

DETAILS1. Persons Contacted

- *G. E. Vaughn, Vice President, Operations
- *W. H. Kinsey, Plant Manager
- *W. L. Mutz, Manager, Operations Strategic Planning
- *M. R. Wisenburg, General Manager, Nuclear Safety Review Board
- *R. W. Chewing, Vice President, Nuclear Assurance
- *D. J. Denver, Manager, Nuclear Engineer
- *A. R. Mikus, General Supervisor, Construction
- *A. W. Hamson, Supervisor, Licensing Engineer
- *C. A. Ayala, Supervisor, Licensing Engineer
- *W. A. Randlett, Security Manager
- *J. A. Slabinski, Quality Engineer Supervisor/Nuclear Assurance
- *S. M. Dew, Manager, Nuclear Purchasing Material Management
- *W. J. Jump, Maintenance Manager
- *A. C. McIntyre, Manager, Support Engineering
- *J. R. Lovell, Technical Services Manager
- *J. W. Loesch, Plant Operations Manager
- *K. J. Christian, Unit 1 Operations Manager
- *L. Giles, Unit 2 Operations Manager
- *D. A. Leazar, Reactor Support Manager
- *A. K. Khosla, Senior Licensing Engineer

In addition to the above, the inspectors also held discussion with various licensee, architect engineer (AE), maintenance, and other contractor personnel during this inspection.

*Denotes those individuals attending the exit interview conducted on February 1, 1990.

2. Plant Status

Unit 1 began this inspection period at 100 percent reactor thermal power. On January 3, 1990, a Technical Specification (TS) required plant shutdown was initiated when a feedwater isolation valve failed its surveillance requirements and was declared inoperable. Reactor power was reduced to 6 percent, the TS action statement exited, and the valve repaired. Power level was increased to 100 percent reactor thermal power on January 8, 1990. Unit 1 remained at 100 percent reactor thermal power level through the end of the inspection period.

Unit 2 began this inspection period in Mode 5 (cold shutdown) as a result of the inoperable No. 22 emergency diesel generator which failed on November 28, 1989. On January 6, 1990, No. 22 emergency diesel generator was declared operable and engineered safety features (ESF) loop tests were commenced. On January 8, 1990, an inadvertent safety injection (SI) occurred during the performance of a logic train functional test. On January 13, 1990, Unit 2 entered Mode 3 and on January 15, 1990, the unit

was taken critical. Unit 2 reached 100 percent reactor thermal power on January 22, 1990, and remained at that power level through the close of this inspection period.

3. Onsite Followup of Events at Operating Power Reactors (93702)

On January 3, 1990, an operability test was performed on the Unit 1 Train C feedwater isolation valve (FWIV) to satisfy TS requirements. The FWIVs are 18-inch, hydraulically opened, nitrogen assisted shut, gate valves. Each valve has two associated solenoid valves in parallel which, upon receipt of an ESF A or B signal, dump hydraulic fluid to allow nitrogen to stroke the valve to the closed position. Each valve also has an associated pump module which consists of electric and air-driven pumps and a fluid reservoir. This pump module maintains proper hydraulic system pressure to open and close the valve as needed.

The acceptance criteria for the feedwater system valve operability test includes the requirement that each of two safety-related FWIV solenoid valves associated with each ESF train change state when the solenoid valves receive actuation signals from redundant trains of the ESF actuation system. The FWIV stroked as required, but one of the two solenoid valves failed to actuate. Therefore, the acceptance criteria for the C train FWIV could not be met, the FWIV was declared inoperable, and TS 3.6.3 was entered. TS 3.6.3 requires the affected containment penetration to be isolated when one or more isolation valves are inoperable. Because the FWIVs are the only containment isolation valves in the main feedwater line and C train FWIV could not be shut because of forward feeding of the steam generators, the action statement of TS 3.6.3 could not be met and TS 3.0.3 was entered. A notification of unusual event (NOUE) was declared at 5:10 p.m. because of the TS-required shutdown and shutdown of Unit 1 was commenced. At 10:34 p.m., with the unit in Mode 2, C train FWIV was closed, the TS action statement exited, and the NOUE terminated. The plant remained in Mode 2 pending repair of the solenoid valve. The solenoid valves for the C train FWIV were removed and the internals of all four solenoid valves were found to be covered with particulate contamination. This particulate contamination was subsequently determined to be dirt and corrosion products. Based on the findings with the C train FWIV solenoids, the licensee made the decision to rework all 16 FWIV solenoid valves. The hydraulic fluid for each FWIV was either filtered or changed to remove particulates in the system. Additionally, a program to periodically sample and analyze the hydraulic fluid was initiated. The analysis results are to be used to initiate maintenance activities when the properties of the samples indicate hydraulic system degradation. Functional testing of the FWIVs was completed on January 9, 1990, and Unit 1 was returned to service.

