indicated outcome is extremely likely. Either detailed analysis has been performed and subjected to independent review or a significant body of directly applicable experimental data published in the technical literature, support this position. The indicated outcome is obtained for all credible assumptions as to the values of parameters in supporting analysis. Arguments against this position are not supported by either analysis or data.

VALUE	DESCRIPTION
(1. - 0.05) i.e., 0.95	The indicated outcome is very likely. Either detailed analysis has been performed and reviewed for completeness or a significant body of relevant experimental data supports this position. Arguments against this position are obviously flawed or data exist that contradict in some measure the arguments presented.
0.9	The indicated outcome is likely. It is supported by analysis or the preponderance of experimental evidence. Arguments against this position are apparently flawed and the technical basis for disagreement with the counter argument has been established. Alternatively, no analysis has been performed but there is general agreement between two or more independent experts that the indicated outcome is appropriate.
0.5	The indicated outcome is fully possible. Either no analysis has been performed or existing analysis is inconclusive. Inconclusive analysis includes that for which no concurrence from an independent party can be gained. Experimental data do not clearly indicate this outcome to be more likely or experiments are obviously no directly pertinent.
0.1	The indicated outcome is unlikely. It cannot be supported by incontrovertible analysis or a preponderance of data. It is, however, a credible outcome when attendant uncertainties are considered.
0.05	The indicated outcome is very unlikely. While analysis cannot rule it out completely, arguments in favor of this outcome are not supported by the available data. At most, a few experiments suggest that this outcome could occur.
0.01	The indicated outcome is extremely unlikely. Uncertainties in the available analysis that show the outcome not to occur can be identified. Consideration of these uncertainties might lead to this outcome but no analytical or experimental support can be found.

VALUE	DESCRIPTION
0.001	The indicated outcome is almost impossible. It has credibility only if a number of unsupported (but not demonstrably incorrect) assumptions are made. No analysis is available to support this result event when relevant uncertainties in the parameters of the analysis are considered.
0.	The indicated outcome is impossible. It is either ruled out by the physical situation or a large body of analysis and experiment support alternate outcomes.

APPENDIX M-C

Probability of Containment Failure Due to Static Over-Pressure

The containment failure curve was generated using data from the EQE overpressure capacity report[1]. The data was used to produce a normal distribution using Lotus 123. The Lotus 123 data is shown below and is shown in Graph form in Figure B1.

LINER TEAR @ MAIN STEAM & FEEDWATER PENETRATIONS (800 F)

Mean Failure Pressure	134 psig
Log Standard Deviation	0.12

Pressure (psig)	Failure Probability	Leak Area* (sq in)	Z	Phi(-Z)
1	0.001	0	-40.815	0.999
50	0.001	0	-8.215	0.999
84.4	0.001	0	-3.852	0.999
90	0.001	0	-3.317	0.999
95	0.002	0	-2.866	0.998
99	0.006	0	-2.523	0.994
100	0.007	0.83	-2.439	0.993
105	0.021	4.03	-2.032	0.979
110	0.050	7.23	-1.645	0.950
115	0.101	10.43	-1.274	0.899
120	0.179	13.63	-0.920	0.821
121	0.198	14.27	-0.850	0.802
125	0.281	16.83	-0.579	0.719
130	0.400	20.03	-0.253	0.600
135	0.525	23.23	0.062	0.525
140	0.642	26.43	0.365	0.642
145	0.744	29.63	0.657	0.744
150	0.832	32.83	0.940	0.832
155	0.888	36.03	1.213	0.888
160	0.932	39.23	1.478	0.932
165	0.960	42.43	1.734	0.960

Wesley, D.A. and H. Hadidi-Tamjed, "Containment Overpressure Capacity for the Indian Point Unit No. 3 Nuclear Power Plant," EQE, July, 1993.

