PRIORITY

(ACCELERATED RIDS PROCESSING)

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9511130289 DOC.DATE: 95/11/07 NOTARIZED: NO DOCKET #
FACIL:50-315 Donald C. Cook Nuclear Power Plant, Unit 1, Indiana M 05000315
AUTH.NAME AUTHOR AFFILIATION
WEBER,G.A. Indiana Michigan Power Co. (formerly Indiana & Michigan Ele
BLIND,A.A. Indiana Michigan Power Co. (formerly Indiana & Michigan Ele
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 95-007-01:on 950825,Conax seal assemblies on RV Post-Accident Vent SVs 1-NSO-21 & 1-NSO-23 found loose.Missing ferrules for 1-NSO-21 & 1-NSO-23 replaced.Determined event not reportable & LER 95-007-00 cancelled.W/951107 ltr.

DISTRIBUTION CODE: IE22T COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 7
TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
	PD3-1 PD	1	1	HICKMAN,J	1	1
INTERNAL:	~~AEOD/SPD/RAB~~	2	2	AEOD/SPD/RRAB	1	1
	FILE CENTER	1	1	NRR/DE/ECGB	1	1
	~~NRR/DE/EELB~~	1	1	NRR/DE/EMEB	1	1
	NRR/DRCH/HHFB	1	1	NRR/DRCH/HICB	1	1
	NRR/DRCH/HOLB	1	1	NRR/DRCH/HQMB	1	1
	NRR/DRPM/PECB	1	1	NRR/DSSA/SPLB	1	1
	NRR/DSSA/SPSB/B	1	1	NRR/DSSA/SRXB	1	1
	RES/DSIR/EIB	1	1	RGN3 FILE 01	1	1
EXTERNAL:	L ST LOBBY WARD	1	1	LITCO BRYCE,J H	2	2
	NOAC MURPHY,G.A	1	1	NOAC POORE,W.	1	1
	NRC PDR	1	1	NUDOCS FULL TXT	1	1

NOTE TO ALL "RIDS" RECIPIENTS:
PLEASE HELP US TO REDUCE WASTE! CONTACT THE DOCUMENT CONTROL DESK, ROOM OWFN 5D8 (415-2083) TO ELIMINATE YOUR NAME FROM DISTRIBUTION LISTS FOR DOCUMENTS YOU DON'T NEED!

FULL TEXT CONVERSION REQUIRED
TOTAL NUMBER OF COPIES REQUIRED: LTTR 26 ENCL 26

PRIORITY 1 DOCUMENT

Indiana Michigan
Power Company
Cook Nuclear Plant
One Cook Place
Bridgman, MI 49106
616 465 5901

AEP
INDIANA
MICHIGAN
POWER

November 7, 1995

United States Nuclear Regulatory Commission
Document Control Desk
Rockville, Maryland 20852

Operating Licenses DPR-58
Docket No. 50-315

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:

95-007-01

Sincerely,

A. A. Blind
Plant Manager

/clc

Attachment

c: H. J. Miller, Region III
E. E. Fitzpatrick
P. A. Barrett
R. F. Kroeger
M. A. Bailey - Ft. Wayne
S. J. Brewer
J. R. Padgett
G. Charnoff, Esq.
D. Hahn
Records Center, INPO
NRC Resident Inspector

IE22
1/1

9511130289 951107
PDR ADOCK 05000315
S PDR

NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

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

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Donald C. Cook Nuclear Plant - Unit 1	05000 315	1 OF 6

TITLE (4)
Cancellation of LER 315/95-007-00

EVENT DATE (5)			LER NUMBER (6)			REPORT NUMBER (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
									Cook - Unit 2	05000 316
08	25	95	95	-- 007 --	01	11	07	95	FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9)	6	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)			
POWER LEVEL (10)	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
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	(Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
G. A. Weber - Plant Engineering Superintendent	616/465-5901, x2511

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

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO				

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

On August 25, 1995, at 2000 hours with Unit 1 in Mode 6, Conax seal assemblies on Reactor Vessel Post-Accident Vent Solenoid Valves 1-NSO-21 and 1-NSO-23 were found to be loose. Further inspection revealed that both of these assemblies were missing a midlock ferrule, which provides the Environmentally Qualified (EQ) seal when appropriately torqued. A review of the design change package that originally installed these Conax seal assemblies to the head vents revealed the Unit 1 and Unit 2 Reactor Vessel Post-Accident Vent Solenoid Valves and Pressurizer Post-Accident Vent Solenoid Valves were inadequately torqued. Two other EQ installation anomalies were also discovered during this evolution involving the Acoustic Valve Monitoring System (AVMS) Conax assemblies and the Pressurizer Pressure Relief Valves' Namco limit switch Conax assemblies.

