

ENCLOSURE 1

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket Nos.: 50-361
50-362

License Nos.: NPF-10
NPF-15

Report No.: 50-361/96-05
50-362/96-05

Licensee: Southern California Edison Co.

Facility: San Onofre Nuclear Generating Station, Units 2 and 3

Location: 5000 S. Pacific Coast Hwy.
San Clemente, California

Dates: May 5 through June 15, 1996

Inspectors: J. A. Sloan, Senior Resident Inspector
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Approved By: D. F. Kirsch, Chief, DRP Branch F

ATTACHMENTS:

Attachment 1: Partial List of Persons Contacted
List of Inspection Procedures Used
List of Items Opened, Closed, and Discussed
List of Acronyms

EXECUTIVE SUMMARY

San Onofre Nuclear Generating Station, Units 2 and 3
NRC Inspection Report 50-361/96-05, 50-362/96-05

This routine announced inspection covers a 6-week period of resident inspection. The report also documents the conclusions of a review of the spent fuel pool (SFP) design basis, performed by the Office of Nuclear Reactor Regulation (NRR) San Onofre Project Manager.

Operations

- Operations activities were conducted in a safe and professional manner (Section 01.1).
- The licensee effectively implemented the overtime controls program (Section 01.2).

Maintenance

- Generally, maintenance and surveillance activities observed were carefully controlled and professionally performed, using appropriate procedures (Sections M1.1 and M1.2).
- Management efforts to encourage self-identification of problem situations have been effective. For example, several minor errors related to component cooling water (CCW) valve maintenance were brought to supervision's attention by the craft involved and were subsequently corrected. However, the errors indicated weaknesses in planning and self-checking practices in the Boiler & Condenser (B&C) group. Procedural changes, resulting from lessons learned, were effective in eliminating errors during work on a similar valve (Section M1.3).
- Maintenance craftsmen made an error in self-checking that resulted in work being performed on a wrong component. The condition was identified by Operations, and had no actual safety consequence. The performance of the work on the wrong component was identified as a noncited violation (Section M1.4).
- Lubrication requirements were inadvertently omitted from a charging pump coupling repetitive maintenance order (RMO), resulting in lubrication frequencies in excess of vendor recommendations for charging Pump 2P190. A thorough root cause evaluation, performed after the coupling failed in May, determined that lubrication was not the principle cause of the failure. Corrective actions were appropriate (Section M3.1).

Engineering

- The root cause evaluation and corrective actions for the engineered safety feature actuation system (ESFAS) relay that failed during performance of a surveillance test were thorough (Section E1.1).

- The licensee's initial actions in response to the analysis of erratic performance of containment high range radiation monitors (HRRMs) were conservative (Section E2.1).
- The Updated Final Safety Analysis Report (UFSAR), through Revision 12, accurately reflected current refueling practices. The UFSAR clearly describes the current refueling practice of completely off-loading the reactor core to the SFP, and the assumptions used in the UFSAR decay heat load analysis are consistent with plant practices (Section E2.3).
- NRC review of the Action Request (AR) system identified that the threshold for identification of problems was very low. Generally, all items were properly reviewed and appropriate actions assigned and implemented. Of the 12 ARs reviewed in detail, one was observed to have a technically weak operability assessment. A self-assessment of the AR process was thorough and resulted in appropriate recommendations for correcting isolated problems and enhancing the effectiveness of the process (Section E7.1).

Report Details

Summary of Plant Status

Unit 2 operated at 100 percent power throughout this inspection period, except for briefly reducing power to 80 percent on May 13 and on May 26 to heat treat the saltwater cooling (SWC) and circulating water systems. Unit 3 operated at 100 percent power throughout the inspection period, except for reducing power to 75 percent on May 15, 1996, to clean condenser waterboxes and heat treat the SWC and circulating water systems. Power was restored to 100 percent on May 19.

I. Operations

01 Conduct of Operations¹

01.1 General Comments (71707)

The inspectors observed several routine periods of operation from the control room. Operations were observed to be conducted professionally. Thorough tailboard discussions were conducted prior to all significant evolutions. Communications and command-and-control functions were sufficiently thorough and clear.