On January 8, 1990, with Unit 2 in Mode 5, an inadvertent SI occurred during the performance of the solid state protection system (SSPS) Logic Train R function test. An operator trainee was assisting in performing the functional test under the direct observation of a licensed operator. The test requires actuation of various Train R and Train S manual block

switches to the block position. The trainee placed the low steamline pressure handswitch for Train S to the block position and then released it. The spring return action of the handswitch caused the handswitch to pass through the neutral position back to the unblock position. This resulted in a low steam line pressure SI. All equipment that was not in pull-to-lock operated as designed. No injection of water into the reactor coolant system occurred because all the SI pumps were in pull-to-lock as allowed for Mode 5 operation. The SI signal was reset and components were restored to normal.

Subsequent investigation determined that the operator trainee was unaware that a quick release of the handswitch could result in the switch traveling past the center position and cause a reverse actuation. The licensee issued a memorandum to all plant operations personnel discussing the event and emphasizing the use of positive control when manipulating spring return type switches. Additionally, the nuclear training department will modify its programs to include training in the proper operation of spring return switches prior to any on-the-job training and will include this incident in lessons-learned training for requalification.

No violations or deviations were identified in this area of the inspection. The licensee's actions appeared appropriate for the events encountered.

4. Operational Safety Verification (71707)

The purpose of this inspection was to ensure that the facility was being operated safely and in conformance with license and regulatory requirements. This inspection also included verifying that selected activities of the licensee's radiological protection program were being implemented in conformance with requirements and procedures, and that the licensee was in compliance with its approved physical security plan.

The inspectors visited the control rooms on a routine basis when onsite and verified that control room staffing, operator decorum, shift turnover, adherence to TS limiting conditions of operations (LCOs), and overall control room decorum were in accordance with requirements. The inspectors conducted tours in various locations of the plant to observe work and operations and to ensure that the facility was being operated safely and in conformance with license and regulatory requirements.

The essential chilled water systems (CH) were inspected to verify the operability and status of the systems. Both the Unit 1, Train C, and Unit 2, Train B, subsystems were inspected. The inspection included comparison of as-found control switch, power supply breaker, and valve positions to positions required by the operating procedures. A comparison of the operating procedures to design documents (piping and instrument diagrams (P&IDs)) was also performed. The procedures reviewed and walked down included:

- ° POP02-CH-0001, "Essential Chilled Water System," Revision 7
- ° 2POP02-CH-0001, "Essential Chilled Water System," Revision 3

Items noted during a technical review of the procedures included (unless specifically noted, the items observed applied to both procedures):

