ATTACHMENT 1

MATERIAL CONDITION TASK FORCE - FINAL REPORT

PALISADES

PLANT MATERIAL CONDITION

REVIEW TASK FORCE

FINAL REPORT

July 3, 1986

Task Force Chairman _____

Plant General Manager _____

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1.0 INTRODUCTION AND SUMMARY

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1.1 Introduction

On May 19, 1986, the Palisades Plant reactor tripped on high pressurizer pressure following a failure of the redundant Electro Hydraulic System (EHC) system power supplies which resulted in closure of the turbine control valves. A number of equipment problems, some of which were known prior to the event, hampered the operators' response to the subsequent plant transient.

On May 22, 1986, with the plant preparing to return to power, the Nuclear Regulatory Commission, Region III, issued a confirmatory action letter (included as Appendix A) which required the Company to proceed immediately to cold shutdown and to remain shutdown until investigations were conducted of the May 19, 1986 reactor trip, and of the general status of plant safety-related equipment and balance of plant systems important to safety.

On May 22, 1986, the Vice President-Nuclear Operations appointed the Palisades Plant Planning Director to head an eleven member Plant Material Condition Review Task Force to address the actions required by the confirmatory action letter, as well as to develop a plant test program to supplement Technical Specification testing, and to address programmatic issues related to current plant problems.

This report describes the Task Force and the scope, approach, and results of its efforts. These results were conveyed to NRC Region III Management on June 25, 1986 in a meeting in their office in Glen Ellyn, Il. The report serves as the Company's response to the NRC's May 22, 1986 confirmatory action letter.

1.2 Summary

1.2.1 Task Force Description

The Task Force consisted of eleven total members chosen to provide extensive nuclear power experience, and also to provide an outside perspective by incorporating experienced personnel without any significant Palisades Plant experience. The eleven members, listed below, have an average of 17 years of industry experience, with an average of 5 years of Palisades Plant experience.

DWJoos - Chairman	JPopa
VJBeilfuss	RESchrader
JGBouwens	AETome
WClark	STWawro
CMGrady	BNYoung
RPMargol	

Resumes of the Task Force members are included as Appendix B to this report.

The Task Force charter was to conduct investigations of the May 19, 1986 reactor trip, and of safety systems and balance of plant systems important to safety as required by the NRC confirmatory action letter of May 22, 1986, and to provide a description of actions taken or planned to assure safe plant startup and subsequent operation for review and approval of the NRC Regional Administrator.

The Task Force was assembled on May 23, 1986, and was disbanded July 3, 1986, with the issuance of this report.

The Task Force reported to the Plant General Manager who was updated daily as to progress and findings. The Vice President-Nuclear Operations also participated in frequent briefings.

1.2.2 Task Force Scope

The scope of the Task Force efforts were prepared on May 23, 1986 and approved by the Plant General Manager and the Vice President-Nuclear Operations.

The approved Task Force scope was as follows:

1. Conduct a thorough investigation of the May 19, 1986, trip as follows:

a. Review existing trip report and conduct interviews with on-shift personnel to determine direct or indirect problems which affected their response (ie, identify any problem which required operator action, attention, or concern during the trip and subsequent Plant stabilization).

b. Review the history of the problems:

- How long has it existed?
- Was operations aware of the problem prior to the recent trip (ie, was it a surprise that it occurred)?
- What corrective action had been taken to resolve the problem prior to the trip?
- What testing had been performed to assure that previous maintenance was successful?
- What corrective actions have been taken since the trip? Are they adequate?
- What testing has been performed since the trip?

c. Determine the impact of the problems under postulated accident conditions.

d. Recommend immediate and follow-up corrective actions:

- Repairs and testing prior to startup.
- Repairs, testing, and monitoring to be performed during subsequent operations.
- Repairs, modifications, testing, etc. to be performed during a subsequent outage.

e. Review CPCo's post-trip review practices and methods of documenting, reviewing, and verifying corrective actions. Provide assessment of adequacy and recommendations for improvement.

2. Conduct a thorough investigation of the status of systems important to safety as follows:

a. Define the systems/components included by:

- Identification of systems designated important to safety in the NPRDS System.
- Review of accident sequences using current PRA.
- Review of omissions by an SRO.
- Inclusion of components which have failed resulting in past Plant trips.

b. Develop a list of known or potential significant deficiencies important to safety through:

- Review of the current operator concern list.
- Review of the existing work order backlog for additional significant items.
- Interviewing Operations personnel and System Engineers.
- Review of recent work order history for repeat problems.
- Review of recently completed work orders/procedures for completion of post-maintenance testing as required.
- Review of recent surveillance test history for repeat failures.
- Review of recent ERs/DRs, audit reports, inspection reports, etc., for equipment-related problems.
- Review of the results of the Operational Readiness Review recently conducted on the Auxiliary Feedwater System.

c. Assess the significance of known or potential deficiencies through SRO review and use of the Palisades PRA.

d. Disposition all significant concerns through:

- Recommend repair/testing prior to startup.
- Justification for continued operation with recommendations for repair/testing following startup.

3. Recommend the scope of the augmented surveillance program which targets equipment important to safety with a failure history.

4. Recommend programmatic changes to assure that corrective actions taken to resolve future problems are adequate and timely.

1.2.3 Results

The following is a brief summary of the Task Force results. More detailed descriptions of the work performed, observations, and planned actions are included in Sections 2.0 through 5.0 of the report.

1. May 19, 1986 Trip Investigation

In summary, the Operations Department personnel felt that the trip was routine and that the Plant responded well to the transient. While a number of equipment problems, some known prior to the event, had some impact on plant response or required operator actions, only two were considered to be of any significance to the Operators:

- Failure of charging pump P-55A to start and run, and

- Failure of letdown intermediate backpressure regulator CV-2012 to open.

Each of the problems which impacted the plant or operator response will be appropriately repaired and extensively tested to assure operability prior to plant restart.

Overall, the post-trip review process is thorough, demanding a detailed review and appropriate approvals prior to plant restart. The Shift Engineer did a prompt, thorough job in performing the post-trip review for this event, though there were some minor deficiencies identified during subsequent investigations. The Shift Engineer's recommendations for plant restart, as well as the Duty and Call Superintendent's approval, were in accordance with the plant procedure and met previously applied standards of plant equipment operability.

Several recommendations were made to improve the post-trip review process, primarily in terms of increasing the standards of plant operability, increasing the visibility of the decision-making process prior to plant restart, and improving communications with the NRC immediately subsequent to the event.

2. Plant Equipment Status Investigation

An extensive investigation was conducted into the status of plant equipment which is safety-related or considered important to reliable plant operation. The focus of the effort was on improving overall plant operability and reliability by addressing both current problems and historical repeat problems.

The effort resulted in a detailed investigation of 222 items by the Task Force, resulting in approximately 480 recommended actions. These actions included such things as maintenance, modifications, inspections, testing and establishment and completion of preventive maintenance activities. Many of these items were considered insignificant, and some were found to have been resolved, so that the number of the items is more indicative of the thoroughness of the review rather than the extent of significant plant problems.

All of the items and associated recommended actions were reviewed in detail by a joint Executive/Plant Review Committee over approximately 30 hours of meetings. The committee generally accelerated or expanded upon actions recommended by the Task Force, resulting in a total of 544 action items, 58 percent of which are to be completed prior to startup from the current outage.

The details of this investigation are provided in Section 3.0 and the specific observations and planned resolutions are provided in Appendix C of this report.

3. Augmented Test Program

At the direction of the Vice President-Nuclear Operations, a test program was developed to augment the existing Technical Specification surveillance program. The program was developed primarily by the plant Probabilistic Risk Assessment (PRA) Administrator as a member of the Task Force to address plant equipment which has a significant impact on plant reliability and safety, but is not addressed by Technical Specification testing requirements. The program was reviewed by the full Task Force for concurrence.

The program involves testing prior to or during plant shutdown to ascertain the status of the equipment and determine whether maintenance is required during the outage to assure reliability during the subsequent plant operating cycle. It also involves occasional testing (approximately every 5 years) of balance of plant equipment which is not routinely challenged or verified during normal operation.

The program will be administered through the plant's Periodic Activities Control System (PACS) program. The PACS will be developed prior to startup from the current outage, and the majority of them will be performed prior to startup.

The specific test activities and associated frequencies are described in Section 4.0 of this report.

4. Programmatic Issues

The Task Force participated with line management to develop a program to enhance the effectiveness of the maintenance process to support a higher standard of plant operability. Input to this effort included the findings of the NRC Augmented Inspection Team (AIT), the 1985 Maintenance Order Task Force, the Operational Readiness Assessment recently conducted internally on the Auxiliary Feedwater System, and observations of the Task Force members during their investigations of plant problems.

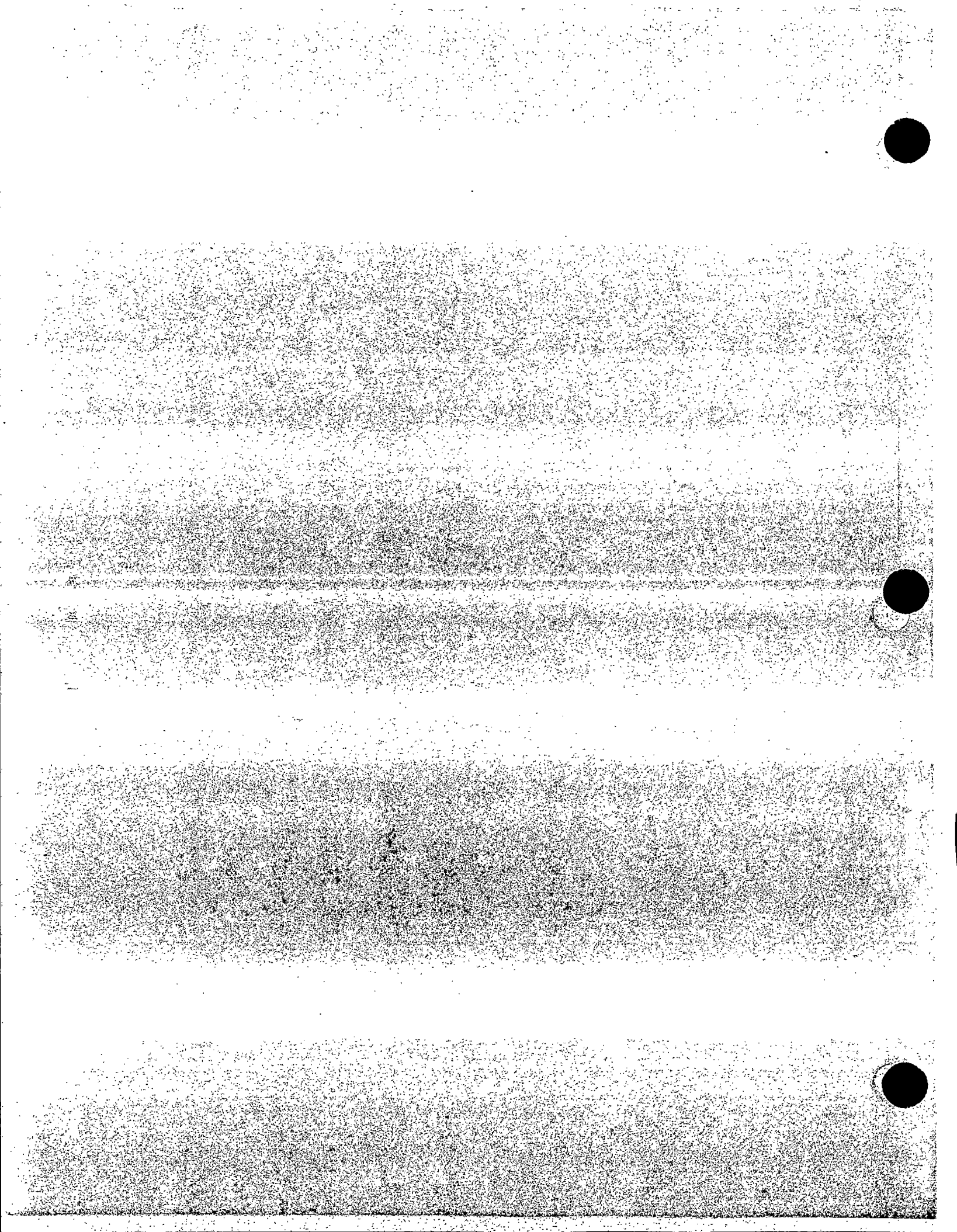
Recommendations were developed in the following areas:

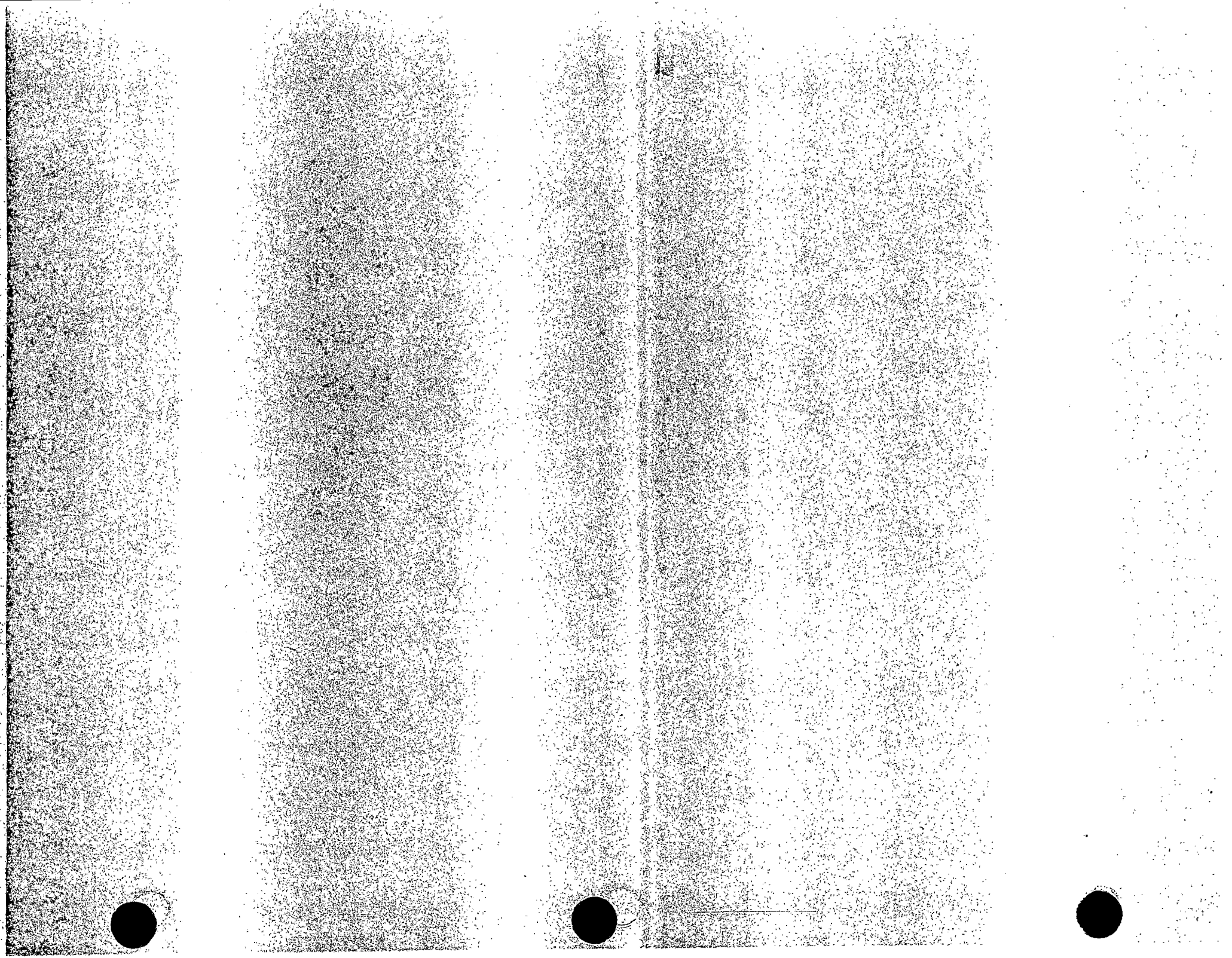
- Work Order Problem Description
- Diagnosis (Troubleshooting)
- Quality of Repair

- Pre- and Post-Maintenance Testing
- Communication
- Use of Industry Experience

The recommendations focused on increased management attention, personnel training, and reliance on a strengthened System Engineer program. Revolutionary changes were avoided based on both internal and external feedback that the performance trend in the areas of plant material condition and maintenance are and have been improving. Rather, the proposed actions are intended to accelerate those trends.

The specific proposed actions, which have been reviewed with and agreed to by plant management, are presented in Section 5.0 of this report.





2.0 MAY 19, 1986 TRIP INVESTIGATION

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2.1 Introduction

The Task Force was chartered in part to conduct an investigation of the May 19, 1986 reactor trip as required by NRC Confirmatory Action Letter of May 22, 1986. The investigation included a review of the trip report and controlling procedure, as well as interviews with Operations personnel on shift at the time of the trip. An effort was made to determine direct or indirect problems which affected their response during the trip and subsequent plant stabilization period. A detailed examination of the Post Trip Review report data package was performed to assess the adequacy of the initial reviews. Interviews with Operations personnel who were not on shift at the time of the trip were also conducted to ascertain the overall attitude with regard to Plant condition and the maintenance process. Results of these interviews were utilized in addressing programmatic issues, which are discussed in Section 5 of the report.

Also included within the scope of the trip investigation were:

1) A review of the history of the equipment problems identified during the investigation;
2) A determination as to the impact of those problems under postulated accident conditions;
3) Recommendations for immediate and follow-up corrective actions;
4) A review of CPCo's Post Trip review practices and methods of documenting, reviewing and verifying corrective actions.

2.2 Description of Trip Event

On May 19, 1986, at 1416, an automatic reactor trip occurred at the Palisades Plant due to high pressurizer pressure. The Plant was operating at approximately 99% power at the time of the occurrence. The reactor protection system (RPS) functioned normally in response to the occurrence.

Licensed personnel on-shift at the time of the trip were:

TCAnderson - Shift Supervisor

JLHanson - Shift Engineer

JFord - Lead Control Operator

KHDunham - Control Operator

Shortly before the trip, the reactor operator noticed that average primary coolant system (PCS) temperature was increasing and began driving control rods into the core. When temperature and pressure continued to increase, he looked at the turbine control panel and saw that the indicating lights were out. From the turbine control panel, the control operator informed the reactor operator that the turbine governor valves had closed. Shortly thereafter, the reactor tripped, initiating a turbine trip. In verifying the reactor trip, the operator noticed control rod #34 bottom light was not lit. However, available rod position indication confirmed that the rod was fully inserted.

The plant cooled down from 576 degrees F to 533 degrees F in approximately two minutes. The resulting shrinkage of the PCS caused pressurizer level to drop and system pressure to drop to 1690 psia before recovering. The level control system automatically deenergized pressurizer heaters and isolated letdown. An unsuccessful attempt was made to start the variable speed charging pump (P-55A) (previously declared inoperable, but presumed available for emergency use) to increase PCS pressure and volume. An alternate charging pump (P-55B) was subsequently started. One of the pressurizer spray valves (CV-1059) remained slightly open, slowing the rate at which PCS pressure recovered.

As pressurizer pressure increased, the letdown backpressure control valve (CV-2012) did not reopen, requiring the operator to shift to the alternate backpressure control valve (CV-2122). The turbine bypass valve (CV-0511) and one of four atmospheric steam dump valves (CV-0779) failed to automatically open. Consequently, PCS temperature was controlled using the three remaining atmospheric steam dumps.

The reactor trip was initially attributed to a loss of load and classified as a four-hour reportable non-emergency event. Notification of the trip was given to the NRC at 1458 May 19, 1986 as well as to the State and Local agencies by the Shift Engineer (SE) on duty at the time of trip. After further investigation it was

determined the reactor trip was attributable to high pressurizer pressure and not as previously reported. Notification of this determination was made to the NRC at 1616. At 1745 an Unusual Event was declared as required in the event of a high pressurizer pressure trip. The Unusual Event was terminated at 1745 and the NRC notified at 1752.

A Post-Trip Review Report (included along with the controlling procedure as Appendix D) was prepared by the Shift Engineer during the hours immediately following the event, and at 2230 on May 19, 1986 the SE signed the report classifying the trip as a Condition II event, reflecting the fact that the complete cause of the trip had not yet been determined, and that safety-related equipment did not function normally during the event. The SE recommended reactor restart to the Hot Standby condition for steam generator chemistry and to test the Electro-Hydraulic Control (EHC) System. He recommended <u>not</u> exceeding 15% power unless testing showed with reasonable assurance that the EHC power supplies would not trip again. At 2230 on May 19, 1986 the Plant Safety Engineering (PSE) Preliminary Analysis was completed by the PSE lead assessor who was in agreement with the SE's recommendation. The Operations Superintendent agreed via telecon with the conditions necessary for a reactor restart.

At 0015 on May 20, 1986, permission to start-up was authorized by the Duty and Call Superintendent, and at 0303 on May 20, 1986 the plant was returned to the Hot Standby condition and troubleshooting of the EHC System performed.

On the afternoon of May 20, 1986, a special meeting of the Palisades Plant Review Committee was held, wherein the Event Report entitled, "Notification of Unusual Event Due to Reactor Trip on Pressurizer High Pressure", and the Post Trip Review of the May 19, 1986 Reactor Trip were reviewed. (PRC minutes included in Appendix F).

During the afternoon of May 21, 1986 Palisades Plant Officials were notified by NRC Region III of a forthcoming Confirmatory Action Letter, and were informed as to the content of the letter, which required an immediate Cold Shutdown. The letter also specified additional investigations to be completed prior to plant restart.

On May 22, 1986 Consumers Power received the Confirmatory Action Letter.

On June 22, at 2159 the plant achieved Cold Shutdown.

A detailed chronology of the significant events after 1400 hours on 5/19/86 is included as Appendix G to this report. The chronology was compiled utilizing information gathered from the following sources and identified as such within the chronology:

a) Shift Supervisors Log - SSL

b) Reactor Log - RXL

c) Control Room Log - CRL

d) Shift Engineer Log - SEL

e) Plant Data Logger - DTL

The chronology is terminated at 2159 May 22, 1986 at which time the Primary Coolant System was in Cold Shutdown in compliance with the Confirmatory Action Letter dated May 22, 1986.

2.3 Cause of the Event

Prior to the occurrence, an Instrument and Control Technician was cleaning the turbine Electro-Hydraulic Control System (EHC) power supply cabinet cooling fans and filters as part of a preventive maintenance program. Investigation showed that when one fan was unplugged, AC line noise was generated, which caused the 15-volt primary power supply to the EHC system to trip. At the time, the technician would have been completely unaware that the primary power supply had tripped.

With the primary power supply tripped, the 15-volt secondary power supply maintained power to the EHC system. Within approximately fifteen minutes, a second fan was unplugged, which again generated an AC line disturbance, and tripped the secondary power supply. This complete loss of power to the EHC system caused the four turbine governor valves to close. Removal of the heat sink from the PCS caused a temperature and pressure transient which initiated the actuation of the RPS.

The cabinet fans had not previously been unplugged during power operation. The EHC power supplies were not known to be sensitive to line noise or other sources of noise such as radio frequency noise.

An EHC Power Supply Trip Investigation Report was prepared by the Consumers Power Laboratory Field Testing and Services Department following extensive testing to verify the cause of the power supply failures.

2.4 Equipment Problems

Utilizing the Post Trip Review Report and interviews with Operations and Engineering and Maintenance Department personnel, a listing of equipment problems related to the May 19, 1986 trip was compiled. Individual detailed accounts of each equipment problem were prepared and are included in Appendix E for the following equipment.

a) Turbine Generator Electro-Hydraulic Control (EHC) System power supplies (E-1)

Tripped due to line noise introduced when two EHC Cabinet Cooling Fans were unplugged for preventive maintenance. Caused turbine valves to close, resulting in eventual reactor trip on high pressure.

b) Turbine Lube Oil Lift Pumps (E-2)

Failed to autostart at 600 RPM; required operator action to start manually.

c) Pressurizer Spray Valve CV-1059 (E-3)

Failed to indicate closed in the Control Room.

d) Turbine Bypass Valve CV-0511 (E-4)

Failed to open in auto or manual.

e) Atmospheric Steam Dump Valve CV-0779 (E-5)

Failed to open

f) Coolant Charging Pump P-55A (E-6)

Failed to start.

g) Letdown Back-Pressure Regulator CV-2012 (E-7)

Failed closed.

h) Reheat Stop Valve CV-0544 (E-8)

Failed to indicate closed on the events recorder.

i) Control Rod #34 (E-9)

Rod bottom light failed to light on control panel following trip.

j) Condensate Recirculation Valve CV-0730 (E-10)

Required operator action to open following trip to avoid deadheading condensate pump.

k) Air Ejector Pressure Control (E-11)

Required Auxiliary Operator action to manually control.

l) Turbine Stop Valves CV-0571/0575 (E-12)

May not have closed until 3 seconds (CV-0571) and 25 seconds (CV-0575) after turbine trip signal.

m) Data Logger/Events Recorder (E-13)

13 discrepancies between the event recorders and the data logger system (ie, sequence of events monitor).

Each of these problems and associated information is provided in detail in Appendix E using the format described below:

a) Problem Description

b) History

History of the component problems developed from a review of the work order history, corrective action documents, and the Nuclear Plant Reliability Data System, and interviews with Plant personnel.

c) Significance to Operations

The Significance to Operations statement was developed by the Senior Reactor Operator (SRO) member of the Plant Material Conditions Task Force.

d) Impact of Problem under Postulated Accident Conditions

The impact of the problem under postulated accident conditions was established by the plant Probabilistic Risk Assessment (PRA) Administrator as a Task Force member based on his knowledge of the plant and the PRA model.

e) Status/Actions

The Status of work on the problem and a description of actions completed or planned as of June 24, 1986 as provided by the plant Engineering and Maintenance Department.

f) Resolution

The resolution represents the actions agreed upon based on Task Force recommendations and subsequent review by the Executive/PRC group.

The development of the problem resolutions is discussed in Section 3 of this report.

2.5 Summary of Operator Interviews

The following observations were made following interviews with Operations personnel on shift at the time of the trip, as well as other Operations Department SRO's.

a) Plant response to the trip was considered extremely smooth and went the way it was expected to go. It was overwhelmingly considered a "routine trip".

b) Two equipment problems were considered significant distractions and surprises during the event:

- Charging Pump P-55A failed to start.
- Letdown Backpressure Regulator CV-2012 failed to work in manual.

c) The number of people in the control room and viewing gallery immediately following the trip represented an operator distraction.

d) Operations personnel are not satisfied with plant problem trouble-shooting and feel maintenance rework is excessive. They consider these issues to be a joint Operations and Maintenance problem.

e) While Operations personnel are not satisfied with current plant material condition, they feel that we are headed in the right direction and are concerned that revolutionary changes will emerge from current efforts.

f) Operations personnel were aware of plant conditions at start-up following the 1985/86 refueling outage. However, factors taken into consideration during the decision-making process surrounding start-up do not appear to have been adequately communicated to all members of the Operations Department. Operators felt that they would have had to "operate around too many problems".

g) Operations personnel do understand the avenues available to them to voice their concerns regarding plant conditions. They are aware of their responsibilities and the remedies available to them should a situation arise where it is determined that a safety issue is not being properly addressed.

2.6 Post-Trip Review Practices

2.6.1 Introduction

Palisades Nuclear Plant Administrative Procedure 4.08, "Post Trip Review Requirements", is designed to provide a documented review that will help ensure that events which have had an impact on the cause of a trip and subsequent equipment responses are identified and thoroughly understood and allow the determination as to the readiness of the plant to be safely returned to operation.

The most recent revision to the Procedure was issued on 5/8/86. The procedure represents a significant improvement in establishing a systematic review process, as well as documenting the conditions of equipment and the sequential decision-making process leading to a restart.

A copy of the procedure, along with completed attachments associated with the May 19, 1986 reactor trip is included as Appendix D to this report.

2.6.2 Procedural Requirements

Post Trip Review Requirements are contained in Plant Administrative Procedure 4.08, Rev 1, "Post Trip Review Requirements". This procedure provides a systematic method for diagnosing the cause(s) of a reactor trip, ascertaining the proper functioning of safety-related and other important equipment during the trip, determining any detrimental effect on plant equipment caused by the trip, and making the determination that the plant can be restarted safely.

The duty Shift Engineer is responsible for preparing the trip report, collecting data for inclusion in the trip report, interviewing plant personnel involved in the trip and making recommendations to the Plant General Manager in reactor startup.

The Plant General Manager or his designate, the Duty and Call Superintendent, is responsible for making the decision to restart the reactor. He is also responsible for verifying that the cause of the trip has been determined and that appropriate corrective action taken.

Plant Safety Engineering is responsible for performing an assessment of every inadvertent plant trip and providing the results of such assessment to the Plant General Manager.

The Post-Trip Review Report final data package consists of:

1) Attachment 1 of Procedure 4.08, "Post Trip Review Report"
2) Attachment 2 of Procedure 4.08, "Plant Personnel Statements", (one for each person involved)
3) collected data and additional documentation (such as PRC minutes) as required.

2.6.3 Post-Trip Review of the May 19, 1986 Trip

The post-trip review of the May 19, 1986 trip was conducted primarily by the Shift Engineer who was on shift during the event, JLHanson. The post-trip review was initiated immediately after the event, and was completed during the subsequent shift.

The following observations were noted by the Task Force in reviewing the post-trip review effort:

1. The duty Shift Engineer performed a comprehensive analysis of the trip in accordance with Procedure 4.08, "Post-Trip Review Requirements"; however, some minor deficiencies/inconsistencies were overlooked. These were:

   a) Under Part 2.f, "Manual Actions", the following equipment was not noted as requiring manual actuation even though manual actuation was required:

      1) Air ejector steam pressure had to be manually controlled; air ejector relief valves lifted and did not reseat.
      2) Condenser Recirculation Valve CV-0730 was closed (due to leakage) approximately two weeks before the reactor trip and had to be opened manually.
      3) Turbine lift pumps had to be started manually.
      4) Control Rod Drive #34 bottom light not working, rod position had to be verified on Primary Position Indication readout.

b) Under Part 2.1, "Other Comments", the following equipment failure was not identified:

1) Several (13) inconsistencies existed between the events recorder trace and Tennecomp data logger system printout; ie, Reactor load (Turbine trip) Channel B (lost), Reactor Control Rod Drive Clutch "A" Relay K-2 (de-energized), etc.

c) Under Part 6, "Identification of Systems with Inadequate Performance", could include:

1) Reheat Stop Valve CV-0544; no indication of operation.

2) Main Stop Valve CV-0571; closed 3.156 seconds late.

3) Main Stop Valve CV-0575; closed 25.052 seconds late.

d) Under Part 9.b.2, "Maintenance and Testing Required before Reactor Restart":

1) Entry "None". No mention was made of dispositioning of 13 identified problem areas.

(a) CV-1059; failure to close.

(b) P-55A; failure to start.

(c) CV-0511; failure to open.

(d) CV-2012; failure to regulate.

(e) CV-0779; failure to open.

(f) CV-0544; failure to close signal.

(g) Control Rod Drive #34; rod bottom light failure.

(h) Air Ejector System Pressure Control; failure.

(i) Condensate Recirculation Valve CV-0730; failure

(j) Turbine Lift Pump; fail to start problem.

(k) Inconsistencies between Events Recorder and Data Logger System.

(l) CV-0571; three (3) second delay in closing.

(m) CV-0575; twenty-five (25) second delay in closing.

e) Under Part 9.b.5, "Conditions Necessary for a Reactor Restart (other than listed above)":

1) Entry "None". Again, no mention was made of dispositioning of 13 identified problem areas.

2. Notification of the trip initially diagnosed as due to loss of load and Emergency Class NA was provided the NRC at 1458. After reevaluation, the trip was attributed to High Pressurizer Pressure and the NRC notified at 1616. Upon further consideration the Emergency class was revised to that of an Unusual event and the NRC notified at 1752. The Unusual Event was declared and terminated at 1745, May 19, 1986.

The Emergency action level should have been reevaluated at the time the initiating condition was determined to be different than originally thought.

3. The trip was correctly identified as a Condition II Event. A Condition II Plant trip is one where:

   a) The cause of the trip is <u>not</u> positively known;
   b) Safety-related equipment or other equipment functioned in an abnormal or degraded manner during the trip and the malfunction has <u>not</u> been corrected;
   c) Safety related equipment or other equipment functioned in an abnormal or degraded manner during the trip and redundant equipment is <u>not</u> available for startup.

4. Recommendations for reactor startup to hot standby (not to exceed 15% power) for steam generator chemistry and EHC System testing were logical. At the time the recommendation was made, the cause of the trip had been identified, and problems with safety-related equipment were understood (except P-55A) which was administratively inoperable due to a cracked block. The SE's recommendation was based on the fact that the event could not be repeated until further testing and troubleshooting had been conducted.

5. While it is apparent that the Shift Engineer went through a conscious decision-making process to determine that no repairs were necessary prior to reactor restart, the basis for not requiring corrective action is not documented.

6. The decision by the Duty and Call Superintendent to start up the reactor without prior PRC approval (but not to exceed 15% power) was in accordance with the procedure at the time it was made based on the information known regarding the cause of the trip and performance of safety systems.

7. It is apparent in the statements by the Shift Engineer during the "Red Phone" report, and by the Plant Safety Engineering representative made in the text of the post-trip review report that a threshold of significance was applied in responding to whether systems operated as expected. Both did not report what they considered to be minor problems and responded in the context of overall plant/system performance. There is no evidence of any intent to withhold or misrepresent any information.

8. The initial review of the trip data by the Shift Engineer and the Plant Safety Engineer, as well as the follow-up reviews by the Operations Superintendent, Lead Shift Engineer, and Plant Safety Engineer, all failed to identify one of the equipment problems which was eventually identified by the Task Force and NRC reviewers: the failure of one of the turbine stop valves to indicate closed until 25 seconds after the first ones closed. It is considered impractical to expect the Shift Engineer to detect all such "hidden" deficiencies, but they should be detected in follow-up reviews.

9. Procedure 4.08, Revision 1, "Post Trip Review Requirements", is a comprehensive document requiring extensive data gathering to reconstruct, analyze and evaluate the event. However, no single mechanism is utilized to disposition and track completion of deficient items or systems.

10. The Post Trip Review Report does not include provisions for documentation regarding notification to regulatory, state or county agencies nor provisions for classification of the event (ie 4-Hour Non-Emergency,

Unusual Event, etc). However, it should be noted that Nuclear Operations Department form, Documentation of Notification to Regulatory Agencies (Form 3160-1-84) is and was utilized to document the trip of May 19, 1986.

2.6.4 Recommendations

The following Task Force recommendations have been reviewed with Plant management, and will be adopted:

1. Review requirements and expectations with appropriate personnel regarding 10CFR50.72 reporting. Emphasize the need to report all equipment problems which had an influence on the plant response or operator response to the transient.

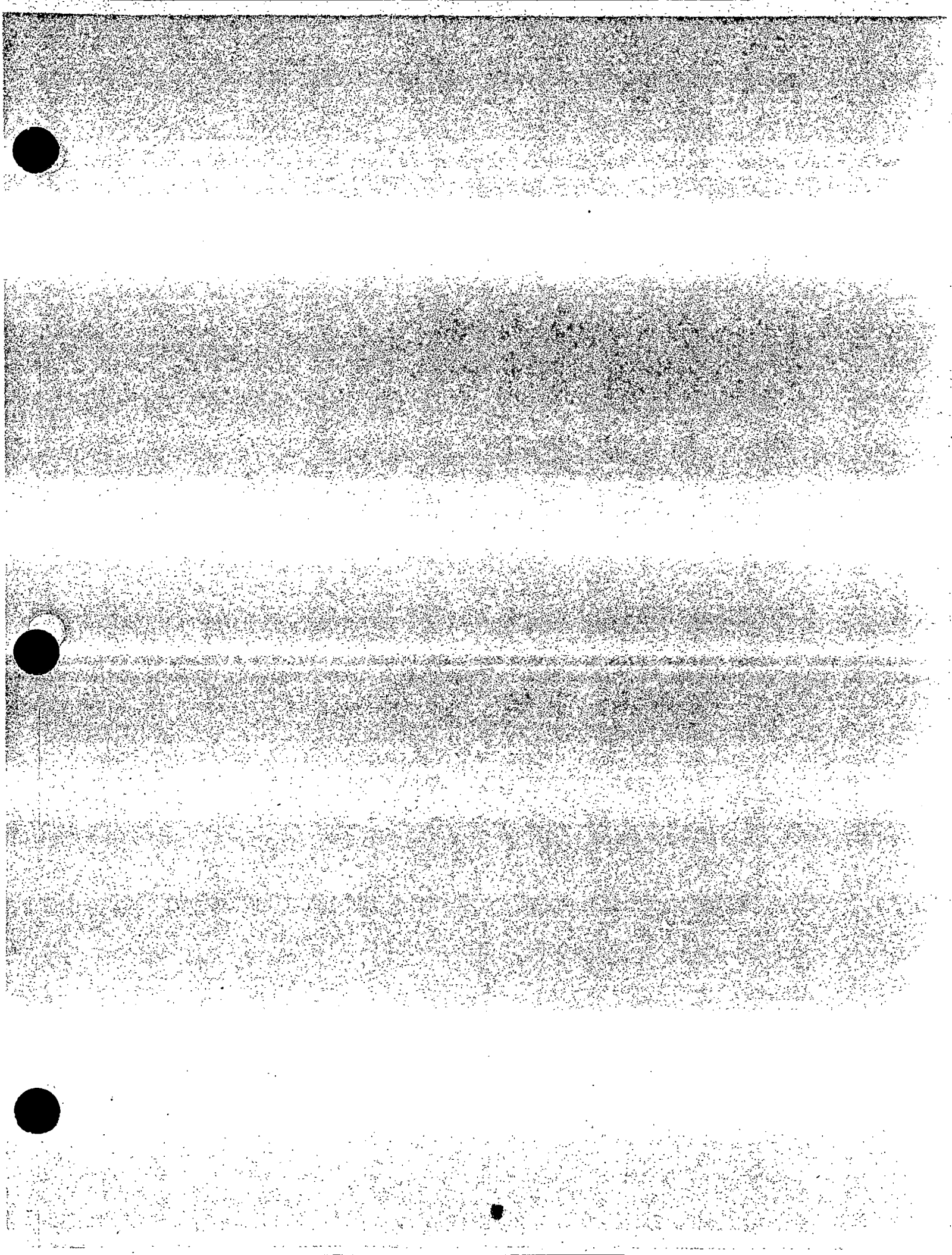
2. Revise Administrative Procedure 4.08 to require and document the resolution of, or justification for startup without resolving, each deficiency noted during the event.

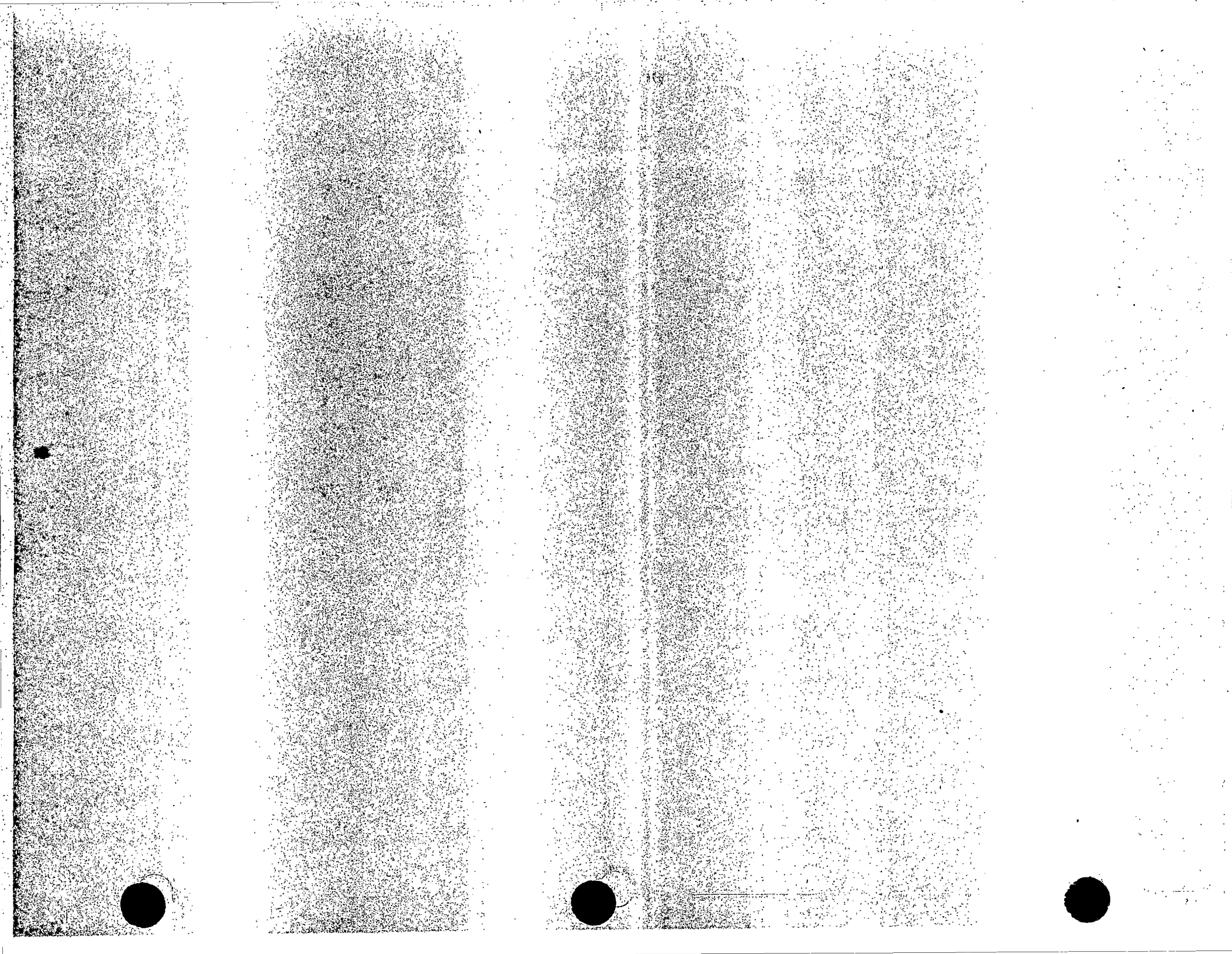
3. The independent follow-up review by the plant Safety Engineering group should be much more detailed and comprehensive to assure that all associated Plant problems are appropriately identified.

4. A list of problems which should be repaired in the event of an outage should be maintained during operation and implemented prior to Plant restart.

5. Emphasize to Duty and Call Superintendents the need to consider the overall number of equipment failures and required operator actions in considering recommendations for Plant restart.

6. Participate in the Combustion Engineering Owners Group (CEOG) - Davis Besse Review Group concerned with root cause determinations. The group will review current practices of a number of plants and recommend actions to improve the root cause determination process.





3.0 PLANT EQUIPMENT STATUS

3.0 PLANT EQUIPMENT STATUS

3.1 Introduction

The May 22, 1986 NRC Confirmatory Action Letter required that Consumers Power Company conduct "a thorough investigation of plant safety systems and balance of plant systems important to safety, with regard to operability and required maintenance." This evaluation was required to be completed prior to Plant Startup. This section of the Task Force report describes the process that was employed to define the scope of the investigation, to conduct the investigation, and to review the results and define the work scope for the current outage. It also describes the follow-up controls which will be applied to assure the program results are properly implemented.

3.2 Investigation Process

The approach chosen to conduct the investigation was to compile a list of known or potential operability or maintenance problems through a number of diverse sources, to screen the list for significance, and to investigate in detail the history and current status of each item. Recommendations were made by the Task Force for each item, and reviewed by an Executive Review Group and Plant Review Committee. This process is described in detail in the following sections.

3.2.1 Item Identification

The list of known or potential significant problems was compiled through the following means:

1) Review of Work Order History

Two members of the Task Force independently reviewed the complete work order history which currently resides on the Company's Advanced Maintenance Management System (AMMS). The review included currently open Work Orders (WO's), three years of past WO's for the safety-related equipment, and one year of past WO's for non-safety-related equipment. A list of approximately 9500 total work orders was reviewed. The reviewers scanned the work order listing for evidence of repeat maintenance problems and generic maintenance problems. Once the initial, independent, lists were compiled, they were reviewed in detail by the full Task Force for applicability to the effort, and consolidated as appropriate into a approximately 140 items which were deemed to merit further investigation. In general, where the Task Force could not eliminate an item as being insignificant, the item was retained for further research.