01.2 Overtime Controls (71707)

Time sheets were reviewed for all onshift licensed operators for the period of April 15-28, 1996, to assess conformance with overtime controls. Procedures for implementing overtime controls were also reviewed and found adequate. All hours worked by operators were within the limitations specified by the facility's operating license, including the required minimum break time between work periods.

01.3 Conclusions on the Conduct of Operations

Operations were conducted in a safe and professional manner. The licensee effectively implemented the overtime control program. See Section M1.4 for additional comments on the conduct of operations.

¹Topical headings such as 01, M8, etc., are used in accordance with the NRC standardized reactor inspection report outline. Individual reports are not expected to address all outline topics.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments

a. Inspection Scope (62703)

The inspectors observed all or portions of the following work activities:

- Inspection of breaker and cubicle for charging Pump 3P191 in Switchgear 3B04 (Unit 3)
- Overhaul charging Pump 2MP190 discharge check Valve 2MU067 due to body to bonnet leakage (Unit 2)
- Determine cause and repair broken charging pump gear reducer to motor coupling (Unit 2)
- Replace reactor coolant hot leg sample water to sample sink isolation Valve S21212MU167 (Units 2 and 3)
- Inspection of 480 volt Bus 2BB and Breaker 2BB38 following electrical fault (Unit 2)

b. Observations and Findings

Work performed for these activities was carefully controlled in accordance with appropriate procedures. Technicians were knowledgeable and performed the activities in a professional manner. Supervisors and system engineers frequently monitored job progress, and quality control personnel were present whenever required by procedure. When applicable, appropriate radiation controls were in place.

In addition, see the specific discussions of maintenance activities under Sections M1.3, M1.5, and M3.1, below.

M1.2 General Comments on Surveillance Activities

a. Inspection Scope (61726)

The inspectors observed all or portions of the following surveillance activities:

- ESFAS Subgroup Relay K401A semiannual test (Unit 2)
- ESFAS Subgroup Relay K401B semiannual test (Unit 2)

- SWC Pump 3MP112 inservice test and valve testing (Unit 3)
- Functional check of self-contained breathing apparatus (Units 2 and 3)

b. Observations and Findings

All surveillances performed for these activities were consistent with Technical Specification (TS) requirements and conducted using appropriate procedures. Test-performers were knowledgeable and performed the surveillances in a professional manner.

M1.3 CCW Pump Mini-flow Valves 2HCV6538 and 2HCV6539 (Unit 2)

a. Inspection Scope (62703)

On April 9, 1996, maintenance activities were observed associated with inspection and repair of CCW mini-flow butterfly Valve 2HCV6539 in accordance with maintenance order (MO) 94120609001. In addition, completed maintenance documentation for identical work on mini-flow Valve 2HCV6538 (MO 94120608000) was reviewed, and troubleshooting of reported bypass leakage from Valve 2HCV6539 (MO 96040926000), following its return to service, was reviewed.

b. Observations and Findings

Observations and review associated with Valve 2HCV6539 (MO 94120609001 and MO 96040926000):

- Before any work was initiated on Valve 2HCV6539, the craft and supervision had documented a significant number of comments in the margins of the procedure used to work on the valve. The majority of the changes were to clarify sections which were not applicable to that particular job, because the procedure was generically written to apply to several different valves. In addition, because the same activity had been performed on a similar valve two weeks earlier, there were lessons learned which were also documented in the margins to clarify the sequence for performing specific steps. However, based on the number of editorial annotations, the inspectors concluded that the procedure was not specifically formatted for the present job because a significant amount of craft and supervisory oversight was needed to identify and delete requirements to perform non-relevant portions of the procedure before actually beginning work. Therefore, it appeared that planning for the job was weak in that the procedure was not specifically adapted to the particular job prior to issuance to the craft.

