TENNESSEE VALLEY AUTHORITY

OFFICE OF NUCLEAR POWER

BROWNS FERRY NUCLEAR PLANT ANNUAL OPERATING REPORT TO THE NUCLEAR REGULATORY COMMISSION

January 1, 1987 - December 31, 1987

DOCKET NUMBER 50-259, 50-260, and 50-296

LICENSE NUMBER DPR-33, DPR-52, and DPR-68

SITE DIRECTOR

PLANT MANAGER

IE-47

1/1

XEB 5/10/88

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SUMMARY OF PLANT CONDITIONS
JANUARY 1, 1987 - DECEMBER 31, 1987

Unit 1

Unit 1 was placed on administrative hold in March 1985 to resolve TVA and NRC concerns and has been in outage for 1027 days. The unit also began its sixth refueling on June 1, 1985, with a scheduled restart date to be determined. The sixth refueling will involve loading 8x8R (retrofit) fuel assemblies into the core. The prior-to-startup unit 1 items are environmental qualification (EQ) of electrical equipment (10CFR50.49), torus modification (Nuclear Regulatory Commission Regulation [NUREG] 0661), containment modifications (NUREG 0737), electrical changes (Appendix R 10CFR50) (all) main steam isolation valve (MSIV) modifications, modification of masonry walls (IEB 80-11), evaluation of the vent drain and test connections (VDTC) (Licensee Event Report [LER] 82020), valve modification (Appendix J), high pressure coolant injection (HPCI) concerns, modification of primary containment isolation system (PCIS) logic (LER 259/85009), replacement of plant process computers, seismic qualifications of piping (IEB 79-02/14), postaccident evaluation (NUREG 0737), reactor protection system (RPS) modifications (IE notice 78-45), H_2O_2 sample line modification (LER 81050), radiation monitors modification (LER 80033), emergency equipment cooling water (EECW) carbon to stainless pipe change out, and all NRC commitment items except anticipated transients without scram (ATWS) modifications which are scheduled for next outage.

There are zero assemblies in the reactor vessel. The spent fuel storage pool presently contains 284 new assemblies, 764 end of cycle (EOC)-6, 252 EOC-5, 260 EOC-4, 232 EOC-3, 156 EOC-2, and 168 EOC-1 assemblies. At the end of this reporting period capacity of the fuel pool was 1355 locations.

Unit 2

Unit 2 was placed on administrative hold on September 3, 1985, to resolve TVA and NRC safety concerns. The unit also began its fifth refueling on September 15, 1984, with a scheduled restart date to be determined. The fifth refueling involves loading 8x8R (retrofit) fuel assemblies into the core. The prior-to-startup unit 2 items are control rod drive (CRD) scram discharge instrument volume (SDIV) piping modification (IEB 80-17), EQ of electrical equipment (10CFR50.49), torus modifications (NUREG 0661), containment modification (NUREG 0737), electrical changes (Appendix R 10CFR50) (partial), MSIV modifications, modification of masonry walls (IEB 80-11), addition of feedwater nozzle temperature monitoring (NUREG 0619), evaluation of the VDTC (LER 82020), valve modification (Appendix J) (partial), diesel generator (DG) speed sensor

installation (LER 81004), high-pressure coolant injection (HPCI) and reactor core isolation cooling (RCIC) testable check valve change out, modification of PCIS logic (LER 259/85009), HPCI concerns, seismic program review, and EECW carbon to stainless pipe change out.

There are zero assemblies in the reactor vessel. At the end of 1987 there were 304 new assemblies, 764 EOC-5, 248 EOC-4, 352 EOC-3, 156 EOC-2, and 132 EOC-1 assemblies in the spent fuel storage pool. At the end of the year, available capacity of the spent fuel pool was 1481 locations. All high density racks (HDRs) have been installed in the pool with the exception of two.

Unit 3

Unit 3 was shut down on March 9, 1985, and placed on administrative hold to resolve various TVA and NRC concerns. The restart date has not been determined. It has been shutdown for 1020 days. On January 30, 1987, fuel unloading was started. This task was completed on March 2, 1987. The sixth refueling outage has been scheduled to start on September 21, 1988, and involves loading 8x8R (retrofit) assemblies into the core and ATWS modifications. The prior-to-startup unit 3 items are EQ of electrical equipment (10CFR50.49), containment modifications (NUREG 0737), electrical changes (Appendix R 10CFR50) (all), MSIV modifications, modification of masonry walls (IEB 80-11), evaluation of the VDTC (LER 82020), valve modifications (Appendix J), HPCI concerns, replacement of plant process computer, seismic qualifications of piping (IEB 79-02/14), postaccident evaluation (NUREG 0737), addition of redundant drywell control air supply, RPS modification (IE Notice 78-45), H_2O_2 sample line modification (LER 31050), radiation monitor modification (LER 80033), replacement of jet pump holddown beams assemblies (IEB 80-07), change out of switches in standby gas treatment (SBGT) (LER 83018), EECW carbon to stainless pipe change out, and plant design upgrade to seismic qualification.

There are zero assemblies in the reactor vessel. There are 764 assemblies to finish EOC-6, 248 EOC-5, 280 EOC-4, 124 EOC-3, 144 EOC-2, and 208 EOC-1 assemblies in the spent fuel storage pool. At the end of this reporting period, available capacity of the fuel pool was 585 locations. All HDRs have been installed in the pool with the exception of six.

OPERATING DATA

Operating Status - Unit 1

1. Unit Name: Browns Ferry Unit One
2. Reporting Period: December 1987
3. Licensed Thermal Power (MWt): 3293
4. Nameplate Rating (Gross MWe): 1152
5. Design Electrical Rating (Net MWe): 1065
6. Maximum Dependable Capacity (Gross MWe): 1098.4
7. Maximum Dependable Capacity (Net MWe): 1065
8. If Changes Occur in Capacity Rating (Items Number 3 Through 7) Since Last Report, Give Reasons: N/A
9. Power Lever To Which Restricted, If Any (Net MWe): N/A
10. Reasons for Restrictions, In Any: N/A

		1987	Cumulative
11.	Hours in Reporting Period	8760	117,680
12.	Number of Hours Reactor Was Critical	0	59,521.38
13.	Reactor Reserve Shutdown Hours	0	6,997.44
14.	Hours Generator On-Line	0	58,267.26
15.	Unit Reserve Shutdown Hours	0	0
16.	Gross Thermal Energy Generated (MWH)	0	168,066,787
17.	Gross Electrical Energy Generated (MWH)	0	55,398,130
18.	Net Electrical Energy Generated (MWH)	-14,233	53,706,402
19.	Unit Service Factor	0	49.51
20.	Unit Availability Factor	0	49.51
21.	Unit Capacity Factor (Using MDC Net)	0	42.85
22.	Unit Capacity Factor (Using DER Net)	0	42.85
23.	Unit Forced Outage Rate	100	41.12

24. Shutdowns Scheduled Over Next 6 Months (Type, Date, and Duration of Each): N/A
25. If Shutdown at end of report period, estimated date of startup: To be determined

OPERATING DATA

Operating Status - Unit 2

1. Unit Name: Browns Ferry Unit Two
2. Reporting Period: December 1987
3. Licensed Thermal Power (MWt): 3293
4. Nameplate Rating (Gross MWe): 1152
5. Design Electrical Rating (Net MWe): 1065
6. Maximum Dependable Capacity (Gross MWe): 1098.4
7. Maximum Dependable Capacity (Net MWe): 1065
8. If Changes Occur in Capacity Rating (Items Number 3 Through 7) Since Last Report , Give Reasons: N/A
9. Power Lever To Which Restricted, If Any (Net MWe): N/A
10. Reasons for Restrictions, In Any: N/A

		1987	Cumulative
11.	Hours in Reporting Period	8760	112,567
12.	Number of Hours Reactor Was Critical	0	55,860.03
13.	Reactor Reserve Shutdown Hours	0	14,200.44
14.	Hours Generator On-Line	0	54,338.36
15.	Unit Reserve Shutdown Hours	0	0
16.	Gross Thermal Energy Generated (MWH)	0	153,245,167
17.	Gross Electrical Energy Generated (MWH)	0	50,771,798
18.	Net Electrical Energy Generated (MWH)	-34,470	49,183,833
19.	Unit Service Factor	0	48.27
20.	Unit Availability Factor	0	48.27
21.	Unit Capacity Factor (Using MDC Net)	0	41.03
22.	Unit Capacity Factor (Using DER Net)	0	41.03
23.	Unit Forced Outage Rate	100	40.25

24. Shutdowns Scheduled Over Next 6 Months (Type, Date, and Duration of Each): N/A

25. If Shutdown at end of report period, estimated date of startup: To be determined

OPERATING DATA

Operating Status - Unit 3

1. Unit Name: Browns Ferry Unit Three
2. Reporting Period: December 1987
3. Licensed Thermal Power (MWt): 3293
4. Nameplate Rating (Gross MWe): 1152
5. Design Electrical Rating (Net MWe): 1065
6. Maximum Dependable Capacity (Gross MWe): 1098.4
7. Maximum Dependable Capacity (Net MWe): 1065
8. If Changes Occur in Capacity Rating (Items Number 3 Through 7) Since Last Report , Give Reasons: N/A

9. Power Lever To Which Restricted, If Any (Net MWe): N/A
10. Reasons for Restrictions, In Any: N/A

		1987	Cumulative
11.	Hours in Reporting Period	8760	94,992
12.	Number of Hours Reactor Was Critical	0	45,306.08
13.	Reactor Reserve Shutdown Hours	0	5,149.55
14.	Hours Generator On-Line	0	44,194.76
15.	Unit Reserve Shutdown Hours	0	0
16.	Gross Thermal Energy Generated (MWH)	0	131,868,267
17.	Gross Electrical Energy Generated (MWH)	0	43,473,760
18.	Net Electrical Energy Generated (MWH)	-50,980	42,041,148
19.	Unit Service Factor	0	46.52
20.	Unit Availability Factor	0	46.52
21.	Unit Capacity Factor (Using MDC Net)	0	41.56
22.	Unit Capacity Factor (Using DER Net)	0	41.56
23.	Unit Forced Outage Rate	100	43.54

24. Shutdowns Scheduled Over Next 6 Months (Type, Date, and Duration of Each):
N/A

25. If Shutdown at end of report period, estimated date of startup:
To be determined

SUMMARY OF PLANT MODIFICATION COMPLETIONS
JANUARY 1, 1987 - DECEMBER 31, 1987

Engineering Change Notice (ECN) P0898 Modifications of Fire Protection System - Unit 2

Description

The sprinklers in the aqueous film-forming foam (AFFF) system were raised or lowered as required by this modification in the unit 2 reactor building on elevation 639'. Certain sprinklers were also rearranged slightly to permit adequate dispersion or water density over the reactor recirculation MG sets.

Safety Evaluation

The modification increased the effectiveness of the AFFF system by improving the spacing, coverage, and discharge of the sprinkler heads over the reactor recirculation motor generator (MG) sets. The AFFF system does not perform a safety-related function. However, proper design considerations were taken to ensure safety-related equipment in the immediate vicinity of sprinklers was not adversely affected. Thus, the margin of safety was not reduced.

ECN P0896 Modifications of Fire Protection System - Unit 2

Description

Installed automatic sprinklers in the unit 2 reactor building above elevation 593'. The modification included hangers to support the piping.

Safety Evaluation

The modification minimizes the potential spread of a fire through the equipment hatch openings and stairwells between elevations 593' and 621' of the unit 2 reactor building. Also, sprinklers were provided for areas on elevation 593' that were not covered by the existing sprinkler system. Therefore, the fire protection capabilities of the plant were improved. The modification did not degrade the reactor building integrity. The margin of safety was not reduced.

ECN P0897 Modifications of Fire Protection System - Unit 2

Description

Installed automatic sprinklers in the unit 2 reactor building above elevation 621'. The modification included hangers to support the piping.

Safety Evaluation

The change minimized the potential spread of a fire through the equipment hatch openings and stairwells between elevations 621' and 639' of the unit 2 reactor building. The modification provided sprinklers for areas on elevation 621' that were not previously covered by the sprinkler system, thus improving the fire protection capabilities of the plant. The piping and supports meet the Class II requirements and do not degrade the Class I structures. Since fire protection was improved in the unit 2 reactor building, the margin of safety was not reduced.

ECN P0895 Modifications of Fire Protection System - Unit 2

Description

Installed automatic sprinklers in the unit 2 reactor building above elevation 565'. The modification included hangers to support the piping. The ECN was totally completed as it only covered unit 2.

Safety Evaluation

The modification minimizes the potential spread of a fire, thus improving the fire protection capabilities of the plant. The additional piping and supports meet the Class II requirements and do not degrade Class I structures. Since the change improved fire protection in the unit 2 reactor building, the margin of safety was not reduced.

ECN P0894 Modifications of Fire Protection System - Unit 2

Description

Installed automatic sprinklers that formed a water curtain below the unit 2 reactor building elevation 565' floor slab in the residual heat removal (RHR) corner rooms. The modifications included hangers to support the piping.

Safety Evaluation

The modification minimizes the potential spread of a fire, thus improving the fire protection capabilities of the plant. The additional piping and supports meet the Class II requirements and do not degrade Class I structures. Since the change improved fire protection in the unit 2 reactor building the margin of safety was not reduced.

ECN P0828 Modifications of Reactor Recirculation System - Unit 2

Description

Installed fuse blocks, associated wiring, and fuses in the protective relay circuits of the 4KV reactor recirculation pump MG sets 2A and 2B.

Safety Evaluation

The modification was performed to bring BFN into compliance with 10CFR50 Appendix R. The added coordinating fuses did not degrade the seismic qualifications of the associated circuitry. The margin of safety was not reduced.

ECN P5500 Modifications of Reactor Building Roof - Common

Description

Inspected and repaired the damaged areas of the reactor building roof.

Safety Evaluation

The repairs to the roof enhanced the margin of safety and improved secondary containment integrity.

ECN P5420 Modifications of Test Ports (System 30, 31, 64) - Common

Description

The ECN was written for documentation only to "as-construct" drawings. The drawings provided for the installation of ventlock test holes in the heating, ventilation, and air conditioning systems.

Safety Evaluation

The modification will not affect the seismic qualification or designed function of the heating, ventilating, and air-conditioning (HVAC) systems. It will facilitate the required postmodification testing for ECNs P3138, P3139, P0956, and P0870 through P0875.

ECN P5303 Modifications of EECW System - Common

Description

The modification was for documentation only to "as construct" drawings to depict the actual plant configuration. TACF 0-85-029-067 was removed, which had previously implemented the modification. The modification removed the

raised face from flange joints of the temperature control valve 67-62.

Safety Evaluation

The modification only altered the flange configuration used for mating valve 67-62 to its associated process piping. The modified joint will perform the same function as the original flange joint and its modified design meets the EECW system design requirements. Based on this, the margin of safety was not reduced.

ECN P5309 Modifications of Cable Tray Support System - Unit 2

Description

Performed modifications required to seismically qualify affected cable tray systems for unit 2 startup and interim operation. Work involved the cable tray supports at the intake pumping station and the unit 2 cable spreading room and the cable tray tunnel (rectangular portion of tunnel from the intake structure to the plant). The ECN was completed.

Safety Evaluation

The modifications assure that the affected cable trays meet the seismic qualifications of seismic Class I cable tray/supports for unit 2 startup and interim operation. The margin of safety was not reduced.

ECN P5295 Modifications of Reactor Building Closed Cooling System - Unit 2

Description

Revised "as designed" drawings to the 1/2-inch cleanup recirculating pump test connection isolation valves 70-666A, 666B, 667A, and 667B to conform to the actual unit 2 configuration.

Safety Evaluation

The valves were not required for system operation and were not required for any nuclear safety function. The modification did not affect the RBCCW system's ability to provide any required design basis function. Based on this, the margin of safety as defined in the basis for any technical specification (TS) was not reduced.

ECN P5277 Modifications of Cable Tray Support #21 - Unit 2

Description

Fabricated and installed the cable tray support baseplate (support #21) in the unit 2 reactor building.

Safety Evaluation

The structural integrity of the seismic cable tray support was evaluated by the Division of Nuclear Engineering (DNE). It was determined that the function, operation, and qualification of the support and other associated equipment was not adversely affected. Thus, the margin of safety was not reduced.

ECN P5228 Modifications of Main Steam System - Unit 2

Description

Installed tees in instrument lines for PT-1-79, 81, 90, 93, and PI-1, 94, 97, 100, 103, 109, 112 which are located on panels 25-110, 25-111, and 25-112.

Safety Evaluation

The modification was designed so that it did not degrade the qualification of the safety-related equipment which provides input to the RPS. Based on this, the margin of safety was not reduced.

ECNs P5224 and P5433 Modifications of Refuel Floor Components - Units 1, 2, and 3

Description

Revised the cribbing requirements for all components set on the refuel floor so as not to exceed 1000 PSF loading on the floor. Provided third laydown area for the unit 2 reactor pressure vessel head during disassembly.

Safety Evaluation

Compliance with these cribbing requirements will ensure the refuel floor loading limits will not be exceeded. Therefore, the margin of safety was not reduced.

ECN P3137 Modifications of Main Steam System - Unit 2

Description

The ECN was for documentation only to "as-construct" drawing 47W600-11 R17. The ECN added note 5 to the drawing. The piping classification was changed from P to M for CV-1-14D, 15D, 26D, 27D, 37D, 38D, 51D, and 52D.

Safety Evaluation

The valves are only needed for testing. They are not required for any safety-related function associated with closing the MSIV. Thus the Class P portion of piping associated with the test valves could be reclassified without adversely affecting the safety of the plant.

ECN P0877 Modifications Fire Protection Draft Stops - Unit 2

Description

Installed draft stops around vertical openings between different reactor building floor elevations.

Safety Evaluation

The modification improved the effectiveness of the fire protection system. The operations of other systems were not affected. Therefore, the change did not reduce the margin of safety.

ECN P0672 Modifications of Reactor Feedwater System - Unit 2

Description

Removed pressure switches PS-3-57A, B, C, and D, and their associated wiring and replaced them with a wire connecting the mode switch (5A-S1) and relays 5A-K11A through D.

Safety Evaluation

The modification did not adversely impact plant safety. A seismic analysis showed the changes did not adversely affect qualification of any seismic Class I equipment. The margin of safety was not reduced.

ECN P0585 Modifications of Standby DGs - Units 1 and 2

Description

Replaced speed sensing system consisting of frequency generator and Electro-Motive Division of General Motors Corporation (EMD) speed switch panels with magnetic pickups and associated speed switches.

Safety Evaluation

The speed sensing panels were replaced with more reliable, solid state panels. The function of the panels was not changed. The new panels were seismically qualified Class 1E. Postmodification testing proved the acceptability of the modification. The margin of safety was not reduced.

ECN P0244 Modifications of Reactor Water Recirculation System - Unit 2

Description

Replaced Foxboro transmitters, PDT-68-65 and PDT-68-82, with Rosemount.

Safety Evaluation

The Rosemount transmitters serve the same functions as the Foxboro models, have proved to be more reliable, and their use will enhance the function served by the transmitters. Hence, the margin of safety has been enhanced.

ECN P0093 Modifications of Primary Containment - Unit 2

Description

Fabricated and installed torus access ladders inside the unit 2 torus. Modified the torus vent header collar supports. Fabricated and installed MK1 plates and increased existing fillet welds. The major portion of the work covered by the ECN was implemented during unit 2 cycle 4. It will be completed during the current unit 2 cycle 5 outage.

Safety Evaluation

ECN P0093 covers the modifications for the long-term torus integrity programs. The modifications covered by the ECN were tested and analyzed by GE. The data gathered by GE showed that the modifications, when performed, would be a great improvement over the present condition. Therefore, the probability of occurrence or the consequences of an accident or the malfunction of equipment important to safety was not increased.

ECN P0570 Modifications of Emergency DGs - Unit 3

Description

Replaced viscous type vibration damper with gear type vibration damper on the unit 3 DG engines. The ECN was completed for unit 3. The modification had been previously implemented on units 1 and 2.

Safety Evaluation

The exchange of DG vibrational dampers (a gear-type for a viscous type) did not reduce the ability of the DGs to perform their function or increase the probability of their failure. The margin of safety was not reduced.

ECN L1896/L1916 Modifications of Control Air System - Unit 2

Description

Revised power sources for FSV-32-28A and FSV-32-29B and made final electrical tie-in for FCV-32-91. Power source for FSV-32-28A was changed from the plant nonpreferred AC system B to an I&C AC system bus. FSV-32-29B power was changed from the I&C bus to the plant nonpreferred bus. The ECNs were field completed but postmodification testing is remaining.

Safety Evaluation

The modification increased the reliability for keeping FSV-32-28A and -29B open during normal plant operation. The implementation of the ECNs will prevent spurious scram due to failure of one of the buses and, thereby, add to the safe operation of the plant.

ECN P0974 Modifications of Cooling Tower 4KV Switch Gear - Common

Description

This ECN provides for the connection of the Environmental Qualification warehouse substation and the stoplight at the north nuclear plant road to the newly constructed 4KV loop line/cooling tower 4KV switchgear. The ECN is not complete.

Safety Evaluation

The addition of this modification and/or possible failure of the equipment will not create any different type of accident than previously evaluated. Also, loss of these additional loads will not impact safety of the plant operation or safe shutdown. Therefore, the margin of safety is not affected.

