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 AUTH. NAME AUTHOR AFFILIATION
 WEBB, T.J. Wisconsin Public Service Corp.
 EVERS, K.H. Wisconsin Public Service Corp.
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 90-010-00: on 901102, rupture restraint not installed as designed results in condition outside plant design basis.

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 TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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600 North Adams • P.O. Box 19002 • Green Bay, WI 54307-9002

December 3, 1990

10 CFR 50.73

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

Gentlemen:

Docket 50-305
Operating License DPR-43
Kewaunee Nuclear Power Plant
Reportable Occurrence 90-010-00

The attached Licensee Event Report for reportable occurrence 90-010-00 is being submitted in accordance with the requirements of 10 CFR 50.73, "Licensee Event Report System."

Sincerely,

K. H. Evers
Manager-Nuclear Power

DJM/jms

Attach.

cc - INPO Records Center
Mr. Patrick Castleman, US NRC
US NRC, Region III

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO 3150-0104

EXPIRES 8/31/85

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (3)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Kewaunee Nuclear Power Plant	0 5 0 0 0 3 0 5	9 0	0 1 0	0 0	0 2	OF	0 4

TEXT (If more space is required, use additional NRC Form 308A's (1121).

Description of Event

At 1225 on November 2, 1990, with the plant at 100% power, Kewaunee plant management completed its review of an analysis of rupture restraint 134-6. The analysis was performed by Westinghouse, Kewaunee's nuclear steam supply system supplier, and had been received earlier that day. Rupture Restraint 134-6 is located on the pressurizer surge line. The review determined that prior to March 12, 1990, rupture restraint 134-6 had not met its design basis. The analysis was conducted because nine of the thirty anchors had not been installed as designed. The anchors secure the base plate for rupture restraint 134-6 to the wall. The nonconformance was discovered on March 11, 1990, during Kewaunee's annual refueling outage.

The event was discovered during an inspection being conducted as part of Kewaunee's response to NRC Bulletin 88-11, "Pressurizer Surge Line Stratification". During the inspection, the personnel involved determined that seven base plate anchors had not been installed and that two of the installed anchors were nonfunctional because they could not be properly torqued.

Upon discovery in March of 1990, Wisconsin Public Service Corporation (WPSC) requested that Kewaunee's architect engineer (Fluor Daniel, formerly Pioneer Services and Engineering) determine what modifications were required to ensure future operability of the restraint. Fluor Daniel determined that operability of the restraint could be assured if three of the missing anchors were installed and if one of the nonfunctional anchors was repaired. The corrective actions recommended by Fluor Daniel were completed on March 12, 1990, prior to the end of the refueling outage.

Westinghouse was contracted to analyze the original as-found condition of the restraint. The Westinghouse analysis was received at approximately 1200 on November 2, 1990. The Westinghouse analysis determined that, had a hypothetical rupture occurred on the surge line, near rupture restraint 134-6, the restraint, as originally installed, would not have restrained the pipe.

Cause of Event

Rupture Restraint 134-6 was installed prior to the plant receiving its operating license in December of 1973. It appears that the nonconformance dates back to original plant construction. Due to the length of time between the installation of the restraint and the time of discovery, the cause of the event could not be conclusively determined.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO 3150-0104
EXPIRES 9/31/85

FACILITY NAME (1) Kewaunee Nuclear Power Plant	DOCKET NUMBER (2) 0500030590	LER NUMBER (3)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		90	010	00	03	04

TEXT (If more space is required, use additional NRC Form 308A's) (17)

Analysis of Event

This event is being reported in accordance with 10CFR50.73 (a)(11)(2) as a condition that resulted in the plant being outside its design basis. It was also reported at 1237 on November 2, 1990 in accordance with 10CFR50.72 (b)(2)(i).

Rupture restraints are installed on high energy piping systems to prevent ruptured pipes from forming plastic hinges and then impacting safety related equipment; i.e. to prevent pipe whip. High energy lines are defined as lines with an internal pressure greater than 275 psig (pounds per square inch gauge) and an internal temperature greater than 200°F (Fahrenheit). However, rupture restraints do not provide pipe support during normal plant operation, during seismic events, or during design basis accidents that do not assume an arbitrary rupture of the line in question.

Rupture restraint 134-6 is located on the pressurizer surge line. The pipe rupture analysis of the pressurizer surge line identifies the southeast support of the 1B steam generator as the potential target of a surge line whip if rupture restraint 134-6 is not installed as designed.

Although rupture restraint 134-6 would not have prevented the surge line from whipping, the lack of restraint did not adversely affect the health and safety of the public. As part of WPSC's response to NRC Bulletin 88-11, a leak before break (LBB) analysis of the surge line is being conducted. A preliminary LBB analysis by Westinghouse stated that:

The Kewaunee plant design is based, in part on the postulation of breaks in high energy piping, including breaks in pressurizer surge line. As a result of this design basis, pipe whip restraints have been installed to mitigate the effects of these breaks. However, the inherent system and material characteristics of the pressurizer surge line piping would preclude the occurrence of pipe breaks in the structural design.

To date, there has been no evidence of cracking identified from the pre-service or inservice inspections. If a flaw was actually present and went undetected, the growth of the flaw over the lifetime of the plant is judged to be within acceptable limits. This judgement is based on the detailed fatigue crack growth evaluations performed by Westinghouse for surge lines in many plants. Based on successful leak-before-break evaluations performed for many plants, it is judged that a postulated through-wall crack would leak at a detectable rate, and in the event such a leak is detected, the plant would be shutdown...

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO 3180-0104

EXPIRES 8/31/85

FACILITY NAME (1) Kewaunee Nuclear Power Plant	DOCKET NUMBER (2) 0 5 0 0 0 3 0 5 9 0	LER NUMBER (3)			PAGE (3)	
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TEXT (If more space is required, use additional NRC Form 308A (9-83))

Based on the above, it is judged that a double-ended guillotine break will not occur in the surge line pipe in the neighborhood of pipe restraint 134-6. Thus, since the probability of restraint 134-6 being challenged by such an event in the surge line pipe is extremely low, the reduced capability of the restraint had no impact on safe operation of the plant.

Corrective Actions

Compliance with Kewaunee's existing design basis was assured when three of the missing anchors were installed and one of the nonfunctional anchors was repaired prior to the end of the 1990 refueling outage.

A rupture restraint sampling program will be conducted to determine if a generic problem exists with the restraints at Kewaunee. A representative sample of the restraints will be reviewed to insure that they are installed in accordance with their design drawings. Further action by WPSC will be based on the results of this analysis.

Additional Information

Similar Events: LER B9-015

Equipment Failures: None