



Kewaunee Nuclear Power Plant
N490, State Highway 42
Kewaunee, WI 54216-9511
920-388-2560

Operated by
Nuclear Management Company, LLC



May 1, 2001

10CFR 50.73

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

Ladies/Gentlemen:

DOCKET 50-305
OPERATING LICENSE DPR-43
KEWAUNEE NUCLEAR POWER PLANT
REPORTABLE OCCURRENCE 2001-001-01

In accordance with the requirements of 10 CFR 50.73, "Licensee Event Report System," the attached Licensee Event Report (LER) for reportable occurrence 2001-001-01 is being submitted. This report contains a commitment to review the Kewaunee Fire Protection Program Plan to ensure implementing procedures adequately prescribe requirements or revise them accordingly.

Sincerely,

Kyle A. Hoops
Manager-Kewaunee Plant

GIH

Attach.

cc - INPO Records Center
US NRC Senior Resident Inspector
US NRC, Region III

Handwritten initials/signature in the bottom right corner.

Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose 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.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of
digits/characters for each block)

FACILITY NAME (1) Kewaunee Nuclear Power Plant				DOCKET NUMBER (2) 05000305				PAGE (3) 1 OF 5			
TITLE (4) Single Barrier Appendix R Fire Door Failed to Close – Door Had Not Been Part of a Periodic Test Program											
EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)		
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER	
01	18	2001	2001	- 001	- 01	05	01	2001	FACILITY NAME	DOCKET NUMBER	
OPERATING MODE (9)			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR .: (Check all that apply) (11)								
N			20.2201(b)			20.2203(a)(3)(ii)			X	50.73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)
			20.2201(d)			20.2203(a)(4)				50.73(a)(2)(iii)	50.73(a)(2)(x)
POWER LEVEL (10)			20.2203(a)(1)			50.36(c)(1)(i)(A)				50.73(a)(2)(iv)(A)	73.71(a)(4)
097			20.2203(a)(2)(i)			50.36(c)(1)(ii)(A)				50.73(a)(2)(v)(A)	73.71(a)(5)
			20.2203(a)(2)(ii)			50.36(c)(2)				50.73(a)(2)(v)(B)	OTHER
			20.2203(a)(2)(iii)			50.46(a)(3)(ii)				50.73(a)(2)(v)(C)	Specify in Abstract below or in NRC Form 366A
			20.2203(a)(2)(iv)			50.73(a)(2)(i)(A)				50.73(a)(2)(v)(D)	
			20.2203(a)(2)(v)			50.73(a)(2)(i)(B)				50.73(a)(2)(vii)	
			20.2203(a)(2)(vi)			50.73(a)(2)(i)(C)				50.73(a)(2)(viii)(A)	
			20.2203(a)(3)(i)			50.73(a)(2)(ii)(A)				50.73(a)(2)(viii)(B)	
LICENSEE CONTACT FOR THIS LER (12)											
NAME Gary I Harrington – Plant Licensing Leader						TELEPHONE NUMBER (Include Area Code) (920) 388-8559					
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)											
CAUSE	SYSTEM	COMPONENT	MANU- FACTURER	REPORTABLE TO EPIX		CAUSE	SYSTEM	COMPONENT	MANU- FACTURER	REPORTABLE TO EPIX	
SUPPLEMENTAL REPORT EXPECTED (14)											
YES (If yes, complete EXPECTED SUBMISSION DATE).						X	NO		EXPECTED SUBMISSION DATE (15)		MONTH
											DAY
											YEAR
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)											
<p>On January 18, 2001, with the reactor at 97 percent power, an Appendix R fire barrier door failed to close completely. The door separates A and B trains of the service water (SW) system equipment. The door failed during the performance of a maintenance procedure (PMP 08-19). Immediate actions were taken to close the door. This event is being reported because an Appendix R required door failed to close and no documentation exists to demonstrate past door performance. Consequently, there is no evidence to indicate that the door was capable of fulfilling its design function since a test last performed in 1993. A protective feature of the door is that when a fusible link melts, the door automatically closes to assure separation of the SW trains in the event of a fire.</p> <p>The root cause investigation determined that a lack of door operation and maintenance caused the door to fail. It also determined that failure to adequately manage changes to the fire protection program plan resulted in not developing adequate guidance for operating and testing the door. Corrective actions will include reviewing program plan requirements and ensuring procedures are adequate and making procedure revisions where necessary.</p> <p>The risk analysis of a fire in the screenhouse with an inoperable fire door shows an increase in risk of 2.2E-7.</p>											