ECN P0957 Modifications of Recirculation System - Unit 2

Description

Replaced and/or modified part of the existing recirculation system piping susceptible to intergranular stress corrosion cracking (IGSCC) with an improved stainless steel material that has increased resistance to IGSCC. The major portion of the field work covered by the ECN has been completed. Some minor support work and hydrostatic testing are all that remains to complete the ECN.

Safety Evaluation

All structures and components affected by this modification were replaced/repaired with equivalent or better materials which meet or exceed current design requirements. The modification does not adversely affect the system operation. Therefore, the margin of safety will not be reduced.

ECNs L1692/P0857 Modifications of RHR/RHRSW Systems - Unit 1

Description

Installed flange connections on RHR/RHRSW heat exchangers 1B per ECN L1692. This represented only a partial completion of the ECN for unit 1 and then the remainder of the work was cancelled. No work on this ECN was completed for units 2 and 3 and the ECN for these units has been cancelled. ECN P0857

pertained to field change requests to revise drawing discrepancies found as the work was being performed on ECN L1692. ECN P0857 was completed on unit 1.

Safety Evaluation

The function, operation, and qualification of the RHR heat exchanger and the RHR service water inlet line were not adversely affected. Based on this, the margin of safety as defined in the basis for any TS is not reduced.

SUMMARY OF PLANT MODIFICATIONS PARTIALLY COMPLETE
JANUARY 1, 1987 - DECEMBER 31, 1987

ECN P0879 Partial Modifications of Fire Protection (Doors) - Common

Description

Replaced or modified various compartmentation boundary doors which did not meet UL requirements and/or did not provide the fire barrier ratings required to meet the 10CFR50 Appendix R requirements. Modifications have been completed for doors 455, 482, 531, 600, 643, 644, 656, 810, 811, 824, and 827. Various other doors are being modified but modifications are not completed.

Safety Evaluation

The door modifications improve the fire protection system design without changing or adversely affecting the operation of the secondary containment system. Therefore, the margin of safety is not reduced.

ECN P0381 Partial Modifications of Various System - Units 2 and 3

Description

GEMAC transmitters are being replaced with Rosemount transmitters on an as-needed basis on designated systems of all three units. The ECN has not been completed on any unit.

Safety Evaluation

The Rosemount transmitters are compatible with existing equipment, perform the same functions as the GEMAC transmitters, and meet the requirements specified for the functions performed. The margin of safety margin required by the TS has not been reduced.

ECN P5213 Partial Modifications of RCIC/HPCI

Description

Modified the bonnet flange joints on valves HCV-71-32 and HVC-73-24. The ECN was completed for unit 2 but not for 1 and 3.

Safety Evaluation

The modification will allow the bonnet flange seal to be leak rate tested under the local leak rate test program. The modified valves perform the same function and meet the same requirements but facilitate testing. The margin of safety was not reduced by this modification.

ECN P5016 - Partial Modifications of Reactor - Recirculation System

Description

Documented the removal of the 4-inch bypass line and the associated snubbers, SS-9, on loops A and B which were removed in accordance with ECN L1633. Also, documented was the removal, by maintenance requests, of the snubber support brackets in order to facilitate weld overlay repairs. The ECN was completed for unit 2, was previously completed on unit 3, but was only partially implemented on unit 1.

Safety Evaluation

Based on the results of DNE calculations, the pipe break analysis is still valid, and the seismic analysis was not adversely affected by the modification.

ECN P0207 Partial Modifications HPCI/RCIC Systems Unit 2

Description

Fabricated and installed access platforms for the HPCI and RCIC temperature switches. The ECN was not completed for unit 2. Inspection and repair is being performed during the unit 2, cycle 5 outage.

Safety Evaluation

The platform does not have a safety-related function. It is seismic Class I so that it will not fail during an earthquake and possibly damage safety-related equipment. The platform is anchored to the reactor building concrete structure. The additional loading of the concrete structure is negligible. Therefore, the probability of an accident or malfunction of equipment important to safety previously evaluated was not increased.

ECN L1970 Partial Modifications of EECW System

Description

Replaced existing valves and made piping tie-in to the new stainless steel components (EECW supply for RHR pump seal heat exchangers). A small portion of the work covered by the ECN has been partially implemented on all 3 units.

Safety Evaluation

The replacement valves and piping tie-ins do not change the operation or affect the ability of the EECW system to respond to an accident situation. The integrity of the EECW piping system was not reduced by the new material. The margin of safety was not reduced.

ECN P0027 Modifications of Spent Fuel Storage - Unit 3

Description

Removed the remaining old style fuel storage racks, control rod racks, and seismic bracing. New base plates, fuel racks, and control rod racks are remaining to be installed on unit 3. The ECN has been completed on unit 1 but only partially implemented on unit 2.

Safety Evaluation

Seismic qualification of the racks and their arrangements were evaluated and approved. NRC approval was obtained prior to implementation of the ECN. The margin of safety will be enhanced with the complete implementation of this ECN.

ECN P0085 Modifications of Primary Containment - Unit 2

Description

Performed modifications for upgrading the existing drywell temperature and pressures instrumentation and annunciator used for the manual initiation of containment spray by the unit operator. The major portion of the work covered by the ECN has been completed. Rerouting of some cables and performing postmodification testing will be performed prior to unit 2 startup.

Safety Evaluation

Implementation of the ECN serves to ensure mitigation of excessive drywell pressures and temperature. Therefore, the consequences of design basis accidents can be held within certain acceptable limits and maintain the containment integrity. The margin of safety will be improved through implementation of the ECN.

ECN P0126 Modifications of Various Systems - Unit 1, 2, & 3

Description

The ECN provides for the replacement of the currently installed pressure, level, and temperature switches with analog transmitter/trip unit combinations (which provide continual monitoring of critical parameters in addition to performing basic logic trip operations) with the proposed analog transmitter/trip unit system for engineered safeguard sensor trip inputs. Work that has been completed includes the installed conduits, cables, junction boxes, panels, and pressure tested instrument sensing lines on unit 2.

Safety Evaluation

The instrument functions will not be changed by the modification. The modification package was reviewed and approved by NRC prior to implementation. The likelihood of failure will be reduced by implementing the ECN.

ECN P0533 Modifications of Temperature Monitoring System

Description

The ECN provides for the design, procurement, and installation of an improved temperature monitoring system for the torus. A major portion of the work has been completed during the unit 2, cycle 5 outage. The modification is still in progress. The physical work for this ECN was previously completed on unit 1. Postmodification test, however, remains to be performed. The major portion of the ECN has been completed on unit 3.

Safety Evaluation

The new monitoring system will provide a more accurate indication of torus water bulk temperature and the local temperature at each quencher than the old system could provide. The modification provides assurance that the torus temperature is within the prescribed limits set forth in the TSs; therefore, the margin of safety was not reduced.

ECN P0768 Modifications of RHRSW/EECW/RCW - Common

Description

Revised drawings to reflect the required design pressure and temperatures for EECW and RHRSW systems, and the interfacing portion of the RCW system. Physical work remains to be implemented, hence, the ECN was not complete.

Safety Evaluation

The documentation change will not provide additional modes of failure. Documenting the "as-is" status of the equipment will provide an accurate base of technical knowledge on which to base future design or operations. No physical work was done to any system which would impact any actual existing margin of safety already built into plant equipment.

NEW TEMPORARY ALTERATIONS
JANUARY 1, 1987 - DECEMBER 31, 1987

0-87-001-26 Installation of Alternating Current (ac) Recording Voltmeter

Purpose

This temporary alteration was installed to troubleshoot false starts on fire pump "C" and detect whether these false starts were initiated by the auto start circuitry of fire protection equipment. This was accomplished by attaching a recording ac voltmeter to the coil of the auto start relay for fire pump "C" motor (FPXC) and to the coil of the fire pump push button auxiliary relay (FPSL).

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the Final Safety Analysis Report (FSAR) was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because the temporary alteration did not affect fire pump "C" operability, the recording voltmeter was fused so that in the event of an accident or malfunction the meter would have become shorted and would have been cleared from the circuit on auto initiation, and work performed was within the scope of the current TS.

0-87-005-90 Change Continuous Air Monitor (CAM) Detectors to Meet New Sensitivity Requirements

Purpose

This alteration was accomplished in order to comply with the radiological environmental technical specification (RETS) and was issued to make changes to CAM RM 90-252. The change included the replacement of the particulate and iodine channel collectors with filter collectors and the replacement of the gaseous channel detectors from GM tubes to scintillation detectors. This alteration will remain installed until permanent changes are implemented by Design Change Request 3421.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because the building effluents will be continuously monitored by a noble gas monitor (instead of by noble gas, particulate, and iodine

monitors) and significant increases in particulate and iodine activity are always accompanied by increases in noble gas activity. The alteration does change the type of detectors referenced in FSAR Section 7.12.6 but the change is to the type required by the new TS (RETS).

0-87-008-57 Eliminate Loss of Power and Undervoltage Load Shed Initiations

Purpose

This temporary alteration was issued to eliminate the loss of power and undervoltage load shed initiation on breaker 2B on 480V shutdown board 1A. The 480V shutdown board 1A is the power source for the control bay ventilation board A which feeds the control room emergency ventilation (CREV) system train A. This alteration will ensure the CREVS train A is operable for any design basis accident.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced. The plant standby AC power supply feeds only one control bay ventilation board which is in conflict with the FSAR. This temporary alteration resulted in supplying both control bay ventilation boards with standby AC power. The loading of the DG will not be increased by the adding of this extra load because RHR pump 1A will be removed from service. The power requirements for the other engineering safeguard systems will be satisfied. Also, during any design basis accident, two trains for the CREV system will be automatically available.

1-87-003-26 Temporary Repair of Fire Protection System Piping

Purpose

This temporary alteration was issued to install a temporary patch on an 8-inch high pressure fire protection system distribution pipe to stop a pinhole spray leak. The location of the patch is elevation 565' unit 1 SC penetration between unit 1 and unit 2.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR

was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because the installation of the temporary patches on the high pressure system distribution piping does not render the system or portion of the system inoperable and does not invalidate piping design per FSAR 10.11.5.1.

1-87-004-90 Change CAMS Detectors to Meet Sensitivity Requirements

Purpose

This alteration was accomplished in order to comply with the radiological environmental TS and was issued to make changes to unit 1 CAMs RM 90-249, -250, and . These changes included the replacement of the particulate and iodine channel collectors with filter collectors and the replacement of the gaseous channel detectors from to scintillation detectors. This alteration installed until permanent changes are implemented by Design Change Request 3421.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because the building effluents will be continuously monitored by a noble gas monitor (instead of by noble gas, particulate, and iodine monitors) and significant increases in particulate and iodine activity are always accompanied by increases in noble gas activity. The alteration does change the type of detectors referenced in FSAR section 7.12.6 but the change is to the type required by the new TS (RETS).

1-87-005-26 Temporary Repair of Fire Protection System Piping

Purpose

This temporary alteration was issued to install a temporary patch on a 4-inch high pressure fire protection system distribution piping to allow this section of the system to remain in service and to stop the existing leak. The location of this patch is in unit 1 reactor building elevation 565' in overhead R7 Q-line.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the

basis of any TS was not reduced. Installation of temporary patches on the high pressure fire protection system distribution piping does not render the system or portion of the system inoperable and does not invalidate piping design per FSAR 10.11.5.1. The increased loading on the pipe and pipe supports is negligible.

1-87-006-26 Temporary Repair of Fire Protection System Piping

Purpose

This temporary alteration was issued to install a temporary patch on a 3-inch high pressure fire protection system distribution pipe to stop a pinhole leak. The location of the patch is in unit 1 reactor building on elevation 593' at the north wall.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced. Installation of temporary patches on the high pressure fire protection system distribution piping does not render the system or portion of the system inoperable and does not invalidate piping design per FSAR 10.11.5.1. The increased loading on the pipe and pipe supports is negligible.

1-87-008-26 Temporary Repair of Fire Protection System Piping

Purpose

This temporary alteration was issued to install a temporary patch on a 2.5-inch high pressure fire protection system distribution pipe to stop a leak located at R2.5 U-line elevation 565' in the unit 1 reactor building.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced. Installation of temporary patches on the high pressure fire protection system distribution piping does not render the system or portion of the system inoperable and does not invalidate piping design per FSAR 10.11.5.1. The increased loading on the pipe and pipe supports is negligible. The difference in pipe stresses (dead weight and seismic) is small and does not exceed USAS B31.1.0-1967 code allowables; however, this fire protection Class II system is not designed for a seismic event.

2-87-002-26 Temporary Repair of Fire Protection System Piping

Purpose

This temporary alteration was issued to install a temporary patch on a 3-inch high pressure fire protection system pipe to stop a pinhole leak. The location of the patch in unit 2 is at U-line and R11 about 14 feet above the floor.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced. Installation of temporary patches on the high pressure fire protection system distribution piping does not render the system or portion of the system inoperable and does not invalidate piping design per FSAR 10.11.5.1. The increased loading on the pipe and pipe supports is negligible.

2-87-004-26 Temporary Repair of Fire Protection System Piping

Purpose

This temporary alteration was issued to install a temporary patch on a 4-inch high pressure fire protection system distribution pipe to stop a leak. The location of the leak was on the 4-inch line above the CRD rebuild room on the east end at elevation 621' of unit 2 reactor building.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced. Installation of temporary patches on the high pressure fire protection system distribution piping does not render the system or portion of the system inoperable and does not invalidate piping design per FSAR 10.11.5.1. The increased loading on the pipe and pipe supports is negligible.

2-87-005-90 Change CAM Detectors to Meet New Sensitivity Requirements

Purpose

This alteration was issued to make changes to unit 2 CAMs RM 90-249, -250, and -251. These changes included the replacement of the

particulate and iodine channel collectors with filter collectors and the replacement of the gaseous channel detectors from GM tubes to scintillation detectors. This alteration will remain installed until permanent changes are implemented by Design Change Request 3421.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because the building effluents will be monitored by a noble gas monitor (instead of by noble gas, particulate, and iodine monitors) and significant increase in particulate and iodine activity are always accompanied by an increase in noble gas activity. The alteration does change the type of detectors referenced in FSAR Section 7.12.6 but the change is to the type required by the new TS (RETS).

2-87-010-26 Provide Cooling Water and Drainage for Induction Heating Stress Improvements (IHSI) Heat Exchanger

Purpose

This temporary alteration was issued to provide cooling water and drainage for IHSI heat exchangers. This task was accomplished by attaching a 1.25-inch line (hose) to valve wye located at R T-line on elevation 621' of the unit 2 reactor building and by attaching a 1.25-inch line (hose) to the roof drain HDR located at R U-line on elevation 573' in the unit 2 reactor building.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced. The system was supplied raw water by three motor-driven vertical turbine pumps rated at 2500 GPM each at 300-foot total head. Backup to those pumps is one diesel-engine-driven vertical turbine fire pump rated at 2500 GPM at 340-foot total head. The diesel-engine pump starts only after the three electric-motor-driven vertical pumps fail to supply adequate system pressure. Only one pump is necessary to supply the water requirement for a fire in one of the safety-related areas specified in the TS. Two pumps would be required to handle the maximum switchyard fire. There was more than sufficient margin to carry this approximate 20 GPM cooling load and still maintain all fire loads. The system will be returned to its original configuration when requested by the shift engineer.

2-87-011-303 Installation of Air Conditioning

Purpose

The purpose of this alteration was to provide cooling for unit 2 drywell during reactor building closed cooling water (RBCCW) system outage by installing a temporary air conditioning system.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced. Positioning of temporary air conditioning unit and associated equipment does not exceed design live loading of 400 pounds per square feet. Actual loading is 335 pounds per square feet. The cooling water for the temporary air conditioning unit is supplied by the nonsafety-related raw cooling water (RCW) system and discharged to the nonsafety-related reactor building roof drain system. Also, the power supply to the unit is from an existing temporary source. Finally, the equipment will be removed prior to fuel load and is not located adjacent to any safety equipment required for this mode of operations. Temporary duct work is routed through primary containment which is not required (per TS 3.7.A) for this mode. All equipment is located in the secondary containment.

2-87-012-26 Temporary Repair of Fire Protection System Piping

Purpose

The temporary alteration was issued to install a temporary patch on a 4-inch fire protection system distribution pipe to stop a pinhole leak. The location of the patch is in unit 2 reactor building on elevation 621' and the R-13 T-line.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced. The high pressure fire protection system pipe was not made inoperable by this temporary patch. The patch will prevent further degradation of piping resulting in the high pressure fire protection piping integrity being maintained. The original design of the piping system will not be altered by the patch.

2-87-014-77 Provision of Temporary Source of Electrical Power to Sump Pump Instrumentation

Purpose

This temporary alteration will install a temporary source of 120V AC power to the drywell sump level monitoring instrumentation to provide level and alarm indication from LIS-77-1A and LIS-77-1B. The normal power supply cables to this system were damaged in the recent drywell fire and are to be disconnected while repairs are being made. This alteration will power the drywell drain sump level instrumentation to give operators control room indication and alarm of drywell sump level. Additionally, the high level alarm setpoint on these sumps will be temporarily raised to accommodate more volume before having to pump out the sumps.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced. The normal power source to the drywell sump level monitoring instruments will be unavailable while repairs are made to that power source. Providing a temporary source of power to the drywell sump level monitoring instruments will restore these instruments to operations thereby providing the control room operators with alarm indications if there is any leakage within the drywell. Thus, the effects on safety normally provided by this system are restored. The temporary power supply is the 10A fused, 120V AC service receptacles on panel 25-52 which has a nonsafety-related power source. Hence, there is no effect on other safety systems. The requirements for operability of these systems is not in effect per section 3.6.C.2 of the TS since unit 2 is shutdown and the reactor is defueled. This temporary alteration will be removed and the normal power supply to the drywell monitoring instruments restored and the high level setpoint returned to the original values prior to unit 2 refueling.

3-87-001-26 Temporary Repair of Fire Protection System Piping

Purpose

This temporary alteration was issued to install a temporary patch on a 4-inch fire protection system distribution pipe to stop a pinhole leak. The location of this patch is on the fire protection header on the third floor of the unit 3 reactor building at the AFFF unit.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced. Installation of temporary patches on the high pressure fire protection system distribution piping does not render the system or portion of the system inoperable and does not invalidate piping design per FSAR 10.11.5.1. The increased loading on the pipe and the pipe supports is negligible.

3-87-002-82 Use of a Commercial Grade Relay

Purpose

This temporary alteration involves replacing DG 3A governor and stop circuit relay (SCR) (type CO-1E series D, class 9050) with an identical, yet commercial model until an acceptable (qualified) model can be procured.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced. The time delay SCR has no safety function. The relays only function is to provide annunciation in the event the diesel does not stop within 30 seconds of a diesel emergency shutdown initiation. The replacement relay, although not Class 1E or seismically qualified, has the same manufacturer's part number and is identical in form and function to the relay replaced. Electrical failure of the relay could render the DG inoperable. The replacement of the relay with the same manufacturer's part number provided reasonable assurance that the reliability of the circuit was not degraded and the DG remained operable to support engineered safeguard equipment. Identical form and mounting of the relay ensures it will not affect other components in a seismic event. A special condition of this alteration is, however, that all three units are defueled and the relay must be replaced with a qualified device prior to loading fuel in any unit.

3-87-003-90 Change CAM Detectors to Meet New Sensitivity Requirements

Purpose

This alteration was issued to make changes to unit 3 CAMs RM 90-249, -250, and -251. These changes included the replacement of the

particulate and iodine channel collectors with filter collectors and the replacement of the gaseous channel detectors. This alteration will remain installed until permanent changes are implement by Design Change Request 3421.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because the building effluents will be monitored by a noble gas monitor (instead of by noble gas, particulate, and iodine monitors) and significant increases in particulate and iodine activity are always accompanied by increases in noble gas activity. The alteration does change the type of detectors referenced in FSAR section 7.12.6 but the change is to the type required by the new TS (RETS).

3-87-004-26 Temporary Repair of Fire Protection System Piping

Purpose

The temporary alteration was issued to install temporary patch on an 8-inch fire protection system distribution pipe to stop a pinhole leak. The location of the patch is at P-16 T-line on elevation 602' next to the stairwell in the unit 3 reactor building.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced. Installation of temporary patches on the high pressure fire protection system distribution piping does not render the system or portion of the system inoperable and does not invalidate piping design per FSAR 10.11.5.1. The increased loading on the piping and supports is negligible. The difference in pipe stresses (dead weight and seismic) is small and will not exceed USAS B31.1.10-1967 code allowables. The fire protection system is a Class II system and not designed for seismic event.

3-87-005-26 Temporary Repair of Fire Protection System Piping

Purpose

This temporary alteration was issued to install a temporary patch on an 8-inch fire protection system distribution pipe to stop a

pinhole leak. The patch is located at R-16, S-line on elevation 565' in the unit 3 reactor building.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced. Installation of temporary patches on the high pressure fire protection system distribution piping does not render the system or portion of the system inoperable and does not invalidate piping design per FSAR 10.11.5.1. The increased loading on the piping and supports is negligible. The difference in pipe stresses (dead weight and seismic) is small and will not exceed USAS B31.1.10-1967 code allowables. The fire protection system is a Class II system and not designed for seismic event.