An interim LER was submitted on September 25, 1995, under 10CFR50.73(a)(2)(v). LER 95-007-00 stated that corrective actions had been taken for the anomalies identified in Unit 2. At that time, further investigation was in progress to resolve the EQ seal issue, including any generic issue concerning the installation of EQ equipment. Upon completion of the investigation, a revision to LER 95-007-00 was to be submitted.

The investigation has been completed, and it has been determined that this event is not reportable. This submittal outlines the evaluation performed to reach and support the conclusion of "Not Reportable", and serves to cancel LER 95-007-00.

Description of Event

On August 25, 1995, Conax seal assemblies on Reactor Vessel Post-Accident Vent Solenoid Valves 1-NSO-21 (EIIS/IP-PSV) and 1-NSO-23 (EIIS/IP-PSV) were found loose. The breakaway torque values on these two assemblies were between 120 and 140 foot-pounds (ft-lbs). The torque, which provides the environmental qualification (EQ) seal, should have been approximately 220 to 250 ft-lbs. On August 31, 1995, a review of the installation design change package revealed that the Conax seal assemblies for both the Unit 1 and Unit 2 Reactor Vessel Post-Accident Vent Solenoid Valves and Pressurizer Post-Accident Vent Solenoid Valves were incorrectly torqued. The procedure specified a torque value of 220-250 ft-lbs, but the plant installation torque value was recorded as 69 ft-lbs on Unit 2 and 68 ft-lbs on Unit 1. When 1-NSO-21 and 1-NSO-23 were disassembled, the midlock ferrules were missing. When the remaining two NSO valves, 1-NSO-22 (EIIS/IP-PSV) and 1-NSO-24 (EIIS/IP-PSV) were inspected, the ferrules were present, but the breakaway torques were insufficient.

During this same period, it was identified that new Namco limit switches and Conax seal assemblies had recently been installed on the Unit 1 Pressurizer Pressure Relief Valves and had not been torqued to the Conax specifications. There are three Pressurizer Pressure Relief Valves per unit, 1-NRV-151, 1-NRV-152, 1-NRV-153, 2-NRV-151, 2-NRV-152, and 2-NRV-153 (EIIS/AB-RV), each with two limit switch assemblies per valve for a total of 12 Conax seal assemblies. A review of the maintenance practices revealed that the midlock cap to seal body connection had not been reassembled correctly. The seal body to device assembly, however, had been adequately torqued to 84 foot-pounds.

The Conax seal assemblies for the Unit 1 and Unit 2 AVMS were also inspected for proper installation. It was determined that three of the eight Conax seal assemblies in Unit 2 were missing ferrules on the Kapton wire assembly. No ferrules were missing on the coax cable assembly or on the Unit 1 AVMS assemblies. While disassembling the Unit 2 assemblies to add the missing ferrules, duct tape was found inside the assemblies where the ferrules should have been located. During reassembly of the seal body to device connection, the seal body threaded all the way into the junction box without tightening. The thread in the junction box was discovered to be a straight tap, as opposed to an NPT thread type. A qualified connection could not be established into the junction box. Subsequently, an inspection performed on the other Conax seal assemblies in Unit 1 and Unit 2 determined that the same type of connection had been installed, resulting in an inadequate connection.