2) Review of Nuclear Plant Reliability Data System (NPRDS)

A member of the Task Force with extensive knowledge of NPRDS reviewed the historical failure data on the system for repeat equipment problems. A number of additional items were identified for more extensive evaluation through this means.

3) Review of the Current Operator Concern List

The Palisades Plant Operations Department maintains a list of current operator concerns as a means of communicating their priorities to the Engineering and Maintenance Department for resolution. This is in addition to communication of work order priorities which are communicated daily in the Plant scheduling meeting. The operator concern list utilized, dated April 21, 1986, includes 55 items ranging from desired improvement of the piping and instrument diagrams (P&ID's) to desired repairs to safety-related equipment. Those within the scope of this effort were each included as line items for further investigation. Many items, such as eighteen which deal with radwaste or makeup water systems, were excluded.

4) Review of Recent Corrective Action Documents

Deviation and event reports issued on or after January 1, 1984 were reviewed for equipment-related problems. A total of 1146 documents were screened, yielding 368 documents for detailed review. The intent of the review of the corrective action documents was to identify repeat problems, and to look for depth and adequacy of corrective actions. Because surveillance test failures and quality assurance audit findings are also documented through issuance of corrective action documents, this process also encompassed a review of the last 2½ years of experience in these area.

5) Review of the Results of the "Operational Readiness Review"

The Vice President-Nuclear Operations Department commissioned a Task Force in early 1986 to evaluate the status of a safety system at each of Palisades and Big Rock Point. The evaluation considered system design, testing, maintenance, operation, and modification. At Palisades, the Auxiliary Feedwater System was evaluated, and a number of follow-up actions were recommended. The results and recommendations of this effort were incorporated into the Plant Material Condition Review Task Force evaluation.

6) Input from Task Force Members

With the extensive Palisades background on the Task Force, the members contributed items for additional investigation based on their knowledge of current or historical problems. The majority of this input came from the Shift Supervisor on the Task Force, and the Task Force member who heads up the Palisades Probabilistic Risk Assessment (PRA) effort. As part of their recommendations, this group was asked to identify any balance of plant equipment which is not routinely tested and may not have been challenged since the completion of the last refueling outage (ie, similar to the atmospheric dump valve). No such items could be identified.

7) Review of Palisades Plant Reactor Trip History

A review of all reactor trips which have occurred since initial plant startup was performed to identify repeat trip initiators. If not already identified through other means, failures which have been responsible for repeat trips in the past were added to the list for further investigation.

8) Review of the May 19, 1986 Reactor Trip Report

All equipment problems identified through review of the May 19, 1986 trip report and subsequent investigation were added as line items for additional research.

9) Interviews with Plant Personnel

As the final step in the problem/potential problem identification process, interviews were conducted with a substantial number of plant personnel to determine the completeness of the items identified through other means. The interviews included the Operations Manager, Operations Superintendent, and Operations Supervisor, along with all of the Shift Supervisors and Shift Engineers, and four of the ten Control Operators. They also included thirty-two of the thirty-six System Engineers, and several of the Project Engineers.

3.2.2 Item Screening

The list of items (problems or potential problems) for further detailed investigation was limited (with a few exceptions) to equipment which is safety-related or "important to reliable plant operation". While safety-related equipment is specifically identified as such, the Task Force had to determine the bounds of balance of plant equipment which is relied upon by the Operators in response to a transient condition or during Plant stabilization. This was done primarily by two of the Task Force members: the Shift Supervisor and the PRA Administrator. The initial list was compiled by the PRA Administrator based on his knowledge of Plant operation and the PRA model which identifies balance of plant equipment which is important in accident scenarios. This list was supplemented by the Shift

Supervisor based on his knowledge of the equipment relied upon by the Operator in response to a transient. Finally, the list was reviewed by the full Task Force, at which time a few additional items were included. The resulting list of "systems important to reliable plant operation", including safety-related systems, is included as Appendix H to this report.

3.2.3 Item Evaluation

The identification and screening processes described in Sections 2.2.1 and 2.2.2 resulted in approximately 228 line items for Task Force investigation. During the course of the evaluation, there were a few items added, and a number of items consolidated, so that the final number of items presented in this report is 222.

The Task Force was subdivided into five teams to conduct the detailed investigations. Each of the teams was responsible to evaluate the items associated with assigned systems as follows:

Team	Systems
WClark/RESchrader	SPS, RIA, RPS, EPS, DTA, FOS, NMS/RRS
JGBouwens/CMGrady	ESS, CAS, SCS, TGS, AES
JPopa/RPMargol	MSS, FWS, CIS, CHM, CLP, PCS, CDS, HED
AETome/MCSniegowski*	CVC, AFW, CRD, FPS, PAS, VAS, CCS, SWS
VJBeilfuss	MIS

* Staff Engineer who aided Task Force

The evaluators were instructed to research the history and current status of the item, and to recommend both immediate and long term actions which should be performed to assure the reliability of the equipment. The recommendations were placed into one of four categories as follows:

1. Prior to Plant Startup - The recommendation should be implemented prior to startup from the current maintenance outage.

2. Before the End of Refout '87 - The recommendation should be implemented prior to startup from the next refueling outage, currently scheduled for the Fall of 1987.

3. As Part of the 5-Year Plan - The Palisades Plant was in the process of developing a Five-Year Plan for maintenance and modification activities at the time of Plant Shutdown on May 19, 1986. The plan represents an "Integrated Living Schedule" approach to prioritization and implementation of workload. A recommendation to include actions "as part of the 5-year Plan" means that the item should be evaluated and prioritized with respect to other Plant improvement projects and implemented accordingly. It is quite possible that recommendations of this category may not be implemented at all due to insufficient payback (dollars, radiation

exposure reduction, radwaste minimization, personnel safety, plant safety, and other such benefits). Development of the Five-Year Plan will resume following Plant startup.

4. No Further Action Required - In many cases, the evaluator determined that the item was no longer of concern, and deemed that no additional actions were necessary.

The investigations generally consisted of a review of work order history and corrective action documents, as well as discussions with plant personnel, primarily the responsible System Engineer. These discussions also included operators and repairmen as appropriate.

In parallel with the evaluator's efforts, a significance assessment was performed on each of the line items by the Shift Supervisor and PRA Administrator assigned to the Task Force. The assessment considered both the impact on the operators, as well as the significance of the equipment from a probabilistic risk assessment perspective.

3.2.4 Task Force Review

The item evaluators presented the results of their evaluations and associated recommendations to the full Task Force for discussion and comments in a series of meetings beginning June 2, 1986. All of the items were reviewed in this manner over the course of approximately 24 hours of meetings.

3.2.5 Executive/Plant Review Committee (PRC) Review

To assure proper management visibility and concurrence with the Task Force findings and recommendations, and also to provide a review for safety significance, a joint Executive/Plant Review Committee group was formed to review the Task Force results.

The Executive Review Committee consisted of:

- FWBuckman - Vice President-Nuclear Operations Department
- RBDeWitt - Vice President-Energy Supply Services Department, former Vice-President of Nuclear Operations Department, and former Palisades Plant Manager
- JFFirlit - Palisades Plant General Manager
- JGLewis - Palisades Plant Technical Director and former Palisades Plant Manager
- RMRice - Palisades Plant Operations Manager
- RDOrosz - Palisades Plant Operations and Maintenance Manager

In addition to JGLewis, RMRice, and RDOrosz, the following personnel constituted the PRC quorum:

- DWJoos - Palisades Plant Planning Director
- STWawro - Palisades Plant Shift Supervisor

All of the Task Force line items which were evaluated as a part of the investigation of Plant equipment status were reviewed in detail by this group in a series of four meetings (totalling approximately 30 hours) held between June 12 and June 19. Also included in the meetings were:

- BNYoung - Palisades Plant PRA Administrator
- Control Operator - With the exception of a few hours of one meeting, a plant control operator was involved.
- System/Project Engineers - The engineers responsible for the associated system on equipment under discussion.

The purpose of the meetings was to establish a "resolution" for each of the 222 line items and concurrence or modification of the Task Force recommendations. In almost all cases, with a few minor exceptions, the resolutions involved expansion of or acceleration of the Task Force recommendations.

3.3 Investigation Results

The results of the Task Force efforts to investigate the status of plant safety systems or balance of plant systems important to reliable plant operation are included in this report as Appendix C. In summary, 222 items were evaluated, involving 26 systems and including 11 generic issues which affect multiple systems. A total of 544 total action items were generated (not including the list of open work orders and control room deficiencies which are recommended for completion prior to startup). Of these action items, 58 percent are to be completed prior to startup, 29 percent are to be completed prior to the end of the next refueling outage, and 13 percent are to be considered for the 5-Year Plan.

3.4 Implementation

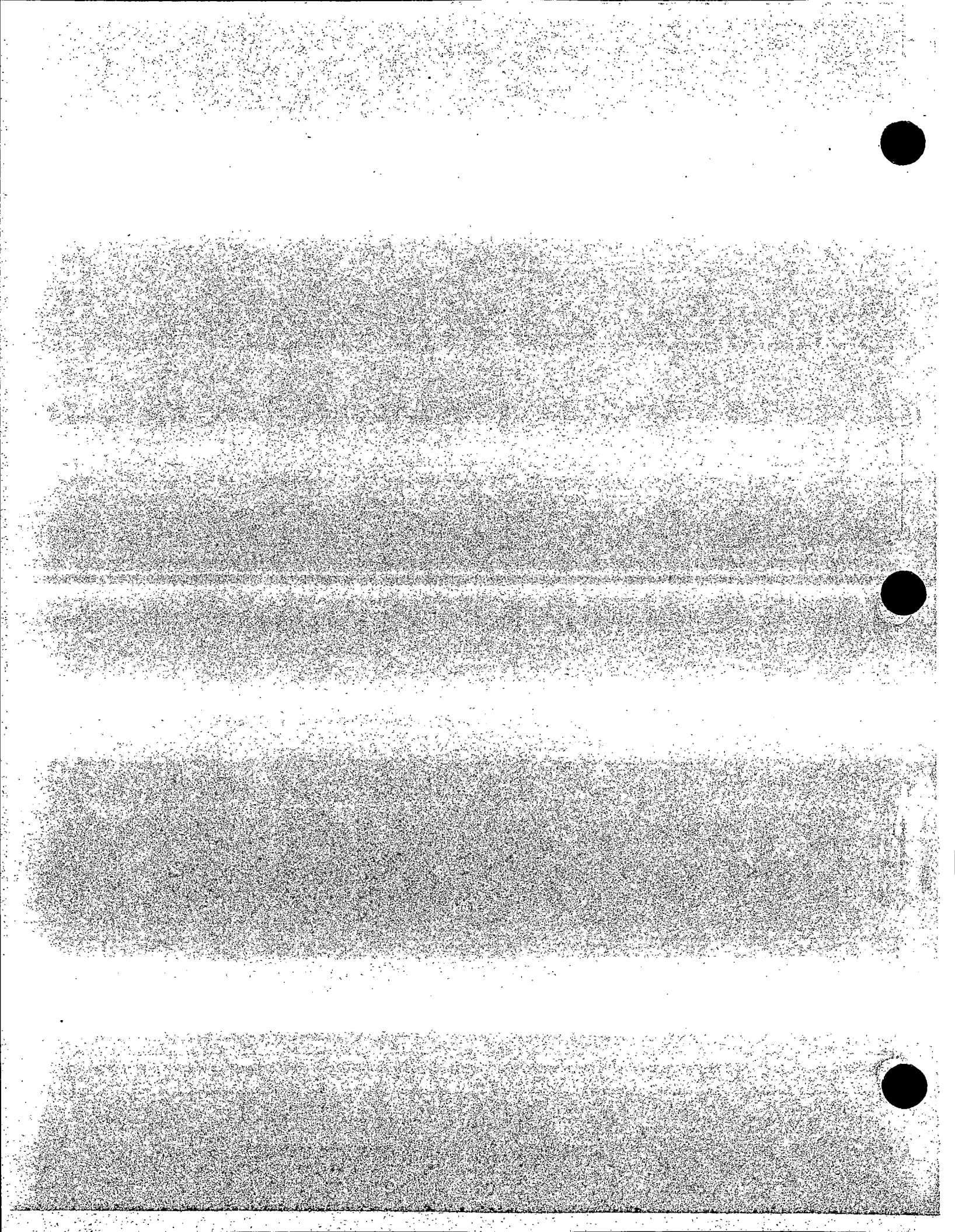
It is the Plant's intention to complete all actions shown in Appendix C for "Prior to Plant Startup" before the Plant returns to power operations. In order to assure proper management attention to this goal, all of these action items will be individually tracked on the outage scope and schedule, and updates will be provided weekly to both the plant General Manager and the Vice President-Nuclear Operations. In addition to this quantitative check, a subcommittee of the Task Force will be reassembled to audit the quality of the work accomplished to assure that it meets the intent of the original recommendation.

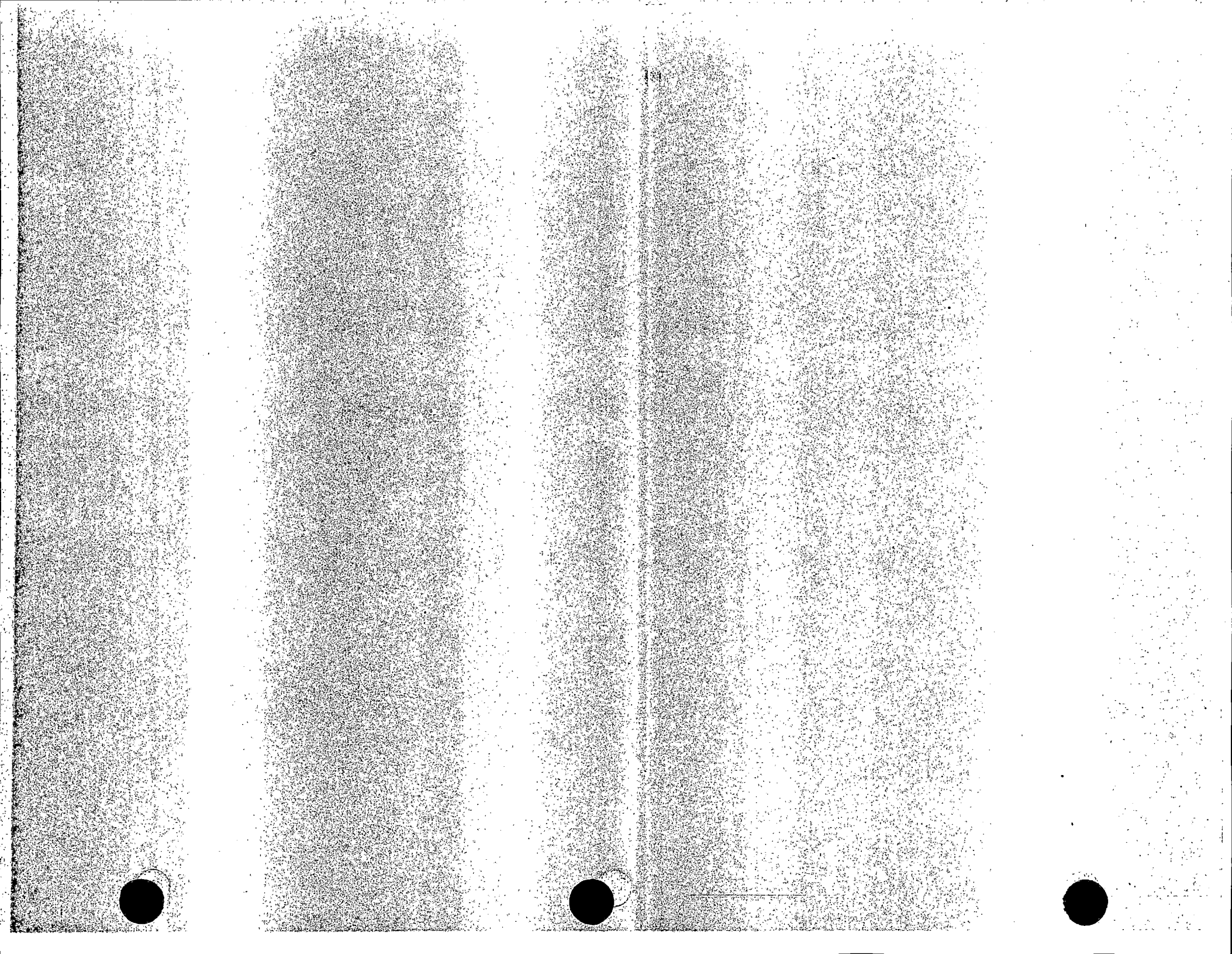
Items scheduled to be completed prior to the end of Refout '87 will be monitored as line items in the scope list for that outage, and the Plant General Manager and Vice President-Nuclear Operations will be updated monthly on the progress made to prepare for their implementation.

3.5 Final Review

A final review of the actual work completed relative to the action items scheduled to be completed prior to plant startup will be conducted by the Executive/Plant Review Committee. Any deviations from the original resolution will be considered for approval. For any deviations granted, a Justification for Continued Operation (JCO) will be prepared, and all such items will be reviewed with the NRC prior to startup.

In addition, a final review of the open work orders and control room deficiencies will be conducted prior to plant startup by the Operations Department to assure that any significant equipment operability problems are addressed.





4.0 AUGMENTED TEST PROGRAM

4.0 AUGMENTED TEST PROGRAM

4.1 Introduction

As part of the Task Force scope, a program to perform inspections, testing, and preventive maintenance on plant equipment which is important to reliable plant operation was proposed. The program is intended to supplement the Plant Technical Specification surveillance testing program.

Development of this program was headed by the Probabilistic Risk Assessment (PRA) Administrator as a member of the Task Force. He was assisted in this effort, particularly with regard to program administration, by the Executive Director of Nuclear Assurance.

4.2 Scope

A review of systems important to reliable plant operation was made to identify equipment which should be tested, yet is not currently tested on any regular basis. Testing recommendations were categorized in the following manner:

Occasional Test - The proper operation of these items should be verified periodically. An interval of every three refueling cycles or every five years is suggested.

Pre-Refueling - The proper operation of this equipment should be assured shortly before, or at the very beginning of, each refueling outage or other major planned outage. It is suggested that each System Engineer ensure, (by these tests, contact with operations, and routine inspections) that all problems with his/her assigned equipment, which might prevent that equipment from satisfactorily completing another entire fuel cycle, are identified before, or at the beginning of, each refueling outage.

Each Startup/Shutdown - These items should be performed each time plant conditions will allow.

Surveillance - These items should be added to current Technical Specification surveillance procedures and treated as Technical Specification requirements.

The recommended periodic testing under this program is shown in Table 4-1, listed by system for each system identified as important to reliable plant operation.

TABLE 4-1

RECOMMENDED PERIODIC TESTING

	I. PRIMARY COOLANT SYSTEM
	A. Primary Coolant Pumps
Occasional Test	1. Verify operability of backstop oil pumps P-83 and P-84.
Occasional Test	2. Verify operability of low backstop oil flow alarm.
Occasional Test	3. Verify operability of reverse rotation alarm.
Each Shutdown	4. Check oil systems for leaks; repair and refill as necessary.
	B. Reactor Head/Pressurizer Vent System (PRV-1067, 68, 69, 70, 71, 72)
Pre-Refueling	1. Cycle each solenoid valve to verify operability.
Pre-Refueling	2. Ensure that each solenoid valve does not leak through.
	II. CHEMICAL AND VOLUME CONTROL SYSTEM
	A. Charging and Letdown stop valves CV-2001, 2113, 2115, 2117.
Pre-Refueling	1. Cycle each valve to ensure operability.
Occasional test	2. Ensure that each valve does not leak through.

NOTE: All instrument loop checks are to be complete loop checks, not component checks.

Pre-Refueling	B.	Instrumentation
	1.	Verify setpoint and operability of high temperature trips:
	a.	Letdown stop CV-2001
	b.	Ion exchanger bypass CV-2023
	C.	Metering Pump P-57
Pre-Refueling	1.	Verify Operability
	D.	Relief Valves
Occasional Test	1.	Verify setting
	a.	Letdown RV-2006, 2013
	b.	Primary coolant pump leak-off RV-2083
	c.	Volume Control Tank RV-2079, 2080
	d.	Charging Pump Discharge RV-2092, 2098, 2104
	e.	Charging Pump Suction RV-2090, 2096, 2102
	E.	Alternate Power Supply
Surveillance	1.	Run charging pumps on alternate power supply.
III.		EMERGENCY CORE COOLING SYSTEM
	A.	Motor-Operated Valves
Surveillance	1.	Cycle with differential pressure
	a.	HPSI sub-cooled suction MO-3070, 71
	b.	Charging to HPSI MO-3072
Pre-Refueling	2.	Loop check instrumentation
	a.	High pressure interlock MO-3015, 16
	b.	Alternate shutdown panel (C-33) cooling controls for CV-3006, 25, 55
	B.	Relief Valves
Occasional Test	1.	Verify setting
	a.	Shutdown cooling suction RV-3164
	b.	LPSI RV-3162
	c.	HPSI RV-3165, 3264, 3266

IV. MAIN STEAM SYSTEM

A. Atmospheric Steam Dumps CV-0779, 80, 81, 82.

Each Startup/Shutdown	1. Verify operability from control room.
Each Startup/Shutdown	2. Loop check all controls a. Quick opening on turbine trip b. Modulating on Tave c. Control from C-33
Pre-Refueling	3. Operate manual isolation valves to detect binding of linkage or excessive packing drag a. MV-0101 MS, 02MS, 03MS, 04MS
Occasional Test	4. Verify operability of solenoid isolation valve on control air supply. a. SV-0779A, 80A, 81A, 82A
Occasional Test	5. Verify integrity of control air to dump valve by leak down test.

B. Turbine Bypass Valve CV-0511

Each Startup/Shutdown	1. Verify operability from control room.
Pre-Refueling	2. Loop check all controls a. Quick opening on turbine trip b. Control on Tave c. Control on steam pressure
Pre-Refueling	3. Operate manual isolation valves to detect binding of linkage or excessive packing drag. a. MV-0101MS, 02MS, 03MS, 04MS
Occasional Test	4. Verify operability of solenoid isolation valve on control air supply. a. SV-0589A

Occasional Test	5. Verify integrity of control air to bypass valve by leak down test.	
	C. Auxiliary Feedwater Turbine Supply	
Occasional Test	1. Verify Relief Valve Setting	
	a. RV-0521	
	D. Moisture Separator/Reheaters	
Occasional Test	1. Verify relief valve settings	
	a. RV-0541, 42, 43, 44, 45 b. RV-0530, 31, 32, 33, 34, 40 c. RV-0549, 50, 51, 52, 58 d. RV-0535, 36, 37, 38, 39, 46	
	V. Feedwater and Condensate Systems	
	A. Condensate Pumps	
Pre-Refueling	1. Inspection/performance monitoring	
	a. P-2A, P-2B	
	B. Feedwater Pumps and Turbines	
Pre-Refueling	1. Inspection/performance monitoring	
	a. P-1A, P-1B	
	C. Heater Drain Pumps	
Pre-Refueling	1. Inspection/performance	
	a. P-10A, P-10B	
	D. Recirculation Valves	
Pre-Refueling	1. Verify operability, perform instrument loop check	
	a. CV-0730 b. CV-0710, 11	

Pre-Refueling	E. Heater Drain Tank Level Control Valves	
	1. Verify operability, perform instrument loop check	
	a. CV-0608, 09	
	F. Feedwater Stop Valves	
Pre-Refueling	1. Verify operability	
	a. CV-0742, 44	
Occasional Test	2. Check for leakage	
	G. Feedwater Check Valves	
Occasional Test	1. Check for back leakage	
	a. CK-0701FW, 0702FW	
	H. Heater Bypass Valves	
Occasional Test	1. Cycle for operability verification	
	a. MV-0722CD, 23CD, 24CD, 27CD, 32CD b. MV-114FW, 115FW	
	I. H.P. Heater Relief Valves	
Occasional Test	1. Verify settings	
	a. RV-0602, 06	
	VI. AUXILIARY FEEDWATER SYSTEM	
	A. Low Suction Trip	
Surveillance	1. Verify setpoints	
	a. PS-0741A, 0741B, 0741DD b. PS-0762A, 0762B, 0762C	
Occasional Test	B. Pump Discharge Relief Valve	
	1. Verify setting	
	a. RV-0783	

C. Check Valves

Occasional Test

1. Check for back leakage

a. CK-0703FW, 04FW, 28FWS, 29FWS

VII. SERVICE WATER SYSTEM

A. Isolation Valves

Pre-Refueling

1. Cycle for operability verification

a. CV-0844, 45, 46, 57
b. CV-1318, 19

Occasional Test

B. Fire System Cross-Connect Valves

1. Cycle for operability verification.

a. MV-130FP, 131FP

VIII. COMPONENT COOLING WATER SYSTEM

A. No items

IX. INSTRUMENT AIR SYSTEM

A. Compressors

Pre-Refueling

1. Inspection/performance monitoring

a. C-2A, B, C

B. Dryers

Pre-Refueling

1. Inspection/performance monitoring

a. M-2

X. HIGH PRESSURE AIR SYSTEM

A. Compressors

Pre-Refueling

1. Inspection/performance monitoring

a. C-6A, B, C

XI. DIESEL GENERATORS

A. No items

	XII.	FIRE SYSTEM
	A.	No items
	XIII.	CONTAINMENT
	A.	No items
	XIV.	TURBINE GENERATOR
	A.	EHC Hydraulic
Pre-Refueling	1.	Verify backup pump auto start
Pre-Refueling	2.	Pump inspection/performance monitoring

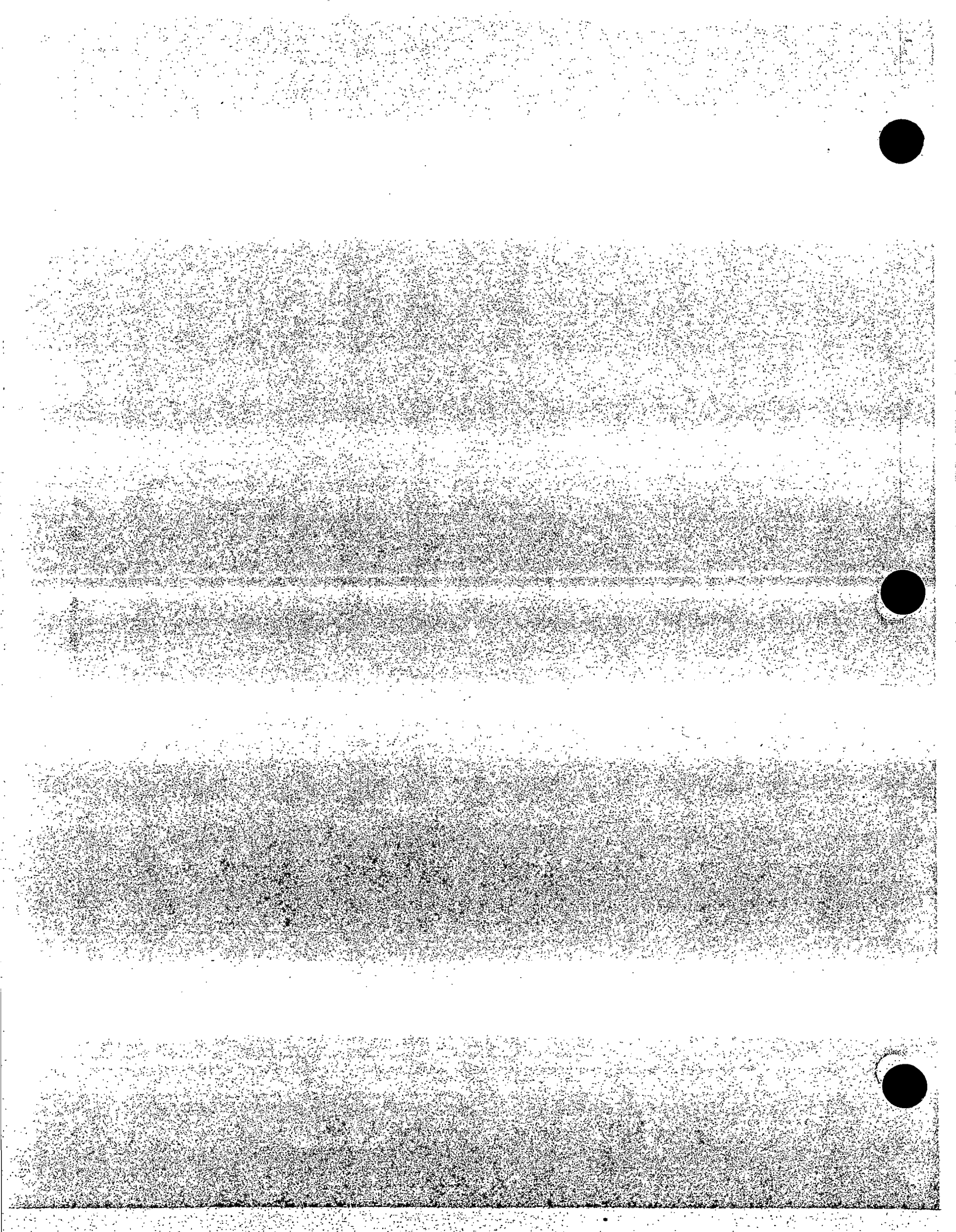
4.3 Administration

All of the proposed activities, with the exception of the "surveillance activities", will be administered through the Plant Periodic Activities Control System (PACS). For each PAC item, a basis document will be developed and retained in the plant's Document Control Center (DCC). The PACS sheets, which are issued automatically at the specified frequency, will include the specific steps to be taken in completing the activity, and will specify equipment performance data to be documented.

The PACS activities will also be incorporated in the forced outage plan and refueling outage plan to assure their completion.

The PACS sheets for the activities listed in the scope will be developed prior to startup from the current outage. It is expected that the majority of the specified items will be performed prior to startup. All will be performed no later than the end of Refout 87.

Surveillance items will be incorporated into the appropriate Technical Specification Tests. Technical Specification changes to reflect these tests will be submitted.



5.0 PROGRAMMATIC ISSUES

5.0 PROGRAMMATIC ISSUES

5.1 Introduction

Included in the Task Force scope was an effort to evaluate the adequacy of the Palisades Plant maintenance process and related issues with respect to achieving a higher level of Plant material condition and reliability. The Task Force reviewed the results of past efforts that have been made to effect improvements in this area, most significantly the result of the Maintenance Order Task Force which was established in early 1985. The review also included a look at the observations and recommendations of the recently completed "Plant Operational Readiness Assessment" which focused on the Auxiliary Feedwater System, but also addressed programmatic issues. Finally, the observations of the NRC Augmented Inspection Team investigation of May 23-25, 1986 were specifically reviewed.

The Task Force utilized the observations and recommendations from these sources to establish a framework on which to evaluate the effectiveness of improvement efforts of the past and focus on where additional or more intensive efforts are required. Because of the varied backgrounds of the Task Force members, including a significant amount of non-Palisades experience, the Task Force was able to provide specific recommendations for improvements in some areas, while others were established through a series of meetings with various plant management personnel and working-level representatives.

In addition, a sub-set of original participants in the Maintenance Order Task Force was reassembled to develop specific recommendations related to maintenance process improvements.

5.2 Observations and Recommendations

In developing recommendations for effecting improvement, care was taken to acknowledge the feedback that was received from internal discussions with Plant personnel, particularly Operations Department personnel, which indicated that revolutionary changes were neither required nor desirable. In fact, even personnel who expressed concern and dissatisfaction with Plant maintenance felt that things were improving, and that a significant change in direction would likely be detrimental. Consequently, the recommendations tend to be more in the line of accelerated or more intensive developmental efforts, rather than a change in direction.

The focus of the programmatic improvement efforts centers around two themes: management attention and personnel training. It is believed that the programs currently in place are sound and address appropriate issues, but that management emphasis and employee experience and knowledge levels have been inadequate to produce results at the desired rate.

The recommendations also reflect a philosophy of utilizing the System Engineers to provide an effective interface between Operations and Maintenance. To do this, it is believed that they will require additional training in Plant Systems and component maintenance, a reduction in paperwork workloads to provide more time to spend in the Plant, and an understanding of management expectations regarding their role.

The recommendations resulting from this process, which have been reviewed and agreed to by the Plant management team, are summarized as follows.

A. Work Order Problem Description

Work Order problem descriptions are often inadequate, leading to occasional misinterpretation and inappropriate repair activities. This problem also reduces the quality of work order history information and consequently, the effectiveness of trending efforts.

Actions

1. Re-emphasize to all plant personnel the need for concise and complete problem descriptions. This will be accomplished through meetings with the Operations and Engineering and Maintenance Departments, addressing the majority of the

Work Request initiators. Communication of this expectation will be reinforced via the Palisades Weekly Bulletin. These actions will be completed by August 1, 1986.

2. Have Plant managers audit Work Orders for adequacy of problem descriptions, planning steps, summary of work performed, and post-maintenance testing. A group of managers, including the Operations Manager, the Engineering and Maintenance Manager, and Engineering and Maintenance Superintendents will audit a sample of both new and completed work requests and work orders for quality of information. This will begin by July 15, 1986 and continue until a uniform standard of excellence is achieved. Feedback will be provided to initiators, planners, first-line supervisors, and repairmen.

3. Provide additional experienced operational staff to interface with the Maintenance Department and assist with problem description, trouble-shooting, prioritization, and post-maintenance testing. The Operations Department was reorganized, effective July 1, 1986. A key feature of the revised organization is the establishment of a group of experienced Operations personnel headed by a former Shift Supervisor to serve as an interface with engineering and maintenance. This group will ensure accurate and complete problem descriptions, assist with problem identification,

trouble-shooting, prioritization, and definition and planning of post-maintenance testing.

B. Diagnosis (Troubleshooting)

Problem diagnosis is often inadequate to establish the true root cause and assure effective repairs are completed. This is recognized as a joint Operations/Maintenance concern.

Actions

1. Utilize the additional operations personnel set aside for this purpose. The newly created Operations planning group described earlier (see A.3 above) will be tasked with assisting and guiding Operations and Engineering and Maintenance with root cause determination related to problems identified through work orders.

2. Improve the effectiveness of the System Engineers and Work Planners:

   a. Decrease System Engineer work backlog by augmenting the engineering work force from within the company. Decreasing the System Engineers' workload (backlog) will enable them to spend more time in the plant with their systems. The Project Engineering and Construction

Department has been contacted for support, which will commence subsequent to completion of this outage.

b. Provide systems training for the System Engineers and Work Planners subsequent to completion of this outage. Training classes will, where feasible, include Operations Auxiliary Operators to provide a broad-based level of experience at the classes and to provide an environment to establish good relationships between the departments. Classes will commence immediately after completion of the outage, and training for existing personnel will be completed by 12/31/87.

c. Provide specific component training to engineers and repairmen to enhance their maintenance skills. There is currently an on-going program at the Company's Muskegon Skills Center to provide maintenance skills training. More Palisades nuclear specific skills such as working with stainless steel valves and pumps and working under the adverse conditions for radiation safety will be incorporated into the training courses. This enhancement will be completed by 12/31/87.

d. Provide an orientation program for new System Engineers including Systems training, Administrative training, and time spent in various departments. The program is expected to be ready by 1/1/87.

C. Quality of Repair

The quality of repairs completed must be enhanced to reduce rework. System Engineer experience level is lower than desired and they do not provide adequate input to problem resolution. Repairmen skill levels with regard to nuclear plant component maintenance are sometimes inadequate.

Actions

1. Provide additional valve and machinist training for repairmen focused more specifically on Palisades plant components. Provide additional valve training and machinist training specifically targeted at conditions encountered at Palisades. This will include some training on unique valves at nuclear sites plus additional training on machining of stainless steels and other less common materials utilized in the nuclear industry. This training will be complete by 12/31/87.

2. Provide Auxiliary Operating training for minor maintenance such as manual valve packing adjustment or lubrication of equipment. The training will begin by 1/1/87.

3. Develop and Utilize Component Specialists:

   a. Use vendors to augment our expertise and enhance our in-house skills for complex problems.

   b. Provide component training to build our in-house capability. Training will be provided to selected individuals to develop their expertise in areas such as pumps, valves, structural analysis, welding or other specialties. We expect the System Engineers to evolve toward certain areas of interest, then enhance their skills with specific training. The process has started and will continue as the engineers gain experience.

4. Accelerate the PM program development to assure better maintenance of our plant equipment. More resources will be devoted to creating more PM's and reviewing our present ones for adequacy. The PM program will be complete by 6/30/87.

5. Emphasize the implementation of the new trend program to acquire the ability to perform predictive maintenance. Full implementation of the Plant Trend Program will take place prior to completion of this outage. The program will be utilized to obtain baseline data on newly repaired systems and as a verification that maintenance performed was satisfactory.

D. Pre- and Post-Maintenance Testing

Pre- and Post-Maintenance Testing is not adequately performed. Often, little testing is prescribed other than Tech Spec operability requirements. This process is hampered by plant conditions being inappropriate for testing when the repairs are complete. More feedback is required to repairmen regarding success of repair efforts.

Actions

1. Utilize the additional Operations personnel established to support the maintenance process. The newly formed section in Operations will be utilized to assist in the definition of testing to be performed and assisting in the coordination of the test effort. This enhancement will be utilized for testing of repairs completed this outage.

2. Provide training/guidance on testing techniques for System Engineers. Supervision and guidance on testing techniques will be provided for the System Engineers prior to startup. This training will be provided by the Operations section recently created and by experienced start-up personnel within Engineering and Maintenance Department. A guideline will be developed after the outage for subsequent use.

3. Obtain better equipment/facilities for testing. Better facilities for bench testing components and specific test equipment for verifying valves will be obtained for testing newly repaired equipment during the outage. Test taps are being installed concurrently with our CVC repairs to enhance our ability to assure successful maintenance.

4. Develop an augmented surveillance program for operability testing of selected non-Q components. An augmented testing program for non-Q systems important to reliable plant operations, described in Section 4.0 of this report, is being developed. Testing will be performed prior to plant startup to verify equipment performance.

E. Communication

More effective communication must occur between the Operations and Maintenance Departments. Operations should provide consistent priority for work and strong expectations for the repair groups. More effective communication of expectations and performance feedback is required within departments.

Actions

1. Flatten the maintenance organization to enhance vertical communication. The Mechanical Engineering and Maintenance Department has been reorganized to decrease the levels of supervision and improve vertical communication.

2. Flatten the Operations organization to enhance vertical communication. The Operations Department has been reorganized to decrease the levels of supervision and improve vertical communication. Specifically, the Operations Supervisor position has been eliminated. In addition, a new section was created to serve as an interface between Operations, Engineering, and Maintenance.

3. Strengthen the Operations organization through key personnel changes. Changes in the Operations Department have been made, including assignment of a new Operations Superintendent. Additional changes will be complete by 8/1/86.

4. Focus on improving the skills, knowledge, and availability of the System Engineers to enhance their relationship with Operations as discussed earlier.

5. Provide supervisory training to enhance employee feedback and coaching skills. In order to strengthen the System Engineer program, Engineering and Maintenance Superintendents, Section Heads and Senior Engineers must be strong leaders with good supervisory skills. Training will be provided to enhance their supervisory skills, starting 1/1/87.

6. Provide additional experienced Operations personnel to interface with Maintenance. Operations Department has enhanced communication with Engineering and Maintenance Department by creating a new section to act as an interface. This provides a group with plant operating experience which is readily available for consultation.

7. Provide System Engineer systems training and relieve backlogs to allow for more time to spend in the Plant.

Subsequent to this outage, System Engineers will be attending systems training. Other in-house engineering will be utilized to reduce the backlog of work to allow the engineers to concentrate on their systems and better maintain them. This backlog work is being identified presently and the PE&C assistance will transfer directly to these tasks immediately following the outage.

8. Implement a program to transfer SRO's into the System Engineer program as available. This program will be underway in early August, 1986 with the completion of the current SRO Hot License Class.

F. Industry Experience

The limited experience of Plant personnel requires use of industry experience to enhance maintenance efforts. Due to the lack of experience, personnel often do not have, or know how to utilize industry contacts.

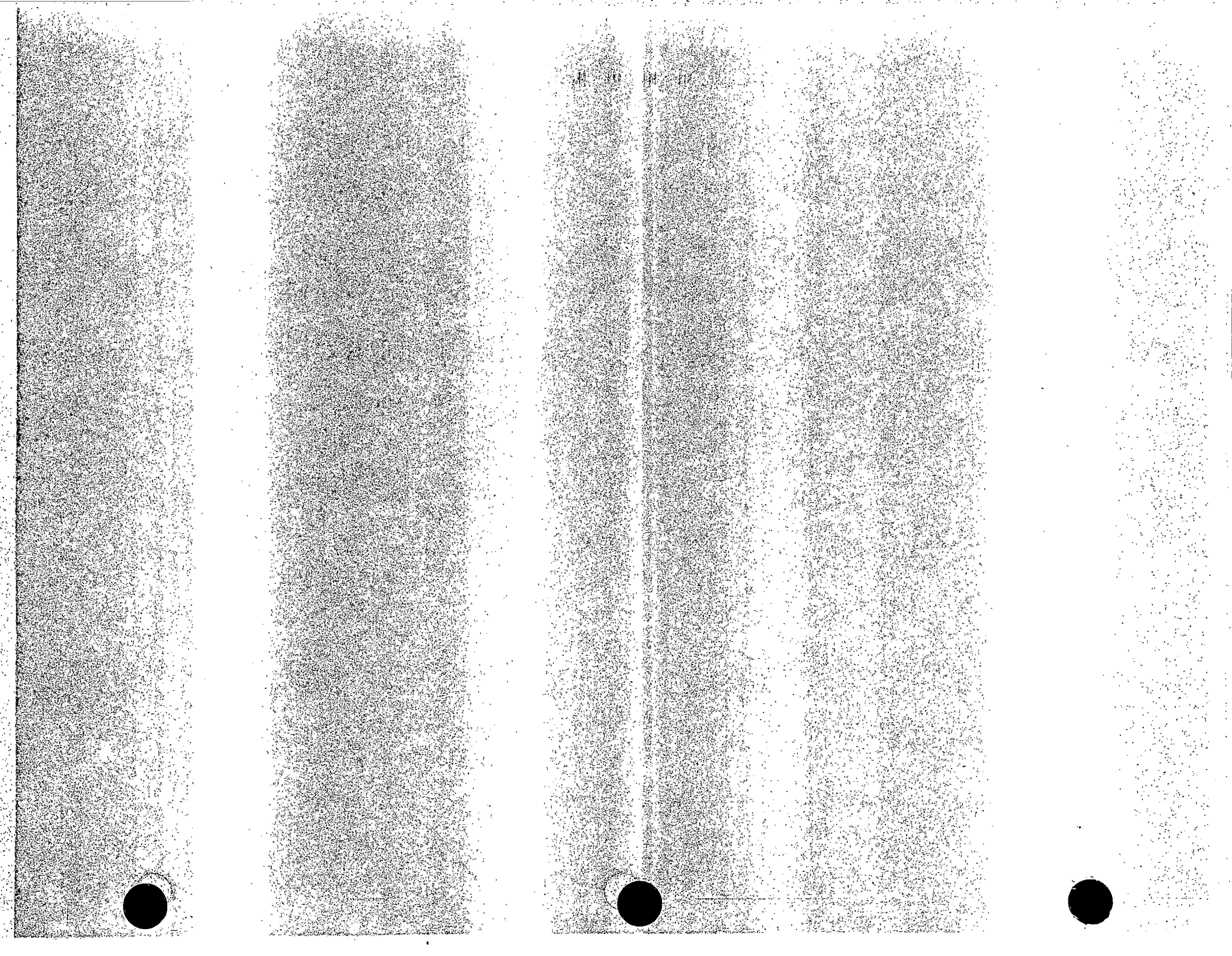
Actions

1. Resubscribe to NOMIS. CPCo will be involved with NOMIS starting mid-July.

2. Continue to utilize Combustion Engineering and Westinghouse site representatives to provide technical expertise. Combustion Engineering and Westinghouse are currently under contract to provide engineering assistance to Palisades.

3. Continue to utilize INPO/NPRDS program to have access to industry experience. Consumers Power is presently utilizing INPO and will continue to use their good practices as a guide.

4. Increase participation in user groups and visits to other plants to establish/enhance contacts. Consumers Power is participating in several Combustion Engineering Owner's Group functions to enhance our operating record.