- ° Step 2.3.3 listed Final Safety Analysis Report (FSAR), Section 9.4.5, as a procedure reference, but Section 9.4.5 (containment vent) had no relationship to the procedures.
- ° Section 4.0, notes and precautions, did not include the essential chiller 30-minute start limitation.
- ° The procedures used the same acronym "ECW" in different steps to refer to different systems, the essential chilled water, and essential cooling water systems.
- ° Section 8.1 established the initial conditions needed to start an essential chiller. The vendor manual wording indicated that a chiller status light check (such as control power available, system run, and oil pump status lights energized) was to be included as part of the chiller start instructions. The procedure did not perform these status light checks; however, the licensee previously determined that status light checks were not necessary during chiller starts.
- ° Steps 8.1.9, 9.1.4, and 10.1.1.10 instructed operators to verify that adequate flow existed to the chiller condensers. Step 8.1.9 referred the operator to local-flow gauges, Step 9.1.4 referred the operator to local-flow status lights, and Step 10.1.1.10 referred the operator to both local lights and flow indicators. The procedure steps were not consistent. The licensee stated the steps were to be revised.
- ° Typographical errors were observed in Procedure 1POP02-CH-0001 which included: (1) the word "chiller" was erroneously listed twice in Step 8.1.4; (2) the essential chilled water checklist (-3) identified Valve 1-CH-0065 as a pressure switch and pressure indicator isolation valve, but the valve was only a pressure indicator isolation valve; (3) the word "Train" was incorrectly spelled as "Trace" nine times in the checklist; (4) Valve 1-CH-0963 was listed twice in the vent checklist; and (5) Vent Valves 1-CH-V1440 and 1-CH-V1511 were missing from the vent checklist.
- ° Typographical errors were observed in Procedure 2POP02-CH-0001 which included: (1) Valve 2-CH-948 was listed as an isolation valve in the valve checklist (-2), but was actually a drain valve; and (2) the required position LIP (Locked In Place) was missing from required position column for Valve 2-CH-0996.

Items observed during the walkdown of the system using the operating procedure and P&IDs included:

- The wrong colored lens covers for two status lights were noted on Essential Chiller 12C. The low-water temperature light was found to be green colored but should have been red per the vendor manual drawings. The motor space heater light was found red, but should have been green. The wrong colored lens covers for two status lights were also noted on Essential Chiller 22A. The excess purge light was found to be green but should have been red. The motor space heater light on Essential Chiller 22A was also red but should have been green.
- Differences between the system P&IDs, Procedure 1POP02-CH-0001 wording, and installed Unit 1, Train C, chilled water components included: (1) seven butterfly valves did not have designated positions (open, closed, locked) on the P&IDs, (2) Valve 1-CH-1433 was a test connection valve that was listed as a drain on the P&IDs, (3) Valve 1-CH-1529 was a sample valve that was listed as a drain on the P&ID, (4) Valve 1-CH-1504 was a vent valve that had no designation (vent or drain) on the P&ID, and (5) the positions of six temperature instruments and vent valves were in slightly different locations in the plant than shown on the P&IDs. There were no design change requests outstanding against any system P&IDs.
- Differences between the system P&IDs, Procedure 2POP02-CH-0001 wording, and installed Unit 2, Train B, chilled water components included: (1) eight butterfly valves did not have designated positions (open, closed, locked) on the system P&IDs; (2) Valves 1-CH-865 and 1-CH-866 were shown as normally closed vent valves on the P&ID and were identified as closed vent valves in the plant, but the valves were required to be open per the valve checklist (this revision of the procedure, Revision 3, had not been performed by operations personnel prior to the day of inspection); (3) Vent Valve 2-CH-1500 was listed in the valve checklist but was not shown on the P&ID; (4) Vent Valves 2-CH-1690 and 2-CH-1691 and Drain Valve 2-CH-1693 were shown on the P&ID but were not listed in the valve checklist; and (5) the positions of four temperature indications and two vent valves were in slightly different locations in the plant than shown on the P&IDs. There were no design change requests outstanding against any system P&ID.
- Other items observed during the walkdown included: (1) Temperature Instruments 1-CH-TI-9565 and 1-CH-TI-9565A (Train C) were incorrectly tagged as 1-CH-TI-9555 and 1-CH-TI-9555A (Train A) in the plant; (2) the air line filter to 1-CH-TV-9496B had an air leak on a sealing surface (no maintenance work request tag was attached); (3) there were more vendor supplied instruments than were shown on the P&IDs, including discharge temperature high, oil temperature high, and condenser water differential pressure; and (4) the Unit 2 postaccident sampling system (PASS) cooler air handling unit (AHU) control switch was OFF. With the nonsafety-related PASS AHU off, the room temperature had increased about 10°F above desired temperature. The switch to the PASS AHU should have been in AUTO per Procedure Checklist 2POP02-HF-0001-2, Revision 3.