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

DESCRIPTION OF EVENT

On January 18, 2001, while the plant was operating at 97% power, an Appendix R fire barrier door [DR] failed to close completely. The door separates A and B trains of the service water (SW)[BI] system equipment. The door failed during performance of a maintenance procedure (PMP 08-19). This event is being reported because an Appendix R required door failed to close and no documentation exists to demonstrate past door performance. Consequently, there is no evidence to indicate that the door was continually capable of fulfilling its design function since a test last performed in 1993.

The door, #281, is a flexible, steel, roll-up style door. The door is normally open to allow personnel and equipment movement between the North and South sections of the screen-house [MK] structure. The door is held open by a series of small gauge chains with mechanical linkage that engage the door actuator to hold it in an open position. A number of fusible links are used to hold tension on the chains and actuator linkage. The weight of the door is used to hold a ratcheted actuator mechanism in place to keep the door open. The door closes automatically when a fusible link melts. Melting the link releases the tension on the chains, and the door free-falls to the closed position. The speed of closure is controlled by spring tension internal to the actuator assembly.

The door provides a single Appendix R design barrier that separates redundant trains of SW system equipment. Without the door closing fully, there is no assurance that a fire on one side of the door would not disable opposite train equipment needed to shutdown the plant in the event of a fire. There is no redundant fire protection barrier to the door.

Kewaunee has two roll-up style doors using this operating principle, door #281 and #279. Both of the doors are single Appendix R barriers. Neither of the doors had been periodically tested as part of a formal testing program since their installation. They have been periodically inspected as part of a routine maintenance schedule. However, the documentation of what the inspection entailed is limited to "satisfactory." Additionally, the procedure used to conduct the door inspection does not specify the extent of door testing.

From personnel interviews, there is only limited recollection as to what exactly may have been inspected for any given performance of the inspection procedure. In 1993 it was identified that personnel may not be properly testing door operation by removing a fusible link and allowing the door to close. At the time, a work request was written to perform a functional door test. However, the inspection procedure was not updated to ensure this was performed during the periodic inspection. Some personnel have indicated that they disconnected a fusible link to ensure the door would close when inspecting doors. However, this action was noted to be inconsistent from one person to the next.

Subsequent to identifying that periodic testing of the door had not been performed, a suitable test methodology was developed and implemented. When the test of door #281 was performed, the door did not close completely. Consequently, the door was found inoperable. Door #279 passed the

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functional test satisfactorily.

CAUSE OF THE EVENT

The door failed to close because it had not been cycled frequently enough to keep the moving parts operating freely. The door also had not received any routine lubrication or maintenance. The procedure used for periodic inspection of fire doors did not contain specific guidance on requirements for testing this type of roll-up fire door. Further investigation focused on why the procedure deficiency existed for so long. The root cause of this failure was found to be inadequate management of changes made to the Kewaunee Nuclear Power Plant (KNPP) Fire Protection Program Plan.

Changes in the KNPP Fire Protection Program Plan were inadequately managed in several instances over the past 16 years. Requirements to test fire protection related equipment were originally described in the plant Technical Specifications and testing was performed under the supervision of the fire protection group using a surveillance procedure (SP). In 1991, fire protection surveillance requirements were removed from Technical Specifications and placed in the KNPP Fire Protection Program Plan. The surveillance procedure was converted to a preventive maintenance procedure, PMP 08-019, and responsibility for testing was transferred to the Maintenance Department. In 1987, and again in 1992, questions were raised about the adequacy of testing the roll-up doors. A subsequent test of the doors was conducted by removing a fusible link. There were no subsequent changes made to the implementing procedure to ensure that the doors would be tested properly in the future.

In 1999, a major revision was made to the KNPP Fire Protection Program Plan. The change included a clarification that the roll-up doors be operationally tested. However, no changes to the implementing procedures were made.