- During work on Valve 2HCV6539, the inspectors observed that a communication weakness led to a one-shift delay in finishing the valve disassembly because, due to an interference, craftsmen could not remove a fastener from a lever arm connecting the actuator to the valve stem. The craftsmen indicated that the exact same problem had been experienced during work performed on Valve 2HCV6538 two weeks earlier. However, the current job had not incorporated the lessons learned. The inspectors concluded that this was an example of a planning weakness in that relevant information was not appropriately incorporated into the procedure.
- Following the work on Valve 2HCV6539, the results of the work were discussed with the responsible maintenance supervisor and the completed maintenance records were reviewed. There were two examples of licensee-identified maintenance errors, indicative of poor craft self-checking practices. The need for craftsmen to account for unnecessary procedural guidance appeared to be a contributing cause of the error.
- Following the return to service of Valve 2HCV6539, Operations reported valve seat leakage. MO 96040926000 was initiated to troubleshoot the cause. The completed MO was reviewed, indicating that the licensee had identified another example of poor craft self-checking practices regarding documentation of the reassembly of the actuator.

Observations and review associated with Valve 2HCV6538 (MO 94120608000):

- Following the work on Valve 2HCV6538, the results of the work were discussed with the responsible maintenance supervisor and the completed maintenance records were reviewed. There was one licensee-identified maintenance error, which was indicative of poor craft self-checking practices.

The errors mentioned above were committed by three different craftsmen in the B&C Maintenance group.

As a result of these observations, the licensee counseled the craftsmen involved, used these examples for continued craft training, and revised the relevant maintenance procedure. Maintenance had recently organized teams comprised of a foreman, a planner, and craft to address enhancing communication between field and planning personnel.

c. Conclusions

Management efforts to encourage self-identification were effective. For example, several minor errors related to CCW valve maintenance were brought to supervision's attention by the craft involved, and were appropriately corrected. However, the errors indicated a weakness in

planning and self-checking practices in the B&C group. Maintenance's recent establishment of teams was a good initiative that may enhance the effectiveness of the planning process, further reducing field errors. Subsequently, in-process maintenance records were reviewed and craft working on a similar valve, 2HCV6537, were interviewed. The inspectors concluded that the procedural changes, resulting from lessons learned, had been effective in eliminating errors.

M1.4 Maintenance on Wrong Component (Unit 3)

a. Inspection Scope (62703 and 71707)

The circumstances surrounding work being performed by Maintenance on the wrong component (i.e., not authorized for work) were examined.

b. Observations and Findings

On June 14, 1996, the licensee informed the resident inspectors that, on June 13, maintenance personnel had inadvertently performed minor maintenance on the actuator for auxiliary feedwater (AFW) Bypass Valve 3HV4762 instead of on the actuator for AFW Bypass Valve 3HV4763. The maintenance involved removing the cover from the actuator, obtaining an oil sample, and inspecting for hydraulic system leaks. The licensee initiated an investigation into the occurrence, including isolating and performing a stroke timing test of Valve 3HV4763 to confirm that the valve was not rendered inoperable by the maintenance. The inspectors reviewed the circumstances and determined that the occurrence did not adversely affect the operability of the valve or the AFW system. The licensee documented the occurrence in AR 960600671.

The inspectors interviewed the day shift plant equipment operator and reviewed the turnover sheet from the previous night shift. The night shift plant equipment operator knew that the actuator cover was not installed on Valve 3HV4763, but did not know why. No work was being performed during the night shift, and he did not inform the control room until approximately 5 a.m., near the end of the shift. The night shift control room staff apparently did not fully evaluate the condition. When the day shift became aware of the unknown status of the valve, their response was appropriate.

The Operations plant superintendent informed the inspectors that the response of the night shift operations crew was not as aggressive as expected in resolving the unknown status of Valve 3HV4763. In addition to counseling the shift superintendent involved, the licensee documented the occurrence as an Event Report.

The maintenance manager stated that interviews with the maintenance craftsmen involved indicated that they had checked the component identification, but had made an error. Appropriate disciplinary actions were taken by the licensee.