All valves, power supply breakers, and switch positions were noted to be in positions required to support plant operation. Items noted by the inspector did not appear to directly impact safe operation of the plant. All observations were referred to the licensee for inclusion in the licensee's long-term program for procedure upgrade.

As part of the operational safety verification portion of the inspection, general housekeeping and potential fire hazards were inspected during nonroutine plant tours. This included the inspection of containers used for storage of flammable liquids. Step 4.3.2 of Procedure OPGP03-ZF-0005, Revision 4, "Use of Flammable Liquids and Gases," states that approved storage areas shall be posted using a copy of the approved Storage of Liquids and Gases Form (-1). "Storage" was defined as the leaving of applicable liquids or gases in a location while not in actual use for 8 hours or more.

The inspector found two flammable liquids storage cabinets in vital areas of the plant without the Storage of Liquids and Gases Form (-1) on or in the two cabinets. One cabinet was found inside the Unit 1, Room 067F (Essential Chiller Room C), and outside Unit 2, Room 067E (Essential Chiller Room B). Both cabinets contained cans of pump or motor oil. The failure to follow approved plant procedures is a violation of TS 6.8.1. This violation of TS (498/9004-01; 499/9004-02) is not cited because it meets the criteria in Section V.A of the general statement of policy and procedure for NRC enforcement actions. The licensee was aware that the forms were missing, because representatives had removed the two forms. The licensee intended to relocate the cabinets and had initiated paperwork to revise the two forms. However, the forms were not returned to the cabinets in a timely manner. Long-term solutions considered by the licensee to prevent recurrence included revision of the fire hazards analysis report to allow a certain amount of combustibles and flammable liquids in the buildings. Procedures for weekly audits of combustibles and flammable liquids would then be performed to ensure the limits were maintained. This would then minimize administrative paperwork needed to keep individual cabinets in the vital areas of the plant.

One violation (noncited) and no deviations were identified in this area of the inspection.

5. Monthly Maintenance Observations (62703)

Selected maintenance activities were observed to verify whether the activities were being conducted in accordance with approved procedures. The Unit 2 activities observed include:

- ° Preventive Maintenance (PM) EM-2-HF-87016764, Lubrication and Inspection of Fuel Handling Building Exhaust Booster Fan 21B Motor
- ° Work Request (WR) NK-81572, Process Temperature Control Panel 9E282ERR0030 Calibration Check

- ° WR MS-88921, Replacement of Steam Generator 2C Pressure Transmitter D2-MS-PT-0535

The inspector verified that the activities were conducted in accordance with approved work instructions and procedures, test equipment was within the current calibration cycles, and housekeeping was being maintained in an acceptable manner. All observations made were referred to the licensee for appropriate action.

PM EM-2-HF-87016764 was performed by electrical technicians to lubricate and inspect the 21B fan motor. The PM was missing Step 2.01 (Step 2.0 was followed by Step 2.02). Step 3.03 instructed the technician to measure the motor space heater current. This was performed at the circuit breaker distribution panel. However, there were two conductors (wires) on the circuit breaker, one wire going to the main exhaust fan heater and the second going to the exhaust booster fan heater. The technicians were not sure at first which wire went to which fan heater. Step 3.03 in the PM should have provided more specific instructions to avoid confusion.

WR NK-81572 was performed by instrumentation and control (I&C) technicians on process Temperature Control Panel 9E282ERR0030. The WR provided instructions to record the circuit temperatures, calibrate temperature readout, if necessary, and obtain as-left data. The temperature readout was found to be low and was recalibrated. The as-left data was then recorded, and the data was within acceptance criteria limits.

WR MS-88921 was performed by I&C technicians to replace Steam Generator 2C Pressure Transmitter D2-MS-PT-0535. The postmaintenance test (Procedure 2PSP05-MS-0535) was also witnessed. No specific concerns were identified with the transmitter replacement process. Comments regarding 2PSP05-MS-0535 are presented in paragraph 7 of this inspection report.

No violations or deviations were identified in this area of the inspection.