3-87-007-26 Temporary Repair of Fire Protection System Piping

Purpose

This temporary alteration was issued to install a temporary patch on an 8-inch fire protection system distribution pipe to repair a pinhole leak. The location of the patch is in unit 3 reactor building on elevation 565' at the R-16, T-line.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because the high pressure fire protection system pipe is not further degraded by the patch and it does not render the piping inoperable. The patch will prevent further degradation of piping resulting in the high pressure fire protection piping integrity (design, function, and performance) being maintained. All actions taken have been in agreement with existing TSs.

SUMMARY OF SPECIAL TESTS COMPLETED
JANUARY 1, 1987 - DECEMBER 31, 1987

ST86-14 Verification that Inoperative Trips are Caused by Circuit-Boards-Out-of-Circuit in the Neutron Monitoring Systems

Test Objective

This test was performed to determine whether the inoperative trip function of the neutron monitoring system functions as required by TSs when the circuit board is removed. The results of this test will be used to determine whether justification exists for deleting the requirement for removing circuit cards from circuits during the performance of surveillance functional tests. Deletion of this removal step will help prevent equipment degradation.

Safety Evaluation

Neither the probability of occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis for any TS was not reduced because all testing performed on the neutron monitoring system components was performed in the logic bypassed configuration which is described in the FSAR and the number of instrument channels allowed to be bypassed by the TS was not exceeded.

ST86-19 Temperature and Dewpoint Traverse of Drywell and Suppression Chamber

Test Objective

This special test was performed to obtain temperature and dewpoint area data within the drywell and suppression chamber to determine the best location for containment intergrated leak rate test (CILRT) instrumentation.

Safety Evaluation

Neither the probability of occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis for any TS was not reduced because the test was performed while the unit was in the cold shutdown mode, the drywell head was unbolted and vented, and the primary containment was not required to be maintained.

ST86-25 Standby Liquid Control (SLC) Special Sodium Pentaborate Analysis Test

Test Objective

This test was performed to verify that proper dissolving and mixing of sodium pentaborate in the SLC tank could be achieved by agitating the solution with air. Air sparging was conducted at a constant rate with periodic axial sampling until the difference in concentration between axial samples was acceptable. The sparging time that yields the desired accuracy will be established as the minimum sparging time for all future surveillances.

Safety Evaluation

Neither the probability of occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis for any TS was not reduced because the SLC system is not specifically required to be operable while each unit is in cold shutdown with fuel removed, but the system was fully functional during testing. The testing did not affect any systems other than the SLC system. The testing did not affect any of the variables or components of the SLC system.

ST86-26 Alternate Rod Injection Backup Scram Valve Diagnostics

Test Objective

The objective of this test included the collection of unit 1 scram valve reaction data on specific hydraulic control units (HCU) during an alternate rod injection (ARI) scram. This data will be used to support the design of the ARI system.

Safety Evaluation

Neither the probability of occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis for any TS was not reduced because all the fuel was removed from the reactor vessel and the test did not affect any system or equipment required to maintain the fuel in a safe configuration. Also, TS 3.1 allows for the disablement of the RPS when fuel has been removed from the vessel. The performance of ST86-26 did not alter or disable any system or equipment necessary to mitigate or prevent any accident or malfunction, which can affect the fuel or spent fuel pools.

ST87-01 Ventilation System Flow Measurements

Test Objective

The objective of this test was to collect dimensional data for use in establishing the location of ventilation monitoring sample probes and determining the current vent flow rates. Knowing the exact nozzle location, nozzle ID and velocity at the nozzle, sample flow rates can be determined and isokinetic conditions established and existing plant instructions can be properly updated to assure compliance with the radiological effluent technical specification (RETS).

Safety Evaluation

Neither the probability of occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis for any TS was not reduced because the probes and continuous air monitors (CAMs) taken out of service served no accident mitigation function, the isolation of secondary containment was not impaired, all work (with the exception of probe measurements on the reactor zone exhaust duct) are outside of this boundary, any exhaust leakage during work on the reactor zone ducts was contained by the refuel floor exhaust system and could be isolated by its isolation features as described in section 5.3 of the FSAR, and because the performance of this test did not place the plant in noncompliance with the TS.

ST87-02 EECW System Loss-of-Power Test

Task Objective

The purpose of this test was to measure the amount of drain down leakage that will occur in the EECW system during a loss-of-offsite power. The test configuration simulated the plant configuration that would exist during a loss-of-offsite power by isolating raw cooling water (RCW) and raw service water (RSW) from the EECW system and then stopping all of the EECW pumps. The amount of EECW system drain down was measured by a gauge glass installed on the north header at the LS-67-52 location.

Safety Evaluation

Neither the probability of occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis for any TS was not reduced because the EECW system south header was operable during the performance of this test and it was capable

of supplying all essential loads and was able to respond to a challenge. Also, the testing did not preclude system function or operability and was retained in a state which ensured no different accident or malfunction possibilities existed.

ST87-03 Offline Liquid Radiation Monitor Isotopic/Transfer Calibration

Test Objective

This special test was performed to determine an accurate sensitivity and efficiency correction and to obtain transfer source data on the offline liquid radiation monitors required for RETS implementation.

Safety Evaluation

Neither the probability of occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis for any TS was not reduced because calibration and operation of the offline liquid radiation monitors will be enhanced and, thereby, an accurate indication of the radioactivity present.

ST87-04 Replacement of Surveillance Instruction (SI) 4.2.A-24

Test Objective

The purpose of this test was to satisfy TS 4.7.B.3-a, due to the existing plant conditions, by performing SI 4.2.A-24 in lieu thereof. The requirement of the TS is to demonstrate the operability of the auto initiation of the SBGT system once per operating cycle. This requirement has been met from a verbatim licensing point of view, but it is felt that the time period since its last performance along with the current operating conditions warrant an operability demonstration of the logic at this time.

Safety Evaluation

Neither the probability of occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis for any TS was not reduced because this test was used to actually demonstrate the initiation of SBGT system by the PCIS exhaust high radiation or offscale signals. All SIs required to verify operability of the secondary containment were performed prior to this test within their frequency and their operability was not affected by the test.

ST87-05 General Electric (GE) Stack Gas Radiation Monitor Isotopic/Transfer Calibration

Test Objective

The purpose of this test was to perform a primary isotopic and secondary transfer calibration of the GE Model 117B1681G1 2X2 NaI(Tl) Scintillation Detector and to determine a National Bureau of Standard (NBS) traceable efficiency correction ratio and obtain transfer source data required for the calibration of the main stack gas radiation monitor to support the implementation of RETS requirements.

Safety Evaluation

Neither the probability of occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis for any TS was not reduced because calibration and operation of the stack gas radiation monitor will be enhanced and thereby an accurate indication of radioactivity released to the environment via the offgas vent can be determined.

ST87-14 Liquid Radwaste Radiation Monitor Isotopic/Transfer Calibration

Test Objective

The purpose of this test was to perform a primary isotopic and secondary transfer calibration of the GE Model 117B1681G1 2X2 NaI(Tl) Scintillation Detector and to determine an NBS traceable efficiency correction ratio and transfer source data required for the calibration of the liquid radwaste radiation monitors to support implementation of RETS requirements.

Safety Evaluation

Neither the probability of occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis for any TS was not reduced because calibration and operation of the long range radiation monitor (LRRM) will be enhanced and thereby the radwaste discharge will isolate when the radioactive concentration in the discharge exceeds 2×10^{-4} µCi/ml.

ST87-15 Unit 1 Off-Gas Posttreatment Radiation Monitor Isotopic/Transfer Calibration

Task Objective

The purpose of this test was to perform a primary isotopic and secondary transfer calibration of the GE Model 117B1681G1 2X2 NaI(Tl) Scintillation Detector and to determine an NBS traceable efficiency ratio and obtain transfer source data for the Unit 1 off-gas posttreatment radiation monitor to support the implementation of RETS requirements.

Safety Evaluation

Neither the probability of occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis for any TS was not reduced because calibration and operation of the off-gas posttreatment radiation monitor will be enhanced and thereby provide an accurate indication of radioactivity and enough information to easily control the release rate.

ST87-16 Unit 2 Off-Gas Posttreatment Radiation Monitor Isotopic/Transfer Calibration

Test Objective

The purpose of this test was to perform a primary isotopic and secondary transfer calibration of the GE Model 117B1681G1 2X2 NaI (Tl) Scintillation Detector and to determine an NBS traceable efficiency ratio and obtain transfer source data for the unit 2 off-gas posttreatment radiation monitor to support the implementation of RETS requirements.

Safety Evaluation

Neither the probability of occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis for any TS was not reduced because calibration and operation of the off-gas posttreatment radiation monitor will be enhanced and thereby provide an accurate indication of the radioactivity and enough information to easily control the release rate.

ST87-17 Unit 3 Off-Gas Posttreatment Radiation Monitor Isotopic/Transfer Calibration

Test Objective

The purpose of this test was to perform a primary isotopic and secondary transfer calibration of the GE Model 117B1681G1 2X2 NaI(Tl) Scintillation Detector and to determine an NBS traceable efficiency ratio and obtain transfer source data for the unit 3 off-gas posttreatment radiation monitor to support the implementation of RETS requirements.

Safety Evaluation

Neither the probability of occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis for any TS was not reduced because calibration and operation of the off-gas posttreatment radiation monitor will be enhanced and thereby provide an accurate indication of the radioactivity and enough information to easily control the release rate.

ST87-18 Radwaste Disposal System Representative Sample Determination

Test Objective

The purpose of this test was to establish a minimum recirculation (mixing) time necessary to ensure representative sampling of radwaste sample tanks. This information is required to establish proper sampling techniques prior to discharging contents or, as applicable, to the condensate storage tanks.

Safety Evaluation

Neither the probability of occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis for any TS was not reduced because none of the design safety features listed in the FSAR were affected, system operation during the special test was not significantly different from normal operation, and the test was performed so there was no way for the occurrence of an unmonitored release to the environment. The TS addresses only the radioactive release from the plant which is not impacted by the special test. The quantity of chemical traces (sodium nitrite) used was small enough to ensure the nitrite additions did not exceed the reportable quantity limits in 40 CFR, Part 117.

ST87-21 Spreading Room Backdraft Damper Test

Test Objective

This special test was performed to verify operability of the two backdraft relief dampers (2-31-2020 and 3-31-2021) located in the cable spreading rooms. The test was designed to verify relief setpoints by pressurizing the upstream plenums with the dampers in place and to ensure CO_2 would be contained.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced. Fire suppression is the safety function of the backdraft dampers. Specifically, they serve to contain CO_2 within the room of discharge, maintain adequate CO_2 concentrations, and prevent migration of the gas into the turbine building. A continuous firewatch was maintained during the performance of this test and 125 pound (minimum) portable fire extinguishers were in place. Doors 470, 477, 534, and 537, which were blocked open for access of an air hose, were covered by firewatches while the doors were open. Security was maintained for doors 534 and 537 by posting a public safety officer at each while the doors were blocked open. Caution statements were included to suspend testing at 1.25-inch WG to prevent overpressurization if the dampers were incorrectly set.

ST87-23 Diesel Generator Excitation Test

Test Objective

This test was performed to obtain data on DG excitation system for use in completing the dynamic analysis of the DG system. Data obtained included data from the maximum field voltage the exciter can produce with the generator unloaded and from the exciter and generator during the start of a large motor (RHR pump) onto an isolated DG feed bus.

Safety Evaluation

Neither the probability of occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis for any TS was not reduced because this test removed DG 3C and loop 2 of the unit 3 RHR system from service. Provisions and limitations for removal from service or loss from service of this

equipment are contained and analyzed in the FSAR. Also, it is assumed in the FSAR that the DG is tested to verify performance and the FSAR contains provisions for possible failure. The design of the electrical system and the TSs allow for systems to be removed for testing.

ST87-27 Yard Loop and Cooling Tower Loop Hydraulic Performance Evaluation

Test Objection

The purpose of this test was to validate a major procedure revision to SI 4.11.A.1.h. prior to issuing it as an approved SI.

Safety Evaluation

Neither the probability of occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis for any TS was not reduced because the valves and equipment operations required by this test did not affect the probability of pressure boundary failure in any safety-related area, or of flooding of safety-related equipment due to any other system malfunction since the test was designed to ensure the automatic functions of the high pressure fire protection system were not impaired or altered. Valve alignments during the test simulated single pipe failure on the yard loop. Such single failures have been analyzed in the FSAR. The procedure required that the system be returned to normal alignment in the event of a fire. The fire protection system remained operable throughout the test. Flow and pressure conditions stayed within the design capability of the fire pump and the water distribution mains.

ST87-29 Optimum Mop and Rag Disposal Technique Determination

Test Objective

The purpose of this special test was to determine the optimum disposal technique for contaminated mops and rags using the drum compactor.

Safety Evaluation

Neither the probability of occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis for any TS was not reduced because the operations of the drum compactor (radwaste) is independent of the safety equipment evaluated in the FSAR. The test did not involve equipment important to safety

nor did it involve the breach of any component or system that may allow an uncontrolled or unmonitored release of radioactivity to the environment.

ST87-30 DG Excitation (3C, B, D)

Test Objective

The purpose of this test was to obtain additional data on the DG excitation system to resolve discrepancies between the results of ST87-23 and previous runs of SI 4.9.A.1.B. The test results were required for completing the dynamic analysis of the DG system.

Safety Evaluation

During this test DGs 3C, B, and D, loop 2 of the unit 3 RHR system, and loop 1 and 2 of the unit 2 RHR system were removed from service. Provisions and limitations for removal from service or loss of this equipment are contained and analyzed in the FSAR, so this testing did not increase the consequence or probability of an analyzed event. Also, the margin of safety was not reduced because the design of the electrical system and the TSs allowed for this system removal for testing. Since it is assumed in the FSAR that testing of the DGs is performed to verify performance and contains provisions for possible failure, the possibility for an accident or malfunction of a different type than previously evaluated was not created. Since the fire protection system remained operable throughout the test and the test instructions provided for a return to normal alignment in the event of a fire alarm, the margin of safety was not reduced.

ST87-32 Valve Leak Rate and Maximum Pressure Differential Test

Test Objective

The objective of this test was to prove that eight EECW System sectionalizing valves and 10 RHRSW heat exchangers inlet valves met acceptance criteria in that the leak rate across the valves internal pressure boundary (flapper) at design pressure was minimal, and that the flapper could withstand the maximum differential pressure that it would be exposed to during a system hydrostatic test.

Safety Evaluation

Neither the probability of occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the

basis for any TS was not reduced because this testing provided a means to verify the valves met test acceptance criteria prior to installation, plant configuration as described in the FSAR was not affected, the valves were not subjected to conditions that exceeded TS limits, and if the test results had been found unacceptable for any valve tested, that component would not have been installed in the plant without further evaluation.

ST87-35 DG D Emergency Load Test

Test Objective

This special test was performed to verify the capability of the DG D to accept its unit 2 emergency loads in incremental steps by supplying power to its assigned loads fed from 4KV SD BD 'D', DSL AUX BD 'B', and 480V SD BD 2B under loss of offsite power/loss of coolant accident conditions and then testing the 480V load shedding feature with selected 480V loads of units 1 and 2. This was the third test in a series of four. Each step increment represents approximately 250KW starting from a base of 2100KW.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because there were no provisions of the FSAR which were violated by the performance of this test. This test was a derivative of SI 4.9.A.1.b-4 which is performed routinely for load acceptance testing of DGs. It has a valid safety evaluation. Also, no modification to the plant was involved in order to perform this test.

NEW PROCEDURES ISSUED
JANUARY 1, 1987 - DECEMBER 31, 1987

FP-0-39-PM-001 Preventive Maintenance for Horizontal CO_2 Activated Fire Damper in DG Building

Reason

The instruction is used to perform preventative maintenance on fire dampers that are CO^2 activated. This instruction allows for the inspection, lubrication, and manual cycling of these dampers to insure operability in the event of CO^2 discharge.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because this procedure will provide periodic inspection and maintenance on the dampers to ensure that they are capable of performing their design functions and comply with FSAR 10.11.6. This procedure does not alter the design or operability of the dampers and complies with TS.

MMG-034 Wilden Model 4100 Dewatering Pump Disassembly, Inspection, and Reassembly

Reason

This instruction describes the assembly and disassembly of the Wilden Model M4100 dewatering pump.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because the involved equipment is not safety-related nor is it connected to any safety-related equipment previously evaluated in the FSAR. The activity involved is not considered in the basis for any TS. The activity is not addressed in any TS nor does it require the use of any equipment that may violate TS.

SDSP 12.3 Plant Component Identification

Reason

Implements procedure to gain consistency and accuracy in functional description of plant equipment. Procedure outlines actions and responsibilities for reviewing and upgrading component identification tags and name plates on or associated with plant operational equipment.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because procedures will provide more accurate functional descriptions on equipment labels and generating instructions, therefore, probability of accident or malfunction should decrease. Safety margins should improve by enhancement of operator ability to correctly understand instructions and implement control actions.

SDSP 16.5 Control of Material After Issue from Power Stores

Reason

This procedure establishes the responsibilities for preparing instructions for control of material after issue from Power Stores and sets forth the minimum requirements which must be addressed in these instructions. Implemented in response to condition adverse to quality report (CAQR) BFQ870131, this CAQR identified the need for an SDSP to adequately control critical structures, systems and components after issue and prior to installation or end use.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because this program does not alter the method of or requirements for procurement or installation of permanent plant material or equipment. This is a program enhancement which provides additional assurance and is not a change to the TS.

SDSP 26.1 Special Nuclear Material Control and Accountability

Reason

The procedure defines those programmatic requirements necessary to ensure the receipt, inspection, handling and shipment of special nuclear material (SNM) are performed according to properly approved written instructions. This instruction ensures that the location and status of all SNM are known and can be verified at all times, and that applicable regulations are adhered to regarding inventories, inspections, and reporting requirements.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because fuel assembly insertion error during refueling and fuel handling accident are the only possible accidents which result from implementing this procedure and these accidents are discussed in the FSAR. There are no changes to systems or procedures which affect system performance which might reduce margin of safety. All implementing procedures all in accordance with TS.

SDSP 27.2 Responsibilities of the Independent Safety Engineering Group

Reason

New procedure implements PMP 604.05, Independent Safety Engineering Group (ISEG) Evaluation. ISEG performs independent reviews, surveillances, and audits of nuclear safety-related activities, programs, and events. ISEG was originally developed for NTOL plants after the Three Mile Island incident.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because SDSP 27.2 is an administrative procedure and does not affect plant equipment. The procedure is not related to accidents or malfunctions, does not effect any margins of safety, and is not addressed in the TSs.

RWI-001 Administration of the Radioactive Material and Radwaste Packaging and Transportation Program, Unit 0

Reason

This instruction, used in conjunction with the radioactive material shipment manual, establishes Browns Ferry Nuclear Plant (BFN) policy to ensure that shipments of radioactive material and radwaste from BFN meet all appropriate regulations.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because RWI-001 is the administration of the radioactive material and radwaste packaging and transportation program. This procedure is strictly administrative. During the implementation of this procedure, no safety-related equipment will be operated or affected in anyway. No physical activities will take place in the plant which may increase the possibility or create a malfunction of a different type previously evaluated in the FSAR.

RWI-101 Identifying Types of Solid Radwaste, Unit 0

Reason

This instruction provides guidance to plant personnel in identifying the various types of solid radioactive waste material commonly generated at BFN.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because the procedure merely identifies different types of radwaste to help each employee be aware of their individual involvement to help reduce the amount of unneccessary radwaste generated at BFN. During the implementation of this procedure, there will be no activities performed which may jeopardize or impair any safety-related equipment as evaluated in the FSAR. No activities will take place which may create an accident that has not been previously evaluated in the FSAR.

RWI-102 Use of Radwaste Package Control Tags, Unit 0

Reason

The purpose of this procedure is to outline the use of tags which establish traceability of all solid waste material received for processing by radwaste. This procedure is applicable to all persons involved with radwaste packages.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because the procedure merely outlines personnel responsibility to help maintain control of solid radioactive waste going to radwaste. No activities will be performed which will increase the probability or consequences of an accident. During the implementation of this procedure, no activities will take place which may create an accident that has not been previously evaluated in the FSAR.

RWI-103 Removal and Routing of Radioactive Waste from Radiologically Controlled Originating Areas, Unit 0

Reason

This instruction provides guidance in the removal and routing of radioactive waste material from the radiologically controlled originating area to the proper areas for handling and processing.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because this procedure merely provides a guideline for all plant employees to follow while routing radioactive waste materials from the originating area to the proper area for handling and processing. There will be no activities performed which may increase the probability or occurrence of an accident. This procedure does not require the use of any equipment or material which may increase the possibility or consequences of an accident that has not been previously evaluated in the FSAR.

RWI-104 Trash Frisk and Segregation Facility Operation, Unit 0

Reason

This instruction provides guidance for the day-to-day operation of the trash frisk and segregation facility. This facility permits the inspection and sorting for reuse, decontamination, and clean release of materials that would otherwise be disposed of as radwaste. The primary purpose of this facility is to prevent the inclusion of clean materials as radwaste, thereby reducing radwaste volume.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because the operation of safety-related equipment will not take place or be impaired by the implementation of this procedure. The equipment used during this operation can in no way affect any safety-related equipment. There is no possibility for a radiological release into the environment or the occurrence of an accident which has not been previously evaluated in the BFN FSAR.

