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November 26, 2002

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Subject: Oconee Nuclear Station
Docket Nos. 50-269,-270, -287
Licensee Event Report 270/2002-01, Revision 0
Problem Investigation Process No.: O-02-5220

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a)(1) and (d), attached is Licensee Event Report 270/2002-01, Revision 0, concerning operation in a condition prohibited by Technical Specifications. Specifically, 2LP-9, a valve in the cross over line between the two independent Low Pressure Injection headers, was manually inoperable longer than allowed by specification due to interference between a hanger and a handle on the valve handwheel. 2LP-9 remained electrically operable during the event.

This report is being submitted in accordance with 10 CFR 50.73 (a)(2)(i)(B). This event is considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

R. A. Jones

IE22

Attachment

cc: Mr. Luis A. Reyes
Administrator, Region II
U.S. Nuclear Regulatory Commission
61 Forsyth Street, S. W., Suite 23T85
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Mr. L. N. Olshan
Project Manager
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Mr. M. C. Shannon
NRC Senior Resident Inspector
Oconee Nuclear Station

INPO (via E-mail)

NRC FORM 366 (7-2001) U.S. NUCLEAR REGULATORY COMMISSION

# LICENSEE EVENT REPORT (LER)

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

APPROVED BY OMB NO. 3150-0104 EXPIRES 7-31-2004

Estimated burden per response to comply with this mandatory information collection request. 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

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4. TITLE

Tech Spec Valve Manually Inoperable due to Mechanical Interference

| 5. EVENT DATE | | | 6. LER NUMBER | | | 7. REPORT DATE | | | 8. OTHER FACILITIES INVOLVED | |
|---|---|---|---|---|---|---|---|---|---|---|
| MO | DAY | YEAR | YEAR | SEQUENTIAL NUMBER | REV NO | MO | DAY | YEAR | FACILITY NAME | DOCKET NUMBER |
| 10 | 03 | 02 | 2002 | - 01 | - 00 | 11 | 26 | 2002 | None | |
| | | | | | | | | | FACILITY NAME | DOCKET NUMBER |

| 9. OPERATING MODE | 1 |
|---|---|
| 10. POWER LEVEL | 100 |

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)

| | | | |
|---|---|---|---|
| 20.2201(b) | 20.2203(a)(3)(ii) | 50.73(a)(2)(ii)(B) | 50.73(a)(2)(ix)(A) |
| 20.2201(d) | 20 2203(a)(4) | 50.73(a)(2)(iii) | 50.73(a)(2)(x) |
| 20 2203(a)(1) | 50 36(c)(1)(i)(A) | 50 73(a)(2)(iv)(A) | 73.71(a)(4) |
| 20 2203(a)(2)(i) | 50 36(c)(1)(ii)(A) | 50 73(a)(2)(v)(A) | 73 71(a)(5) |
| 20 2203(a)(2)(ii) | 50 36(c)(2) | 50.73(a)(2)(v)(B) | OTHER Specify in Abstract below or in NRC Form 366A |
| 20 2203(a)(2)(iii) | 50 46(a)(3)(ii) | 50 73(a)(2)(v)(C) | |
| 20 2203(a)(2)(iv) | 50.73(a)(2)(i)(A) | 50.73(a)(2)(v)(D) | |
| 20.2203(a)(2)(v) X | 50.73(a)(2)(i)(B) | 50.73(a)(2)(vii) | |
| 20.2203(a)(2)(vi) | 50.73(a)(2)(i)(C) | 50 73(a)(2)(viii)(A) | |
| 20.2203(a)(3)(i) | 50 73(a)(2)(ii)(A) | 50.73(a)(2)(viii)(B) | |

12. LICENSEE CONTACT FOR THIS LER

| NAME | TELEPHONE NUMBER (Include Area Code) |
|---|---|
| L.E. Nicholson, Regulatory Compliance Manager | (864) 885-3292 |

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

| CAUSE | SYSTEM | COMPONENT | MANU-FACTURER | REPORTABLE TO EPIX | CAUSE | SYSTEM | COMPONENT | MANU-FACTURER | REPORTABLE TO EPIX |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

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

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


On 10-3-02, with Unit 2 operating at 100% in Mode 1, Maintenance personnel performing a routine Preventive Maintenance lubrication procedure discovered that 2LP-9 could not be manually operated, as required by Technical Specification 3.5.3, due to interference between a handle on the handwheel and a hanger. Operations and Engineering were contacted. Engineering determined that the handle is not a requirement for operation. The handle was removed from the handwheel, allowing the valve to be manually opened.

