

Power Generation Group

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Lew W. Myers
Vice President

April 24, 1997
PY-CEI/NRR-2166L

- United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Perry Nuclear Power Plant
Docket No. 50-440
Reply to a Notice of Violation

Ladies and Gentlemen:

Enclosed is the Perry Nuclear Power Plant (PNPP) reply to the Notice of Violation contained in NRC Inspection Report 50-440/96018, which was transmitted by letter dated March 19, 1997. An extension beyond the normal thirty day response was requested and received in discussions between Messrs. Henry Hegrat from PNPP and John Jacobson of the NRC on April 17 and April 21, 1997.

The Notice of Violation addressed two concerns. First, the initial recorded cooldown temperature reading was not taken within the first thirty minutes following the reactor scram. Second, the Surveillance Instruction allowed cooldown readings to be taken from temperature sensors that did not reflect the actual cooldown rate during this event.

It is PNPP management's expectation that monitoring of cooldown parameters begin as soon as practicable after the commencement of power transients or reactor trips, consistent with plant priorities needed for maintaining public health and safety. Recording cooldown data within thirty minutes of a power transient or reactor trip is not required by Technical Specifications or plant procedures.

During this particular transient, the priorities in the control room should not have impacted the Shift Technical Advisor's ability to record the first cooldown reading within thirty minutes. Management's expectation that cooldown readings be taken as soon as practicable, which in most cases will be within thirty minutes, was emphasized in operation shift briefings following the transient on January 7, 1997, and in a standing instruction that was issued to the operating crews.

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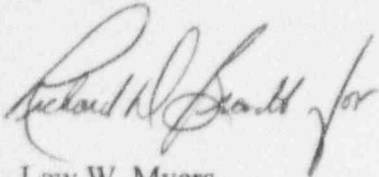


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During the event investigation, additional issues were identified, some of which were significant and include broader programmatic concerns. These issues, which are separate from the Notice of Violation, are being addressed via the PNPP corrective action program. If you have questions or require additional information, please contact Mr. Henry L. Hegrat, Manager-Regulatory Affairs, at (216) 280-5606.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Lew W. Myers for".

Lew W. Myers
Vice President-Nuclear

Enclosure

cc: NRC Region III Administrator
NRC Resident Inspector
NRC Project Manager

REPLY TO A NOTICE OF VIOLATION

VIOLATION 96018-01

Restatement of the Violation

During an NRC inspection conducted on December 21, 1996, through February 3, 1997, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions" (Enforcement Policy), NUREG-1600, the violation is listed below:

10 CFR 50 Appendix B, Criterion V, Instructions, Procedures, and Drawings, states "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with the instructions, procedures, or drawings. Instructions, procedures, or drawings shall include appropriate quantitative acceptance criteria for determining that important activities have been satisfactorily accomplished."

Surveillance Instruction (SVI) B21-T1176, RCS Heatup and Cooldown Surveillance, Revision 4, September 13, 1996, required that reactor coolant system (RCS) temperatures be verified every 30 minutes to be within TS limits during cooldown (inspector note - the SVI did not indicate when the first reading should be taken). The SVI also lists the TS limit for cooldown to be 100 degrees F per hour. The reactor scram and the start of the cooldown occurred at 5:34 a.m.

Contrary to the above the first recorded temperature reading was at 6:30 a.m. Also, the procedure allowed readings to be taken from temperature sensors that did not reflect the actual cooldown rate. This contributed to an inadequate awareness of the cooldown rate which exceeded the TS limits.

This is a Severity Level IV violation (Supplement 1)

Issue

In NRC Inspection Report No. 50-440/96018, it was identified that Perry Nuclear Power Plant (PNPP) personnel were inadequately monitoring cooldown temperatures during the reactor scram on January 7, 1997. SVI B21-T1176 allowed readings to be taken from temperature sensors that did not reflect the actual cooldown rate and also did not indicate when the first temperature reading should be taken. The NRC concluded that this contributed to an inadequate awareness of the cooldown rate which exceeded Technical Specification (TS) limits. The NRC determined that while in general, the conduct of operations continued to be safety-conscious, the reactor scram was caused by a personnel error and was followed by a cooldown that was exacerbated by another personnel error.

