

Indian Point 3
Nuclear Power Plant
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L. M. Hill
Resident Manager

November 3, 1994
IPN-94-140

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

SUBJECT: Indian Point 3 Nuclear Power Plant
Docket No. 50-286
License No. DPR-64
Reply to Notice of Violation 50-286/94-21

Dear Sir:

Attachment I to this letter provides the Authority's reply to the subject Notice of Violation. The Authority agrees with the Notice of Violation contained in NRC Region I Inspection Report 50-286/94-21. The new commitments made in this reply are listed in Attachment II.

The second violation involved continuing deficiencies in the area of procedural adherence and attention to detail (human performance). In addition to the actions identified in the enclosed response (Attachment 1), the Authority is currently addressing these issues globally with action plans that are part of the Restart and Continuous Improvement Plan. These action plans are the Procedure Adherence action plan and the recently added Human Performance Enhancement action plan.

If you have any questions, please contact Mr. K. Peters at (914) 736-8029.

Very truly yours,

A handwritten signature in cursive script, appearing to read 'L. M. Hill'.

L. M. Hill
Resident Manager
Indian Point 3 Nuclear Power Plant

Attachments

cc: See next page

9411150048 941103
PDR ADOCK 05000286
Q PDR

Handwritten initials or a signature in the bottom right corner of the page.

cc: Mr. Curtis Cowgill
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U.S. Nuclear Regulatory Commission
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Indian Point 3 Nuclear Power Plant

Reply to Notice of Violation (NRC Region I Inspection 50-286/94-21)

Violation 94-21-01

Degradation of the Emergency Boration Capability of the 31 Boric Acid Transfer System due to Improper Valve Adjustment

10 CFR 50, Appendix B, Criteria V, "Instructions, Procedures, and Drawings," in part, requires that activities affecting quality shall be prescribed by documented instructions, procedures or drawings, and that these activities shall be accomplished in accordance with these instructions, procedures or drawings.

Contrary to the above, prior to May 4, 1994, NYPA personnel performed undocumented and improper valve stem adjustments to the 31 boric acid storage tank recirculation valve (CH-HCV-105). As a result, CH-HCV-105 was fully open when the valve position indicator indicated the valve to be closed. This condition caused a degradation of the emergency boration capability of the 31 boric acid transfer system train under certain conditions.

This is a Severity Level IV Violation.

Response to Violation 94-21-01

The Authority agrees with this violation.

The cause of the event is indeterminate, as discussed below:

- The Authority found no maintenance history on this valve prior to July 1992. A review of the available maintenance history of the subject valve indicated that Instrumentation and Control (I&C) technicians had performed maintenance on the valve in July 1992, during the cycle 8/9 refueling outage, to correct an apparent valve sticking problem. The technicians noted that, although the valve stroked satisfactorily, it did not shut fully. The retest for this maintenance confirmed the findings of the technicians. Additional maintenance was performed on this valve during the current plant outage up to the discovery of the valve stem misadjustment. The Authority cannot determine, by review of the maintenance history and by interviews with the personnel involved with the maintenance activities associated with this valve, what the cause of the event was. The most probable cause of the event was personnel error in performing improper, undocumented maintenance. It was not recognized until May 4, 1994 that the valve stem might have been mis-adjusted.

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Contributing causes of the event are:

- There is no installed flow measurement instrumentation within the Boric Acid Storage Tank (BAST) recirculation flow path. Therefore, no attempt was made to test the throttling characteristics of CH-HCV-105. Such a test would have shown no change in Boric Acid Transfer Pump (BATP) flow rate or outlet pressure versus valve stroke, indicating that the valve's position was not changing.
- A design flaw in the Boric Acid Heat Trace (BAHT) system resulted in frequent blockage (rocking up) of the pressure instrument sensing lines used to measure BATP outlet pressure. This flaw caused difficulties in obtaining reliable data on pump developed head when this instrumentation became rocked up. Thus, a retest using pump developed head to measure the throttling characteristics of CH-HCV-105 would likely have failed to detect a change in outlet pressure even if the valve had functioned properly.

The corrective steps that have been taken and the results achieved:

- 31 BAST recirculation valve stem travel was adjusted and verified to be stroking properly on June 7, 1994.
- The Authority modified the BAHT system. While not performed specifically for this event, this modification corrects the design flaw (rocking up phenomenon) which resulted in the failure to heat the BATP pressure instrumentation sensing lines.

