NRC FORM 366 (6-1998) U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001
LICENSEE EVENT REPORT (LER) (See reverse for required number of digits/characters for each block)	Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

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TITLE (4)
Failures to Comply with Technical Specification 4.0.5 Identified by Inservice Testing Program Assessment

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
									Cook Nuclear Plant Unit 2	05000-316
12	17	1999	1999	-- 032--	00	01	18	2000	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	--	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
			20.2201(b)		20.2203(a)(2)(v)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)
POWER LEVEL (10)	0%		20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)
			20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71
			20.2203(a)(2)(ii)		20.2203(a)(4)		50.73(a)(2)(iv)		OTHER
			20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A
			20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
R.M. Cook, Compliance Engineer	(616) 465-5901 X 2285

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
	YES (If yes, complete EXPECTED SUBMISSION DATE).	X NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On December 17, 1999, further examples of failure to comply with Technical Specification (TS) 4.0.5 that were identified during the extent of condition investigation being conducted for LER 315/98-057-00 were determined to be reportable as individual failures to comply with TS 4.0.5. The examples include failure to verify stroke timing of valves, failure to include active check valves in the IST program, and failure to verify valve local/remote position indications. The systems in which these examples were found include the Spent Fuel Pit Cooling/Cleanup, Auxiliary Feedwater, Component Cooling Water, Residual Heat Removal, Reactor Coolant Pump Seal Water Injection, and Containment Purge System. The extent of condition was being conducted as part of the Inservice Testing (IST) Program Assessment, as discussed in the previously cited LER. The further examples of failure to comply with TS 4.0.5 are reportable as conditions prohibited by TS pursuant to the requirements of 10CFR50.73(a)(2)(i)(B).

The causes of these conditions have been determined to be a lack of knowledge of the American Society of Mechanical Engineers (ASME) Codes, licensing and design basis of the plant, and ineffective scoping and implementation of the IST program. Each of the specific examples will be resolved prior to the respective system being returned to operable status. Past testing and/or operation of the valves have not indicated any failure or malfunction which would have caused the valves not to have performed their intended function.

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Conditions Prior To Event

Unit 1 - Defueled
Unit 2 - Defueled

Description Of The Event

On December 17, 1999, further examples of failure to comply with Technical Specification (TS) 4.0.5 that were identified during the extent of condition investigation being conducted for LER 315/98-057-00 were determined to be reportable as individual failures to comply with TS 4.0.5. The extent of condition was being conducted as part of the Inservice Testing (IST) Program Assessment, as discussed in the previously cited LER. The examples include failure to stroke time test valves, failure to include active check valves in the IST program, and failure to verify valve local/remote position indications. The systems in which these examples were found include the Spent Fuel Pit Cooling/Cleanup, Auxiliary Feedwater, Component Cooling Water, Residual Heat Removal, Reactor Coolant Pump Seal Water Injection, and Containment Purge System.

Cause Of The Event

The causes of the conditions were determined to be a lack of knowledge of the ASME Code, the licensing and design basis of the plants, and ineffective scoping and implementation of the IST Program. The IST Program development at each of the three (3) ten-year intervals was not consistent with industry standards because of fragmented interface between offsite and onsite organizations in developing program scope and content. This was found to be evident in the past use of engineers that had no strong Code background for developing IST Program scope. Program administrative procedures were vague and relied on the knowledge of IST Program Coordinators for effective implementation.

Opportunities for identification of these conditions included a 1997 assessment that identified many of these deficiencies, but no mechanism, such as the Condition Report program, was used to ensure effective corrective actions were taken. An independent assessment was conducted in 1998, which identified many of these same issues. The latter assessment resulted in the full scope assessment of the IST Program that has identified the items reported herein.

Analysis Of The Event

The further examples of a failure to comply with TS 4.0.5 were identified between March 2 and September 8, 1999. At the time of each example's identification, it was erroneously concluded that because the investigation that identified the example was part of the extent of condition for LER 315/98-057-01, a supplement would be submitted when the extent of condition and reviews of any further examples for TS non-compliance were completed. This type of conclusion was called into question during the NRC Programmatic Readiness Inspection conducted the week of December 13, 1999, at DC Cook. On December 17, 1999, the NRC determined that some issues identified as a part of the DC Cook Corrective Action Program were further examples of reportable conditions that should have been reported within 30 days of identification, and failure to do so represented a violation of 10CFR50.73. Investigation by DC Cook of other examples for previously submitted LERs identified several examples that by themselves would be reportable. These included the examples reported herein. As such, this LER is submitted outside the 30 days required by 10CFR50.73. The failure to submit the LER in accordance with 10CFR50.73 will be resolved within the guidelines of the DC Cook Corrective Action Program.