ANALYSIS OF THE EVENT

This report is being submitted in accordance with 10CFR50.73(a)(2)(ii)(B), any event or condition that resulted in the nuclear power plant being in an unanalyzed condition that significantly degraded plant safety. The failure of door #281 to close resulted in the plant's failure to meet Appendix R requirements to ensure safe shutdown equipment availability in the event of a fire in the screenhouse structure.

From a review of the effects of the fire hazard for which the door would have to protect, the effects of damage would likely be minimal. By applying the fire induced vulnerability evaluations (FIVE) methodology to capture the effects of a small volume oil fire, the hazard of concern, the impact on opposite train equipment would most likely cause a loss of only one of two available SW pumps [P]. Probabalistic Risk Assessment analysis of a fire in the screenhouse with the roll-up door failure shows an increase in risk of 2.2E-7.

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CORRECTIVE ACTIONS

Immediate actions were to close door #281 until repairs could be completed. To date, repairs have been limited to lubricating and cycling door #281. This resulted in the door operating freely and going completely closed under its own weight. However, further inspection of the doors and actuators has raised additional questions as to how the door system operates. The additional area of concern was reported in accordance with the requirements of 10CFR50.72 and 10 CFR50.73 (refer Licensee Event Report 2001-003-00).

Longer term corrective actions will be to compare the KNPP Fire Protection Program Plan to implementing procedures to verify:

- Fire Plan requirements are being implemented adequately.
- Compensatory measures required for inoperable equipment or failed tests are included in precautions and limitations of the implementing procedures.

The preventive maintenance procedure used to test and inspect fire doors will be revised to include:

- Fire Plan requirements for testing fire doors.
- Adequate technical detail for conducting tests and resetting the doors in accordance with the manufacturer instructions and industry guidance for maintenance of fire doors.

A validation and verification process for maintenance procedures will be developed and implemented. This process will be designed to ensure that when maintenance procedures are revised they are reviewed to verify that the content is adequate to perform the intended task.

ADDITIONAL INFORMATION

Subsequent to the initial notification made on January 18, 2001, at 1351 eastern standard time (EST), 1251 central (CST), it was noted that some of the information provided was in error. The initial notification noted the event to occur at 1200 CST when in fact the door failed its test approximately 20 minutes earlier. Also, the initial notice indicated that the door only failed to close for the final two to three inches of travel. It was later discovered that the distance may have been somewhat greater, approximately six to eight inches. The two errors in information have been captured in the plants' corrective action identification program. Neither error has any impact on the consequence of the actual failure or the outcome of the analysis.

The timing issue was a result of personnel involved in the testing failing to recognize that the door's failure to close was an immediately reportable event with a one hour time limitation. Consequently, the specific time of the affected door failing the test was not immediately noted and reported.

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The gap that remained when the test failure occurred was initially reported based on the recollection of a plant staff member present when the door was tested. There was no measurement taken of the opening. Subsequent to making the call to the Emergency Operations Center (EOC), Kewaunee's resident inspector, who also witnessed the test, stated that the gap was greater than the reported two to three inches. His recollection of the opening was approximately six to eight inches. Regardless of the size of the gap, the consequence remains the same. The door could not provide its design function in either case. This information is being provided to document the error in the original notification and get the correct data on the Docket.

This event is not considered a Safety System Functional Failure (SSFF) as defined in NEI 99-02. Although the failure resulted in a single Appendix R barrier failure, the fire hazards review determined that only two SW pumps could be affected by the credible fire hazard.

The hazard is a small volume oil fire. The source of the oil is one SW pump, either from the A or B train pump located on either side of the affected Appendix R barrier. Given the door's failing to close completely, the scenario would be oil from one pump, adjacent to the Appendix R wall traveling across the barrier boundary and impacting the opposite train SW pump. The affected pumps have to be the two pumps, one from each train, located adjacent to the Appendix R barrier wall. The size of the oil pool that can develop from a failure of a SW pump lube oil reservoir can not reach the redundant pumps for the same train. The distance between the pumps is too great. Therefore, one pump in each SW train would remain available to conduct a plant shutdown. Consequently, the SSFF definition is not met.

SIMILAR EVENTS

None

EQUIPMENT

The roll-up doors are manufactured by Cornwell Iron Works. The technical information we have available is contained in vendor technical manual #ES10209.