6.0 APPENDICES

APPENDIX A

MAY 22, 1986 NRC

CONFIRMATORY ACTION LETTER

CONFIRMATORY ACTION LETTER CAL-RIII-86-002

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

Docket No. 50-255

Consumers Power Company
ATTN: Dr. F. W. Buckman
Vice President
Nuclear Operations
212 West Michigan Avenue
Jackson, MI 49201

Gentlemen:

This letter confirms the conversation on May 21, 1986 between you and E. G. Greenman of this office. The conversation related to our concerns over multiple equipment failures at the Palisades facility, as demonstrated by the May 19 reactor trip event and associated equipment failures, the potential for serious challenges to safety systems that they pose, and the burden failures of this type place on your operator staff in order to maintain the plant in a safe operating condition. With regard to the matters discussed, we understand that you will complete the following actions:

1. You will immediately take the facility to the cold shutdown condition;

2. You will not restart the facility (i.e. place the facility in a condition higher than hot standby) until:

(a) a thorough investigation into the causes and implications of the May 19, 1986 reactor trip is completed;

(b) a thorough investigation of plant safety systems and balance of plant systems important to safety, with regard to operability and required maintenance, is completed;

(c) The Regional Administrator, or his designee, is briefed on the results of the investigations and the corrective actions taken or planned; and

(d) you obtain the approval of the Regional Administrator, or his designee.

Should your understanding differ from that stated above, please inform this office immediately.

Sincerely,

James G. Keppler
Regional Administrator

cc w/enclosure:
Mr. Kenneth W. Berry, Director
Nuclear Licensing
J. F. Firlit, General Manager
DCS/RSB (RIDS)
Licensing Fee Management Branch
Resident Inspector, RIII
Ronald Callen, Michigan
Public Service Commission
Nuclear Facilities and
Environmental Monitoring
Section

APPENDIX B

TASK FORCE RESUMES

NAME: Vern Beilfuss

TITLE: Supervisory Engineer - Eng & Maint - Palisades

EDUCATION: BS Nuclear Engineer 1975 University of Wisconsin

WORK HISTORY:

06/75 - 11/77	Shift Refueling Engineer - General Dynamics
11/78 - 11/78	Shift Test Engineer - General Dynamics
11/78 - 08/79	Test Engineer - CPCo Modifications, Palisades
08/79 - 06/85	Project Testing Supervisor - CPCo Modifications, Palisades
06/85 - Present	Section Head - CPCo Eng & Maint, Palisades

NAME: John G Bouwens

TITLE: Senior Engineer - Eng & Maint - Palisades

EDUCATION:

BA Math 1978
Hope College

BS Mechanical Engineering 1980
University of Michigan

WORK HISTORY:

06/80 - 09/83	Startup Engineer/ISI Coordinator - CPCo Midland
09/83 - 04/85	Plant Safety Engineer - CPCo Palisades
04/85 - 06/86	Engineer NPRDS & Q-List - CPCo Palisades

NAME: William Clark

TITLE: Project Manager - Palisades

EDUCATION: BS Marine Engineering - USMMA 1959

WORK HISTORY:

1962 - 1963	Applications Engineer - Worthington Corp
1963 - 1964	Fluid Systems Engineer - General Dynamics
	Test Engineer - General Dynamics
1967 - 1969	Service Engineer - Nuclear Power - Commonwealth Associates
1970 - 1983	Construction & Modification Engineer - CPCo (Nuclear & Fossil)
1983 - 1985	Project Construction Engineer - CPCo (Nuclear & Fossil)
1985 - 1986	Steam Generator Project Manager - CPCo - Palisades

NAME: Colin M Grady

TITLE: Plant Mechanical Supervisor - Mech Eng & Maint - Palisades

EDUCATION: Caro Community High School - 1964

WORK HISTORY:

1966 - 1969	Operator - CPCo - Saginaw River Steam Plant
1969 - 1971	Stockman - CPCo - Palisades
1971 - 1975	Mechanical Repairman - CPCo - Palisades
1975 - 1977	Mechanical Supervisor - CPCo - Palisades
1977 - 1981	Mechanical Supervisor - CPCo - Midland
1981 - 1985	Plant Mechanical Supervisor - CPCo - Midland
1985 - Present	Plant Mechanical Supervisor - CPCo - Palisades

NAME: David W Joos

TITLE: Planning Director - Palisades

EDUCATION: 1975 BS Engineering Science, Iowa State University

1976 MS Nuclear Engineering, Iowa State University

WORK HISTORY:

09/76 - 10/77	CPCo - Associate Engineer - Big Rock Point
10/77 - 05/78	CPCo - Associate Engineer - Palisades
05/78 - 07/79	CPCo - General Engineer - Midland
07/79 - 02/81	Black & Veatch Consulting Engineers - General Systems Engineer - Black Fox Nuclear Project
02/81 - 04/83	Black & Veatch Consulting Engineers - Senior Systems Engineer - Pollution Control Group
04/83 - 10/83	CPCo - Planning & Scheduling Administrator, Nuclear Planning & Administration Department, General Office
10/83 - 11/84	CPCo - Director of Planning - Nuclear Planning and Administration Department, General Office
11/84 - Present	CPCo - Planning Director, Palisades

NAME: Richard P Margol

TITLE: QA Administrator

EDUCATION: BS Mechanical Engineering - Michigan State University 1975

WORK HISTORY:

09/75 - 05/76	Engineering - Technical Department - Palisades
06/76 - 02/78	Projects - Technical Department - Palisades
03/78 - 09/79	Technical Engineering - Modification - Palisades
10/79 - 12/81	Shift Technical Advisor - Palisades
01/82 - 01/83	Section Head - Fluid Systems - Palisades
12/83 - Present	QA Administrator - Palisades

NAME: John J Popa

TITLE: Staff Engineer - Eng & Maint - Palisades

EDUCATION: BS Mechanical Engineering
Michigan Technological University 1973

WORK HISTORY:

1967 - 1969	Boiler & Air Conditioning - Wares & Sons
1969 - 1973	(College)
1973 - 1975	Project & Maint Engineer - CPCo - J H Campbell
1975 - 1978	Maintenance Engineer - CPCo - Big Rock
1978 - 1982	Maintenance Superintendent - CPCo - Big Rock
1982 - 1983	Evaluation & Analysis - INPO
1983 - 1984	Section Head - Testing - CPCo - Midland
1984 - 1986	Field Maintenance Superintendent - CPCo - Bay City
1986 - Present	Staff Engineer - Eng & Maint - CPCo - Palisades

LICENSES: SRO/BWR - Big Rock 1980

NAME: Robert E Schrader

TITLE: Electrical/I&C Engineering Supervisor - Big Rock

EDUCATION: Industrial Controls for Automation
DeVry Technical Institute 1961

WORK HISTORY:

1956 - 1961	Laboratory Technician - CPCo - Cobb
1961 - 1968	I&C Technician - CPCo - Big Rock
1968 - 1976	I&C Supervisor - CPCo - Big Rock
1976 - 1977	Project Engineering - CPCo - Big Rock
1977 - 1982	Technical Superintendent - CPCo - Big Rock
1982 - 1984	I&C General Supervisor - CPCo - (Nuclear Plant Support)
1984 - 1985	Electrical/I&C Engineering Supervisor - CPCo (Nuclear Plt Support)

LICENSES: SRO - Big Rock 1969

NAME: Anthony E Tome, Jr

TITLE: Manager, Plant Performance, Delian Corporation

EDUCATION: BS Mathematics - University of Pittsburgh 1972

Graduate Studies in ME - University of Pittsburgh 1974-1978

WORK HISTORY:

1984 - Present	Senior Engineer - Risk Assessment - Delian Corporation
1981 - 1984	Senior Engineer - Plant Performance - Wood-Leaver & Assoc
1980 - 1981	Senior Engineer - Plant Performance - Science Applications
1970 - 1980	Senior Engineer - Design & Analysis - Westinghouse

NAME: Steve T Wawro

TITLE: Shift Supervisor - Palisades

EDUCATION: Monroe Woodbury High, Central Valley, NY 1972

WORK HISTORY:

84 - Present	Shift Supervisor - CPCo Palisades
83 - 84	Operations Supervisor - CPCo Midland
81 - 83	Shift Supervisor - CPCo Midland
79 - 81	Engineering Watch Supervisor - US Navy
77 - 79	Reactor Operator - US Navy
73 - 77	Reactor Operator - D1G Prototype - USN
72 - 73	Electronic Technician - US Navy

Licenses: SRO - Palisades
SRO - Midland (Cold License)

NAME: Barry N Young

TITLE: Staff Engineer - Risk Assessment - Palisades

EDUCATION: BS Mechanical Engineering - Western Michigan University 1981

MS Aeronautical Engineering - Notre Dame 1984

WORK HISTORY:

1962 - 1969	US Navy Nuclear Program USN
1969 - 1973	Staff Engineer - Combustion Engineering - Palisades, Ft Calhoun
1973 - 1074	Start-up Coordinator - Townsend & Bottum - DC Karn 3&4
1974 - 1980	Director/Consultant - Nuclear Start Up Services D C Cook Unit I - Salem I - D C Cook II
1982 - Present	Staff Engineer - CPCo - Palisades

LICENSES:

SRO - Palisades	1971
SRO - Ft Calhoun	1973
SRO - D C Cook	1974

APPENDIX C

PLANT EQUIPMENT STATUS

OBSERVATIONS AND RESOLUTIONS

APPENDIX C

PLANT EQUIPMENT STATUS
OBSERVATIONS AND RESOLUTIONS

INDEX

APPENDIX C

PLANT EQUIPMENT STATUS
OBSERVATIONS AND RESOLUTIONS

INDEX

SYSTEM	TITLE
AES	MAIN AIR EJECTOR AND GLAND SEAL AIR EJECTOR SYSTEM
01	PCV-0633 Air Ejector Condenser Steam Pressure Control Valve; RV-0633 Air Ejector Condenser Relief Valve

OBSERVATION NO: AES-01 COMPONENT(S): PCV-0633 Air Ejector Condenser Steam Pressure Control Valve
RV-0633 Air Ejector Condenser Relief Valve

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 6/23/86

DESCRIPTION: RV-0633 lifted during the 5/19/86 trip, apparently due to PCV-0633 not reacting fast enough to increased steam pressure. RV-0633 was worked on during REFOUT 85 due to seat leakage. The Work Order indicates that during the return to service phase the relief valve failed and required removal, repair and retesting.

SIGNIFICANCE: Important to reliable plant operation. Poses a hindrance to response on a Plant transient to Auxiliary Operators that must take manual control of PCV-0633 to reseat RV-0633 if necessary.

RESOLUTIONS:

Prior To Plant Startup
1. Troubleshoot and repair PCV-0633 as necessary and test.
2. Retest RV-0633 for proper setpoint pressure.

SYSTEM	TITLE
AFW	AUXILIARY FEEDWATER SYSTEM
01	Auxiliary Feedwater Pump P-8B (K-8 turbine)
02	Auxiliary Feedwater Isolation Valve MO-0743
03	Auxiliary Feedwater Pumps P-8A, P-8B & P-8C
04	Auxiliary Feedwater Flow Controllers FIC-0736A, FIC-0737A, FIC-0727, FIC-0749
05	Auxiliary Feedwater Flow Control Valves FCV-0736A, FCV-0737A, FCV-0727, FCV-0749
06	Auxiliary Feedwater Primary Steam Supply Valves PCV-0521A, CV-0521
07	Auxiliary Feedwater Check Valves CK-0728, CK-0729, CK-0703, CK-0704
08	Auxiliary Feedwater Instrument Power Supplies
09	Auxiliary Feedwater Pumps P-8A & P-8B Bearings

OBSERVATION NO: AFW-01 (FWS-04) COMPONENT(S): Auxiliary Feedwater Pump P-8B (K-8 turbine)

EVALUATOR(S): AETome REV NO: 2 DATE: 6/23/86

DESCRIPTION: Governor control problems. Oil and water leaks. The governor for K-8 was replaced by SC-85-105, which has corrected the problems experienced by the old governor. The System Engineer has plans to replace bearing cooling tubes. A review of MOs revealed only one which had been issued due to bearing cooling tube leaks. A problem has also been experienced with hunting between the pressure controller on the steam supply pressure control valve and the governor. K-8 governor/pressure controller interaction are addressed under AFW-06.

REF: SC-85-105, SC-85-213, SC-85-214, SC-85-215, SC-85-216, D-PAL-85-190, D-PAL-86-94

SIGNIFICANCE: Technical Specification required. Failure or degradation can result in forced outage. K-8 governor and steam pressure controller do not work well in parallel causing speed and discharge pressure fluctuations. Operability of P-8B is important during Plant startup and shutdown, and during almost all accident sequences. It is especially significant during station blackout. Redundancy is provided (except during blackout) by P-8A or P-8C.

RESOLUTIONS:

As Part of 5-Year Plan - Replace bearing cooling tubes.

OBSERVATION NO: AFW-02 (FWS-05) COMPONENT(S): Auxiliary Feedwater Isolation Valve MO-0743

EVALUATOR(S): AETome REV NO: 2 DATE: 6/23/86

DESCRIPTION: Valve has had packing leaks. MOs were written for packing leaks on three of the eight isolation valves over the last three years. No MOs existed for the valve operators, however, Limitorque problems are being investigated as a generic issue (MIS-10). These valves will now be stroked monthly as part of Tech Spec Surveillance requirements. This could result in increased packing leaks occurring in the future.

SIGNIFICANCE: Not a current operator concern or distraction. The only Limitorque operated valves in the Auxiliary Feedwater System are the FOGG valves. These valves are only of safety significance if they should close inadvertently. We have had no such closures. Failure of these valves to close is less significant due to our having multiple methods of stopping flow and due to the very slight effect of failing to do so. Packing leakage has no safety impact.

RESOLUTIONS:

No Further Action Required

OBSERVATION NO: AFW-03 (FWS-06) COMPONENT(S): Auxiliary Feedwater Pumps P-8A, P-8B & P-8C

EVALUATOR(S): AETome REV NO: 2 DATE: 6/23/86

DESCRIPTION: Packing, starting problems and motor problems. Starting problems are addressed by SPS-02. Packing adjustment requirements have been added to the test procedures which provides for making adjustments to the packing during surveillance testing. Pump bearing problems are addressed under AFW-09. The Emergency Operating Procedures have been revised to increase the allowable motor current limit for P-8A. The Operational Readiness Assessment performed on the Auxiliary Feedwater System had a concern about the quality of the test data collected during surveillance testing. The concern was that testing is not performed near the conditions in which the Auxiliary Feedwater System would be expected to operate during a transient.

REF: E-PAL-84-45, E-PAL-84-53, E-PAL-84-84, E-PAL-86-05, D-PAL-84-187, D-PAL-84-197, D-PAL-84-199, D-PAL-84-302, D-PAL-85-165, D-PAL-85-180, D-PAL-85-189, D-PAL-85-190, D-PAL-85-208

SIGNIFICANCE: Technical Specifications requirements. Not a current operator concern or distraction. Listed due to numbers of DRs and ERs. Failure or degradation could result in forced outage. The Auxiliary Feedwater System is important during startup and shutdown, and during most accident sequences. Redundancy is provided by two "trains" containing three pumps and four flow paths.

RESOLUTIONS:

Prior To Plant Startup - Testing of the Auxiliary Feed Pumps should be performed at hot shutdown.

OBSERVATION NO: AFW-04 (FWS-09) COMPONENT(S): Auxiliary Feedwater Flow Controllers FIC-0736A, FIC-0737A, FIC-0727, FIC-0749

EVALUATOR(S): AETome REV NO: 2 DATE: 6/23/86

DESCRIPTION: When the difference between the flow setpoint on the flow controller and the flow indicated by the flow indicators is greater than 20 gpm, a Deviation Report must be written. There have been many MOs written on problems with the flow controllers. A review of these MOs indicates that many times work was performed on the valve rather than the FICs. Neither the System Engineer nor I&C saw a problem with the FICs. I&C feel that the controllers are reliable and that most of the perceived problem is due to the inability of the flow control valves to control at low flows.

REF: D-PAL-84-196, D-PAL-84-311, D-PAL-85-42, D-PAL-85-50

SIGNIFICANCE: Technical Specification requirements. Inability to regulate steady flow condition poses a hindrance to response on a plant startup or shutdown. While Auxiliary Feedwater is important to startup, shutdown and most accident sequences, slight inaccuracies in flow measurement have little effect. Flow is usually adjusted as required to maintain Steam Generator level.

RESOLUTIONS:

Prior To Plant Startup

1. The System Engineer and I&C should review the corrective action history of the flow controllers and flow indicators. Based upon this review, root causes should be identified and corrective action taken.
2. Evaluate the root cause of the flow indication discrepancy and resolve.

OBSERVATION NO: AFW-05 (FWS-10) COMPONENT(S): Auxiliary Feedwater Flow Control Valves FCV-0736A, FCV-0737A, FCV-0727, FCV-0749

EVALUATOR(S): AETome REV NO: 2 DATE: 6/23/86

DESCRIPTION: Won't control at low flows (50-100 gpm). The System Engineer proposes to add a mini-flow control valve in parallel with the existing flow control valves. The System Engineer is concerned that present method of controlling auxiliary feedwater flow during startup may cause the auxiliary feedwater nozzle manufacturer's recommended number of thermal cycles to be exceeded.

SIGNIFICANCE: Valve operability is Technical Specification required. Inability to regulate steady low flow condition poses a hindrance to response on a plant startup or shutdown. Neither control of Auxiliary Feedwater at low flow rates, nor absolute shutoff of the FCVs is important to any accident sequences. Additional on-off cycling does add to the (low) potential for thermal fatigue induced failure of the Auxiliary Feedwater nozzle. Such failures would most likely be of the leak-before-break type.

RESOLUTIONS:

Prior To Plant Startup - Review Westinghouse recommendations for systems operation relative to the Auxiliary Feedwater water hammer and thermal cycling concerns.

Before The End of 87 REFOUT
1. Evaluate existing valve internals replacement or valve replacement to improve flow control below 100 gpm.
2. Inspect the Auxiliary Feedwater flow nozzles.

OBSERVATION NO: AFW-06 (FWS-11) COMPONENT(S): Auxiliary Feedwater Primary Steam Supply Valves PCV-0521A, CV-0521

EVALUATOR(S): AETome REV NO: 2 DATE: 6/23/86

DESCRIPTION: CV-0521 leaks by in the closed position. Leakage through the primary and alternate steam supply isolation valves results in a loss of efficiency and a possible reduction in the reliability of the turbine driven auxiliary feed pump. PCV-0521A has received considerable attention without much success in solving the problem. The pressure controller (PC-0521) is scheduled to be replaced. System Engineer indicates that valve cannot be made leak tight and that emphasis should be on isolation valves.

REF: SC-86-118

SIGNIFICANCE: Not an active operator concern or distraction on a plant trip or transient. Listed solely due to repeat maintenance concern. Failure of the PCV can lead to temporary loss of P-8B. Restoration would require operator action in the Auxiliary Feedwater Room. AFW is important during Plant startup and shutdown, and during most accident sequences. P-8B is especially important during station blackout. Redundancy is normally provided by P-8A and P-8C.

RESOLUTIONS:

Prior To Plant Startup
1. Complete the specification change for the replacement of PC-0521 and complete the replacement.
2. Make necessary tests at hot shutdown to verify performance and make necessary adjustments.

Before The End of 87 REFOUT - Replace CV-0521.

OBSERVATION NO: AFW-07 (FWS-12) COMPONENT(S): Auxiliary Feedwater Check Valves CK-0728, CK-0729, CK-0703, CK-0704

EVALUATOR(S): AETome REV NO: 3 DATE: 6/23/86

DESCRIPTION: Possible leak through causing steam binding of the auxiliary feedwater pumps. There is no indication that these check valves experience back leakage. The only reason to consider this issue is the fact that other check valves have experienced back leakage. There are two check valves and a flow control valve in the discharge of each pump. Currently, the operators check pipe temperatures as part of normal walkdowns to check for leakage through check valves.

SIGNIFICANCE: Not an active operator concern or distraction on a plant transient or trip. Generically an industry concern. Requires Auxiliary Operator to monitor for back leakage on a shiftly basis. Unless the back leakage becomes severe, this item has no safety significance. We have operator checks every eight hours and three-valve-in-series protection to assure back leakage does not become severe.

RESOLUTIONS:

Prior To Plant Startup - Test the check valves for back leakage using existing drains. Implement repairs as necessary.

OBSERVATION NO: AFW-08 (FWS-13) COMPONENT(S): Auxiliary Feedwater Instrument Power Supplies

EVALUATOR(S): AETome REV NO: 2 DATE: 6/23/86

DESCRIPTION: There is a common power supply for the flow control valves in the discharge of P-8A & P-8B and for the low suction pressure trips. Several failures have occurred recently due to overvoltage trips. I&C has raised the overvoltage setpoint on J-1501 to 28 volts, and is currently tracking setpoint for evidence of drift. No regular calibration is performed on the power supply overvoltage setpoints. A spare power supply has been ordered. I&C is not sure if the trip was caused by a voltage spike or if the setpoint had drifted.

REF: E-PAL-85-63, E-PAL-86-48, E-PAL-86-53, E-PAL-86-54

SIGNIFICANCE: Failure renders AFW system inoperable in excess of Technical Specification allowances resulting in forced outage. Listed due to recent repeat failure. AFW is important to start and shutdown and to most accident sequences. Failure of a power supply could disable the associated AFW train. (Although P-8B could still be operated from Remote Panel C-150.)

RESOLUTIONS:

Prior To Plant Startup

1. Perform an independent investigation of the power supply failure (L&FTS).
2. Document the basis for the over-voltage trip setpoint.
3. Initiate a PAC to calibrate every refueling outage (perform prior to startup from current outage).
4. Checkout J-1502, the opposite train power supply, and implement changes as appropriate.

Before The End Of 87 REFOUT - I&C should recommend a program for periodic inspection/calibration for important power supplies as appropriate.

OBSERVATION NO: AFW-09 (FWS-14) COMPONENT(S): Auxiliary Feedwater Pumps P-8A & P-8B Bearings

EVALUATOR(S): AETome REV NO: 2 DATE: 6/23/86

DESCRIPTION: Pump bearing anomaly. A thrust bearing failure occurred on the A pump during shutdown for REFOUT 85. The bearing temperature has been higher than historical values since the bearing was replaced, although the current temperature is within the acceptable range per the manufacturer. The bearing was inspected during the short March outage and found to be satisfacory. As a result of the A pump bearing failure, bearings on pump B were inspected and replaced during REFOUT '85 due to normal wear. There has been increased surveillance of P-8A & P-8B bearings due to the presence of iron in the bearing lube oil.

REF: Letter from DABixel to JDAlderink 5/23/86, D-PAL-85-208

SIGNIFICANCE: Safety Related. Failure or degradation could lead to forced outage. Auxiliary Feedwater is important to startup and shutdown and to most accident sequences. We have three full capacity pumps arranged in two trains. We have had only one failure of this type in fifteen years. The pumps are considered quite reliable.

RESOLUTIONS:

Prior To Plant Startup - Continue to implement the program to perform periodic sampling of bearing lube oil, inspection of bearings, and monitoring of vibration and temperature levels.

SYSTEM	TITLE
CAS	INSTRUMENT SERVICE AIR SYSTEM
01	C-2A, C-2B, C-2C Instrument Air Compressors
02	(see CAS-04)
03	M-2, Instrument Air Dryer
04	Desiccant and Excessive Moisture in Instrument Air System

OBSERVATION NO: CAS-01 COMPONENT(S): C-2A, C-2B, C-2C Instrument Air Compressors

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 6/23/86

DESCRIPTION: Instrument Air Compressors require significant periodic maintenance due basically to their design and operation. Failure of suction and discharge valves and unloaders account for significant equipment downtime. Drive belts and cooling water system problems have also reduced compressor reliability. Currently compressors are reasonably reliable, but are under-designed to support plant instrument and service air loads. Per System Engineer GESchrader, one compressor is designed to provide 200 SCFM which was the requirement of original Plant design. Plant additions and modifications have increased demand on the air system so that a single compressor is incapable of providing adequate supply. It is estimated we spend $10K per compressor per year for maintenance, and that one new one would cost approximately $30K (hardware only).

SIGNIFICANCE: Important to reliable Plant operation. Failure or degradation can lead to Plant trip. Poses a hindrance to response on a Plant transient. Control air is important to control of many Plant functions. Loss of control air pressure would cause a Plant trip. System components are designed to "fail safe" on loss of air pressure, but the inability to control normal functions would cause difficulty for the operators. Redundancy is provided by (1) three low pressure compressors, (2) backup from high pressure air to some components, and (3) backup from the two feedwater purity air compressors.

RESOLUTIONS:

Prior To Plant Startup - Walk down air loads to evaluate need for a new compressor.

Before The End of REFOUT 87:

1. Revise existing preventive maintenance activities to correct recurring maintenance problems.
2. Establish a baseline compressed air performance test from which future system problems can be predicted and corrected prior to component failure.
3. Develop and implement a periodic inspection program.
4. Evaluate the feed breakers for adequacy under frequent cycling.
5. Add instrument air flow indication.
6. Replace one compressor with one of higher capacity which requires less periodic maintenance.

As Part of 5-Year Plan - Evaluate replacement of remaining compressors with a minimum of 300 SCFM each and of a design which requires less periodic maintenance.

Observation No: CAS-02 - See Observation No: CAS-04

OBSERVATION NO: CAS-03 COMPONENT(S): M-2, Instrument Air Dryer

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 6/23/86

DESCRIPTION: Air dryer has experienced many problems over the years. These include transfer valve sticking and failure of after-filter to contain desiccant. The air dryer has been unreliable because it was under-designed to handle the air capacity, operated at high drying temperatures, and utilized component materials with short lifetimes.

SIGNIFICANCE: Important to reliable Plant operation. Failure or degradation can lead to Plant trip. Poses a hindrance to response on a Plant transient. Failure of the air dryer and/or filter is unlikely to have safety-significant effects. It is more likely to (and does) cause nagging recurrent maintenance problems. To have safety effects failures would have to simultaneously occur in redundant components without detection. Our surveillance program is designed to avoid this.

RESOLUTIONS:

Prior To Plant Startup

1. Install new air dryer.
2. Ensure spare parts have been ordered.
3. Identify and initiate preventive maintenance activities.
4. Perform post-installation testing to ensure dryer is acceptable for use.

OBSERVATION NO: CAS-04 COMPONENT(S): Desiccant and Excessive Moisture in Instrument Air System

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 6/23/86

DESCRIPTION: Instrument air system may contain desiccant due to instrument air dryer failure and may have higher than normal moisture due to air dryer failure and the lack of drain traps at points downstream of the dryer. Desiccant and moisture could cause failure of equipment operated or controlled by instrument air. The System Engineer for Instrument Air System indicated that desiccant problems should be eliminated by installation of a new air dryer. New after filters were installed mid-1985 which stopped passing desiccant downstream. WOs were initiated to inspect 160 critical components supplied by instrument air. After a sample of components had been inspected, GESchrader and BLSchaner conducted an evaluation and determined that no further components require inspection.
REF: D-PAL-86-92, D-PAL-86-120, D-PAL-84-146, D-PAL-85-75, D-PAL-86-64, E-PAL-84-35

SIGNIFICANCE: Important to reliable Plant operation. Failure or degradation can lead to Plant trip. Poses a hindrance to response on a Plant transient. Failure of the air dryer and/or filter is unlikely to have safety-significant effects. It is more likely to (and does) cause nagging recurrent maintenance problems. To have safety effects, failures would have to simultaneously fail redundant components without detection. Our surveillance program is designed to avoid this.

RESOLUTIONS:

Prior To Plant Startup - Conduct a systematic blowdown of all instrument air lines below 590' elevation.*

Before The End of REFOUT 87

1. After installation of new air dryer, perform an evaluation of instrument air system for the addition/deletion of drain traps.

2. Conduct a blowdown of instrument air system that will eliminate all unwanted contaminants. This should include disassembly and inspection of a random sample of instrument air-supplied components to ascertain adequacy of system blowdown.*

*It was noted that the conduct of the systematic blowdowns may require the addition of taps and valves in the air lines.

SYSTEM	TITLE
CCS	COMPONENT COOLING WATER SYSTEM
01	CV-0918 CCW Surge Tank Fill Valve
02	P-52A, P-52B, P-52C CCW Pumps
03	FS-0958/A-1156L Low Flow Alarm
04	CCW Heat Exchangers E-54A & E-54B

OBSERVATION NO: CCS-01 COMPONENT(S): CV-0918 CCW Surge Tank Fill Valve

EVALUATOR(S): AETome REV NO: 2 DATE: 6/23/86

DESCRIPTION: CV-0918 or its manual bypass valve MV-182CC leaks by. MV-182CC has been recently replaced. The operators have not observed or experienced any difficulty in controlling tank level since the manual valve replacement.

REF: MO 24500834, MO 24501340

SIGNIFICANCE: This requires an operator to manually unisolate the CCW surge tank fill line and refill the surge tank manually. System presently working as designed with no operator action.

RESOLUTIONS:

No Further Action Required

OBSERVATION NO: CCS-02 COMPONENT(S): P-52A, P-52B, P-52C CCW Pumps

EVALUATOR(S): AETome REV NO: 3 DATE: 6/23/86

DESCRIPTION: CCW Pumps P-52A, P-52B & P-52C have had high mechanical seal leakage. From a review of maintenance orders for the last three years, the seal failures have occurred mainly within the past 18 months. At this time, a Work Order is open for the replacement of the seals on the A pump. The seals have been replaced once recently on the B pump (11/30/84). The seals on the C pump have been changed 2 times recently and are being replaced during the present outage.

REF: D-PAL-85-72
MO 24604248, MO 24604462

SIGNIFICANCE: As a result of the seal leakage, repeated filling of the CCW Surge Tank and repeated chemical additions to system are required. Leakage water has high chromate concentration and requires special handling by the Auxiliary Operators who have to clean up the leakage. Personnel safety issue. This item poses only indirect effect on accident sequences:

1) Frequent seal failures increase pump down time for maintenance and reduce redundancy leading to slightly lower system availability.

2) Excessive seal leakage could, though only in the extreme case, lead to depletion of CCW inventory, pump cavitation, and loss of cooling capability. For this to happen would require concurrent and sustained failure to add water to the surge tank.

RESOLUTIONS:

Before The End of 87 REFOUT- 1. Evaluate the effectiveness of placing an O-ring on the tapered edge of the shaft sleeve to eliminate seal leakage.

2. Evaluate replacing mechanical seals with a new design which can be repaired.

3. If shaft sleeve modification doesn't stop leakage, machine pump casings for one CCW pump.

4. Inspect and repair pump internals as necessary.

As Part of 5-Year Plan - Evaluate performance of seal modifications. If successful, implement changes on remaining pumps.

OBSERVATION NO: CCS-03 COMPONENT(S): FS-0958/A-1156L Low Flow Alarm

EVALUATOR(S): AETome REV NO: 2 DATE: 6/23/86

DESCRIPTION: A low component cooling water flow alarm was in during the performance of MO-22 on 5/19/86. The alarm cleared when CV-0913 was closed as is normal. The alarmed channel was from FS-0958 which senses component cooling water flow to P-54A, P-66A and P-67A.

SIGNIFICANCE: Important to reliable Plant operation. Component cooling water to pump seals prolong the life of the pumps.

RESOLUTIONS:

Prior To Plant Startup - Troubleshoot and/or calibrate FS-0958 and possibly FS-0954. Test operability.

OBSERVATION NO: CCS-04 COMPONENT(S): CCW Heat Exchangers E-54A & E-54B

EVALUATOR(S): AETome REV NO: 2 DATE: 6/23/86

DESCRIPTION: There is an administrative limit on the D/P which can be maintained across the CCW heat exhangers. Currently the D/P is not to exceed 10.5 psid. Another limit is the flow required to the Primary Coolant Pump seals. This is currently set at 80 gpm or greater for startup of the PCP's. If the D/P limit on the heat exchangers is observed, the 80 gpm limit for the PCP's cannot be reached.

SIGNIFICANCE: Necessary for startup.

RESOLUTIONS:

No Further Action Required - Since the issue was initially evaluated, the limit on D/P across the CCW heat exchangers was raised to 14 psi, thereby eliminating the concern.

SYSTEM	TITLE
CDS	CONDENSATE AND DEMINERALIZER SYSTEM
01	CV-0710, CV-0711, CV-0730, Main Feedwater Recirc Valves
02	Condenser Expansion Joint
03	P-2A & P-2B, Condensate Pumps
04	TIA-0794, P-2A Thrust Bearing Temperature Indicator
05	P-64A & P-64B, Hotwell Sample Pumps; P-100A & P-100B, Radwaste Caustic Injection Pump
06	CV-0733, Condenser Hot Well Makeup Valve
07	CV-0608 & CV-0609 Moisture Separator Drain Tank Drain Valves
08	P-10A & P-10B, Heater Drain Pumps
09	Air Ejector Main Jets
10	RV-0765 Condensate Pump Seal Relief
11	PCV-0764 Condensate Pump Seal Pressure Control

OBSERVATION NO: CDS-01 COMPONENT(S): CV-0710, CV-0711, CV-0730, Main Feedwater Recirc Valves

EVALUATOR(S): JJPopa REV NO: 2 DATE: 6/23/86

DESCRIPTION: Main Condenser Pump Recirc CV-0730 required manual action to open on the May 19, 1986 Plant trip. It has failed open before, which could cause a Plant trip. The valve positioner was overhauled during the 1985 outage. CV-0730 was tested prior to startup, but could not be fully stroked due to condensate pump dead-heading. Additional stroke testing was not performed at power. Main Feed Pump Recircs CV-0711 and CV-0710 have demonstrated seat leakage requiring manual isolation and loss of feed pump recirc capability. CV-0710 has recently had bonnet leak and solenoid failure. A new seat was installed in CV-0711 during the REFOUT, and experienced bonnet leakage during startup. CV-0711 & CV-0710 packing leakage has been a routine problem.

SIGNIFICANCE: Loss of Feed Pump or Condensate Pump Recirc capability poses a significant chance of loss of that pump or requires immediate operator action during a power derate or Plant trip to ensure recirc flow is maintained. Failure of valves can result in Plant trip. Neither CV-0710 or CV-0711 have any function during identified accident sequences. CV-0730 has significance only in those accident sequences where:

1) Secondary PCS cooling is required (ie, not large LOCA).
2) AFW is not available (Condensate System is one possible backup).
3) Off-site power is available (to run Condensate Pump).
4) Main feedwater piping is intact.

In order to fail the Condensate System, CV-0730 would have to fail closed in such a manner that it could not be opened by operator action. (Failure of control air would be one such failure mode).

RESOLUTIONS:

Prior To Plant Startup

1. Inspect the internals of either CV-0710 or CV-0711 for body erosion. If found, repair and open the other valve for inspection/repair.
2. CV-0710 - Properly test and check out controls.
3. CV-0730
   a. Properly test and adjust controls during startup.
   b. Identify and complete required valve maintenance.
   c. Determine correct controller operation and instruct Operations of proper operation (CV-0730).
   d. Evaluate whether valve configuration (ie, laying on side) is proper for this valve and take appropriate action.
   e. Inspect the orifice at discharge of the air ejector (RO-0789).
   f. Open and inspect the gland seal condenser for possible tube blockage in order to assure correct functioning of the differential pressure indicator.

OBSERVATION NO: CDS-02 COMPONENT(S): Condenser Expansion Joint

EVALUATOR(S): JJPopa REV NO: 2 DATE: 6/23/86

DESCRIPTION: Excessive air in-leakage occurred at the Condenser Expansion Joint. This remains a suspect site each startup. Though we have good leakage detection equipment, there is limited knowledge onsite as to how to use it, and a vendor is consequently typically used to help locate leakage paths.

SIGNIFICANCE: No safety concerns. Air inleakage raises condensate oxygen levels which can place the Plant in chemistry power restrictions.

RESOLUTIONS:

Before The End Of REFOUT 87

1. Investigate putting in a seal trough or a new expansion joint.
2. Investigate using better leak detection method or skills.
3. Review the study that was performed as a result of last expansion joint installation and renew actions that were recommended.

OBSERVATION NO: CDS-03 COMPONENT(S): P-2A & P-2B, Condensate Pumps

EVALUATOR(S): JJPopa REV NO: 2 DATE: 6/23/86

DESCRIPTION: Several recent packing failures have required power derates. Chemistry data obtained during April indicates the possibility of ground-water in-leakage through the P-2A casing. P-2A was replaced with a spare during Refout 85, but subsequent vibration problems resulted in cracks in the base. Cracking and breakage of oil cooler fittings has been a repeat problem for both pumps. High motor temperatures during warm weather results in repeated alarms and possible motor degradation.

REF: D-PAL-84-121, D-PAL-84-276, D-PAL-84-291

SIGNIFICANCE: Loss of a Condensate Pump will result in an immediate Plant trip. Degradation will cause power derates. Pump air in-leakage results in Plant chemistry holds. The condensate pumps provide a possible back up to the Auxiliary Feedwater system. In order to defeat this method of feeding the Steam Generators due to loss of a condensate pump, the other would have to either be inoperative or fail simultaneously.

Failure of a condensate pump is only significant to accident sequences where:

1) Secondary PCS cooling is required (not a large LOCA) and,
2) AFW is not available and,
3) Offsite power is available and,
4) Feed system is intact and,
5) The Plant was at reduced power or both pumps failed simultaneously.

Condensate pump failure is thus a small contributor to risk. The greatest contribution from condensate pump failure is as a trip initiator.

RESOLUTIONS:

Before The End Of REFOUT 87

1. Rebuild spare pump and install during the next convenient outage in place of P-2A.
2. Test for ground water leaks and repair as required.
3. Repair all cracks in pump base.
4. Modify oil coolers to new design.

As Part of 5-Year Plan

1. Modify air coolers on motor.
2. Change out P-2B motor/pump on PM.

OBSERVATION NO: CDS-04 COMPONENT(S): TIA-0794, P-2A Thrust Bearing Temperature Indicator

EVALUATOR(S): JJPopa REV NO: 1 DATE: 6/23/86

DESCRIPTION: TIA-0794 has caused many Control Room condensate pump temperature alarms due to RTD failures. Repeated Control Room deficiency. MOs indicate repeated alarms/drifting. New RTDs were installed in November, 1985.

SIGNIFICANCE: When this alarm is in, we lose the alarming function of the other condensate pump temperature indications and condensate pump overload alarming function.

RESOLUTIONS:

Prior To Plant Startup

1. Insure temperature indicator/alarm is checked out and calibrated (both A&B).
2. Put on frequent checkout during this run to calibrate, and to determine whether recent repairs have been successful.

OBSERVATION NO: CDS-05 COMPONENT(S): P-64A & P-64B, Hotwell Sample Pumps;
P-100A & P-100B, Radwaste Caustic Injection Pump

EVALUATOR(S): JJPopa REV NO: 2 DATE: 6/23/86

DESCRIPTION: P-64A & P-64B, P-100A & P-100B are similar pumps (small metering pumps) which have repeatedly failed to function properly. A review of maintenance history shows maintenance on one pump (out of four) during the last 12 months due to failure. WOs show fitting leaks on piping (mostly after repairs), and maintenance problems on pump internal components.

SIGNIFICANCE: Not a direct operator concern. Listed due to repeat failures. Pumps have high visibility to Auxiliary Operators and they see many Work Orders performed. Not important to safety.

RESOLUTIONS:

Prior To Plant Startup
1. Check proper pump operation (on all four).
2. Check for fitting leaks.
3. Check piping for proper flow in suction lines (can do when hot well is filled for P-64A & P-64B).

Before The End Of REFOUT 87
1. Put on yearly PM to overhaul.
2. Use minor procedure or incorporate into WO system the proper method of installation of internal parts.
3. Include proper method of installation to prevent piping/fitting leaks.

OBSERVATION NO: CDS-06 COMPONENT(S): CV-0733 Condenser Hot Well Makeup Valve

EVALUATOR(S): JJPopa REV NO: 1 DATE: 6/23/86

DESCRIPTION: Large history of air leakage from positioner. Positioner sticks and air blows causing a drain on the air system. Solenoids have been worked on and replaced.

SIGNIFICANCE: Important to reliable Plant operation. Valve allows very fast condenser makeup following Plant trip with main steam relief operation. Air leakage increases load on C-6C air compressor.

RESOLUTIONS:

Prior To Plant Startup

1. Check out positioner; repair, replace, clean and adjust as necessary.
2. Stroke valve and set properly.
3. Clean oilers and/or separators on air supply.
4. Perform 3 month PM to check oilers/separators & clean & adjust controls.

Before The End of 87 REFOUT - Evaluate the need for the valve and determine whether it should be permanently removed.

OBSERVATION NO: CDS-07 COMPONENT(S): CV-0608 & CV-0609 Moisture Separator Drain Tank Drain Valves

EVALUATOR(S): JJPopa REV NO: 1 DATE: 6/23/86

DESCRIPTION: Many positioner & operator signal failures. Valves frequently stick open/closed or fail to respond. Positioners have been worked on once or twice a year. Diaphragm on CV-0608 was repaired during the 1985 REFOUT.

SIGNIFICANCE: CV-0608 & CV-0609 are frequent failure valves which have and can result in Plant trip.

RESOLUTIONS:

Prior To Plant Startup
1. Replace Positioners and insure proper operation.
2. Clean out air lines.
3. Check out for air leaks/O-ring leaks on controller
4. Put on a quarterly PM.

Before The End Of REFOUT 87
1. Evaluate the need to upgrade or replace positioner and controller
   -Filter & Oiler
   -Different type
   -PM or maintenance on actuator & controls

OBSERVATION NO: CDS-08 COMPONENT(S): P-10A & P-10B Heater Drain Pumps

EVALUATOR(S): JJPopa REV NO: 1 DATE: 6/23/86

DESCRIPTION: P-10 may have a casing leak, and there is also speculation of other flange or bowl leaks around the foundation. There have been yearly packing leaks, and maintenance repacks annually. A consultant came in and a small packing modification was performed with apparent success.

SIGNIFICANCE: P-10B casing leak causes operator concern. P-10A & P-10B packing failure can result in Plant derate. Failure or degradation in P-10A or P-10B can cause Plant trip.

RESOLUTIONS:

Prior To Plant Startup

1. Determine cause & repair casing leak on P-10B.
2. Perform a visual internal inspection of piping on P-10B to determine if erosion is excessive.
3. Repair packing leaks on both P-10A & P-10B.
4. Test both pumps for leakage.

As Part of 5-Year Plan

1. Consider replacement with horizontal pumps.
2. Evaluate the need to perform foundation/well repairs to eliminate ground-water inleakage concern.

OBSERVATION NO: CDS-09 COMPONENT(S): Air Ejector Main Jets

EVALUATOR(S): JJPopa REV NO: 1 DATE: 6/23/86

DESCRIPTION: Worn jets.

SIGNIFICANCE: On operators concerns list. Degradation can cause plant derate due to high condenser back pressure. No safety significance.

RESOLUTIONS:

Prior to Plant Startup - Replace air ejectors if parts are in stock or readily available.

Before The End of REFOUT 87

1. Purchase/replace air ejector jets if not done prior to startup from current outage.
2. Put in PACS to replace air ejector jets each REFOUT or 18 mo maint outage.

OBSERVATION NO: CDS-10 COMPONENT(S): RV-0765 Condensate Pump Seal Relief

EVALUATOR(S): JJPopa REV NO: 1 DATE: 6/23/86

DESCRIPTION: Relief valve leaks through seat at estimated 3-5 gpm to turbine building sump.

SIGNIFICANCE: Leakage through seat reduces pressure to Condensate Pump Seals possibly degrading pump packing which could lead to forced outage. Leakage also greatly increases amount of makeup water usage in the Secondary side.

RESOLUTIONS:

Prior To Plant Startup

1. Repair or replace RV-0765.
2. Test for acceptability.

OBSERVATION NO: CDS-11 COMPONENT(S): PCV-0764 Condensate Pump Seal Pressure Control

EVALUATOR(S): JJPopa REV NO: 1 DATE: 6/23/86

DESCRIPTION: Pressure Control Valve does not maintain pressure. Auxiliary Operators must throttle pressure with MV-144CD.

SIGNIFICANCE: Failure to maintain proper pressure can degrade both seals on P-2A & P-2B Condensate Pumps. Failure of Condensate Pump packing will result in forced outage or derate. Constant Auxiliary Operator attention is required during power level changes.

