



March 30, 2000

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Operating Licenses DPR-58 and DPR-74
Docket Nos. 50-315 and 50-316

Document Control Manager:

In accordance with the criteria established by 10 CFR 50.73 entitled Licensee Event Report System, the following report is being submitted:

LER 315/2000-002-00, "Large Bore Piping Not Meeting the Code of Record Results in Safety Systems Being Seriously Degraded"

The following commitments were identified in this submittal:

- A design change package for Unit 2 has been issued to modify existing supports and install a limited number of new supports. These modifications are currently being installed. The most critical of these modifications will be installed to establish system operability in accordance with the requirements of Generic Letter 91-18, "Information to Licensees Regarding NRC Inspection Manual Section on Resolution of Degraded and Nonconforming Conditions," before entry of Unit 2 into Mode 6. Until the remaining modifications are installed, the piping systems will be operable but degraded. The remaining modifications will be installed prior to the end of the next refueling outage to return the piping systems to full compliance with the code.
- The LBPRP analysis is being completed for Unit 1.
- Based on the results of the Unit 1 analysis, modifications will be installed to return the piping systems to full conformance.

Should you have any questions regarding this correspondence, please contact Mr. Robert C. Godley, Director, Regulatory Affairs, at 616/465-5901, extension 2698.

Sincerely,

A handwritten signature in black ink that reads "Robert C. Godley".

M. W. Rencheck
Vice President – Nuclear Engineering

/mbd
Attachment

c: J. E. Dyer, Region III

TE22

R. C. Godley
D. Hahn
W. J. Kropp
R. P. Powers
R. Whale
Records Center, INPO
NRC Resident Inspector

FACILITY NAME (1) Cook Nuclear Plant Unit 1

DOCKET NUMBER (2) 05000-315

PAGE (3) 1 OF 3

TITLE (4)
 Large Bore Piping Not Meeting the Code of Record Results in Safety Systems Being Seriously Degraded

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
03	03	2000	2000	002	00	03	30	2000	Cook Nuclear Plant Unit 2	05000-316
									FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9) Defuel

POWER LEVEL (10) 0%

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(x)
<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 73.71
<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> OTHER
<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> Specify in Abstract below
<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> or in NRC Form 366A

LICENSEE CONTACT FOR THIS LER (12)

NAME M. B. Depuydt, Regulatory Compliance

TELEPHONE NUMBER (Include Area Code) (616) 465-5901 X 1589

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)

YES (If yes, complete EXPECTED SUBMISSION DATE). **NO**

EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

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

On March 3, 2000, a number of non-conformances were identified with pipe supports for portions of the Unit 2 Residual Heat Removal, Safety Injection, Containment Spray and Charging piping systems as a result of an engineering evaluation of all safety-related large bore piping. The analysis concluded that these piping systems deviate from the design criteria of USAS B31.1-1967, which is the code of record for the Cook Nuclear Plant. As the design and construction of the corresponding systems in Unit 1 are similar, this report is being made for both units though the Unit 1 review has not been completed. A four hour notification was made on March 3, 2000, at 1745 hours in accordance with 10CFR50.72(b)(2)(i) for a condition which was found while both reactors were shutdown, which, had it been found while the reactors were in operation, could have resulted in the nuclear plants, including their principal safety barriers, being seriously degraded. This LER is submitted in accordance with the requirement of 10CFR50.73(a)(2)(ii)(A).

At the time of original plant design, using standard analytical methods, the piping design was thought to meet the requirements of USAS B31.1-1967. Records of specific analyses and calculations have not been easily retrievable from that period for review. When the piping systems were reanalyzed during the Large Bore Piping Reconstitution Project using more sophisticated analytical tools and incorporating the as-built configurations, it was determined that not all piping met the requirements. Modifications will be installed on both units to bring the piping systems back into compliance with USAS B31.1-1967.

Using engineering judgment, if alternate methods of analyses were used, the piping and pipe support stresses calculated would be within the allowable limits and the piping would not fail in a seismic event. Therefore, the safety significance of the identified condition is judged to be minimal.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

FACILITY NAME (1)	DOCKET (2) NUMBER (2)	LER NUMBER (6)			PAGE (3)
Cook Nuclear Plant Unit 1	05000-315	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 3
		2000	002	00	

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

Conditions Prior To Event

Unit 1 was defueled
Unit 2 was defueled

Description Of The Event

As a result of walkdowns performed during the Large Bore Piping Reconstitution Project (LBPRP), a number of pipe support non-conformances were identified. On March 3, 2000, an analysis concluded that sections of the Unit 2 Residual Heat Removal (RHR), Safety Injection (SI), Containment Spray (CTS) and Charging (CC) piping systems deviate from the design criteria of USAS B31.1-1967, which is the code of record for the Cook Nuclear Plant (CNP), and might not be able to withstand a design basis seismic event. It was determined that these piping systems required either installation of new pipe supports or modifications to existing pipe supports to meet the operability criteria established for the LBPRP.

