



**Boston Edison**

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U.S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, DC 20555

Docket No. 50-293  
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REPLY TO NOTICE OF VIOLATIONS 97-13-01 AND 97-13-02  
NRC INSPECTION REPORT NO. 50-293/97-13, DATED FEBRUARY 6, 1998

Enclosures 1 and 2 provide Boston Edison Company's reply to the Notice of Violations 97-13-01 and 97-13-02 contained in the subject inspection report.

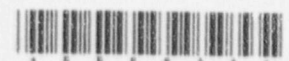
Violation 97-13-02 states the degraded condition due to temperature detector deficiencies resulted in an extra plant cooldown and heatup. This is an incorrect statement; Pilgrim did not undergo an extra heatup and cooldown due to temperature detector deficiencies. The heatup and cooldown referenced in the violation was performed as a result of a management decision, and it is generally Pilgrim Station policy to place the plant in shutdown cooling following shutdowns to perform maintenance and prepare for startup. Also, engineering analysis confirmed the vessel flange to shell differential temperatures during heatup and cooldown did not result in exceeding code stress allowables.

This letter includes the following commitments.

Commitments addressing violation 97-13-01 (Enclosure 1): The effectiveness of the preparation and implementation of the maintenance work package (MWP) process will be enhanced by March 27, 1998, as follows:

- Work control planners will be provided with clear expectations for preparing and reviewing work packages involving substitution equivalency evaluations (SEEs), plant design changes, and field revision notices.
- The task-ready review process will be enhanced. The expectations for I&C technicians and supervisors on task-ready review walkdowns will be clearly defined with an individual MWP walkdown review sheet to cover all requirements of a task-ready review in accordance with procedure 1.5.20, "Work Control Process". These expectations will be discussed with all I&C Maintenance Department personnel relative to MWP walkdowns and like-for-like replacements during implementation of MWPs.
- The engineering department managers will hold meetings with their staff to discuss and review the events associated with ATWS relay replacement problems.

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- Maintenance, I&C, work control, and engineering departments will review the multiple human errors caused by indirect communications to promote face-to-face communications to minimize misinterpretations and missed information.
- A standard method for building replacement parts reservations and documenting them will be established in the planning department's desktop instructions.

Commitments addressing violation 97-13-02 (Enclosure 2): The following corrective actions are planned to avoid further violations of vessel flange temperature indications.

- A technical specification change to remove the requirement for vessel shell to vessel flange differential temperature limit of 145°F will be submitted by March 27, 1998, for NRC approval.
- A redesign of the temperature element leads in the drywell will be prepared. This modification is currently planned for implementation during RFO 12 or an outage of sufficient duration that would provide access to the drywell.
- This violation will be presented as a case study within the existing continuing training programs. The case study will be prepared and the training schedule will be determined by April 10, 1998.

Please do not hesitate to contact me if there are any questions regarding the enclosed reply.

  
L. J. Olivier

WGL/ VIO97-13-01&02

Enclosure 1: Reply to Notice of Violation 97-13-01

Enclosure 2: Reply to Notice of Violation 97-13-02

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ENCLOSURE 1

Reply to Notice of Violation 97-13-01

VIOLATION 97-13-01 (identified as item B in the Notice of Violation)

During an NRC inspection conducted on November 11, 1997, through January 6, 1998, violations of NRC requirements were identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions, NUREG-1600, the violations are listed below:

- A. (see Enclosure 2)
- B. Pilgrim Technical Specification (TS) 6.8A, Procedures, requires that procedures be implemented for activities covered under Appendix "A" of NRC Regulatory Guide 1.33. Section 9, Procedures For Performing Maintenance, of Appendix "A" requires that maintenance be properly preplanned, and be performed in accordance with written procedures or instructions that are appropriate to the circumstances. Additionally, BECo procedure 1.5.20, Work Control Process, step 7.5, Task Ready Review, specifies that planners and I&C supervisors shall ensure that parts are in reserve/withdrawn for the work prior to designating a package as task ready. Step 7.5 also specifies that the work supervisor or his designee will perform a hands-on parts verification for each job.

Contrary to the above on December 20, 1997, a work control planner and I&C supervisor classified a work package to replace an ATWS system electrical relay as task ready when all parts were not available. Additionally, a hands-on parts verification was not performed prior to the start of work. As a result, a relay of the incorrect voltage rating was installed which overheated and resulted in an unplanned ATWS system LCO maintenance outage.

This is a Severity Level IV violation (Supplement I).

REASON FOR THE VIOLATION

The reason for the violation was non-compliance with procedure 1.5.20, "Work Control Process". Our assessment (PR 97.9821) of the ATWS relay replacement activity revealed the following.

