



ARKANSAS POWER & LIGHT COMPANY

June 5, 1989

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U. S. Nuclear Regulatory Commission
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SUBJECT: Arkansas Nuclear One - Unit 2
Docket No. 50-368
License No. NPF-6
Licensee Event Report No. 50-368/87-012-00

Gentlemen:

In accordance with 10CFR50.73(a)(2)(ii)(B), attached is the subject report concerning the Low Temperature Overpressure Protection System piping seismic qualification being compromised due to a deficient pipe support which resulted from an inadequate modification process.

Very truly yours,

E. C. Ewing
General Manager,
Plant Support

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attachment

cc w/att: Regional Administrator
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U.S. Nuclear Regulatory Commission
Approved OMB No. 3150-0104
Expires: 8/31/85

L I C E N S E E E V E N T R E P O R T (L E R)

FACILITY NAME (1) Arkansas Nuclear One, Unit Two DOCKET NUMBER (2) PAGE (3)
05000316810F013

TITLE (4) Low Temperature Overpressure Protection System Piping Seismic Qualification Compromised
Due to a Deficient Pipe Support Resulting From an Inadequate Modification Process

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)		
Month	Day	Year	Sequential Number	Revision Number	Month	Day	Year	Facility Names		Docket Number(s)	
05	11	87	01	01	06	05	08			05000316810F013	

OPERATING MODE (9) 5 THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

POWER LEVEL (10)	Code	20.402(b)	20.405(a)(1)(i)	20.405(a)(1)(ii)	20.405(a)(1)(iii)	20.405(a)(1)(iv)	20.405(a)(1)(v)	20.405(c)	50.36(c)(1)	50.36(c)(2)	50.73(a)(2)(i)	50.73(a)(2)(ii)	50.73(a)(2)(iii)	50.73(a)(2)(iv)	50.73(a)(2)(v)	50.73(a)(2)(vii)	50.73(a)(2)(viii)(A)	50.73(a)(2)(viii)(B)	50.73(a)(2)(x)	73.71(b)	73.71(c)	Other (Specify in Abstract below and in Text, NRC Form 366A)	

LICENSEE CONTACT FOR THIS LER (12)
Name: Larry A. Taylor, Nuclear Safety and Licensing Specialist Telephone Number: 50191641311010
Area Code: 50191641311010

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

Cause	System	Component	Manufacturer	Reportable to NPRDS	Cause	System	Component	Manufacturer	Reportable to NPRDS

SUPPLEMENT REPORT EXPECTED (14) EXPECTED SUBMISSION DATE (15)
 Yes (If yes, complete Expected Submission Date) No

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

On May 11, 1987, during a Design Engineering walkdown in support of a planned system modification, it was identified that the as-found pipe support configurations of the pressurizer code safety relief valves and the Low Temperature Overpressure Protection (LTOP) System relief valves deviated from the configurations shown on the piping isometric drawings. Evaluations were conducted which concluded the supports were operable in their as-found condition with the exception of a snubber clamp located on a section of piping associated with one of the LTOP relief valves connected to the pressurizer. This clamp was loaded at an angle of approximately 30 degrees from horizontal which reduced its load capacity to less than the calculated piping load. Because of this condition, the continued operability of the LTOP piping could not be assured if a seismic event were to occur. The cause of this event was a lack of programmatic modification controls which resulted in inadequate post modification verifications. The snubber clamp was replaced with a redesigned clamp prior to plant heatup. Additionally, the modification process has been improved and strengthened since the occurrence of this event. Furthermore, an Engineering walkdown of safety related systems is being performed. The walkdown findings are being compared to current applicable design drawings and seismic calculations to ensure compliance with design requirements.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		Year	Sequential Number	Revision Number	
Arkansas Nuclear One, Unit Two	0510010368	87	012	0	020F03

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

A. Plant Status

At the time of discovery of this condition, Arkansas Nuclear One, Unit Two (ANO-2) was in Cold Shutdown with the Reactor Coolant System (RCS) [AB] vented to atmosphere and RCS temperature at approximately 120 degrees Fahrenheit.

B. Event Description

On May 11, 1987, during a Design Engineering walkdown in support of a planned system modification package development, it was identified that the as-found configurations of the supports for piping associated with the pressurizer code safety relief valves [AB-RV] and the Low Temperature Overpressure Protection (LTOP) System relief valves [AB-RV] deviated from the documented as-built configurations shown on piping isometric drawings and design analyses developed to demonstrate acceptable system responses during design basis occurrences. An evaluation of each identified discrepancy was performed to determine the capability of the piping and associated valves to function as designed during seismic events and postulated LTOP relief valve or pressurizer code safety relief valve blowdown events. The deviations were shown not to affect operability of the related piping and supports in the as-found condition with the exception of one support. A snubber [AB-SNB] clamp located on a section of piping associated with one of the LTOP relief valves was loaded at an angle of approximately 30 degrees from horizontal. At this angle, the calculated piping load exceeded the load capacity of the clamp indicating that under certain conditions the clamp might be overloaded and could fail. The piping clamp attaches a mechanical snubber (shock suppressor) to a section of seismic LTOP relief valve piping located on the top of the RCS pressurizer. The snubber functions to limit pipe movement during seismic events and other operational occurrences such as relief valve blowdown which may induce pipe movement. This pipe movement is restricted, by design, under these conditions to prevent excessive loads which could potentially cause the pipe to fail.

