



**Entergy
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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. 50-368/90-022-00

Gentlemen:

In accordance with 10CFR50.73(a)(2)(ii)(B) attached is the subject report concerning seismic qualification deficiencies with cooling units located in engineered safety features electrical switchgear rooms due to improper bolting of cooling coil mounting brackets caused by inadequate work instructions during coil replacement. A supplement will be submitted by December 11, 1990.

Very truly yours,

James J. Fisicaro

James J. Fisicaro
Manager, Licensing

JJF/LAT/sgw
Attachment

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Arkansas Nuclear One, Unit Two

DOCKET NUMBER (2)	PAGE (3)
050003681	OF05

TITLE (4) Switchgear Room Cooling Units Not Seismically Qualified Due to Improper Bolting of Cooling Coil Mounting Brackets Caused by Inadequate Work Instructions During Coil Replacement

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 Names	Docket Number(s)																
0	9	2	6	9	0	9	0	--	0	2	2	--	0	0	1	1	1	9	9	0	0	5	0	0	0	0

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

POWER LEVEL (10)	1	0	0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
				20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
				20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	Other (Specify in
				20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	Abstract below and
				20.405(a)(1)(iv)	X 50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	in Text, NRC Form
				20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	366A)

LICENSEE CONTACT FOR THIS LER (12)

Name	Telephone Number
Larry A. Taylor, Nuclear Safety and Licensing Specialist	Area Code: 501964-5000

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

Cause	System	Component	Manufacturer	Reportable to NERDS	Cause	System	Component	Manufacturer	Reportable to NERDS

SUPPLEMENT REPORT EXPECTED (14)

EXPECTED SUBMISSION DATE (15)	Month	Day	Year
<input checked="" type="checkbox"/> Yes (If yes, complete Expected Submission Date) <input type="checkbox"/> No	1	2	1 9 0

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

On September 24, 1990, maintenance personnel noticed that coil unit mounting brackets were not properly installed on the fan side of the Service Water System (SW) Switchgear Room Unit Coolers 2VUC-2B and 2VUC-2D. A subsequent inspection conducted on September 26, 1990, revealed that mounting brackets were installed on the filter side of the coil units; however only three bolts instead of the required eight bolts were installed. Further engineering analyses are underway to provide seismic modeling of the coils. The results of these analyses will determine the safety significance and the potential for room flooding. The affected coolers were drained until proper bolting was installed. The condition appears to have originated with maintenance performed in April, 1985, involving replacement of the coil units. The root cause of the condition was determined to be inadequate work instructions describing proper bracket and bolt installation. An evaluation of the planner's Desk Guide will be performed to determine what improved criteria should be provided to planners to ensure seismic requirements are maintained.

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

A. Plant Status

At the time of discovery of this condition on September 24, 1990, Arkansas Nuclear One, Unit Two (ANO-2) was operating at 100 percent of rated thermal power. Reactor Coolant System (RCS)[AB] pressure was approximately 2250 psia and RCS average temperature was approximately 580 degrees Fahrenheit.

B. Event Description

On September 24, 1990, at approximately 0800 hours, maintenance personnel performing a routine Preventive Maintenance (PM) inspection of Engineered Safety Features (ESF) electrical switchgear room unit coolers noticed that mounting bracket bolts were missing from the fan side (air outlet) of the cooling coil for unit cooler 2VUC-2B. Also the mounting bracket and bolts were discovered to be missing from the fan side of the cooling coil on cooler 2VUC-2D. These units, manufactured by American Air Filter (AAF) are model H-9-LPAC-YA air handling units. They are supplied with cooling water from the Service Water System (SWS) [BI]. Switchgear Room 2100 is normally cooled by coolers 2VUC-2A and 2VUC-2B, while Switchgear Room 2101 is normally cooled by coolers 2VUC-2C and 2VUC-2D.

Upon discovery of this condition the vendor was contacted to discuss the mounting requirements for the cooling coils. The AAF representative stated that the coils were seismically qualified based only on the air filter side mounting hardware being in place. Following these discussions a job order was issued to inspect the filter side (air inlet) of the coils to verify that proper mounting hardware was installed. On September 26, 1990, this inspection was conducted. The inspection revealed the proper mounting brackets were present; however, only three self-tapping bolts (two at the bottom corners of the coil unit and one in the upper right corner) instead of the required eight self-tapping bolts were installed in the mounting brackets for each cooler's coil unit. With only three bolts, the integrity of the room cooler coil units following a seismic event was questioned. Investigations revealed that the original seismic qualification of the room coolers was based upon "shaker" tests. The "shaker" tests were performed with coils properly secured with eight mounting bracket bolts, therefore, the impact of having only three bolts was not addressed. It was, therefore, concluded that integrity of the coils following a seismic event could not be assured.

Following the inspection, both room coolers were immediately removed from service and drained to preclude any postulated room flooding due to coil failure during or following a seismic event. There were no Seismic Category II over I concerns as the coils would be contained by the unit housings, which remained seismically mounted. Engineering evaluations were initiated to determine the potential impact of coil failure on vital electrical equipment contained in the Switchgear Rooms.