The root cause of the installation of the incorrect voltage ATWS relay is the maintenance work package (MWP) being signed as "task ready" without all the relays reserved. The contributing causes are (i) a wrong substitution equivalency evaluation (SEE) was used for ATWS relays, (ii) human errors during MWP preparation and review and parts verification, and (iii) communication errors by personnel during the preparation and implementation of ATWS relay MWP. These errors resulted in violations of the work control process requirements.

To replace the aging ATWS relays, a work control planner prepared a MWP to replace four ATWS relays using the wrong generic SEE No. 797. The ATWS package dealt with three 24



vdc and one 125 vdc relays. The SEE was not intended for replacement of ATWS relays. The planner reserved three 24 vdc relays and ordered the 125 vdc relay, but did not include a copy of the stock material request form (MRF) in the work package. The planner placed the work package on a "parts hold" status pending the arrival of the fourth relay. The MWP did not caution the technicians that it differed from the other relay packages that were planned for the ECCS panel. The MWP steps only required technicians to remove and replace relays per SEE No. 797.

Two weeks prior to the implementation of the ATWS relays replacement MWP, a second planner was assigned to make the package task ready. The second planner was not familiar with the previous history of the package and took shortcuts to arrive at an assumption all parts were reserved. Since the task ready review on the MWP was already signed by the first planner, the second planner changed the MWP status coding without making an entry in the "actions taken" section that he was now the alternate member of the team, in accordance with procedure 1.5.20 section 7.4, and without becoming familiar with the work plan and its instructions. Accordingly, the second planner changed the status from "parts hold" to "task ready" on or about December 10, 1997.

Also, the I&C supervisor delegated the maintenance portion of the task ready review for walkdown review to a lead technician. He had four Agastat relay replacement packages for review. Each package was written to replace four relays in either the ECCS or the ATWS panels using SEE No. 797. The MWP for replacement of ATWS relays should have been based upon SEE No. 107. The technician reviewed the first package for the ECCS panel and had questions that needed to be resolved with the SEE on socket compatibility. Since the same SEE was incorrectly referenced in all four relay replacement packages, the technician decided not to walk the three other packages down until after the questions about the SEE were resolved.

The I&C supervisor and his lead technician communicated through a MWP status sheet. The MWP status sheet was not intended to go into the details necessary to properly cover all the concerns and complete the reviews. The status sheet indicated one MWP had problems and the other three had similar problems with the SEE. The I&C supervisor mistook the status sheet to mean that all four packages had been walked down and only one common problem existed due to the SEE about the socket. The packages were placed on hold until the system engineer resolved questions on SEE No. 797. Once the SEE questions were resolved, the I&C supervisor assumed the MWPs were ready to work; accordingly, he approved the task-ready reviews as being completed and changed the status code for all four MWPs. This assumption resulted from miscommunications and violated step 7.5[4] of the Work Control Process.

The final opportunity to detect the incorrect part was missed when one-for-one verification of the removed relay was not performed. The technicians performed a spot check by only verifying two of the four relays. The normally energized hot relays required gloves to handle them which contributed to the technician not obtaining and verifying all information on the removed parts. A mindset was created that all relays were the same due to a previous MWP that replaced all the same 24 volt relays in a ECCS panel.

A review of multiple human performance errors was conducted. Miscommunications during the MWP development, review, and implementation were a major contributing cause to barrier breakdowns.

### CORRECTIVE STEPS TAKEN AND RESULTS ACHIEVED

The following corrective steps were taken to resolve the errors included in the Notice of Violation:

- I&C took an immediate corrective action to replace the incorrect voltage ATWS relay. Operations entered active LCO A97-435 and walkdowns were performed, which revealed no visual damage to relay sockets or associated wiring. An adjacent relay had signs of external damage due to localized overheating. A priority 1 maintenance request, (MR19703150) was written, which later replaced the two damaged relays with the appropriate relays. Temporary Procedure TP97-084 described the necessary post work testing. Independent reviews were also conducted of all previous MWP's associated with SEE No. 797 to ensure no other problems existed. None were found.
- Individuals involved in the preparation and implementation of the MWP were counseled concerning the standards and requirements of task ready review, significance of their signatures in the task ready reviews, and adherence to procedure requirements.
- A critique was held on December 31, 1997, at 0730 to gather facts, ensure the plant was in a safe condition, and determine any further immediate corrective actions. No other immediate corrective actions were needed.

### CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FURTHER VIOLATIONS

The effectiveness of preparation and implementation of the maintenance work package (MWP) process will be improved by March 27, 1998, as follows:

- Work control planners will be provided with clear expectations for preparing and reviewing work packages involving substitution equivalency evaluations (SEEs), plant design changes, and field revision notices.
- The task-ready review process will be enhanced. The expectations for I&C technicians and supervisors on task-ready review walkdowns will be clearly defined with an individual MWP walkdown review sheet to cover all requirements of a task-ready review in accordance with procedure 1.5.20, "Work Control Process". These expectations will be discussed with all I&C Maintenance Department personnel relative to MWP walkdowns and like-for-like replacements during implementation of MWP's.
- Engineering department managers will hold meetings with their staff to discuss and review the events associated with ATWS relay replacement problems.
- Maintenance, I&C, work control, and engineering departments will review the multiple human errors caused by indirect communications to promote face-to-face communications to minimize misinterpretations and missed information.
- A standard method for building replacement parts reservations and documenting them will be established in the planning department's desktop instructions.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

Full compliance was achieved on December 31, 1997, when ATWS relays were replaced.

The MWP process improvements will be completed by March 27, 1998.



ENCLOSURE 2

Reply to Notice of Violation 97-13-02

VIOLATION NO. 97-13-02 (identified as item A in the Notice of Violation)

During an NRC inspection conducted on November 11, 1997, through January 6, 1998, violations of NRC requirements were identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions, NUREG-1600, the violations are listed below:

- A. 10 CFR 50 Appendix B, Criterion XVI, Corrective Action, states, in part, that measures shall be established to assure that conditions adverse to quality, such as deficiencies, deviations, and non-conformances are promptly identified and corrected. The measures shall assure that the cause of the condition is determined and corrective actions taken to preclude repetition.

Procedure 1.3.121, "Problem Report Program," revision 3, section 6.6.3 and 6.6.4 require that corrective actions taken and/or required to correct the deficiency shall be identified and corrective actions developed are adequate to prevent recurrence. Step 6.1(1) requires that "Hardware and non-hardware (human performance, administrative controls, procedural deficiencies) related problems shall be documented on a PR. This includes failures, malfunctions, deficiencies, human errors, abnormal occurrences, defective or degraded material or equipment, and non-conformances."

Contrary to the above, BECo did not properly evaluate the cause and implement corrective actions to preclude repetition of the temporary temperature detectors deficiencies from the reactor vessel flange. The temperature elements moved/separated from the reactor vessel flange on three separate occasions (November 27, December 2, and December 7, 1997). This degraded condition resulted in an extra plant cooldown and heatup. In addition, BECo failed to document on a problem report that two of three temporary temperature detectors, installed per temporary modification 97-29, had become disengaged from the reactor vessel flange on November 27, 1997.

This is a severity Level IV Violation (Supplement I).

REASON FOR THE VIOLATION

The root cause for the violation was our failure to assign ownership for permanent resolution of all temperature detector deficiencies following startup from RFO 11. This initial barrier failure led to a later non-compliance with procedure 1.3.121, "Problem Report Program" during troubleshooting and repair efforts on the temperature elements. The assessment (PR97.9747 and 98.0271) conducted in response to the reactor vessel flange temperature indication problems and notice of violation revealed the following.

The cause of our failure to perform adequate causal investigation and implement commensurate corrective actions during the forced shutdowns for the temperature detector

deficiencies, as well as our failure to document on a problem report that two of three detectors became disengaged from the reactor vessel flange on November 27, 1997, is human performance error. This cause is attributed to our failure to assign ownership for permanent resolution of all temperature detector deficiencies following startup from RFO 11. At that time, the condition of the originally installed temperature elements (TE) was known to be degraded resulting in the installation of temporary modification TM 97-29. Since TEs are non safety-related and there were no known problems associated with TM 97-29 during heatup from RFO 11, there was no elevated awareness or urgency to initiate actions to develop a permanent resolution until the next refueling outage. Accordingly, the problems received low priority for a permanent resolution. When TE problems again occurred on November 23, 1997, with no individual owner in place and, consequently, with no established plan in place to permanently solve the TE problems, all efforts were focused on restoring the temporary modification to working condition.

The violation states that the degraded condition due to temperature detector deficiencies resulted in an extra plant cooldown and heatup. This is an incorrect statement; Pilgrim did not undergo an extra heatup and cooldown due to temperature detector deficiencies. The heatup and cooldown referenced in the violation was performed as a result of a management decision, and it is generally Pilgrim Station policy to place the plant in shutdown cooling following shutdowns to perform maintenance and prepare for startup.

Also, notwithstanding the temperature detectors' failures to provide reliable temperature indications, engineering analysis (EE 97-67, Rev. 0) confirmed the vessel flange to shell differential temperatures during heatup and cooldown did not result in exceeding code stress allowables.