RWI-105 Packaging of Acceptable Noncompactible Materials in Drums, Unit 0

Reason

This instruction provides for the packaging of acceptable noncompactible material into drums.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because there will be no safety-related equipment operated or impaired nor will the probability or consequences of an accident be increased. No activities will take place that may cause an accident which has not previously been evaluated in the FSAR.

RWI-106 Packaging of Acceptable Material in Noncompactible Boxes

Reason

This instruction provides the method for the packaging of acceptable noncompacted materials into boxes.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because there will be no safety-related equipment operated or impaired nor will the probability or consequences of an accident be increased. No activities will take place that may cause an accident which has not previously been evaluated in the FSAR.

RWI-109 Loading Radioactive Waste for Shipment, Unit 0

Reason

The purpose of this instruction is to provide guidance in the proper techniques for loading and inspecting radioactive waste packages prior to shipment from BFN.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because implementation of the procedure will not require the use of any equipment important to safety. Also, the probability or consequence of an accident previously evaluated in the FSAR will not be increased. There will be no work performed during this instruction which may create the possibility of an accident or malfunction which has not been previously evaluated in FSAR.

RWI-110 Shipment of Radioactive Material, Unit 0

Reason

This instruction outlines the requirements for shipping radioactive material from BFN to other TVA locations, or to outside organizations. This instruction is applicable to shipments involving radioactive material such as samples, sources, nonirradiated incore detectors, laundry, contaminated plant hardware, etc.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because the implementation of this procedure will not require the use of any safety-related equipment nor will it require any work to be performed in the plant. Therefore the probability of occurrence or the consequences of an accident cannot be created.

RWI-111 Storage of Radioactive Waste and Materials, Unit 0

Reason

This instruction outlines the requirements for both short-term and long-term storage of low level radioactive waste and materials onsite. It provides guidance on the preparation, transport, storage, and removal from storage of materials.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because the items in this procedure do not create any conditions which may increase the potential of an accident that are different than normal operating conditions. Strict adherence to this procedure will ensure that the possibility for an accident or malfunction of a different type than any evaluated previously in the BFN FSAR will not be created.

RWI-112 Container Marking, Unit 0

Reason

This instruction provides information needed to properly mark radwaste containers intended for disposal. This instruction is applicable to any radwaste drum, box, or resin liner. It includes marking information for both the Barnwell, South Carolina, and the Richland, Washington, disposal sites.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or

malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because this instruction is strictly an administrative procedure. There will be no safety-related equipment operated or affected. Also, no activities will be performed which may increase the possibility or consequences of an accident which has not been previously evaluated in the current BFN FSAR. This procedure does not require the use of any equipment which may create an accident or malfunction of a different type.

RWI-113 Mechanical Filter Solidification, Unit 0

Reason

This instruction outlines the method for solidification of mechanical filter elements which contain some free liquid. This instruction is applicable only to filters which are waste class and have a specific activity of less that 1u Ci/cc of isotopes with greater than 5 year half-lives.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because implementation of the procedure will not require the use of any equipment important to safety. Also, the probability or consequence of an accident previously evaluated in the FSAR will not be increased. There will be no work performed during this instruction which may create the possibility of an accident or malfunction which has not been previously evaluation in the FSAR.

RWI-115 Processing Unacceptable Material Into Drums and Boxes, Unit 0

Reason

This instruction provides the method for the processing of unacceptable material into noncompacted drums or boxes.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the

basis of any TS was not reduced because implementation of the procedure will not require the use of any equipment important to safety. Also, the probability or consequences of an accident previously evaluated in FSAR will not be increased. There will be no work performed during this instruction which may create the possibility of an accident or malfunction which has not been previously evaluated in the FSAR.

RWI-120 Quality Assurance Program for Resin Liner Dewatering, Unit 0

Reason

This instruction provides the means to ensure that resin liners which have been filled and dewatered meet the disposal site and regulatory criteria for free standing liquid. This instruction is applicable to TVA steel liners, General Electric (GE), cask steel liners, and Chem-Nuclear Systems, Inc., high integrity containers 14-195, 8-120, and 14-170.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because this procedure is strictly administrative. It provides the means to ensure that criteria are met. No safety-related equipment is involved. This procedure in no way can reduce the margin of safety.

RWI-121 Leak Test for GE Model 589 Shipping Cask, Unit 0

Reason

The purpose of this instruction is to perform a test to verify that the GE model 589 cask is leak tight. This instruction applies only to the model 589 cask. The test shall be performed annually or each time the lead O-ring seal on the cask is replaced.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because although the shipping cask involved in carrying out this procedure are considered to be critical structures, systems, and components while onsite, they are not connected to any safety-related equipment. Extreme caution is exercised during this test to prevent the possibility of an accident.

RWI-122 Sampling Procedures Waste Classification, Unit 0

Reason

This procedure describes routine sampling methods to be used to obtain reasonably representative samples of plant solid waste for spectroscopy measurements. The methods were developed to ensure that shipments of radioactive materials from the plant site are properly characterized as to their radionuclide composition and activity levels.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because the implementation of this procedure will not increase the occurrence or consequences of an accident or impair the operation of any safety-related equipment. No equipment will be operated nor will activities be performed which may create an accident.

RWI-123 Use of Casks, Unit 0

Reason

This instruction provides basic information relating to the use of NRC licensed packages for disposal shipments.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because this procedure is strictly administrative. It merely outlines the use of casks. No safety-related equipment is involved. Therefore, this procedure in no way can compromise the margin of safety.

RWI-124 Utilization of Scaling Factors, Unit 0

Reason

To describe methods of utilizing scaling factors to calculate the concentrations of hard to detect isotopes as required by 10CFR61 for determining radioactive waste classifications.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because this procedure is strictly an outline of the method to calculate isotopic concentrations. The implementation of this procedure does not require any work inside the vital area. Therefore, the possibility of an accident does not exist.

RWI-151 Verification of Radioactive Waste Package Contents (Noncompacted)

Reason

New procedure to provide for the inspection of radwaste packages containing noncompacted material in order to ensure compliance with all applicable regulations and requirements.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because the unpacking inspections and repacking of radwaste packages will not in any way impact nuclear safety. This new instruction does not in any way change the facility or any plant operating characteristic.

RWI-152 Verification of Radioactive Waste Package Contents (Compacted)

Reason

New procedure to provide for the inspection of radwaste packages containing compacted material in order to ensure compliance with all applicable regulations and requirements.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because the unpacking inspections and repacking of radwaste packages will not in anyway impact nuclear safety. This new instruction does not in anyway change the facility or any plant operating characteristic.

PLANT INSTRUCTION REVISIONS
JANUARY 1, 1987 - DECEMBER 31, 1987

The following procedures were revised to comply with the BFN Nuclear Performance Plan by ensuring they were properly scoped, formatted, based on the best technical sources, corrected for technical inaccuracies, and written in clear, easy to understand, sequential steps using well defined terms, including applicable commitments, and separated information, cautions, and warnings from actions. Also, unit 2 procedures were reviewed to ensure they detailed the proper steps for the safe operation and shutdown of the plant. Procedures covering a general operation or surveillance were broken down into individual instructions for the applicable unit.

0-AOI-32-1 Loss of Control Air, Unit 0	1-OI-71 Reactor Core Isolation Cooling System, Unit 1	2-AOI-57-5A Loss of I&C Bus A
0-OI-65 Standby Gas Treatment OI, Unit 0	1-OI-92 Source Range Monitors OI	2-AOI-57-5B Loss of I&C Bus B
1-AOI-2-1 Reactor Coolant High Conductivity, Unit 1	1-OI-92A Intermediate Range Monitors OI	2-AOI-68-1 Recirculation Pump Trip, Unit 2
1-AOI-57-5A Loss of I&C Bus A	1-OI-92B Average Power Range Monitoring OI	2-AOI-68-2 Jet Pump Failure, Unit 2
1-AOI-57-5B Loss of I&C Bus B	1-OI-92C Rod Block Monitor OI	2-AOI-68-3 Recirculation Loop A or B Speed Control Failure, Unit 2
1-AOI-70-1 Loss of Reactor Building Closed Cooling Water, Unit 1	1-OI-94 Traversing Incore Probe System, Unit 1	2-AOI-70-1 Loss of Reactor Building Closed Cooling Water, Unit 2
1-AOI-85-4 Loss of RPIS Unit 1	1-OI-99 Reactor Protection System OI, Unit 1	2-AOI-85-4 Loss of RPIS, Unit 2
1-AOI-92-1 RBM Failure	1-SI-4.6.A.6&7 Reactor Recirculation Pump Start Limitations	2-AOI-92-1 RBM Failure
1-AOI-99-1 Loss of Power to one RPS Bus, Unit 1	2-AOI-2-1 Reactor Coolant High Conductivity, Unit 2	2-AOI-99-1 Loss of Power to one RPS Bus, Unit 2
2-OI-37 Gland Seal Water System, Unit 2	3-AOI-92-1 RBM Failure	AOI-90-1 Area Radiation High, Unit 2
2-OI-70 Reactor Building Closed Cooling Water, Unit 2	3-AOI-99-1 Loss of Power to one RPS Bus, Unit 3	OI-24 Raw Cooling Water System, Unit 2

2-OI-71 Reactor Core Isolation Cooling System, Unit 2	3-OI-71 Reactor Core Isolation Cooling System, Unit 3	OI-27 Condenser Circulating Water System, Unit 2
2-OI-92 Source Range Monitors OI	3-OI-92 Source Range Monitors OI	OI-34 Vacuum Priming System, Unit 0
2-OI-92A Intermediate Range Monitors OI	3-OI-92A Intermediate Range Monitors OI	OI-53 Demineralizer Backwash Air System, Unit 0
2-OI-92B Average Power Range Monitoring OI	3-OI-92B Average Power Range Monitoring OI	OI-75 Core Spray System, Unit 2
2-OI-92C Rod Block Monitor OI	3-OI-92C Rod Block Monitor OI	OI-82 Standby Diesel Generator
2-OI-94 Traversing Incore Probe System, Unit 2	3-OI-94 Traversing Incore Probe System, Unit 3	SI 4.5.B.14-01 Recirculation Pump Discharge Valve Cycling Unit 2
2-OI-99 Reactor Protection System OI, Unit 2	3-OI-99 Reactor Protection System OI, Unit 3	SI 4.6.A.5-01 RPV Temperature Monitoring with Head Tensioned (Cold Shutdown), Unit 2
2-SI-4.6.A.6&7 Reactor Recirculation Pump Start Limitations	3-SI-4.6.A.6&7 Reactor Recirculation Pump Start Limitations	SI.4.7.B.1.g Standby Gas Treatment Filter Pressure Drop Test, Unit 0
3-AOI-2-1 Reactor Coolant High Conductivity, Unit 3	AOI-57-2 Station Blackout Unit 0	SI.4.7.B.2.d Standby Gas Treatment System Train Operation, Unit 0
3-AOI-57-5A Loss of I&C Bus A	AOI-57-6 Loss of Nonpreferred, Unit 0	SI.4.7.B.3.b Standby Gas Treatment System Filter Cooling Bypass Valve Operability, Unit 0
3-AOI-57-5B Loss of I&C Bus B	AOI-85-3 CRD System Failure, Unit 1	
3-AOI-70-1 Loss of Reactor Building Closed Cooling Water, Unit 3	AOI-85-3 CRD System Failure, Unit 3	
3-AOI-85-4 Loss of RPIS, Unit 3	AOI-85-3 CRD System Failure, Unit 2	

The following procedures were revised in response to the revision of SI-1. SI-1 was revised to ensure that TSs were correctly translated into surveillance

scheduling requirements. These scheduling requirements were implemented in the following SIs by this revision.

SI 3.1 Inservice Pump Testing Required by ASME XI, Unit 0

SI-3.1.1 Core Spray Pump Performance

SI 3.1.11 EECW pump Baseline Data Acquisition and Evaluation, Unit 0

SI-3.1.12 HPCI System Pump Baseline Data Evaluation

SI-3.1.13 RCIC System Pump Baseline Data Evaluation

SI-3.1.3 RHRSW Pump Performance

SI 3.1.7 S.W Pump Performance, Units 1, 2, and 3

SI-3.2 Inservice Valve Testing Required by ASME Section XI

SI-4.2.B-45B RHR System Logic-Time Delay Calibration, Unit 2 only

SI.4.7.A.3.b Suppression Chamber - Reactor Building Vacuum Breakers

The following procedures were revised in response to an NRC unresolved item in report 84-17-05. TVA evaluated unsupervised carbon dioxide system actuation circuits to check if additional surveillance was required in order to increase reliability of the automatic carbon dioxide fire suppression systems. This revision changed performance frequency for part of the SI which deals with CO_2 initiation in the DG rooms.

Added note to NA sections on semiannual performance due to increased performance frequency. Also, changed local panel number.

SI 4.11.C 4&5 Fire Protection System Testing of Heat and Smoke Detectors, Unit 1

SI 4.11C1&5 Fire Protection System Testing of Heat and Smoke Detectors, Unit 3

TS Amendments 138 (U1), 134 (U2), and 109 (U3) revised section 6.8.1. This revision made provision for any applicable procedure, detailed in Appendix A of regulatory guide 1.33, revision 2 (February 1978), other than administrative procedures to be reviewed by process of technical review rather than by way of the Plant Operations Review Committee (PORC). Revision of the following procedures coincides with the amendments to TSs, providing for technical review.

SDSP 12.2 Development of System Test Specifications

SDSP 2.1 Site Procedures
and Instructions

SDSP 2.11 Implementation
and Change of Site Procedures
and Instructions.

The following procedures were revised in response to NRC report 87-29. This report provides instructions to all personnel involved about the responsibilities pertaining to the control and accountability of special nuclear material. Revisions to the following procedures outline those responsibilities.

EMI-35 Traversing Incore
Probe Detector Replacement,
Units 1, 2, and 3

SMI 192.2 LPRM Maintenance
Instruction, Units 1, 2, and 3

SMI 192.4 IRM System
Maintenance Instruction,
Unit 1

SMI 192.5 SRM Maintenance
Instruction, Unit 1

The following procedures were revised to correct discrepancies found during review of SI 4.5.C.1. These discrepancies include verification of calibration for instruments and testing frequency inconsistent instruments with TS. These discrepancies are detailed in conditions adverse to quality reports (CAQRs).

SI-4.5.C.1 (3) RHRSW Pump
and Header Operability and
Flow Test, Unit 2

SI-4.5.C.1 (3) RHRSW Pump
and Header Operability and
Flow Test, Unit 3

The following procedures were revised in response to NRC inspection report 86-38. Report 86-38 details the misplacement of five fission counters at BFN. The revisions establish better control and accountability of special nuclear material.

SMI 192.2 LPRM
Maintenance Instructions
Units 1, 2, and 3

SMI 192.4 IRM
Maintenance Instructions
Units 1, 2, and 3

SMI 192.5 SRM Maintenance
Instructions, Units 1, 2, and 3

The following procedure was revised to incorporate valve changes made per ECN P0392. Changed frequency from once per operating cycle to once per 18 months, added step to notify unit operator before commencing the instruction, changed to notify shift engineer rather than the assistant shift engineer, added two annunciators (steps 4.6 and 7.5.23), changed range of torque wrench (step 5.21), clarified voltage range (step 5.3.4).

SI 4.1.A-8 CAL RPS High
Water Level in Scram
Discharge Tank

The following procedure was revised to incorporate valve changes made per ECN P0392. Added step to notify unit operator before commencing the instruction, changed to notify shift engineer rather than assistant shift engineer, added two annunciators (steps 4.6 and 7.5.16), clarified voltage range (step 5.2.2).

SI.4.1.A-8FT RPS High
Water Level in Scram
Discharge Tank Functional
Test

The following procedures were revised in response to NRC IE notice 86-048. This notice outlines generic problems found by NRC dealing with boron concentration and SLC tank levels. A special test (8625) was run as a result of this notice to establish and verify proper mixing of the SLC tank with applied air sparging of the solution. Revision complies with the recommendation from this special test. Revised to reflect the beginning and end air sparge time.

CI 463.1 Sampling
Sodium Pentaborate
Solution from the SLC
Storage Tank.
Unit 0

SI.4.4-08 SLC System,
Unit 0

The following procedures were revised in response to NRC inspection report 87-27. This report identified a failure to track and control radioactive byproduct material. Revision made to comply with a commitment to track and control radioactive byproduct material made as a result of this report.

SDSP 23.2 Radioactive Source
Control, Unit 0

SI 4.8.E Miscellaneous
Radioactive Material
Sources, Unit 0

The following procedures were revised as a result of commitment in licensee Event Report 50-259/85050. This is a commitment to review and revise SI-1 to ensure TS requirements are correctly implemented. This revision implements the upgraded version of SI-1 for unit 3.

1-SI-1 Surveillance Program,
Unit 1

2-SI-1 Surveillance Program,
Unit 2

3-SI-1 Surveillance Program,
Unit 3

The following procedures were revised in response to NRC generic letter 82-12. This letter outlined the NRC's policy on factors causing fatigue of operating personnel. Revision made to comply with NRC policy.

BF 12.24 Conduct of Operations,
Units 1, 2, and 3

SI 4.2.B-32 Instrumentation
that Initiates or Controls the
CSCS RCIC Steam Line Space
High Temperature, Units 1, 2,
and 3

The following procedure was revised in response to a July 13, 1987 letter from TVA to NRC. The commitment was to revise SDSP 12.1 and BF 1.10 to denote the NSSS vendor, GE, as a member of the joint test group. This revision deleted the statement that the joint test group subchairman shall have the authority to sign for PORC chairman on prescribed forms. Also, added modifications with an associated design change notice or engineering change notice issued (SDSP 8.4) to the review list of the workplan subcommittee.

BF 1.10 Plant Operations
Review Committee
Unit 0

The following procedure was revised in response to NRC inspection report 84-26-14. This report questions the QA controls applied during maintenance of open systems to verify foreign material is exempted. BF 3.10 revised to require evaluation and when necessary the application of methods to exclude foreign articles from critical plant piping systems.

Also, revised to incorporate a temporary change and incorporate revisions due to the periodic 2-year review.

BF 3.10 Cleanliness of
Fluid Systems, Units 1,
2, and 3

The following procedure was revised in response to NUREG 1000. This NUREG concerns the generic implications of ATWS events at the Salem Nuclear Power Plant. This revision made to comply with items found within NUREG 1000 applicable to BFN.

EMI-72 Overhaul and
Test Procedure for GE
Medium Voltage Circuit
Breakers - Types AM-4.76-
350/250 and AM-4.76-250
Magna-Blast

The following procedure was revised as a result of the completion of a 2-year review as required by SDSP (DR 860622). General revision made as result of this 2-year review.

GOI 100.10 Operation with
Torus Drained Unit 3

The following procedure was revised to implement the details of ISI-7. ISI-7 (page 363 of SI 4.6.G) outlines the relief from inspection requirements of NRC for inaccessible welds in piping penetrations and under rigid pipe restraints. The flued head to process pipe welds are inaccessible for any type of examination. The pipe welds located under rigid pipe restraints are inaccessible for volumetric examination. ISI-7 identifies the specific locations at BFN where these conditions occur. MAI-23 was revised to include a note outlining the conditions which fall under the scope of ISI-7.

MAI-23 Support and
Installation of Piping
Systems in Category I
Structures.

The following revision was made to ensure the verification of bolt material grade for QC, verification of bolt tightness, inspection of surface beneath baseplate, and clarification of requirements for distance between holes in use and abandoned holes. All revisions made in accordance with the applicable general construction specification G32 revision 12.

MAI4 Bolt Anchors Set in
Hardened Concrete Structures,
Units 1, 2, and 3

The following procedure was revised to ensure segregation of defective equipment from nondefective equipment per Nuclear Managers Review Group (NMRG) report R-86-02-NPS finding L4. This finding notes the possibility of mistakenly using defective equipment in the place of nondefective equipment. This could occur in the case of defective equipment losing its tag and being stored with nondefective equipment. Segregation reduces this risk and is accomplished per revision to MMI-102.

MMI-102 Rigging Equipment
and Portable Hoist Program,
Unit 0

The following procedure was revised to correct sequences and instructions for receiving permission from the shift engineer and unit operator before starting this instruction. Also, revised as result of periodic 2-year review.

MMI-17-02 Main Steam
Isolation Valve Assembly
(Inspection, Maintenance
and Repair), Units 1, 2, and
3

The following procedure was revised in response to NRC inspection report 86-32. This report indicated deficiencies in the technique of lifting the refueling platform for inspection and repair. This revision outlined the correct technique and requirements for lifting the refueling platform.

MMI-34 Refueling Platform
Inspection and Repair,
Unit 0

The following procedure was revised to delete the requirements for ECN packages being retained in the shift engineer's office. Also, revised due to incorporation of SDSP 8.2 into SDSP 8.4 (Preparation and Processing of Workplan and Inspection Records).

PMI-8.2 Plant Design Change
Review, Unit 0

The following procedure was revised in response to NRC IFI 87-12-02. This revision ensures qualification of test engineers, test procedure used is of latest revision, and establishing controls on test performance. Revision also incorporated the new conditions adverse to quality (CAQ) program.

SDSP 12.1 Restart Test Program

The following procedure was revised to change substitution of filler material. Substitution of filler material for welds was found unpermissible in ASME code work where toughness requirements are invoked. Revision prohibits the substitution of E705-6 for E7035-3 filler metal in applications requiring impact testing. (Corrective action for SCR BFN NEB 8616.)