Procedure S0123-I-1.2, Temporary Change Notice (TCN) 0-5, "Work Authorization Process," states in precaution Step 4.6 that "no person shall work on plant equipment without authorization." Maintenance did not have authorization to perform work on 3HV4763, which is a violation of TS 6.8.1. This licensee-identified and corrected violation is being treated as a noncited violation, consistent with Section VII.B.1 of the NRC Enforcement Policy (NCV 50-362/96005-01).

c. Conclusions

The maintenance craftsman had performed inadequate self-checking, resulting in working on the wrong component. Operations did not resolve the unknown status of the safety-related component in a timely manner.

M1.5 Conclusions on the Conduct of Maintenance

Maintenance and surveillance activities were professionally performed, with few exceptions. Maintenance personnel self-identified and reported errors. Weak planning and self-checking contributed to the errors. Another Maintenance self-checking error, identified by Operations, resulted in work being performed on a wrong component, which was identified as a noncited violation.

M3 Maintenance Procedures and Documentation

M3.1 Failed Unit 2 Charging Pump Coupling

a. Inspection Scope (37551 and 62703)

Activities to investigate the cause of failure, and the replacement of, a Unit 2 charging pump coupling were examined.

The inspectors visually inspected the failed coupling, interviewed maintenance and engineering personnel, and reviewed the following:

- Vendor Manuals S023-928-18, "Gaulin Model NP18-3TPS Reciprocating Charging Pump," dated 1984 and "Falk Gear Couplings 448-110 Service Manual," dated 1974.
- The maintenance history of Charging Pump 2P190, including MO 93091675000, performed in October 1993, intended to replace the motor-to-gear reducer coupling of Pump 2P190.
- Station Technical's "Evaluation of Cause" for the failure of the motor-to-gear reducer coupling of Pump 2P190 on May 24, 1996.
- MO 94091876, used to implement Procedure S023-I-8.25, TCN 2-3, "Charging Pump Repack, Lubrication, and Crosshead Adjustment," which was used to lubricate the failed coupling in September 1995.

- MO 94071073, used to implement Procedure S023-I-8.85, TCN 2-3, "Pumps - Charging Pump and Gear Reducer Routine Maintenance." This MO was superseded but used previous to the above procedure and erroneously did not require lubricating the coupling.
- Section 9.3.4, "CVCS," of the Units 2 and 3 UFSAR

b. Observations and Findings

On May 24, 1996, with Unit 2 at essentially full power, charging Pump 2P190, the only charging pump in operation, failed. This resulted in a momentary loss of charging flow to the reactor coolant system. Operators started a standby charging pump prior to any automatic start, reestablishing charging flow. Pump failure was caused by a failed coupling on the motor end of the motor-to-gear reducer coupling.

The coupling was manufactured by Falk Inc., and consisted of geared hubs shrunk-fit and keyed to the motor and gear reducer shafts. Sleeves geared on the interior were bolted together, providing the coupling. Grease holes were provided to inject grease into the geared area, and the coupling was designed to provide limited flexibility. The gear teeth were slightly crowned, which set the sleeve in place on the hubs.

The licensee performed an evaluation to determine the cause of the failure. The motor end sleeve of the coupling had locked in place adjacent to the geared teeth on the motor hub. This caused the coupling to lose flexibility, wear excessively, and, subsequently, fail. The evaluation indicated that the sleeve had shifted from a proper running position because, in October 1993, the reduction gear end of the coupling had been replaced by a new hub and sleeve, but the motor end had been removed and reinstalled, but not replaced. Although the vendor stated that the parts were compatible, the licensee stated that the motor end sleeve had been reinstalled without matchmarking the sleeve and hub. Thus, the running engagement pattern had not been preserved, and the new wear patterns caused a net force to shift the sleeves into contact with the teeth, as described above. The teeth on the motor end hub were failed over about two-thirds of their length, indicating incomplete gear engagement consistent with the sleeves shifting position. The grease in the motor end coupling was found hardened and voided in the geared area.

The cognizant engineer informed the inspectors that vendor-recommended lubrication periodicity for the couplings, which was every 6 calendar months (not run time months), had been exceeded for this coupling. During the 1994 time frame, the RMO intended to perform this lubrication, which the licensee intended to be performed during pump plunger repacking, erroneously did not include the lubrication. The licensee also stated that the failure to perform this lubrication was not a principal cause of the failure. The licensee also determined that

the coupling was adequately lubricated, and that the vendor's recommendation conservatively assumed a harsher environment than that of the charging pumps at San Onofre.