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Analysis Of The Event (continued)

Technical Specification Surveillance Requirement (TSSR) 4.0.5 addresses the requirements for inservice inspection and testing of ASME Code Class 1, 2, and 3 components. Per TSSR 4.0.5, Inservice testing of ASME Code Class 1, 2 and 3 pumps and valves shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by 10CFR50, Section 50.55a. Section 50.55a(f) requires the implementation of IST programs in accordance with the applicable edition of the ASME Code for those pumps and valves whose function is required for safety. Missed IST/ASME tests are reportable when the test interval plus any allowable extension plus the LCO action time has been exceeded. The failure to effectively identify IST Program requirements or translate the IST Program requirements into implementing procedures resulted in several ASME testing requirements required by TSSR 4.0.5 not being met. These failures are equivalent to missed surveillance tests. On December 17, 1999, these conditions were determined to be reportable as conditions prohibited by TS pursuant to the requirements of 10CFR50.73(a)(2)(i)(B).

Each of the identified non-compliant components will be evaluated in the following:

- Containment Purge Isolation Valves 1-VCR-101, 1-VCR-102, 1-VCR-103, 1-VCR-104, 1-VCR-105, 1-VCR-106, 1-VCR-107, 1-VCR-201, 1-VCR-202, 1-VCR-203, 1-VCR-204, 1-VCR-205, 1-VCR-206, 1-VCR-207, 2-VCR-101, 2-VCR-102, 2-VCR-103, 2-VCR-104, 2-VCR-105, 2-VCR-106, 2-VCR-107, 2-VCR-201, 2-VCR-202, 2-VCR-203, 2-VCR-204, 2-VCR-205, 2-VCR-206, 2-VCR-207

  The Containment Purge and Exhaust Isolation Valves are required to be Operable in Modes 1, 2, 3, and 4 and during Core Alterations or movement of irradiated fuel within the containment. The NRC Safety Evaluation Report for License Amendments 34 and 15 for Unit 1 and 2, respectively, discussed the closure time for these valves and the IST Program specifies a quarterly stroke time test of these valves when they are required to be Operable. The Containment Purge Isolation Valves, though stroke time tested during Modes 1-4, are not stroke time tested prior to or during Core Alterations. Past stroke time testing of these valves during Modes 1-4 has shown that the valves would be expected to pass the stroke time testing requirements during Core Alterations or movement of irradiated fuel within containment.

- Spent Fuel Pool Filter manual isolation valve 12-SF-129
  This valve provides isolation of the non-code class piping from the code class piping. In the event of a seismic event, the valve would be required to be closed to prevent diversion of cooling water in the event of the loss of the downstream non-code class piping. The valve is not exercised quarterly for IST purposes as required by ASME, Section XI. The valve has been shown to have reasonable assurance of functioning when called upon based on normal plant activities of filter changeout.

- Motor Driven Auxiliary Feedwater Pump (MDAFP) Supply to Steam Generator Check Valves 1-FW-132-1, 1-FW-132-2, 1-FW-132-3, 1-FW-132-4, 2-FW-132-1, 2-FW-132-2, 2-FW-132-3, 2-FW-132-4
  The Auxiliary Feedwater (AFW) System is designed to provide sufficient flow to all steam generators to ensure that the reactor coolant system can be cooled to less than 350^{0}F from normal operating conditions. The AFW System is also designed to be capable of providing water to three intact steam generators to mitigate the effects of a main feedwater or steam line break. Each MDAFP has a design flow rate of 450 gpm that is divided between two steam generators. Full flow testing of the check valves is required by the IST Program and ASME, Section XI. However, flow testing of the MDAFP check valves performed in accordance with IST procedure only requires the valves to be tested at approximately 50% flow. Therefore, there is reasonable assurance that the check valves can pass partial (approximately 50%) flow. In addition, there is no indication that the valve would malfunction prohibiting the MDAFP's from providing full flow to the steam generators.