Evaluation

10CFR50.49 requires all EQ devices, seals, etc. be tested to prove they will function in the accident environment for which they are needed to mitigate. It was determined that the Conax assemblies had not been installed to the manufacturer's specifications. These specifications ensure the EQ requirements are satisfied. The inadequate torque values and installation deficiencies effectively invalidated the environmental qualification seal for the Conax assembly. The vendor, Conax Buffalo, was contacted concerning this event, and concluded the missing ferrules and torque values applied by the plant were not compatible with any of their tested configurations, and therefore could not be considered environmentally qualified.

Evaluation (cont'd)

The purpose of the Conax seal assembly is to seal the valve enclosure against a potential steam and chemical spray environment that would be generated following a small LOCA TMI-type event.

Unit 1 and Unit 2 NSOs

The Conax seal assemblies for the Target Rock solenoid valves were found installed at a variance with the manufacturer's instructions. Specifically, two midlock ferrules were missing, and the applied torques for the sealed connections were less than that specified by the manufacturer.

Environmental testing to verify qualification of the valves had subjected the sealed enclosure to a harsh, high temperature steam (420° F), and chemical spray environment. The testing used IEEE 323-1974 stringent conditions designed to envelope the worst such conditions that could be found in the industry. At the Cook Plant, for this type of accident and the location of the components, conditions are relatively mild by comparison (230° F steam and no chemical spray conditions). In addition, the valves were tested at their end-of-life condition, but at the Cook Plant, the solenoid assembly and reed switch assembly are replaced every refueling outage. Since they are qualified for 28 months, they are relatively new in comparison with the tested valves when they are removed from service.

The presence of the seal assembly midlock cap indicates a closed enclosure, though not a sealed one since a ferrule was missing on two of the 16 assemblies (both units). However, none of the enclosures were completely open to the atmosphere. In addition:

1) the solenoids are high temperature, high pressure epoxied coils,
2) the reed switches are glass enclosed, magnetic type, and
3) the cable connections to coils and switches are qualified Raychem splices.

Given the quality of the electrical equipment and the relatively mild post-accident conditions, it is unlikely that the absence of an absolute sealing condition would have been sufficient to fail the operation of the system.

It was concluded that these solenoid operated vent valves would have achieved their intended function if they had been needed. The as found configuration of the Conax seal assembly would have prevented the solenoid vent valve enclosure from being directly exposed to the surrounding environment. However, the as found configuration of the Conax seal assemblies did not provide the sealing capability of a seal assembly installed in accordance with the equipment's EQ basis. Moisture intrusion is considered to be unlikely because of the location of the solenoid valve enclosures, on the top of the reactor and the pressurizer vessels, where there is no direct fluid impingement. Moisture may condense on the surface of the conduit, but, lacking a high differential pressure, it is improbable that the liquid would have entered the solenoid vent valve enclosure.

Evaluation (cont'd)

Based on the above review, AEPSC Nuclear Licensing and Fuels concludes that these solenoid operated valves would have functioned to achieve their intended function, and so this condition does not represent a significant challenge to the public health and safety.

Unit 1 and Unit 2 AVMS

The AVMS Conax seal assemblies were improperly installed. The connections from the seal assembly into the Crouse-Hinds box for all of the charge converters were not NPT entrances, and therefore, the intended environmental seal was not established.

The AVMS deficiency involved the sealing of the enclosure in which the charge converter for the system is contained. The only identified event where the AVMS would be exposed to a harsh environment is a feedwater line break. There is no specific analysis for the temperature and pressure inside containment following a feedwater line break. However, because the values of the reactor coolant enthalpy and the feedwater enthalpy are similar (both on the order of 500-600 BTU/LB), the temperature inside containment would be expected to be similar. Because of the lower mass flow from a feedwater line break, the pressure would be expected to be lower than that resulting form a reactor coolant system line break. The maximum temperature for a reactor coolant system line break is approximately 230° F and the peak pressure is approximately 12 psig.

A known failure of the charge converter (an older model than used at the Cook Plant) occurred during a test when the system was exposed to chemical spray, temperatures as high as 465° F and pressure as high as 88 psig. During this test, moisture intrusion into the enclosure occurred; however, the failure was attributed to thermal effects rather than moisture intrusion.