SDSP 13.6 Field Instruction
for Welding Techniques and
Repair for G-29M Application

The following procedure was revised to provide adequate technical instruction for preparation and processing of FCRs.

SDSP 8.9 Field Change Request
Unit 1, 2, and 3

The following procedure was revised to incorporate temporary changes and to correct a procedural deficiency. This instruction failed to outline requirements for qualification of the QC inspector (CAQR BFT870669). This revision outlines the qualification requirements for the QC inspector.

SDSP 9.6 Mechanical and
Instrument and Controls
System Walkdown

Revision to the following procedure incorporated signoff verifying that all prerequisites have been met. Revised to require notification of applicable unit operator of testing being performed. Also, revised test apparatus sketch and procedure to reflect change in apparatus. (Revision in accordance with condition identified by CAQR BFQ 870059.)

SI 3.2.9 Testing of Section
XI Relief valves
Units 1, 2, and 3

The following procedure was revised to correct discrepancies found during review of SI 4.5.B.2. The stated discrepancies include inconsistency in requirements for completion of data sheets, nonclarification of qualification requirements for inspectors, and various other procedural discrepancies and inconsistencies. These discrepancies are corrected by this revision. (DR 87-0217)

SI 4.5.B Residual Heat
Removal System Units 1, 2,
and 3

The following procedure was revised to correct discrepancies found during review of SI 4.5.C.1. These discrepancies include inconsistency with controlling document, improper logging of SI data, and improper testing techniques (CAQR BFQ870044).

SI-4.5.C.1 (2) EECW Pump
Operation Surveillance
Instruction, Unit 3

The following procedure was revised in response to NRC inspection item 87-02-07. This report concerns the monitoring of the reactor building ventilation. This revision incorporates the following comments made in this report.

1) The SI lacks a note for signoff by Shift Engineer, Assistant Shift Engineer, or Unit Operator to verify equipment lineups.

2) Step 6.4 requires that reactor building indoor air temperature be recorded; however, no temperature instrument was referenced for retrieval of this data.

3) Step 6.9 states, "Verify indicating lights on panel 9-25 for FC 064-36, the drywell/torus bypass damper." This indication is not provided on panel 9-25.

SI 4.7.C-05 Secondary
Containment
Units 1, 2, and 3

The following procedure was revised to update procedure for tracking charcoal samples from CREV unit. Procedure updated to better measure flow rates of CREV units. Clarified steps for start and stop times for CREV units. Also, revised to require notification of unit operator before commencing instruction (LER 259/82032).

SI-4.7.E CREV

The following SI was revised to add attachments for alpha activity calculations and steps to tie the SI to the CI. Also, revised to delete a temporary change.

SI 4.8.B.2-2 Airborne
Effluent - Particulate
Filter Analysis (monthly
gross alpha)

The following procedure was revised to include inspection of the power boost current transformer connections (LER 259/87005). This LER documents the events pertaining to the burning out of this connection on March 3, 1987. Revised to include specifics for inspection of contact finger and inspection of bolted

connection as a result of the consequences of a phase-to-phase short between contacts in the DG control cabinet for the 3ED DG that occurred on April 20, 1987. Also, revision added requirement for check of actuator coupling.

SI 4.9.A.1.d Diesel Generator
Annual Inspection
Units 1, 2, and 3

The following procedure was revised to clarify RHR seal cooler operability requirements.

TI 33-06 EECW Flow
Verification
Units 1, 2, and 3

The following procedure was revised in response to NRC commitment 86-29. TI-77 was found to contain the following problems.

1) The scope of the document was too broad.

2) Procedure not specific in its directions to the user.

3) Procedure contains instructions inappropriate for a technical instruction.

4) The procedure format requires the user to repeatedly refer to a number of sections within the procedure in order to acquire all necessary information on a particular task.

   Corrective action was taken to revise TI-77 and resulted in the deletion of this instruction. Radwaste tasks previously accomplished through TI-77 are now accomplished through a series of RWIs. Each RWI deals with a specific radwaste instruction.

TI-77 Radwaste
Packaging and Shipping.

RESTART TEST PROGRAM TEST INSTRUCTIONS ISSUED
JANUARY 1, 1987 - DECEMBER 31, 1987

2-BFN-RTP-002 Main Condensate System

Objective

The objective of this instruction is to perform testing to verify the proper clean and precoat sequence of the unit 2 condensate demineralizers.

Safety Evaluation

This test instruction does not involve a change in the facility design or plant operating characteristics from that described in the FSAR and which could impact nuclear safety. The system being tested, main condensate system, is nonsafety-related and non-CSSC, and the test does not require any operations that deviate from normal.

2-BFN-RTP-023 Residual Heat Removal Service Water System

Objective

The purpose of this test instruction is to provide an intergrated systems test based on TS SI of the RHRSW system which are listed below in addition to the backup control test which is described in 2-BFN-RTP-BUC. During the test, valves and pumps operability and system logic including the reservoir level monitoring will be verified.

SI-4.2.B.67 RHR Service Water Initiation Logic
SI-4.5.C.1(3) RHRSW Pump and Header Operability Flow Test
SI-4.9.A.3.a Common Accident Signal Logic System
SI-4.2.B-39A Core Spray System Logic
SI-4.5.C.1(1) RHRSW and EECW System Valve Operability Test
SI-4.5.B.1.c Residual Heat Removal System
SI-4.2.H.1 Reservoir Level Monitoring Functional Test

Safety Evaluation

The functions demonstrated by performing this test, residual heat removal service water system, are described in the FSAR and the TSs. Therefore, this test is bounded by the evaluation in the FSAR and plant TSs. Also, this test instruction does not involve a change in the facility design or plant operating characteristics from that described in the FSAR and which could impact nuclear safety.

2-BFN-RTP-024 RO Raw Cooling Water System

Objective

The purpose of this restart test procedure is to specify the functional testing required to demonstrate that the raw cooling water system will meet the design baseline evaluation requirements and minimum operational requirements. This procedure will include verification of proper valve opening and closure upon loss of air and transferal of system usage. Also, RCW pumps and booster pumps will be tested.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created because the accident conditions, functions, and tests demonstrated by this test of the RCW system are within the description of the RCW system in the BFN FSAR. The RCW system does not affect TSs. Therefore, the margin of safety for any TS is not reduced by this test.

2-BFN-RTP-025 Raw Service Water System

Objective

The objective of this restart test program instruction is to provide a description for performing integrated systems testing of the raw service water high pressure fire protection and radwaste as required by the Design Baseline and Verification Program (DBVP). The test involves the determination of proper operability of the systems, valves, pumps, and logic including certain PCIS isolation signal responses and local leak rate measurements.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created because the tests performed on these systems are system functions described in the FSAR for the systems affected. These systems functions described in this test instruction are within the bounds of the TSs applicable for the system tested. Therefore, this test will not reduce the margin of safety for any TS.

2-BFN-RTP-027 Condenser Circulating Water

Objective

The objective of the condenser circulating water (CCW) restart test program test instruction is to verify operability of the crosstie valves, condenser waterbox outlet butterfly valves, and the condenser waterbox vacuum priming system. It also provides test instructions for verifying instrumentation loops for the continuous warm water channel level and forebay/warm water channel differential level indications in the control room bay. Lastly, the test provides for verifying the vacuum breaking capability of the condenser circulating water system.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created because no test conditions are specified or actions will be conducted that conflict with the functions of the CCW or vacuum priming system as described in the FSAR. The TSs are not affected by the test. No margin of safety for any TS is reduced by this test. This test will be performed to meet the safe shutdown requirements as identified by the DBVP test requirements.

2-BFN-RTP-030 DG Building and Reactor Building Ventilation System

Objective

The purpose of this restart test procedure is to verify proper operation of the DG exhaust fans with their associated damper motor operators and battery vent hood exhaust fans, determine the air temperatures surrounding an idling and fully loading diesel for analyzing heat loads, and determining the proper operation of the stairwell and battery rooms exhaust fans. These tests are to verify that the system can meet the functional requirements for mitigation and shutdown from events resulting from modes identified in the scope of the DBVP.

Safety Evaluation

This test instruction does not involve a change in the facility design or plant operating characteristics from that described in the FSAR and which could impact nuclear safety. The system being tested is the DG building and reactor building ventilation system. This test identifies normal system operation. Hence, neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a

different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced.

2-BFN-RTP-032 Control Air/Drywell Control Air

Objective

The purpose of this test instruction is to describe the tests necessary to demonstrate and document that the control air system (CAS) and drywell control air system shutdown features can perform their required safety function for the safe shutdown of unit 2. Specific objectives of the tests address testing the CAS primary containment isolation valves for proper closure upon receipt of a PCIS isolation signal, loss of control air, or loss of power; verifying adequacy of the control air supply to the MSRV accumulators and their storage capacity for supporting the automatic depressurization system (ADS) function and the MSIV accumulators for one closing cycle of these valves; and to check the seals and door interlocks for the equipment access door. Leak rate tests are also inherently addressed in this testing.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because test conditions are specified or actions conducted that do not conflict with the automatic or manual operation of the system as described in the FSAR and are not different from normal testing or previously conducted tests. Also, testing of the ADS accumulators is performed by MMI-42 (which has been previously evaluated for safety considerations) which requires the unit to be in cold shutdown. This test is bounded by accidents and malfunctions previously analyzed in the FSAR and will be conducted within the bound of the TSs.

2-BFN-RTP-057-1 125V Direct Current (DC) System Test

Objective

The overall objective of this instruction is to insure that testing of the 125V DC system can provide its design function in support of reactor safe shutdown. This will be accomplished by demonstrating that the 125V DC batteries are capable of supplying their assigned loads for safe shutdown by performing a battery capacity test and by demonstrating the 125V DC battery chargers' output voltage ripple is within design limitations by monitoring the voltage during battery recharge.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created because this test utilizes SI-4.9.A.2.c alone to verify proper operation of the batteries. No other test steps are required. Hence, strict adherence to the TS is assured. The FSAR assumes that testing of the batteries will be performed to verify performance, thus this condition is no different than those analyzed for the FSAR. The design of the electrical system and TS allow for systems to be out of service for testing, thus the margin of safety is not reduced.

2-BFN-RTP-057-3 250V DC Distribution System-Unit Batteries

Objective

This restart test instruction is designed to determine and document that the 250V DC distribution system-unit batteries perform as required to support the safe shutdown of the reactor. This test includes discharge capacity testing of the units 1, 2, and 3 batteries. The most recently performed battery discharge test data for the units 1 and 2 batteries will be reviewed for acceptability to satisfy the discharge test requirements for those batteries. A ripple test will be performed on 250V DC battery chargers 1, 2A, 2B, and 3. Chargers 1, 2A, and 2B will be tested to verify their functional requirements upon receipt of a 480V load shed signal.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because this test utilizes approved SIs alone to verify proper operation of the 250V DC unit batteries as allowed by the FSAR, section 8.6.2.5 and 8.6.5. The conduct of the test causes sections of 250V DC unit battery system to be inoperable from the TS aspect, but allowances for these conditions are considered by the FSAR and are within the bounds of the TSs.

2-BFN-RTP-057-4 480V Distribution System

Objective

The purpose of this test is to demonstrate the 480V AC distribution system is adequate to support the safe shutdown of BFN as described in the Safe Shutdown Analysis. This will be accomplished by verifying automatic and proper transfer of 480V, reactor motor

operator valve and control bay vent boards normal sources to their alternate supply of power on loss of voltage to the normal feed. The test is also designed to verify automatic load shedding and time-delayed reenergization of designated 480V loads under accident conditions (LOP/LOCA) and automatic shedding of designated loads of 480V shutdown boards 2A and 2B under sustained loss of potential conditions.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because this test was designed to confirm design requirements as described in the FSAR for the 480V AC power supply system. No test conditions are specified or actions conducted that conflict with the automatic or manual operations of the system as defined by the FSAR. The conduct of the test causes sections of 480V AC power supply system to be inoperable from the TS aspect, but allowances for these conditions are considered by the FSAR and are within the bounds of the TS.

2-BFN-RTP-057-5 4.16 KV Distribution System

Objective

This instruction is designed to demonstrate that the 4KV power distribution system can meet the functional requirements for safe shutdown. Specifically, verified during this testing will be that the shutdown buses, unit boards, and the 4KV distribution and common boards

- will transfer from normal to alternate upon loss of power to the normal source, and that with either the normal or alternate breaker closed the respective open breaker will not close, and that the 4KV distribution system will provide auto start signals to the RHRSW pumps upon receipt of various designated signals;

- can process reactor recirculation pump and ATWS signals and generate trip signals to the pump and MG set;

- can effect control and indication for DGs from both control rooms and the shutdown boards and successfully parallel the DGs between units and with the grid under normal and emergency conditions;

- will provide input start signals to the DGs with loss of voltage, with bus voltage degraded, and with common accident signal;

- will provide input to shutdown boards to shed loads and to sequence on preselected loads for shutdown boards after receipt of sustained undervoltage, degraded voltage signal, and LOCA signal when the DGs are providing power;

- and that the 4KV distribution system controls for each shutdown bus and board can be transferred from control room to the respective bus or board and operated and then transferred back to the control room.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because the test is conducted to verify the performance of the 4KV power distribution system and is consistent with the design as described in the FSAR. No test conditions are specified or actions conducted that conflict with automatic or manual operations of the system as defined by the FSAR. The conduct of the test causes sections of 4KV distribution system to be inoperable from the TS aspect, but allowances for these conditions are considered by the FSAR and are within the bounds of the TSs.

2-BFN-RTP-057-7 250V DC Shutdown Batteries

Objective

This restart test instruction will be performed to document the battery discharge capacity for shutdown board batteries A, B, C, D, and 3EB. The shutdown board battery chargers SB-A, -B, -C, -D, -3EB, and -Spare (portable) will be tested to verify the ripple voltage does not exceed design specification. This test instruction, will be used to determine that the 250V DC shutdown board batteries SB-A, -B, -C, -D, and -3EB are capable of supplying the 250V DC loads for safe shutdown and that the shutdown board battery chargers SB-A, -B, -C, -D, -3EB and -Spare outputs do not contain excessive ripple.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because this test utilizes surveillance procedures alone to verify proper operation of the 250V DC shutdown batteries as allowed by the FSAR, section 8.6.2.5 and 8.6.5. During the conduct of the test, sections of 250V DC shutdown battery system will be inoperable from the TS aspect, but allowances for these conditions are considered by the FSAR and are within the bounds of the TS.

2-RTP-063 SLC System

Objective

This restart test instruction will be performed in an effort to ensure that the SLC system is capable of meeting established operability and safety requirements in support of unit 2 operation. The test instruction includes demonstrating the neutron absorbing effectiveness of the sodium pentaborate solution contained in the SLC storage tanks, verify the operability of the SLC pump 2A and 2B suction header heat trace control loops, demonstrate that the SLC pump 2A and 2B discharge relief valves will lift within the acceptable range to ensure that system over pressurization will not occur, and by functionally testing SLC pump 2A and 2B interlock and controls simultaneous with the operation of each of the pumps in a boron solution recirculation mode. The functional ability of the SLC will be tested by injecting demineralized water into the reactor vessel.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced. The SLC is required to be available at all times when it is possible to make the reactor critical as stated in section 3.8 of the BFN FSAR. The SLC is not required to be operable at times when there is no fuel in the reactor vessel. This test will be performed under these conditions. Hence, compliance with the TS and FSAR are assured. The ability to shutdown the reactor without control rods, using the SLC system, is analyzed as a special event in the FSAR. Assumptions and analyses made will not be violated.

2-BFN-RTP-065 R1 Secondary Containment

Objective

The purpose of this test instruction is to test the SBGT system and secondary containment system in a manner that will verify their design function of limiting the discharge of radioactive material to the environs. The test will ensure that all three SBGT trains start automatically upon receipt of a PC 15 (Group G) signal and that all combinations of two out of three SBGT trains maintain the specified negative pressure while taking suction from zones requiring secondary containment. Operability of the SBGT dampers and components, heaters, filters, fans, and secondary containment dampers will be determined. The secondary containment will be tested to determine in-leakage flow and pressure drop across the filters of each SBGT train.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced. This test instruction does not involve a change in the facility design or plant operating characteristics from that described in the FSAR and which could impact nuclear safety. The system being tested, secondary containment system, conforms to applicable TSs.

2-BFN-RTP-067 EECW System

Objectives

The objective of this restart test instruction is to perform the testing identified in system test specification which will provide verification that the EECW performs as designed to meet the safe shutdown requirements. Specifically, this test is required to perform or verify that the EECW system will supply essential equipment with the required flow rates and pressures and that the nonessential cooler supply valve closing setpoints are adequate; the units 1 and 2 control bay emergency chiller unit can be supplied when the control bay chillers are valved out; EECW water inventory condition in the north header during a loss of offsite (AC) power event is adequate; operability of the EECW pump discharge strainers and backwash valves, motor operated pump discharge valves, automatic nonessential equipment supply valves, and chillers cooling water discharge valves; and that either of the two EECW headers are capable of providing water to any unit's fuel pool.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced. This test instruction does not involve a change in the facility design or plant operating characteristics or procedure from that described in the FSAR and which could impact nuclear safety and is hence bounded by the analysis provided in the FSAR and TS.

2-BFN-RTP-070 Reactor Building Closed Cooling Water (RBCCW) System

Objective

Performance of the test described in this instruction will result in functional verification of the proper operation of the RBCCW system and its components. Operations of the RBCCW components from inside

and outside the control room will be tested. Also, operability of spare pump suction and discharge valve interlocks, automatic start of pump B, 3 seconds after failure of pump A to start, automatic closure of the sectionalizing MOV due to low pressure, and the drywell atmosphere cooling system will be determined. Other related tests will evaluate the RBCCW logic and primary containment and provide additional supportive information for the overall evaluation of the RBCCW system.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced. The test is conducted to verify that the performance of the system is consistent with the design as described in the FSAR, section 10.6. No test conditions or actions are specified that conflict with the automatic or manual operation of the system as described in the FSAR and which provide the basis for the accident analysis in the FSAR. The test is conducted within all TS requirements, although none specifically address the RBCCW system. Thus the margin of safety provided by TS is not reduced.

2-BFN-RTP-071 RCIC System

Objective

The purpose of this restart test instruction is to describe those tests which are necessary to demonstrate and document that the unit 2 RCIC system can perform its required safety function as well as perform its design function. This includes the fact that proper operation of each RCIC system motor-operated valve, solenoid valve, air-operated valve, and air-operated check valve must be verified for automatic and manual operation from the control room and from outside the control room as well as proper operation of the RCIC system instrument line excess flow check valves; RCIC system initiation logic with RCIC in the standby readiness configuration and in the flow test configuration utilizing the design input initiation signals; RCIC system isolation logic utilizing the design input isolation signals; RCIC system under flow conditions in the test configuration and that it is capable of delivering rated flow and pressure; and RCIC turbine overspeed trip mechanisms. Other aspects of this restart test requirement include a RCIC system reactor coolant pressure boundary components hydrostatic pressure test, RCIC primary containment penetration isolation valves leak rate testing, and that the ECCS analog trip units power supplies currently designated as RCIC components supply the correct division I and II components.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced because this test is conducted to verify that the performance of the system is consistent with the design as described in the FSAR, section 4.7 and 4.8.5.2. No test conditions or actions are specified that conflict with the automatic or manual operation of the system as described in the FSAR. This testing is bounded by TS section 3.5.F and tables 3.2.B and 4.2.B.

2-BFN-RTP-075 Core Spray System

Objective

The objective of this test is to demonstrate that the core spray system (75) performs as designed to maintain the reactor in a safe mode. This includes thorough intergrated tests of the core spray system valves and pumps operability and system logic.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced. This test instruction does not involve a change in the facility design or plant operating characteristics from that described in the FSAR and which could impact nuclear safety. This procedure change does not add anything new that has not been previously evaluated. The testing described in the procedure is addressed in TS.

2-BFN-RTP-079 Fuel Handling and Storage

Objective

The purpose of this test instruction is to functionally test the fuel handling and storage system. The test will verify proper electrical logic whose design intent is to provide safe fuel handling and prevent inadvertent criticality during refueling operations. The test will ensure that the refueling platform main grapple "loaded," frame mounted hoist "loaded," and monorail mounted hoist "loaded" setpoints are verified.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced. This test is consistent with the design as described in the FSAR as corrected by the baseline program test requirements document for system 079. No test conditions are specified or actions conducted that conflict with the automatic or manual operations of the system as defined by the FSAR as modified by the baseline program test requirements document for system 079. The operation of the fuel handling and storage system as conducted by this test are within the bounds of the FSAR (as modified by the baseline program test requirements document for system 079) and TS.