The corrective steps that will be taken to avoid further violations:

- The Boron Injection Tank (BIT) removal modification, including the installation of permanent flow measurement instrumentation, is scheduled to be completed by Construction Services prior to plant startup. This is a repeat of commitment IPN-94-109-01 made in LER 94-008-00.
- Surveillance Test 3PT-Q38, "Boric Acid Transfer Pump Function Test," will be revised to trend pump discharge flow with the BAST recirculation valves at their normal operating position of 25 percent full open. This revision will be completed prior to plant startup. This commitment is tied to the completion of the BIT removal modification. This is a repeat of commitment IPN-94-109-02 made in LER 94-008-00.
- The Maintenance and the I&C Departments will review this event with respect to their departmental specific training regarding these valves and incorporate changes as appropriate. This task will be completed by December 31, 1994. This is a repeat of commitment IPN-94-109-03 made in LER 94-008-00.

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- The Maintenance valve engineer will brief the Maintenance Department supervisors and mechanics on the poor work practice cited in this event by November 18, 1994.
- An evaluation of the extent of condition of this event will be conducted by the Maintenance Department. This extent of condition will address similar valve configurations in the plant. This evaluation will be completed by December 31, 1994. This is a repeat of commitment IPN-94-109-04 made in LER 94-008-00.

The date when full compliance was achieved:

- Full compliance in resolving the undocumented and improper valve stem adjustments was achieved on June 7, 1994 when the 31 BAST recirculation valve stem travel was adjusted and verified to be stroking properly. The corrective actions to date have been effective in restoring the 31 Boric Acid Transfer system train capability.

Violation 94-21-02

Four Examples of Procedure Adherence Problems During Maintenance

Indian Point 3 Technical Specification 6.8.1, requires that written procedures shall be established, implemented and maintained covering the activities referenced in Appendix A of Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)", November 1972. Section I of Appendix A to Regulatory Guide 1.33 requires performing maintenance in accordance with written procedures.

Indian Point 3 Administrative Procedure (AP)-4, Revision 12, "Procedure Adherence and Use," written to comply with TS 6.8.1 and Appendix A to Regulatory Guide 1.33, specifies that procedures shall be followed.

1. Work Request 94-03803-00 allowed instrumentation and control personnel to perform work only on the 31 EDG fuel oil storage tank level transmitter and specified the proper method for lifting leads.

Contrary to the above, on August 8, 1994, instrumentation and control personnel performed work on the 33 EDG fuel oil storage tank level transmitter. Additionally, when the error was recognized, the technicians improperly reconnected two lifted leads. These actions caused the 33 fuel oil transfer pump to be inoperable.

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2. Work Request 94-01252, step 4.1, required mechanics to record and double verify the termination points for the electrical leads of the limit switch to PORV-456 prior to lifting these electrical leads.

Contrary to the above, on August 1, 1994, the record of the limit switch termination points was not double verified by a second mechanic prior to lifting the electrical leads. As a result, the limit switch electrical leads were reconnected improperly and led to a subsequent malfunction of PORV-456.

3. Work Request 94-02361, step 4.2, required a QC verification of the wiring diagram for pressure switch PC-115OS-Z27 prior to lifting leads.

Contrary to the above, on August 23, 1994, maintenance mechanics failed to obtain QC verification prior to lifting leads.

4. Work Request 94-00005-02, step 4.3, and procedure SOV-004-ELC, revision 0, step 5.6.2, specified the proper installation of solenoid operated valve (SOV)-310.

Contrary to the above, on August 19, 1994, SOV-310 was installed incorrectly. As a result, upon re-establishing air to the system, SOV-310 malfunctioned.

These examples constitute a Severity Level IV Violation.

Response to Violation 94-21-02

The Authority agrees that the four examples above (of procedure adherence problems) constitute a violation.

1. **First Example of Procedural Adherence Problems**

The Authority agrees with this example. However, the work was performed on August 10, 1994 and not August 8, 1994 as indicated in the Notice of Violation.

The causes of the event are:

- Personnel error, inattention to detail, in that Instrumentation and Controls (I&C) technicians and an I&C supervisor failed to apply self checking techniques to ensure they were working on the correct train.

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- An opportunity was missed to identify the proper Emergency Diesel Generator (EDG) train when the technicians failed to compare the identification number on the control switch with the work package. The I&C supervisor visited the work area shortly after the technicians removed 33 EDG fuel tank cover but also failed to note that work was being performed on the incorrect EDG train.
- The EDG system engineer observed while passing by the area that the technicians were working on the wrong EDG. The technicians and their supervisor, after concurring with the system engineer that they were working on the wrong EDG, stopped working. The technicians proceeded under the direction of the supervisor to reconnect the removed wires. The shift supervisor was contacted and he directed the recovery as authorized under an emergency condition. The technician, however, incorrectly reterminated the wires, causing the fuel oil transfer pump to remain inoperable. The technician incorrectly reterminated the wires on the level switch most probably due to the distraction caused by the discovery that the work was performed on the wrong EDG.