The newer model, which has improved thermal capabilities and was placed in an insulated enclosure, was pre-aged at 212° F prior to being subjected to the transient test. Of note is the fact that the pre-aging temperature does not differ significantly from the expected accident temperature. Thus, the conditions under which the newer model was tested are far more severe than the conditions that would be expected during an accident in which the AVMS would be required to function.

Though the environmental protection of the charge converters was in a degraded condition, they are installed within a bulky NEMA 4 box protecting them against thermal shock and direct water impact. Based on the test profile and the relatively mild conditions that would result from an inside containment feedwater line break, the AEPSC Nuclear Licensing and Fuels Section, and the AEPSC NED Section concludes that the charge converters would have functioned to achieve their intended function, and so this condition does not represent a significant challenge to the public health and safety.

Evaluation (cont'd)

Unit 1 and Unit 2 NRVs

The deficiency associated with the NRV limit switch installation was restricted to the use of lower torque values on the "swage" connection rather than those specified by the seal assembly manufacturer (Conax).

Tests performed by Conax on September 12, 1995 at 40 ft-lbs torque found that even at such low torque values the seal was still perfectly made. Using 5, 10, 15, and 20 psig (1 x E-6 cc helium), leakage at all four pressure ranges was in the order of 1 x E-10. Since the NRV limit switches for 2-NRV-151 had torque values below the 40 ft-lbs range, AEPSC is still uncertain as to the absolute quality of this connection. However, considering that these limit switches would not be subjected to chemical spray in their location inside the pressurizer doghouse, and that, they would have been protected from the impact of the post-accident environment, AEPSC Nuclear Licensing and Fuels Section, and the AEPSC NED Section determined that the degraded condition of the seals did not adversely impact plant safety. It was concluded that the limit switches would have functioned to achieve their intended function, and so this condition does not represent a significant challenge to the public health and safety.

Conclusions

Bases on the analyses, it was concluded that the components would not have failed even though the EQ configuration was not per design. Therefore, this event is not reportable under 10CFR50.73. This document shall serve to cancel LER 95-007-00.

The following information on corrective actions is provided for document completeness.

Corrective Actions

The missing ferrules for 1-NSO-21 and 1-NSO-23 were replaced. The feedthrough was examined for nicks, gouges, and defects per Conax Buffalo's instruction. Both barrels were in satisfactory condition. Both the seal body to device connection and the midlock cap to seal body connection were retorqued to the Target Rock solenoids.

The procedures that direct work activities on the NSO valves were revised. Directions were added to ensure the torque value for the seal body to device connection follows the instruction as defined by Conax installation manual. In addition, directions were added to ensure that the midlock cap to seal body connection is retorqued to a specified value if the connection is ever broken. A drawing of the Conax assembly with all the parts, connection specifics, and orientation has been added to the procedure.

Corrective Actions (cont'd)

Both the seal body to device and the midlock cap to seal body connections for the Pressurizer Pressure Relief Valve Namco Limit Switch Conax Assemblies were torqued to the values specified in the Conax installation manual.

An EQ Preservation Document will be revised to make note of the special torque requirement on the Conax seal assembly attributes. In addition, a procedure will be developed to address the EQ maintenance process concerning the Pressurizer Pressure Relief Valve Namco Limit Switch Conax Assemblies.

The AVMS torques for the midlock cap to seal body swaged connections were performed per the Conax manufacturer guidance. The seal body to enclosure connections to the Crouse-Hinds box were modified to provide an acceptable environmentally qualified seal.

An EQ Preservation Document will be issued to make special note of the Conax seal assemblies' attributes for the AVMS Conax installations. In addition, the Acoustic Valve Monitor System Test procedure will be revised to include EQ maintenance process concerning the AVMS Conax installations.

The design change process has been changed since the initial installation of these EQ components. These revisions to the process have incorporated requirements which will help to preclude recurrence of this problem. No changes were made to the design change process as a result of this event.

A comprehensive review was performed of all other EQ components to identify any additional generic installation problems. An independent QA audit was performed to determine if there are generic installation problems stemming from the original installation of EQ components. No additional generic EQ installations problems were found.

In conclusion, the subject event is not reportable under the LER system. This condition did not constitute operation prohibited by Technical Specifications nor did it result in an unanalyzed condition that significantly compromised plant safety.