2-BFN-RTP-082 R1 Standby DGs

Objective

The objective of this test is to insure that the standby DGs, the fuel oil system, and the diesel starting air system during the restart test program perform in accordance with design requirements. Specifically, the test is designed to demonstrate that the DGs will start automatically and manually and thereby provide a 4KV standby source of onsite power; will automatically provide the power when the normal and alternate power sources are unavailable and will override the parallel operation mode selector switch and automatically configure the voltage regulator and governor for single unit operation; can supply its assigned emergency loads; can reject its full load and its largest assigned emergency load without exceeding designated speed limits as well as operate at full load for at least 24 hours, and can be resynchronized and paralleled to a DG fed emergency bus to offsite power, and transfer the load to offsite power without interrupting the supply to the loads; that the DGs of units 1 and 2 can be operated in parallel with the corresponding DGs of unit 3, and that total loading will be shared equally while operating in parallel; each DG breaker can be operated from the 4KV shutdown board when the transfer switch is positioned in "Emergency" and all other feeder breakers are open and that the DG breaker control from the main control room is disabled in "Emergency" position only; each bank of the diesel starting air system (DSAS) can start its associated diesel and has sufficient capacity at minimum normal operating pressure to support the normal and alternate automatic DG starting sequences; a common accident signal will initiate proper sequencing of the emergency loads with normal voltage available and all protective functions except the differential overcurrent and overspeed are bypassed when this signal is present; the fuel oil system automatically provides fuel to the diesels, can transfer fuel oil between 7-day storage tanks, will operate properly

on loss of plant control air with service air available to transfer fuel oil and be controlled and monitored by attendant level detecting equipment, and that voltage is provided to operate the fuel transfer pumps for continued operation of the DGs; a signal indicating DG cooling requirement is provided to initiate RHR service water pumps; start circuits are operational and can be switched for activating multiple consecutive start attempts; to obtain DG voltage and frequency stability data when both fuel transfer pumps (FTM1 and FTM2) are started simultaneously; and fuel oil consumption rate data.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced. This test was conducted to verify the performance of the standby DGs and associated support systems. It is consistent with the design as described in the FSAR. No test conditions are specified or actions conducted that conflict with the automatic or manual operations of the systems as defined by the FSAR. The conduct of the test causes individual DGs to be inoperable from the TS aspect, but allowances for these conditions are considered by the FSAR and are within the bounds of the TS.

2-BFN-RTP-085 CRD System

Objective

The purpose of this instruction is to provide tests needed to verify that the CRD system can meet the safe shutdown requirements and readiness to support startup from the unit 2 cycle 5 outage. Reactor manual control system (RMCS) and rod position information system (RPIS) testing will also be performed to ensure the reliable operation of components required to support the CRD system. Specifically, the test will verify that the scram discharge system will function to allow reactor scram by providing sufficient volume for CRD over piston area and seal leakage water, and verify the successful completion of modifications performed to the scram discharge system by various ECNs; verify the satisfactory performance of the RPIS by ensuring that displays and logic will operate properly during system operation; verify that the scram pilot air header switches will provide reactor scram upon receipt of low indicated header pressure, the SDIV level instrumentation will provide reactor scram while sufficient volume exists to accommodate control rod scram exhaust water, satisfy the inspection requirements for the CRD housing support installation and alignment, and provide scram insertion times for all 185 control rods during plant startup;

verify instructions necessary to perform rod block functional testing of the RMCS and diagnostic testing for each CRD to determine satisfactory performance; verify control response and stability for CRDH system flow control valves replaced by ECN P0596.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced. This test instruction does not involve a change in the facility design or plant operating characteristics from that described in the FSAR and which could impact nuclear safety.

2-BFN-RTP-090 Radiation Monitoring System (RMS)

Objective

The functional test requirements provided by this system test instruction outlines the testing which is necessary to determine whether the RMS can provide for safe shutdown from anticipated transients and accidents. Specifically, the testing will be used to verify that the main steam line radiation monitor provides a trip signal to the RPS on high radiation in excess of setpoint and on loss of voltage to the monitors, verify that the reactor building ventilation monitors provide an isolation signal to the PCIS on receipt of a high radiation signal and separately on a loss of voltage signal from the monitors, and verify that the refueling zone ventilation monitors provide a trip signal to the PCIS on receipt of a high radiation signal and separately on a loss of voltage signal from the monitors.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced. The test is conducted to verify that the performance of the system is consistent with the design as described in the FSAR, section 7.12. No test conditions or actions are specified that conflict with the automatic or manual operation of the system as described in the FSAR. Also, the test is conducted within all TS requirements for the RMS.

2-BFN-RTP-244 Backup Control Communications System

Objective

The objective of this test is to verify that the backup control communications system can receive and transmit both signal (howler) and voice as required from primary and alternate sound powered stations.

This includes verifying each fixed station sound powered telephone operates properly for transmission and reception, is connected to the system only when push to talk button is depressed, selector switch and howler operates, and can transmit and receive voice transmission using portable sound powered chest sets tied to the system.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created, and the margin of safety as defined in the basis of any TS was not reduced. The communication system has no direct interface with any of the systems described in Chapter 14 or Appendix G of the FSAR accident analysis. Also, there is no accident or malfunction considered in Chapter 14 or Appendix G of the FSAR that concerns this system. The communications system is not addressed in the TS so a test of this system will have no affect on the margin of safety.

CHANGE NOTICES FOR RESTART TEST PROCEDURES ISSUED
JANUARY 1, 1987 - DECEMBER 31, 1987

2-BFN-RTP-024 R1 Raw Cooling Water (RCW) System

Reason

The purpose of this restart test procedure is to specify the functional testing required to demonstrate that RCW system will meet the design baseline evaluation requirements and minimum operational requirements. Units 1 and 2 control bay air chiller temperature control valves are operable and fail open on loss of air. RCW system provides pressure boundary integrity to EECW by verifying that normally open RCW check valves shut when flow is transferred from RCW to EECW and EECW header pressure is maintained. EECW alignment will ensure the autostart on a simulated RCW header low pressure. RCW pumps 1D and 3D backup control from outside the control room is operable. RCW pumps auto start on low RCW discharge pressure and auto stop when RCW discharge pressure is sufficient. RCW booster pump auto start and auto stop functions are operable. Long layup time and corrosion problems have not degraded the RCW heat exchanger and cooler flows and that the component flow is sufficient to support unit startup. RCW pumps and RCW booster pumps supply adequate discharge head.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created because accident conditions, functions, and tests demonstrated by this test are in the description of the RCW system in the BFN FSAR. The RCW system does not affect TSs. Therefore, the margin of safety for any TS is not reduced by this test.

2-BFN-RTP-025 CN-1 Raw Service Water (RSW) System

Reason

Because of installed instrument locations and the lack of installed flow elements, volumetric flow obtained is suspect. Also, given that 'shutoff head' measurements meet acceptance criteria and that a single RSW pump can raise level in the RSW head tank, flow curve comparisons are unnecessary. Hence, this test instruction was revised to delete the requirement for the RSW pump flow to be within 50 gpm of the design curve.

Safety Evaluation

This change is bounded by the approved unreviewed safety question determination (USQD) and does not constitute a change in procedural detail in the FSAR or TS or any other safety analysis that supports a licensing document. Although this intent change deleted flow rate acceptance criteria for the RSW pumps, flow rate for the RSW pumps is not addressed in the FSAR (section 3.11) or the TS. This test does not confirm a safe shutdown requirement or mode for the RSW system.

2-BFN-RTP-057-3 CN-1 250V DC Distribution System-Unit Batteries

Reason

This change notice was issued to implement a tighter ripple criteria specification for testing the 250V DC battery chargers.

Safety Evaluation

This change is bounded by the approved USQD and does not constitute a change in procedural detail in the FSAR or TSs. The change does not alter overall test objectives or any of the conditions established during testing. It does, however, tighten the acceptance criteria from "two percent or less" to "one percent or less for ripple."

2-BFN-RTP-057-4 CN-4 480V AC Distribution System

Reason

The reason for this intent change was to increase the scope of the test to include 480V shutdown board for units 1 and 3 in addition to those for unit 2. All 480V shutdown boards have been determined to be required for unit 2 safe shutdown. Therefore, instead of having to test only unit 2 shutdown boards, units 1 and 3 shutdown boards must be tested and verified operable.

Safety Evaluation

This change is bounded by the approved USQD and does not constitute a change in procedural detail in FSAR or TSs because this intent change does not change test objectives, acceptance criteria, or any of the conditions established during testing.

2-BFN-RTP-057-4 CN-5 480V Distribution System

Reason

This intent change notice was issued to add instruction clarification and verification and documentation of the 480V control bay vent board A and the 480V load shedding capabilities of the 480V distribution system. This revision also included changes of the acceptance criteria to agree with test requirements documentation.

Safety Evalaution

This test instruction revision does not involve a change in the facility design or plant operating characteristics from that described in the FSAR and which could impact nuclear safety. It is bounded by the approved USQD for the original instruction. The changes to the system being tested, 480V distribution system, involves use/additions to the PORC approved procedure and does not exceed the bounds of the design bases.

2-BFN-RTP-057-4 CN-6 480V Distribution System

Reason

The basic test instruction (2-BFN-RTP-57-4) is performed concurrently with SI 4.9.A.1.b. The SI initiates the load shedding and this test instruction is used to document the events. Hence, this test instruction was revised because of SI 4.9.A.1.b revisions to accommodate load shed documentation.

Safety Evaluation

This test instruction does not involve a change in the facility design or plant operating characteristics from that described in the FSAR and which could impact nuclear safety. The change being made to the system tested, 480V load shed logic which is initiated by SI 4.9.A.1.b.4, will not exceed the bounds of the design bases.

2-BFN-RTP-057-5 CN-17 4.16 KV Distribution System

Reason

This change notice was issued to correct specific alignment and restoration steps regarding the configuration of the bus tie board and allow the test to be performed in its abnormal configuration. This instruction change included operation requirements for board transfer change, clarification of procedure to conform with TVA nomenclature change, and correction of chart speed.

Safety Evaluation

Neither the probability of the occurrence or the consequences of an accident or malfunction nor the possibility for an accident or malfunction of a different type than previously evaluated in the FSAR was increased or created because the configuration of the plant electrical distribution system is in an analyzed condition. In worst case, a loss of all offsite power or an electrical fault on either shutdown bus or the bus tie board, the shutdown boards would be isolated and start the DG just as they would in normal configuration. TS 3.9.B.5 allows all unit 1 and unit 2 shutdown boards to be fed from one shutdown bus for a limited amount of time. Therefore, the margin of safety will not be reduced.

2-BFN-RTP-057-5 CN-21 4.16 KV Distribution System

Reason

This change notice was issued to revise the extent of unit 3 diesel load acceptance testing as previously described in this test instruction. Specifically, the test will be limited to residual heat removal service water (RHRSW) pump sequencing and shedding. This limited testing in conjunction with unit 3 condition will not allow performance of SI 4.9.1.A.1.b emergency load acceptance test. Unit 2 restart testing required will be contained within 2-BFN-RTP-082 and will be appended to this procedure.

Safety Evaluation

This change is bounded by the approved USQD and does not constitute a change in procedural detail in the FSAR or TS. This change does not alter test objectives, acceptance criteria, or any of the conditions established during testing as analyzed in the existing USQD.

2-BFN-RTP-057-5 CN-22 4.16 KV Distribution System

Reason

The purpose of this change was to delete test instruction steps which were not required for the test performance and documentation of test results. These steps dealt with the use of a SI review cover sheet to document the performance of supporting tests.

Safety Evaluation

This change is bounded by the approved USQD and does not constitute a change in procedural detail in the FSAR or TS. This intent change does not change test objectives, acceptance criteria, or any of the conditions established during testing.

2-BFN-RTP-057-5 CN-23 4.16 KV Distribution System

Reason

Steps were deleted because testing as originally proposed in supporting tests (DPSO-SMI 1-A.4 through 1-3ED.4) did not cover load shed properly. Current DPSO-SMI test instructions now cover this requirement. Thus, this instruction change deleted steps which became redundant and served no useful purpose. Also, typographical errors were corrected by this change notice.

Safety Evaluation

This change is bounded by the approved USQD and does not constitute a change in procedural detail in the FSAR or TS because this intent change does not change test objectives, acceptance criteria, or any of the conditions established during testing.

2-BFN-RTP-057-7 CN-1 250V DC Shutdown Batteries

Reason

This change notification was issued to implement a tighter change ripple criteria specification for testing the 250V DC battery chargers.

Safety Evaluation

This change is bounded by the approved USQD and does not constitute a change in procedural detail in the FSAR or TS. The change does not alter overall test objectives or any of the conditions established during testing. It does, however, tighten the acceptance criteria from "two percent or less" to "one percent or less for ripple."

2-BFN-RTP-070 CN-1 Reactor Building Closed Cooling Water (RBCCW)

Reason

The test objective to verify primary containment integrity by means of a local leak rate test was deleted because it is no longer a test

for requirement for the RBCCW system. Primary containment integrity will be verified by testing the containment penetration system.

Safety Evalaution

This test instruction does not involve a change in the facility design or plant operating characteristics from that described in the FSAR and which could impact nuclear safety. The section deleted is no longer a requirement of this test.

2-BFN-RTP-082 CN-4 Standby DGs

Reason

Fuel oil transfer pump steps were deleted and replaced because the initial steps in the procedure did not result in properly priming the transfer pumps. The revised steps utilized an air hose priming method. This also required replacement of existing data sheets 7.1 thru 7.8 to correspond to these revised steps. Minor procedural clarification was also made to properly describe the stop switch as a pair of stop buttons.

Safety Evaluation

This change is bounded by the approved USQD and does not constitute a change in procedural detail in the FSAR or TS. This intent change does not change test objectives, acceptance criteria, or any of the conditions established during testing.

2-BFN-RTP-082 CN-10 Standby DG

Reason

This revision was made to address the calibration of overcurrent relay in accordance with preestablished DPSO procedures.

Safety Evaluation

This test instruction does not involve a change in the facility design or plant operating characteristics from that described in the FSAR and which could impact nuclear safety. Relay setting changes allow performance of the emergency power system-diesel lube oil subsystem tests previously evaluated in the USQD for 2-BFN-RTP-082.

2-BFN-RTP-082 CN-17 Standby DG

Reason

This revision was made to ensure proper load testing of DG 3A by including the 480V shutdown board 3A from alternate to normal feed transfer in accordance with OI-57.

Safety Evaluation

This test instruction does not involve a change in the facility design or plant operating characteristics from that described in the FSAR and which could impact nuclear safety. The change does not interfere with operating characteristics of the plant or require data to support DBE test requirements. This change is bound by the USQD for system test 2-BFN-RTP-082 R0.

2-BFN-RTP-090 CN-05 Radiation Monitoring System

Reason

This revision was issued to ensure that the test requirement to verify that a trip signal is sent to the CREV system on receipt of a simulated high radiation signal was properly cross-referenced to another instruction. Hence, the requirement to satisfy this step is included in another procedure.

Safety Evaluation

This change is bounded by the approved USQD and does not constitute a change in procedural detail in the FSAR or TS because this intent change does not change test objectives, acceptance criteria, or any of the conditions established during testing.

2-BFN-RTP-090 CN-3 Radiation Monitoring System

Reason

Test instruction step 5.1.5 was inadvertently left out during preparation and has been added in this revision. This step adds the use of a SI to assist in testing the reactor auto scram channels A-D initiation signals to the RPS logic from main steam radiation monitors upon receipt of high radiation in excess of setpoint signal.

Safety Evalaution

This change is bounded by the approved USQD and does not constitute a change in procedural detail in the FSAR or TS. This change does not change test objectives, acceptance criteria, or any of the conditions established during testing.

2-BFN-RTP-090 CN-06 Radiation Monitoring System

Reason

Test objectives were added to verify that all main steam line and all reactor building ventilation exhaust line radiation monitor channels respond when exposed to gamma flux sources. This verification was added because the test objectives, test descriptions, and acceptance criteria were not clear as to the requirement to check detector/monitor response. Changes were made to clarify the procedure.

Safety Evaluation

This change is bounded by the approved USQD and does not constitute a change in procedural detail in the FSAR or TS. This change does not change test objectives, acceptance criteria, or any of the conditions established during testing.

2-BFN-RTP-090 CN-07 Radiation Monitoring System

Reason

This change incorporates the revised acceptance criteria and lists the steps to test the requirements. Verification that a PCIS group 6 isolation signal overrides all manual-electric operations of valves with the exception of emergency open steps were added because of the acceptance criteria changed during the revision of the test, but the changed criteria was not incorporated into the test until this change notice. Step 6.24, verification that the isolation valves of the drywell radioactive particulate, iodine, and gaseous monitors close on receipt of group 6 isolation signal from PCIS was deleted because this step does not apply to this test and requirement to perform this step was transferred to 2-BFN-STS-P064A. The use of SI 4.2.A.10 was deleted as the instruction for verifying that reactor building ventilation monitors provide a (reset) signal to the PCIS when the monitor loses voltage.

Safety Evaluation

This test instruction does not involve a change in the facility design or plant operating characteristics from that described in the FSAR and which could impact nuclear safety. The test instruction changes are still within the scope of the original USQD.

1987 RELEASE SUMMARY

MONTH	Gaseous Releases				Liquid Releases			
	Fissions & Activation (Ci)	Iodines (Ci)	Particulates (Ci)	Tritium (Ci)	Gross Radioactivity (Ci)	Tritium (Ci)	Dissolved Noble Gases (Ci)	Gross Alpha (Ci)
January	<1.21E 02	<1.88E-04	<8.99E-04	1.86E-01	2.82E-02	3.92E-01	<1.02E-03	<2.45E-04
February	<1.21E 02	<3.57E-04	1.30E-04	2.37E-01	1.46E-02	2.46E-01	<6.20E-04	1.91E-04
March	3.10E-05	<2.91E-04	3.69E-04	3.01E-02	2.26E-02	2.17E-01	<9.90E-04	<1.75E-03
April	8.16E-03	<5.16E-04	1.22E-04	2.76E-02	2.72E-02	1.72E-01	<6.19E-04	<1.42E-04
May	<9.44E 01	<9.63E-05	3.99E-05	5.69E-02	2.50E-02	1.62E-01	<1.08E-03	<1.05E-04
June	<1.41E 01	<6.10E-04	2.28E-04	1.28E-01	3.82E-02	1.74E-01	<1.84E-03	<1.13E-04
July	<1.08E 02	<1.32E-01	<7.40E-02	1.52E-01	2.67E-02	1.70E-01	<1.80E-03	<1.80E-04
August	<1.04E 02	<6.69E-04	3.63E-04	9.25E-02	2.64E-02	1.61E-01	<1.19E-03	<1.71E-04
September	<1.46E 02	<2.18E-04	<6.87E-04	9.88E-02	2.12E-02	8.89E-02	<8.26E-04	2.79E-04
October	<9.38E 01	<8.46E 01	3.01E-04	8.69E-02	5.02E-02	1.06E-01	<1.89E-03	4.39E-04
November	<1.77E 02	<3.78E-05	4.30E-05	6.37E-02	2.94E-02	8.74E-02	<1.15E-03	1.10E-03
December	3.14E-01	<3.50E-05	1.88E-04	2.00E-02	2.47E-02	4.98E-02	<9.04E-04	6.52E-04

Variation in the data for gaseous releases have been correlated with the numbers of operating fans. There were no excursion of interest nor releases which exceeded TS limits.

TRANSMISSION LINE CORRIDOR HERBICIDE USAGE
JANUARY 1, 1987 - DECEMBER 31, 1987

The herbicide Spike (dry flowable [DF]) was used on a section of the BFN-West Point 500-kV transmission line in calendar year 1987. Spike DF is a preemergence herbicide manufactured by Elanco Products Company under environmental protection agency (EPA) registration No. 1471-147 (specimen label and product safety data sheet attached).

The BFN-West Point 500-kV transmission line right-of-way is 200 feet wide; however, vegetation is controlled on a 150-foot wide section leaving a 25-foot wide buffer zone on each outer edge of the right-of-way. The right-of-way is maintained by a combination of mechanical clearing and herbicide application.

The herbicide Spike (DF) was applied on approximately 10 miles of this right-of-way by the banding method to eliminate danger to trees and to maintain the 150-foot right-of-way.

The banding method consists of applying a single band, approximately 2 inches wide, along each outer edge of the cleared section of right-of-way. A total of 122 pounds of Spike (DF) was applied by the banding method of 24.24 acres at the rate of 5 pounds (4.25 pounds active ingredients) per acre with water as the carrier.

The combination of mechanical clearing and herbicide treatment has proven effective and cost efficient in controlling undesirable vegetation along transmission line rights-of-way.

ELANCO

ID 5943

Herbicide

Spike®

Dry Flowable

TM

Spike® will kill trees and shrubs. Carefully read the precautions before using.

A preemergence and postemergence herbicide for control of brush and weeds in such areas as:

Airport runways
Utility substations and rights-of-way
Tank farms
Railway roadbeds and ballast
Railroad rights-of-way
Road shoulders where no vegetation is desired
Under asphalt and concrete pavements where no future landscaping is planned
At the base of highway guardrails, signposts, and markers
At the base of transmission towers and poles
Around industrial buildings
Lumberyards
Railroad yards
Ditchbanks
Firebreaks
Fence rows

The degree and duration of control may vary with the amount of chemical applied, soil texture, and other conditions.

Active ingredient:
tebuthiuron: *N*[5-(1,1-dimethylethyl)-1,3,4-thiadiazol-2-yl]-*N,N'*-dimethylurea 85.0%
Inert ingredients: 15.0%

Contains 3.4 pounds active ingredient per 4 pounds. SPIKE®—the registered trademark for Elanco Products tebuthiuron.

WARNING: KEEP OUT OF REACH OF CHILDREN. See back panel for additional caution statements.

Net Weight 4 Pounds

EPA Reg. No. 1471-147

Elanco Products Company • A Division of Eli Lilly and Company • Indianapolis, IN 46285, U.S.A.