RESOLUTIONS:

Prior To Plant Startup
1. Repair or replace PCV-0764.
2. Test after repair or replacement.

SYSTEM	TITLE
CHM	CHEMICAL ADDITION SYSTEM
01	P-15B, P-15C, P-15D, P-15F and P-15G, Chemical Addition Pumps

OBSERVATION NO: CHM-01 COMPONENT(S): P-15B, P-15C, P-15D, P-15F and P-15G, Chemical Addition Pumps

EVALUATOR(S): JJPopa REV NO: 1 DATE: 6/23/86

DESCRIPTION: Pumps are a repeat maintenance item. Diaphragms fail frequently. Couplings have failed, though actions have been taken to improve assembly techniques. Has been proposed for 5-Year Plan to modify piping for better priming and routing for chemical addition.

SIGNIFICANCE: Not safety-related. Not safety or operator concern. Is not a distraction to Operations. Will not lead to Plant trip or distraction during Plant trips.

RECOMMENDATIONS:

Prior To Plant Startup - Relocate the pumps to provide adequate NPSH.

Before The End Of 87 REFOUT - Initiate a frequent PM (frequency to be determined by the System Engineer).

SYSTEM	TITLE
CIS	CONTAINMENT ISOLATION SYSTEM
01	MZ-19 Personnel Air Lock
02	MZ-50 Escape Lock
03	Generic Issue-Containment Isolation Valves
04	Containment Hydrogen Monitoring System Valves

OBSERVATION NO: CIS-01 COMPONENT(S): MZ-19 Personnel Air Lock

EVALUATOR(S): RPMargol REV NO: 2 DATE: 6/23/86

DESCRIPTION: Personnel air lock door seals are a repeat maintenance problem. Have had numerous problems with seals, alignment, interlocks and adjustments. Ability to successfully pass repetitive leak rate tests and eliminate significant maintenance activities between testing does not appear to be achievable with existing components.

REF: D-PAL-86-82, D-PAL-86-83, E-PAL-84-48, E-PAL-85-13, E-PAL-85-19

SIGNIFICANCE: Excessive air leakage could lead to plant shutdown. Does not cause plant trip or cause distraction during a plant trip.

RESOLUTIONS:

Prior To Plant Startup

1. Periodic Activity Control Sheet, CIS-011, has been recently established, but has not yet been performed. Checkout of air-lock through performance of PAC's CIS-011 & CIS-012 and leak testing via procedure SO-4A should be performed. The vendor representative should be present to assess appropriateness and detail of preventive maintenance as well as providing professional consulting to maintenance repairmen/ supervisor and System Engineer.
2. Complete Work Order 24603703.

As Part of 5-Year Plan

1. An extensive study should be performed in conjunction with the vendor to review equipment history, operation and current maintenance practices for determining component upgrade or replacement which will improve reliability and reduce maintenance.

OBSERVATION NO: CIS-02 COMPONENT(S): MZ-50 Escape Lock

EVALUATOR(S): RPMargol REV NO: 1 DATE: 6/23/866

DESCRIPTION: Escape lock seals, equalizing valve and indicating lights are a high maintenance problem. The Escape Lock has had numerous problems with seals, alignment and adjustments. The ability to successfully pass repetitive leak tests and eliminating significant maintenance activities between test does not appear to be achievable with existing components.

REF: D-PAL-84-281

SIGNIFICANCE: Does not cause a Plant distraction during reactor trips.

RESOLUTIONS:

Prior To Plant Startup

1. Periodic Activity Control Sheet (PACS) CIS-010, has recently been established but has not yet been performed. Recommend checkout of the Escape Lock by performing PACS CIS-10, and testing via SO-4B.

2. Recommend vendor representative be present to assess appropriateness and detail of preventive maintenance as well as providing professional consulting service to maintenance repairmen, superivsors and system engineers.

As Part Of 5-Year Plan - An extensive study should be performed in conjunction with the vendor to review equipment history, operation and maintenance practices to determine the best economical upgrade or component replacement that will improve reliability and reduce maintenance.

OBSERVATION NO: CIS-03 COMPONENT(S): Generic Issue-Containment Isolation Valves

EVALUATOR(S): RPMargol REV NO: 1 DATE: 6/23/86

DESCRIPTION: High maintenance problem. The last two as-found ILRTs have failed due to high local leak rates. A corrective action plan is currently being developed.

REF: D-PAL-84-191, D-PAL-85-187

SIGNIFICANCE: Failure will not cause plant trip or distractions during plant trip.

RESOLUTIONS:

Prior To Plant Startup - Perform LLRT on penetrations 40, 41, 52, 64, 69 and SE electrical penetrations.

Before The End of REFOUT 87

1. The following LLRT program enhancements should be implemented (this program is proposed by RWard as corrective action in response to a NRC citation for integrated leak rate test 'as found' leakage violation):
   a. Implement an augmented local leak rate test program which will increase the frequency for testing all penetration valves.
   b. Develop valve trending program to track valve performances for identification of degradation prior to valve failing leak test.
   c. Review valve type and manufacturer to determine any generic problem with a specific valve type and those that are reliable performers.
   d. Evaluate replacement of unreliable performing valves.
   e. Implement corrective maintenance/replacement of those valves identified through the trend evaluation program.
   f. Review test methodology, procedures, and program management for needed improvements.

OBSERVATION NO: CIS-04 COMPONENT(S): Containment Hydrogen Monitoring System Valves

EVALUATOR(S): RPMargol REV NO: 1 DATE: 6/23/86

DESCRIPTION: Valve position high maintenance item. SV-2415A is an example. Tech Spec testing is performed daily to assure containment integrity, and limit switch problems cause concern over whether the valves are closed following stroking.

SIGNIFICANCE: Failure or degradation of component can result in forced outage.

RESOLUTIONS:

Prior To Plant Startup

1. Stroke test SV-2414A, SV-2414B, SV-2412A, SV-2412B, SV-2415A SV-2415B, SV-2413A SV-2413B, repetitively to verify position indication is proper.
2. Adjust or replace switches found to be deficient under the direction of a vendor representative. NOTE: No further action should be required as valve position is verified by Tech Spec test RO-11 and RO-30 and only SV-2415A and SV-2414A have a history of position indication problems.

Before The End of 87 REFOUT - Pursue a Tech Spec change to reduce the testing frequency.

SYSTEM	TITLE
CLP	CONTAINMENT
01	Containment Sump Level LT-0382 & LT-0383; Transmitters & Recorders LPIR-0382 & LPIR-0383

OBSERVATION NO: CLP-01 COMPONENT(S): Containment Sump Level LT-0382 & LT-0383
Transmitters & Recorders LPIR-0382 & LPIR-0383

EVALUATOR(S): JJPopa REV NO: 2 DATE: 6/23/86

DESCRIPTION: Indicators and recorders are a repeat maintenance problem and are a source of many Control Room deficiencies. The indications (required by Tech Specs) separate as containment sump level increases above 6 inches, causing concern as to which is correct. Every 8 hours, the operators are required to assure consistency within 2 inches. These transmitters were installed for TMI mods (REFOUT 81). Several WOs have been written due to calibration drift, attirbuted to water in air lines or venting problems. A modification was done in September 1985 so that proper venting can be done. The handle on the transmitter interferes with piping, which could cause improper valving at transmitter. I&C evaluating reference leg concerns.

SIGNIFICANCE: Component is important to safety, can cause plant shutdowns as required by Tech Specs.

RESOLUTIONS:

Prior To Plant Startup

1. Insure seal pot is in correct position.
2. Modify handles on transmitter for proper operation.
3. Do hold tests prior to and after handle modifications.
4. Insure they are in proper calibration prior to startup, including resolution of the apparent span problem.
5. Increase surveillance if possible - 30-60 days.
6. Evaluate the 2 inch difference acceptance criteria and increase if possible.

SYSTEM	TITLE
CRD	CONTROL ROD DRIVE SYSTEM
01	Control Rod Drives
02	CRD Seals & Autoclave Gaskets
03	CRD Thermocouples and Chart Recorders
04	CRD Primary & Secondary Position Indicators
05	CRD Rod Bottom Lights & Limit Switches

OBSERVATION NO: CRD-01 COMPONENT(S): Control Rod Drives

EVALUATOR(S): AETome REV NO: 2 DATE: 6/23/86

DESCRIPTION: From a review of MOs and DRs over the last 3 years, there have been 12 control rod drive failures in the past 3 years in which the drives have not moved or were slow in movement. In all but one case, the failures were rectified by replacing the CRD packages. In the other case, the rod support tube had to be replaced due to buffer piston galling. There is no evidence that repeat maintenance has been necessary. Some of the CRDM failures could be attributed to the seal and gasket leaks which are the most prevalent failure. Gasket failures are addressed in CRD-02.

REF: D-PAL-84-347, D-PAL-85-69, D-PAL-85-107, D-PAL-86-96, D-PAL-85-120, E-PAL-85-046.

SIGNIFICANCE: Not a current operator concern or distraction. Listed solely due to repeat maintenance. None of these CRDM failures affected the ability of the rod to trip.

RESOLUTIONS:

No Further Action Required

OBSERVATION NO: CRD-02 COMPONENT(S): CRD Seals & Autoclave Gaskets

EVALUATOR(S): AETome REV NO: 2 DATE: 6/23/86

DESCRIPTION: CRD seal and autoclave gaskets have leaked. Autoclave gasket leaks are the predominant failure in the CRD system. These failures seem to have been responsible for failures in the primary position indication, CRDM's, and rod position limit switches due to boric acid contamination. Six gaskets were replaced in 1985 with a new, thicker type, and 20 have been replaced during this outage. Results with the new design have been very good.

SIGNIFICANCE: Failure or degradation can result in forced outage due to PCS leakage. CRDM seal and gasket leakage is not a PRA type issue. Total seal failure could be classed as a small LOCA, but leakage is well within the capacity of installed pumps.

RESOLUTIONS:

Before The End of 87 REFOUT - Replace remaining autoclave gaskets (19).

OBSERVATION NO: CRD-03 COMPONENT(S): CRD Thermocouples and Chart Recorders

EVALUATOR(S): AETome REV NO: 5 DATE: 6/23/86

DESCRIPTION: Control Rod Thermocouples used to monitor CRD seal leakage have failed high. Problem is almost always high resistance oxide coating on the multiple connectors in the circuit between the thermocouple and the chart recorder. Loss of millivolt signal causes the high impedance rectifier amplifier to go upscale due to amplified hum, etc, from plant electrical noise. Problem is usually rectified by passing a 5-10 milliamp current through the circuit which punches a hole through the oxide layer. This restores thermocouple signal to normal.

SIGNIFICANCE: Many failures of thermocouple readings reduce credibility in indicated readings.

RECOMMENDATIONS

Before The End of 87 REFOUT

1. Evaluate use of protective coatings on all exposed terminal blocks to prevent oxide formation.
2. Evaluate replacing existing TCs with upgraded model (possibly RTDs).
3. Evaluate replacement of chart recorder.

OBSERVATION NO: CRD-04 COMPONENT(S): CRD Primary & Secondary Position Indicators

EVALUATOR(S): AETome REV NO: 2 DATE: 6/23/86

DESCRIPTION: Position indication of a control rod is sometimes lost. The SPIs are failing due to age of the equipment and the failures of the primary position indicators seem to be caused by seal and gasket leakage. System Engineer believes that primary indication performance will be improved by recent changes in seals and autoclave gaskets. The SPIs are scheduled to be replaced during the next refueling outage.

REF: D-PAL-84-173, D-PAL-84-346, D-PAL-85-21

SIGNIFICANCE: Poses a hindrance to response on a plant transient. Leads to many Control Room deficiencies.

RESOLUTIONS:

Before The End of 87 REFOUT - Replace secondary position indication

OBSERVATION NO: CRD-05 COMPONENT(S): CRD Rod Bottom Lights & Limit Switches

EVALUATOR(S): AETome REV NO: 2 DATE: 6/23/86

DESCRIPTION: Rod bottom indication does not always come in for all rods, requiring the operators to use backup means of verifying rod insertion. Some of the indicator problems are related to seal leakage which results in boric acid contamination of the switches. A WO has been issued to repair Indicator #34, which failed during the 5/19/86 trip, during this outage.

SIGNIFICANCE: Poses a hindrance to response on a plant transient. Results in Control Room deficiencies.

RESOLUTIONS:

Prior To Plant Startup - Repair and test Rod #34 bottom indication.

SYSTEM	TITLE
CVC	CHEMICAL AND VOLUME CONTROL SYSTEM
01	CK-2113, & CK-2116 Charging Line Loop Check Valves; CK-2154 & CK-2156 Boric Acid Blender Check Valves
02	CV-2001 Regenerative Heat Exchanger Letdown Stop Valve
03	CV-2003, CV-2004, CV-2005 Letdown Orifice Stop Valves
04	CV-2002 and CV-2202 Letdown Orifice Bypass Valves
05	CV-2009 Low Pressure Letdown - Containment Isolation
06	CV-2012 & CV-2122 Intermediate Letdown Backpressure Regulator
07	CV-2056 Letdown to VolumeControl Tank (VCT) or Radwaste Tank (RWT)
08	CV-2080 VCT Vent Valve
09	CV-2111 Charging Line Stop Valve
10	CV-2113 and CV-2115 Charging Loop Stop Valves
11	CV-2117 Pressurizer Auxiliary Spray Valve
12	CV-2130 and CV-2136 Boric Acid Storage Tank Recirc Valves
13	CV-2153 Inlet to Blender; CV-2155 Outlet; CV-2165 Pri Makeup Water
14	EC-30 Boric Acid Heat Trace Control Panel
15	P-55A, P-55B, P-55C Charging Pumps
16	P-56A & P-56B Concentrated Boric Acid Pumps

SYSTEM	TITLE
(CVC SYSTEM-CONTINUED)	
17	RO-2003, RO-2004, RO-2005 Letdown Control Orifices & MV-2263, MV-2264, MV-2265 Trim Valves
18	RV-2006 Letdown Heat Exchanger Inlet Relief Valve
19	T-105 A&B Charging Pump Suction Stabilizer
20	T-106 A&B Charging Pump Discharge Accumulator
21	CK-2105 P-55C Discharge Check Valve
22	MV-2035; MV-2248; MV-2046 Ion Exchanger T-51 Bed Lift Valves
23	RV-2079; RV-2080 VCT Relief Valves
24	MV-2106; P-55C Discharge Isolation Valve
25	FIA-0212; FT-0212 Charging Flow Alarm and Transmitter
26	P-57 Hydrazine Metering Pump
27	MV-2201, Primary Makeup Water Isolation Valve & MV-2162, PMW Supply Stop Valve
28	Boronometer AE-0203

OBSERVATION NO: CVC-01

COMPONENT(S): CK-2114; CK-2116 Charging Line Loop Check Valves
CK-2154; CK-2156 Boric Acid Blender Check Valves

EVALUATOR(S): MCSniegowski

REV NO: 2

DATE: 6/23/86

DESCRIPTION: These valves are leaking by the seats. PEC has the responsibility to order/install new valves. CK-2154 will be disassembled and repaired by the Plant staff this outage. CK-2156 will be disassembled and repaired by PEC this outage. These valves were evaluated by the task force because they had open Work Orders outstanding and were in the CVC System. Because of the overall system problems, all open CVC Work Orders were evaluated.

SIGNIFICANCE: Important to reliable Plant operation.

RESOLUTIONS:

Prior To Plant Startup
1. Repair CK-2154 and CK-2156
2. Develop a test program to ensure proper operation and determine acceptable values for leakage.

Before The End of 87 REFOUT - Evaluate the need to repair/replace CK-2114 and CK-2116.

OBSERVATION NO: CVC-02 COMPONENT(S): CV-2001 - Regenerative Heat Exchanger Letdown Stop Valve

EVALUATOR(S): MCSniegowski REV NO: 1 DATE: 6/23/86

DESCRIPTION: CV-2001 leaks by the seat. PEC is looking at the development of a post-maintenance test procedure to determine the effectiveness of repairs performed during this outage. Early this year, repairs were attempted, but a badly corroded yoke nut was found. Since a spare yoke nut was not in stock, this work was not completed but is in the process of being repaired now.

SIGNIFICANCE: Important to reliable plant operation. CV-2001 is a requirement to prevent RV-2006 lifting and to allow complete letdown flow stoppage.

RESOLUTIONS:

Prior To Plant Startup - Repair and test CV-2001.

OBSERVATION NO: CVC-03 COMPONENT(S): CV-2003, CV-2004, CV-2005 Letdown Orifice Stop Valves

EVALUATOR(S): MCSniegowski REV NO: 2 DATE: 6/23/86

DESCRIPTION: These valves have a history of seat leakage or stroke misadjustment. Currently pre- and post-maintenance testing is being planned this outage to isolate which valves need repairs. Those needing repair will be repaired.

As of 6/17/86, CV-2003 & CV-2005 have been identified as leakers. CV-2004, which was rebuilt during the 1985 outage, has been tested satisfactorily.

REF: D-PAL-86-49

SIGNIFICANCE: Important to safety. Ability to adjust letdown flow is essential to stable CVCS conditions.

RESOLUTIONS:

Prior To Plant Startup - Test and repair as necessary.

Before the End of 87 REFOUT - Evaluate development of a test procedure to determine leakage and use as necessary in future.

OBSERVATION NO: CVC-04 COMPONENT(S): CV-2002 and CV-2202 Letdown Orifice Bypass Valves

EVALUATOR(S): MCSniegowski REV NO: 3 DATE: 6/23/86

DESCRIPTION: Currently suspect seat leakage. Running pre-maintenance test to determine which valve is leaking. As of 6/17/86, both valves have been tested and do leak.

SIGNIFICANCE: Important to reliable Plant operation. CV-2002 & CV-2202 seat leakage will impair setting of letdown trim orifices.

RESOLUTIONS:

Prior To Plant Startup

1. Test and determine extent of valve leakage.
2. Repair as necessary this outage.
3. Repeat test prior to startup.
4. Evaluate development of a test procedure for testing these valves in the future if needed.

OBSERVATION NO: CVC-05 COMPONENT(S): CV-2009 Low Pressure Letdown - Containment Isolation

EVALUATOR(S): MCSniegowski REV NO: 2 DATE: 6/23/86

DESCRIPTION: Work Order history indicates a packing leakage problem. Currently this valve does not show evidence of leakage, and therefore there are no current repair plans by the System Engineer.

SIGNIFICANCE: Important to reliable plant operation. Packing leakage adds to PCS leakage.

RESOLUTIONS:

Prior To Plant Startup
1. Inspect packing areas for leakage.
2. Stroke test valve prior to startup

OBSERVATION NO: CVC-06 COMPONENT(S): CV-2012 & CV-2122 Intermediate Letdown Backpressure Regulator

EVALUATOR(S): MCSniegowski REV NO: 2 DATE: 6/23/86

DESCRIPTION: CV-2012 failed during 5/19/86 trip. PIC-0202, the valve controller, is a high maintenance item. Signals are anticipatory from the letdown trim valves. Troubleshooting indicates that the valve positioners are the problem. Positioners on each valve will be replaced this outage. Fine turning of the control signals will be done at normal operating temperature and pressure.

REF: CVC-04 5 Year Plan

SIGNIFICANCE: Important to reliable plant operation. Failure can cause operator distractions during plant trips or transients. Can lead to failure of RV-2006.

RESOLUTIONS:

Prior To Plant Startup - 1. Change out positioners this outage

2. Perform dynamic testing and adjust as necessary

OBSERVATION NO: CVC-07 COMPONENT(S): CV-2056 Letdown to Volume Control tank (VCT) or Radwaste Tank (RWT)

EVALUATOR(S): MCSniegowski REV NO: 2 DATE: 6/23/86

DESCRIPTION: This 3-way valve has had seat leakage problems. Leakage to the Radwaste Tank represents PCS leakage. Minor leakage to the VCT while diverting is acceptable. The valve is currently leak-free, but long-term confidence is not high. A project has been initiated to evaluate replacement/modification to this portion of the system. As part of this project, it is proposed to relocate the valve(s) to a lower radiation area to facilitate maintenance.

REF: E-PAL-85-84, E-PAL-85-86

SIGNIFICANCE: Important to reliable Plant operation. Can lead to inadvertent PCS diversion to radwaste. Leakage to VCT is not an operator concern or distraction. Leakage has not occurred to radwaste for last 6 weeks prior to 5/19 trip.

RESOLUTIONS:

Prior To Plant Startup - Stage and test a replacement valve as a contingency for leakage problems which may occur during startup.

Before The End of 87 REFOUT - Consider replacement/modification of this portion of the CVCS. Engineering and procurement should be completed as soon as possible as a contingency for leakage problems over the current operating cycle.

OBSERVATION NO: CVC-08 COMPONENT(S): CV-2080 VCT Vent Valve

EVALUATOR(S): MCSniegowski REV NO: 2 DATE: 6/23/86

DESCRIPTION: History of recurring valve seat leakage. The valve was rebuilt during the 1985 REFOUT under vendor supervision. Reference CVC-23 for related discussion.

SIGNIFICANCE: Leakage leads to operator concern, excessive radwaste gas production. May result in explosive mixture in the Waste Gas Surge Tank.

RESOLUTIONS:

Prior To Plant Startup - Cut the valve out of the system, bench test and reinstall.

OBSERVATION NO: CVC-09 COMPONENT(S): CV-2111 Charging Line Stop Valve

EVALUATOR(S): MCSniegowski REV NO: 3 DATE: 6/23/86

DESCRIPTION: Currently not considered to have problems. Past history indicates supply air line leaks.

SIGNIFICANCE: Not an active operator concern or distraction.

RESOLUTIONS:

Prior To Plant Startup
1. Stroke test to verify that there are not current problems.
2. Inspect air lines for leaks.

OBSERVATION NO: CVC-10 COMPONENT(S): CV-2113 CV-2115 Charging Loop Stop Valves

EVALUATOR(S): MCSniegowski REV NO: 3 DATE: 6/23/86

DESCRIPTION: Both valves have a history of packing leaks. Both valves will be repacked this outage. The packing failures of these valves are currently being evaluated as part of the generic packing issue.

SIGNIFICANCE: May contribute to PCS leakage.

RESOLUTIONS:

Prior To Plant Startup - Repack valves and test.

OBSERVATION NO: CVC-11 COMPONENT(S): CV-2117 Pressurizer Auxiliary Spray Valve

EVALUATOR(S): MCSniegowski REV NO: 3 DATE: 6/23/86

DESCRIPTION: History of packing leaks. No current plans to repack since valve is clean. This valve will be considered as part of the generic packing issue. Currently there is a concern that the valve does not stroke fully closed. Valve has been closed manually to the fully closed position by the Auxiliary Operators.

SIGNIFICANCE: Important to reliable plant operation. Current concern that valve is not stroking fully closed. Operators have been manually closing valve in containment.

RESOLUTIONS:

Prior To Plant Startup - Adjust packing and stroke as necessary to ensure proper operation.

OBSERVATION NO: CVC-12 COMPONENT(S): CV-2130; CV-2136 Boric Acid Storage Tank Recirc Valves

EVALUATOR(S): MCSniegowski REV NO: 2 DATE: 6/23/86

DESCRIPTION: During the 1983 REFOUT the actuator settings were changed at the recommendation of the manufacturer to allow full stroke of the valve. The new settings were not documented on the calibration sheets and therefore were subsequently changed back to the old settings by I&C during the 1985 REFOUT. Later, during the 1985 REFOUT, the actuator settings were adjusted to the new settings but the calibration sheets were not changed. During the current outage, settings will be verified, recorded and calibration sheets changed.

SIGNIFICANCE: Not an active operator concern or distraction during a plant trip or transient. Failure or degradation could lead to forced outage. Tech Spec required.

RESOLUTIONS:

Prior To Plant Startup

1. Adjust the actuator and test as necessary this outage.
2. Revise calibration sheets as appropriate and assure proper documentation of actuator settings.

OBSERVATION NO: CVC-13 COMPONENT(S): CV-2153 Inlet to Blender; CV-2155 Outlet; CV-2165 Pri Makeup Wtr

EVALUATOR(S): MCSniegowski REV NO: 3 DATE: 6/23/86

DESCRIPTION: These three valves are important to the control of boron concentration in the PCS. Operator confidence in these valves has been low in the past. CV-2153 and CV-2165 have recently been reworked and tested and they appear to be holding satisfactorily. However, similar repairs were implemented and tested during the last REFOUT, and valve leakage reappeared after a short period of operation. CV-2155 leaks and is scheduled for repair this outage. There is a long term plan to replace all three valves.

REF: D-PAL-85-128 CVC-01 5 Year Plan

SIGNIFICANCE: Important to reliable plant operation. On operators' concern list.

RESOLUTIONS:

Prior To Plant Startup 1. PE&C to evaluate replacement of all three valves, if possible.

2. Test all three valves to assure that they are leak-tight.

Before the End of 87 REFOUT - Replace all three valves if not completed during the current outage.

OBSERVATION NO: CVC-14 COMPONENT(S): EC-30 Boric Acid Heat Trace Control Panel

EVALUATOR(S): MCSniegowski REV NO: 2 DATE: 6/23/86

DESCRIPTION: Setpoints drift on the heat tracing controls requiring DRs to be generated. The system requires extra care when performing maintenance on the components which are heat traced since the distance between RTDs and heat tracing is important to the performance of the controller. There are no plans to work these items during the current outage. However, the system engineer recognizes the need to establish a PM/Testing program to maintain the controllers.

REF: D-PAL-84-367, D-PAL-84-373

SIGNIFICANCE: Safety related. Technical Specification required. Failure of component can result in a forced outage.

RESOLUTIONS:

Prior To Plant Startup - 1. Ensure all boric acid heat trace points on Tech Spec equipment are operable.
2. Ensure boric acid heat trace alarms clear.

Before the End of 87 REFOUT - Repair and restore to original as-built condition.

As Part of 5-Year Plan - Evaluate lowering concentration of boric acid system so that heat tracing is no longer required.

OBSERVATION NO: CVC-15 COMPONENT(S): P-55A, P-55B, P-55C Charging Pumps

EVALUATOR(S): MCSniegowski REV NO: 3 DATE: 6/23/86

DESCRIPTION: These pumps have a significant number of Work Orders in the history. Pumps have packing which has an average life of one month. Currently 'A' has a cracked block and a new block is being expedited. 'A' will be tested (both pump & motor) to determine cause of start failure during the 5/19/86 trip. 'B' pump will be rebuilt during the outage. The vendor will be brought in to oversee rebuild as well as review current PM program. 'A' pump, although not operable, was available for emergency operation. However, it failed to start during the 5/19/86 trip. The cause of this failure was determined to be a low oil pressure protective trip.

REF: *D-PAL-86-100, D-PAL-86-136, E-PA-84-111, D-PAL-84-303, D-PAL-85-52, D-PAL-85-11
CVC-06, CVC-07, CVC-16 SC-86-133, SC-36-135

SIGNIFICANCE: Safety related. Technical Specification related. Failure or degradation of component can result in a forced outage. On operators' concern list. Poses a hindrance to response on a Plant transient. The charging pumps provide two functions; they maintain or restore PCS inventory during operation and following trips or transients and they inject boric acid for reactivity control. Three pumps are provided.

The accident sequences where the charging pumps are the most important are those where the PCS remains at, or can return to high pressure (steam line break, small LOCA, loss of feedwater). The capability to inject concentrated boric acid into a fully pressurized PCS would be important in case of ATWS.

In accident sequences which depressurize the PCS, the HPSI or LPSI pumps provide the necessary water and boric acid.

RESOLUTIONS:

Prior To Plant Startup

1. Insure P-55A operable prior to startup either with repaired block or justification for operability with leak and leakage collection system installed.
2. Inspect breakers to determine if constant start and stop of the pump has degraded contacts.
3. Adjust time delay in oil pressure switch or repair lube oil system.
4. Inspect the P-55B block for cracking. If found, inspect the P-55C block.

Before the End of REFOUT 87 - Replace P-55A block.

As Part of 5-Year Plan - Evaluate packing life and oil leakage and make recommendations.

OBSERVATION NO: CVC-16 COMPONENT(S): P-56A & P-56B Concentrated Boric Acid Pumps

EVALUATOR(S): MCSniegowski REV NO: 4 DATE: 6/23/86

DESCRIPTION: Both pumps were identified to have had boric acid leaks and therefore were evaluated. Recent run of P-56B indicates no problems. P-56A was rebuilt August 85. Both pumps need to be overhauled so that old obsolete parts may be replaced with upgraded parts. Both pumps will be tested with the Surv Test prior to startup. P-56B was flagged as a casing leak, but has now been identified a stuffing box to pump case leak.

REF: D-PAL-86-67

SIGNIFICANCE: Technical Specification required. Failure or degradation may result in a forced outage. Not an active operator concern or distraction on a plant transient or trip.

RESOLUTIONS:

Prior To Plant Startup - Rebuild and test P-56B this outage.

OBSERVATION NO: CVC-17

COMPONENT(S): RO-2003, RO-2004, RO-2005 Letdown Control Orifices & MV-2263, MV-2264, MV-2265 Trim Valves

EVALUATOR(S): MCSniegowski

REV NO: 2

DATE: 06/11/86

DESCRIPTION: Orifices and trim valves have failed to control letdown flow and due to condition, operators have been hesitant to adjust flows with the trim valves. All orifices and trim valves will be replaced this outage. Orifices will be tested prior to changeout at Trail Street to assure they meet specifications. Post maintenance testing will also be performed.

REF: SC-86-136, SC-86-137

SIGNIFICANCE: Important to reliable plant operation. On operators' concern list. Poses a hindrance to response on a Plant transient.

RESOLUTIONS:

Prior To Plant Startup

1. Replace all orifices and trim valves this outage.
2. Perform PM and post installation testing.

OBSERVATION NO: CVC-18 COMPONENT(S): RV-2006 Letdown Heat Exchanger Inlet Relief Valve

EVALUATOR(S): MCSniegowski REV NO: 3 DATE: 6/23/86

DESCRIPTION: This relief valve has been a long-standing problem during Plant startup. The problem has been failure to reseat following multiple operations, aggravated by the other CVCS problems which cause it to lift frequently. This item has been assigned to PEC to seek out a possible replacement valve to install this outage. Spare parts are being shipped in the event replacement is not feasible. This is part of the generic issue on Farris Relief valves.

REF: E-PAL-85-103

SIGNIFICANCE: Failure of component can result in a forced outage due to PCS leakage. Disturbances in letdown flow challenges this RV. Testing on letdown system following repairs this outage will lift this RV. Confidence in this RV's reseating capability is low. Poses a hindrance to response on a plant transient.

RESOLUTIONS:

Prior To Plant Startup - Replace valve or, as a minimum, rebuild and test after all CVC testing is complete.

OBSERVATION NO: CVC-19 COMPONENT(S): T-105 A&B Charging Pump Suction Stabilizer

EVALUATOR(S): MCSniegowski REV NO: 2 DATE: 6/23/86

DESCRIPTION: A problem exists with these stabilizers deflating, resulting in system vibration. There is a PM performed every 6 months. On occasion, these stabilizers are found deflated during the PM.

REF: D-PAL-86-108, *D-QP-85-27

SIGNIFICANCE: Not an active operator concern or distraction on plant transient or trip. Listed solely due to number of DR's.

RESOLUTIONS:

Prior To Plant Startup- 1. Evaluate the frequency of the PM and increase as appropriate.

2. Evaluate the addition of instrumentation to allow for ease of detecting bladder deflation.

As Part of 5-Year Plan - Study and resolve issue.

OBSERVATION NO: CVC-20 COMPONENT(S): T-106 A&B Charging Pump Discharge Accumulator

EVALUATOR(S): MCSniegowski REV NO: 2 DATE: 6/23/86

DESCRIPTION: A problem exists with these stabilizers deflating, resulting in system vibration. There is a PM performed every 6 months. On occasion, these stabilizers are found deflated during the PM.

REF: D-PAL-86-108, *D-QP-85-27 CVC-08

SIGNIFICANCE: Not an active operator concern or distraction on plant transient or trip. Listed solely due to number of DR's.

RESOLUTIONS:

Prior To Plant Startup- 1. Evaluate the frequency of the PM and increase as appropriate.

2. Evaluate the addition of instrumentation to allow for ease of detecting bladder deflation.

As Part of 5-Year Plan - Study and resolve issue.

OBSERVATION NO: CVC-21 COMPONENT(S): CK-2105 P-55C Discharge Check Valve

EVALUATOR(S): MCSniegowski REV NO: 2 DATE: 6/23/86

DESCRIPTION: During performance of the startup surveillance test, the valve was found to have a leak in the seal weld surrounding the check valve body cap. It was evaluated since it was an open WO in the CVC system. Valve is scheduled to be replaced this outage.

SIGNIFICANCE: Important to reliable Plant operation. Failure or degradation can result in a forced outage.

RESOLUTIONS:

Prior To Plant Startup - Replace valve and test.

OBSERVATION NO: CVC-22 COMPONENT(S): MV-2035; MV-2248; MV-2046 Ion Exchanger T-51 Bed Lift Valves

EVALUATOR(S): MCSniegowski REV NO: 3 DATE: 6/23/86

DESCRIPTION: MV-2035 and MV-2046 seat leakage problems are scheduled to be repaired this outage. Operations believes that MV-2248 may also leak and should be repaired. These valves were evaluated because they were open WOs in the CVC system and also an operators concern. Leakage by MV-2035 pressurizes T-69, Spent Resin Storage Tank. The resins can sluice inadvertently if these valves leak by.

SIGNIFICANCE: Leakage through these valves cause Plant shutdown through excessive PCS leakage.

RESOLUTIONS:

Prior To Plant Startup - Repair and test MV-2035, MV-2046 and MV-2248.

OBSERVATION NO: CVC-23 COMPONENT(S): RV-2079; RV-2080 VCT Relief Valves

EVALUATOR(S): MCSniegowski REV NO: 3 DATE: 6/23/86

DESCRIPTION: Maintenance history indicates that these relief valves are chronic leakers. Part of generic study on replacement of Farris relief valves. Related to CVC-08.

REF: SC-86-099

SIGNIFICANCE: Important to reliable Plant operation. There is a belief that leakage past these valves contributes to H_2 leakage to the Waste Gas System, though they normally function as water reliefs to the Dirty Waste Tank.

RESOLUTIONS:

Prior To Plant Startup — Perform a thorough investigation (including troubleshooting) to evaluate the problem of hydrogen leakage to the Waste Gas System. Identify and implement necessary repairs/ replacement to CV-2080, RV-2079, RV-2080 and other contributors which may be identified.

OBSERVATION NO: CVC-24 COMPONENT(S): MV-2106; P-55C Discharge Isolation Valve

EVALUATOR(S): MCSniegowski REV NO: 1 DATE: 6/23/86

DESCRIPTION: Currently this valve has a broken manual operator. This item was evaluated since an open Work Order existed on a component in the CVC System.

SIGNIFICANCE: Isolation of P-55C without this valve is made more compound.

RESOLUTIONS:

Prior To Plant Startup - Test and replace valve.

OBSERVATION NO: CVC-25 COMPONENT(S): FIA-0212; FT-0212 Charging Flow Alarm and Transmitter

EVALUATOR(S): MCSniegowski REV NO: 3 DATE: 6/23/86

DESCRIPTION: NPRDS indicates two failures over the last two years. There were a number of problems with flow indications coming out of the 1985 REFOUT which were corrected by recalibration. Current operations however do not indicate a problem.

SIGNIFICANCE: Important to reliable Plant operation.

RESOLUTIONS:

Prior To Plant Startup - Verify calibration of flow instruments.

OBSERVATION NO: CVC-26 COMPONENT(S): P-57 Hydrazine Metering Pump

EVALUATOR(S): MCSniegowski REV NO: 2 DATE: 6/23/86

DESCRIPTION: This pump has a history of oil leaks and not putting out the desired flows. The pump is used at startup to add hydrazine to the primary system for Oxygen control. This pump is not tested and in most cases is determined to be inoperable when chemicals are needed to be added to the primary system.

SIGNIFICANCE: Pump needed for Plant startup and chemistry adding to CVCS at power. No active concern on Plant transient or trip. Pump out of service causes delays in Plant heatup.

RESOLUTIONS:

Prior To Plant Startup - Test pump and repair if necessary. Testing should be done early enough so that repairs, if necessary, will not affect Plant startup.

Before The End of 87 REFOUT - Complete evaluation and pump replacement, if required.

OBSERVATION NO: CVC-27 COMPONENT(S): MV-2201, Primary Makeup Water Isolation Valve
MV-2162, PMW Supply Stop Valve

EVALUATOR(S): MCSniegowski REV NO: 1 DATE: 6/23/86

DESCRIPTION: Reported that valves leak by, however, based upon test performed when CV-2165 was removed for maintenance, these valves hold. It would be advantageous to retest to verify if one or both have begun to leak by the seat.

SIGNIFICANCE: Not an operator concern or distraction.

RESOLUTIONS:

Prior To Plant Startup - Test and repair as necessary (verify condition of each when CV-2165 is removed)

OBSERVATION NO: CVC-28 COMPONENT(S): Boronometer AE-0203

EVALUATOR(S): MCSniegowski REV NO: 2 DATE: 6/23/86

DESCRIPTION: Equipment is high maintenance item and has not been reliable.

SIGNIFICANCE: Not important to reliable plant operation. Boronmeter causes high level of operator response due to repeat alarms. Would be an operator aid if it could be relied upon.

RESOLUTIONS:

Prior To Plant Startup - Remove the alarm from service.

Before the End of 87 REFOUT - Remove or replace Boronmeter and associated instruments.

SYSTEM	TITLE
CWS	CIRCULATING WATER SYSTEM
01	P-39A and P-39B Cooling Tower Pumps
02	LS 5307/5308 Cooling Tower Basin Level Switches

OBSERVATION NO: CWS-01 COMPONENT(S): P-39A and P-39B Cooling Tower Pumps

EVALUATOR(S): VJBeilfuss REV NO: 1 DATE: 6/23/86

DESCRIPTION: P-39B has been repacked three times in the last 6 months and is scheduled for repack again this outage. Pump vibration has been recorded since repair in 1982. There is a trend of increasing vibration indicating a degradation of the pump bearings, though indications are that the vibration will remain within acceptable limits through the current operating cycle. Both pumps are being closely monitored to prevent failure (which occurred in 1982).

SIGNIFICANCE: Failure or degradation can result in a plant trip or forced outage.

RESOLUTIONS:

Before The End of REFOUT 87 - Refurbish pumps.

OBSERVATION NO: CWS-02 COMPONENT(S): LS 5307/5308 Cooling Tower Basin Level Switches

EVALUATOR(S): JGLewis REV NO: 1 DATE: 6/23/86

DESCRIPTION: Cooling tower basin-low level trip of CT pumps. This trip comes from a single air bubbler instrument which is susceptible to loss of air and/or freezing. It caused one plant trip some years ago. Considering the existing pump trip from loss of seal cooling (derived from pump discharge now), addition of 60,000 gpm dilution flow to basins, and consequences of a CT trip, this should be deleted.

SIGNIFICANCE: No safety significance beyond plant trip. However, loss of CT pumps is one of the most severe normal transients for the plant, and should be avoided if possible. Chances of CT pumps damage from low basin level are minimal.

RESOLUTIONS:

Prior To Plant Startup - Delete the trip function (only) from LS 5307 and LS 5308. Leave alarm intact.

SYSTEM	TITLE
DTA	DATA LOGGER/EVENTS RECORDER
01	Data Logger System (Tennecomp)
02	Datalogger Systems & Events Recorder - Generic

OBSERVATION NO: DTA-01 COMPONENT(S): Data Logger System (Tennecomp)

EVALUATOR(S): R E Schrader REV NO: 02 DATE: 06/23/86

DESCRIPTION: Thirteen DLS points did not respond when comparable event recorder pens operated during the 5/19/86 trip.

SIGNIFICANCE: Failure or degradation can result in difficulty in reconstructing events following a transient. Does not pose an active operator concern or distraction.

RESOLUTIONS:

Prior To Plant Startup Repair inputs. Memo to system engineer (L Hoover) forwarded on 6/2/86

OBSERVATION NO: DTA-02 COMPONENT(S): Datalogger Systems & Events Recorder - Generic

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: Twenty-nine (29) items (work orders, deviation reports) were reviewed covering a three (3) year period. Items included equipment failures (17) in computer systems, software corrections (2) and external hardware failures (5) in the primary and secondary data loggers. Four (4) items involved either modifications or preventive maintenance testing; one (1) item involved procedural error. Failures were not repetitive in nature; failures of this nature are not abnormal in electronic data systems such as these and the failure rate is not excessive considering the age of the primary and secondary data logger systems.

Failures in the Feedwater Purity Datalogger (Tennecomp) are not well documented. The assigned technician usually checks the system on a daily basis. Environmental conditions (ie, heat) in the station power room where this equipment is located is not conducive to good computer operation. The equipment is unique and obsolete. An Engineering Service request has been generated to relocate the control room printer to the station power room. As this system monitors several inputs to the Events Recorder Systems, loss of Event Recorder power can result in loss of signals to this datalogger.

SIGNIFICANCE: Failure or degradation can result in difficulty in reconstructing events following a transient. Primary Data Logger has LCO requirements.

RESOLUTIONS:

Prior To Plant Startup

1. Evaluate Engineering Service Request and relocate data logger printer to Station Power Room if action is warranted.

2. Improve documentation of maintenance activities on data-logger systems by implementing open work orders on each data-logger system so that equipment histories may be maintained.

Before The End of REFOUT 87 - Plans for replacement of the plant sequence-of-events monitor and data-logging system should be completed. This should include evaluation of the present versus required inputs in light of the recent addition of the critical function monitor.

As Part of 5-Year Plan - Replacement of the PIP, SPI and Plant Datalogger (Tennecomp) is presently in the Five Year Plan (as well as other plant computer systems).

SYSTEM	TITLE
EPS	EMERGENCY POWER SYSTEM
01	Emergency Diesel Generator Instrumentation
02	D/G Starting & Control Circuitry
03	Diesel Generator Air Starting Motors
04	D/G Fuel Oil Problems & P-18 Fuel Oil Pumps
05	Diesel Generator Lube Oil Temperature Switch
06	Emergency Lighting Units
07	Diesel Generator Battery Chargers
08	Diesel Generator Jacket Water System and Heaters
09	Diesel Generators 1-1 & 1-2
10	Diesel Generators 1-1 & 1-2

OBSERVATION NO: EPS-01 COMPONENT(S): Emergency Diesel Generator Instrumentation

EVALUATOR(S): WClark REV NO: 2 DATE: 06/23/86

DESCRIPTION: Diesel Generator frequency and load indication have proven to be inaccurate and difficult to calibrate. The lack of an alarm reflash capability can lead to degraded D/G operation because the operator might not be aware of conditions.

Ref: D-PAL-84-185, D-PAL-85-125

SIGNIFICANCE: D/G instrumentation and alarms are important to reliable plant operations.

RESOLUTIONS:

Prior To Startup - If feasible, replace frequency and load indication.

Before The End of REFOUT 87 1. Replace frequency and load indication (if not done during current outage)

2. Incorporate reflash capability.

OBSERVATION NO: EPS-02 COMPONENT(S): D/G Starting & Control Circuitry

EVALUATOR(S): WClark REV NO: 2 DATE: 06/23/86

DESCRIPTION: The System Engineer is concerned about excessive engine wear which might result from repeated starts, and proposes to eliminate the D/G auto start on a turbine trip. He proposes to have the D/G's auto-start on loss of off-site power only (E&M proposed project EPS-86-01). The System Engineer is also concerned about the potential for D/G damage during testing due to the lack of protective trips, and proposes to to establish 2 separate D/G control schemes, one for testing and one for parallel which will allow for a greater number of engine protective trips. The alternate control scheme would have minimal protective trips during emergency operation.

SIGNIFICANCE: Safety Related.

RESOLUTIONS:

As Part of 5-Year Plan - Evaluate cost/benefit and assure that Operations is in agreement with proposed modifications prior to incorporation into 5-Year Plan. Consider that diesel generator history does not appear to show signs of excessive wear as a result of the number of starts.

OBSERVATION NO: EPS-03 COMPONENT(S): Diesel Generator Air Starting Motors

EVALUATOR(S): WClark REV NO: 3 DATE: 06/23/86

DESCRIPTION: There are currently 3 models of air start motors in use on the diesel/generators. Parts availability appears to be increasingly more difficult. D/G's have exhibited high start reliability over plant life.

SIGNIFICANCE: Failure or degradation of component can result in a forced outage. Not an operator concern or distraction during a plant trip.

RESOLUTIONS:

As Part of 5-Year Plan - Consider standardization to one type of air start motor.