An Emergency Notification System (ENS) phone call was made on March 3, 2000, at 1745 hours in accordance with 10CFR50.72(b)(2)(i), for a condition which was found while both reactors were shutdown, which, had it been found while the reactors were in operation, could have resulted in the nuclear plants, including their principal safety barriers, being seriously degraded. This LER is submitted in accordance with the requirement of 10CFR50.73(a)(2)(ii)(A).

The review for Unit 1 has not yet been completed. However, since the design and construction of the corresponding systems in Unit 1 are similar, this report is being made for both units.

Cause Of The Event

At the time of original plant design, using standard analytical methods, the piping design was thought to meet the requirements of USAS B31.1-1967. Records of specific analyses and calculations have not been easily retrievable from that period for review. When the walkdowns were performed for LBPRP, it was determined that the as-built configuration did not match the design in multiple instances. When the piping systems were reanalyzed during LBPRP using more sophisticated analytical tools and incorporating the as-built configurations, it was determined that not all piping met the requirements.

Analysis Of The Event

The piping affected by this condition includes the suction piping from the Refueling Water Storage Tank (RWST) to the suction of the RHR, SI, CTS and CC pumps, and from the discharge of the RHR pumps to the containment penetrations. The suction piping from the RWST to the CC pumps is maintained in standby lineup during power operation and shutdown to satisfy Technical Specification requirements for boration flowpaths. The RHR piping can be used during refueling to transfer water from the RWST to the refueling cavity and a portion of the piping is also used for the shutdown cooling flowpath. Under design basis accident conditions, the discharge of the RHR pumps also provides flow to the suction of the SI and CC pumps after switchover to the containment recirculation sump. Postulated failure of the affected piping could, depending on the location of the failure, impact the ability to place and maintain the plant in a safe condition.

The analysis performed for the LBPRP, using the uniform response spectrum method, enveloped seismic excitations at all attachment points to the building structures. This piping system analytical model is very large and its 197 support points, consisting of 182 supports and 15 anchors, attach to the Containment wall and the Auxiliary building at several different elevations. Industry experience shows that by performing a refined time-history analysis, which takes into account the different excitation levels and phase differences at each support location, the piping response during a seismic event is significantly reduced.

Many vertical supports in the piping system are unidirectional and do not provide restraint in the upward direction. The analysis does not have the capability of modeling these supports appropriately. When results indicate an uplift load on such a support, that support must be removed from the analytical model. This creates a domino effect, where successive supports indicate uplift and must be removed, resulting in an unnecessarily conservative model. Additional analyses were performed where the unidirectional restraints that indicated an uplift load were kept in the analytical model. The results of these analyses show that the piping and support stresses are within the operability limits of the Mechanical Design Guideline. While this approach is not as conservative as removing the supports from the model, it demonstrates that the system behavior should be bounded by these two extremes.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

	DOCKET (2) NUMBER (2)	LER NUMBER (6)			PAGE (3)
Cook Nuclear Plant Unit 1	05000-315	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 OF 3
		2000	002	00	

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

Analysis Of The Event (continued)

Using engineering judgment, if a refined time-history analysis were performed and unidirectional restraints that indicated an uplift load were kept in the analytical model of analyses, the piping and pipe support stresses calculated would be within the allowable limits which indicates that the piping would not fail in a seismic event. Therefore, the safety significance of the identified condition is judged to be minimal.

Corrective Actions

No immediate action was required as both units are defueled and none of the systems are required operable at this time.

A design change package for Unit 2 has been issued to modify existing supports and install a limited number of new supports. These modifications are currently being installed. The most critical of these modifications will be installed to establish system operability in accordance with the requirements of Generic Letter 91-18, "Information to Licensees Regarding NRC Inspection Manual Section on Resolution of Degraded and Nonconforming Conditions," before entry of Unit 2 into Mode 6. Until the remaining modifications are installed, the piping systems will be operable but degraded. The remaining modifications will be installed prior to the end of the next refueling outage to return the piping systems to full compliance with the code.

The LBPRP analysis is being completed for Unit 1. Based on the results of this analysis, modifications will be prepared to correct any identified non-conformances and return the piping systems to full conformance with the code as necessary. Installation of required modifications will be in accordance with the Unit 1 startup schedule.

AEP:NRC:1260GH, "Enforcement Actions 98-150, 98-151, 98-152 and 98-186 Reply to Notice Of Violation October 13, 1998", dated March 19, 1999, responded to identified programmatic weaknesses in plant Design and Licensing Basis, and configuration management. Corrective actions relative to plant Design and Licensing basis have been implemented via the Engineering Leadership Plan.

Similar Events

- 315/99-026-00
- 315/99-017-00
- 315/98-058-00
- 315/98-046-00