Background

On January 7, 1997, at 5:34 a.m., the plant automatically scrammed from full power as a result of a nonlicensed operator error during balance-of-plant inverter switching operations which is addressed in Licensee Event Report (LER) 97-001. The operator used the correct operating instruction; however, he performed a step that should not have been implemented for this evolution. The error removed power from the feedwater control system and various control room instruments. Feedwater was lost which led to low reactor vessel water level and the subsequent reactor scram. Reactor vessel water level was recovered by the High Pressure Core Spray (HPCS) system and Reactor Core Isolation Cooling (RCIC) system. The Reactor Water Cleanup (RWCU) system isolated and both reactor recirculation pumps tripped as designed, leading

to natural circulation in the reactor vessel and reactor recirculation loops. Control Rod Drive (CRD) system water was injected at approximately 200 gallons per minute for about two hours contributing to the cooldown and thermal stratification of water in the reactor vessel. During the transient, the cooldown rate exceeded TS limits.

Reason for the Violation

It is PNPP management's expectation that monitoring of cooldown parameters begin as soon as practicable after the commencement of power transients or reactor trips, consistent with plant priorities needed for maintaining public health and safety. In most cases, the first cooldown reading should be taken within thirty minutes. During this particular transient, the priorities in the control room should not have impacted the Shift Technical Advisor's (STA) ability to record the first cooldown reading within thirty minutes. Although a management expectation, recording cooldown data within thirty minutes of a power transient or reactor trip is not required by Technical Specifications or plant procedures. PNPP management believes that it is prudent to allow the operating crew flexibility in establishing control room priorities during transients, emergencies, and other off-normal conditions.

The PNPP corrective action investigation confirmed that recording cooldown data within thirty minutes of a power transient or reactor trip is not required by Technical Specifications or plant procedures. The following specific conclusions were reached:

- The requirement to perform Surveillance Requirement (SR) 3.4.11.1 every thirty minutes is limited to planned heatup and cooldown operations and during RCS inservice leak and hydrostatic testing operations.
- Since the heatup, cooldown and pressure/temperature limits are required at all times, the limits must be maintained even during plant transients and reactor trips. Therefore, it would be prudent for control room personnel to start monitoring these parameters as soon as practicable after the commencement of the power transient or reactor trip based on plant priorities. However, monitoring is required at the time that the plant transient or reactor trip is concluded and the planned heatup/cooldown is commenced.

The basis for these conclusions are described below.

SVI B21-T1176 is used to verify RCS pressure and temperature are within TS limits during heatup, cooldown, and inservice leak and hydrostatic testing operations. The instruction satisfies the requirements of TS SR 3.4.11.1 and 3.4.11.2. The instruction requires that RCS temperatures be verified every 30 minutes to be within TS limits during cooldown. The SVI does not explicitly direct when the first reading should be taken. In addition, entry into the SVI following a plant transient, such as a reactor scan, is governed by Plant Emergency Instructions and Off Normal Instructions and is based on plant priorities.

TS SR 3.4.11.1 requires that the RCS heatup and cooldown rate be verified to be less than or equal to 100°F in any one hour period (every 30 minutes) during RCS heatup and cooldown operations and during RCS inservice leak and hydrostatic testing. The TS Bases description states that verification that operation is within limits (i.e., to the right of the appropriate limit line) is required every 30 minutes when RCS pressure and temperature conditions are undergoing **planned** changes. Since temperature rate of change limits are specified in hourly increments, 30 minutes permits assessment and correction of minor deviations. The background section of the Bases states that components of the RCS are designed to withstand the effects of cyclic loads due to system pressure and temperature changes. These loads are introduced by startup (heatup) and shutdown (cooldown) operations, power transients, and reactor trips. This particular Limiting Condition

for Operation (LCO) addresses the pressure and temperature changes during RCS heatup and cooldown, and ensures they are maintained within the design assumptions and the stress limits for cyclic operation.