OBSERVATION NO: EPS-04 COMPONENT(S): D/G Fuel Oil Problems & P-18 Fuel Oil Pumps

EVALUATOR(S): WClark REV NO: 3 DATE: 06/23/86

DESCRIPTION: Repeat Surveillance Testing Failures. D-PAL-86-001 involved fuel oil transfer pump excessive current. The problem has not repeated and was dispositioned as an isolated occurrence and possibly measurement technique error. D-PAL-85-053 resulted from a tagout for maintenance which removed the normal means of transferring oil and a subsequent question of operability. D-PAL-85-008 resulted from an inability to take as found readings because incomplete M&TE, not an installed equipment problem. D-PAL-86-061 resulted when fuel oil transfer pumps P-18A & P-18B failed to achieve acceptable discharge pressure during performance of H07C while motor currents were acceptable and a tank level increase was verified for both pumps. System Engineer intends to revise procedure to allow operability determination by monitoring level. Gauge had been determined to be in calibration. Two work orders exist that include replacement of old fluehoses and cleaning out of K-6B (1-2) diesel generator fuel oil tanks. Past experience revealed sludge and the 1-1 diesel generator tanks were cleaned (D-PAL-86-008).

SIGNIFICANCE: Does not produce operator distractions. Repeat surveillance failures are the only concern.

RESOLUTIONS:

Prior To Plant Startup 1. Replace hoses and clean diesel belly and day tanks for 1-2 D/G.

Before The End of REFOUT 87 1. Process a facility change to provide a tie between T-10 and T-926.

2. Procure a spare fuel oil transfer pump.

3. Consider providing a secondary containment for T-10.

OBSERVATION NO: EPS-05 COMPONENT(S): Diesel Generator Lube Oil Temperature Switch

EVALUATOR(S): WClark REV NO: 2 DATE: 06/23/86

DESCRIPTION: Temperature Switch TS-1478 currently has a WO (24605486) against it which was initiated on 5/13/86. Cause for the WO was a high lube oil temperature alarm. Past history shows two additional WOs on this item. One concerns a missing capillary sheath and the other a faulty high lube oil temperature alarm (10/4/85).

SIGNIFICANCE: Component important to reliable plant operation.

RESOLUTIONS:

Prior To Plant Startup - Complete W O 24605486.

Before the End of 87 Refout - System Engineer should develop a solution which is free of repetitive failures. Issues to address should include items such as suitability for service, installation locale, condition of instrument, etc. NOTE: Complete this action prior to 12/31/86 if possible.

OBSERVATION NO: EPS-06 COMPONENT(S): Emergency Lighting Units

EVALUATOR(S): WClark REV NO: 2 DATE: 06/23/86

DESCRIPTION: Exide units presently installed experience repeated failures. A significant quantity (estimate 30 to 40%) will not meet the Appendix R eight-hour requirement and the remainder are marginal. T Leva is currently preparing an objective record to replace ELU's.

SIGNIFICANCE: Not an active operator concern. Could pose a hindrance to response on a plant transient. Listed due to concern about meeting Appendix R requirements.

RESOLUTIONS:

Before The End of REFOUT 87 - Replace Appendix R Emergency Lighting units.

OBSERVATION NO: EPS-07 COMPONENT(S): Diesel Generator Battery Chargers

EVALUATOR(S): WClark REV NO: 2 DATE: 06/23/86

DESCRIPTION: D/G Battery Chargers are a repeat maintenance problem. Subject chargers have been changed to auto trickle chargers which have been in service 5-6 months with no difficulties having been experienced. WO 24605240 was recently (late May 86) written against Aux Gas Motor on C-3B describing that the battery wouldn't crank. The WO was closed out after the battery was determined to be charged and the engine cranked. Review (6/4/86) of the WO resulted in an Electrical Maintenance commitment to obtain output charge voltage measurements.

SIGNIFICANCE: Not directly important to reliable plant operation, nor do they produce an operator distraction on a plant trip. Repeat maintenance is the only concern.

RESOLUTIONS:

Prior To Plant Startup - Obtain output voltage data and evaluate for acceptability.

OBSERVATION NO: EPS-08 COMPONENT(S): Diesel Generator Jacket Water System and Heaters

EVALUATOR(S): WClark REV NO: 2 DATE: 06/23/86

DESCRIPTION: D-PAL-85-61 addressed a 1-1 D/G trip which was attributed to a loss of jacket water inventory resulting from a cracked cylinder head in the 9L location. The evaluation concluded that no evidence exists to support the existence of a generic cylinder head failure problem and the vendor did not recommend further cylinder head replacement (other than 9L) (PRC apprvd Mtg 85-14).
D-PAL-85-100 on jacket water cooling degradation instituted temperature stabilization requirements prior to recording temperatures which ultimately are utilized for evaluation purposes.
D-PAL-85-01 addressed indications resulting from PT inspection of repair work on the K6B cooler head. Jacket water heaters were replaced (affected by chromates) with a new type. One failure resulted from improper electrical installation.
E&M project EPS-86-07 proposed replacement of existing jacket water treatment (chromates) with a less hazardous type of treatment.

SIGNIFICANCE: Failure or degradation of component can result in a forced outage. Not an operator concern during a plant transient.

RESOLUTIONS:

<u>As Part of 5-Year Plan</u> - Pursue replacement of chromates with an alternative jacket water treatment.

OBSERVATION NO: EPS-09 COMPONENT(S): Diesel Generators D1-1 & D1-2

EVALUATOR(S): WClark REV NO: 2 DATE: 06/23/86

DESCRIPTION: D-PAL-85-013, 84-372, 84-234, 84-309, apply to D1-1 and are based on high frequency while performing MO-7A-1 which was attributable to operator unawareness of the requirements for use of the strobe-tac during this procedure or their use of installed frequency meters (see EPS-01) in lieu of the strobe-tac. D-PAL-84-006 and D-PAL-85-122 apply to one-time failures that were resolved (cylinder test cork & 1-2 generator bearing).

D-PAL-85-043, 85-65, 85-74 & 85-086 all apply to D/G 1-2 low manifold pressure and span from 4/19/85 to 7/16/85 during the performance of MO-7A-2 which was eventually attributed to a defective gauge supply hose which was replaced. D-PAL-84-324 also resulted from a D/G 1-2 low manifold air pressure which was resolved by gauge calibration and intake filter replacement. D-PAL-84-126, 84-211 and 84-098 stem from the need for calibration of pyrometer. Calibration sheets have been revised to include the proper method for bench calibration. D-PAL-86-008 addressed reliability issues of DG1-1 in 3 areas: 1) fuel oil supply problems 2) load instability & 3) failure of air start motor to disengage. Items 1 & 2 appear to have resolved specific problems however, the proposed remedial corrective action evaluation is outstanding concerning item 2 - load swing (6/1/86). E&M proposed project EPS-86-13 also addresses this item.

D-PAL-85-124 addresses a high cylinder head temp in the #3 left cylinder in the unloaded condition and the proposed remedial corrective action was to be completed 11/15/85.

SIGNIFICANCE: Safety related. Results in operator distraction due to diesel not maintaining constant load during parallel operation.

RESOLUTIONS:

Prior To Plant Startup

1. Complete evaluation as to adequacy & stability of D/G controls including the implications of these factors on each mode of operation.
2. Complete proposed remedial corrective action to D-PAL-85-124.
3. Inspect the D1-1 and D1-2 control panels for relay cleanliness.

OBSERVATION NO: EPS-10 COMPONENT(S): Diesel Generator 1-1 & 1-2

EVALUATOR(S): WClark REV NO: 2 DATE: 06/23/86

DESCRIPTION: Reliability - Generic Letter 84-15 proposed staff actions to improve and maintain diesel generator reliability. CPCo letter dated Oct 1, 1984 provided: 1) diesel generator reliability data; 2) comments on proposed NRC diesel generator reliability program and performance technical specifications; 3) notified NRC that we do not subject EDG's to "cold fast starts" - Draft Regulatory Guide & Value/Impact Statement.

SIGNIFICANCE: Not an active operator concern or distraction during a plant transient or trip. Listed solely due to generic concern about diesel generator reliability.

RESOLUTIONS:

No Further Action Required - No further action is required by task force recommendation. The draft regulatory guide is presently under review through normal established channels and comments are due to Licensing by 6/1/86.

SYSTEM	TITLE
ESS	ENGINEERED SAFEGUARDS SYSTEM
01	C-6A, C-6B and C-6C, H/P Control Air Compresor
02	Safety Injection Check Valves; CK-3102, CK-3117, CK-3132, CK-3147, CK-3101, CK-3116, CK-3131, CK-3146
03	SI Fill and Drain and Pressure Control Valves; CV-3003, CV-3004, CV-3039, CV-3043, PCV-3038, PCV-3042, PCV-3046, and PCV-3047
04	L.P.S.I. Shutdown Clg Hx Bypass, Inlet, Crossover Valves; CV-3006, CV-3025, and CV-3055
05	Shutdown Cooling Heat Exchanger Inlet and Outlet Valves; CV-3212, CV-3213, CV-3223, & CV-3224
06	CV-3031, CV-3057 SIRW Tank Outlet Isolation Valves
07	FI-0404, FT-0404, SIRW Tank Recirc Flow Indication
08	Containment Spray Flow Indication FI-0302, FT-0302, FI-0301, FT-0301
09	HPSI Loop 2A Flow Transmitter FT-0312
10	LIA-0331, LIA-0332 SIRW Tank Level Indicator/Alarm
11	Safety Injection Bottle Level Alarm and Transmitters LIA-0365 LIA-0368, LIA-0372, LIA-0374, LT-0365, LT-0368, LT-0372, and LT-0374
12	LIA-0437 A&B, LIA-0438 A&B, LT-0437 A&B, LT-0438 A&B Iodine Tank Level Alarms & Transmitters
13	MO-3007 HPSI to PCS Loop 1A
14	See MIS-06
15	See MIS-10

SYSTEM	TITLE
(ESS SYSTEM-CONTINUED)	
16	P-66A and P-66B HPSI Pumps
17	P-67A & P-67B LPSI Pumps
18	SIRW Tank Recirc Pump P-74
19	PCV-0437A Nitrogen Supply to T-102
20	DBA/Normal Shutdown Sequencers
21	CV-3040, CV-3044, CV-3048, CV-3050 N_2 Supply to SI Tanks
22	MO-3015, MO-3016, Shutdown Cooling Inlet Isolation Valves
23	SIRW Tank T-58
24	CV-3001, CV-3002 Containment Spray Valves
25	T-103 Iodine Removal Make-up Tank
26	C-6C High Pressure Air Compressor
27	Recirculation Actuation Circuitry
28	CV-3051, CV-3065 Vent Valves on SI Bottles
29	General - Safety Injection Signal Circuitry
30	P-54A, Containment Spray Pump
31	CK-32265, CK-3216 Containment Spray Check VAlves

SYSTEM	TITLE
(ESS SYSTEM-CONTINUED)	
32	T-102, T-103 Outlet Check Valves
33	See CVC-28

OBSERVATION NO: ESS-01 COMPONENT(S): C-6A, C-6B, and C-6C, H/P Control Air Compressor

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 6/23/86

DESCRIPTION: C-6A was rebuilt on 11/7/85; C-6B replaced belts, breaker tripped on thermal overload, motor base cracked, flex conduit broke; C-6C tripped on thermal overload, breaker tripping problem was caused by unloader valves sticking. Compressors have been running continuously due to leaking valve operators per System Engineer.

SIGNIFICANCE: Components important to reliable Plant operation. Needed for Plant stable operation. Failure of components can result in forced outage. High pressure air compressors C-6A and C-6B provide control air to ECCS valves. The only valves which have to cycle during design conditions, however, are the SIRWT and sump suctions. The control air supplies for these valves are backed up by instrument air.

C-6C provides air to the Auxiliary Feedwater pump turbine back up supply valve CV-0521 (which fails open on loss of air); to the main feedwater stop valves; and to the MSIVs as a back up to instrument air.

RESOLUTIONS:

Prior to Plant Startup - Evaluate H/P air system for excessive air leakage and continuous compressor operation; evaluate compressor reliability and determine if preventive maintenance is required prior to startup.

Before the End of REFOUT 87 - Develop and implement electrical and mechanical preventive maintenance activities that will ensure reliable compressor and H/P air system operation.

OBSERVATION NO: ESS-02 COMPONENT(S): Safety Injection Check Valves
CK-3102, CK-3117, CK-3132, CK-3147, CK-3101, CK-3116, CK-3131, CK-3146

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 06/23/86

DESCRIPTION: Repeated DRs and ERs on back leakage. Causes SI bottle level and concentration problems. New check valves, in storeroom, have removable seats. Recent repair history is as follows:

CK-3116 repaired REFOUT 85.
CK-3101 repaired REFOUT 83.
CK-3102 repaired REFOUT 83.
CK-3146 repaired 3/19/86; repaired REFOUT 83.

REF: D-PAL-85-162, D-PAL-85-134, D-PAL-86-161, D-PAL-85-179, E-PAL-84-62

SIGNIFICANCE: Not an operator concern during Plant trip. Failure or degradation of components can result in a forced outage.

RESOLUTIONS:

Before the End of REFOUT 87 1. Currently, there are no problems with safety injection check valves. Recommend that a facility change be initiated as a contingency plan to replace all four safety injection valves in the event of leakage problems. Should be done before end of next outage since there is a possibility of lack of stellite on the seating surface making repairs impossible.

OBSERVATION NO: ESS-03 COMPONENT(S): SI Fill and Drain and Pressure Control Valves
CV-3003, CV-3004, CV-3039, CV-3043, PCV-3038, PCV-3042, PCV-3046, PCV-3047

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 06/23/86

DESCRIPTION: Repeated work orders on valves leaking by, packing leaks, stroke adjustment. CV-3003, CV-3004, CV-3039 and CV-3043 are controlling globe valves in an open/closed application. These valves have been recently repaired and the leakage has been greatly reduced. Trending of leakage through these valves is available.

REF: D-PAL-86-124

SIGNIFICANCE: Safety Related. Failure or degradation of component can result in a forced outage. Important to reliable Plant operation.

RESOLUTIONS:

Before The End of REFOUT 87

1. CV-3003, CV-3004, CV-3039, CV-3043 should be replaced with a positive shut off valve.

2. PCV-3038, PCV-3042, PCV-3046, PCV-3047 should be evaluated to determine if they can be leak free in this application. If not, a leak free pressure control valve should be installed.

OBSERVATION NO: ESS-04 COMPONENT(S): L.P.S.I. Shutdown Clg. Hx Bypass, Inlet, Crossover Valves CV-3006, 3025, 3055

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 6/23/86

DESCRIPTION: Valves leaking through. To remove/repair need to be off shutdown cooling. Concern for maintenance because valve won't isolate. The leakage across CV-3025 and CV-3055 were evaluated by D-PAL-84-063 and D-PAL-84-064 respectively. The leakage is only a concern during an emergency situation to cross leakage between containment spray and LPSI. This has been evaluated and found to be acceptable.

REF: D-PAL-84-063, D-PAL-84-064, E-PAL-84-083

SIGNIFICANCE: Not an operator concern or distraction during a trip or transient. Listed due to number of DR's/ER's and leakage when in shutdown cooling.

RESOLUTIONS:

Before The End of REFOUT 87 - Develop a contingency plan to provide alternate shutdown cooling before the end of REFOUT 87 and replace/repair these valves. As part of the project, add manual control air operation capability to CV-3025 and CV-3055.

OBSERVATION NO: ESS-05 COMPONENT(S): Shutdown Cooling Heat Exchanger Inlet and Outlet Valves CV-3212, CV-3213, CV-3223, CV-3224

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 06/23/86

DESCRIPTION: Valves leaking through prevents isolation of coolers for maintenance. There is a 900 R/hr hot spot in one of shutdown cooling heat exchangers. We have experienced valve operator problems and leakage due to lack of stellite on CV-3223. PSE Assessment P85-042 evaluated the safety significance of above valve leakage.

REF: D-PAL-84-064

SIGNIFICANCE: Not an operator distraction during Plant transients. Leakage through these valves prevents complete isolation of heat exchangers for maintenance.

RESOLUTIONS:

Prior To Plant Startup - 900 R hot spot should be removed.

Before The End of REFOUT 87

1. Valve operators should be put on regular PM inspection and rebuild program.
2. Due to leakage through and lack of stellite on valve seats, they should be replaced.
3. Permanently shield shutdown heat exchanger.

OBSERVATION NO: ESS-06 COMPONENT(S): CV-3031, CV-3057 SIRWT Tank Outlet Isolation Valves

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 06/23/86

DESCRIPTION: History of packing leaks and stroke time actuator problems. Recent modification changed SVs, removing mufflers and replacing with a metering valve on inlets to CVs. Work completed on SC-83-148 for CV-3057 and SC-83-190 for CV-3031. CV-3091 has corrective WOs for packing leaks, stroke times, replace oiler, and clean air lines. CV-3057 has corrective WOs for stroke times and packing leaks.

REF: E-PAL-84-034, E-PAL-84-033, D-PAL-85-103

SIGNIFICANCE: Not an operator concern during Plant transients. Maintenance and surveillance problems due to leaky valve.

RESOLUTIONS:

Prior to Plant Startup 1. Adjust packing and check stroke timing. Based on recent WO history, it appears the modifications performed on SC-83-148 and SC-83-190 have corrected stroke time problem.

2. Perform existing PMs and adjust frequencies as necessary.

Before The End of 87 REFOUT 1. Conduct quarterly visual inspections for leakage (adjust and retest if plant conditions allow). This action is important to the cleanliness of ESS rooms.

2. Install new packing configuration and trend for acceptability. Ensure stroke testing is done after any packing adjustments (if plant conditions allow).

OBSERVATION NO: ESS-07 COMPONENT(S): FI-0404, FT-0404 SIRW Tank Recirc Flow Indication

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 06/23/86

DESCRIPTION: FT-0404 is overanged by fast recirc of SIRW Tank using spent fuel pumps at approximately 1750 gpm. FI-0404 is capable of only approximately 400 gpm. Leads to problems with Technical Specification Tests and no indication of adequate mini-flow of ESS Pumps.

REF: D-PAL-85-20, D-PAL-85-175

SIGNIFICANCE: Failure or degradation of component can result in a forced outage. Results in frequent Technical Specification failures due to improper recirc flow readings.

RESOLUTIONS:

Prior to Plant Startup - FT-0404 should be moved upstream of the fast recirc line so as to prevent overranging.

OBSERVATION NO: ESS-08 COMPONENT(S): Containment Spray Flow Indication FI-0302, FT-0302, FI-0301, FT-0301

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 06/23/86

DESCRIPTION: Flow indication problems. WO history for flow indicators/flow transmitters has shown transmitter calibration problems were the root cause of most failures.

SIGNIFICANCE: Frequent Control Room deficiency.

RESOLUTIONS:

Prior to Plant Startup

1. I&C should perform a loop check.
2. This item is a repeat Control Room deficiency and work order history indicates a repeat problem. Transmitters should be replaced. Also, investigate and accelerate calibration schedule.

OBSERVATION NO: ESS-09 COMPONENT(S): HPSI Loop 2A Flow Transmitter FT-0312

EVALUATOR(S): JGBouwens/CMGrady REV NO: 1 DATE: 06/23/86

DESCRIPTION: Transmitter failure.

REF: E-PAL-85-64, D-PAL-85-106, E-PAL-85-60, E-PAL-85-61

SIGNIFICANCE: Not a recent Operator concern. Failure or degradation of component can result in a forced outage.

RESOLUTIONS:

As Part of 5-Year Plan: Scheduled for replacement/calibration as part of an NRC commitment.

OBSERVATION NO: ESS-10 COMPONENT(S): LIA-0331, 0332 SIRW Tank Level Indicator/Alarm

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 6/23/86

DESCRIPTION: LIA-0332 became 0332A and added 0332B on C-150. Loop check performed. There were indicator problems, but they have been resolved. Heat tracing failure alarm being added for transmitters to ensure transmitters do not freeze. There have been no problems with the transmitters since they have been installed.

SIGNIFICANCE: Failure or degradation of component can result in forced outage. No recent problems of operator concern.

RESOLUTIONS:

No Further Action Required - Indicators have worked since installation and had adequate post maintenance testing (ie, loop check).

OBSERVATION NO: ESS-11 COMPONENT(S): Safety Injection Bottle Level Alarm and Transmitters LIA-0365, LIA-0368, LIA-0372, LIA-0374; LT-0365, LT-0368, LT-0372, LT-0374

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 06/23/86

DESCRIPTION: Operator concern of correct indication and alarms. If there were no back leakage problems through the safety injection check valves, these transmitters would not be a problem.

SIGNIFICANCE: Component important to reliable Plant operation. Failure or degradation of component can result in forced outage. High operator concern item. Potential distraction for operators during plant transients.

RESOLUTIONS:

Before The End of REFOUT 87 - Currently not a concern because there is no check valve leakage. Plant Projects should pursue the most cost effective method to prevent changes due to temperature swings. Most cost-effective modification to prevent temperature swings should be implemented before the end of REFOUT 87.

OBSERVATION NO: ESS-12 COMPONENT(S): LIA-0437A&B, LIA-0438A&B, LT-0437A&B, LT-0438A&B
Iodine Removal Tank Level Alarms and Transmitters

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 6/23/86

DESCRIPTION: Operator concern of correct indication and alarms. I&C has heat traced T-102 (hydrazine) transmitter reference leg and T-103 (sodium hydroxide) calibration sheet problems have been corrected. I&C indicated the above has corrected the problem. At 0950 on 6/4/86, LIA-0437A&B disagreed, LIA-0437B alarming.

REF: E-PAL-85-003, D-PAL-85-018, D-PAL-85-016, E-PAL-85-39

SIGNIFICANCE: Failure or degradation of components can result in a forced outage. Important to reliable plant operation.

RESOLUTIONS:

Prior To Plant Startup 1. Resolve problems with these instruments so that indication is reliable.
2. Trend instrument performance over next run to ensure reliable operation.

Before The End of REFOUT 87 - Investigate deletion of the requirement for chemical addition to the containment spray system.

OBSERVATION NO: ESS-13 COMPONENT(S): MO-3007 HPSI to PCS Loop 1A

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 06/23/86

DESCRIPTION: Limitorque operator missing; valve currently locked open.

SIGNIFICANCE: Safety related. Operator concern. Operator distraction during routine evolution or surveillances but not during Plant trip.

RESOLUTIONS:

Prior to Plant Startup - Install new limitorque operator or obtain new valve with operator and install.

Observation No: ESS-14 - See Observation No: MIS-06

Observation No: ESS-15 - See Observation No: MIS-10

OBSERVATION NO: ESS-16 COMPONENT(S): P-66A and P-66B HPSI Pumps

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 06/23/86

DESCRIPTION: Repeat problems with sealing surface between the mechanical seals and the pump casing. Leakage problem (contamination), but not a pump performance problem.

REF: D-PAL-86-140, D-PAL-85-143, D-PAL-86-115, E-PAL-86-029

SIGNIFICANCE: Safety related; failure or degradation of component can result in forced outage. Not an operator concern during Plant trips.

RESOLUTIONS:

<u>As Part of 5-Year Plan</u> - Seal leakage is due to design, but does not cause pump performance problem. Review new seal design.

OBSERVATION NO: ESS-17 COMPONENT(S): P-67A & P-67B LPSI Pumps

EVALUATOR(S): JGBouwens/CMGrady REV NO: 4 DATE: 6/23/86

DESCRIPTION: Leaking gaskets, drop in pump performance as shown in Tech Spec test.

REF: D-PAL-86-104, D-PAL-85-142, D-PAL-85-135, D-PAL-84-77, E-PAL-84-073,

SIGNIFICANCE: Safety Related. Failure or degradation of component can results in forced outage. Not an active operator distraction on plant trips.

RESOLUTIONS:

Prior To Plant Startup

1. Due to excessive casing gasket leakage, suction and discharge flange leakage and decreasing pump performance from Tech Spec tests, P-67B should be rebuilt under vendor supervision prior to startup.
2. Suction and discharge piping may be misaligned - evaluate and repair.
3. Resolve WO 24500152 for P-67A.

OBSERVATION NO: ESS-18 COMPONENT(S): SIRW Tank Recirc Pump P-74

EVALUATOR(S): JGBouwens/CMGrady REV NO: 1 DATE: 6/23/86

DESCRIPTION: There have been 4 mechanical seal replacements since 11/16/83.

SIGNIFICANCE: Operator concern. Failure of pump requires alternate SIRW tk recirc lineup.

RESOLUTIONS:

Prior To Plant Startup: Review last 3 years of WO history to determine root cause for seal failure and repair as necessary by November 1986.

OBSERVATION NO: ESS-19 COMPONENT(S): PCV-0437A Nitrogen Supply to T-102

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 06/23/86

DESCRIPTION: Not properly controlling flow. System has not worked as designed since initial installation.

SIGNIFICANCE: Requires Operator's attention to maintain tank within Technical Specification limits.

RESOLUTIONS:

Prior To Plant Startup Complete the project to closeout FC-419 and replace PCV-0437B with three-way regulator to allow bleeding T-102 pressure and maintain pressure within Technical Specification limits. Add test connection to allow in-place testing of components.

OBSERVATION NO: ESS-20 COMPONENT(S): DBA/Normal Shutdown Sequencers

EVALUATOR(S): REschrader REV NO: 03 DATE: 06/23/86

DESCRIPTION: Contacts fail to close, setpoints drift, continuously fails Tech Spec tests and intermittently stops operation partway through timing sequence. Actual failure rates on the sequencers is "clouded" by a) lack of a good preventive maintenance program; b) lack of familiarity with sequencer operation and testing devices and c) plant modifications (covers) to the sequencers which have caused some operating failures from interference.

REF: D-QP-84-02, D-PAL-84-190, E-PAL-84-047, D-PAL-86-63, D-PAL-86-76, D-PAL-86-104.

SIGNIFICANCE: Safety related. Does not cause operator distractions on normal plant trips but during accidents could pose significant distractions. Misaligned cams could cause improper loading sequence and subsequent loss of emergency power system.

RESOLUTIONS:

Prior To Plant Startup

1. Carefully examine the protective covers and redesign, if appropriate, to preclude additional sequencer failures from cover interference.
2. Utilize spare contacts on the sequencers, in parallel with those already in use, for redundancy in the most critical applications.
3. Perform procedures ESS-E-12 and ESS-I-13; include recommendation No 2 on Page 6 of IOM: D-PAL-84-195A from REschrader (RES 32-84) dated 12/7/84.
4. Perform Technical Specification surveillance tests on each sequencer to ensure operability.

Before The End of REFOUT 87 Evaluate alternatives II, III and IV of IOM: RES 32-84 to determine if redesign/ replacement provides a cost effective solution for resolution of sequencer failures.

OBSERVATION NO: ESS-21 COMPONENT(S): CV-3040, CV-3044, CV-3048, CV-3050 N_2 Supply to SI Tanks

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 06/23/86

DESCRIPTION: CV-3044 and CV-3050 leakage prior to and during 5/19/86 trip. This leakage resulted in SIT T-82B & T-82D being effectively crosstied in the gas space. If T-82B pressure dropped, T-82D would also. This could leak to a condition that both SITs could be inoperable at the same time. Currently being repaired. One had scored seat, one had bent stem.

SIGNIFICANCE: Safety Related. Failure or degradation of component can result in forced outage. Results in operator distraction.

RESOLUTIONS:

Prior To Plant Startup
1. Repair and test.
2. Test valves and ensure valves leak tight.

OBSERVATION NO: ESS-22 COMPONENT(S): MO-3015, MO-3016 Shutdown Cooling Inlet Isolation Valves

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 06/23/86

DESCRIPTION: High maintenance item due to packing leaks.

REF: D-PAL-85-146

SIGNIFICANCE: Safety Related. Failure or degradation of component can result in forced outage due to PCS leakage.

RESOLUTIONS:

Prior To Plant Startup 1.Repack and test stroke time.

2.Implement live load packing and blocking off leakoff line.

Before The End of REFOUT 87 - This arrangement should be watched during this cycle and evaluated at REFOUT 87.

OBSERVATION NO: ESS-23 COMPONENT(S): SIRW Tank T-58

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 06/23/86

DESCRIPTION: A leak was discovered in the SIRW tank during REFOUT 85 in the vicinity of the recirc return line. The leak was evaluated and supports added to the line to provide independent support. At the same time a leak detection system was installed and a surveillance implemented.

SIGNIFICANCE: Safety Related. Lack of knowledge about leak status causes operator concerns. Not an active concern during plant transients.

RESOLUTIONS:

Prior To Plant Startup - Evaluate the current status of SIRW tank leakage, leakage condition and monitoring actions and provide status to plant management and plant operators.

Before The End of REFOUT 87 - Repair SIRW Tank.

OBSERVATION NO: ESS-24 COMPONENT(S): CV-3001, CV-3002 Containment Spray Valves

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 06/23/86

DESCRIPTION: Containment spray valves leak through. This leakage requires manual isolation of Low Pressure Safety Injection and Containment Spray Pumps to run monthly surveillance testing so that leakage does not result in water spray to containment. This makes the LPSI & Containment Spray Pumps inoperable for this testing.

REF: E-PAL-84-81; E-PAL-84-88

SIGNIFICANCE: Safety Related. Not an active concern during Plant trips.

RESOLUTIONS:

Before The End of REFOUT 87

1. Repair or replace CV-3001 & CV-3002.
2. Revise surveillance procedures after repair so as not to render LPSI and spray pump inoperable. Tech Spec test was run until 1981 without rendering pumps inoperable.

OBSERVATION NO: ESS-25 COMPONENT(S): T-103 Iodine Removal Make-up Tank

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 6/23/86

DESCRIPTION: N_2 leaks, tank has no pressure control system to provide automatic fill. Requires AO/Operator attention.

SIGNIFICANCE: Component results in operator response. Tank must be manually pressurized on a routine basis.

RESOLUTIONS:

Prior To Plant Startup - Inspect T-103 and related components to ensure leak tight.

Before The End of REFOUT 87 - Consider deletion of requirement for tank. (Reference ESS-12).

OBSERVATION NO: ESS-26 COMPONENT(S): C-6C High Pressure Air Compressor

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 6/23/86

DESCRIPTION: High pressure air compressor is not presently cross tied to MSIV air. A modification was made in response to previous MSIV trip problems to provide the cross-tie. Possibly not presently tied due to excessive run time of C-6C. Cross tie of high pressure air with instrument air was a result of a modification to the Main Steam Isolation Valve. A new stainless steel disc/disc arm was installed to provide adequate design margin if valve went closed under full flow condition. The new disc/disc arm assembly is substantially more massive than the old style. After return to full power operation, inadvertent MSIV closure was experienced. It was determined the air operator for the MSIV was marginal with the new disc arm. Subsequently, larger bore air operators were installed eliminating the inadvertent MSIV closures.

SIGNIFICANCE: Important to reliable plant operation. Component has the potential for challenging safety systems.

RESOLUTIONS:

Prior To Plant Startup - System Engineer evaluate if backup air supply is required and return high pressure air to MSIV's to service if required.

OBSERVATION NO: ESS-27 COMPONENT(S): Recirculation Actuation Circuitry

EVALUATOR(S): BNYoung REV NO: 1 DATE: 06/23/86

DESCRIPTION: Previous failures of RAS circuitry as documented by corrective action documents. There are no repeat items. These items (E-PAL-84-032, E-PAL-84-031, Work Order 24602377) are all related to the same single item; other items are unrelated items on the same system.

REF: E-PAL-84-37, E-PAL-84-32, E-PAL-84-31, D-PAL-86-53

SIGNIFICANCE: Safety Related. Not an active operator concern or distraction. Listed due to repeat failures.

RESOLUTIONS:

No Further Action Required

OBSERVATION NO: ESS-28 COMPONENT(S): CV-3051, CV-3065 Vent Valves on SI Bottles

EVALUATOR(S): JGBouwens/CMGrady REV NO: 1 DATE: 06/23/86

DESCRIPTION: These valves are the vents on the SI bottles that are currently experiencing leakage through N_2 valves. They were changed and repaired during REFOUT 85. They are included here to ensure previous work was completed correctly.

SIGNIFICANCE: Not an active operator concern or distraction. No leakage through vent valves has occurred this run. Does not appear to be a present problem.

RESOLUTIONS:

No Further Action Required Not an active concern. Any leakage will be monitored and diagnosed as part of SIT N-2 supply valve leakage monitoring prior to critical.

OBSERVATION NO: ESS-29 COMPONENT(S): General - Safety Injection Signal Circuitry

EVALUATOR(S): BNYoung REV NO: 2 DATE: 06/23/86

DESCRIPTION: Seven items pertaining to SIAS were identified:

- Two separate, non-repeatable failures possibly due to dirty contacts.
- Two items where procedures were not updated after specification changes.
- Two occurrences where an SIS block relay failed.
- A single occurrence where links were not reclosed following maintenance.

Of the seven items in this file, only the sticking SIS block relay, (TX-4/TD) was a repeat failure. This item was addressed by LER 85-001. Facility Change, FC-683 is currently underway to close out the recommended corrective actions. The FC has been reviewed with the responsible engineer and found to be sufficient.

REF: D-PAL-84-237, D-PAL-85-112, D-PAL-86-043, E-PAL-85-65

SIGNIFICANCE: The safety injection circuitry is important to safety. It initiates the major actions which are designed into the Plant to limit the effects of an accident. Redundant safety injection initiation circuits are provided. No failure in this file affected more than one train, nor did any failure in this file disable any safety injection function.

RESOLUTIONS:

Prior To Plant Startup - Complete Facility Change FC-683.

OBSERVATION NO: ESS-30 COMPONENT(S): P-54A, Containment Spray Pump

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 06/23/86

DESCRIPTION: Containment spray pump flow and vibration have been consistent since the end of the 1985 refueling outage. 1985 history shows consistent pump performance. Deviation Reports appear to address a one-time isolated incident. Currently, adding a gauge on P-54A to get DP on the pump.

REF: D-PAL-84-278; D-PAL-84-286

SIGNIFICANCE: Not an active operator concern or distraction. Listed solely due to repeat Deviation Reports.

RESOLUTIONS:

No Further Action Required - Pump problems will be identified during normal surveillance testing.

OBSERVATION NO: ESS-31 COMPONENT(S): CK-3226, CK-3216 Containment Spray Check Valves

EVALUATOR(S): JGBouwens/CMGrady REV NO: 1 DATE: 06/23/86

DESCRIPTION: Containment Spray check valves have routinely failed Tech Spec Surveillance Test QO-10, though there is no indication of an actual hardware problem. Valves were disassembled in August to ensure operability and tested by an alternate source during REFOUT 85. The problem has been isolated to the test method, in particular a recirculation line which is used during the test.

REF: D-PAL-85-104, D-PAL-86-51

SIGNIFICANCE: Safety Related. Not an active operator concern or distraction; repeated failures only concern.

RESOLUTIONS:

Prior To Plant Startup - Cut out MV-3217 and clean recirc line prior to running QO-10. If QO-10 passes test, problem is addressed. If test does not pass determine cause and repair prior to startup.

OBSERVATION NO: ESS-32 COMPONENT(S): T-102, 103 Outlet Check Valves

EVALUATOR(S): REV NO: 1 DATE: 06/23/86

DESCRIPTION: Problem with test method has resulted in test failures. Test has been revised.

REF: D-PAL-86-69

SIGNIFICANCE: Not an active operator concern or distraction. Failure of surveillances only current concern.

RESOLUTIONS:

No Further Action Required: Item is adequately addressed by resolution of D-PAL-86-069.

Observation No: ESS-33 - See Observation No: CVC-28

SYSTEM	TITLE
FPS	FIRE PROTECTION SYSTEM
01	Diesel Fire Pumps and Drivers, K-5, K-10, P-41, P-9B
02	LI-1307 Basin Level Indicator
03	MV-130 and MV-131 Fire Protection System to SWS Cross Connect Valves
04	Fire Doors
05	Fire Pump Auto Start Instrumentation
06	Sprinkler Fire Alarm Panel C-47

OBSERVATION NO: FPS-01 COMPONENT(S): Diesel Fire Pumps and Drivers, K-5, K-10, P-41, P-9B

EVALUATOR(S): AETome REV NO: 2 DATE: 06/23/86

DESCRIPTION: Diesel driven fire pumps have experienced battery problems and cooling system corrosion. There have been industry problems with flywheel cracking. The flywheels are scheduled to be replaced and the old wheel will be NDT'd. The last battery failure occurred in 1984. The battery PM program should preclude these failures from recurring. The System Engineer is currently evaluating cooling water treatments. The water jacket on K-5 was flushed in January of 1986. Currently, one diesel water jacket has a chromate corrosion inhibitor.

REF: E-PAL-84-04, D-PAL-84-101,

SIGNIFICANCE: Not a current operator concern or distraction. Listed due to number of Work Orders and general concern about cracked flywheel.

RESOLUTIONS:

Before The End of 87 REFOUT - Replace flywheels.

As Part of 5-Year Plan 1. Evaluate old flywheels.

2. Evaluate the use of chromates.

OBSERVATION NO: FPS-02 COMPONENT(S): LI-1307 Basin Level Indicator

EVALUATOR(S): AETome REV NO: 2 DATE: 06/23/86

DESCRIPTION: This indicator is used to calculate service water and fire water pump pressure drop. If the pressure drop is out of tolerance a DR is issued and the plant enters an LCO. The total dynamic head, pressure drop across the pump, is being used as an indicator of performance.

REF: D-PAL-85-115

SIGNIFICANCE: Not an active operator concern or distraction during a plant trip or transient. Listed due to inaccuracy of level instrument placing service water pumps in an inoperable status.

RESOLUTIONS:

Prior To Plant Startup - Add a prerequisite to MO-16 to service LI-1307.

As Part of 5-Year Plan - Evaluate replacement of LI-1307.

OBSERVATION NO: FPS-03 COMPONENT(S): MV-130 - MV-131 Fire Protection System to SWS Cross Connect Valves

EVALUATOR(S): AETome REV NO: 2 DATE: 06/23/86

DESCRIPTION: The cross connect valves between the fire protection system and the service water system cannot be opened manually against the pressure drop between the two systems. The FPS is a backup to both the SWS and the AFS.

SIGNIFICANCE: Poses a hindrance to plant response on a loss of service water capacity. Not a concern during normal plant operating or transients.

RESOLUTIONS:

Prior To Plant Startup - Resolve the problem of ability to open the valves under dp, including replacement of the handwheels if necessary.

OBSERVATION NO: FPS-04 COMPONENT(S): Fire Doors

EVALUATOR(S): AETome REV NO: 1 DATE: 6/23/86

DESCRIPTION: Some fire doors are inoperable at times. Inoperable fire doors require an hourly fire inspection by the security department. This has resulted in increased manpower requirements for the security department.
MO's are in the system to replace several fire doors.

SIGNIFICANCE: Not an active operator concern or distraction. Listed solely due to number of work orders.

RESOLUTIONS:

Before The End of 87 REFOUT: Replace and repair inoperable fire doors.

OBSERVATION NO: FPS-05 COMPONENT(S): Fire Pump Auto Start Instrumentation

EVALUATOR(S): AETome REV NO: 1 DATE: 6/23/86

DESCRIPTION: Diesel Fire Pumps had been starting at a pressure below the acceptance criteria pressure. This resulted in initiation of a DR and declaring the pump inoperable. The administrative setpoint was changed so that the pumps would start earlier, prior to reaching the Tech Spec limits. This was done in early 1983.

REF: D-PAL-84-316, D-PAL-85-19, D-PAL-84-362
SPC-85-012, 013, 014

SIGNIFICANCE: Not an active operator concern or distraction. Listed solely due to number of deviation reports.

RESOLUTIONS: No Further Action Required

OBSERVATION NO: FPS-06 COMPONENT(S): Sprinkler Fire Alarm Panel C-47

EVALUATOR(S): AETome REV NO: 1 DATE: 6/23/86

DESCRIPTION: The C-47 fire alarm panel does not have reflash capability. An Event Report is currently outstanding which recommends replacing this panel. The specification change, SC-83-115, has been completed and the hardware has been procured.

REF: E-PAL-82-143, D-PAL-81-116, E-PAL-81-083, E-PAL-81-092, E-PAL-81-047, E-PAL-82-080. SC-83-115.

SIGNIFICANCE: Lack of reflash alarm capability results in control room operators needing to frequently check the present panel which is in the back corner of the control room to ensure no other alarms exist.

RESOLUTIONS:

Before The End of REFOUT 87 - Replace Panel C-47.

SYSTEM	TITLE
FWS	FEEDWATER SYSTEM
01	Feed Reg CV-0701, CV-0703
02	CV-0734, CV-0735 Feedwater Reg Bypass Valves
03	CV-0742, CV-0744 Feedwater Reg Block Valves
04	See AFW-01
05	See AFW-02
06	See AFW-03
07	P-1A & B Main Feedwater Pumps
08	CK-0701, CK-0702 Feedwater Check Valves
09	See AFW-04
10	See AFW-05
11	See AFW-06
12	See AFW-07
13	See AFW-08
14	See AFW-09
15	Feedwater Pump Controls HIC-0525, 0526, and 0529

OBSERVATION NO: FWS-01 COMPONENT(S): Feed Reg CV-0701, CV-0703

EVALUATOR(S): JJPopa REV NO: 2 DATE: 06/23/86

DESCRIPTION: Have had several maintenance problems with these valves (packing, air leaks, valve operation). It is difficult to do PMs because valve operability is required during operation. The valves have been repacked approximately annually. There is also a history of operator and control failures (gaskets and O-rings)

SIGNIFICANCE: Important to reliable Plant operation. Failure to operate poses a hindrance to response on a plant transient. Feedwater regulating valves CV-0701 and CV-0703 are both required for Plant operation. Malfunction of either of these valves can (and has) caused Plant trip. These valves are designed to close on a Steam Generator low pressure signal to prevent continued feedwater addition in the event of a main steam line or main feedwater line break. Failure to close under these postulated accident conditons could result in above design containment pressure and temperature (though not so high as to challenge containment structural integrity).

At least one of these valves or one Feed Reg Bypass must be operable in order to use the condensate system as a backup to the Auxiliary Feedwater System.

RESOLUTIONS:

Prior To Plant Startup

1. Visually inspect the operator (disassembly not necessarily required).
2. Check controls.
3. Check for air leaks.
4. Blow out lines.
5. Check for dirt.
6. Calibrate and adjust.
7. Check packing.
8. Initiate a PACS or Work Order to include the above approximately every six months as plant conditions allow.

OBSERVATION NO: FWS-02 COMPONENT(S): CV-0734, CV-0735 Feedwater Reg Bypass Valves

EVALUATOR(S): JJPopa REV NO: 2 DATE: 06/23/86

DESCRIPTION: There have been actuator and positioner problems, and there is a current problem with controller response. Review of past 2 years of MOs do not indicate packing leaks or failures.

SIGNIFICANCE: Important to Reliable Plant Operation. Poses a hindrance in response on a Plant Transient. The Feedwater Reg Valve bypasses or the Feedwater Reg Valves provide a flow path for use of the condensate system as a backup to the Auxiliary Feedwater system. It would be desirable to have both bypasses, which are smaller, available for this mode of operation. For success, however, any one of four valves, Feed Regs or bypasses, being operable is sufficient.

RESOLUTIONS:

Prior To Plant Startup - Check/clean/adjust controllers startup (last one was 1½ years ago).

Before The End Of REFOUT 87

1. Initiate an annual refueling/outage PACS on cleaning and adjusting controller.
2. Inspect/replace packing (if necessary) annually PAC.
3. Correct the P&ID's to show that these valves are not air-to-open (they fail as is).

OBSERVATION NO: FWS-03 COMPONENT(S): CV-0742, CV-0744 Feedwater Reg Block Valves

EVALUATOR(S): JJPopa REV NO: 2 DATE: 06/23/86

DESCRIPTION: Positioner problems have been experienced in the past. Review of MO's shows recent repairs to actuator. Both operators were overhauled during the refueling outage and had to be reworked in April and May respectively. Operations has not been able to open under high dp (though not a great concern, and it is not clear that they are designed to operate under high dp).

SIGNIFICANCE: Not an active concern or distraction to operators on Plant trip or transient. Air leakage causes excessive run time on C-6C High Pressure Air Compressor.

RESOLUTIONS:

Prior To Plant Startup
1. Check for air leakage indicating bad seals, O-rings
2. Check packing
3. Determine need or presence of oiler and filter

Before The End Of REFOUT 87
1. Long term PM on seals and O-rings using some type of PAC sheet with instructions. Include checking of air filter.
2. Evaluate whether valves should operate under high dp and resolve if necessary.

