

LICENSEE EVENT REPORT (LER)

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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.

FACILITY NAME (1)

Cook Nuclear Plant Unit 1

DOCKET NUMBER (2)

05000-315

PAGE (3)

1 OF 4

TITLE (4)
Inadequate Technical Specification Surveillance Testing of Essential Service Water Pump Engineered Safety Feature Response Time

| 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 |
| 09 | 07 | 1999 | 1999 | 023 | 00 | 10 | 07 | 1999 | Cook Nuclear Plant Unit 2 | 05000-316 |
| | | | | | | | | | FACILITY NAME | DOCKET NUMBER |
| | | | | | | | | | | |
| OPERATING MODE (9) | | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (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) | | | | 50.73(a)(2)(ii) | 50.73(a)(2)(x) |
| | | | | | 20.2203(a)(2)(i) | | | | 50.73(a)(2)(iii) | 73.71 |
| | | | | | 20.2203(a)(2)(ii) | | | | 50.73(a)(2)(iv) | OTHER |
| | | | | | 20.2203(a)(2)(iii) | | | | 50.73(a)(2)(v) | Specify in Abstract below or in NRC Form 366A |
| | | | | | 20.2203(a)(2)(iv) | | | | 50.73(a)(2)(vii) | |

LICENSEE CONTACT FOR THIS LER (12)

NAME

Mary Beth Depuydt, Regulatory Compliance

TELEPHONE NUMBER (Include Area Code)

(616) 465-5901 X1589

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 |
|-------|--------|-----------|--------------|--------------------|-------|--------|-----------|--------------|--------------------|
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SUPPLEMENTAL REPORT EXPECTED (14)

| | | | | | | |
|---|---|----|----------|-------|-----|------|
| YES (If yes, complete EXPECTED SUBMISSION DATE). | X | NO | EXPECTED | MONTH | DAY | YEAR |
| | | | | | | |

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

On June 24, 1999, during a review of the findings of Expanded System Readiness Review (ESRR) team by Performance Assurance (PA), it was discovered that no testing program could be identified which verifies the capability of the Essential Service Water (ESW) pumps to meet the Engineered Safety Feature (ESF) response time specified in the Technical Specifications (TS) or the Updated Safety Analysis Report. Subsequent investigation confirmed that in-place TS surveillance testing measured the ESF response time for the ESW pumps as the elapsed time from actuation of the channel sensor until pump breaker closure, but did not include the time until a specified pump discharge pressure is reached or until the ESW pump discharge valve is open; as required by the definition of Engineered Safety Feature Response Time.

Since existing surveillance testing did not satisfy the TS definition of ESF response time, the identified condition constitutes a missed surveillance test. This is an operation or condition prohibited by TS and was determined to be reportable pursuant to the requirements of 10CFR50.73(a)(2)(i)(B) on September 7, 1999. The apparent cause of this event was the inadequate understanding of the plant design basis. Surveillance tests will be revised and implemented to include the time to achieve prescribed pump discharge pressure/flow and/or discharge valve position as part of the overall ESF response time testing for the ESW system prior to restart of each respective unit. The ESW ESF response times in UFSAR Table 7.2-7 will be evaluated and revised, if necessary, prior to restart of each respective unit. ESW system performance records and surveillance test results provide reasonable assurance that the system has remained capable of performing its intended functions. Therefore, there were minimal safety implications to the health and safety of the public as a result of this event.

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CONDITIONS PRIOR TO EVENT

Unit 1 was defueled

Unit 2 was defueled

DESCRIPTION OF THE EVENT

On June 24, 1999, during a review of the findings of Expanded System Readiness Review (ESRR) team by Performance Assurance (PA), it was documented that no testing program could be identified which verifies the capability of the Essential Service Water (ESW) pumps to meet the Engineered Safety Feature (ESF) response time specified in the Technical Specifications or the Updated Safety Analysis Report. Subsequent investigation of this condition by Engineering, completed September 1, 1999, confirmed that the acceptance criteria for in-place Technical Specification surveillance testing defined the ESF response time for the ESW pumps as the elapsed time from actuation of the channel sensor until pump breaker closure. Testing did not include the time until a specified pump discharge pressure is reached or the ESW pump discharge valve is open, as required by the definition of Engineered Safety Feature Response Time. The Technical Specification (TS) and UFSAR definition of Engineered Safety Feature Response Time is that time interval from when the monitored parameter exceeds its ESF actuation setpoint at the channel sensor to until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Since existing surveillance testing did not satisfy the TS definition of ESF response time, the identified condition constitutes a missed surveillance test.

CAUSE OF THE EVENT

The apparent cause of this event was inadequate understanding of the design basis of the plant. During the development of the ESW ESF response times, the design basis requirements for ESW availability during an accident were inadequately understood. This resulted in surveillance procedures for ESW which did not satisfy the UFSAR and Technical Specification definition of ESF response time.