Investigation found that the interference had existed since a larger operator was installed on the valve in May, 2001. The cause was a design oversight during the development of the modification. Appropriate personnel have been counseled.

A contributing factor was that a manual stroke test, part of the Post-Modification Test plan, was performed after the hanger was removed due to emergent work needed to facilitate additional testing. Additional personnel will receive awareness training on this event.

This event is considered to have no significance with respect to the health and safety of the public.

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

EVALUATION:
BACKGROUND

This event is reportable per 10CFR 50.73(a)(2)(i)(B)as operation in a condition prohibited by Technical Specifications (TS).

The Low Pressure Injection (LPI) System [EIIS:BP] is used for decay heat removal and as a portion of the Emergency Core Cooling System.

2LP-9 and 2LP-10 are motor operated valves used for LPI discharge header crossover isolation. 2LP-9 and 2LP-10 are maintained closed to isolate the discharge headers of the LPI pumps in Modes 1, 2 and 3, which require operability of two independent trains of LPI.

For a Core Flood line Loss Of Coolant Accident (LOCA) assuming a single failure of the LPI train associated with the intact Core Flood line, one High Pressure Injection (HPI) [EIIS:BG] train and one Core Flood Tank will provide "adequate" core cooling in the short term. However, for that scenario, 2LP-9 and 2LP-10 are credited to open to supply "abundant" long term core cooling flow by cross connecting an operable LPI pump to the vessel through the intact LPI header. If the crossover valves cannot be opened, the LPI to HPI "Piggyback" alignment can provide sufficient flow to cool the core.

TS 3.5.3 requires 2LP-9 to be manually operable in Modes 1, 2 and 3 and Condition B provides a 72 hour completion time if one or more valves in the crossover line are manually inoperable. Surveillance Requirement 3.5.3.7 requires manual stroking of 2LP-9 every 18 months to assure that the valve can be opened in a timely manner even if the capability to operate it from the control room is lost. Previously, Licensee Event Report (LER) 269/1999-07, Revision 1, dated 3-30-2000, reported a potential for high radiation levels at the valve during some scenarios. As a result, the TS 3.5.3 basis was revised to state that the valve is required to be manually operable both remotely (electrically from the control room) and locally (using the handwheel). Also, corrective actions were taken to enhance the remote electrical reliability of 2LP-9 and emergency procedures were revised to give increased reliance on electrical operation of 2LP-9.

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

Prior to this event Unit 2 was operating at 100% power in Mode 1 with no safety systems or components out of service that would have contributed to this event.

EVENT DESCRIPTION

On 10-3-02, at 0446 hours, Operations entered TS 3.5.3, Condition B, because the Unit 2 LPI discharge header crossover line, including 2LP-9, was removed from service for a routine Preventive Maintenance (PM) lubrication procedure.

During the course of performing this PM, the Maintenance crew discovered that 2LP-9 could not be manually operated. The problem was interference between the handle on the handwheel and a hanger which supports a cable tray [EIIS:FA] which runs under the valve and operator. Because of the interference, the handwheel could not be turned a full revolution and, therefore, the valve could not be manually opened.

Engineering was contacted. They noted that the handle is an aid during local manual operation. However, not all actuators have such handles, and the handle is not a requirement for operation. The handle was removed from the handwheel, allowing the handwheel to be rotated. No further action was required to ensure local manual operation of the handwheel and actuator. By design, the handwheel of a Limitorque operator does not turn during electrical operation, so presence or absence of the handle has no impact on electrical operability of the valve.

Following removal of the handle and completion of the PM procedure, Operations exited TS 3.5.3, Condition B, at 1228 hours.

An investigation was performed. As part of the corrective actions from LER 269/1999-07, the electrical valve operators on 2LP-9 and 2LP-10 had been replaced with larger operators (Limitorque model SMB-0-40) during 2EOC18 refueling outage (May, 2001). According to a comparison of vendor drawings, the handle on the new operator extended approximately three inches further from the valve stem center line than the handle on the old operator. Maintenance records indicate that a cable tray support, some cable tray, an instrument tray, and a pipe support/restraint had been temporarily removed to facilitate installation of the new operator on 2LP-9.

On 5-15-01, these items were restored after some valve testing was complete.