Observation No: FWS-04 - See Observation No: AFW-01

Observation No: FWS-05 - See Observation No: AFW-02

Observation No: FWS-06 - See Observation No: AFW-03

OBSERVATION NO: FWS-07 COMPONENT(S): P-1A & B Main Feedwater Pumps

EVALUATOR(S): JJPopa REV NO: 1 DATE: 06/23/86

DESCRIPTION: Seal and lube oil leaks, pump vibration. Review of Maint Orders show some hanger adjustments. Oil becomes contaminated with water (due to leakage by the seals) when the pump is idle and condensate pumps are running. Two modifications were implemented in 1985 to improve monitoring and handling of water. Minor oil leaks are not a major concern, and aren't abnormal on such a large complicated piece of equipment. Additional vibration monitoring equipment has been installed and a program is ongoing.

SIGNIFICANCE: Important to Reliable Plant Operation, potential for challenging safety systems, failure or degradation can result in a plant trip.

RESOLUTIONS:

Prior To Plant Startup

1. Review the pump startup procedures with Operations to minimize water to oil during start.
2. Have the vendor review the current status of our seal problems and provide recommendations.

OBSERVATION NO: FWS-08 COMPONENT(S): CK-0701, 0702 Feedwater Check Valves

EVALUATOR(S): JJPopa REV NO: 1 DATE: 6/23/86

DESCRIPTION: Have been several occasions where slight leakage of water is backfeeding by the check valves.

SIGNIFICANCE: Leakage past the main feed check valves in the backwards direction limits complete isolation of feedwater heaters from the steam genertors. This condition would only occur during startup and shutdowns. Severe leakage past different types of check valves in the same service at other PWR's has caused hindrance to plant control during transients.

RESOLUTIONS:

Prior To Plant Startup Disassemble and inspect valves and make repairs as necessary.

Observation No: FWS-09 - See Observation No: AFW-04

Observation No: FWS-10 - See Observation No: AFW-05

Observation No: FWS-11 - See Observation No: AFW-06

Observation No: FWS-12 - See Observation No: AFW-07

Observation No: FWS-13 - See Observation No: AFW-08

Observation No: FWS-14 - See Observation No: AFW-09

OBSERVATION NO: FWS-15 COMPONENT(S): Feedwater Pump Controls HIC-0525, 0526, and 0529

EVALUATOR(S): RPMargol REV NO: 1 DATE: 6/23/86

DESCRIPTION: System is operated in manual to prevent feedpump speed from hunting. May be tied to feedwater reg valve control(FWS-01). Issue identified by one of the Shift Engineers.

SIGNIFICANCE: Poses a hindrance to response on a plant transient or trip.
Failure or degradation can lead to a plant trip.

RESOLUTIONS:

Prior To Plant Startup

1. Perform a loop check/calibration on the feedwater regulatory circuitry.
2. Verify proper feedwater control during and after plant power ascension.

Before The End of REFOUT 87

1. If loop check/calibration did not adequately resolve control problem, establish system design parameters and test monitor system to verify if it is performing to design. Identify any degraded equipment (eg feedpumps, valves, heaters), that could be contributing to control problems. Repair components as required.
2. Evaluate calibration frequency of feedwater regulating circuitry ~~circuitry~~ (currently 18 months) for a more frequent interval.

SYSTEM	TITLE
MIS	MISCELLANEOUS
01	Control Room Chart Recorders Drive Systems (Generic Issue)
02	Generic Issue Farris Relief Valves
03	Generic Issue - GE Hand Switches
04	Control Room Deficiencies
	(including Pages 1-4 Control Room Deficiencies)
05	Communications - Phone System
06	Generic Issue - Valve Packing & Packing Adjustment; Affecting Valve Stroke Time
07	See EPS-06
08	Generic Hangers/Restraints
09	Solenoid Valves
10	Limitorque Valve Operators
11	Work Order Backlog Review

OBSERVATION NO: MIS-1 COMPONENT(S): Control Room Chart Recorders Drive Systems (Generic Issue)

EVALUATOR(S): VJBeilfuss REV NO: 2 DATE: 6/23/86

DESCRIPTION: Control Room chart recorders are high maintenance items. These recorders are necessary to observe trends on plant parameters. Specific items have been evaluated (PCS-07, PCS-15, PCS-16) for action.

SIGNIFICANCE: Causes operator distraction due to frequent failures (paper binding, not inking). Several recorders are used frequently for key plant parameters (S/G level). Backup indication is available but not as accessible. Poses a hindrance to response on a plant transient.

RESOLUTIONS:

Prior To Plant Startup - Insure all control room recorders are operational.

Before The End of REFOUT 87 - Prepare a list of recorders that need to be replaced.

As Part of 5-Year Plan - Replace targeted recorders with new, more reliable units.

OBSERVATION NO: MIS-2 COMPONENT(S): Generic Issue Farris Relief Valves

EVALUATOR(S): VJBeilfuss REV NO: 3 DATE: 6/23/86

DESCRIPTION: There are continuing problems with Farris Relief Valves. They do not have an 'N' stamp and cannot provide parts for safety-related valves. For non-safety related valves, Farris is updating materials. CPCo is planning to cross reference parts between valves and document the new parts.

SIGNIFICANCE: Leakage through these valves can result in a plant forced outage. Specific problem relief valves are addressed in separate line items.

RESOLUTIONS:

Before The End of REFOUT 87 - Identify safety-related relief valves and determine if spare parts are adequate based upon equipment history. If not, process SC's to replace with different manufacturer.

As Part of 5-Year Plan - Incorporate into 5-Year plan the action to replace safety-related relief valves with those from a vendor who can provide spare parts and support. This has no impact on reliable plant operation at this time.

OBSERVATION NO: MIS-03 COMPONENT(S): Generic Issue - G E Hand Switches

EVALUATOR(S): VJBeilfuss REV NO: 2 DATE: 6/23/86

DESCRIPTION: G E hand switches Model CR2940 have had a recent history of failure. Most problems have been associated with the switch operators. Approximately 50 operators or cams were replaced due to the lack of a step in the cam. The switch operator for MOV-3015 was found to be damaged, most probably during factory assembly and was an isolated case.

SIGNIFICANCE: Not an active operator concern or distraction. Many of these switches were replaced during 85 Refout and several failures have occurred during subsequent startup testing. Failure of switches could result in plant shutdown due to technical specification violation.

RESOLUTIONS:

No Further Action Required - Problems have been identified with cams and retainer screws in the switch operator. Procedures have been modified to include "Loc-titing" retainer screws in the switch operator and a PAC is in place to replace the switch operator every 5 years. Based upon the recent operational history of these switches, no further action is required.

OBSERVATION NO: MIS-04 COMPONENT(S): Control Room Deficiencies

EVALUATOR(S): VJBeilfuss REV NO: 1 DATE: 06/24/86

DESCRIPTION: Control Room deficiencies are listed as a separate line item to address equipment failures as a group which add to operator distraction. List of Control Room deficiencies are composed weekly allowing review and disposition of deficiencies as a generic line item. Latest printout (as of 6/11) indicates there are 36 items, 5 of which cannot be repaired at this time.

SIGNIFICANCE: Control Room deficiencies and alarms pose a hindrance to Plant response on a transient or a trip and creates operator concern and distraction.

RECOMMENDATIONS:

Prior To Plant Startup - Correct all deficiencies listed on the attached Control Room Deficiency List, with the exception of the five listed: TIA-0137A, TIA-0138A, TIA-0138B, TIA-0146, TR-0506

Before The End Of REFOUT 87 - Repair all remaining Control Room deficiencies that cannot be completed at this time.

OUTSTANDING

CONTROL ROOM DEFICIENCIES

6/11/86

COMPONENT	PROBLEM	WO NUMBER	RESP DEPT	STATUS	EST COMP DATE
TIA-0137A	Failed low	24500359	I	AFS	Requires Disassembly of RCP "A" Motor
TIA-0138A	Failed low	24500362	I	AFS	Requires Disassembly of RCP "A" Motor
TIA-0138B	Spikes down	24504434	I	AFS	Requires Disassembly of RCP "B" Motor
RIA-5710	Keeps alarming	24501165	I	APE	
PIC-0202	Will not always control in auto.	24605120	I	SCH	
TIA-0146A	Reads low	24605135	I	SCH	Outage
TR-0506	PT #4 Erratic	24505022	I	AFS	Outage
K01, 58	Alarm won't clear	14604484	I		Outage
TIA-0104	Failed low	24604465	I	SUS	Outage
K02-14	C-163 heat trace failed	24605192	I	APT	Materials
CV-0730	Drifts open	24605005	I	APE/SUS	Outage
RIA-2315	Erratic	24605175	I	SUS/APE	Rx Bld Entry Req
TR-0506	Pointer sticks	24605535	I	CMP	
LT-0383	Reads high	24605532	I	SUS	

OUTSTAN..G

CONTROL ROOM DEFICIENCIES

6/11/86

COMPONENT	PROBLEM	WO NUMBER	RESP DEPT	STATUS	EST COMP DATE
K13-47	Alarm intermittent	24605643	I	APT/OPS - SUS back in service	
TI-5340	Reads low	080376	I		
CV-2012	Failed close	24605794	I	SCH	
K-11 #37	FS-0954 faulty	24605824	I	APT	
K-11 #38	FS-0958 faulty	24605823	I	APT	
K-35 #9	Unable to clear alarm	24605789	I	SUS	
FI-0404	Calibrate		I		
LIA-2020	Repair alarm	086533	I		
PIC-0101B	Repair alarm	086539	I		

OUTSTANDING

CONTROL ROOM DEFICIENCIES

6/11/86

COMPONENT	PROBLEM	WO NUMBER	RESP DEPT	STATUS	EST COMP DATE
Pzr Htrs Group 2	No red light when heaters on alarms	24501984	E	APE	Post Refout
D.G.1-1 Freq Meter	Meter broken	080764	E	Lab Services	
K09-40	Backstop pump may be tripped	24605368	E	IPS	
K09-38	Backstop pump may be tripped	24605142	E	IPS	
VC-10	Compressor trips	080461	E		

OUTSTANDING

CONTROL ROOM DEFICIENCIES

6/11/86

COMPONENT	PROBLEM	WO NUMBER	RESP DEPT	STATUS	EST COMP DATE
MO-3007	Operator missing	24501222	M	APT	Material
K-11, #11	Valve not shifting Inst Air Dryer		M		
CV-2001	Leaks by seat	24604601	M	APT	
PRV-1072	Does not always reset	24605021	M	SCH	
CV-0779	Won't open on trip	24605524	M	APE	
P-55A	Switch broke	24605522	M	IPS	
CV-2002	Leaks by	24604993	M	IPS	
P-72A	Will not shut off in auto	24605512	M	AFS	

OBSERVATION NO: MIS-5 COMPONENT(S): Communications - Phone System

EVALUATOR(S): VJBeilfuss REV NO: 1 DATE: 06/23/86

DESCRIPTION: In January, 1984 there was a loss of offsite power which caused loss of certain features of the telephone system.

Ref: D-PAL-84-054.

SIGNIFICANCE: Important to reliable plant operation. Would cause significant operator distraction after 2 hours following loss of power.

RESOLUTIONS:

No Further Action Required - The phone system has been extensively modified and upgraded in November, 1985. There is a letter (ref CSK86*050 attached) explaining the use and procedure for phones under conditions of loss of power. No further action appears to be necessary to assure reliable plant operation.

OBSERVATION NO: MIS-06 COMPONENT(S): Generic Issue - Valve Packing and Packing Adjustment Affecting Valve Stroke Time

EVALUATOR(S): VJBeilfuss REV NO: 1 DATE: 06/23/86

DESCRIPTION: There is a high number of work orders which indicate poor success with valve packing. This issue has several elements which can affect reliable plant operation.

1. Valve Packing: Packing leaks are annoying, can contribute to PCS leakage, and can possibly inhibit operator with severe leaks.
2. Packing Adjustment: Packing adjustment must be made carefully and with system awareness. Control valve stroking times is affected by torque applied to the packing glands.

SIGNIFICANCE: Stroke times of control valves and motor operated valves are checked and adjusted within specifications prior to startup, therefore it does not pose a distraction or concern during plant transients or trips. Operator distraction may occur during startup testing when packing adjustments affect valve stroking times.

RESOLUTIONS:

Before The End of REFOUT 87:
1. Develop and implement the valve packing program.
2. Employ an outside agency to review and confirm the adequacy of the program.
3. Develop a training program to improve the success rate of packing valves.

Observation No: MIS-07 - See Observation No: EPS-06

OBSERVATION NO: MISC-08 COMPONENT(S): Generic Hangers/Restraints

EVALUATOR(S): RPMargol/VJBeilfuss REV NO: 1 DATE: 06/23/86

DESCRIPTION: D-PAL-84-049 - Missing Nut, D-PAL-84-110, MSS & FWS Hangers and Supports (AIR A-PAL-82-87 cancelled), D-PAL-84-115 Bent Pipe Support, D-QP-84-08 Disconnected Hanger, D-QP-84-14, Conduit Support, D-QP-84-31, Seismic Restraint, D-QP-84-33, Motor Conduit, D-PAL-84-100 Cable Tray Support, D-PAL-84-250 Support Bracket, *D-PAL-84-262, D-PAL-84-90 EHC Bracket, D-PAL-85-102 Loose Anchor Bolt, D-PAL-86-27,Hanger Deficiency, D-QP-85-10, E-PAL-84-020, Disconnected Hanger, D-QP-85-11 Pipe Restraint, *D-QP-85-12 Pipe Restraint Corrective Action Documents indicate numerous piping hanger/restraint problems (Q and non-Q). Some of these deficiencies contributed to system failures (EHC, PCS, >1 gpm leak rate, etc)

SIGNIFICANCE: Failure or degradation can and has lead to plant forced outages or trips.

RESOLUTIONS:

Prior To Plant Startup:

1. Failure of the EHC system has lead to previous plant trips. Evaluate EHC piping restraints for adequacy (See TGS-01).
2. Feedwater heater E-4A has a broken floor support and has sunk into the the floor. Recommend repairing the floor pad and restoring the heater and associated piping to normal elevation to resolve the current piping and support concerns.
3. Walkdown high energy systems (MSS, HED, FWS, etc) to insure that hangers and restraints are properly fastened and adjusted.

Before the End of REFOUT 87

1. Develop a hanger and restraint inspection program and implement.

OBSERVATION NO: MIS-09 COMPONENT(S): Solenoid Valves

EVALUATOR(S): RPMargol REV NO: 1 DATE: 06/23/86

DESCRIPTION: IEIN 84-68 identified a potential deficiency in improperly rated field wiring to solenoid valves. The concern being the wire terminated inside the solenoid valve body housing. Ambient temperature inside the solenoid housing (energized) could reach up to 280°F and exceed the wire insulation rating. Potential for premature insulation degradation exists which could cause failure. Plant Safety Engineering Department who reviews IEINs for applicability dispositioned this particular IEIN by stating Palisades was replacing numerous solenoid valves (EEQ) with solenoids having pigtails external to the valve housing.

SIGNIFICANCE: Not an active operator concern or distraction during a Plant transient or trip. Failure or degradation could lead to a Plant forced outage.

RESOLUTIONS:

Before the End of REFOUT 87 Identify solenoid valves which were not included in the EEQ program which could be affected by this condition, and take appropriate corrective actions.

OBSERVATION NO: MIS-10 COMPONENT(S): Limitorque Valve Operators

EVALUATOR(S): VJBellfuss REV NO: 1 DATE: 06/23/86

DESCRIPTION: There is an industry concern over Limitorque valve operators. The concern involves torque switch settings, gear box lubrication, and wiring. Jumpers on the torque switches were modified during REFOUT 85-86 and tested satisfactory. Palisades has not had a history of operator failure. Two cooling tower valves had water in the gearbox and froze and the MSIV bypass valve operators were found to be undersized and would not operate.

SIGNIFICANCE: Important to reliable Plant operation. Some Safety Related. Could pose hindrance to Plant response on transient or trip. Failure or degradation could lead to Plant trip or forced outage.

RESOLUTIONS:

Prior To Plant Startup
1. Investigate a sample of those valves important to reliable Plant operation.
2. Obtain a grease sample.
3. Check torque switch settings.
4. Inspect limit switch lubrication.
5. Obtain amperage readings while stroking.

Before the End of REFOUT 87
1. Rebuild all Limitorques in the plant.

OBSERVATION NO: MIS-11 COMPONENT(S): Work Order Backlog Review

EVALUATOR(S): STWawro REV NO: 1 DATE: 07/01/86

DESCRIPTION: Perform Operations review of Work Order backlog to assure all significant work items are identified and included in outage work scope. Work order backlog as of 6/14/86 was reviewed by the Operations Support Supervisor (DWKaupa - SRO), a Shift Supervisor (BPBenson - SRO, and STWawro (SRO). A list was prepared (attached) of work orders that should be completed and closed out prior to startup.

SIGNIFICANCE: Important to reliable plant operations.

RESOLUTIONS:

Prior To Plant Startup - Complete W O's listed on the attachment. Any exceptions should be reviewed by the Operations/Maintenance Scheduling Group (headed by STWawro). Any conflicts which cannot be resolved shall be reviewed by the Executive/PRC group, and a Justification for Continued Operation should be prepared if approval of the exception is granted.

MIS-11 WORK ORDER BACKLOG REVIEW
ATTACHMENT

W O #	Equipment	Description
24605165	MV-AE140	Hole through Body
24605685	C-2A	Complete PM
24604935	C-2B	Water Line Leak
24605588	C-2C	Complete PM
24605694	C-903A	Intermittent Load Problem
24605143	C-6A	L S Doesn't Operate
24603940	M-902	Air Dryer Hung Up
24503176	PS-2500	Needs Replacing
24605824	FS-0954	Alarm in Control Room
24605823	FS-0958	Alarm in Control Room
24605878	E-10	Clean East Water Box
24605902	CV-5317, 5318	Crack in Air Line
24605693	CK-CRW407	Pen 41 did not Hold Pressure
24605789	EK-3509	Alarm will not Clear
24605513	MSM	Cooling Twr Pipes not Supported
24604250	EC-4	Replace Meter
24605877	C-6C	Drain Leaks
24605859	CV-3025	Air Leak
24605816	CV-3069	Packing Leak
24600683	MO-3041	Packing Leak
24600514	MO-3045	Large Packing Leak
24605472	MV-3203	Galling Up
24605473	MV-3231	Galling Up
24605559	MV-3352	Yoke Assembly Rotates
24605563	CV-0727	Packing Leak
24605562	CV-0749	Packing Leak
24604484	EK-0158	Alarm will not Clear
24604783	ST-0527	Not Cycling Properly
24605192	EC-163	H_2 Heat Trace Failed
24605134	CV-0522A	Body/Bonnet Leak
24605915	CV-0522B	Packing Leak
24604765	LIC-0101AL	PZR Level Failed Low
24602209	MV-1045	Replace Valve
24506146	TE-0111A	Reads High
24502097	LS-1068	Alarm will not Clear
24600790	P-77A	P-77A Coupling Alignment
24600792	P-77B	P-77B Coupling Alignment
24605481	EX-10	Breaker 8-3 Tripped
24605190	K-16	Won't Regulate Pressure
24505022	TR-0506	Erratic Point #4
24605921	PS-1678	VC-10 Tripping
24601600	VC-10	VC-10 Relay Buzzing
24605818	VC-11	VC-11 Suction Pressure

SYSTEM	TITLE
MSS	MAIN STEAM SYSTEM
01	CV-0511 Turbine Bypass Valve
02	CV-0522A, CV-0522B Auxiliary Feedwater Pump Steam Supply Valves
03	CV-0779, CV-0780, CV-0781, CV-0782 Atmospheric Dump Valves
04	MO-0501 & MO-0510 MSIV Bypass Valves
05	POS-0771 S/G E-50A Bottom Blowdown Isolation Valve Positioner
06	101 MS, 102 MS, 103 MS, 104 MS Steam Dump Manual Isolation Valves
07	CV-0501 & CV-0510 Main Steam Isolation Valves
08	RV-0701 through RV-0724 Main Steam Relief Valves

OBSERVATION NO: MSS-01 COMPONENT(S): CV-0511 Turbine Bypass Valve

EVALUATOR(S): JJPopa REV NO: 1 DATE: 06/23/86

DESCRIPTION: Failed to open on plant trip. Past history indicates repeated failure to operate properly.

SIGNIFICANCE: Poses a hindrance to Plant response on a trip or transient. Needed during startup and shutdown. On operator's concerns list.

RESOLUTIONS:

Prior To Plant Startup

1. Repair or replace.
2. Check, adjust & insure operability.
3. Evaluate testing in conjunction with monthly turbine valve testing. (Add to Operations "Weekly" Schedule)

OBSERVATION NO: MSS-02 COMPONENT(S): CV-0522A, CV-0522B Auxiliary Feedwater Pump Steam Supply Valves

EVALUATOR(S): JJPopa REV NO: 1 DATE: 06/23/86

DESCRIPTION: Recent repairs were to address stroke times and leakage through seats. Seat repair on both valves was performed this past REFOUT. Some packing leakage problems have been experienced. Stroke time adjustment varied from WO to WO depending upon the "requirement" at the time (between 120-25 sec).

SIGNIFICANCE: Not an active concern or operator distraction. Listed because of ERs and DRs.

RESOLUTIONS:

Prior To Plant Startup 1. Repair packing leaks.

2. Determine correct stroke times for these valves (minimum & maximum) and adjust as necessary.

Before The End of REFOUT 87 1. Review the timing sequencer to determine whether additional margin can be provided.

OBSERVATION NO: MSS-03 COMPONENT(S): CV-0779, 0780, 0781, 0782 Atmospheric Dump Valves

EVALUATOR(S): JJPopa REV NO: 2 DATE: 6/23/86

DESCRIPTION: CV-0779 failed to open on May 19 trip. It has subsequently been identified that the diaphragm had failed. Review of past WO's indicate repeat diaphragm failures

SIGNIFICANCE: Important to reliable plant operation. Poses a hindrance to response on plant transient.

RESOLUTIONS:

Prior To Plant Startup
1. Change out diaphragms on all valves.
2. Check for glycol leaks on all valves.
3. Adjust packing on all valves.
4. Stroke and test all valves.

Before The End of REFOUT 87
1. Write PACS to replace diaphragms every 4 years or so.
2. Add to forced outage shutdowns to adjust packing during startup (PAC)

OBSERVATION NO: MSS-04 COMPONENT(S): MO-0501 & MO-0510 MSIV Bypass Valves

EVALUATOR(S): JPopa REV NO: 1 DATE: 06/23/86

DESCRIPTION: Work Order history shows Limitorque problems, valve binding problems and packing leaks. The valves used to be handwheel operated, and were changed to Limitorques in 1981. The original Limitorque motors were too small and were subsequently replaced with larger motors. However, the problem has still not been resolved. MO-0501 has a current packing leak.

SIGNIFICANCE: Needed for Plant startups and shutdowns. An operator has to manually operate the valves (at times) during heatup and cooldowns and when in Hot Standby. On Operator Concern List.

RESOLUTIONS:

Prior To Plant Startup

1. Repack MO-0501
2. Determine actions required to assure valve operability and implement.
3. Develop and implement PM on the valves and operators.

OBSERVATION NO: MSS-05 COMPONENT(S): POS-0771 S/G E-50A Bottom Blowdown Isolation Valve Positioner

EVALUATOR(S): JJPopa REV NO: 1 DATE: 06/23/86

DESCRIPTION: Review of past MOs show position indicator problems, which results in an operator concern due to inability to verify containment integrity from the control room. There is presently an open DR relating to the indicator mounting.

SIGNIFICANCE: Not an active concern or operator distraction. Listed solely to ensure limit switches set properly prior to startup.

RESOLUTIONS:

Prior To Plant Startup

1. Evaluate why there were repeated positioner/stroking problems & recommend a fix.
2. Complete repairs to this positioner and other like positioners as recommended in D-PAL-86-135.
3. Include proper setting & adjustment in PM and document on Work Order.

OBSERVATION NO: MSS-06 COMPONENT(S): 101 MS, 102 MS, 103 MS, 104 MS Steam Dump Manual Isolation Valves

EVALUATOR(S): JJPopa REV NO: 1 DATE: 06/23/86

DESCRIPTION: Troubleshooting of CV-0779 and CV-0781 on 5/21/86 proved the manual isolation valves to be extremely difficult to cycle. Approximately 25 minutes were required to stroke each valve.

SIGNIFICANCE: Important to reliable Plant operation. Poses a hindrance to response on a Plant transient.

RESOLUTIONS:

Prior To Plant Startup

1. Insure valves move/operate freely.
2. Clean & add new grease to gear boxes (if any)
3. Lubricate stems.
4. Inspect reach rods for free travel, lubrication, pins, etc.
5. Initiate a PACS for periodic inspection, PM and testing.

As Part of 5-Year Plan

1. Evaluate a simplified reach-rod configuration to improve operability.

OBSERVATION NO: MSS-07 COMPONENT(S): CV-0501 & CV-0510 Main Steam Isolation Valves

EVALUATOR(S): JJPopa REV NO: 1 DATE: 06/23/86

DESCRIPTION: Have had repeat packing leakage problems, and a long-term problem with bonnet gasket leakage. The gasket leakage was resolved during Refout '85. CV-0501 & CV-0510 had packing leaks during last startup.

SIGNIFICANCE: Not a current operator concern or distraction. Listed solely due to number of past Work Orders.

RESOLUTIONS:

Prior To Plant Startup

1. Repack CV-0501 and CV-0510.
2. During startup, inspect CV-0501, CV-0510 for packing leaks & adjust.

OBSERVATION NO: MSS-08 COMPONENT(S): RV-0701 through RV-0724 Main Steam Relief Valves

EVALUATOR(S): JJPopa REV NO: 1 DATE: 06/23/86

DESCRIPTION: Review of MOs show they were for testing, setting and examinations as required by code.

REF: E-PAL-86-07 (13 valves didn't meet set point during testing, though all were within 3% of initial settings.)

SIGNIFICANCE: Not an active operator concern or distraction. Listed due to number of Work Orders and to track resolution of Main Steam Relief Valve potential opening on 5/19/86 and following day.

RESOLUTIONS:

No Further Action Required - Valves are tested and inspected as required by Tech Specs, FSAR, Code, etc.

SYSTEM	TITLE
NMS	NEUTRON MONITORING SYSTEM
01	Neutron Instrumentation & Neutron Recorders
02	Neutron Monitoring System Work Orders

OBSERVATION NO: NMS-01 COMPONENT(S): Neutron Instrumentation & Neutron Recorders

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: Nuclear instrumentation drawers have been refurbished by the vendor within the last four years to update circuitry and perform minor modifications. The plant is presently considering involvement with the Combustion-Engineering owner's group studying replacement of neutron monitoring systems at Palisades vintage plants. The wide range channels are classified as EEQ related and are required to be upgraded, per commitment to the USNRC, possibly in 1988-89. Recorder problems are covered under MIS-01. At the present time, very few problems exist that need attention; most detectors (chambers) are new. The power range chamber holder (birdcage) insulators do get dirty and ground leakage causes noise problems; however most noise problems occur from external noise such as relay chatter, welding, etc.

Ref: E-PAL-86-024, E-PAL-86-021, E-PAL-85-076, E-PAL-85-078, E-PAL-85-079

SIGNIFICANCE: Safety related; failure of component can result in a plant trip.

RESOLUTIONS:

Before The End of REFOUT 87 - Palisades should become a member of the C-E owner's group to address neutron instrumentation concerns (this is also in line with the commitment for EEQ upgrade of the wide monitors).

OBSERVATION NO: NMS-02 COMPONENT(S): Neutron Monitoring System Work Orders

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: Reviewed three (3) work orders in the MSI category dated May, 1984 through September, 1985. One work order involved repair of the power ratio signal calculator (failed power supply), one involved repair to a recorder (cleaned slidewires) and the third involved bench checkout of a spare power range drawer. This power range drawer, although recently refurbished by the vendor, did not meet receipt inspection requirements; a non-conforming material report has been issued. The failures indicated above are not unique or repetitive and can be expected on electronic equipment such as this. No specific action prior to startup is recommended.

SIGNIFICANCE: Safety related, failure of component can result in plant trip.

RESOLUTIONS:

Before The End of REFOUT 87 - Return spare power channel (S/N 106) to vendor for refurbishment. (Ref nonconforming material report N-QP-86-066).

SYSTEM	TITLE
PAS	POST ACCIDENT SAMPLING SYSTEM
01	EC-103-1 Post Accident Sampling Panel

OBSERVATION NO: PAS-01 COMPONENT(S): EC-103-1 Post Accident Sampling Panel

EVALUATOR(S): AETome REV NO: 3 DATE: 06/23/86

DESCRIPTION: Solenoid valves on the PAS panel were leaking thru and had to be manually isolated. There has also been a history of Swagelok fitting leaks. The solenoid valves have been replaced during this outage. They are no longer welded in place, but have quick disconnect fittings to make replacement easier in the future. Spare valves are being kept in stock. A number of instrument deficiencies have been identified by the Chemistry Department.

REF: ESS-09, ESS-10, ESS-11, ESS-12

SIGNIFICANCE: Not an operator concern or distraction. Potential for PCS leakage.

RESOLUTIONS:

Prior To Plant Startup

1. Troubleshoot, repair, and/or calibrate.
   a) Liquid sample hi/lo flow lights
   b) Containment air hi/lo flow lights
   c) Temperature elements 1900, 1902 & 1903
   d) High sump alarm
2. Repair PI-1908 & PI-1909 diaphragms
3. Reverse MV-1933 & MV-1931 handles so they give proper indication
4. Repair SN-1 gas needle so it holds vacuum.
5. Repair SV-1916 and SV-1917

SYSTEM	TITLE
PCS	PRIMARY COOLANT SYSTEM
01	CV-1059 and POS-1059, Pressurizer Spray Valve and Indication
02	CV-1903, Primary Coolant Loop 2, Hot Leg Sample CV
03	See PAs-01
04	EC-32 NSSS Panel
05	PCP Motor Lube Oil and Lift Oil Systems
06	TR-0111/TR-0121, Primary Loop Measurement Channels 1 and 1, Reactor Regulating Recorder
07	TS-0115; PTR-0115; PS-0115; Primary Loop Measurement Channel 1; hot Leg Recorder
08	TIA-0103, TIA-0104 Pressurizer Spray Line Temperature Indicators
09	PIA-0102A Pressurizer Pressure S.I. "A" Channel
10	TE&TI-0106, 0107, 0108, 0109 Pressurizer PORV & Safety Dischrge Temp Indicators
11	Primary Coolant Pump/Motor Instrumentation
12	Primary Coolant Pump Impeller Cracking Problem
13	Pressurizer Heater Breakers
14	PrV-1067, 1068, 1069, 1070, 1071, 1072; Pressurizer & Reactor Head Vent Valves
15	PTR-0125 Wide Range Temp Recorder - Cold Leg No. 2

SYSTEM	TITLE
(PCS SYSTEM-CONTINUED) -	
16	LRC-0101A Pressurizer Level Control Recorder Channel No. 1
17	Pressurizer Block Valves MO-1043A & MO-1042A
18	P-50B Primary Coolant Pump

OBSERVATION NO: PCS-01 COMPONENT(S): CV-1059 and POS-1059, Pressurizer Spray Valve and Indication

EVALUATOR(S): RPMargol REV NO: 2 DATE: 6/23/86

DESCRIPTION: Pressurizer spray valve indicated partially open with full close signal applied during trip 5/19/86. It was subsequently determined that the valve was slightly open, and that minor adjustment to the positioners were required. Past high maintenance item.

SIGNIFICANCE: Important To Reliable Plant Operation. High probability for challenging safety systems. Failure of valve can result in plant trip or consequences unfavorable in plant Operations during trip.

RESOLUTIONS:

Prior To Plant Startup

1. Valve should be disassembled and inspected for physical obstructions that would prevent valve from going full close (DR D-PAL-84-212 identified foreign material and cocked seat ring for CV-1057).
2. Inspect & repack valve in accordance with established Maintenance Procedure (PCS-M-8).
3. Both CV-1057 & 1059 have had considerable packing leaks that could have sprayed the valve auxiliaries (ie, switches, stem, actuator, etc.) with borated water. Valve auxiliaries should be thoroughly inspected with those demonstrating significant degradation (corrosion) replaced.
4. Upon return to hot shutdown conditions, valve should be repetitively stroked and packing re-adjusted. Also, open/close indication should be verified with each stroke.
5. Calibrate positioners and E/P's for both CV-1057 and CV-1059.
6. Prepare, review and perform a post-maintenance test.

Before The End of REFOUT 87 - Establish PACS for packing adjustments during any future outages to prevent or minimize leakage. (Current practice indicates no maintenance on valves until leakage occurs.)

As Part of 5 YEAR PLAN - Replace valves. Spare parts for existing valves are becoming difficult to procure.

OBSERVATION NO: PCS-02 COMPONENT(S): CV-1903, Primary Coolant Loop 2, Hot Leg Sample CV

EVALUATOR(S): RPMargol REV NO: 2 DATE: 06/23/86

DESCRIPTION: Repeat maintenance item. Valve failures were experienced shortly after failure of Primary Coolant Pump P-50C, contributing to Primary Coolant System high suspended solids (ie wear ring/impeller damage).

SIGNIFICANCE: Not an active operator concern or distraction.

RESOLUTIONS:

No Further Action Required - Valve has been replaced and has been functioning properly for over a year.

Observation No: PCS-03 - See Observation No: PAS-01

OBSERVATION NO: PCS-04 COMPONENT(S): EC-32, NSSS Panel

EVALUATOR(S): RPMargol REV NO: 2 DATE: 06/23/86

DESCRIPTION: High maintenance. Valve leak through can be contributed to the Primary Coolant System suspended solids resulting from P-50C pump shaft/impeller separation. Shortly after starting primary coolant pumps, valve failures began to occur in the NSSS panel. Current valve maintenance trend is decreasing with few valve leakage problems being experienced.

SIGNIFICANCE: Not an active Operations concern or distraction. Listed solely due to repeat maintenance concern.

RESOLUTIONS:

Prior to Plant Startup - 1. Complete the actions specified in D-PAL-85-46.

2. Repair of temperature element, TE-1902, and solenoid valves, SV-1916, and SV-1917, and checkout (Order Order #'s 24605591, 24502706, and 24502707).

OBSERVATION NO: PCS-05 COMPONENT(S): PCP Motor Lube Oil and Lift Oil Systems

EVALUATOR(S): RPMargol REV NO: 2 DATE: 6/23/86

DESCRIPTION: Numerous system problems causing high maintenance, delays in startup, difficulties in aligning pumps, alarms and overall reliability.

E-PAL-84-97, D-PAL-86-117, D-PAL-84-27, D-PAL-84-312, D-PAL-84-340

SIGNIFICANCE: Important To Reliable Plant Operation.

RESOLUTIONS:

Prior to Plant Startup

1. Inspect lift systems for proper pressures and flows. Clean up oil and tighten any leaking fittings.
2. Resolve backstop low flow alarm concern - may involve high ambient temperatures with respect to backstop motor thermal overloads.

As Part of 5-Year Plan

1. Evaluate and implement system upgrades to include eliminating use of rubber hoses, minimize threaded and flange connections, periodic oil changes (or filtration to clean oil), oil system flushes and establish motor inspections (PM's).

OBSERVATION NO: PCS-06 COMPONENT(S): TR-0111/TR-0121, Primary Loop Measurement Channels 1 and 2, Reactor Regulating Recorder

EVALUATOR(S): RPMargol REV NO: 2 DATE: 06/23/86

DESCRIPTION: Frequent maintenance. Equipment concerns have been with recorder reliability and calibration. Current Periodic Activity Control Sheet (PACS) indicates calibration to be on six-month interval.

SIGNIFICANCE: Important to reliable Plant operation.

RESOLUTION:

Prior to Plant Startup

1. Complete Work Order 24604277 which indicates TR-0111 and TR-0121 disagree by six degrees F. Activity should include thorough inspection of recorders physical condition (ie pens, gears, motor take-up reels).
2. PACS (PCS-I-38) for calibration should be performed. (currently overdue)

Before The End of 87 REFOUT

1. TR-0111 and TR-0121 should be targeted as a number one priority for recorder change-out which is being addressed by the 5-Year Plan for control room chart recorder upgrade.
2. Continue adherence to PACS interval for calibration of recorders.

OBSERVATION NO: PCS-07 COMPONENT(S): TS-0115; PTR-0115; PS-0115, Primary Loop Measurement Channel 1 Hot Leg Recorder

EVALUATOR(S): RPMargol REV NO: 3 DATE: 06/23/86

DESCRIPTION: Frequent maintenance. Numerous problems with recorder reliabiltiy. Instrumentation calibrated by Technical Specifications Test RI-59 which is an 18-month interval.

REF: E-PAL-84-44, E-PAL-84-42, *D-PAL-85-80

SIGNIFICANCE: Important to reliable Plant operation.

RESOLUTION:

Prior To Plant Startup

1. Inspect PTR-0115 physical condition (ie pens, gears, motor, take-up reels).
2. Evaluate current calibration interval for appropriateness. Establish Periodic Activity Control Sheet (PACS) for more frequent calibration if warranted (especially for those instruments in loop that can be calibrated during power operation).
3. PACS should be established for physical inspection of recorder.

Before The End of 87 Refout - Target recorder as a number one priority for control room chart recorder upgrade as described in 5-Year Plan.

OBSERVATION NO: PCS-08 COMPONENT(S): TIA-0103, 0104 Pressurizer Spray Line Temp. Indicators

EVALUATOR(S): RPMargol REV NO: 3 DATE: 6/23/86

DESCRIPTION: Frequent maintenance. Temperature indication has been failing low over the past year. Both have been alarming on occasion. Troubleshooting efforts appear to correct immediate problem, only to recur at a later date.

SIGNIFICANCE: Important to Reliable Plant Operation. Recurring Control Room deficiency.

RESOLUTION:

Prior To Plant Startup - Complete Work Order #24604465. Activity should include physical inspection of connectors for loose connection, improper terminations/crimps, a more positive means for termination connections, evidence of moisture/corrosion and means of eliminating (consider Raychem, if feasible), grounds/shorts of cable (especially compensating cable). Inspection should occur at temperature indicator, penetration and RTD. L&FTS should assist in the trouble-shooting and resolution of this problem.

OBSERVATION NO: PCS-09 COMPONENT(S): PIA-0102A, Pressurizer Pressure S.I. "A" Channel

EVALUATOR(S): RPMargol REV NO: 3 DATE: 06/23/86

DESCRIPTION: Frequent maintenance. Component inoperable during 05/19/86 trip. Thermal margin/low pressure instrumentation was last calibrated in March 1986 (Tech Spec Test RI-02). Subsequently, PIA-0102A was reading 60 psi higher than the other channels. Similar occurrences were in 1976 and 1983. These occurrences identified a defective transistor and an unidentifiable problem remedied by calibration. One other occurrence due to spiking identified a potential meter drift. These occurrences appear to be indicating internal component failures within calculator PY-0102A.

SIGNIFICANCE: Important to reliable Plant operation. Has the potential for challenging safety system.

RESOLUTION:

Prior To Plant Startup

1. Thorough input/output testing of PY-0102A to identify aged or defective internal components.
2. Perform calibration of loop (current WO 24605463).

Before the End of 87 REFOUT - A variable high power trip modification will be installed which will eliminate current instrumentation. If modification not performed, increase frequency of calibration.

OBSERVATION NO: PCS-10 COMPONENT(S): TE&TI-0106, 0107, 0108, 0109 Pressurizer PORV & Safety Discharge Temp. Indicators

EVALUATOR(S): RPMargol REV NO: 2 DATE: 6/23/86

DESCRIPTION: Instrument drift has been contributed to added resistance due to connector corrosion.

Ref. D-PAL-85-154, D-PAL-85-163

SIGNIFICANCE: Technical Specification required. Drifting of temperature readings cause operator attention and control room deficiencies. Failure or degradation may cause forced outage.

RESOLUTION:

Prior To Plant Startup 1. Inspect and clean connections. If feasible, consider Raychem to minimize exposure of connectors to moisture.

Before The End of 87 REFOUT - Investigate replacement or modification to terminations to eliminate corrosion of existing connectors.

OBSERVATION NO: PCS-11 COMPONENT(S): Primary Coolant Pump/Motor Instrumentation

EVALUATOR(S): RPMargol REV NO: 3 DATE: 6/23/86

DESCRIPTION: Instrumentation not reliable

SIGNIFICANCE: Important to Reliable Operation of Plant.

RESOLUTION:

Before The End of REFOUT 87 - Disassemble and PM either the P-50A or P-50B primary coolant pump motor. Repair the associated motor bearing temperature indicator. Based on findings, determine whether the other pump should be disassembled for PM in the 1989 refout.

As Part of 5-Year Plan - Perform evaluation of PCP/motor parameters which require instrumentation. Evaluation should take into consideration, any existing instrumentation that can be eliminated, addition of new instrumentation (eg, flow measurement), upgrading of existing instrumentation (eg, vibration monitoring) and review of existing instrumentation specifications to verify they meet known operating conditions (eg, ambient temperature, mounting location, vibration, etc).

OBSERVATION NO: PCS-12 COMPONENT(S): Primary Coolant Pump Impeller Cracking Problem

EVALUATOR(S): RPMargol REV NO: 1 DATE: 06/23/86

DESCRIPTION: In early 1983, P-50C was identified as having a piece of impeller missing. At that time it was determined to replace the impeller assembly with a spare as a result of the finding. Inspection of the removed impeller assembly identified other cracks along the vane/hub intersection. It is unknown if the other three installed impellers (P-50A, P-50B & P-50D) demonstrate similar cracking.

An early evaluation of the cracking mechanism identified two possible causes of cracking (a) cavitation induce, propagating by cyclic fatigue mechanism, (b) casting process voids existing in thin impeller cross section-cracking induce by fatigue cycling. Cavitation was eliminated as the cause by inspection of the impeller which had no presence of cavitation indications. Therefore it was deduced that the cause was due to casting shrinkage causing voids in the impeller.

Discussion with Byron-Jackson at that time indicated they had little concern with operating the pumps with the existence of cracks in the impeller. Again, this was based on cracks propagating from areas of the impeller where voids from the casting process were thought to have formed. B-J did indicate periodic inspections of the other three pumps were prudent.

Subsequent metallurgical analysis of the crack portion of the impeller indicates there were no voids in the areas of the crack. However, the crack did appear to be initiated and propagate by a cyclic fatigue mechanism.

The corrective action document is currently being closed out. Remote inspection of the other three pumps was determined not to be feasible through the use of a fibroscope.

SIGNIFICANCE: Lack of knowledge by Plant operators over actual condition of Primary Coolant Pumps leads to operator concern.

RESOLUTION:

Before The End Of REFOUT 87

1. Based on the current metallurgical examination, it is recommended that this evidence be reviewed with Byron-Jackson, as their original recommendations were based on casting process voids. Consideration should be given to the impact on the new spare impeller with regards to the findings of the metallurgical examination.

2. Evaluation should be conducted as to the advisability of a physical inspection during the [redacted]ut.

OBSERVATION NO: PCS-13 COMPONENT(S): Pressurizer Heater Breakers

EVALUATOR(S): RPMargol REV NO: 2 DATE: 6/23/86

DESCRIPTION: Repeat breaker tripping. Also, breaker was not in place because breaker bucket was not installed.

SIGNIFICANCE: Poses a hindrance to response on a plant transient. Important to reliable operation of the plant. On operators concerns list.

RESOLUTION:

Prior To Plant Startup - Repair/replace and/or verify all pressurizer heater breakers to assure they are operational.

Before The End of REFOUT 87

1. Re-evaluate heater component specification versus current operation of heaters and ambient conditions heated components are exposed to for appropriateness of existing components to perform reliably. Evaluation should also include continuous operation of heaters with respect to minimum heater warranty design life (480V - 10,000 hrs at full power with 5,000 on-off cycles; 20,000 hrs at half power with 10,000 proportionately controlled voltage cycles). Evaluation should conclude if current maintenance inspection are appropriate or if additional maintenance/inspections are warranted due to the continuous operation of the heaters.
2. Reevaluate mode of operation to determine if continuous heater energization is appropriate.
3. Replace/modify components (breakers, cables, etc) as evaluation determines.
4. Assure capability to replace heater elements exists if heater element replacement is required.