Therefore, the Bases background indicates that the SR is applicable for making checks during plant heatup and cooldown, but not during power transients or reactor trips. The applicability for this LCO is "at all times" and, therefore, temperature and pressure limits apply for power transients and reactor trips. However, the requirement to perform SR 3.4.11.1 does not apply to times when the plant is undergoing transients or reactor trips. Once the control room has recovered from the plant transient or reactor trip, and a **planned** cooldown or heatup is commenced, then SR 3.4.11.1 is required to be performed. In addition, if the plant transient or reactor trip may have impacted any of the limits of LCO 3.4.11, then a historical review of plant data should be performed to determine if any of the heatup, cooldown, or pressure/temperature limits were violated. If a limit was exceeded, LCO 3.4.11 Condition A would be entered, and the appropriate actions, including an acceptability determination will be performed in accordance with PNPP TS.

Following the reactor scram on January 7, 1997, the STA recorded the first temperature reading at 6:30 a.m., approximately one hour after the scram. This action is in accordance with plant procedures which allow for prioritizing recovery activities during emergency and off-normal conditions before proceeding with other activities; however, it did not meet management's expectation that monitoring of cooldown parameters begin as soon as practicable after the commencement of power transients or reactor trips, consistent with plant priorities. Following a scram where both recirculation pumps trip and RWCU isolates, a rapid cooldown of the reactor bottom head region is expected. In this particular event, initial actions were appropriately prioritized to determine control rod position, restore the lost instrument bus, and to stabilize the plant (i.e., power, level, and pressure control); however, there was still sufficient time available to take the first cooldown reading within approximately thirty minutes versus the 56 minutes it actually took.

The second part of the violation indicated that SVI B21-T1176 allowed the STA to use only one recirculation loop thermocouple to track cooldown. The precautions and limitations section of the SVI states that Emergency Response Information System (ERIS) points may be used to take readings if they correspond directly to an instrument specified in the instruction and are validated. The STA initially verified that the ERIS points were consistent with the chart recorder data; however, he did not use the chart recorder again until a licensed operator asked him to look at the temperature drop on the chart recorder (about 7:50 a.m.). The chart recorder provided thermocouple readings for both loops and a real time visual history of recent conditions. Although the SVI is consistent with General Electric recommendations and directs the STA to take readings from a recirculation loop when RWCU is isolated, it did not provide sufficient guidance to assure adequate monitoring of the cooldown rate for the transient and subsequent thermohydraulic effects experienced on January 7, 1997.

Corrective Steps Taken and Results Achieved

Shift crews were briefed regarding the details of the event with emphasis on management expectations that monitoring of the cooldown parameters begin as soon as practicable after the commencement of the power transient or reactor trip consistent with plant priorities. Additionally, Plant Emergency Instruction, Off-Normal Instruction, and SVI interaction was discussed, as well as prioritization of restoration activities.

Corrective Steps that Will be Taken to Avoid Further Violations

In the interim, the SVI will be revised to indicate that the chart recorder is the preferred or primary instrument for cooldown monitoring and trending; however, ERIS may still be used. The SVI will also be

revised to record both recirculation loops and the reactor vessel bottom head drain temperatures which will be evaluated against TS requirements. The SVI will be revised by June 30, 1997.

The current instruction guidance is being reevaluated. Discussions are ongoing with General Electric to develop enhanced monitoring techniques. These discussions will be complete and recommendations implemented, or implementation plans made, by December 31, 1997.

Date When Full Compliance Will Be Achieved

Full compliance will be achieved by June 30, 1997, following implementation of the interim corrective action that will revise the SVI.

The following table identifies those actions which are considered to be regulatory commitments. Any other actions discussed in this document represent intended or planned actions, are described for the NRC's information, and are not regulatory commitment. Please notify the Manager - Regulatory Affairs at the Perry Nuclear Power Plant of any questions regarding this document or any associated regulatory commitments.

COMMITMENTS

SVI B21-T1176 will be revised to indicate that the chart recorder is the preferred or primary instrument for cooldown monitoring and trending; however, ERIS may still be used. The SVI will also be revised to record both recirculation loops and the reactor vessel bottom head drain temperatures which will be evaluated against TS requirements. The SVI will be revised by June 30, 1997.

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