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Analysis Of The Event (continued)

- Component Cooling Water to Reactor Coolant Pumps Check Valves 1-CCW-122, 2-CCW-122; Component Cooling Water to Reactor Support Coolers Check Valves 1-CCW-135, 2-CCW-135; Component Cooling Water to Excess Letdown Heat Exchanger Check Valves 1-CCW-142, 2-CCW-122

  These valves are within the boundary credited for penetration protection in accordance with the CNP response to Generic Letter 96-06 but have not been adequately addressed in the IST Program. The valves will open when the penetration is subjected to thermal expansion, thereby providing a flow path from the penetration to the relief valve protecting the penetration, as follows:

  CCW-122, Penetration CPN-38 and Relief Valve SV-63 (Reactor Coolant Pumps Motor Bearing Oil Cooler CCW Return Header Safety Valve)

  CCW-135, Penetration CPN-82 and Relief Valve 1-SV-122-37 or 2-SV-122-23 (CCW Return Header Relief Valves)

  CCW-142, Penetration CPN-75 and Relief Valve SV-64 (Excess Letdown Heat Exchanger CCW Outlet Safety Valve)

  Based on these functions, the valves should have been included in the IST Program for full flow testing. No current testing verifies the full flow testing requirement for these valves. The check valves are open during normal operation and pass design flow in excess of the flow required to provide overpressure protection. Therefore, it would be expected that they would have functioned if required to provide overpressure protection for their respective penetrations.

- Residual Heat Removal (RHR) Heat Exchanger Outlet Flow Control Valves 1-IRV-310, 1-IRV-320, 2-IRV-310, 2-IRV-320)

  The RHR Heat Exchanger Outlet Flow Control Valves are air operated valves and have a fail open safety function to provide a flow path for the Low Head Safety Injection System (LHSI) Emergency Core Cooling System (ECCS) operation. The valves are used during RHR operation to throttle flow from the RHR heat exchangers for control of RHR flow and primary system cooldown rate, and possibly for control during the recirculation phase of ECCS operation. They are presently in the IST Program as Passive valves. However, based on the fail open function, the valves are required to be included in the IST Program as Active valves and required to be full stroke, stroke time and fail open tested. In the past these valves have been verified open as part of ECCS In Standby Readiness. The valves have also been stroked by various procedures when the units are in other than Modes 1, 2, or 3. Therefore, there is reasonable assurance that the valves would have stroked from the mid or closed position to a full open position.

- Reactor Coolant Pump Seal Water Injection Containment Isolation Check Valves 1-CS-442-1, 1-CS-442-2, 1-CS-442-3, 1-CS-442-4, 2-CS-442-1, 2-CS-442-2, 2-CS-442-3, 2-CS-442-4; Chemical Volume and Control System (CVCS) Charging to RCS Containment Isolation Check Valve, 1-CS-321, 2-CS-321; CVCS Alternate Charging to RCS Loop 1 Cold Leg Check Valve 1-CS-328-L1, 2-CS-328-L1; CVCS Normal Charging to RCS Loop 4 Cold Leg Check Valve, 1-CS-328-L4, 2-CS-328-L4; CVCS Alternate Charging to RCS Loop 1 Cold Leg Check Valve 1-CS-329-L1, 2-CS-329-L1; CVCS Normal Charging to RCS Loop 4 Cold Leg Check Valve 1-CS-329-L4, 2-CS-329-L4

  The Reactor Coolant Pump (RCP) Seal Water Injection Containment Isolation Check Valves are located on the seal water supply lines to the reactor coolant pump seals. These valves are located inside containment and provide containment isolation capability as well as, per LER 98-018-00, allowing alternate boration of the RCS through the RCP seals from the CVCS. The valves are not being adequately tested as specified in the IST Program as Active valves.

  The closed safety function is tested during 10CFR50, Appendix J testing. The open function by full flow testing has not been performed, but partial flow testing has been performed for the seal injection flowpath. In addition, there has been

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no indication of valve malfunction that would have prohibited full flow injection to the reactor coolant pump seals. It should be further noted that the requirement to provide an alternate boration flowpath through the RCP seals has been questioned and is under further review. Appropriate adjustments will be made to the IST program based on the results of this review.

Valves 1-CS-321 and 2-CS-321 provide a containment isolation function, and an open flow path to supply borated water from the Volume Control Tank to the Regenerative Heat Exchanger via the charging pumps for chemical shim control and reactor coolant system makeup. They are presently included in the IST Program as performing a closed safety function, but should also include an open safety function which has been added to the IST Program. The containment isolation function has been tested during 10CFR50, Appendix J testing. Full or partial stroke testing per the IST Program has not been performed. However, the valves have been stroked during normal system operations with no indication of valve malfunction that would prohibit full flow injection to the RCS.