Contributing causes of the event are:

- The EDG tank gratings were not labelled.
- The error in choosing 33 EDG over 31 EDG resulted from confusion on the part of the technicians over the orientation of the EDGs at the control building 15' elevation. The technicians are normally accustomed to the ground level configuration of the Diesel Generator rooms which is 31, 32 and 33. At the roof (outside) level this arrangement is opposite (33, 32, 31).

The corrective steps that have been taken and the results achieved:

- Maintenance, I&C, Technical Services, Construction Services and Radiological and Environmental Services (RES) Department managers reemphasized their expectations regarding the use of self-checking with all their department supervisors and general supervisors.
- The I&C manager discussed this event and its causes with the I&C, Maintenance and Construction Services Departments.
- External labels were provided on the outside cover gratings identifying each EDG.

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The corrective steps that have been taken to avoid further violations:

- An ongoing tagging program is in place to ensure that components/areas of the plant are appropriately labelled. No other areas such as areas with train dependent components have been identified as inappropriately labelled.

The date when full compliance was achieved:

- Compliance with Work Request 94-03803-00 was achieved the same day (August 10, 1994) when the wires were correctly terminated and the transfer pump was again operable following post work testing.
- This is the first instance of a procedure adherence issue involving I&C technicians since September 1993. No adverse trends have been observed subsequent to this event which would indicate a continuing procedure adherence problem.

2. Second Example of Procedural Adherence Problems

The Authority agrees with this example:

The lead mechanic recorded termination points while the second mechanic left to gather tools. The lead mechanic proceeded to lift the leads without obtaining the required double verification because the second mechanic had not returned to the work site. Upon return of the second mechanic, the lifting of leads was completed. The second mechanic verified what he could and signed the double verification signature. Both mechanics re-terminated connections in accordance with step text. The re-termination of the leads per the drawing resulted in PORV-456 failing to operate during the post-maintenance testing. Investigation into the event revealed that the sketch made by the lead mechanic was incorrectly drawn. Therefore, the re-termination made in accordance with this incorrect sketch resulted in incorrect re-termination of the valve limit switch wiring.

The cause of the event is:

- Personnel error, failure to follow procedure, when both mechanics failed to comply with the double verification requirement of step 4.1 of the work request.

The corrective steps that have been taken and the results achieved:

- The electrical leads were reterminated correctly and PORV-456 was tested satisfactorily on August 2, 1994.

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- The two workers involved were disciplined and were not allowed to de-terminate/re-terminate electrical leads unless a supervisor was present until retraining was completed. One worker had the restriction lifted on October 24, 1994 and the other worker was assigned to a different capacity and will not be allowed to perform these tasks without management approval.
- As an extent of condition response, the Maintenance Engineering Supervisor revised Maintenance Directive 3-MD-19, "Maintenance Procedure Writing Guide", on October 12, 1994, to include the use of tool lists in procedures. The MD now provides maintenance procedure writers with instruction to include tool lists in procedures which maintenance personnel utilize. Maintenance personnel who start a job with required tools will be less likely to leave the work site and bypass work request step text such as double verification signatures.
- Maintenance Department directive 3-MD-46, "Lifted Leads and Jumpers" was developed to formalize the requirements for lifting electrical leads and jumpers. This MD was made effective on October 28, 1994.

Additional corrective step that was taken to avoid further violations:

- The Maintenance manager re-briefed the Maintenance Department on the meaning of a verification signature and the double verification requirements during a tailgate meeting and redistributed the memoranda providing the maintenance department policy on these subjects (IP-MTC-94-107, "Verification Signatures" dated April 26, 1994 and IP-MTC-94-190, "Double Verification" dated June 27, 1994) to the Maintenance Department.

The date when full compliance was achieved:

- All of the corrective steps were completed by October 28, 1994. No further problems of improper double verification have occurred since this incident.

3. Third Example of Procedural Adherence Problems

The Authority agrees with this example.

The cause of the event is:

- Personnel error, inattention to detail, in that both mechanics were inattentive to the step text in use which required a QC verification prior to lifting these leads.

