

TENNESSEE VALLEY AUTHORITY

NUCLEAR SAFETY REVIEW STAFF

NSRS INVESTIGATION REPORT NO. I-85-327-WBN

EMPLOYEE CONCERN IN-85-142-006

MILESTONE 2

SUBJECT: ADJUSTING ZERO TO MAKE REDUNDANT INDICATORS READ THE SAME

DATES OF INVESTIGATION: December 6, 1985-January 10, 1986

INVESTIGATOR:

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2/12/86
Date

REVIEWED BY:

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I. BACKGROUND

NSRS has investigated Employee Concern IN-85-142-006 which Quality Technology Company (QTC) identified during the Watts Bar Employee Concern Program. The concern is worded:

RWST in Unit 1 narrow range 1-LT-63-46 & 1-LT-63-49 reading were 6% off inst eng (name known) directed instrumentation mechanic to adjust to zero. This would make reading match the control room. Similar on SIS Accumulators 1-4, elev 716. Two transmitters on each accumulator. This practice causes false readings in control room.

Note: The safety injection system (SIS) accumulator portion of the above concern was encompassed in NSRS Investigation Report IN-85-208-WBN (Employee Concern IN-85-281-003) and was not reinvestigated. Corrective action pertaining to the redundant level instrumentation for the SIS accumulators was tracked by IN-85-208-WBN.

II. SCOPE

The adjusting of the zero on instrumentation so that redundant indicators read the same was determined to be the primary concern. The concern was investigated by contacting applicable personnel and reviewing documentation relating to the calibration of narrow-range level instrumentation for the Refueling Water Storage Tank (RWST). NSRS reviewed procedures/instructions, technical specifications, and instrument calibration records.

III. SUMMARY OF FINDINGS

During the course of this investigation NSRS identified several discrepancies which, although not specifically related to the primary concern, could have nuclear-safety significance and therefore will be addressed in this report. Based upon a review of applicable documents and interviews with appropriate personnel, the specific findings listed below were identified.

A. WBNP Procedures/Instructions

1. A review of WBN Instruction TI-49, "Compliance Instruments," identified that the RWST narrow-range level indicators LI-63-46 and LI-64-49, located in the control room, were compliance instruments.
2. WBN Instruction IMI-162, "Periodic Calibration Guidelines," states that all redundant control room indicators shall be independently verified to agree with each other within the loop accuracy after calibration or loop check of any single loop. This statement was also present in WBN Instrument Section Instruction Letter No. 3.8, "Configuration Control of Instrument Maintenance Activities."

3. A review of WBN Instruction SI-3, "Weekly Log Units 1 and 2," identified that level indicator LI-63-46 would be recorded weekly when in modes 1, 2, 3, and 4. This reading complied with WBN Technical Specifications.
4. A review of WBN Instruction AI-9.2, "Maintenance Requests and Equipment Maintenance History," identified the following.
 - a. Maintenance on CSSC and other process plant equipment shall be initiated and/or documented by the use of a maintenance request (MR).
 - b. Changes to plant component's and subcomponent's as-design status; i.e., the design which is currently implemented in as-constructed drawings, must be handled by certain methods. Temporary alterations approved per AI-2.15 is one such method.
 - c. When temporary alterations are made to inoperable plant equipment during troubleshooting, a second-party verification is required to verify the return-to-normal condition.
5. A review of WBN Instruction AI-2.15, "Temporary Alterations," identified the following.
 - a. The requirements of this instruction apply to temporary alterations to both CSSC and non-CSSC equipment.
 - b. The Temporary Alteration Control Form (TACP) and Temporary Alteration Order (TAO) shall be used to keep all plant personnel informed of temporary conditions within the plant unless a plant-approved instruction is used to install/remove the temporary alteration.
 - c. Only short-term changes should be installed using plant instructions or MRs. Long-term changes (greater than 30 days) should be controlled using a TACP. This statement primarily applies to CSSC equipment but may also apply to non-CSSC equipment.
6. A review of WBN Instruction Letter ISL-3.8, "Configuration Control of Instrument Maintenance Activities," identified that one of the purposes of the instruction was to provide configuration control during maintenance activities including troubleshooting. It also notes that if a configuration change will remain after completion of the activity then a TACP shall be initiated. When configuration changes are made, a completed Attachment B - Configuration Change Sheet shall be part of the documented work.

B. Documentation

1. NSRS reviewed MR A-584594 which requested maintenance be performed on both wide- and narrow-range level instrumentation for the Unit 1 RWST. This review identified the following information.
 - a. RWST wide-range level transmitters (LTs) were functionally checked. One LT was recalibrated and, as a result, all wide-range redundant indicators were within tolerance. This work was performed July 15, 1985.
 - b. RWST narrow-range LTs, 1-LT-63-46 and 1-LT-63-49, were recalibrated July 16, 1985. On July 17, at Operations request, current and voltage measurements were taken: 1-LT-63-46 was indicating approximately 20 percent less than 1-LT-63-49; a recalibration of the LTs was performed. July 19, the circuit board in 1-LT-63-49 was replaced. July 22, the output from 1-LT-63-46 was still drifting. July 23, installed and calibrated a new transmitter for 1-LT-63-46. August 9, 1-LT-63-46 was still drifting. August 13, lifted the electrical leads for 1-LT-63-46. This was documented on the Attachment B - Configuration Change Sheet - Wire Lift. The corrective action/work performed section of the MR did not include the installation of a temporary load to keep the loop energized, nor was an ISL-3.8 Attachment B for this configuration change documented in the MR package. Since all work requested by the MR was not completed, MR A-584594 was still open.
2. NSRS reviewed the scaling and setpoint documents and calibration records for the RWST narrow-range level instrumentation. This review identified that the input ranges for the LTs were revised as a result of the relocation of the transmitters. Based upon the accuracy of the instruments, the two level indicators should agree within 5 percent. The latest calibration records indicated that 1-LT-63-46 and 1-LT-63-49 were calibrated July 17, 1985 using the revised input range.
3. A review of the TACP log in the Shift Engineer's office identified that a TACP for 1-LT-63-46 was not in place.
4. A review of the WBN critical systems, structures, and components (CSSC) list identified that the RWST narrow-range instrumentation was not classed as CSSC equipment.