## BACKGROUND

On February 19, 1997, following reactor shutdown for RFO 11, PR 97.9125 reported that TR-263-105 shell temperature was indicating low. I&C Engineering performed a direct cause analysis that determined the recorder was out of calibration. During the RFO 11 reactor vessel hydrostatic test, the vessel flange thermocouples gave inadequate temperature readings. PR97.1487 was issued to document the low readings on the flange temperature elements. TM 97-27 was installed to allow operators to read the actual vessel flange temperature during the reactor vessel hydrostatic test. On April 5, 1997, at the time of the restart from the RFO 11, TM 97-27 was changed to provide temperature indications in the control room and was installed on April 7, 1997, as TM 97-29 per MR#19700982. There were no known problems with TM 97-29 during heatup from RFO 11.

On April 30, 1997, PR97.1780 was issued stating that vessel flange TEs leading to TR-263-105 (blue pen, point 2) were not reading correctly. This problem report was dispositioned to a maintenance request to calibrate the recorder.

On November 24, 1997, at the time of plant cooldown for MSIV repairs, the Operations Department observed TR-263-105 blue pen failed downscale. On November 26, PR97.9731 stated TR-263-105 blue pen failed downscale during plant cooldown. This recorder, as well as TR-263-104, measures vessel flange temperature, and TR-263-104 is commonly used as the technical specification reading (point 3). MR#19702899 was issued and PR97.9731 was closed. MR#19702899 was closed to MR#19700982 and all work was performed under MR#19700982. Numerous entries into the drywell were performed to ensure magnetic mounted TEs provide reliable temperature indication. Investigation by maintenance personnel



revealed the temperature element for point 3 was found separated from the vessel flange. Inspection of the other elements revealed point 2 had also separated from the vessel flange. The terminal screws for these two TEs were loose. However, no problem report was written to document the temperature elements had separated from the reactor vessel flange.

During the December 6, 1997, forced outage, I&C Maintenance, System Engineering, and I&C supervisory and management personnel were involved at different times in performing investigation and corrective actions for the TE problems. With no single point of contact established for ownership, a situation was created in which the coordination of the overall resolution, including consistent, reliable, accurate communication and evaluation became ineffective. Additionally, more than one MR was being used to address the TE problems and MR log documentation practices were not well implemented for some entries regarding conditions found and actions taken. Both of these items added additional confusion. The general mindset was these TEs are non safety-related devices, only required for startups and shutdowns. Important information concerning the as-found condition of the TEs pulled back during the investigative entry on November 26, 1997, was communicated to a system engineer, documented in an MR log, but was not documented on a problem report. This failure to write problem report and to address cumulative temperature detectors deficiencies violated procedure 1.3.121.

Once the TEs became an issue for potential technical specification violations on December 2, 1997, concurrent with the issuance of PR97.9747, the I&C Engineering and Maintenance Managers engaged in direct and prompt work actions for a permanent resolution. Currently, the adequacy of the design and compliance with technical specification are being addressed to prevent repeat occurrences.

#### CORRECTIVE STEPS TAKEN AND RESULTS ACHIEVED

The following corrective steps were taken to resolve ineffective corrective actions included in the Notice of Violation.

- An engineering evaluation, EE 97-67, Rev. 0, was completed in response to PR97.9747 which confirmed that vessel flange to shell differential temperatures during heatup and cooldown did not result in exceeding code stress allowables.
- An I&C night order was issued on December 23, 1997, advising I&C technicians to write problem reports when they discover deficiencies and problems.

#### CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FURTHER VIOLATIONS

Attempts to correct the loss of correct temperature indication on November 26, December 3, and 7, 1997 were unsuccessful. Accordingly, the following corrective actions are planned to avoid further violations.

- A technical specification change to remove the requirement for vessel shell to vessel flange differential temperature limit of 145°F will be submitted by March 27, 1998, for NRC approval.
- A redesign of the temperature element leads in the drywell will be prepared. This modification is currently planned for implementation during RFO 12 or an outage of sufficient duration that would provide access to the drywell.

- This violation involved many different personnel and plant processes and is essentially a case of missed opportunities. Knowledge-based errors were made, and the application is broad affecting the entire organization. Accordingly, this violation will be presented as a case study within the existing continuing training programs. This case study will be prepared and the schedule for training will be determined by April 10, 1998.

#### DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

Full compliance resolving all issues related to the vessel flange to shell temperature monitoring will be completed by RFO 12.

The proposed technical specification changes to remove the vessel flange differential temperature limit will be submitted to the NRC by March 27, 1998.

The vessel flange temperature corrective action case study and schedule for training will be set by April 10, 1998.