6. Monthly Surveillance Observations (61726)

Selected surveillance activities were observed to ascertain whether the surveillance of safety-significant systems and components were being conducted in accordance with TS and other requirements. The following surveillance tests were observed and the documents reviewed:

- ° 1PSP03-CC-0003, "Component Cooling Water Pump 1C Inservice Test," Revision 3
- ° 1PSP03-SI-0006, "High Head Safety Injection Pump 1C Inservice Test," Revision 4
- ° 2PSP03-CV-0012, "Chemical and Volume Control System Valve Operability Test," Revision 1

- ° 2PSP06-PK-0005, "4.16KV Class 1E Degraded Voltage Relay Channel Calibration/TADOT-Channel 1," Revision 2
- ° 2PSP02-HC-0935, "Containment Pressure Set 3 ACOT (P-0935)," Revision 0
- ° 2PSP02-SI-0952, "Accumulator 2B Level Group 4 ACOT (L-0952)," Revision 0

Specific items inspected included verifying that as-left data was within acceptance criteria limits, the acceptance criteria as listed in the procedures agreed with values listed in the design documents or instrument setpoint indexes, and the test equipment used was within its current calibration cycles. Following observation by the inspector of the surveillance activities, the procedures were reviewed for technical accuracy and for conformance to TS requirements.

Selected inspector observations are discussed below:

Procedures 1PSP03-CC-0003 and 1PSP03-SI-0006 were performed by Unit 1 operations personnel to verify operability of the component cooling water (CCW) Pump 1C and high head safety injection (HHSI) Pump 1C. Observations noted during performance of 1PSP03-CC-0003 included: (1) Step 5.4 instructed the operator to verify that adequate pump oil level existed, but failed to instruct the operator to verify that the motor had sufficient oil; (2) Step 5.19.2 instructed the operator to record a flowrate using a nonsafety-related analog meter, but the information was also available in digital form on the safety-related qualified display processing system (QDPS); and (3) following completion of the test a measured flowrate of 400 gallons per minute (gpm) was noted through the residual heat removal (RHR) Heat Exchanger 1C although the outlet valve was shut. This suggested the outlet valve was leaking by; however, the 400 gpm measurement was within the instrument loop tolerance for the setpoint of 0 gpm. Observations noted during performance of 1PSP03-SI-0006 included: (1) Step 4.1 referenced a TS Section 3.5.4 which did not exist; and (2) procedure step numbering errors were noted in Step 5.27 and on data sheet (-2) at Step 5.7.1.

Procedure 2PSP03-CV-0012 was performed by a Unit 2 reactor operations trainee under the supervision of a licensed operator to verify chemical and volume control system valve operability. Observations noted during performance of 2PSP03-CV-0012 included: (1) Step 5.9.b.3 instructed operators to open local Valve CV-0239 (valve was manually shut in a preceding step) without mentioning the fact that CV-0239 was required to be locked in place two and a half turns open; (2) Valve CV0239 was found full open, but should have been locked open (an investigation of this matter was initiated by the unit supervisor with appropriate followup by the licensee); (3) Valve FCV-0202 failed the stroke time test by 0.2 seconds and was declared inoperable (Valve FCV-0202 was reworked and later passed the stroke time test); and (4) step numbering errors were noted in Step 5.9.b.3 and on data sheet (-2) at Step 5.8.3.

Procedure 2PSP06-PK-0005 was performed by electrical technicians to verify the accuracy of the 4.16KV Bus E2C degraded voltage relay. Observations made during procedure performance included: (1) the note prior to Step 7.6 actually applied to Steps 7.9.1 and 7.9.11, which were not on the same page as the note. The note should have been located just prior to the applicable steps to help remind the technicians which order to open and close certain relay knife switches; and (2) Step 7.9.10 instructed the technician to remove test leads, but the leads were still energized. For safety reasons, the words "de-energize test equipment" should have been added to the step prior to lifting the test leads.

Procedures 2PSP02-HC-0935 and 2PSP02-SI-0952 were performed by I&C technicians to verify the accuracies of selected instrument loops for containment pressure and SI accumulator level. No concerns were identified with these two procedures.

No violations or deviations were identified in this area of the inspection.