PRECAUTIONARY STATEMENTS

WARNING

Human: Harmful if swallowed. Avoid contact with skin, eyes or clothing. Avoid inhaling dust from product. In case of contact, flush with water.

Environmental: Do not contaminate any body of water, ponds or streams as death or injury may occur to vegetation irrigated by such. Do not contaminate water by cleaning of equipment or disposal of wastes.

Storage and Disposal: The herbicidal properties of SPIKE Dry Flowable require caution in handling, storage and transportation of this product. Do not contaminate food or feed by storage or disposal. Open dumping is prohibited. Do not reuse empty container. Dispose in an incinerator or land fill approved for pesticide containers or bury in a noncropland area away from desirable plants, trees and water supply.

The manufacturer makes no warranties, express or implied, concerning this product or its use which extend beyond the description on the label. All statements made concerning this product apply only when used as directed. SPIKE Dry Flowable must be applied according to Elanco's written instructions, including, but not limited to, recommended rates. Failure to do so may result in poor weed control or plant injury. Elanco expressly disclaims any warranty, either express or implied, for the use of SPIKE Dry Flowable, alone or in combination with other products, when that use is not in strict compliance with Elanco's written recommendations.

PRECAUTIONS

SPIKE DRY FLOWABLE IS INTENDED FOR NONCROPLAND VEGETATION CONTROL. IT IS AN EXTREMELY ACTIVE HERBICIDE WHICH WILL KILL TREES, SHRUBS AND OTHER FORMS OF DESIRABLE VEGETATION HAVING ROOTS EXTENDING INTO THE TREATED AREA. FEEDER ROOTS OF MANY SPECIES OF DESIRABLE VEGETATION EXTEND MANY FEET BEYOND THE DRIP LINE OF THE BRANCHES, AND A VERY SMALL AMOUNT OF SPIKE Dry Flowable IN CONTACT WITH ONE FEEDER ROOT OF A TREE, SHRUB OR OTHER DESIRABLE VEGETATION MAY CAUSE SERIOUS INJURY OR DEATH TO THE ENTIRE PLANT.

AN ARBORICULTURIST (TREE EXPERT) SHOULD BE CONSULTED TO HELP YOU TO DETERMINE IF THE AREA OF PROPOSED APPLICATION IS FREE OF ALL ROOTS OF DESIRABLE VEGETATION. THE EFFECT OF SPIKE Dry Flowable ON DESIRABLE VEGETATION MAY BE IRREVERSIBLE AND ITS PRESENCE IN THE SOIL MAY PREVENT GROWTH OF OTHER DESIRABLE VEGETATION FOR SOME YEARS AFTER APPLICATION.

READ THE ENTIRE LABEL BEFORE USING SPIKE Dry Flowable TO DETERMINE IF THIS PRODUCT IS SUITABLE FOR THE DESIRED PURPOSE.

Do not use SPIKE Dry Flowable on areas such as walks, driveways, streets, lawns, patios, tennis courts, swimming pools, cemeteries, or other landscaped areas, or under asphalt or concrete pavement where future landscaping is planned. Do not apply on field crops. Do not apply on any area into which the roots of field crops or other desirable vegetation may extend. ROOTS OF TREES, SHRUBS, AND OTHER DESIRABLE VEGETATION MAY EXTEND FAR BEYOND THE DRIP LINE OF THE PLANT'S BRANCHES.

AVOID NONTARGET DRIFT OR PRODUCT MOVEMENT. DO NOT APPLY WHEN WINDS ARE GUSTY OR UNDER ANY OTHER CONDITION WHICH WILL ALLOW DRIFT OR PRODUCT MOVEMENT. DO NOT APPLY TO AREAS WHERE SOIL MOVEMENT BY WATER EROSION AND/OR NATURAL OR MECHANICAL MEANS IS LIKELY. DO NOT APPLY TO AREAS WHERE WIND IS LIKELY TO CAUSE SOIL MOVEMENT UNLESS A SOIL SEALANT IS USED. DRIFT OR ANY FORM OF PRODUCT MOVEMENT FROM TREATED AREAS MAY CAUSE DAMAGE TO ANY VEGETATION TO WHICH TREATMENT IS NOT INTENDED.

Ditchbank Usage — Do not apply SPIKE Dry Flowable to any portion of the ditchbank that will come into direct contact with water as movement of SPIKE Dry Flowable in this water to non-target plant species may result in the injury or death of those plants. Do not apply on ditches used to transport irrigation or potable water. Keep from contact with other pesticides and seeds.

Thoroughly clean all traces of SPIKE Dry Flowable from application equipment after use. DO NOT EMPTY RESIDUES CLEANED FROM APPLICATION EQUIPMENT ON AREAS WHERE THEY MAY COME IN CONTACT WITH THE ROOTS OF DESIRABLE VEGETATION OR THE WATER SOURCE FOR SUCH VEGETATION.

Woody Plant Control — Grazing is allowed in areas receiving band or individual plant treatments with 4.70 pounds per acre or less of SPIKE Dry Flowable. In areas receiving band or individual plant treatments with 4.70 pounds per acre or less of SPIKE Dry Flowable, grass may be cut for hay one year after application.

SPIKE Dry Flowable may injure or suppress certain herbaceous vegetation in the treated area. Therefore, do not apply where such injury cannot be tolerated. Do not apply broadcast applications of SPIKE Dry Flowable where forage or maintenance of a grass cover is desired. Injury to most herbaceous perennials is reduced if SPIKE Dry Flowable is applied when this vegetation is dormant.

DIRECTIONS FOR USE: Read All Directions Carefully Before Applying.

Total Vegetation Control: SPIKE Dry Flowable is a preemergence and postemergence herbicide for total control of vegetation in such noncropland areas as: airport runways, utility substations and rights-of-way, and concrete pavements where no future landscaping is planned, at the base of highway guardrails, sign posts and markers, at the base of transmission towers and poles, around industrial buildings, lumberyards, railroad yards, ditchbanks, firebreaks, and fence rows.

For total vegetation control in areas *not treated the previous season* with SPIKE Dry Flowable or other residual herbicides, apply SPIKE Dry Flowable prior to or just after emergence of plants as follows:

At 4.75 pounds per acre, SPIKE Dry Flowable will control the following:

Alfalfa	Broomsedge
Aster, heath	Buffelgrass
Aster, white heath	Burclover
Barley, little	Buttercup, smallflower
Bedstraw	Camphorweed
Bluegrass, annual	Carrot, wild
Bluegrass, Kentucky	Catsear, spotted
Bouncingbet	Cheat
Bromegrass, downy	Chickweed
Bromegrass, ripgut	Clover, red
Bromegrass, smooth	Cocklebur

Creeper, Virginia
Crowfootgrass
Dock, curly
Dogfennel
Fescue
Fescue, rattail
Fiddleneck, coast
Filaree
Filaree, redstem
Fleabane, annual
Foxtail
Gaillardia, rosering
Geranium, Carolina
Goldenrod
Grape
Gumweed
Hemlock, poison
Henbit
Honeysuckle, Japanese
Horseweed
Knapweed
Kochia
Lambsquarters
Lupine
Medic, black
Morninggiory
Mullein, common
Nightshade, silverleaf
Oat, wild
Panicum, Texas
Pepperweed, Virginia
Pigweed
Plantain, buckhorn
Puncturevine
Ragweed, giant
Raspberry, red
Ryegrass, Italian
Sedge, annual
Shepherdspurse
Sida, prickly
Sowthistle, annual
Spikeweed
Spurge
Spurge, spotted
Starthistle, yellow
Strawberry
Sunflower, common
Telegraphplant
Timothy
Trumpetcreeper
Velvetgrass
Vetch
Witchgrass

At 7.0 pounds per acre, SPIKE Dry Flowable will control the following:

Awngrass, triple
Barley, foxtail
Bromegrass, Japanese
Canarygrass, reed
Carpetweed
Chicory
Cinquefoil, common
Ivy, poison
Reed, common
Sandbur, field
Smartweed, swamp
Sowthistle, perennial
Spurge, prostrate
Sumac, staghorn
Sweetclover, white

At 9.5 pounds per acre, SPIKE Dry Flowable will control the following:

Barnyardgrass
Crabgrass
Itchgrass
Johnsongrass, seeding
Lovegrass
Orchardgrass
Oxtongue, bristly
Poorjoe
Purslane, common
Ragweed, common
Saltbush
Sedge bull

At 18.75 pounds per acre, SPIKE Dry Flowable will control the following:

Bermudagrass
Cudweed
Dallisgrass
Lookingglass, Venus
Vaseygrass

For the *maintenance of total vegetation control* in noncropland areas *east of the Rocky Mountains* which were treated the previous season with SPIKE Dry Flowable or other residual herbicides, apply SPIKE Dry Flowable prior to or just after emergence of plants as follows: (Some of the species listed may show erratic control depending on the time between application and weed germination.)

At 2.0 pounds per acre, SPIKE Dry Flowable will control the following:

Bluegrass, annual
Bluegrass, Kentucky
Carrot, wild
Chickweed, common
Croton
Fleabane, annual
Horseweed
Mullein
Panicum, fall
Parsnip, wild
Pepperweed
Pigweed
Ragweed, common
Smartweed, Pennsylvania
Sweetclover
Thistle, Canada
Woodsorrel, yellow

At 3 pounds per acre, SPIKE Dry Flowable will control the following:

Goldenrod
Spurge

In areas of rainfall greater than 25 inches per year, the 3 pounds per acre maintenance rate should be used for all weed species listed above.

For the *maintenance of total vegetation control* in noncropland areas *west of the Rocky Mountains* which were treated the previous season with SPIKE Dry Flowable or other residual herbicides, apply SPIKE Dry Flowable prior to or just after emergence of plants as follows: (Some of the species listed may show erratic control depending on the time between application and weed germination.)

At 1.5 pounds per acre, SPIKE Dry Flowable will control the following:

Bassia, fivehook
Cheat
Cudweed
Foxtail
Lettuce, prickly
Oat, wild
Oxtongue, bristly
Pigweed
Plantain
Ryegrass, annual
Saltbush
Shepherdspurse
Witchgrass

At 2.0 pounds per acre SPIKE Dry Flowable will control the following:

Buttercup
Canarygrass, reed
Knapweed, Russian
Knotweed
Mallow
Mustard
Ragweed, western
Starthistle, yellow
Telegraphplant

At 3.0 pounds per acre, SPIKE Dry Flowable will control the following:

Barley
Gumweed
Puncturevine
Sida, alkali
Smartweed, swamp

In areas of rainfall greater than 25 inches per year, the 3 pounds per acre maintenance rate should be used for all weed species listed above.

APPLICATION DIRECTIONS

Apply SPIKE Dry Flowable in 15 to 150 gallons of water per acre before or during the period of active growth of plants to be controlled. Initial control is enhanced by rainfall.

In areas of low annual rainfall (less than 15 inches per year) SPIKE Dry Flowable should be applied prior to the time of year when the predominant portion of that rainfall occurs. A minimum of 1 to 1½ inches of rainfall is required to activate SPIKE Dry Flowable and place it in the primary weed seed germination zone.

To maximize performance under a variety of conditions, SPIKE Dry Flowable is recommended for use in tank-mix combination with any of the following products: amitrole, Atratol® 80 W, Banvel® 720, Banvel® W.S., Karmex® 80W, MSMA, paraquat, Princep® 80W, Roundup®, SURFLAN® 75W, 2,4-D or Oust®. Where applications are made to existing vegetation, the contact or burning properties of paraquat or MSMA provide the rapid top kill while SPIKE Dry Flowable gives the residual long-term control desired. Applications to areas which are infested with certain difficult to control perennial weeds (such as johnsongrass, bermuda-

grass, quackgrass, horsetail, bindweed, dandelion or nutsedge) will benefit from tank-mixing SPIKE Dry Flowable with Roundup, amitrole, Banvel, Banvel 720, or 2,4-D. The addition of SURFLAN, Oust, Karmex, Atratol or Princep will improve SPIKE's performance on certain annual broadleaf and grass weeds such as foxtail, kochia, Russian thistle, or seedling johnsongrass.

Read the SPIKE Dry Flowable label and labels of products to be tank-mixed carefully before using. Note all warnings, cautions, precautions, and limitations of warranty on all labels.

Apply with any sprayer that will apply the spray uniformly. Check the sprayer before and during use to insure proper calibration and uniform application.

To mix, fill spray tank half full of water. Start agitation and continue during the entire mixing process. Add required amount of SPIKE Dry Flowable and allow to mix when tank mixing. If additional product is a wettable powder, add to tank and allow to mix thoroughly. If additional product is a liquid, add slowly while filling remainder of tank with water. Continuous agitation in the spray tank is required to keep the materials in suspension throughout application.

Agitate by mechanical or bypass (hydraulic) means in the spray tank. If bypass or return agitation is used, it should terminate at the bottom of the tank to minimize foaming.

For treating small areas, a tank type hand sprayer or sprinkling can may be used. Before application determine the amount of water and chemical necessary to cover uniformly the area to be treated. Shake or stir frequently.

WOODY PLANT CONTROL

SPIKE Dry Flowable is an effective herbicide for the control of brush and vines. SPIKE Dry Flowable can be applied either as a broadcast spray, banded application or as an individual plant treatment depending upon the size, density and location of brush to be controlled.

SPIKE is to be applied to the soil (Not the Foliage!) where it is absorbed by the roots of plants. Effects are slow to appear and will not become apparent until sufficient moisture has carried SPIKE Dry Flowable into the root zone. The time required to achieve control is dependent on soil type, amount of rainfall and rooting depth of target species. Some species may go through several defoliations and refoliations over a period of approximately two to three years prior to dying.

SPIKE Dry Flowable can be applied anytime except when the ground is frozen or the soil is saturated with moisture. For optimum results, applications should be made just prior to the resumption of active seasonal growth in the spring and/or periods of rainfall. For applications made in the late summer or early fall in areas of average annual rainfall of greater than 25 inches, higher rates should be used and inconsistent control may result on densely infested brush areas and hard to control species.

SPIKE Dry Flowable may be used on cut brush but for optimum results time should be allowed for the brush to resprout to a height of approximately 5 feet prior to application. SPIKE requires an actively growing plant to be effective. The larger the resprouts the more SPIKE that will be taken up by the plant and the more effective and consistent the control will be.

For the control of woody plants and vines, the following rates of SPIKE Dry Flowable are recommended. These rates can vary depending upon soil type, rainfall, time of application and size/density of the woody plants.

SPIKE Dry Flowable applied at the rate of 1.25 pounds per acre will control the following species.

Haplopappus tenuisectus	(Burroweed)
Larrea tridentata	(Creosotebush)
Mimosa biuncitera	(Wait-a-minute-bush)

SPIKE Dry Flowable applied at the rate of 2.50 pounds per acre will control the following species.

Ailanthus altissima	(Tree-of-heaven)
Aloysia lycioides	(Whitebrush)
Artemisia tridentata	(Big sagebrush)
Carya glabra	(Pignut hickory)
Celtis occidentalis	(Western hackberry)
Datura discolor	(Desert thornapple)
Lycium berlandieri	(Berlandier wolfberry)
Morus rubra	(Red mulberry)
Pinus monticola	(Western white pine)
Pinus spp.	(Pine)
Prunus emarginata	(Bitter cherry)
Rhus glabra	(Smooth sumac)
Robinia pseudoacacia	(Black locust)
Rosa multiflora	(Multiflora rose)
Salvia leucophylla	(Black sage)
Symphoncarpos orbiculatus	(Buckbrush)
Ulmus americana	(American elm)
Vaccinium spp.	(Blueberry)
Gaylussacia spp.	(Huckleberry)

SPIKE Dry Flowable applied at the rate of 3.50 pounds per acre will control the following species.

Abies balsamea	(Balsam fir)
Acacia farnesiana	(Huisache)
Acer saccharum	(Sugar maple)
Alnus rugosa	(Speckled alder)
Betula populifolia	(Gray birch)
Carya texana	(Black hickory)
Celtis pallida	(Granjeno)
Condalia obtusifolia	(Lotebush condalia)
Ilex vomitoria	(Yaupon)
Larix laricina	(Tamarack)
Picea glauca	(White spruce)
Populus balsamifera	(Balsam poplar)
Populus deltoides	(Eastern cottonwood)
Quercus douglasii	(Blue Oak)
Quercus marilandica	(Blackjack oak)
Quercus stellata	(Post oak)
Salix spp.	(Willow)
Schaefferia cuneifolia	(Desert yaupon)
Spiraea tomentosa	(Hardhack)
Ulmus alata	(Winged elm)

SPIKE Dry Flowable applied at the rate of 4.70 pounds per acre will control the following species.

Acacia berlandieri	(Guajillo)
Acacia greggii	(Catclaw acacia)
Acacia rigidula	(Blackbrush acacia)
Acacia tortuosa	(Twisted acacia)
Acer negundo	(Boxelder)
Adenostoma fasciculatum	(Chamise)
Alnus rubra	(Red alder)
Campsis radicans	(Trumpetcreeper)
Carya ovata	(Shagbark hickory)
Cercocarpus betuloides	(Birchleaf mountainmahogany)
Colubrina texensis	(Texas colubrina)
Condalia obovata	(Bluewood condalia)
Cornus drummondii	(Roughleaf dogwood)
Crataegus spp.	(Hawthorn)
Eysenhardtia texana	(Texas kidneywood)
Fagus grandifolia	(American beech)

Jatropha dioica	(Leatherstem)
Leucophyllum frutescens	(Cenizo [Texas silverleaf])
Liquidambar styraciflua	(Sweetgum)
Parthenocissus quinquefolia	(Virginia creeper)
Populus grandidentata	(Bigtooth aspen)
Porliena angustifolia	(Guayacan)
Prunus virginiana	(Common chokecherry)
Pseudotsuga menziesii	(Douglas fir)
Puerana lobata	(Kudzu)
Quercus dumosa	(California scrub oak)
Quercus palustris	(Pin oak)
Quercus rubra	(Red oak)
Quercus virginiana	(Live oak)
Rhus typhina	(Staghorn sumac)
Rubus allegheniensis	(Allegheny blackberry)
Salvia ballotaeflora	(Shrubby blue salvia)

SPIKE Dry Flowable applied at the rate of 6.00 pounds per acre will control the following species:

Acer macrophyllum	(Bigleaf maple)
Acer platanoides	(Norway maple)
Acer saccharinum	(Silver maple)
Baccharis spp.	(Groundsel tree)
Cornus florida	(Flowering dogwood)
Fraxinus pennsylvanica	(Green ash)
Gaulthena shallon	(Salal)
Juniperus virginiana	(Eastern redcedar)
Lantana camara	(Lantana)
Liriodendron tulipifera	(Tuliptree)
Melaleuca quinquenervia	(Melaleuca)
Pinus banksiana	(Jack pine)
Pinus echinata	(Shortleaf pine)
Pinus resinosa	(Red pine)
Pinus virginiana	(Virginia pine)
Platanus occidentalis	(American sycamore)
Prunus serotina	(Black Cherry)
Quercus alba	(White oak)
Rubus laciniatus	(Evergreen blackberry)
Rubus occidentalis	(Black raspberry)
Schinus terebinthifolius	(Brazilian peppertree)

SPIKE Dry Flowable applied at the rate of 7.0 pounds per acre will control the following species.

Acer circinatum	(Vine maple)
Arctostaphylos patula	(Greenleaf manzanita)
Ceanothus cuneatus	(Wedgeleaf ceanothus)
Ceanothus leucodermis	(Whitethorn chaparral)
Crataegus crus-galli	(Cockspur hawthorn)
Elaeagnus angustifolia	(Russianolive)
Fraxinus americana	(White ash)
Ligustrum spp.	(Privet)
Rhus laurina	(Laurel sumac)
Sapium sebiferum	(Tallowtree)
Smilax rotundifolia	(Common greenbrier)
Ulmus parvifolia	(Chinese elm)
Ulmus rubra	(Slippery elm)

BROADCAST APPLICATION

Apply SPIKE Dry Flowable in 15 to 150 gallons of water per acre with any properly calibrated herbicide sprayer. Check the sprayer before and during use to insure proper calibration and uniform application. Add the recommended amount of SPIKE Dry Flowable to clean water in the spray tank during the filling operation. Material must be kept in suspension at all times by constant agitation. Agitate by mechanical or bypass (hydraulic) means in the spray tank. If bypass or return agitation is used, it should terminate at the bottom of the tank to minimize foaming.

For treating small areas, a tank type hand sprayer may be used. Before application, determine the amount of water and chemical necessary to cover uniformly the area to be treated. Shake or stir frequently.

Do not apply broadcast applications of SPIKE Dry Flowable where forage or maintenance of a grass cover is desired.

BANDED APPLICATION

SPIKE Dry Flowable is recommended for the control of woody plant species in noncropland areas (such as utility, railroad, and pipeline rights-of-way, ditchbanks and fence rows) by application of a series of parallel bands to the soil surface. Individual bands should be spaced at intervals from 4 to 10 feet and at the currently labeled rate range of 2.5 to 7.0 pounds per acre depending on the woody species to be controlled. Actual herbicide bands should be kept as narrow as possible during application to achieve minimal injury or control of herbaceous vegetation. Apply SPIKE Dry Flowable to the soil surface in 5 to 75 gallons of water per acre in a series of parallel bands with spacing between bands ranging from 4 to 10 feet. In areas such as brush infested fence rows on utility rights-of-way, a single band may be applied. Control is dependent upon root systems intercepting bands. Therefore larger stems should be *treated individually* when using single bands.