The inspectors reviewed the coupling lubrication history for the three Unit 2 and three Unit 3 charging pumps and found that the vendor-recommended periodicity had been exceeded. Pump 2P190 couplings had been lubricated at intervals of 8 and 23 months since 1993. Pump 3P191 had been lubricated at intervals of 3, 1, and 22 months. Other charging pump lubrication intervals were not as long, but all exceeded the 6-month recommended periodicity. This was due to a failure to include the maintenance in the schedule, as described above, and to the pumps generally requiring repacking on a greater than 6-month interval. The inspectors determined that the current MO did require coupling lubrication during plunger rod packing maintenance. The licensee stated that exceeding the 6-month periodicity, due to including the lubrication in the repacking activity, would be addressed as an item for a previously established charging pump Maintenance and Engineering assessment team. The licensee also planned on decoupling and, if necessary, greasing all Unit 2 and Unit 3 charging pump couplings as the pumps were repacked. Greasing was usually performed by using the grease holes and not by the more rigorous method of decoupling and inspecting.

The MO used to replace the coupling in 1993 was examined. The MO stated that both halves were removed and replaced and that a coupling set (two sleeves and two hubs) had been used. However, based on the type of coupling found on the pump (a Model 1015G on the speed reducer end, which was a newer model, and a Model 15G on the motor end, which was an older model) and on the engineer's field notes, the inspectors determined that the MO documentation was not accurate and that only the speed reducer end was replaced. The licensee's cognizant engineer identified this documentation inconsistency. The inspectors concluded that the inaccuracy of the documentation complicated the efforts to determine the root cause of this failure.

The licensee's root cause assessment determined that the motor end coupling had been reused and reinstalled without matchmarking. The inspectors determined that the licensee engineering assessment fit the known data. The inspectors also found that other probable causes, a lack of lubrication or a misalignment of the motor to speed reducer, had been addressed by the licensee. The machine had been aligned during the course of installing a new coupling, and lubrication was being addressed as described above. As-found alignment data had not been obtained by the licensee after the failure.

The inspectors also reviewed Section 9.3.4.1 of the UFSAR and observed that a table on page 9.3-99 stated that the seal water system for the Units 2 and 3 charging pumps was powered by a Class 1E source. Seal water was provided to the charging pump plunger packing by packing cooling water pumps, which were not powered by a Class 1E source. The

charging pump vendor manual states that charging pumps will operate up to 100 hours without seal water cooling, depending upon the initial condition of the packing. The charging pumps provide auxiliary spray in the event of a loss of reactor coolant system flow and inject boron to provide negative reactivity. This item is an unresolved item pending a review of the safety significance of this issue (Unresolved Item 50-361(362)/96005-02).

c. Conclusions

The licensee had inadvertently deleted charging pump coupling lubrication requirements from the RMO, resulting in lubrication frequencies in excess of vendor recommendations for charging Pump 2P190. However, the licensee performed a thorough root cause evaluation after the coupling failed in May and determined that lubrication was not the principle cause of the failure. Corrective actions were appropriate.

The inspectors identified that the UFSAR description of the seal water system for the charging pumps was inaccurate because it incorrectly described the system as being powered from a Class 1E source.

III. Engineering

E1 Conduct of Engineering

E1.1 ESFAS Relay Failure (Unit 2)

a. Inspection Scope (62703)

The licensee identified a relay failure during subgroup relay testing during May 1996. The licensee's actions in response to the failure of ESFAS Relay K109A to start low pressure safety injection Pump 2P015 during subgroup relay testing were reviewed.

b. Observations and Findings

After the failure, operators successfully started Pump 2P015 from the control room, demonstrating that the failure was in the ESFAS logic and not in the normal controls.