C. Interview Information

1. The Instrument Maintenance Supervisor stated that it was not common practice to make zero adjustments to make redundant indicators read the same value. Recalibration of the instruments will usually correct the problem. However, there will be some acceptable tolerance between the readings of the indicators based upon the accuracies of the loop instrumentation.

2. Instrument Maintenance personnel stated that they had a lot of problems during the time period of the concern calibrating the RWST narrow-range LTs, particularly 1-LT-63-46. Since the LTs are located on the upper side of the RWST, a bucket truck was used to get test equipment and workers to the transmitters. After performing a calibration of the LTs, the output did not appear correct. Measurements were made from the sense tap to the transmitter, and the scaling sheets were revised to reflect the measurement change. Maintenance personnel recalibrated both transmitters with the new scaling information; however, the output of 1-LT-63-46 would drift. This transmitter was recalibrated at least three times; and at some point in this process, the instrument mechanics told them to just zero the transmitter for 10 milli amps with the head compensation included. A new transmitter was installed, but its output drifted also. The 1-LT-63-46 transmitter was removed and a temporary pot (potentiometer) was installed to keep the loop energized.
3. The cognizant Instrument Engineer referenced in the concern stated that he "may" have told the Maintenance personnel to adjust the zero at the transmitter to get the indicators to read the same. He stated, "if the instruments were in tolerance then adjustment of the zero was alright. However, it would not be alright to correct an out-of-tolerance condition." He also stated that he was not aware that a temporary pot had been installed in the loop for 1-LT-63-46.
4. Instrument Maintenance managers stated that since the MR was still open, a TACP was not required to document the temporary pot that was installed.

IV. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

- A. The employee concern was substantiated. The changing of the zero adjustment so that redundant indicators read the same was not an approved method for correcting the discrepancy. WBN plant instructions such as IMI-162 states, "redundant control room indicators shall agree with each other within the loop accuracy after calibration or loop check of any single loop." If redundant indicators do not meet the established accuracy limit then a recalibration of the instruments shall be performed. When recalibration does not correct the problem then further investigation/troubleshooting is required.
- B. During the course of this investigation, NSRS identified the temporary installation of a pot in the instrument loop for 1-LT-63-46. This temporary installation was not documented in the corrective action/work performed section of the MR, an ISL 3.8 Attachment B - Configuration Change Sheet reflecting this temporary alteration was not included in the MR package, and a TACP was not initiated to document the installation of the pot.

- C. It appears that WBN AI-2.15, "Temporary Alterations," does not clearly define when long-term temporary alterations made in conjunction with an MR will be documented by a TACF. The working interpretation was that if the MR was still open, regardless of time, a TACF was not required to document the temporary alteration.

Recommendations

I-85-327-WBN-01 - Discuss Proper Method to Resolve Redundant Indicator Problem

Discuss with Instrument Maintenance engineers and Maintenance employees the proper methods to apply when redundant indicators do not read within the acceptable tolerance, stressing that adjusting the zero is not an acceptable method.

I-85-327-WBN-02 - Document the Temporary Alteration in MR A-584594 Packages

Document the temporary alteration made to the instrument loop for 1-LT-63-46 in the MR A-584594 package. Document the installation of the temporary pot in the MR package by adding this information to the ISL 3.8 Attachment A - Work Performance Sheet and filling out an ISL 3.8 Attachment B - Configuration Change Sheet.

I-85-327-WBN-03 - Initiate TACF and Review WBN AI-2.15

Initiate a TACF on the temporary pot as required by plant instructions. Review WBN AI-2.15, Section 6.4.2, and clarify the intent of "long term changes (greater than 30 days) should be controlled using a TACF."

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

TO: H. L. Abercrombie, Site Director, Sequoyah Nuclear Plant

FROM: K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

DATE: FEB 18 1966

SUBJECT: NUCLEAR SAFETY REVIEW STAFF INVESTIGATION REPORT TRANSMITTAL


Transmitted herein is NSRS Report No. I-85-768-SQM

Subject UNCERTIFIED WELDER FOREMEN PERFORM PREWELD INSPECTIONS

Concern No. SQM-5-001-001 and SQM-5-001-002

No response or corrective action is required for this report. It is being transmitted to you for information purposes only. Should you have any questions, please contact W. D. Stevens at telephone 6231.

Recommend Reportability Determination: Yes No


Director, NSRS/Designee

WDS:JTH

Attachment

cc (Attachment):

- W. C. Bibb, BFM
- J. W. Coan, W9C135 C-K
- W. T. Cottle, WBN
- James P. Darling, BLM
- R. P. Denise, LP6N40A-C
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- QTC/ERT, Watts Bar Nuclear Plant
- Eric Sliger, LP6N48A-C
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