Band spacing should be selected based on the size of the woody plants in the area to be treated and the amount of injury or control of herbaceous vegetation that can be tolerated.

Where control of young or seedling woody plants is desired, bands should be spaced closer together. This will achieve maximum exposure to their limited root systems. Where larger more mature woody species are to be controlled, bands should be spaced at the wider end of the recommended spacing range.

In addition to allowing adequate exposure of the more extensive root systems of these larger woody species for control, use of the wider spacings will further reduce injury or control of herbaceous vegetation in the area of treatment.

Within the treated band nearly all vegetation, woody and herbaceous, will be killed. Some herbaceous vegetation close to the treated band with roots extending into it may be severely injured or killed. However, since herbaceous species tend to have restricted root systems, most species outside the treated band will not be affected. Banded applications in areas of steep terrain should be applied across existing slopes in order to prevent soil erosion.

Apply with equipment designed to deliver the spray uniformly in the bands. To maintain the integrity of the individual herbicide bands, straight stream nozzles fitted with internal stabilizing vanes or their equivalent are recommended. Operating pressures should also be kept as low as will provide uniform delivery of the spray solution. Pressures in the range of 10 to 40 psi should be adequate. Pressures in excess of 40 psi will tend to cause the individual bands to break up.

When applications are made in an area where nozzles are elevated above the soil surface more than 5 feet, breakup of the individual spray streams may occur. If conditions do not permit delivery of intact spray streams to the soil surface, this method of application should not be used.

Fill the spray tank half-full of water. Start agitation and continue during entire mixing and spraying operation. Add the required amount of SPIKE Dry Flowable and allow it to mix thoroughly while completing the spray tank filling. If hand held or back pack type sprayers are used, shake vigorously after filling and periodically during application to maintain product

suspension. A master shut-off switch for the entire spraying system and nozzle check valves are recommended on commercial spray equipment.

Material must be kept in suspension at all times by continuous agitation. Agitate by mechanical or bypass (hydraulic) means in the spray tank. If bypass or return agitation is used, it should terminate at the bottom of the tank to minimize foaming. Check the sprayer frequently before and during use to insure proper calibration and uniform application.

INDIVIDUAL (SPOT) APPLICATION

SPIKE Dry Flowable may be applied in high or low volumes of water to selectively control individual woody plants. Recommended rates will vary depending upon site conditions with the higher rates needed for difficult to control species, large plants, heavier soils, fall applications and cut brush. Consult your local Elanco SPIKE distributor to determine the best rates for your location.

For high volume applications, mix 1 pound of SPIKE Dry Flowable in enough water to make 10 gallons of solution. Apply 10 ounces of material to the soil per every 2 to 4 inches of stem diameter.

For low volume applications, mix 1 pound of SPIKE Dry Flowable in enough water to make 1 gallon of solution. Apply 1 ounce of material to the soil per every 2 to 4 inches of stem diameter.

When treating large stems, apply the multiple treatments in even spacing around the stem.

For applying SPIKE Dry Flowable in banded or individual plant treatment, two pieces of equipment are suggested; the Solo Model 425 back pack sprayer for both banding and individual plant treatment and the Spot Gun for individual plant treatment.

The Solo sprayer is prepared for spraying by adding the pre-slurried contents of a 4 pound bag of SPIKE Dry Flowable and water to the tank. Fill to capacity with additional water and shake vigorously. Equip the Solo sprayer with a 0003-SS straight stream nozzle and the Solo pressure regulator with the green (10 psi) pressure limiting spring. To band SPIKE Dry Flowable at 5 pounds per acre, walk at 3 mph (264 feet per minute) with the Solo on continuously and space the bands 5 feet apart. Adjust the rate and walking speed according to the brush species and conditions encountered. For individual plant treatment with the Solo, apply a 1.5 second shot for every 1 to 2 inches of stem diameter at the base of unwanted woody plants.

The Spot Gun is prepared for individual plant treatment by mixing 2 pounds of SPIKE Dry Flowable in sufficient water to obtain 1 gallon of spray solution. Set the Spot Gun to deliver 8 milliliters of this solution for every 1 to 2 inches of stem diameter at the base of the unwanted woody plants. For application on steep slopes or other sensitive areas, the Spot Gun can be equipped with a soil probe to allow injection of the SPIKE Dry Flowable solution beneath the soil surface. Placement at a soil depth of 2 to 4 inches will eliminate any surface movement and reduce injury to herbaceous vegetation.

At the prescribed rates, a 4 pound bag of SPIKE Dry Flowable will treat approximately 950 stems 1 to 2 inches in diameter. Because of its non-volatile nature and low potential for drift this SPIKE application technique can be used for treating unwanted woody plants growing on non-cropland areas adjacent to sensitive crops. (See label precautions.) A white spot should be visible at the base of each treated stem which should aid in inspection of the completed work.

CAUTION: DO NOT USE SPIKE Dry Flowable IN THIS MANNER IN ANY AREA WHERE DESIRABLE SPECIES ARE IN THE VICINITY OF THE PLANTS TO BE ELIMINATED. A SMALL AMOUNT OF SPIKE Dry Flowable IN CONTACT WITH THE ROOTS OF DESIRABLE TREES OR OTHER WOODY SPECIES MAY CAUSE SEVERE INJURY OR DEATH. THE ROOTS OF SUCH PLANTS MAY EXTEND FAR BEYOND THEIR DRIP LINES.

SPIKE Dry Flowable will injure or control other herbaceous vegetation in the treated area. Therefore, do not apply where such injury cannot be tolerated. See the list of herbaceous vegetation controlled by SPIKE Dry Flowable under the Total Vegetation Control section of this booklet.

SPIKE® — tebuthiuron, Elanco Products Company
SURFLAN® — oryzalin, Elanco Products Company
Atrazin® — atrazine and prometon, Ciba-Geigy
Banvel® — dicamba, Velsicol Chemical Corporation
Karmex® — diuron, E.I. DuPont De Nemours & Company
Princep® — simazine, Ciba-Geigy
Roundup® — glyphosate, Monsanto Company
Oust® — sulfometuron methyl, E. I. DuPont De Nemours & Company

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Product Safety Data Sheet

ELANCO™

Elanco Products Company A Division of Eli Lilly and Company Lilly Corporate Center Indianapolis, IN 46285

Spike® Dry Flowable

ID 5943; FN 3084

SPIKE® DRY FLOWABLE is a preemergence and postemergence herbicide for control of brush and weeds in noncrop areas.

I. PHYSICAL AND CHEMICAL PROPERTIES

A. Active Ingredient Generic Name
Tebuthiuron

B. Chemical Name
N-[5-(1,1-dimethylethyl)-1,3,4-thiadiazol-2-yl]-*N*,*N'*-dimethylurea

C. Product Components

Tebuthiuron	85.0%
Inert Ingredients	15.0%

D. DOT Classification
Nonregulated

E. Normal Physical State
Neutral gray water dispersible granule with a mild odor

F. Auto-Ignition Temperature
Decomposes at 320°F (160°C)

G. Flashpoint
Not applicable

H. Explosive Limit
Does not yield dust

I. Solubility
Disperses in water

J. Threshold Limit Value
Not established

K. pH (aqueous 50/50)
6.6

II. STABILITY AND STORAGE

The herbicidal properties of SPIKE DRY FLOWABLE require caution in handling, storage and transportation of this product. Store in original container only. Do not contaminate water, food, or feed by storage or disposal.

III. UNUSUAL FIRE AND EXPLOSION HAZARDS

None known

IV. SPILL INFORMATION

In case of leak or spill, contain material and dispose as waste. Do not contaminate any body of water. Sweep up material. Place it and damaged unusable containers in a landfill approved for pesticides in accordance with applicable regulations.

Large spills due to traffic accidents, etc. should be reported immediately to CHEMTREC and Elanco Products Company for assistance. Prevent spilled material from flowing onto adjacent land or into streams, ponds or lakes.

V. PROTECTIVE EQUIPMENT REQUIREMENTS

During manufacture, wear goggles to protect eyes, wear impermeable gloves and protective equipment to avoid direct contact with skin. Use NIOSH (1) approved dust respirator.

VI. FIRE FIGHTING INFORMATION

Considered nonflammable. May emit toxic fumes when heated to decomposition. Do not allow water run-off from fire site to enter nearby streams, ponds or lakes. Keep containers cooled with water spray.

NOTE: In case of an emergency involving human ingestion or contact, call the Eli Lilly and Company telephone operator, (317) 261-2000 for referral to the physician on call.

Emergency Information

In the event an individual has accidentally consumed or has been overly exposed to an Elanco product, follow the first aid procedures set forth in this document. If further information is required, have a physician contact S. M. Cherniak, M.D., (317) 261-2586. If Dr. Cherniak cannot be reached, call M. R. Goldberg, M.D., (317) 261-3658. If Dr. Goldberg cannot be reached, call M. L. Cloud, M.D., (317) 261-6634. After working hours or weekends call (317) 261-2000. In case of a large chemical spill or contamination, call (317) 261-2570, at night or weekends (317) 261-2000, or CHEMTREC (800) 424-9300.

This Product Safety Sheet is principally directed to manufacturers, processors and formulators whose personnel may be exposed to this product. It is intended for use by manufacturers, safety hygiene and medical personnel. For users of the formulated and packaged product, follow label directions.

All information contained herein is offered in good faith and with the belief that it is accurate. As of the date of issuance, we are providing all information that we have or are aware of relevant to the foreseeable use or handling of the product. However, in the event of an adverse incident associated with this product, this Safety Sheet is not, and is not intended, to be a substitute for consultation with appropriately trained personnel.

VII. TOXICOLOGY

A. Acute Exposure (SPIKE DRY FLOWABLE)

1. **Eyes**–Moderate ocular irritation occurred when SPIKE DRY FLOWABLE was placed in the eyes of rabbits. All treated eyes cleared within three days posttreatment.

2. **Skin**–SPIKE DRY FLOWABLE caused no systemic toxicity or dermal irritation when applied to the skin of rabbits at a dose of 2000 mg per kg of body weight.

3. **Inhalation**–Rats were exposed "nose only" for four hours to a solid particulate aerosol containing 4.84 mg of post-mill blend SPIKE DRY FLOWABLE per liter of air, based on a total gravimetric concentration basis. All rats survived the exposure and 14-day postexposure observation period. Signs of toxicity included ataxia, body weight loss, dry nasal exudate, reduced activity, labored respiration, and poor grooming that disappeared within five days after exposure. SPIKE DRY FLOWABLE was tested as a post-mill blend for inhalation toxicity because only a low percentage of the bulk SPIKE DRY FLOWABLE forms a respirable aerosol.

4. **Ingestion**–The median lethal dose for rats given a single oral dose of SPIKE DRY FLOWABLE was estimated at 408 mg per kg of body weight. Signs of toxicity included leg weakness, lethargy, tremors, ataxia, coma, reduced activity, and salivation. Survivors appeared normal by 72 hours.

5. **Sensitization**–There was no indication of contact sensitization when guinea pigs were exposed topically to SPIKE DRY FLOWABLE.

VIII. HUMAN HEALTH

Laboratory animal studies that have been conducted with tebuthiuron indicate that the use of tebuthiuron does not present a hazard when recommended handling procedures are followed.*

IX. FIRST AID (Statement of Practical Treatment)

A. **Eyes**–Flush eyes with plenty of water and call a physician if irritation persists.

B. **Skin**–Wash exposed areas with plenty of soap and water. Wash all contaminated clothes before reuse. Call a physician if irritation persists.

C. **Inhalation**–Remove individual to fresh air. If breathing difficulty occurs, provide cardiopulmonary resuscitation assistance and get medical attention.

D. **Ingestion**–May be fatal if swallowed. Call a physician or Poison Control Center. Drink one or two glasses of water and induce vomiting by touching back of throat with finger, or, if available, by administering one to two tablespoons of syrup of ipecac:

Children 1 to 5 years	15 ml (1 tablespoon, 1/2 oz)
Adults and older children	15-30 ml (2 tablespoons, 1 oz)

Then give at least 10 oz of water to children and 24 oz to adults. Do not induce vomiting or give anything by mouth to an unconscious person.

X. LABEL STATEMENTS

A. Container Disposal

Triple rinse (or equivalent). Do not reuse. Then puncture and dispose of in a sanitary landfill, away from desirable plants, trees and water supply, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

B. Precautionary Statements

This product will kill trees, shrubs and other forms of desirable vegetation having roots extending into the treated area. Read precautions on label carefully before using.

1. **Human**–Keep out of reach of children. May be fatal if swallowed. Causes moderate eye irritation. Harmful if absorbed through the skin. Avoid breathing dust and contact with skin or eyes. Use eye protection and protective clothing, such as coveralls, a long sleeved shirt, and impermeable gloves when handling this product. Wash thoroughly with soap and water after handling and before eating, drinking, or using tobacco. Wash exposed clothing before reuse.

2. **Environmental**–Do not contaminate any body of water, ponds or streams as death or injury may occur to vegetation irrigated by such. Do not contaminate water by cleaning of equipment or disposal of wastes.

EPA Registration Number: 1471-147

Chemical Abstract Registry Number: 34014-18-1

XI. REFERENCES

(1) 1985 NIOSH Certified Equipment Guide

NOTE: This information applies only to SPIKE DRY FLOWABLE which is sold in the U.S.

*For user handling procedures, refer to product label; for manufacturing handling procedures refer to NACA Guidelines for the Good Workplace Standard for the Manufacturing and Formulation of Pesticides.

REACTOR VESSEL FATIGUE USAGE EVALUATION

The cumulative usage factors for the reactor vessel are as follows:

	Usage Factor		
Location	Unit 1	Unit 2	Unit 3
Shell at water line	0.00620	0.00492	0.00431
Feedwater nozzle	0.29782	0.21329	0.16139
Closure studs	0.24204	0.17629	0.14360

CHALLENGES TO OR FAILURES OF MAIN STEAM RELIEF VALVE

JANUARY 1, 1987 - DECEMBER 31, 1987

Unit 1

None

Unit 2

None

Unit 3

None

All three units were in cold shutdown during the entire reporting period.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION
PLANT: BROWNS FERRY NUCLEAR PLANT 1987 16:42 MONDAY, FEBRUARY 1, 1988

NUMBER OF PERSONNEL (>100 M-REM) TOTAL MAN-REM

MO=REACTOR OPS SURVEILLANCE

GROUP	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT AND OTHERS	TOTAL PERSONS	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT AND OTHERS	TOTAL M-REMS
MAINTENANCE PERSONNEL	775	34	18	827	55.229	1.516	0.513	57.258
OPERATING PERSONNEL	65	1	8	74	7.766	0.087	1.108	8.961
HEALTH PHYSICS PERSONNEL	132	2	41	175	45.869	0.203	10.329	56.401
SUPERVISORY PERSONNEL	13	2	1	16	1.393	0.184	0.053	1.630
ENGINEERING PERSONNEL	132	1	173	306	10.021	0.017	28.666	38.704
MO	1117	40	241	1398	120.278	2.007	40.669	162.954

MO=ROUTINE MAINTENANCE

GROUP	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT AND OTHERS	TOTAL PERSONS	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT AND OTHERS	TOTAL M-REMS
MAINTENANCE PERSONNEL	895	34	48	977	410.051	5.387	5.908	421.346
OPERATING PERSONNEL	63	1	7	71	1.079	0.084	0.056	1.219
HEALTH PHYSICS PERSONNEL	129	1	40	170	16.365	0.006	2.984	19.355
SUPERVISORY PERSONNEL	11	1	3	15	0.891	0.000	0.024	0.915
ENGINEERING PERSONNEL	122	5	155	282	17.444	0.609	16.942	34.995
MO	1220	42	253	1515	445.830	6.086	25.914	477.830

MO=IN-SERVICE INSPECTION

GROUP	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT AND OTHERS	TOTAL PERSONS	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT AND OTHERS	TOTAL M-REMS
MAINTENANCE PERSONNEL	138	27	3	168	12.258	5.977	0.499	18.734
OPERATING PERSONNEL	3	0	1	4	0.003	0.000	0.025	0.028
HEALTH PHYSICS PERSONNEL	59	1	22	82	0.386	0.005	0.174	0.565
SUPERVISORY PERSONNEL	5	0	0	5	0.487	0.000	0.000	0.487
ENGINEERING PERSONNEL	13	3	20	36	0.426	0.039	6.803	7.268
MO	218	31	46	295	13.560	6.021	7.501	27.082

MO=SPECIAL MAINTENANCE

GROUP	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT AND OTHERS	TOTAL PERSONS	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT AND OTHERS	TOTAL M-REMS
MAINTENANCE PERSONNEL	637	21	115	773	177.342	6.927	89.462	273.731
OPERATING PERSONNEL	35	0	1	36	0.797	0.000	0.000	0.797
HEALTH PHYSICS PERSONNEL	106	1	37	144	24.368	0.001	11.114	35.483
SUPERVISORY PERSONNEL	8	0	1	9	1.239	0.000	0.030	1.269
ENGINEERING PERSONNEL	92	3	75	170	15.450	0.628	16.745	32.823
MO	878	25	229	1132	219.196	7.556	117.351	344.103

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION
PLANT: BROWNS FERRY NUCLEAR PLANT 1987 16:42 MONDAY, FEBRUARY 1, 1988

GROUP	NUMBER OF PERSONNEL (>100 M-REM)				TOTAL MAN-REM			
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT AND OTHERS	TOTAL PERSONS	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT AND OTHERS	TOTAL M-REMS
MAINTENANCE PERSONNEL	2589	116	191	2896	663.695	19.807	96.709	780.211
OPERATING PERSONNEL	208	2	18	228	11.219	0.171	1.194	12.584
HEALTH PHYSICS PERSONNEL	526	5	163	694	88.872	0.215	25.076	114.163
SUPERVISORY PERSONNEL	41	3	5	49	4.224	0.184	0.107	4.515
ENGINEERING PERSONNEL	386	13	454	853	44.395	1.298	69.689	115.382
	====	===	===	====	=======	======	=======	========
	3750	139	831	4720	812.405	21.675	192.775	1026.855

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION
PLANT: BROWNS FERRY NUCLEAR PLANT 1987

16:42 MONDAY, FEBRUARY 1, 1988

MC=WASTE PROCESSING

GROUP	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT AND OTHERS	TOTAL PERSONS	TOTAL MAN-REM STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT AND OTHERS	TOTAL M-REMS
MAINTENANCE PERSONNEL	93	0	7	100	2.844	0.000	0.327	3.171
OPERATING PERSONNEL	12	0	1	13	1.004	0.000	0.005	1.009
HEALTH PHYSICS PERSONNEL	72	0	11	83	1.251	0.000	0.090	1.341
SUPERVISORY PERSONNEL	4	0	0	4	0.214	0.000	0.000	0.214
ENGINEERING PERSONNEL	10	0	15	25	0.481	0.000	0.207	0.688
MO	191	0	34	225	5.794	0.000	0.629	6.423

MC=REFUEL

GROUP	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT AND OTHERS	TOTAL PERSONS	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT AND OTHERS	TOTAL M-REMS
MAINTENANCE PERSONNEL	51	0	0	51	5.971	0.000	0.000	5.971
OPERATING PERSONNEL	30	0	0	30	0.570	0.000	0.000	0.570
HEALTH PHYSICS PERSONNEL	28	0	12	40	0.633	0.000	0.385	1.018
ENGINEERING PERSONNEL	17	1	16	34	0.573	0.005	0.326	0.904
MO	126	1	28	155	7.747	0.005	0.711	8.463
	3750	139	831	4720	812.405	21.675	192.775	1026.855

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION
PLANT: BROWNS FERRY NUCLEAR PLANT 1987 16:42 MONDAY, FEBRUARY 1, 1988
TOTAL NUMBERS OF INDIVIDUALS

GROUP	STATION	UTILITY	CONTRACT	TOTAL
MAINTENANCE PERSONNEL	946	44	121	1111
OPERATING PERSONNEL	65	1	9	75
HEALTH PHYSICS PERSONNEL	134	0	27	161
SUPERVISORY PERSONNEL	14	0	3	17
ENGINEERING PERSONNEL	115	2	154	271
	====	==	===	====
	1274	47	314	1635

TENNESSEE VALLEY AUTHORITY
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APR 05 1988

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

In the Matter of	)	Docket Nos. 50-259
Tennessee Valley Authority	)	50-260
	)	50-296

BROWNS FERRY NUCLEAR PLANT (BFN) UNITS 1, 2, AND 3 - ANNUAL OPERATING REPORT FOR JANUARY 1, 1987 - DECEMBER 31, 1987

Enclosed is the Annual Operating Report for BFN for the period of January 1 to December 31, 1987. This report is being submitted to satisfy the requirements of 10 CFR 50.59, BFN Technical Specifications Appendix A, sections 6.9.1.2 and 6.9.2, and BFN Technical Specifications Appendix B, section 3.2.2. It contains a summary of plant modifications, special tests, procedures issued and revised, occupational exposure data, reactor vessel, fatigue usage, and herbicide usage.

If you have any questions, please telephone M. J. May at (205) 729-3566.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

R. Gridley, Director
Nuclear Licensing and
Regulatory Affairs

Enclosure
cc: See page 2

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U.S. Nuclear Regulatory Commission

APR 05 1988

cc (Enclosure):

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