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On September 27, 1990, the mounting brackets were properly restored to their design condition by the addition of the missing bolts and the room cooler units were subsequently returned to service. Additionally, on September 28, 1990 the remaining Switchgear Room Unit Coolers 2VUC-2A and 2VUC-2C were inspected. Mounting brackets for the coil units were determined to be adequately installed.

C. Root Cause

This condition appears to have originated during replacement of the cooling coils in April of 1985. The coils and mounting brackets for 2VUC-2B and 2VUC-2D were removed and replaced with new coils and mounting brackets by personnel in the modifications organization at ANO. The root cause of the improper bracket installation was determined to be inadequate written work instructions for replacement of the cooling coils. The job orders were the only written instructions provided and these did not contain sufficiently detailed information to ensure the coils were properly reinstalled with the necessary mounting bracket bolting material to maintain proper seismic support. The job orders only specified that the coils be replaced. Detailed instructions on the number and location of bolts were not specified as part of the work instructions. The new coil brackets required drilling for bolt installation, so bolting requirements were not obvious to personnel performing the work. Vendor prints providing detailed bolting information were not available during the April, 1985, time frame.

D. Corrective Actions

Upon identification of the inadequate bolting on September 26, 1990, the affected room cooler units were immediately tagged and drained. The mounting brackets were drilled and the proper number of bolts were installed on September 27, 1990, thereby returning the units to their design condition. Redundant unit coolers 2VUC-2A and 2VUC-2C were inspected on September 28, 1990, and found to have adequately installed seismic supports.

An inspection of AAF room cooling units with replacement coils had been previously planned as a result of an unrelated ASME code bolting issue. These inspections will ensure the proper number, size and type of bolts are installed. Inspections of ANO-2 AAF coolers will be completed by April 1, 1991. A sampling of other safety-related coolers was performed. The results of this inspection did not identify any seismic bolting deficiencies. Although ASME code compliance is not required for Unit 1 room coolers, AAF room cooling units with replacement coils are currently being inspected during the refueling outage (1R9).

As evidenced by the fact that discovery of this condition was made by ANO maintenance personnel performing a routine PM activity, awareness of ANO personnel to the existence of this type of deficiency has increased since the time period when this condition occurred. In order to provide even more sensitivity to seismic qualification requirements for plant equipment, this event will be reviewed with ANO maintenance, modification and planning personnel. This action will be completed by December 31, 1990.

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Additionally, in order to help preclude future occurrence, applicable vendor print information containing seismic bolting requirements will be added to the SIMS component data base for the ANO-2 Switchgear Room Coolers, if warranted. This action will be completed by December 15, 1990. Additionally, an evaluation of the maintenance planner's Desk Guide will be performed to determine what improved criteria should be provided to planners to assure that seismic requirements are identified as part of the planning process. This evaluation is scheduled for completion by January 31, 1991.

E. Safety Significance

Switchgear Room 2100 houses the 2A4 ESF 4160 Switchgear Bus. The room also contains the 2B6 4160V/480V Transformer and the 2B6 ESF 480V Load Center. Additionally, one of the four 480V ESF Motor Control Centers (MCC) fed from the 2B6 Load Center is in Room 2100 (MCC 2B64). Room 2101 contains the redundant electrical equipment to that contained in Room 2100, including the 2A3 ESF 4160V Switchgear Bus, the 2B5 4160V/480V Transformer, the 2B5 ESF 480V Load Center and the 2B54 ESF 480V MCC.

Normal room cooling for both Switchgear Rooms is provided by the room cooler units. Room coolers 2VUC-2A and 2VUC-2B, which are fed by Service Water Loop II, supply normal cooling for Room 2100. Room coolers 2VUC-2C and 2VUC-2D, which are fed by Service Water Loop I, provide normal cooling for Room 2101. These room coolers are not required for safe shutdown following a design bases accident. Post-DBA room cooling is assumed to be supplied by room exhaust fans located above the rooms.

Leakage from a room cooler unit is designed to accumulate in the bottom of the unit housing. A level switch is supplied to generate a Control Room "Cooler Unit Trouble" alarm in the event of a high water level in the cooler housing; however, this trouble alarm has other inputs (e.g., low fan air flow, etc.). A one inch drain line is provided to route any leakage from the cooler to equipment drains located in the Switchgear Rooms. The cooler drains terminate in an open-ended fashion within larger diameter equipment drain pipes, which are also open-ended and are stubbed about three and one-quarter inches above the room floor. These equipment drains flow into a common four inch drain line.

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Further engineering analyses are underway to provide seismic modeling of the coils. The results of these analyses, will determine the safety significance and the potential for room flooding. The results of these analyses will be provided in a supplement to this report.

F. Basis For Reportability

Because the room cooler coil units were not bolted in accordance with their seismic qualification requirements this condition is considered to be outside the design basis of the plant and is therefore reportable in accordance with 10CFR50.73(a)(2)(ii)(B).

This condition was reported to the NRC Operations Center on October 19, 1990, at 1655 hours, in accordance with 10CFR50.72(b)(1)(ii)(B) and 10CFR50.72(b)(2)(iii)(A).

Event date and reportability date are greater than 30 days apart due to time taken to perform engineering evaluations (e.g., room flooding calculations, review and evaluation of room design and drainage features, assessment of seismic qualifications, etc.).

G. Additional Information

There have been no previous similar events involving inadequate seismic qualification of room coolers.

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