The CVCS Charging to the RCP Cold Leg Check Valves prevent backflow of charging water from the RCS and permits sufficient flow forward for RCS boration and makeup. These check valves are required to be full and partial stroke tested in accordance with the IST Program, but this testing has never been performed. The valves have been stroked during normal system operations and have exhibited no indication of valve malfunction that would prohibit injection to or isolation from the RCS.

- Local/Remote Valve Position Indication for: Residual Heat Removal (RHR) Pump Discharge Containment Isolation Valves 1-ICM-311, 1-ICM-321, 2-ICM-311, 2-ICM-321; Accumulator Discharge Valves 1-IMO-110, 1-IMO-120, 1-IMO-130, 1-IMO-140, 2-IMO-110, 2-IMO-120, 2-IMO-130, 2-IMO-12-IMO-140; Refueling Water Storage Tank to RHR Pump Suction 1-IMO-390, 2-IMO-390; Safety Injection Pump Fill to Accumulator 1-IRV-60, 2-IRV-60; Accumulator Drain Valves 1-IRV-110, 1-IRV-120, 1-IRV-130, 1-IRV-140, 2-IRV-110, 2-IRV-120, 2-IRV-130, 2-IRV-140; Steam Generator Power Operated Relief Valves 1-MRV-213, 1-MRV-223, 1-MRV-233, 1-MRV-243, 2-MRV-213, 2-MRV-223, 2-MRV-233, 2-MRV-243

  The requirement to verify valve position indication was incorporated into the DC Cook IST Program during the Third Ten Year Interval upgrade on July 1, 1996. The requirement specifies that the local and remote position indication be verified every two years for the above cited valves. These requirements were not incorporated into procedures and, though remote indication is verified by other procedures, local indication verification has not been performed. Based on system lineup procedures and remote indication verification, there is no reason to believe the valves have ever been in other than their indicated positions.

- Component Cooling Water (CCW) Surge Tank Vacuum Breaker Check Valve 1-CCW-215, 2-CCW-215

  The CCW Surge Tank Vacuum Breaker Check Valve provides a Safety Class 3 pressure boundary. The check valve is required to be open to accommodate changes in surge volume when valve 1(2)-CRV-412 is isolated due to high radiation, and is required to close to prevent release of potentially contaminated CCW volume and to provide the Safety Class 3 pressure boundary. The valve was not previously included in the IST Program but has been added for open and closed testing. There is no indication that the valve would fail to perform its function in the open or closed position when required.

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Corrective Actions

The structure of the AEP Nuclear Generation Group has changed such that the IST Program is now administered by and maintained within the same organization, therefore, fragmentation of interfaces is no longer an issue.

Safety Screening/Evaluation, Temporary Modification, and Design Change procedures have been revised to ensure appropriate consideration of and feedback to the IST Program is performed by the design organizations.

The system safety functions for each component within the IST boundary were reviewed during the Enhanced System Readiness Reviews. Specific component related issues identified during these reviews will be resolved prior to the respective system being returned to operable status.

The IST Program and implementing procedures will be updated to address identified deficiencies, as necessary, prior to the respective system being returned to operable status.

IST Program administrative procedures will be developed or, where procedures currently exist, will be strengthened as necessary prior to entry into Mode 2 for the respective unit. These procedures will define ASME Code and TS requirements that apply to the IST Program, and will define roles and responsibilities for IST Program implementation and maintenance.

Using the information and insight gained from the above reviews and activities to bring the IST Program into compliance with ASME Code requirements and TS 4.0.5, the IST Program Basis documentation will be finalized by September 30, 2000, and will include a cross-reference of IST Program licensing and design basis information and documents to ensure consistency in evaluating program changes.

IST Program management has received industry training on IST Program development requirements and implementation responsibilities. Experienced and qualified IST personnel have been employed by the AEP Nuclear Generation Group to correct, in conjunction with supplemental experienced consulting personnel, the technical deficiencies in the IST program. IST training lesson plans and modules, including the interface between the licensing and design basis and the ASME Code requirements, will be developed by April 1, 2001, for IST personnel continuing training and general Nuclear Generation Group personnel training.

Similar Events

315/99-014-00
316/98-041-00
316/98-043-00
315/99-002-00
315/98-057-00