OBSERVATION NO: PCS-14 COMPONENT(S): PRV-1067, 1068, 1069, 1070, 1071, 1072
Pressurizer & Reactor Head Vent Valves

EVALUATOR(S): RPMargol REV NO: 2 DATE: 06/23/86

DESCRIPTION: Current leakage exists through PRV-1068 or PRV-1069 and PRV-1072.

SIGNIFICANCE: Important To reliable operation of Plant. May cause Plant shutdown due to PCS leakage. Distraction due to continuous alarm.

RESOLUTION:

Prior To Plant Startup
1. Repair PRV-1068, PRV-1069 & PRV-1072 to prevent existing leak through.
2. Physically inspect condition of all reactor head vent valves for any signs of degradation external to the valves (loose bolts, binding in manual valves, leakage, etc).
3. Stroke all PRV's for reactor head vent and demonstrate proper open/close indication.
4. Perform leak test to demonstrate adequacy of valve maintenance.

As Part Of 5-Year Plan - Perform system assessment for component reliability and adequacy of preventive maintenance.

OBSERVATION NO: PCS-15 COMPONENT(S): PTR-0125 Wide Range Temp Recorder - Cold Leg No. 2

EVALUATOR(S): RPMargol REV NO: 2 DATE: 06/23/86

DESCRIPTION: High maintenance. Numerous problems with recorder reliability. Instrumentation calibrated by Tech Spec Test RI-59 which is on an 18 month interval.

SIGNIFICANCE: Component failures require operator attention. Related to generic recorder problems.

RESOLUTION:

Prior To Plant Startup

1. Inspect PTR-0125 physical condition (ie pens, gears, motors, take up reel, etc).
2. Evaluate current calibration interval for appropriateness. Establish PACS for more frequent calibration if warranted (especially for those instruments in loop that can be calibrated during power operation).
3. PACS should be established for physical inspection of recorder.

Before The End Of REFOUT 87 - Target recorder as a number one priority for Control Room chart recorder upgrade as described in 5 year plan.

OBSERVATION NO: PCS-16 COMPONENT(S): LRC-0101A Pressurizer Level Control Recorder Channel No. 1

EVALUATOR(S): RPMargol REV NO: 2 DATE: 06/23/86

DESCRIPTION: Repetitive recorder problems.

SIGNIFICANCE: Results in operator having to repair ink pens. Generic recorder problems.

RESOLUTION:

<u>As Part Of 5-Year Plan</u> - Include LRC-0101A as candidate for Control Room recorder upgrade.

OBSERVATION NO: PCS-17 COMPONENT(S): Pressurizer Block Valves MO-1043A & MO-1042A

EVALUATOR(S): RPMargol REV NO: 1 DATE: 06/23/86

DESCRIPTION: Minor through-leakage detected via quench tank level indication. (only apparent when PORV's are opened for testing). Current packing leak.

SIGNIFICANCE: Not an active operator concern or distraction on Plant trip or transient. PORVs do not presently leak through and are electrically-locked closed during power operation. Leakage only a concern due to leakage during MO-27 PORV testing prior to placing LTOP in service. Leakage is not sufficient to cause an excessive concern during this short test.

RESOLUTION:

Prior To Plant Startup

1. Work Order 24604809 should be completed (packing adjustment or correction).
2. Task force items MIS-10 and ESS-15 recommendations should apply to the valve operators.
3. Quantify leakage through MO-1042A and MO-1043A and determine if repairs are necessary.

OBSERVATION NO: PCS-18 COMPONENT(S): P-50B Primary Coolant Pump

EVALUATOR(S): RPMargol REV NO: 1 DATE: 06/23/86

DESCRIPTION: P-50B vibration was above the alert alarm since startup from the "mini outage". This alarm blocked future alarms on increasing vibration on the other PCPs. The alarm level was recently adjusted slightly above existing vibration allowing future alarms to be monitored.

SIGNIFICANCE: Operators concerned about potential for vibration induced pump damage. Failure of pump would cause a Plant trip.

RESOLUTION:

Prior To Plant Startup

1. Verify pump run out to be consistent with as-left condition after pump seal change out.
2. Upon pump startup, perform vibration analysis to determine accuracy of installed pump vibration monitoring equipment and independent measurement of pump vibration to support continued operation.
3. If pump vibration is verified as an increasing trend, appropriate pump alignment/repairs should be taken or adequate vibration monitoring/action limits established such that maintenance will occur prior to significant pump degradation.

SYSTEM	TITLE
RIA	RADIATION MONITORING SYSTEM
01	FR-2318 Stack Gas Flow Recorder
02	P-1811 W Engineered Safeguards Room Monitor Sample Pump
03	RIA-0202A Failed Fuel Monitor Radiation Indicator
04	RIA-0631 Off Gas Monitor Radiation Indicator
05	RIA-1049 Liquid Radwaste Discharge Process Monitor
06	RIA-1805 Containment Isolation High Radiation Monitor
07	RIA-1808 Containment Isolation High Radiation Monitor
08	RIA-2304 Controlled Lab Monitor
09	RIA-2307 Containment Purge Room Monitor
10	RIA-2315 Personnel Air Lock Monitor
11	RIA-2318 Stack Gas Monitor Radiation Alarm Indicator
12	RIA-2319 Stack Gas Monitor Radiation Alarm Indicator
13	RIA-2320 S/G Blowdown Tank Vent Monitor
14	RIA-2321 Containment Gamma Radiation Monitor (Left)
15	RIA-2322 Containment Gamma Radiation Monitor (Right)

SYSTEM	TITLE
(RIA SYSTEM-CONTINUED)	
16	RIA-2323 Main Steam Safety and Dump Valve Area Monitor
17	RIA-2324 Main STeam Safety & Dump Valve Area Monitor
18	RIA-2326 Normal Range Noble Gas Stack Monitor
19	RIA-2327 High Range Noble Gas Stack Monitor
20	RIA-5711 Radwaste Addition Ventilation Monitor
21	RIA-5712 Fuel Handling Ventilation Monitor
22	RIA-8258 Flat Bed Filter Room Radiation Monitor
23	RIA-2316 Fuel Handling Area Monitor #1
24	RIA-2317 Fuel Handling Area Monitor #2
25	RIA-0707 S/G Blowdown Monitor
26	RIA-1113 Waste Gas Discharge
27	RE-1805 Containment Isolation High Radiation Monitor
28	RE-1807 Containment Isolation High Radiation Monitor
29	RE-1809 Radwaste Ventilation Monitor
30	RE-1810 East Engineered Safeguard Radwaste Isolation Vent
31	RIA-1811 West Engineered Safeguard Radwaste Isolation vent
32	RE-5710 Aux Bldg Addition Monitor

OBSERVATION NO: RIA-01 COMPONENT(S): FR-2318 Stack Gas Flow Recorder

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: Frequent failures due to condensation/freezing of flow transmitter sensing lines.

SIGNIFICANCE: Technical Specification requirement. When out of service, operators or other personnel have to perform and insure that special flow estimating requirements exist.

RESOLUTIONS:

Prior To Plant Startup- 1. Ensure operability.

2. Initiate a PACS to blow lines on a monthly basis.

As Part of 5-Year Plan - Modify sensing lines by adding drainer traps/heat tracing or revise sensing line piping to eliminate low points.

OBSERVATION NO: RIA-02 COMPONENT(S): P-1811 W Engineered Safeguards Room Monitor Sample Pump

EVALUATOR(S): RESchrader REV NO: 3 DATE: 6/23/86

DESCRIPTION: Frequent recent failures - no record of previous failures.

SIGNIFICANCE: Technical Specification requirement. When monitor RIA-1811 is inoperable due to low flow on pump, all ventilation into and out of room must be secured.

RESOLUTIONS:

Prior To Plant Startup- 1. Ensure operability.

2. Place sample pumps for both E&W Engineered Safeguards Room Monitors on PACS for inspection and PM.

Before The End of 87 REFOUT - Perform Q-List interpretation.

As Part Of 5 Year Plan- 1. Consider monitor replacement.

2. Consider adding reflash capability to the annunciator system.

OBSERVATION NO: RIA-03 COMPONENT(S): RIA-0202A Failed Fuel Monitor Radiation Indicator

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: Minor drift noted during calibration intervals (approx 1%). The meter reading sometimes indicates outside of the calibration range shown on themeter, though the range is very restrictive.

SIGNIFICANCE: Technical Specification requirement. Special sampling requirements exist when monitor is inoperable.

RESOLUTIONS:

Prior To Plant Startup- 1. Ensure operability.

2. Complete review of procedures for realistic acceptance criteria.

As Part of 5-Year Plan- 1. Consider monitor replacement.

2. Evaluate necessity of this monitor and revise Tech Specs if appropriate.

OBSERVATION NO: RIA-04 COMPONENT(S): RIA-0631 Off Gas Monitor Radiation Indicator

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: Recent failures have increased in frequency. I&C presently upgrading detector circuit cards.

D-PAL-85-11

SIGNIFICANCE: Technical Specification Requirement. Special operator sampling required during inoperable periods. Poses a hindrance to response on a plant transient.

RESOLUTIONS:

Prior To Plant Startup - Ensure operability.

Before The End Of 87 REFOUT - Replace with more reliable monitor.

As Part of 5-Year Plan - Consider adding reflash capability to the annunciator system.

OBSERVATION NO: RIA-05 COMPONENT(S): RIA-1049 Liquid Radwaste Discharge Process Monitor

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: High failure rate (this system is being replaced this year).

SIGNIFICANCE: Technical Specification Requirement. Failure prevents release of liquid radwaste.

RESOLUTIONS:

Prior To Plant Startup - Ensure operability.

Before the End of 87 REFOUT - Complete the replacement package.

As Part of 5-Year Plan - Consider adding reflash capability to the annunciator.

OBSERVATION NO: RIA-06 COMPONENT(S): RIA-1805-Containment Isolation High Radiation Monitor

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: Hi Failure rate - Replaced with EEQ monitor during '85-'86 Refout. New detector exhibits downscale failure due to low background radiation.

D-PAL-85-118

SIGNIFICANCE: Technical Specification Requirement. Component has the potential for challenging safety system.

RESOLUTIONS:

Prior To Plant Startup- 1. Install radiation source to increase background level at detector.

2. Ensure operability.

OBSERVATION NO: RIA-07 COMPONENT(S): RIA-1808 Containment Isolation High Radiation Monitor

EVALUATOR(S): RESchrader REV NO: 3 DATE: 6/23/86

DESCRIPTION: High previous failure rate - Replaced with EEQ monitor during Refout 85-86. New detector exhibits downscale failure due to low background radiation.

SIGNIFICANCE: Technical Specification requirement. Component has the potential for challenging safety systems.

RESOLUTIONS:

Prior To Plant Startup- 1. Install radiation source to increase background level at detector.

2. Ensure operability.

OBSERVATION NO: RIA-08 COMPONENT(S): RIA-2304 Controlled Lab Monitor

EVALUATOR(S): REschrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: Characteristic electronic failures; upgrading of preamplifiers is in progress when failures occur.

SIGNIFICANCE: Health Physics personnel perform surveys when monitor is reading erratic.

RESOLUTIONS:

Prior To Plant Startup - Ensure operability.

Before the End of 87 REFOUT - Perform Q-List Interpretation.

As Part of 5-Year Plan - Consider replacement of all area monitors.

OBSERVATION NO: RIA-09 COMPONENT(S): RIA-2307 Containment Purge Room Monitor

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: One failure listed; preamplifiers presently undergoing improvement modifications to electronics as failures occur.

SIGNIFICANCE: Health Physics personnel perform surveys when monitor is reading erratic.

RESOLUTIONS:

Prior To Plant Startup - Ensure operability.

Before the End of 87 REFOUT - Perform Q-List Interpretation.

As Part of 5-Year Plan - Consider replacement of all area monitors.

OBSERVATION NO: RIA-10 COMPONENT(S): RIA-2315 Personnel Air Lock Monitor

EVALUATOR(S): RESchrader REV NO: 3 DATE: 6/23/86

DESCRIPTION: Recent failure - has been repaired (improvements are being made to detectors as failures occur).

SIGNIFICANCE: Possibly not a recent concern. Monitor has been performing without alarming.

RESOLUTIONS:

Prior To Plant Startup - Ensure operability.

Before the End of 87 REFOUT - Perform Q-List Interpretation.

As Part of 5-Year Plan - Consider replacement of all area monitors.

OBSERVATION NO: RIA-11 COMPONENT(S): RIA-2318 Stack Gas Monitor Radiation Alarm Indicator

EVALUATOR(S): REschrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: Backup Monitor - Three failures in five months (not repetitive)

SIGNIFICANCE: Technical Specification requirement. Alternate monitor paths are available when monitor is out of service.

RESOLUTIONS:

Prior To Plant Startup - Ensure operability.

Before the End of 87 REFOUT- 1. Perform Q-List Interpretation.

2. Replace monitoring system.

As Part of 5-Year Plan - Consider adding reflash capability to the annunciator.

OBSERVATION NO: RIA-12 COMPONENT(S): RIA-2319 Stack Gas Monitor Radiation Alarm Indicator

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: Non-repetitive failures; improvements to detectors are being made as failures to detectors occur.

SIGNIFICANCE: Operator has to respond to alarm conditions.

RESOLUTIONS:

Prior To Plant Startup - Ensure operability.

Before the End of 87 REFOUT- 1. Perform Q-List Interpretation.

2. Replace monitoring system.

As Part Of 5 Year Plan - Consider adding reflash capability to the annunciator system.

OBSERVATION NO: RIA-13 COMPONENT(S): RIA-2320 S/G Blowdown Tank Vent Monitor

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: One failure listed (1985).

SIGNIFICANCE: Technical Specification requirement. Poses a hindrance to response on a plant transient.

RESOLUTIONS:

Prior To Plant Startup - Ensure operability.

Before the End of 87 REFOUT - Perform Q-List Interpretation.

As Part of 5 Year Plan- 1. Consider monitor replacement.

2. Consider adding reflash capability to the annunciator.

OBSERVATION NO: RIA-14 COMPONENT(S): RIA-2321 Containment Gamma Radiation Monitor (Left)

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: Modification corrected low readings; one switch problem (Units - 2 years old).

SIGNIFICANCE: Not a current operator distraction or concern. Technical Specification requirement.

RESOLUTIONS:

Prior To Plant Startup - Ensure operability.

OBSERVATION NO: RIA-15 COMPONENT(S): RIA-2322 Containment Gamma Radiation Monitor (Right)

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: Modifications corrected low readings; no other problems (approx 2 years old).

SIGNIFICANCE: Not a current operator concern. Failure or degradation could result in spurious alarms.

RESOLUTIONS:

Prior To Plant Startup - Ensure operability.

OBSERVATION NO: RIA-16 COMPONENT(S): RIA-2323 Main Steam Safety and Dump Valve Area Monitor

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: Previous failures corrected; alarm setpoint change completed in 10/85 should eliminate spurious alarms.

SIGNIFICANCE: Spurious alarms require operator attention/response. Technical Specification requirement.

RESOLUTIONS:

Prior To Plant Startup - Ensure operability.

As Part Of 5 Year Plan - Evaluate monitor replacement.

OBSERVATION NO: RIA-17 COMPONENT(S): RIA-2324 Main Steam Safety & Dump Valve Area Monitor

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: Previous failures attributed to operating very close to alarm setpoint. Setpoint change performed in 10/85 should eliminate concerns.

SIGNIFICANCE: Spurious alarms require frequent operator attention/response. T/S requirement.

RESOLUTIONS:

Prior To Plant Startup - Ensure operability.

As Part Of 5 Year Plan - Evaluate monitor replacement.

OBSERVATION NO: RIA-18 COMPONENT(S): RIA-2326 Normal Range Noble Gas Stack Monitor

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: High previous calibration failure rate. No failures since October, 1984.

SIGNIFICANCE: Spiking requires operator response and correction. Technical Specifications requirement.

RESOLUTIONS:

Prior To Plant Startup - Ensure operability.

As Part Of 5 Year Plan - Consider adding reflash capability to the annunciator system.

OBSERVATION NO: RIA-19 COMPONENT(S): RIA-2327 High Range Noble Gas Stack Monitor

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: New unit 1984 - One failure to count/one hardware failure.

SIGNIFICANCE: Not an active operator concern or distraction. Work order history concern.

RESOLUTIONS:

Prior To Plant Startup - Ensure operability.

As Part Of 5 Year Plan - Consider adding reflash capability to the annunciator system.

OBSERVATION NO: RIA-20 COMPONENT(S): RIA-5711 Radwaste Addition Ventilation Monitor

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: Frequent flow problems, motor etc. This unit is scheduled to be replaced; parts have been purchased and are onsite.

SIGNIFICANCE: High failure rate of this monitor causes frequent alarms and requires operator response.

RESOLUTIONS:

Prior To Plant Startup - Ensure operability.

Before the End of 87 REFOUT- 1. Continue with planned modification.

2. Perform Q-List Interpretation.

As Part Of 5 Year Plan - Consider adding reflash capability to the annunciator system.

OBSERVATION NO: RIA-21 COMPONENT(S): RIA-5712 Fuel Handling Ventilation Monitor

EVALUATOR(S): REschrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: Flow faults/frequent failures. This unit is scheduled to be replaced; parts have been purchased and are onsite.

SIGNIFICANCE: Excessive failures cause alarms & require operator attention. It results in a Control Room deficiency.

RESOLUTIONS:

Prior To Plant Startup - Ensure operability.

Before the End of 87 REFOUT- 1. Continue with planned modification.

2. Perform Q-List Interpretation.

As Part Of 5 Year Plan - Consider adding reflash capability to the annunciator system.

OBSERVATION NO: RIA-22 COMPONENT(S): RIA-8258 Flat Bed Filter Room Radiation Monitor

EVALUATOR(S): REschrader REV NO: 3 DATE: 6/23/86

DESCRIPTION: Nuisance alarms in June, 1985; repaired preamplifier and cable at that time.

SIGNIFICANCE: Spurious alarms occur when monitor is erratic. Health Physics personnel respond to survey area.

RESOLUTIONS:

Prior To Plant Startup - Ensure operability.

Before the End of 87 REFOUT - Perform Q-List Interpretation.

As Part of 5-Year Plan - Consider replacement of all area monitors.

OBSERVATION NO: RIA-23 COMPONENT(S): RIA-2316 Fuel Handling Area Monitor #1

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: Failures prior to August 1983. This monitor serves as an isolation monitor during refueling.

SIGNIFICANCE: Not an active operator concern or distraction. Used only during refueling operations. On list only because of number of Work Orders.

RESOLUTIONS:

Prior To Plant Startup - Ensure operability.

As Part of 5 Year Plan - Consider replacement of all area monitors.

OBSERVATION NO: RIA-24 COMPONENT(S): RIA-2317 Fuel Handling Area Monitor #2

EVALUATOR(S): RESchrader REV NO: 3 DATE: 6/23/86

DESCRIPTION: No failures since February 1984; serves as isolation monitor during refueling.

SIGNIFICANCE: Not an active operator concern or distraction. Used only during refueling operations. On list only because of number of Work Orders.

RESOLUTIONS:

<u>As Part of 5-Year Plan</u> - Consider replacement of all area monitors.

OBSERVATION NO: RIA-25 COMPONENT(S): RIA-0707 S/G Blowdown Monitor

EVALUATOR(S): RESchrader REV NO: 3 DATE: 6/23/86

DESCRIPTION: Last failure documented in June 1982 (NPRDS).

SIGNIFICANCE: Technical Specification required. Poses a hindrance to response on a Plant transient. Out of service for weeks before 5/19/86 trip due to broken rotometer (which has been repaired).

RESOLUTIONS:

Prior To Plant Startup - Ensure operability.

Before The End Of 87 REFOUT - Replace monitor with more reliable unit.

As Part Of 5 Year Plan - Consider adding reflash capability to the annunciator system.

OBSERVATION NO: RIA-26 COMPONENT(S): RIA-1113 Waste Gas Discharge

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: No failures documented since October, 1982.

SIGNIFICANCE: Technical Specification requirement. Failure or degradation leads to spurious alarms which require operator attention/response.

RESOLUTIONS:

Prior To Plant Startup - Ensure operability.

As Part Of 5 Year Plan- 1. Consider monitor replacement.

2. Consider adding reflash capability to the annunciator system.

OBSERVATION NO: RIA-27 COMPONENT(S): RE-1805 Containment Isolation High Radiation Monitor

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: Old failures. Replaced with EEQ monitor during '85-'86 Refout. New detector exhibits downscale failure due to low background level radiation.

SIGNIFICANCE: Technical Specification requirement. Failure or degradation of component could result in a forced outage. Alarms require operator attention.

RESOLUTIONS:

Prior To Plant Startup- 1. Install radiation source to increase background level at detector.

2. Ensure operability.

OBSERVATION NO: RIA-28 COMPONENT(S): RE-1807 Containment Isolation High Radiation Monitor

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: Old failures - Replaced with EEQ monitor during '85-'86 Refout. New detector exhibits downscale failure due to low background level radiation.

SIGNIFICANCE: Technical Specification requirement. Failure or degradation could result in a forced outage. Alarms require operator attention.

RESOLUTIONS:

Prior To Plant Startup- 1. Install a radiation source to increase background level at detector.

2. Ensure operability.

OBSERVATION NO: RIA-29 COMPONENT(S): RE-1809 Radwaste Ventilation Monitor

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: Failures listed only for 1974 and 1976.

SIGNIFICANCE: Not a present operator concern or distraction. Listed solely due to repeat maintenance concern.

RESOLUTIONS:

Prior To Plant Startup - Ensure operability.

Before The End Of 87 REFOUT - Perform Q-List Interpretation.

As Part Of 5 Year Plan - Consider replacement of all area monitors.

OBSERVATION NO: RIA-30 COMPONENT(S): RE-1810 East Engineered Safeguard Radwaste Isolation Vent

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: Failed preamplifier in March 1981.

SIGNIFICANCE: Technical Specification requirement. Failure of monitor requires operator attention. Air flow has to be isolated to the Safeguards Room.

RESOLUTIONS:

Prior To Plant Startup - Ensure operability.

Before the End of 87 REFOUT - Perform Q-List Interpretation.

As Part Of 5 Year Plan- 1. Consider replacement with reliable monitor.

2. Consider adding reflash capability to the annunciator system.

OBSERVATION NO: RIA-31 COMPONENT(S): RIA-1811 West Engineered Safeguard Radwaste Isolation Vent

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: Unrelated failures (bent contact vs failed capacitor) in February 1980 and April 1981, respectively.

SIGNIFICANCE: Technical Specification requirement. Failure of monitor results in need to isolate air flow to Safeguards Room.

RESOLUTIONS:

Prior To Plant Startup - Ensure operability.

Before The End Of 87 REFOUT - Perform Q-List Interpretation.

As Part Of 5 Year Plan- 1. Consider replacement with reliable monitor.

2. Consider adding reflash capability to the annunciator system.

OBSERVATION NO: RIA-32 COMPONENT(S): RE-5710 Aux Bldg Addition Monitor

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: Detector failures in 1976.

SIGNIFICANCE: Not an active operator distraction or concern. Listed due to repeat maintenance.

RESOLUTIONS:

Prior To Plant Startup - Ensure operability.

Before The End Of 87 REFOUT - Perform Q-List Interpretation.

As Part Of 5 Year Plan - Consider replacement of all area monitors.

SYSTEM	TITLE
RPS	REACTOR PROTECTION SYSTEM
01	Reactor Protection System
02	TM/LP (A) PY-0102A
03	Reactor Protection System - Generic

OBSERVATION NO: RPS-01 COMPONENT(S): Reactor Protection System

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: Reviewed NPRDS items from 2/2/78 through 6/5/84. Failures included instrument drift (2), loose RTD connections (1), and defective components (4), from the review of seven items. Failure rate is not excessive considering the complexity of the system; electronic component failures are to be expected in such a system. The existing surveillance procedures are adequate to monitor system status.

SIGNIFICANCE: Safety Related. Failure of multiple components can result in a Plant Trip. Failure or degradation of multiple components can result in a forced outage. Not an active operator concern.

RESOLUTIONS:

No Further Action Required - No specific actions are recommended based on recent equipment history.

OBSERVATION NO: RPS-02 COMPONENT(S): TM/LP (A) PY-0102A

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: This unit had been bypassed for over a month prior to the Plant trip on 5/19/86. Consultation with I&C Department personnel indicated that this channel had been repaired (replacement of failed power supply capacitors which had to be ordered) but not declared operable. Also addressed in observation PCS-09.

SIGNIFICANCE: Safety Related. Technical Specification requires 2 out of 4 channels operable.

RESOLUTIONS:

Prior To Plant Startup - Ensure operability of PY-0102A.

Before The End Of REFOUT 87 - Complete the modification for the variable high power trip.

OBSERVATION NO: RPS-03 COMPONENT(S): Reactor Protection System - Generic

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: Review of maintenance history over three-year period. Eleven work orders reviewed; eight work orders involved problem areas, three work orders involved bench repair of previously failed components. Failures generally consist of repair of aging components (capacitors, etc) in the Reactor Protection System; this is to be expected considering the age of the equipment involved. Failure rates are not excessive; repair generally consists of replacement of available electronic components.

SIGNIFICANCE: Safety Related. Failure of multiple components can result in a Plant trip. Failure or degradation of multiple components can result in a forced outage. Not an active operator concern.

RESOLUTIONS:

Before The End Of REFOUT 87 - Ensure spare parts are available for critical components with a known failure history.

SYSTEM	TITLE
RRS	REACTOR REGULATING SYSTEM
01	See PCS-06

Observation No: RRS-01 - See Observation No: PCS-06

SYSTEM	TITLE
SPS	STATION POWER SYSTEM
01	EY-10, EY-20, EY-30, EY-40 Preferred AC Bus Inverters
02	480V, 2400V, 4160V Switchgear
03	DC Bus Ground Alarm
04	Sation Power Breakers

OBSERVATION NO: SPS-01 COMPONENT(S): EY-10, EY-20, EY-30, EY-40 Preferred AC Bus Inverters

EVALUATOR(S): WClark REV NO: 2 DATE: 6/23/86

DESCRIPTION: Recent history of inverters included SC85-005 thru SC8-008 which involved the changeout of C15 & C16 capacitors. Inverter PM's were performed and similar types of failures were experienced during the 85/86 refueling outage and subsequently attributed to cold solder joints and repaired. Other breaker failures have been attributed to normal wear. The breaker extension handles and linkage have been identified as unwieldy and preliminary discussions favor removal of these handles. Following repair of the cold solder joints, inverter performance has proven reliable. The equipment under discussion is old and parts availability is limited requiring bench repair of components.

Ref: E-PAL-85-01, D-PAL-84-113, E-PAL-86-14.

SIGNIFICANCE: Safety related. Failure or degradation can result in a forced outage.

RESOLUTIONS:

As Part of 5-Year Plan: Consider replacement with state-of-the-art equipment to improve reliability and assure spare parts availability.

OBSERVATION NO: SPS-02 COMPONENT(S): 480V, 2400V, 4160V Switchgear

EVALUATOR(S): WClark REV NO: 1 DATE: 6/23/86

DESCRIPTION: P-55B Charging Pump has experienced four 52Y coil failures since 1978. During the period when P-55A is being repacked or out of service P-55B is utilized on a cycling rather than steady state basis. Pumps P-52B, P-52A, P-8A and P-7C experienced failures to start during post maintenance testing (4 total). In one instance, the latching lever at bottom was not engaging properly. D-PAL-86-68 indicates that these breakers are sensitive to the final position when racked in and the interlock plunger fully engaged. During April 1985, Breaker 152-106 failed to close (E-PAL-85-28). The most recent work included the installation of HFA relays (SC-84-068) & the cleaning of auxiliary contacts in the breaker cubicle. Review of Diesel Generator Breaker 152-107 revealed two failures to close since mid-1984 and in one case, the root cause was attributed to a fuse blown during the installation of a modification (D-PAL-84-186) and the other attributed to a PT drawer not latched properly and a grounded wire lug in the breaker cubicle.

SIGNIFICANCE: Technical Specification related failure of component can cause a Plant trip. Poses a hindrance to response on a Plant transient.

RESOLUTIONS:

NOTE: Charging pump breaker problems will become much less significant after CVCS repairs are implemented.

Prior To Plant Startup

1. Replace coil 52Y (per Electrical Department).
2. Electrical Maintenance inspect one of the four suspect breakers to verify that the proper latch springs are installed (proposed remedial Corrective Action). Per D-PAL-86-68.
3. Operations complete evaluation and training if required as proposed action to prevent recurrence as committed to in D-PAL-86-68.
4. Electrical Maintenance & Operations complete the proposed remedial corrective corrective action and action to prevent recurrence required by E-PAL-85-28.

5. Evaluate the reliability of this switchgear relative to appropriate standards and determine what additional corrective action is warranted.

6. Develop a recommendation for a revised breaker PM program to reduce outage workload.

As Part Of 5-Year Plan - Pursue addition of P-55B and P-55C motor starters.

OBSERVATION NO: SPS-03 COMPONENT(S): DC Bus Ground Alarm

EVALUATOR(S): WClark REV NO: 1 DATE: 6/23/86

DESCRIPTION: DC Bus Ground Alarm seems to come in with Volume Reduction System (VRS) problems. Repeated DC grounds exist on DC buses. Not all are associated with VRS. Grounding during 5/19/86 trip may have been associated with VRS. The watch shift engineer at time of trip stated the ground had been traced to the VRS. At this time the ground indication is nonexistent.

SIGNIFICANCE: DC Bus Grounds result in operator response to alarm. Important to reliable plant operation. May pose hindrance to response on a plant transient.

RESOLUTIONS:

Prior to Plant Startup:

1. Prior to startup Operations and Electrical Maintenance personnel should achieve a common understanding as to the importance of the DC Bus ground alarm and the significance to each party. Also an agreement should be arrived at as to who will take the lead in performance monitoring and the initiation of work orders and troubleshooting.
2. Electrical Maintenance obtain the services of an independent authority to assist with the grounding problem assessment and resolutions.

OBSERVATION NO: SPS-04 COMPONENT(S): Station Power Breakers

EVALUATOR(S): BNYoung REV NO: 2 DATE: 6/23/86

DESCRIPTION: 4160 and 2400 volt breakers have a high rate of failing to close on demand. Preliminary data indicates that our failure rate is substantially higher than the industry average.

SIGNIFICANCE: Failure of a breaker to close can: 1) cause a plant trip (3 occurrences at Palisades), 2) cause loss of power to a vital bus requiring diesel generator operation, 3) fail a vital piece of safeguards equipment (ECCS pump, AFW pump, diesel generator, etc)

RESOLUTIONS:

Before The End of 87 REFOUT 1. Change operating procedures to eliminate transferring to station power. A complete description of the problem and solution will be provided to Operations by BNYoung.

SYSTEM	TITLE
SWS	SERVICE WATER SYSTEM
01	Generic Issue Bettis Robot Arm Actuators & Allis Chalmer Valves
02	Service Water Pumps P-7A, P-7B & P-7C
03	TC-0852 Exciter Air Cooler Temp Control
04	Generic SWS issue - Sand

OBSERVATION NO: SWS-01 COMPONENT(S): Generic Issue Bettis Robot Arm Actuators & Allis Chalmer Valves

EVALUATOR(S): AETome REV NO: 2 DATE: 6/23/86

DESCRIPTION: A review of MOs indicates that control problems have been experienced on valves in the SWS which have Bettis Robot Arm Actuators. These actuators and the Allis Chalmers valves (36 in all) have not been rebuilt over the life of the Plant. Several valves in the system have recently been replaced. This system has alot of debris, in the form of sand, which can impair the operation of equipment. In addition, these actuators have experienced problems due to desiccant in their air lines. Spare parts are no longer available, though seal kits are available.

REF: E-PAL-86-33, D-PAL-84-155, E-PAL-84-29, D-PAL-86-070

SIGNIFICANCE: Failure or degradation of component can result in a forced outage.

RESOLUTIONS:

Prior To Plant Startup- 1. Identify any critical service water valves with current problems and repair/replace as necessary.

2. Rebuild actuators on the following valves: CV-1359, CV-0838, CV-0873, CV-0864.

Before The End of 87 REFOUT- 1. All of the remaining Bettis actuators should be rebuilt.

2. All of the Allis Chalmers valves and other valves within the SWS should be inspected for seat and valve erosion and cleaned and rebuilt as needed.

3. A preventive maintenance program should be developed which consists of periodic inspections of both valves and actuators.

OBSERVATION NO: SWS-02 COMPONENT(S): Service Water Pumps P-7A, P-7B & P-7C

EVALUATOR(S): AETome REV NO: 2 DATE: 6/23/86

DESCRIPTION: There has been a problem with pump vibration, packing leaks, and motor overheating. P-7B was rebuilt in December 1985. There was heavy erosion of the impeller and shaft. At present, P-7C is scheduled for rebuild due to vibration levels being in the alert range. Maintenance procedures are being revised to incorporate the manufacturer's suggested alignment procedure in order to minimize vibration.
REF: D-PAL-85-203, D-PAL-86-66, D-PAL-85-12, D-PAL-85-115, and D-PAL-85-202.

SIGNIFICANCE: Failure or degradation could result in a forced outage. Not an active operator concern or distraction on a Plant trip or transient. Service water is one of the more important ECCS systems. Many safety related systems depend directly or indirectly on the service water system:

Diesel Generators
Component Cooling
Shutdown Cooling
Containment Spray
Containment Air Coolers
Instrument Air
Control Room HVAC

Unlike many "safety related" systems, service water is necessary for almost all operating conditions and accident sequences.

RESOLUTIONS:

Prior To Plant Startup - Rebuild Pump P-7C

Before The End of REFOUT 87- 1. Rebuild Pump P-7A
2. Evaluate sources of vibration using signature analysis.
3. Place the service water pumps on a periodic inspection program.

OBSERVATION NO: SWS-03 COMPONENT(S): TC-0852 Exciter Air Cooler Temp. Control

EVALUATOR(S): AETome REV NO: 2 DATE: 6/23/86

DESCRIPTION: The Exciter Air Cooler Discharge Temperature Control Valve & Controller does not function. WO 24501253 addresses the problem of the valve not being able to fully close. A subsequent WO (WO 24604720) was issued for valve replacement. The work order descriptions do not indicate that the operator or the valve was disassembled to determine if (1) there were desiccants in the actuator or (2) if the presence of sand was affecting operation.

SIGNIFICANCE: Important to reliable plant operation. Control of exciter temperature is critical to maintaining life of exciter.

RESOLUTIONS:

Prior To Plant Startup
1. Disassemble and inspect CV-0852 operator and valve.
2. Repair or replace as necessary.

OBSERVATION NO: SWS-04 COMPONENT(S): Generic SWS issue - Sand

EVALUATOR(S): AETome REV NO: 2 DATE: 6/23/86

DESCRIPTION: Sand entrained in the Service Water System flow may be responsible for a number of problems associated with equipment cooled by the SWS. Leaks have been identified as concerns in the Control Room air coolers and the lube oil system coolers. In addition, sand may be accumulating in the system which interferes with efficient heat transfer in heat exchangers and valve operation. A flow test performed on the Containment Air Coolers indicates that they could be partially plugged. A study was performed by the GO which looked at the feasibility of removing sand prior to the intake. It was not determined to be cost effective.

REF: D-PAL-85-202

SIGNIFICANCE: Failure of components can result in a forced outage. Important to reliable plant operation.

RESOLUTIONS:

Prior To Plant Startup- 1. Disassemble and inspect one containment air cooler heat exchanger. Choose one which had lowest flow based on recent flow tests. If found to be significantly plugged, clean that heat exchanger.

2. If the first heat exchanger is found to be plugged significantly, disassemble and inspect remaining heat exchangers in order of severity based on the flow test results.

Before The End Of REFOUT 87- 1. Implement a program for the inspection of all safety related heat exchangers cooled by service water.

2. System Engineer to recommend inspection intervals for all non-safety related heat exchangers cooled by the service water system.

3. Place critical equipment as identified by the System Engineer, in the preventive maintenance program.

As Part Of 5 Year Plan - Evaluate placing in-line filters or other sand removal devices to protect equipment whose operation can be affected by.

SYSTEM	TITLE
TGS	TURBINE GENERATOR SYSTEMS
01	Generic Issue EHC Problems
02	Generator Hydrogen Leakage
03	Generator Voltage Regulator
04	Generic Issue T/G Instrumentation
05	MSRs RV-0530 thru RV-0558 (22 Valves)
06	Gland Seal Air In-Leakage
07	Main Stop Bypass Solenoid Air Pilot Valves
08	Automatic Turbine Functions
09	Seal Oil System
10	Turbine Lube Oil Lift Pumps
11	Turbine Control Unit
12	Reheat Stop Valve CV-0544 Position Indication
13	CV-0571 and CV-0575 Turbine Stop Valves
14	P-45A & P-45B Turbine Building Sump Pumps
15	Turbine-Generator Thrust Bearing Trip Oil Orifices Clogged
16	Turbine-Generator EHC Power Supplies

OBSERVATION NO: TGS-01 COMPONENT(S): Generic Issue EHC Problems

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 6/23/86

DESCRIPTION: Recurring concerns about EHC internal leakage and pump cycle time. Repeated investigations have not totally solved problems. The MOOG valve (servo actuated EHC fluid control to governor) is being investigated as cause of leakage. Currently a new MOOG valve has been installed and has not stopped the leakage. An old MOOG valve and a new MOOG valve are being sent to the vendor to determine if either works correctly. Also the dump valves are again being investigated. There have also been problems with external leakage due to the flared fittings.

SIGNIFICANCE: Important to reliable Plant operation. Fitting leaks have caused many forced outages and can lead to Plant trips.

RESOLUTIONS:

Prior To Plant Startup

1. The cause of the internal leakage must be identified and the system operable. There is a new design dump valve that is available that may solve the dump valve leakage problems. If the dump valves are determined to be the problem and they cannot be repaired, the new design should be evaluated and installed, if acceptable, on the governor valves.
2. External leaks are present. System should be free of external leakage.
3. Evaluate the adequacy of EHC tubing supports.
4. Perform turbine valve testing with Shift Engineer.

Before The End of REFOUT 87 - Upgrade EHC piping and fittings per Westinghouse recommendations.

As Part of 5 Year Plan - Consider total upgrade to Turbine Control System.

OBSERVATION NO: TGS-02 COMPONENT(S): Generator Hydrogen Leakage

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 6/23/86

DESCRIPTION: The Palisades generator has had a history of hydrogen leakage. During the 1985/1986 REFOUT the generator end bells were found to be out of true and repaired with liquid steel. There also is a leak on the hydrogen cooler that had to be temporarily repaired via sealant injection. Prior to the present outage, the area around the generator was roped off due to two reasons: (1) Hydrogen cooler which had a leak which was temporarily repaired and (2) suspected radial seal leakage which was found to be insignificant.

SIGNIFICANCE: Important to reliable Plant operation. Personnel safety concern.

RESOLUTIONS:

Prior To Plant Startup- 1. Permanently repair hydrogen cooler leak.

2. Perform a generator air drop test and evaluate results for acceptability.

3. Develop and communicate to Operations action level criteria based on hydrogen usage increases.

Before The End of REFOUT 87 - Repair the end bell leakage.

OBSERVATION NO: TGS-03 COMPONENT(S): Generator Voltage Regulator

EVALUATOR(S): JGBouwens/CMGrady REV NO: 1 DATE: 6/23/86

DESCRIPTION: The main generator voltage regulator has caused 8 reactor trips and has been a high maintenance problem. Voltage regulator failures have occurred while adjusting voltage in the manual position. Per discussion with the System Engineer, most of the voltage regulator problems have been resolved. L&FTS, MASD and plant electrical engineers have spent a significant amount of time correcting voltage regulator problems. Experience level of technicians has increased, adequate spare parts are on site and preventative maintenance activities are performed. Currently Westinghouse has a 1972 model WTA voltage regulator which is slightly better than our 1966 model WMA. Palisades has implemented modifications which brings our model WMA up to the 1972 model WTA specifications. Last outage work was performed on excitation limiter and auto portion of voltage regulator.

SIGNIFICANCE: Component has the potential for challenging safety systems. Failure of component does result in plant trips.

RESOLUTIONS:

Prior To Plant Startup - Provide guidance to Operations Department regarding load following policy and revise Alarm & Response procedures as necessary.

As Part of 5-Year Plan - Evaluate the replacement of voltage regulator if Westinghouse or another vendor has a suitable replacement which would result in significant improvement over the present regulator.

OBSERVATION NO: TGS-04 COMPONENT(S): Generic Issue T/G Instrumentation

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 6/23/86

DESCRIPTION: Age of turbine supervisory instrumentation has lead to concern about spare parts availability. State-of-the art instrumentation is available. There are currently no known problems or a listing of failures in work order history.

SIGNIFICANCE: Important to reliable Plant operation.

RESOLUTIONS:

As Part of 5-Year Plan - Items should be replaced.

OBSERVATION NO: TGS-05 COMPONENT(S): MSRs RV-0530 thru RV-0558 (22 valves)

EVALUATOR(S): JGBouwens/CMGrady REV NO: 1 DATE: 6/23/86

DESCRIPTION: Moisture Separator Reheater Safety Valves have a historical record of air in-leakage during startup until Plant is at 25% power. Over the past year, Work Orders for seat leakage, pilot valve leaks, steam leaks and fitting leaks have been initiated and performed. Discussions with relief valve manufacturer by the System Engineer have indicated that application of these valves is incorrect. Valves are scheduled to be worked next REFOUT.

SIGNIFICANCE: Contributes to secondary side air in-leakage during startup.

RESOLUTIONS:

Before The End Of REFOUT 87 - Test and rebuild valves.

As Part Of 5-Year Plan - Evaluate replacement of valves with better design.

OBSERVATION NO: TGS-06 COMPONENT(S): Gland Seal Air In-Leakage

EVALUATOR(S): JGBouwens/CMGrady REV NO: 1 DATE: 6/23/86

DESCRIPTION: Air in-leakage has been occuring at the gland seal area. Tried to drop pressure to normal range after replacing HP seals, but due to air in leakage, pressure was raised to 13 psig. LP seals have been disassembled and one packing ring in two of the seals were found with their pressure side reversed. Also, cleaning all gasket surfaces and replacing gaskets on all LP seals.

SIGNIFICANCE: Failure or degradation can result in Plant Chemistry holds or forced outage. Operation at increased seal pressure may cause premature seal failure and a forced outage.

RESOLUTIONS:

Prior To Plant Startup - Continue with current rebuild and leak test.

Before The End Of 87 REFOUT - Implement permanent repairs to gland and casing if deemed appropriate.

OBSERVATION NO: TGS-07 COMPONENT(S): Main Stop Bypass Solenoid Air Pilot Valves

EVALUATOR(S): JGBouwens/CMGrady REV NO: 1 DATE: 6/23/86

DESCRIPTION: Main stop bypass solenoid air pilots are not reliable and often require AO attention.

SIGNIFICANCE: Component necessary for plant startup or turbine valve testing and causes operator distraction during these evalutions. Leakage contributes to instrument air system demand. Not an active operator concern or distraction on a plant trip or transient.

RESOLUTIONS:

Prior To Plant Startup - Manual air pilot valve should be replaced with solenoid and pilot valve if feasible.

Before The End of REFOUT 87 - Complete the above modification if not completed prior to startup from current outage.

OBSERVATION NO: TGS-08 COMPONENT(S): Automatic Turbine Functions

EVALUATOR(S): JGBouwens REV NO: 1 DATE: 6/23/86

DESCRIPTION: Automatic functions associated with turbine generator do not work from the Control Room. Turning gear has historically not auto latched at zero speed and will kick off during shutdown with no Control Room indication.

SIGNIFICANCE: Component necessary for startup or shutdown. Not an active operator concern during a Plant trip or transient.

RESOLUTIONS:

Prior To Plant Startup - Turbine auto latch has been adjusted during current outage. Test and verify.

Before The End Of REFOUT 87 - Evaluate timing gear problems and develop plan to fix.

OBSERVATION NO: TGS-09 COMPONENT(S): Seal Oil System

EVALUATOR(S): JGBouwens/CMGrady REV NO: 1 DATE: 6/23/86

DESCRIPTION: Seal oil pumps cannot supply adequate pressure without the redundant regulator because temperature swings and running at elevated temperatures causes the viscosity of the seal oil system to drop requiring the redundant regulator to operate. Requires A.O. attention to ensure constant seal oil temperature. Service water changes seal oil temperature depending on service water load. Over-cooling of seals could cause seals to seize on shaft. Seal oil temperature swings contributed to #9 bearing vibration during the last operating cycle.