The licensee performed a root cause analysis of the failure and determined that a relay had failed. The relay was a Potter & Brumfield Model MDR-7032-SCE-0, and was found to have oversized coils. The failure was the result of coil shrinkage due to epoxy flowing when the coils were energized, reducing the pressure on the bottom shock plate and increasing the friction on the rotating mechanism. This failure was similar to previous failures documented in a 10 CFR Part 21 report. Model MDR relay failures have usually occurred soon after the relays were put in service, unlike this relay, which was in service for 5 years

before the failure. The licensee determined that this failure was isolated, and that the probability of additional failures was low.

The licensee replaced and tested the relay.

c. Conclusions

The licensee's root cause analysis of the failed relay was thorough, and the associated corrective actions were appropriate.

E2 Engineering Support of Facilities and Equipment

E2.1 Containment HRRM (Units 2 and 3)

a. Inspection Scope (37551 and 71707)

The inspectors reviewed the licensee's actions in response to an investigation of environmental effects on containment HRRMs RT7820-1 and RT7820-2.

b. Observations and Findings

NCR 951100073 was initiated in November 1995 as the result of anomalous performance being observed on the containment postaccident HRRMs. To resolve questions raised by the NRR project manager regarding operability of the monitors during accident conditions, the licensee performed an engineering analysis of the transient effects of high temperature and pressure conditions on the coaxial signal cable used with the HRRMs. This analysis was completed on June 4, 1996.

The analysis concluded that differential temperatures between the inside of the signal cables and the containment atmosphere result in thermally induced currents. These currents could result in the HRRM indications being incorrect on the order of thousands of R/hr until the temperatures equalize (about 15 minutes). Additionally, during laboratory testing, the licensee observed that moisture seeped into the cables at the test chamber cable penetration, resulting in erratic signals. The licensee concluded that the test configuration was similar to the actual containment penetration configuration, and that moisture could potentially interfere with HRRM indications in postaccident conditions in both Units 2 and 3. This item is an inspector followup item pending evaluation of the circumstances surrounding the situation (Inspector Followup Item 50-361(362)/96005-04).

AR 960600430 and NCR 960600430 were initiated, and both HRRMs in both units were conservatively declared inoperable on June 11, 1996.

In order to avoid an unwarranted plant shutdown, as required by the current TS, the licensee implemented, with NRR approval, the revised TS for this condition. The revised TS were already approved by NRC, and

the licensee had intended on implementing the revised TS on July 15, 1996. The early implementation was coordinated by correspondence between the licensee and the NRR Project Manager. The licensee established an alternate means of monitoring the postaccident containment radiation levels, consistent with the basis for the revised TS.

c. Conclusions

The licensee's initial actions in response to the analysis were conservative and appropriate. The inspectors will review the engineering analysis more thoroughly during a future inspection.

E2.2 Review of Facility and Equipment Conformance to UFSAR Description

A recent discovery of a different licensee operating its facility in a manner contrary to the UFSAR description highlighted the need for a special focused review that compares plant practices, procedures and/or parameters to the UFSAR description. The inspectors reviewed the applicable sections of the UFSAR that related to the inspection areas inspected. The following inconsistency was noted between the wording of the UFSAR and the plant practices, procedures and/or parameters observed by the inspectors:

- The seal water for the charging pumps was inaccurately described in the UFSAR as being Class 1E-powered (Section M3.1).

E2.4 SFP Decay Heat Removal Licensing Basis Audit

a. Audit Scope

An audit was performed onsite on March 19-20, 1996, of the current refueling practices compared to the licensing basis concerning decay heat removal from the Units 2 and 3 SFPs. The purpose of this audit was to determine the extent to which core offload compliance concerns encountered at other nuclear power plants existed at San Onofre Units 2 and 3. The licensing basis sources used in this audit were primarily the TS and UFSAR, through Revision 12. Revision 12 was submitted on April 5, 1996, to clarify the assumptions and results of the heat load cases evaluated in the UFSAR.

The specific objectives of the audit were to: (1) conduct a review and evaluation of the current licensing basis for the spent fuel storage system and refueling outage core offload practices; (2) review operating procedures to assure compliance with the current licensing basis; and (3) collect detailed design basis data on the spent fuel storage system for use in generic studies by NRC staff.

b. Observations and Findings

The current licensing basis of the SFP cooling system and decay heat management practices met the applicable NRC requirements. The spent fuel storage pool design satisfied the single failure criteria outlined in Standard Review Plan 9.1.3, and the normal and abnormal heat load evaluations contained in the UFSAR also conformed to the guidance found in Standard Review Plan 9.1.3.