ANALYSIS OF THE EVENT

The Technical Specification (TS) and UFSAR definition of Engineered Safety Feature Response Time is that time interval from when the monitored parameter exceeds its ESF actuation setpoint at the channel sensor to until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Since existing surveillance testing did not satisfy the TS definition of ESF response time, the identified condition constitutes a missed surveillance test. This is an operation or condition prohibited by TS and was determined to be reportable pursuant to the requirements of 10CFR50.73(a)(2)(i)(B) on September 7, 1999.

Response times for Engineered Safety Features are provided in the UFSAR, Section 7.2, Table 7.2-7. The ESF Response Time Basis Procedure specifies the strategy used at Cook Nuclear Plant to demonstrate the operability of various Engineered Safety Features, systems and sub-systems. This procedure defines "Device Response Time" as the time from Safeguards Master Relay closing until the component reaches its ESF position. Additionally, "ESF Response Time" is defined as the time interval from when the monitored parameter exceeds its ESF actuation setpoint at the channel sensor until the ESF equipment is capable of performing its safety function.

Technical Specifications Surveillance Requirements for ESF response time in Section 4.3.2.1.3 and Table 3.3-3 specify that each Engineered Safety Feature Actuation Signal (ESFAS) function will be demonstrated to be within limits at least once per 18 months.

Review of Emergency Diesel Generator Load Sequencing and ESF Testing revealed the ESF response time for the ESW

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pumps is measured from the initiating sensor channel to the pump breaker closure. Testing does not include the time for the pump to reach the required discharge pressure or for the ESW pump discharge valve to open.

In early 1975, operational problems identified with the ESW system, including severe water hammer at pump start-up, lead to testing being performed under various operational transients. This testing did not result in a significant water hammer; however, a previous test and operating experience showed that the water hammer did not occur when an idle pump was started with a throttled discharge valve even though its header had not been pressurized for as long as twelve hours. Determination was made that the water hammers were induced upon the start of an idle ESW pump with a fully open discharge valve even when the header had been depressurized for no more than a few minutes. This determination lead to modification of the design of the ESW pump discharge valves, such that the valves remain closed when the ESW pump is idle, and are interlocked to open on ESW pump start at breaker closure.

Response times for sensor actuation to ESW pump breaker closure and ESW pump discharge MOV stroke times are measured under the Surveillance Test Program. However, these times are not combined to provide an overall ESF response time which meets the TS definition and which is compared to an acceptance criteria. The ESF response time test procedure was reviewed to verify that ESF pumps other than ESW are tested from pump start to required system pressure/flow. Each was verified to include requirements to measure the overall response time from sensor actuation until an acceptable discharge pressure or flow prescribed by acceptance criteria.

Although the ESW ESF response times are included in UFSAR Table 7.2-7, ESW response times are not explicitly included in the UFSAR Chapter 14.0 accident analysis assumptions. ESW is not immediately required to support the containment spray system (CTS) and Emergency Diesel Generator during a design basis Loss of Coolant Accident (LOCA). ESW system performance records and surveillance test results provide reasonable assurance that the system has remained capable of performing its intended functions. Based upon the above information, there were minimal safety implications to the health and safety of the public as a result of this event.

CORRECTIVE ACTIONS

Surveillance tests will be revised and implemented to include the time to achieve prescribed pump discharge pressure/flow and/or discharge valve position as part of the overall ESF response time testing for the ESW system prior to restart of each respective unit.

The ESW ESF response times in UFSAR Table 7.2-7 will be evaluated and revised, if necessary, prior to restart of each respective unit.

As discussed in letter AEP:NRC:1260GH, "Donald C. Cook Nuclear Power Plant, Units 1 and 2, Enforcement Actions 98-150, 98-151, 98-152 and 98-156, Reply To Notice Of Violation Dated October 13, 1998," dated March 19, 1999, a surveillance program owner and manager position has been established, reporting to the Work Control Director. A Leadership Plan has been developed which includes the creation of a detailed surveillance data base to align surveillance requirements to specific implementing procedures and a comprehensive adequacy review of surveillance testing procedures.

As previously discussed in LER 315/99-021-00 and as part of Restart Action Plan # 0001 for the Programmatic Breakdown in Surveillance Testing, the adequacy of the TS surveillance program will be evaluated. This evaluation includes verification that TS surveillance requirements for all modes of plant operation are incorporated into TS surveillance test procedures. Also, as part of the Restart effort, System and programmatic assessments in the Expanded System Readiness Reviews and Licensing Basis Reviews are reestablishing and documenting the plant's Design and Licensing Basis.



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SIMILAR EVENTS

315/99-010-00
315/99-015-00
315/99-016-00
315/99-021-00