SIGNIFICANCE: Failure of component can result in a plant forced outage. Not an active operator concern or distraction during a plant trip or transient.

RESOLUTIONS:

Before The End of REFOUT 87 - Install temperature control valves on seal oil system to reduce operator attention.

OBSERVATION NO: TGS-10 COMPONENT(S): Turbine Lube Oil Lift Pumps

EVALUATOR(S): JGBouwens/CMGrady REV NO: 1 DATE: 6/23/86

DESCRIPTION: Lift pumps did not start automatically on turbine speed reduction during trip of 5/19/86. Failure attributed to loss of AEH power supply. Auto start test should be performed to ensure reliability. The bearing oil lift pumps have been high failure rate components.

SIGNIFICANCE: Poses a hindrance to response on a Plant trip. While auto start of the lift pumps on a trip will extend bearing life, the lift system is not required on turbine trip to protect the turbine.

RESOLUTIONS:

Prior To Plant Startup - Test and ensure lift pump starts at 600 RPM on a turbine trip.

As Part of 5-Year Plan - Evaluate the reliability of the lift system and replace as required.

OBSERVATION NO: TGS-11 COMPONENT(S): Turbine Control Unit

EVALUATOR(S): JGBouwens/CMGrady REV NO: 1 DATE: 6/23/86

DESCRIPTION: The turbine control unit does not annunciate in Control Room upon failures/abnormal condition, and therefore does not immediately alert the operator to a change in status which may require his attention. There are currently small lights on the panel to show a problem.

SIGNIFICANCE: Lack of alarms for important turbine/generator malfunctions or limits reduces the operators ability to respond before a plant trip or transient.

RESOLUTIONS:

Prior To Plant Startup - Provide audible alarms in the Control Room for all turbine control unit alarms.

OBSERVATION NO: TGS-12 COMPONENT(S): Reheat Stop Valve CV-0544 Position Indication

EVALUATOR(S): JGBouwens/CMGrady REV NO: 1 DATE: 6/23/86

DESCRIPTION: CV-0544 did not indicate closed although valve was verified closed on 5/19/86 trip. Limit switch has been a known problem since the end of the last REFOUT.

SIGNIFICANCE: Lack of reliable limit switch position for reheat/intercept position poses an operator distraction during startups/shutdowns and plant transients.

RESOLUTIONS:

Prior To Plant Startup - 1. Replace existing switches with more reliable switches if feasible.
2. Ensure all limit switches for indication on all turbine valves are properly set and tested.

Before The End Of 87 REFOUT - Replace with more reliable limit switches if not completed prior to startup from current outage.

OBSERVATION NO: TGS-13 COMPONENT(S): CV-0571 and CV-0575 Turbine Stop Valves

EVALUATOR(S): JGBouwens/CMGrady REV NO: 1 DATE: 6/23/86

DESCRIPTION: Turbine stop valves indicated delaying closing (ie, CV-0571 - 3 seconds; CV-0575 - 25 seconds) on 5/19/86 trip. Valves have checked out mechanically ok. Turbine engineer suspects a delay in limit switch system. Valves were not closing as normally designed during a trip. Governor valves were closed so the stop valves did not have a significant differential pressure to drive them to closed.

SIGNIFICANCE: Important to reliable plant operation. Failure poses a hindrance to response on a Plant transient.

RESOLUTIONS:

Prior To Plant Startup - Inspect, test and repair as necessary. This included complete verification of closing times and limit switch and events recorder circuitry.

OBSERVATION NO: TGS-14 COMPONENT(S): P-45A & P-45B Turbine Building Sump Pumps

EVALUATOR(S): JGBouwens/CMGrady REV NO: 2 DATE: 6/23/86

DESCRIPTION: In one year's time there have been eleven work orders for both pumps, three to repair couplings, four due to pumps bound up, two for check valve replacement, and several for motor replacement and pump columns leaking. Since 1979 there have been 24 MO's/WO's for repairs on these pumps. Due to piping arrangements, it's difficult to work on just one pump without taking the other one out of service. Usually when maintenance is performed on these pumps, a temporary sump pump is installed to handle the water volume.

SIGNIFICANCE: Important to reliable plant operation. Could lead to forced outage due to flooding of Auxiliary Feedwater Pump Room. The Auxiliary Feedwater Pump room has been flooded due to failure of the Turbine Building sump pump system. This is a potential means of failing two of our three Auxiliary Feedwater Pumps.

RESOLUTIONS:

Prior To Plant Startup-
1. Peform PACS to clean out turbine building sump and PM pumps.
2. Revise and upgrade existing preventive maintenance activities to correct high failure components.
3. Evaluate why so much trash is going to sump and what methods are available to prevent clogging of pump suction strainers.
4. Initiate a change to install valves to isolate pumps for maintenance activities.

Before The End Of 87 REFOUT-
1. Evaluate pump design and capacity and recommend modification(s) as necessary to correct high maintenance and reduce volume of water going to the sump.
2. Evaluate the installation of a permanent sump pump in the Auxiliary Feedwater Pump Room.

OBSERVATION NO: TGS-15 COMPONENT(S): Turbine-Generator Thrust Bearing Trip Oil Orifices Clogged

EVALUATOR(S): VJBeilfuss REV NO: 1 DATE: 6/23/86

DESCRIPTION: While troubleshooting the autostop oil system the week of June 9 it was noticed that there was no thrust bearing trip oil flowing at the thrust bearing. The pressure reducing orifices were opened. They were found to be completely clogged with dirt, scale and corrosion products. The turbine had been operating without the thrust bearing trip operable. It is unknown how long this situation has existed.

SIGNIFICANCE: High thrust condition would not have tripped the turbine and could have resulted in turbine damage if it went unnoticed.

RESOLUTIONS:

Prior To Plant Startup 1. Clean and flush thrust trip orifices and tubing.

2. Establish a thrust trip oil pressure curve.

Before The End of REFOUT 87 1. Initiate a PAC to inspect and clean each refueling outage.

OBSERVATION NO: TGS-16 COMPONENT(S): Turbine-Generator EHC Power Supplies

EVALUATOR(S): RESchrader REV NO: 1 DATE: 6/23/86

DESCRIPTION: Failure of EHC +15 volt D-C power supplies leading to loss of EHC control voltage, closure of governor valves and subsequent reactor trip on 5/19/86. The power supplies tripped due to AC line noise induced by unplugging of EHC cabinet ventilation fans for cleaning /PM.

SIGNIFICANCE: Failure of both power supplies (i.e, primary and secondary) can cause loss of turbine control, loss of control for turbine-generator auxiliary systems, instability in the secondary plant and present challenges to the reactor protection system resulting in reactor trip.

RESOLUTIONS:

Prior To Plant Startup

1. Repair the 200 volt DC, 420 Hz supply.
2. Remove the fans from the primary 60 Hz supply and provide power from an external source. Ensure fan source does not induce transients into power supply voltage sources.
3. Install transient suppressors on power supply input AC connections.
4. Install circuit breaker lock on AC power source to primary power supplies at AC panel to prevent inadvertent opening.
5. Verify proper operation of -15 VDC supplies; check voltage regulation and ripple.

RESOLUTIONS: (Continued) -

Prior To Plant Startup (continued)

6. Verify proper operation of -48 VDC supplies; check voltage regulation and ripple.
7. Modify the outside air cooling duct to prevent moisture incursion and resultant corrosion in the EHC cabinet.

Before The End of REFOUT 87

1. Install audible alarm in control room for turbine panel trouble (TGS-11).
2. Evaluate replacement of aging on power supplies; replace if necessary.

As Part of 5-Year Plan

1. Evaluate the addition of backup power supplies on each power source to provide double redundancy.

SYSTEM	TITLE
VAS	HEATING, VENTILATING AND AIR CONDITIONING SYSTEM
01	Control Room Air Conditioners VX-10 & VC-11
02	Engineering Safeguard Coolers VHX-27A & VHX-27B

OBSERVATION NO: VAS-01 COMPONENT(S): Control Room Air Conditioners VC-10 & VC-11

EVALUATOR(S): AETome REV NO: 2 DATE: 6/23/86

DESCRIPTION: System has been experiencing vibration problems which result in freon leaks necessitating frequent charging. Vibration of metal ID tag holders had been causing wear on tubing which resulted in leaks. These tags have been removed. Other problems are occurring due to the continued vibration of equipment. Source of the problem may be associated with the manner in which the equipment is mounted.

SIGNIFICANCE: Not an active operator concern or distraction during plant trips or transients. Listed due to repeat maintenance orders.

RESOLUTIONS:

Before The End of 87 REFOUT - Investigate sources of vibration and propose modifications to resolve.

OBSERVATION NO: VAS-02 COMPONENT(S): Engineering Safeguard Coolers VHX-27A & VHX-27B

EVALUATOR(S): AETome REV NO: 3 DATE: 6/23/86

DESCRIPTION: System has been experiencing tube leaks. Tube bundles were scheduled to have cleanout bends replaced in 1985. MOs have been issued for the replacement of all cleanout bends on VHX-27A & VHX-27B, the repair of a pinhole leak in VHX-27B and the repair of a leak at the service water inlet nozzle on VHX-27B. The replacement of the cleanout bends will be completed by the end of the present outage.

REF: MO 24503809, 24604608

SIGNIFICANCE: Failure or degradation of cooler can lead to forced outage. Not an active operator distraction on a trip or transient. Isolation of leaky cooler renders all components in that room inoperable and requires immediate shutdown by Tech Specs.

RESOLUTIONS:

Prior To Plant Startup - Leak test heat exchangers.

Before The End of 87 REFOUT - Evaluate feasibility of isolating individual coolers for maintenance during power operations. This may involve the addition of manual isolation valves and possibly Tech Spec changes.

APPENDIX D

PALISADES PLANT ADMINISTRATIVE PROCEDURE 4.08

"POST-TRIP REVIEW REQUIREMENTS"

AND

MAY 19, 1986 POST-TRIP REVIEW REPORT

TITLE: POST TRIP REVIEW REQUIREMENTS

1.0 PURPOSE

This procedure is to provide a systematic method for diagnosing the cause(s) of a reactor trip, ascertaining the proper functioning of safety related and other important equipment during the trip, determining any detrimental effect on plant equipment caused by the trip, and making the determination that the plant can be restarted safely.

2.0 SCOPE

A documented review should help ensure events that have had an impact on the cause of the trip and subsequent equipment responses are identified and thoroughly understood. The review results will permit a determination to be made as to the readiness of the plant to be safely returned to operation. The format of this procedure can also be used to diagnose reactor plant transients other than those involving reactor trips.

3.0 REFERENCES

3.1 NODS-A17, "Management Overview"

3.2 NRC Generic Letter 83-28, dated July 8, 1983

3.3 Palisades Administrative Procedure 10.41, "Procedure On Procedures"

3.4 Palisades Administrative Procedure 10.42, "Procedure/Document Matrix"

3.5 Palisades Administrative Procedure 10.46, "Plant Records"

3.6 Palisades Administrative Procedure 4.01, "Shift Operations"

3.7 Nuclear Assurance Department Procedure XIX-2, "Plant Safety Engineering Assessment Program"

3.8 Palisades Plant Site Emergency Plan

4.0 RESPONSIBILITIES

4.1 PLANT GENERAL MANAGER

The Plant General Manager or the Duty and Call Superintendent is responsible for making the decision to start up the reactor. For the purpose of this procedure, reference to the Plant General Manger includes the Duty and Call Superintendent when applicable.

In addition the Plant General Manager shall verify the cause of the trip has been determined and appropriate corrective action taken.

4.2 PLANT SAFETY ENGINEERING (PSE)

PSE shall perform an assessment of every inadvertant plant trip and provide the results of such assessment to the Plant General Manager in accordance with Reference 3.7.

4.3 OPERATIONS SUPERINTENDENT

a. For unplanned reactor trips involving control rod motion when the reactor is not critical or for plant transients other than reactor trips, the Operations Superintendent may direct that the Post Trip Review Process be performed.

b. For a Condition II event, as determined by Step 5.3.4, the Operations Superintendent or his designated alternate shall:

1. Report to the Plant site to assist in the further investigation of the trip and to determine necessary corrective action before restart.

2. Analyze the event reconstruction and supply information per Step 5.4.2 to the Plant General Manager.

4.4 LEAD SHIFT ENGINEER

The Lead Shift Engineer shall review all completed Reactor Trip Reports.

4.5 DUTY SHIFT ENGINEER

a. The Shift Engineer (SE) on duty shall:

1. Complete offsite personnel and agency notification in accordance with Reference 3.6 and 3.8 as appropriate.

2. Interview plant personnel involved in the trip.

3. Collect data for inclusion in trip report.

4. Make recommendations to Plant General Manager on reactor startup.

5. Prepare Trip Report.

b. The Shift Engineer (SE) on duty should notify the Operations Superintendent of:

1. Any unplanned reactor trip involving control rod motion when the reactor is not critical.

2. Significant plant transients other than reactor trips (eg, Engineered Safeguards Feature actuations, significant feedwater or turbine transients, significant PCS pressure, level or temperature transients, etc).

3. Any Condition II event.

4.6 SHIFT SUPERVISOR/OPERATIONS

a. The Shift Supervisor/Operations (SS) shall:

1. Assist the SE with data collection as Plant conditions allow.

2. Make recommendation to Plant General Manager on reactor startup.

3. Ensure Plant shutdown actions are completed after the reactor trip.

4. Maintain the Plant in a safe condition.

b. The Shift Supervisor/Operations (SS) should notify the Operations Superintendent of:

1. Any unplanned reactor trip involving control rod motion when the reactor is not critical.

2. Significant plant transients other than reactor trips (eg, Engineered Safeguards Feature actuations, significant feedwater or turbine transients, significant PCS pressure, level or temperature transients, etc).

3. Any Condition II event.

5.0 PROCEDURE

5.1 GENERAL INSTRUCTIONS

5.1.1 Post Trip Review Process

The post-trip review process is a five-step process. The five steps are as follows:

Step	Responsiblity
(1) Data collection	Shift Engineer
(2) Trip investigation	Shift Engineer
(3) Restart decision	Plant General Manager
(4) Trip investigation review	Plant General Manager/PRC
(5) Independent assessment/ comparison with past trips for trends.	Plant Safety Engineering

5.1.2 Initiation

Any unscheduled reactor trip when the reactor is critical shall require the post-trip review process to be initiated. For unplanned reactor trips involving control rod motion when the reactor is not critical, or for plant transients other than reactor trips (eg, Engineered Safeguards Feature actuations, significant feedwater or turbine transients, significant PCS pressure, level or temperature transients, etc), the post trip review process may be initiated as directed by the Operations Superintendent. The post-trip review shall be initiated after plant conditions have stabilized. The Post-Trip Review Report, Attachment 1, guides and documents the post-trip process. The post-trip review shall not distract the Shift Supervisor, Shift Engineer, or operating personnel from their primary responsibility of monitoring plant parameters and maintaining the plant in a safe condition.

5.2 DATA COLLECTION

5.2.1 Hard Copy Information

The Shift Engineer is responsible for the collection of required hard copy information. The purpose of this data is to reconstruct the transient from prior to the initiating event until plant parameters have stabilized. Part 2(a) and (b) of the Post-Trip Review Report, Attachment 1, lists the information that should be collected. Strip chart recordings must accurately reflect real time to have meaningful information. If this is not the case, the SE should ensure the chart paper is annotated with a time mark, chart speed (chart speed may change during the transient), and time scale.

5.2.2 Operator Statements

After the plant is in a safe, stable condition, the SE should ensure each individual involved in the trip (eg, reactor operator, repairman/technician, Maintenance Supervisor, etc) provides a statement concerning his/her involvement in the reactor trip. These statements may be obtained in one of the following ways:

a. Written operator statements (use Attachment 2).

b. SS/SE interviews with personnel involved in the reactor trip.

c. Critique with all involved personnel.

If either of the last two techniques are used, the information should be recorded to ensure future availability of the information. The operator statements should be restricted to facts concerning the event, and the facts should be stated chronologically, if possible. The statement should include the following:

a. Plant conditions prior to the trip (for maintenance personnel, this will include the status of maintenance or testing).

b. First indication that a problem existed.

c. Individual's actions as a result of the indications.

d. Subsequent indications and plant response, including manual actions.

e. Noted equipment malfunctions or inadequacies.

f. Procedure deficiencies identified during the situation.

g. Recommendations to prevent recurrence.

The signed written statements or signed transcripts of tape recordings shall be included in the reactor trip data package to assist in the event reconstruction.

5.2.3 Post-Trip Review Report Data

The SE shall complete Part 1 and Part 2 of the Post-Trip Review Report, documenting the initial plant conditions and the plant response. Information for the Post-Trip Review Report shall come from a compilation of available data.

5.2.4 Post-Trip Review Data Package

The SE should collect the hard copy information, operator statements, and the Post-Trip Review Report. This will be the post-trip review data package that will be used during the post-trip investigation.

5.3 POST-TRIP INVESTIGATION

5.3.1 Event Reconstruction

The Shift Engineer is responsible for the initial post-trip investigation. The purpose of this investigation is to determine the cause of the trip, verify proper plant response, and to assess the plant's readiness to return to operation. The SE will reconstruct the transient in Part 3 of the Post-Trip Review Report, Attachment 1, using the collected data. A chronological description of the event will be developed, using all available data. Pertinent alarms, trips, actuations, and isolations will be listed or marked on the sequence-of-events or Feedwater Purity Data Logger printout. Pertinent plant parameters should be incorporated into the chronological list of events during the reconstruction.

5.3.2 Analysis and Evaluation

The Shift Supervisor, and the Shift Engineer shall analyze and evaluate the event reconstruction to determine the cause of the trip and the following:

a. If all major safety-related and other important equipment involved in the trip operated as anticipated or expected.

b. If the trip/transient caused any detrimental effects on plant equipment.

c. If it is acceptable to restart the reactor.

The Shift Supervisor and the Shift Engineer should look beyond the obvious indications to diagnose the cause of the trip and evaluate the plant response. They should review the available information thoroughly, looking for:

a. abnormal indications or degraded trends in equipment performance,

b. events occurring out of the normal or anticipated sequence,

c. failed or degraded response of equipment to control signals,

d. unusual chemistry results or radiation readings, and

e. unanticipated alarms.

The actual or suspected cause of the trip and any abnormal or degraded indication identified during the transient shall be documented in Parts 4 through 6 of the Post-Trip Review Report.

5.3.3 Preliminary Safety Assessment

A preliminary safety assessment of the trip and subsequent plant response shall be performed by the Shift Supervisor and the Shift Engineer. The maximum and minimum values of selected parameters shall be compared with their established limits in the Technical Specifications. Parts 7 and 8 of the Post-Trip Review Report will document this safety assessment.

5.3.4 Trip Classification

Based on the results of the analysis and evaluation of the plant trip and subsequent response, the Shift Supervisor and the Shift Engineer shall classify the event as one of the following conditions and document their classification in Part 9 of Attachment 1:

a. Condition I

The cause of the trip is positively known and has been corrected; all safety-related and other important equipment functioned properly during the trip, or if not, the malfunction has either been corrected or redundant equipment is available for reactor start-up.

b. Condition II

1. The cause of the trip is not positively known.

Or

2. Safety related equipment or other equipment functioned in an abnormal or degraded manner during the trip and the malfunction has not been corrected.

Or

3. Safety related equipment or other equipment functioned in an abnormal or degraded manner during the trip and redundant equipment is not available for startup.

If the Shift Supervisor and Shift Engineer cannot agree on classification of the transient, the event shall be classified as Condition II and referred to the Operations Superintendent for evaluation.

5.3.5 Notifications

Once the reactor trip event is classified, the Shift Supervisor/Shift Engineer shall inform the Plant General Manager of the classification of the event, their recommendation for plant startup, and the Plant Safety Engineering investigation findings and recommendations. If the event is classified Condition II, the SS/SE shall also inform the Operations Superintendent. If necessary, emergency plan notifications shall be made as required in References 3.6 and 3.8.

5.4 RESTART DECISION

The Plant General Manager has the responsibility and authority to grant permission to commence a reactor startup following a reactor trip. This permission shall be documented by the Shift Supervisor or Shift Engineer in Part 11 of the Post Trip Review Report, Attachment 1.

5.4.1 Condition I Events

The Shift Supervisor/Shift Engineer shall inform the Plant General Manager if the unscheduled reactor trip event is classified as Condition I. Based upon this classification, the SS/SE recommends restart of the reactor.

5.4.2 Condition II Event

The Shift Supervisor/Shift Engineer shall inform the Plant General Manager when an event is classified Condition II. The Operations Superintendent or his designated alternate shall report to the plant site to assist in the further investigation of the trip and to determine necessary corrective action before restart.

The Operations Superintendent will analyze the event reconstruction, emphasizing the root cause of the trip and the resolution of abnormal or degraded indications. He should use available expertise to resolve questions concerning the cause and plant response. Sources of expertise that should be considered include nuclear steam supply vendors, vendor engineers, onsite engineering staff and other experienced operations and maintenance personnel. The Operations Superintendent should supply the following information to the Plant Manager and document it in Part 9 of the Post Trip Review Report:

a. The actual or most probable cause of the trip.

b. The maintenance and testing necessary before reactor restart including additional measures to verify the most probable cause.

c. Additional monitoring or trending required during and/or after reactor restart.

d. Necessary briefings to operations and/or maintenance personnel concerning specific equipment indications or possible malfunctions.

e. The conditions necessary for a reactor restart.

5.4.3 Plant General Manager Evaluation and Decision

The Plant General Manager should evaluate the recommendation made by the personnel performing the trip investigation. The Plant General Manager should consider convening the PRC to review the trip investigation prior to reactor restart for Condition II events. The PRC can advise the Plant General Manager on the thoroughness, technical accuracy and consistency of the trip investigation.

The Plant General Manager's decision to restart the reactor shall include the following considerations:

a. The most probable cause of the trip is known and corrected.

b. Major safety-related and other important equipment functioned properly during the transient, or corrective maintenance and satisfactory testing has been performed or will be completed when plant conditions permit.

c. The plant response during the event has been analyzed and the plant responded as anticipated, or all abnormalties are understood and corrected as required by Technical Specifications.

d. If the cause of the trip has not been positively identified, the Plant General Manager shall determine if the cause and the circumstances surrounding the cause have been analyzed adequately. He shall take adequate measures to prevent repetitive challenges to safety systems during future power operations.

5.5 INVESTIGATION REVIEW

The Lead Shift Engineer, Operations Superintendent, Plant General Manager and PRC Chariman shall document their reviews in Part 12 of the Post-Trip Review Report.

5.5.1 Condition I Events

Condition I event trip reports shall be reviewed by the Lead Shift Engineer, Operations Superintendent, and Plant General Manager within two weeks of the trip. The report should be reviewed by the PRC during the next regularly scheduled PRC meeting or routed for review.

5.5.2 Condition II Events

If directed by the Plant General Manager, a Condition II event shall be reviewed by the PRC before a reactor restart is commenced. Otherwise, a Condition II event will receive a PRC review during the next regularly scheduled PRC meeting or routed for review.

5.6 PLANT SAFETY ENGINEERING ASSESSMENT PROGRAM

Plant Safety Engineering will perform an independent assessment of each unplanned reactor trip as addressed in Reference 3.7.

The Lead Assessor shall provide a specific Plant Safety Engineering conclusion related to acceptability of Plant Startup or continued operation. This conclusion shall be documented in Part 10 of the Post-Trip Review Report.

6.0 ATTACHMENTS AND RECORDS

6.1 ATTACHMENTS

6.1.1 Attachment 1, "Post-Trip Review Report"

6.1.2 Attachment 2, "Plant Personnel Statements"

6.2 RECORDS

The post-trip review data packages shall be retained for the life of the plant. This will allow the data package to be available for comparison with future trips.

POST-TRIP REVIEW REPORT

Date of Occurrence: 5/19/86 Time of Occurrence: 1416

PART 1: INITIAL CONDITIONS

a. Reactor Power 99 %

b. Reactor Coolant Pumps Operating (circle) A B C D

c. Main Feed Pump(s) Operating (circle) A B

d. Status of Control Stations (circle)

1.	Turbine Control	Man	Oper Auto Imp In Imp Out
2.	A Feedpump Control	Man	Auto
	B Feedpump Control	Man	Auto
3.	A Main Feedwater Reg Valve	Man	Auto
	B Main Feedwater Reg Valve	Man	Auto
4.	Turbine Bypass Valve (**CV-0511)	Man	Auto
5.	Pressurizer Level Control Channel A/B	Man	Auto
6.	Pressurizer Pressure Control Channel A/B	Man	Auto

Combined controllers in manual

e. PORV Block Valves (circle) OPEN CLOSED

f. Off-normal Status (of any trains/portions of safety systems)

DETAILS

1. Reactor Protection System A TMLP bypassed

2. Safety Injection Actuation System P-66A HPSI was running for Tech Spec Surveillance MO-22

POST-TRIP REVIEW REPORT

DETAILS

3. Containment Cooling & Spray None - nothing abnormal

4. Auxiliary Feedwater no abnormal conditions

g. Testing/Surveillances in progress (include test # and test status):

MO-22 High Pressure Safety Injection Pump Surveillance was in progress on P-66A

POST-TRIP REVIEW REPORT

PART 2: PLANT RESPONSE

a. Obtain a copy of the applicable parameter plots given below:

Check If Included	Parameter
✓	1. Rx Power
✓	2. Pzr Level
✓	3. Pzr Pressure
✓	4. T_{ave}
✓	5. Tc WR
✓	6. SG Levels

b. Obtain a Printout from:

- ✓ 1. Tennecomp Data Logger
- ✓ 2. Event Recorder
- ✓ 3. Critical Function Monitor: Obtain hard copies of pertinent parameters to include, at a minimum, S/G "A" pressure (Point ID **PT-0751B) and S/G "B" pressure (Point ID **PT-0752B)

c. Obtain copies of pertinent logs from past 24 hours (Chemistry, Control Room, Auxiliary Operator, etc).
None Pertinent

d. Safety System Actuation and Performance

1. Reactor Protection System

Type of Trip: High Pressurizer Pressure Time of Trip: 1416

2. Safety Injection Actuation System

Actuation Time N/A: _____

Actuation Signal: _____

System Response _____

_____

_____

POST-TRIP REVIEW REPORT

3. Containment Isolation

Actuation Time N/A :____

Actuation Signal _____

System Response: _____

4. PZR Code Safety Valves Lifted YES (NO)

Did they reseat properly? YES NO

How Confirmed? _____

5. Main Steam Relief Valves Lifted S/G pressures exceeded Safety Lift setpoints max pressure 1025 psia YES (NO) per

Did they reseat properly? (YES) NO

How confirmed? Visual and by Rx temperature response

e. Control System Actions

1. Turbine Trip Trip Time 14 : 16

Trip Signal Rx Trip

2. PCS Pressure Control

Did PORV lift? YES (NO)

Was PZR heater response normal? (YES) NO

Was PZR spray response normal? CV-1057 did not go fully closed YES (NO)

Was PZR level control normal? 'A' ccp had been secured was started manually after Rx trip YES (NO)

f. Manual Actions

Were any control stations taken from Auto to Manual? (YES) NO

POST-TRIP REVIEW REPORT

Specify Station Time/Sequence: P-8A auxiliary feed pump was started manually by the control operator as part of the immediate actions for a Rx trip

Other Manual Actions: P-55A was manually started (attempted - failed to start), CV-0511 taken to manual + attempted to open, Manually took CV-1059 to close / switched boric pressure regulate to CV-2122

g. Radiological response: (include abnormal area radiation monitor, process radiation monitor, or environmental monitoring indication)

No abnormal radiological response

h. Chemistry conditions:

1. Primary Pre trip I-131 .0052 uci/ml

Post trip I-131 .023 uci/ml [B] 1006

2. Secondary Normal

i. Other comments:

(1) The events Recorder and the CFM indicated that Main Steam Dump CV-0779 failed to operate

(2) The events recorder indicated that Reheat Stop CV-0544 failed to close however the value was verified to have closed

(3) ROD #34 GREEN ROD BOTTOM LIGHT DID NOT LITE AFTER TRIP - VERIFIED ROD 34 ON BOTTOM VIA PID & SPI (NR WINDOW or ROD 34 GREEN (LOWER E.C. SWITCH) LIGHT.

POST-TRIP REVIEW REPORT

PART 3: SEQUENCE OF EVENT

TIME:	EVENT DESCRIPTION:
1415	EHC primary & Secondary Power supplies failed causing T/G
	governor and intercept valves to close
	Drove Control rods in
1416	Rx trip on high pressurizer pressure
	Steam Dumps opened
1417	Steam Dumps closed

PLANT PERSONNEL STATEMENT

(Include the Plant conditions prior to the trip, your indications that a problem existed, your action as a result of those indications, noted equipment malfunctions or inadequacies and any identified procedure deficiencies. Also, include any information you consider important to review this unscheduled reactor trip. Use additional sheets as necessary).

The Reactor was at ~99.5 % Rx power prior to the trip. From the Shift Supervisors office I heard a CO say "I think we're going to lose it. I looked into the control room And saw the CO-2 driving control rods in and then the reactor tripped. I observed the CO's verifying the immediate actions of EOP-1 and I watched Pzr press d.p down to 1690 psia and then recover. I observed that the Pzr spray Valve HCV-1059 had open indication but Pzr press was recovering. I also observed CV-0511 failed to operated in auto, the CO-1 attempted manual operation but the Valve failed to respond. The DC bus ground alarm came in but was cleared by the CO-2. It appeared to be related to a continuing problem with a ground in the UPS sys ~~and was unrelated to trip~~. The plant response for the tripped appeared normal. I Observed that the lights on the EHC control cabinet were not lit.

Jackson Lubbers 1/5/19/86 / 2000
Signature Date Time

ad0285-0014c-93-89

Proc No 4.08
Attachment 2
Revision 1
Page 1 of 1

PLANT PERSONNEL STATEMENT

(Include the Plant conditions prior to the trip, your indications that a problem existed, your action as a result of those indications, noted equipment malfunctions or inadequacies and any identified procedure deficiencies. Also, include any information you consider important to review this unscheduled reactor trip. Use additional sheets as necessary).

was in the S.S. office - heard control operators
voices sudden concern - entered control room and
observed Turbine Valves had shut and one
control operator was doing work to reduce temp.
which was rising. Plant was @ ≈ 99.5% Pow.
N.I.T. & N.O. sent A's to look for EH leaks -
Trip hit. Assumed EOP-1 immediate actions
carried out - recognized consequents, dispatched
J. Booth to inspect EHC Cabinet power supplies &
Noted: Atmos steam operated ok - but CV-1059
would not operate. Also had only open indication
on spray valve CV-1059 - later found closed like
had burnt out - when bulb replaced - it will
energized - suspect limit switch problem. CO-II had
difficulties getting P-55A to start - he also
noticed the CVCS back pass reg valve had
failed closed.

J.C. Anderson 15/16/88 1645
Signature Date Time

ad0285-0014c-93-89

VOID

Exhaust gas [illegible] — [illegible] ...
[illegible] fans started — had A.O. manually
[illegible] at 1600! Following A.O. reported
[illegible] Air ejector steam [illegible] manually
A/E relief valves lifted but not [illegible]
verified SI margin and calculated boron
addition necessary to achieve hot shutdown
Had A.O. check Switchyard for hot
Targets! CO-1 requested permission
to shut both mn. FEED block valves to
stop "B" MFP from spinning backwards.
Declared 4 hour non emerg. report — SE
made notifications. EEC reported both
15 VDC pwr. supplies dead in EHC cabinet
and 200 VDC pwr. supply lost. Earlier on
EEC tech had been doing a PM on
the EHC cabinet fans & contacted
Operators to write up statements for
Rx trip report. Also time of trip did not
get green bottom lite on CRDM #34

PLANT PERSONNEL STATEMENT

(Include the Plant conditions prior to the trip, your indications that a problem existed, your action as a result of those indications, noted equipment malfunctions or inadequacies and any identified procedure deficiencies. Also, include any information you consider important to review this unscheduled reactor trip. Use additional sheets as necessary).

100% PWR TAVE 563.7° ARO ~809 MW

TAVE-Dev Alarm Gross AWP alarm.
Checked Turbine Control Immediately
All Governor & Reheat Intercept Valves going closed or closed
No Lites Indication on Ref. Setter Numbers on Turbine
Controls, no lites on Auto-Manual Turbine Control.
Check TAVE Raising Rapidly, Started To Trip Turbine
Plant @ Turbine Trip Button, TO Late, Trouble
& Rx Trip Loss of Load., Follow-Up EOP 1
Immediate Action, Turbine Bypass Valve No Work
Auto or Manual.

Signature 5-19-96 1540
Date Time

ad0285-0014c-93-89

PLANT PERSONNEL STATEMENT

(Include the Plant conditions prior to the trip, your indications that a problem existed, your action as a result of those indications, noted equipment malfunctions or inadequacies and any identified procedure deficiencies. Also, include any information you consider important to review this unscheduled reactor trip. Use additional sheets as necessary).

Running at 99.8% pwr & Tave @ 563.8°F. observation Tave increasing (564.8°F) and commenced driving control Rods. Tave & PCS pressure continued to increase. Looked over to Turb control pannel & noticed that setter & load indi tubes were black. CO-1 notified me that all turbine valves (EH type) had closed Rx & Turb tripped very shortly after his statement. Tripped A MFP with Tave at 558°F Tripped B MFP at 538°F. PZR level shrank to ≈ 22% and when it returned to 36% & letdown was restored - CV 2012 failed closed - shifted back pressure control to CV 2122 and it works well. CV 1059 never appeared to close when PCS pressure was low - Thus PCS pressure was slow to return. Turbine B/P valve never operated, so controlled Tave with Atmos Dumps & use of

Kurt H. Denham / 5-19-86 / 1535
Signature Date Time

ad0285-0014c-93-89

P8A & P8B while also trying to bring S/G levels to

PLANT PERSONNEL STATEMENT

(Include the Plant conditions prior to the trip, your indications that a problem existed, your action as a result of those indications, noted equipment malfunctions or inadequacies and any identified procedure deficiencies. Also, include any information you consider important to review this unscheduled reactor trip. Use additional sheets as necessary).

Was in C.R. at time of trip.
Noticed nothing.

J. Schwarzbach 5/19/86 0535
Signature Date Time

ad0285-0014c-93-89

PLANT PERSONNEL STATEMENT

(Include the Plant conditions prior to the trip, your indications that a problem existed, your action as a result of those indications, noted equipment malfunctions or inadequacies and any identified procedure deficiencies. Also, include any information you consider important to review this unscheduled reactor trip. Use additional sheets as necessary).

plant condition normal.
No indication of any problem.
On Control Room at time of trip.

AC Cordell 10-19-86 1535
Signature Date Time

PLANT PERSONNEL STATEMENT

(Include the Plant conditions prior to the trip, your indications that a problem existed, your action as a result of those indications, noted equipment malfunctions or inadequacies and any identified procedure deficiencies. Also, include any information you consider important to review this unscheduled reactor trip. Use additional sheets as necessary).

In East Safeguards - did not hear plant trip

M. Overton 5-19-86 1525
Signature Date Time

PLANT PERSONNEL STATEMENT

(Include the Plant conditions prior to the trip, your indications that a problem existed, your action as a result of those indications, noted equipment malfunctions or inadequacies and any identified procedure deficiencies. Also, include any information you consider important to review this unscheduled reactor trip. Use additional sheets as necessary).

In Safegaurds doing MO-22 -
Didnt hear anything -
Was told on phone that plant Tripped.

J P Bain 5-19-86 1525
Signature Date Time

ad0285-0014c-93-89

POST-TRIP REVIEW REPORT

PART 4: PROBABLE CAUSE OF TRIP

EHC power supply failure caused the Turbine Governor Valves and intercept valves to close removing the heat sink and causing a pressure transient that resulted in the Rx tripping on High Pressurizer Pressure

Comments: The cause of the power supply cannot be determined with any degree of certainty. It appears the primary over voltage trip is sensitive to RF noise and could have tripped when the cooling fan in the cabinet was unplugged, however that does not explain why the secondary power supply tripped.

PART 5: UNEXPECTED ASPECTS OF TRANSIENT BEHAVIOR

(if event compared with previous similar transient, note the transient with which compared)

Compared With

Previous trip on: 1/26/83 / 0443
Date Time

There were no unexpected Aspects of transient behavior

POST-TRIP REVIEW REPORT

PART 6: IDENTIFICATION OF SYSTEMS WITH INADEQUATE PERFORMANCE

System/Component	Description of Problem
CV-0511 Turbine bypass valve	failed to open
CV-1059 Pzr spray VLV	failed to go full closed
P-55A Coolant Charging Pump	could not be started manually ~~Switch had to be cycled to get pump~~ ~~to start~~
CV-2012 Back pressure Regulator	failed closed
CV-0779 Steam Dump	failed to open

WR's SUBMITTED 5/20/86 mb

Parts 3 thru 6 reviewed by:

Shift Supervisor — per telecon JJ Hamm for TC Anderson / 5/19/86 / 2230 (Signature / Date / Time)

Shift Engineer — Johnny La Hamm / 5/19/86 / 2230 (Signature / Date / Time)

POST-TRIP REVIEW REPORT

PART 7: TRANSIENT DATA FOR PERTINENT PLANT PARAMETERS

		Maximum	Minimum
a.	PCS Pressure	Ch 1 2250 2 2252	Ch 1 1680 2 1680
b.	PCS Average Temperature	Ch 1 576 2 574	Ch 1 533 2 533
c.	S/G Press	S/G A 1025 B 1019	S/G A 860 B 854
d.	S/G Level	S/G A 68 B 70	S/G A 11 B 12

PART 8: PRELIMINARY SAFETY ASSESSMENT

a.	PCS Pressure Remained Above Setpoint for Automatic SI Actuation.	(YES)	NO
b.	PCS Pressure Remained Below Setpoint for PZR Code Safety Valve Actuation.	(YES)	NO
c.	PCS Temperature Decreased Less Than 100° F/hr (Tech Spec).	YES	(NO)
d.	Reactor Coolant Was Contained Within The PCS and Quench Tank.	(YES)	NO
e.	Indicated PZR Level Remained On Scale.	(YES)	NO
f.	Indicated SG Level Remained On Scale (wide range and narrow range - specify below if either went off scale.)	(YES)	NO

Comments:

PCS Temperature decreased very rapidly from 576 to 533 within 2 minutes following the trip as designed. The cooldown rate following the initial transients was well within the Tech Spec requirements

POST-TRIP REVIEW REPORT

PART 9: PLANT EVALUATION AND RECOMMENDATION

a. Classify trip as Condition I or Condition II according to guidelines in procedure.

The event on 5/19/86 (Date) at 14:16 (Time) is a condition II (I, II) event

Signature indicates agreement with condition.

per telecon
for T.C. Anderson / 5/19/86 / 2230
Shift Supervisor Date Time

J. Hamm / 5/19/86 / 2230
Shift Engineer Date Time

Comments and recommendations:

Recommend Rx startup to Hot Sdby for S/G chemistry and to test EHC system. Recommend not exceeding 15% power unless testing shows with reasonable assurance that the EHC power supplies will not trip again.

b. Operations Superintendent's Analysis (for Condition II events only)

1. Actual or most probable cause of trip:

EHC power supply failure - most probable cause of trip of the primary power supply was RF noise generated by unplugging a cabinet cooling fan. No cause for the secondary power supply trip can be determined

POST-TRIP REVIEW REPORT

2. Maintenance and testing required before reactor restart.

none

3. Additional monitoring or trending required during and/or after reactor restart.

Further testing to ensure reliability of EHC power supplies to be performed prior to exceeding 15% power

4. Necessary briefings to operations and/or maintenance personnel concerning specific equipment indications or possible malfunctions.

hang tag on cabinet cooling fan to ensure it is not plugged back in to original power supply

Done 5/20/86 mcg

5. Conditions necessary for a reactor restart (other than listed above)

none

per Telecon
for CS Hozup
Operations Superintendent

POST-TRIP REVIEW REPORT

PART 10: PLANT SAFETY ENGINEERING PRELIMINARY ANALYSIS

1. Evaluation:

At 14:16 on 5/14/86 the reactor trippen on high Pressurizer Pressure. All systems responded as expected. The cause of trip was determined to be Loss of EHC control Power. The Loss of control Power caused the turbine Governor Valves the intercept Values to close. With the loss of the sink the unit trippen on high Pressurizer Pressure

2. Recommendations:

The unit should not be taken above 15% Power until the cause of the control power failure has been determined and repaired or until adequate testing has been completed to assure that the failure will not be repeated

G W Ford 5/14/86 22:30
PSE Lead Assessor Date Time

POST-TRIP REVIEW REPORT

PART 11: PERMISSION TO START UP

Plant General Manager notified and permission granted to start up the reactor.

per Telecon
MSLhuss for RMRxe [illegible] 0015
Shift Engineer or Shift Supervisor Date Time

Comments: D&C has determined that PRC review of this event is not required prior to Rx start-up.

POST-TRIP REVIEW REPORT

PART 12: INVESTIGATION REVIEW

Datalogger printout shows turbine speed going from 1800 → 1160 → 458 at 14:15:11 with the Main Turbine Low Speed alarm at 14:15:13. The reactor trip followed at 14:16:10. Printout shows T_c starting to increase at 14:15:31 and at Steam Flow increasing; S/G A & B Pressure ↑, P_{zr} Pressure ↑, P_{zr} level ↑ at 14:15:26. These are all consistent with the closing of the turbine valves. The signals to the Main Turbine Low Speed Alarm of 14:15:13 and the Turbine Spud decrease of 14:15:11 need to be thoroughly evaluated and the input signals explained as they are the precursor events to everything else which occurred. CSK 5/22/86

Post-Trip Report review conducted:

Lead Shift Engineer 5/22/86

Operations Superintendent CSKoszyp 5/22/86

Plant General Manager emlie for JFF 5/20/86

Comments (note if PRC review is required prior to restart): Yes - see meeting minutes

PRC review of event on: 5/20/86, meeting number: _____

Minutes of the meeting(s) are attached

PRC Chairman / Date

Comments:

CHANGE NUMBER EI-86-005

INFO COPY

TEMPORARY CHANGE TO A PROCEDURE

Procedure Type EMERGENCY INSTRUCTION Procedure No EI-1 Rev No/Date 11/10 11-85

Procedure Title ACTIVATION OF THE SITE EMERGENCY PLAN / EMERGENCY CLASSIFICATION

Paragraph No — Attachment 1 ATMS No EI 0780-00056 15-4-85

Reason for this change: TO PROVIDE NOTE TO CROSS REFERENCE ALTERNATE CLASSIFICATION METHOD

Change: ON ATTACHMENT 1 (PG 15 of 33) UNDER THE "MISCELLANEOUS" HEADING, ADD THE FOLLOWING NOTE IN THE 'EMERGENCY ACTION LEVEL' COLUMN FOR THE 'UNUSUAL EVENT' CLASSIFICATION:

"NOTE: FOR RX TRIPS FROM HIGH RCS PRESSURE (INITIATING EVENT) SEE 'PRIMARY COOLANT SYSTEM - TEMPERATURE OR PRESSURE' CATEGORY"

Recommend change be made permanent? (Yes) No) IF NO, expiration date _____
Does the Procedure require PRC review per Administrative Procedure 10.42? (Yes) No)
The above meets the criteria on the reverse side

[signature] 5/22/86
Initiator Date

Approved [signature] 5/22/86
PRC Member Date

Approved [signature] 5/22/86
SRO-PRC Member Date

Change to become permanent? Yes No

/
Department Head Date

PRC Review Meeting Number _____

ad0582-0003f-93-154

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NEW CODES

AA RA DKT TASK F2 DESCRIPTION:

AA RA DKT TASK F2 DESCRIPTION:

AA RA DKT TASK F2 DESCRIPTION:

AA RA DKT TASK F2 DESCRIPTION:

AA RA DKT TASK F2 DESCRIPTION:

AA RA DKT TASK F2 DESCRIPTION:

AA RA DKT TASK F2 DESCRIPTION:

AA RA DKT TASK F2 DESCRIPTION:

AA RA DKT TASK F2 DESCRIPTION:

PRIMARY FILE LOCATION/LEVEL

DSB #:

FCEN F1 F2 F3

NOTES/SPECIAL INSTRUCTIONS

INDEXER QC DDC

Generate New Label

Generate New RIDS Sheet

Encl Contains Prop Info

Refilm: PDR CF PROP

Encl Contains Foldout Pages

Do Not Refilm

NUCLEAR DOCUMENTS SYSTEM

ADMIN:

RIDS:

REV 2 06/22/88