170	0.976	45.63	1.983	0.976
175	0.987	48.83	2.225	0.987
180	0.993	52.03	2.459	0.993
185	0.996	55.23	2.688	0.996
190	0.998	58.43	2.910	0.998
195	0.999	61.63	3.126	0.999
200	0.999	64.83	3.337	0.999

* Leak area assumes leak begins @ 5% failure prob and propagates with slow increase in pressure

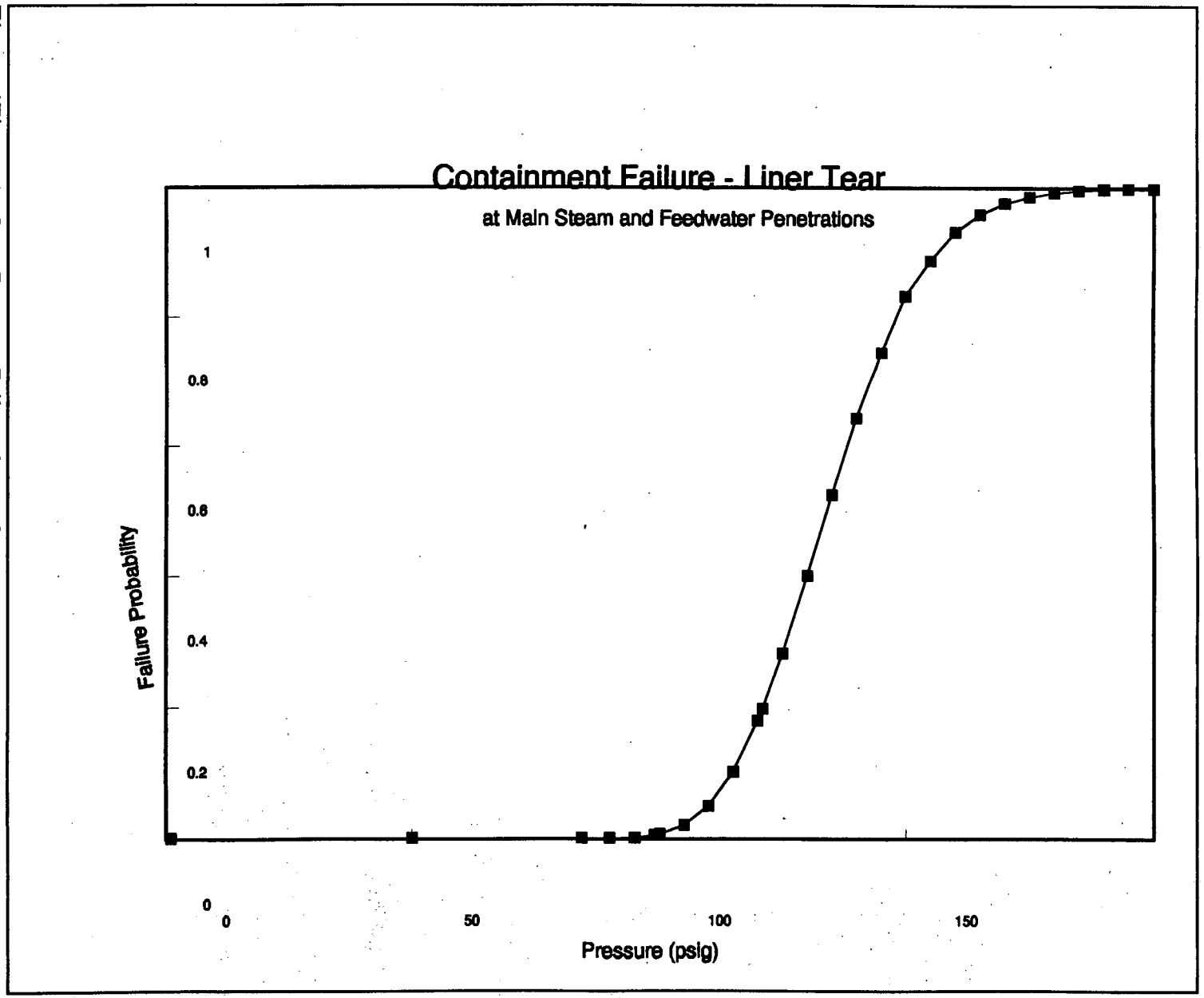

Figure 1 Figure 1 Over-Pressure Failure Curve for IP3