On 5-16-01 it was recognized that the cable tray limited access to the valve limit switch compartment. An additional Work Order was created, and the cable tray and it's support were removed again prior to additional system testing. On 05-19-01 a manual stroke test was documented as being successfully performed as a task on the original work order.

5-20-01, after the manual stroke test, the cable tray support was again restored, which created the interference. From that time until the discovery on 10-3-02, 2LP-09 was electrically stroked periodically, with no problems.

CAUSAL FACTORS

The apparent cause of this event is Design Error. The valve operator replacement was made under the "Minor Modification" (MM) program. The Modification Engineering Group prepared the MM package, including required sketches or revised drawings, calculations, implementation instructions, Modification Test Plan (MTP), etc. Modification Engineering personnel visited the job site several times while preparing the MM package and identified other potential interferences. However, the handwheel interference was not recognized. This is considered an oversight due to lack of attention to detail.

A contributing factor which prevented discovery of the problem prior to returning the valve to service in 2001 was the sequence of performance of test activities relative to other tasks. Nuclear System Directive 408, "Testing" defines "Post-Modification Testing" (PMT) as "All appropriate testing (installation tests, functional verifications, and/or retests) performed following a modification to verify that a system, structure or component may be returned to service." In application, PMT is normally performed after all activities are complete that have been identified as possibly affecting the PMT/MTP performance. In this case, a manual stroke test was identified and performed as part of the MTP. Furthermore, the original work order sequenced the manual stroke task after the planned tasks for restoration of interference items which had been removed for ease of installation of the operator. However, because

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

access to the operator limit switch compartment was required during one of the other identified tests, a new work order was generated to remove some of these interference items again. The manual stroke test was performed during the second time period that these items were removed. In this condition the interference between the handwheel handle and the cable tray support was not apparent. The final restoration activities were not recognized as affecting or invalidating the manual stroke test, therefore it was not repeated.

CORRECTIVE ACTIONS

Immediate:

1. Following consultation with Engineering, the handle was permanently removed from the operator handwheel.

Subsequent:

1. Appropriate personnel were counseled on the need to verify dimensional clearances for both operation and maintenance when modifying components.

Planned:

1. Planners in Maintenance, Work Control, and Modification Engineering will review this incident for awareness. Emphasis will be placed on:
   a) the need to fully evaluate and identify which activities have a potential to adversely impact some portion of the component performance,
   b) the need to assure that individual Post Maintenance Testing (PMT) or MTP tasks are performed after all those identified activities that may affect the PMT/MTP performance are complete; and
   c) the need to fully evaluate the impact of emerging tasks on the plan.

2. Appropriate Maintenance Teams and Supervisors will review this incident for awareness. This review will focus on the impact that changing plans and emerging work may have on specified PMT/MTP's.

No corrective actions are considered NRC Commitment items. There are no other NRC Commitment items contained in this LER.

SAFETY ANALYSIS

There is an inherently low probability, conservatively estimated to be less than 1.2E-10/RY, for a scenario which would require local manual operation of 2LP-9. The scenario involves a Core Flood break, a single failure in the LPI train associated with the intact Core Flood line, and an additional single failure affecting the electrical function of 2LP-9. The probability of loss of the electrical function of 2LP-9 is reduced because the load center that supplies power to 2LP-9 is powered from safety busses and will automatically switch to the alternate source if the primary source fails. Therefore, although it is considered non-safety grade, 2LP-9 electrical power is redundant and highly reliable.

Based on the expected low probability that the action could have been required, the risk significance of 2LP-9 not being available for local operation is judged to be insignificant. The risk significance is further reduced when it is considered that should such a scenario actually occur, the LPI to HPI "Piggyback" alignment can provide "adequate" flow to cool the core.

2LP-9 and 2LP-10 are credited to open to supply "abundant" core cooling flow by cross connecting an operable LPI pump to the vessel through the intact header. Since "adequate" flow can be provided, the inability to open 2LP-9 manually results in a loss of margin rather than a loss of safety function.

This event did not include a Safety System Functional Failure. Therefore, there was no actual impact on the health and safety of the public due to this event.

ADDITIONAL INFORMATION

Energy Industry Identification System (EIIS) codes are identified in the Text within brackets [ ].

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There were no releases of radioactive materials, radiation exposures or personnel injuries associated with this event.

This event is not considered reportable under the Equipment Performance and Information Exchange (EPIX) program.

A review of events occurring within the preceding 24 months indicates this is not a recurring event.