As a result of the pipe support evaluations, required system modifications were identified. Plant design modification packages were developed and implemented which corrected the discrepancies prior to unit heatup.

C. Safety Significance

The ANO-2 RCS pressurizer [AB-PZR] is equipped with two ASME code safety relief valves which operate to prevent the RCS from becoming pressurized above its design limit of 2750 psia anytime the RCS temperature is above 280 degrees. In addition to these valves, two redundant spring loaded LTOP relief valves are installed on the pressurizer for overpressure protection during plant cooldowns and while the plant is in a cold shutdown condition. Each LTOP relief is isolated from the RCS by two motor operated isolation valves whenever the RCS temperature is greater than 280 degrees. A portion of the piping associated with one of the LTOP relief valves is also used to provide a manual vent path from the pressurizer steam space. The discharge piping from the pressurizer code safety valves, the LTOP relief valves and the pressurizer manual vent line are connected to a common header which directs flow to the RCS system quench tank. This piping and component configuration is located within the Containment Building.

Based on the assumption that the as-found condition of the pipe clamp configuration was not qualified, the LTOP piping could be affected. System operability during a seismic event or under other dynamic operating conditions, such as pressurizer code safety relief valve blowdown or LTOP valve blowdown, could not be assured. Based on engineering judgement, considering failure of the pipe clamp and resultant pipe stresses, if failure of the piping would have occurred the most likely location would have been at a 3 inch x 4 inch tee downstream of LTOP relief isolation valve 2CV-4740-2. A postulated break at this location would have been isolable from the RCS, thus minimizing the effect of the event. However, the potential for failure of the piping at a location which could not be isolated could not be conclusively eliminated. Such a failure could have resulted in a Loss of Coolant Accident which (although is within the bounds of existing accident analysis limits) is considered to be safety significant.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
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Arkansas Nuclear One, Unit Two	050101368	87--	012--	0013013	013

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

D. Root Cause

The original LTOP piping system design and supporting qualifying calculations were developed during the initial plant construction/design process. During the response to NUREG-0737, the analyses were significantly revised, followed by modifications to the system piping. Limited access in the location of the piping system and lack of programmatic modification control resulted in an inadequate post modification verification.

E. Basis for Reportability

Since the continued operability of the LTOP piping could not be assured during a seismic event or under other dynamic operating conditions, this event is reportable pursuant to 10CFR50.73(a)(2)(ii)(B) as a condition outside the plant's design basis. These findings were reported per the requirements of 10CFR50.72(b)(2)(i) at 1:55 on April 26, 1989.

This event was only recently identified as reportable when the reportability of the condition was reevaluated during a review/closeout of open action items related to previously identified plant conditions. This review was being conducted as part of a plant improvement program to convert to a new system for identifying and reporting events or conditions and implementing appropriate corrective actions. This new system is receiving additional review to determine if the process can be further enhanced to improve the timeliness of reportability determinations to prevent the recurrence of late reporting and LER submittals such as occurred for this event.

F. Corrective Actions

The subject piping clamp was replaced with a redesigned clamp that met the analyzed system requirements. This was accomplished prior to plant heatup following identification of the discrepancy.

Considering the root cause and future planned system modifications, a re-analysis (including seismic) of the pressurizer LTOP and safety relief valve discharge piping using new modelling techniques was performed. This reanalysis included the following items:

- (1) Incorporation of the as-built discrepancies identified and reconciled by engineering evaluations.
- (2) Incorporation of new design specifications and a review of existing system design assumptions and criteria.
- (3) Consideration of design improvements planned for incorporation in the future.

The results of the seismic analysis showed three areas of potential overstress. However, an operability assessment verified that the present system configuration remained operable.

With respect to the process used to develop and implement plant modifications at ANO, significant changes in this process have been accomplished over the past several years. Improvements have been made in areas such as design development, review, and post modification inspection. Also, a project structured to reconcile safety-related piping isometric and hanger drawings with the as-built condition of the plant was begun in late 1987. These programmatic improvements should assist in the prevention of recurrence and the identification of these type events.

G. Additional Information

A similar event in which the as-built configuration of a piping support deviated from the design drawings as a result of an inadequate modifications process was reported in LER 50-313/88-011-00.

Energy Industry Identification System (EIIS) codes are identified in the text as [XX].