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U. S. Nuclear Regulatory Commission
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SUBJECT: Arkansas Nuclear One - Unit 2
Docket No. 50-368
License No. NPF-6
Licensee Event Report No. 50-368/90-021-00

Gentlemen:

In accordance with 10CFR50.73(a)(2)(i)(B), attached is the subject report concerning pressurizer and steam generator low pressure variable setpoint trips not calibrated in accordance with Technical Specification requirements due to inadequate procedures.

Very truly yours,

James J. Fisicaro

James J. Fisicaro
Manager, Licensing

JJF/LAT/sgw
Attachment

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Commission
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U.S. Nuclear Regulatory

Approved OMB No. 3150-0104
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# LICENSEE EVENT REPORT (LER)

| FACILITY NAME (1) | DOCKET NUMBER (2) | PAGE (3) |
|---|---|---|
| Arkansas Nuclear One, Unit Two | 0 5 0 0 0 3 6 8 | 1 OF 0 4 |

TITLE (4) Pressurizer and Steam Generator Low Pressure Variable Setpoint Trips not Calibrated in Accordance with Technical Specification Requirements Due to Inadequate Procedures

| 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 9 | 2 7 | 9 0 | 9 0 | -- 0 2 1 | -- 0 0 | 1 0 | 2 6 | 9 0 | | 0 5 0 0 0 |
| | | | | | | | | | | 0 5 0 0 0 |

OPERATING MODE (9): 1

POWER LEVEL (10): 1 0 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

| | | | |
|---|---|---|---|
| __ 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) | __ Other (Specify in Abstract below and in Text, NRC Form 366A) |
| __ 20.405(a)(1)(iii) | X 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) |
|---|---|
| Larry A. Taylor, Nuclear Safety and Licensing Specialist | 5 0 1 9 6 4 - 3 1 0 0 |

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

| Cause | System | Component | Manufacturer | Reportable to NPRDS | Cause | System | Component | Manufacturer | Reportable to NPRDS |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| | | | | | | | | | |

| SUPPLEMENT 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)


On September 27, 1990, during a review of surveillance procedures it was discovered that setpoint tolerances specified in the Plant Protection System (PPS) calibration and monthly testing procedures would allow the Pressurizer Pressure-Low Variable setpoint (VSP) cards and the Steam Generator Pressure-Low VSP cards to be set such that Technical Specification (TS) requirements could be exceeded during a plant cooldown and depressurization. Procedures were changed to specify new tolerances and calibration checks were performed on all four PPS channels. Some of the values for these parameters were found to be slightly (approximately 1 psia) greater than allowed by the TS. The trip setpoints were changed while performing the calibration procedures. The root cause was determined to be personnel errors resulting in the procedural deficiencies. A review of other ANO-1 and ANO-2 procedures used to adjust and verify trip setpoints will be performed. There was no safety significance related to this event.

A. Plant Status

At the time of discovery of this condition, Arkansas Nuclear One, Unit Two (ANO-2) was operating in Mode 1 (Power Operation) at 100% power with the Reactor Coolant System (RCS) [AB] at 2250 psia and RCS temperature at 580 degrees Fahrenheit.

B. Event Description

On September 27, 1990, as part of a project initiated to ensure plant procedures are adequate to satisfy the surveillance requirements of Technical Specifications (ANO Business Plan Item C.1.4), it was discovered that the setpoint tolerances specified in the Plant Protection System (PPS) [JC] calibration and monthly functional testing procedures would allow the Pressurizer Pressure - Low Variable Setpoint (VSP) Cards and the Steam Generator Pressure - Low VSP Cards to be set such that Technical Specification (TS) requirements could be exceeded. These VSP cards, which are part of the bistable trip units, allow the trip and pretrip setpoints for these parameters to be manually reduced during a plant cooldown and depressurization and automatically increase the trip and pretrip setpoints during a plant heatup as system pressure is increased. The VSP feature is provided for the four Pressurizer Low Pressure bistable trip units (one in each PPS channel) and the eight (1 for each S/G in each PPS channel) Steam Generator Low Pressure bistable trip units.