The plant operating procedures adequately translated the TS requirements and UFSAR design information into appropriate operator actions, with the exception of the number of fuel assemblies allowed on the fuel transfer trolley in the fuel transfer tube. The UFSAR only analyzes the case of one fuel assembly being stuck in the fuel transfer tube, while the plant procedures allow two fuel assemblies to be transferred at one time. This inaccuracy was identified by the licensee, who intended to provide the NRC with a complete safety analysis of the effects of two fuel assemblies being stuck in the fuel transfer tube. This is an unresolved item pending NRC evaluation of the licensee's safety analysis (Unresolved Item 50-361(362)/96005-05).

c. Conclusions

The UFSAR, through Revision 12, adequately reflected current refueling practices. The UFSAR clearly describes the current refueling practice of completely off-loading the reactor core to the SFP, and the assumptions used in the UFSAR decay heat load analysis are consistent with plant practices.

E7 Quality Assurance in Engineering Activities

E7.1 AR Program Implementation

a. Inspection Scope (71707 and 92720)

The purpose of an AR is to provide a single system for reporting conditions, events, and proposed improvements for corrective action, by all organizations. Approximately 50 ARs were examined, selected from a listing of over 1800 ARs initiated by the licensee during March 1996. Additionally, three AR Committee meetings were attended and key AR Committee personnel were interviewed. Several ARs were selected for additional review and discussion. Procedures S0123-XX-1, Issue 2, Revisions 1 and 2, "AR/MO Initiation and Processing," and S0123-XV-5, Revisions 4 and 5, "NonConforming Material, Parts, or Components," were reviewed.

ARs selected for additional review included:

960301726	960301144	960300164	960301019
969391129	969300098	969301012	960300259
960301513	960301504	960301009	960400935

b. Observations and Findings

General Observations

The licensee implemented a new problem identification and corrective action program in December 1995, in conjunction with the implementation of a new computer system. Most aspects of the new system were well suited to user needs. The licensee was working to enhance the system's user interface for greater utility.

Evaluation and corrective actions for all the ARs reviewed were appropriate. Some minor discrepancies were identified and discussed with AR Committee personnel.

The AR Committee reviewed new ARs in sufficient depth to determine appropriate followup. Some ARs were screened from committee review based on criteria set forth in Procedure S0123-XX-1. The inspectors reviewed all ARs screened from committee review for June 4, 1996, and determined that the criteria were appropriately implemented. Event reports and other nonequipment-related ARs could bypass committee review if the AR originator had authority to assign actions independently.

Operability Assessment

AR 960400935, initiated on April 18, 1996, which involved a leaking mechanical seal on Unit 2 CCW Pump 2P026, was reviewed. The AR recommended that the pump be restricted for emergency use only. Discussions with station technical revealed that the licensee had discussed the condition with the pump vendor. An April 24, 1996, electronic memorandum written by the station technical supervisor indicated that the vendor would not support a permissible leak rate for the seals, and indicated that any leakage warrants seal replacement. The memorandum stated that the seal leak rate can change rapidly, and cited an example of a previous leakage condition in a Unit 3 CCW pump that led to major pump repairs being required. The seals in this Unit 2 pump were 9 years old, and the licensee had extended the seal lifetime from 4 years, recommended by the vendor, to 10 years. The memorandum stated that station technical did not believe that the seal would last until the next scheduled replacement.

The operability assessment for AR 960400935 stated that "the deterioration of the seals is not predictable especially when the assembly is enclosed," and recommended restricted use of this pump until the mechanical seals were reworked. The operability assessment

concluded that CCW Train B was operable since the swing CCW pump could be aligned to Train B. The inspectors reviewed work authorizations and determined that the swing CCW pump (Pump 2P025) was operable during the period that CCW Pump 2P026 was degraded. Pump 2P026 was taken out of service on May 13, 1996, for seal replacement.

