**Stephen B. Bram**
Vice President

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July 4, 1991

Re: Indian Point Unit No. 2
Docket No. 50-247
LER 91-09-00

Document Control Desk
US Nuclear Regulatory Commission
Mail Station P1-137
Washington, DC 20555

The attached Licensee Event Report LER 91-09-00 is hereby submitted in accordance with the requirements of 10 CFR 50.73.

Very truly yours,

Attachment

cc: Mr. Thomas T. Martin
Regional Administrator - Region I
US Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Mr. Francis J. Williams, Jr., Project Manager
Project Directorate I-1
Division of Reactor Projects I/II
US Nuclear Regulatory Commission
Mail Stop 14B-2
Washington, DC 20555

Senior Resident Inspector
US Nuclear Regulatory Commission
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NRC FORM 366 (6-89)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WTH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

# LICENSEE EVENT REPORT (LER)

| FACILITY NAME (1) | DOCKET NUMBER (2) | PAGE (3) |
|---|---|---|
| Indian Point Unit No. 2 | 0 5 0 0 0 2 4 7 | 1 OF 0 4 |

TITLE (4)

Improper Installation of CONAX Connectors

| 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 6 | 0 5 | 9 1 | 9 1 | — 0 0 9 | — 0 0 | 0 7 | 0 4 | 9 1 | | 0 5 0 0 0 |
| | | | | | | | | | | 0 5 0 0 0 |

| OPERATING MODE (9) | N | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11) | | | |
|---|---|---|---|---|---|
| POWER LEVEL (10) | 0 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) | X OTHER (Specify in Abstract below and in Text, NRC Form 366A) |
| | | 20.405(a)(1)(iii) | 50.73(a)(2)(i) | 50.73(a)(2)(viii)(A) | |
| | | 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 |
|---|---|
| | AREA CODE |
| John R. Ellwanger, Principal Engineer | 9 1 4 5 2 6 - 5 1 8 2 |

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

| CAUSE | SYSTEM | COMPONENT | MANUFAC-TURER | REPORTABLE TO NPRDS | | CAUSE | SYSTEM | COMPONENT | MANUFAC-TURER | 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 fifteen single-space typewritten lines) (16)


During a planned preventive maintenance procedure for the limit switches associated with the Steam Generator Blowdown (SGBD) Containment isolation valves, it was determined that Conax connectors associated with limit switches were installed incorrectly. At the time of discovery the plant was at cold shutdown for a refueling outage. An evaluation of the Conax connector installation was initiated for those associated with the solenoid operated valves (SOVs) controlling operation of the SGBD isolation valves and subsequently to all installed Conax connectors. All 46 Conax connectors currently in service are located external to containment. Other equipment served by the Conax connectors include the main steam isolation valves (MSIVs) and associated limit switches as well as the recirculation valves/limit switches for the motor driven auxiliary feedwater pumps.

To determine operability of the "as found" configuration, the connectors together with SOVs/limit switches were subjected to functional testing in the "as found condition", with positive results being obtained. Test parameters enveloped the environment which would be seen under postulated accident scenarios. Accordingly, despite the discrepancy in the installed configuration, it was determined that all safety functions would have been fulfilled.

PLANT AND SYSTEM IDENTIFICATION:

Westinghouse 4-Loop Pressurized Water Reactor

IDENTIFICATION OF OCCURRENCE:

Incorrect installation of Conax connectors.

EVENT DATE:

June 5, 1991

REPORT DUE DATE:

July 4, 1991

PAST SIMILAR OCCURRENCE:

None

DESCRIPTION OF OCCURRENCE:

Background

Conax electrical conductor seal assemblies (ECSA) are used to provide environmentally qualified (EQ) connectors. The EQ seal is obtained by compressing a tapered ferrule against a similarly beveled seat within the assembly housing. This compression is obtained by torquing a midlock cap nut, which irreversibly deforms the ferrule around the conductors and their insulating sheaths, thereby creating a permanent seal.

Description

A part of a preplanned preventive maintenance procedure required replacement of limit switches associated with the position of the SGBD containment isolation valves. During the procedure, it was noted that the midlock caps of the ECSAs were not fully tightened and the ferrules were not seated. This condition appeared improper and the Conax installation manual was consulted for guidance. The manufacturer required a torque in the range of 220 to 250 ft-lbs. on the midlock cap to adequately seal the connector.

DESCRIPTION OF OCCURRENCE: (Continued)

The inspection of the ECSAs was initiated for those associated with the SOVs which control the position of the SGBD isolation valves. The ECSAs were found to have been installed in the reverse direction; the midlock cap was attached directly to the device as opposed to the sealbody, thereby having the EQ seal away from the device which is to be environmentally qualified. Upon disassembly of the ECSAs, several additional anomalies concerning ferrules were found. These included ferrules inserted in the wrong direction and/or misplacement of the ferrules such that compression/seal formation would not occur. A total of 24 ECSAs were associated with the 8 SGBD isolation valves; one for each of 8 SOVs and one for each of 16 limit switches.

The remaining 22 ECSAs installed were inspected. All ECSAs were installed external to containment. These remaining ECSAs were associated with 4 main steam isolation valves - one for each of 16 SOVs; and 2 motor driven auxiliary feedwater pump recirculation valves - one for each of two SOVs and one for each of 4 limit switches. Similar to earlier findings, all the ECSAs were found to have been improperly torqued and a number evidenced a reversal in the ECSA assembly.

Technical data was available for the NAMCO limit switches which indicated that these limit switches would remain operable despite extensive exposure to water. On this basis four samples (2 limit switches and 2 SOVs with associated ECSAs) were tested in the "as found" configurations. The environmental parameters and test duration - 4 psig, saturated steam subsequently superheated to 264°F and held for one hour - enveloped the worst environment that the equipment would be subjected to in the accident scenario. Throughout the one hour test, the limit switches and SOVs functioned reliably thereby demonstrating operability in the "as found" configuration.

ANALYSIS OF OCCURRENCE:

Since the SOVs and limit switches functioned acceptably during the environmental testing of the "as found" configuration, it is concluded that all safety related equipment was operable in the past. Thus, there was no impact upon the health and safety of the public.

CAUSE OF OCCURRENCE:

As a result of the nonconformances, a review was conducted of the work packages for the original installation in 1982. This documentation contained no installation instructions for Conax ECSAs. An Engineering document did acknowledge acceptance of a reversed Conax coupling for the MSIV SOVs which came about as a result of then existing field conditions. The thread size of the midlock cap (1" male NPT) matched that of the SOV female NPTs. Engineering justification for approval of the field condition was documented.

It is thus concluded that the Conax ECSAs were installed improperly in 1982 as a result of inadequate installation instructions and faulty workmanship.

CORRECTIVE ACTION:

All Conax connectors presently conform to their "Environmental" configuration, thus assuring operability under possible future adverse conditions.

For the past several years, increased emphasis has been placed upon the importance of maintaining environmentally qualified installations. Consequently, it is believed that this is a singular occurrence that would not be repeated in the future. In place programs for extensive training, preventive maintenance and inspections provide reasonable assurance against a repeat occurrence.