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The corrective steps that have been taken and the results achieved:

- The leads were correctly reterminated on August 27, 1994 and the pressure switch was tested satisfactorily on September 21, 1994.
- The two workers involved were personally re-instructed by the General Supervisor as to the necessity of attention to detail and the requirement that QC verification signatures must be obtained prior to proceeding to the next step.
- This incident was discussed several times at Maintenance Department tailgate meetings with emphasis on attention to detail and the procedural requirement to obtain verification signatures prior to continuing performance of a procedure.

The corrective steps that have been taken or will be taken to avoid further violations:

- The General Manager of Maintenance issued memorandum IP-GMM-94-060 on October 20, 1994 which in effect, requires each work package step to be signed off before starting the next step. Some step sequences may be changed by the work supervisors but completing several steps from memory then signing them off will not be allowed.
- The General Manager of Maintenance (GMM) will monitor adherence to work package step text to determine if further procedure guidance is necessary or if this problem can be resolved by better training and supervision. This monitoring will continue through December 30, 1994 at which time the GMM will decide whether to revise Administrative Procedure AP-4, "Procedure Use and Adherence" or address the issue in another manner.

The date when full compliance will be achieved:

- Full compliance with step text of the work request was achieved on September 21, 1994 when the pressure switch was tested satisfactorily.

4. Fourth Example of Procedural Adherence Problems

The Authority agrees with this example.

The causes of this event are:

- Personnel error in that manufacturer's installation instructions were misinterpreted.

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- This event was not a straightforward failure to follow a procedure, but rather a misinterpretation of the manufacturer's installation instructions which were referred to by the work package step text. Because of the misinterpretation, the incoming air was connected to the wrong valve port so that when air pressure was restored to SOV-310 as part of the work package post-work testing, the air was vented to atmosphere.

Contributing causes of the event are:

- Lack of experience and understanding of SOV installation. Installation instructions can be confusing unless the person reading them is experienced and has a thorough understanding of SOV installation. This was determined from interviews with the two workers and the QC inspector who also had misinterpreted the installation instructions.

The corrective steps that have been taken and the results achieved:

- Once it became apparent that the input air was connected to the wrong point, the installation instructions were again referred to and the proper input port determined. The air tubing was reconnected properly and SOV-310 was tested satisfactorily. All work was completed on August 22, 1994.
- On August 22, 1994, this incident was explained to the Maintenance Department supervisors and they were instructed to brief their crews on the problem and personally ensure that all SOV installations under their cognizance are correct.

The corrective steps that will be taken to avoid further violations:

- The Central Planning Department will provide enhanced work instructions (e.g., expanded/upgraded step text in work requests or procedure guidance) to cover the installation of SOVs by January 31, 1995.
- The Training and Maintenance Departments will work together to develop a duty area (qualification area) by December 31, 1994 for SOV installation and maintenance to better train personnel on SOVs.
- The Quality Assurance Department will schedule to send, by December 31, 1994, selected NYPA Quality Services Specialists to the same training (for SOV installation and maintenance) which the Training Department will develop. These specialists will pass along the lessons learned from this training to other NYPA and contractor Quality Control Inspectors.

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The date when full compliance will be achieved:

- All corrective steps will be completed by January 31, 1995. There have been no more problems with SOV installations since this incident.

List of Commitments

Number	Commitment	Due
IPN-94-140-01	The Maintenance valve engineer will brief the Maintenance Department supervisors and mechanics on the poor work practice cited in this event (undocumented and improper valve stem adjustments to the 31 boric acid storage tank recirculation valve CH-HCV-105).	November 18, 1994
IPN-94-140-02	The Training and Maintenance Departments will work together to develop a duty area (qualification area) by December 31, 1994 for SOV installation and maintenance to better train personnel on SOVs.	December 31, 1994
IPN-94-140-03	The General Manager of Maintenance (GMM) will monitor adherence to work package step text to determine if further procedure guidance is necessary or if this problem can be resolved by better training and supervision. This monitoring will continue through December 30, 1994 at which time the GMM will decide whether to revise Administrative Procedure AP-4, "Procedure Use and Adherence" or address the issue in another manner.	December 30, 1994
IPN-94-140-04	The Quality Assurance Department will schedule to send, by December 31, 1994, selected NYPA Quality Services Specialists to the same training (for SOV installation and maintenance) which the Training Department will develop. These specialists will pass along the lessons learned from this training to other NYPA and contractor Quality Control Inspectors.	December 31, 1994
IPN-94-140-05	The Central Planning Department will provide enhanced work instructions (e.g., expanded/upgraded step text in work requests or procedure guidance) to cover the installation of SOVs by January 31, 1995.	January 31, 1995