The applicable TS requirements during a planned reduction in RCS or S/G pressure, specify: (1) the margin between actual pressurizer pressure and the Pressurizer Pressure - Low Trip Setpoint to be less than or equal to 200 psia, (2) the minimum value of the Pressurizer Pressure - Low Trip Setpoint to be greater than or equal to 100 psia, and (3) the margin between actual steam generator pressure and the Steam Generator Pressure-Low Trip Setpoint to be less than or equal to 200 psia. These requirements are contained in footnotes to TS Table 2.2-1 (Reactor Protective Instrumentation Trip Setpoint Limits) and TS Table 3.3-4 (Engineered Safety Features Actuation System Instrumentation Trip Values). The tolerances specified in the monthly testing and calibration procedures would have allowed (1) the margin between the actual pressurizer pressure and the Pressurizer Pressure - Low VSP trip setpoint to be a maximum of 203.25 psia, (2) the minimum value of the Pressurizer Pressure - Low VSP trip to be approximately 78.75 psia, and (3) the margin between actual steam generator pressure and the Steam Generator Pressure - Low VSP trip setpoints to be a maximum of 201.3 psia.

On September 28, 1990, the procedures were changed to specify new tolerances which would ensure the TS requirements were met. Calibration checks were performed on all four PPS channels. The actual as-found values indicated that the margin between the pressurizer pressure and the VSP Low Pressure Trip setpoint for the pressurizer would have been slightly above (1 psia) the 200 psia TS requirement in two of four channels during a plant cooldown and depressurization. Also, the minimum VSP

Low Pressure Trip setpoint for the pressurizer was determined to be slightly below (1 psia) the 100 psia minimum TS requirement in one of four channels. The as-found margin between steam generator pressure and the VSP Low Pressure Trip setpoint was determined to be slightly above (1 psia) the 200 psia TS requirement in one of the four channels for both Steam Generator 'A' and Steam Generator 'B'. The trip setpoints were appropriately changed while performing the calibration checks.

C. Root Cause

The root cause of this event was determined to be personnel errors resulting in the procedure deficiencies. Personnel responsible for development of the procedures and reviewers of the procedures failed to recognize that the tolerances allowed by the procedure could result in trip setpoints which did not satisfy the TS requirements.

The TS requirements are contained in footnotes to Table 2.2-1 and Table 3.3-4 and are not listed in the "Trip Setpoint/Allowable Value" format as the other trip setpoint values included in the Table. For this reason, a perception of the VSP function as an 'operational feature' rather than as a 'required trip setpoint limit' contributed to the failure of the procedure originators and reviewers of the procedures to ensure the specified procedural tolerances would not allow the limits to be exceeded.

D. Corrective Action

A review of procedures which adjust and verify setpoints for the ANO-2 PPS and the ANO-1 Reactor Protection System, Engineered Safeguards Actuation Systems and Emergency Feedwater Instrumentation and Control System will be conducted to assure compliance with TS. Emphasis will be placed on identifying and verifying setpoints which are specified in areas of the TS other than explict tabular listings (e.g., footnotes, action statements, TS Bases, etc.).
This review will be complete by November 30, 1990.

The project which resulted in identification of these procedure deficiences is continuing. This review is identified as an ANO Business Plan item (Item C.1.4) to verify that plant procedures adequately implement TS surveillance requirements. The review is scheduled for completion by July 1, 1992.

E. Safety Significance

Although the setpoints for some of the VSP cards were found to be inconsistent with TS requirements, there is no actual safety significance related to this event. The VSP cards and related trip functions remained functional and the actual difference between the as found setpoints and the TS requirements were negligible (1 psi). At least two channels for each trip function were set within TS requirements. Additionally, the ANO-2 safety analysis does not credit or assume operation of this PPS trip function during plant cooldowns or heatups as part of any analysis of design basis events for the plant.

F. Basis For Reportability

A review of previous calibration procedures indicate that setpoints for the Pressurizer Low Pressure VSP trips, the minimum allowed Pressurizer Low Pressure VSP Trip value and the Steam Generator Low Pressure VSP trips had been left slightly outside of TS requirements. Therefore, it was concluded that during previous plant cooldowns and depressurizations the TS requirements had not been satisfied. This condition constitutes operation in a condition prohibited by TS and is reportable pursuant to 10CFR50.73(a)(2)(i)(B).

G. Additional Information

Investigations following identification of this problem revealed that a similar event involving a TS specified value for Pressurizer Low Pressure Trip Bypass also contained in a table footnote had occurred on June 17, 1986. As a result of that event, described in LER No. 50-368/86-016, corrective actions were initiated to perform a review of other PPS "setpoints" to ensure they were conservative with respect to TS limits. This review was performed; however, the procedural discrepancies related to the Pressurizer Low Pressure VSP, minimum Pressurizer Low Pressure VSP value or Steam Generator Low Pressure VSP discussed in this report were not identified during this effort apparently because as previously discussed these setpoints were viewed as being related to an operational feature of the PPS rather than as TS limits.

Energy Industry Information system (EIIS) codes are indicated in the text as [XX].