7. Complex Surveillance (61701)

An inspection was performed to ascertain whether functional testing of the more complex safety-related systems and subsystems was in conformance with regulatory requirements and approved procedures. The inspection included witnessing the performance of Procedure 2PSP05-MS-0535, "Steam Pressure Loop 3 Set 2 Calibration (P-0535)," Revision 0. A technical review of the procedure was also performed.

Surveillance 2PSP05-MS-0535 is routinely performed every 18 months, but was performed early because of replacement of the Pressure Transmitter D2-MS-PT-0535. The transmitter was replaced per WR MS-88921. Procedure 2PSP05-MS-0535 was performed to satisfy the postmaintenance testing requirements. The procedure verified and reestablished the accuracies of the transmitter output, trip setpoints, computer point and visual alarm actuations, remote displays, and associated signal processing equipment.

Items inspected during performance of the surveillance procedure included: (1) minimum crew requirements were met, (2) test prerequisites were completed, (3) required test equipment was within current calibration cycles, (4) the procedure used was approved and the most current revision available, and (5) as-left data was within acceptance criteria limits. Items inspected during the technical review of the procedure included: (1) the acceptance criteria listed in the procedure agreed with design documents, (2) acceptance criteria tolerance was correct per design documents, and (3) the procedure instructions were thorough and complete.

Items observed during the inspection included:

- ° The Pressure Transmitter D2-MS-PT-0535 was found slightly out-of-tolerance and was re-adjusted. The as-left values were noted to be within acceptance criteria limits.

- ° Step 7.4.7 of 2PSP05-MS-0535 instructed the technicians to ensure that several bistable status monitoring panel lights, annunciator windows, and computer alarms were on. The succeeding steps after Step 7.4.7 did not list any computer alarms, although some were associated with the instrument loop.
- ° The Calibration Data Package 2PSP05-MS-0535-1 cover sheet referenced one TS section incorrectly while a second TS section was incorrectly punctuated. The wrong location for Instrument PB-535A was listed in the calibration data package. The correct location was P02-0624, but the data package listed the location as P02-0625.
- ° The calibration data package for QDPS Computer Point MSPA0535 listed the wrong setpoint tolerance values. Per the instrument scaling manual, Loop D2MS-P-0535, Revision 1, the required tolerance was plus or minus 4.9 psig. The data package tolerance was plus or minus 4.0 psig, which was a more conservative value. The as-found and as-left values recorded were within the more conservative tolerance limit (4.0 psig).

The as-left values recorded were noted to be within acceptance criteria limits, the technicians appeared knowledgeable and competent, housekeeping was adequate, and the surveillance test was performed in accordance with approved procedure. All items observed were referred to the licensee for appropriate action.

No violations or deviations were identified in this area of the inspection.

8. Observation of Initial Licensee Fitness-for-Duty Training (TI 2515/104)

The inspector attended the licensee's fitness-for-duty (FFD) training for supervisory and managerial personnel to determine acceptability of the training program implementation. On June 7, 1989, the NRC published the final rule and statement of policy on FFD programs for commercial nuclear power reactors (10 CFR Part 26) with an effective date for program implementation of January 3, 1990. Appropriate FFD awareness training for employees and training for supervisors and escorts is required by the rule. The inspector attended the licensee's continual behavior observation program training for supervisory personnel during this inspection period. The training generally addressed the following areas:

- ° The role and responsibilities of supervisory and managerial personnel in implementing the FFD program;
- ° The roles and responsibilities of others, such as the personnel, medical, and employee assistance program staffs;
- ° Behavioral observation techniques for detecting degradation in performance, impairment, or changes in employee behavior; and

- ° Procedures for initiating appropriate corrective action, including referral to the Employee Assistance Program.

Training was conducted utilizing both lecture and video presentation and was found to properly address the FFD program requirements.

No violations or deviations were identified in this area of the inspection.

9. Exit Interview (30703)

The inspectors met with licensee representatives (denoted in paragraph 1) on February 1, 1990. The inspectors summarized the scope and findings of the inspection utilizing viewgraphs and an overhead projector to facilitate the presentation. The licensee noted that use of the viewgraphs facilitated understanding of the inspection findings. The licensee did not identify as proprietary any of the information provided to, or reviewed by, the inspectors.