The station technical manager acknowledged that the operability assessment in the AR was not technically rigorous. On June 11, 1996, the licensee again contacted the vendor and subsequently revised the operability assessment in the AR to more thoroughly support the basis for the operability determination that had been made in April. The inspectors reviewed the revised operability assessment and found that it addressed all relevant issues. Specifically, it concluded that a small amount of steady leakage was within the design of the seals. Further, the licensee observed that there was no observable leakage while the pump was running.

Self-Assessment of ARs

The inspectors reviewed Safety Engineering Root Cause Report SEA 96-003, "Assessment of AR Process," dated February 28, 1996. This report identified several process problems, such as weaknesses in assignment of actions, tracking completion of assigned actions, unclear status of some actions, and problems with the software interfaces with other electronic data sources. The report provided appropriate recommendations for correcting the observed deficiencies.

c. Conclusions

The threshold for identification of problems, using the AR system, was very low, and nearly all items were properly reviewed and appropriate actions assigned and implemented. Of the 12 ARs reviewed in detail, one was observed to have a technically weak operability assessment. The licensee's self-assessment of the AR process was thorough and resulted in appropriate recommendations for correcting isolated problems and enhancing the effectiveness of the process.

E8 Miscellaneous Engineering Issues (90712 and 92903)

- E8.1 (Closed) Unresolved Item 50-361(362)/96002-05: weld specification material not updated in UFSAR. This unresolved item was administratively closed and reopened as an inspectors followup item (Inspector Followup Item 50-361(362)/96005-03).
- E8.2 (Closed) Licensee Event Report 50-361/96004-00: AFW system turbine-driven pump relatch. This was a voluntary report, submitted to document a design issue that complicates resetting the overspeed trip mechanism while an emergency feedwater actuation signal is present. The licensee provided clarifying guidance to operators on potential trip mechanism alignment to resolve the concerns. This item is closed.

IV. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the exit meeting on June 18, 1996. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

ATTACHMENT 1

PARTIAL LIST OF PERSONS CONTACTED

Licensee

D. Brieg, Manager, Station Technical
J. Fee, Manager, Maintenance
G. Gibson, Manager, Compliance
R. Krieger, Vice President, Nuclear Generation
W. Marsh, Manager, Nuclear Regulatory Affairs
D. Nunn, Vice President, Engineering and Technical Services
T. Vogt, Plant Superintendent, Units 2 and 3
R. Waldo, Manager, Operations

NRC

M. Fields, NRR Project Manager

INSPECTION PROCEDURES USED

IP 37551: Onsite Engineering
IP 61726: Surveillance Observations
IP 62703: Maintenance Observations
IP 71707: Plant Operations
IP 90712: Inoffice Followup of Licensee Event Reports
IP 92720: Corrective Action
IP 92903: Followup - Engineering

ITEMS OPENED AND CLOSED

Opened

50-362/96005-01 NCV AFW Bypass Valve Worked Without Authorization
50-361/96005-02 URI UFSAR description of power for charging pump seal water
50-362/96005-02
50-361/96005-03 IFI UFSAR description of weld materials
50-362/96005-03
50-361/96005-04 IFI Evaluation of containment high range radiation monitor
50-362/96005-04 environmental qualification
50-361/96005-05 URI Evaluation of the effects of transferring two fuel
50-362/96005-06 assemblies simultaneously through the fuel transfer tube

Closed

50-361/96004-00 LER AFW system turbine-driven pump relatch
50-361/96002-05 URI UFSAR description of weld materials
50-362/96002-05
50-362/96005-01 NCV AFW Bypass Valve Worked Without Authorization

LIST OF ACRONYMS USED

AFW	auxiliary feedwater
AR	action request
B&C	boiler and condenser
CCW	component cooling water
ESFAS	engineered safety feature actuation system
HRRM	high range radiation monitor
MO	maintenance order
PDR	Public Document Room
RMO	repetitive maintenance order
SFP	spent fuel pool
SWC	saltwater cooling
TCN	temporary change notice
TS	technical specification
UFSAR	Updated Final Safety Analysis Report