



**Consumers  
Power**

**POWERING  
MICHIGAN'S PROGRESS**

Palisades Nuclear Plant: 27780 Blue Star Memorial Highway, Covert, MI 49043

March 6, 1996

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

**DOCKET 50-255 - LICENSE DPR-20 - PALISADES PLANT**

**REPLY TO NOTICE OF VIOLATION FOR TWO VIOLATIONS - INADEQUATE  
FREEZE PROTECTION FOR CONDENSATE STORAGE TANK LEVEL INDICATOR  
AND SAFETY INJECTION LOW PRESSURIZER PRESSURE SIGNAL DISABLED  
WITH PRIMARY COOLANT SYSTEM GREATER THAN 300°F.**

NRC Inspection Report No. 50-255/95014 contained a Notice of Violation for two Severity Level IV Violations. The first violation (50-255/95014-01) concerned the failure to take adequate corrective measures to prevent recurrence of the loss of a condensate storage tank level indicator due to inadequate freeze protection. Attachment 1 contains our response to this violation. The second violation (50-255/95014-02) concerned the failure to maintain the low pressurizer pressure function of the safety injection system (SIS) operable above 210°F by failing to follow procedures. This event was also discussed in Licensee Event Report (LER) 96-004 which was submitted on February 19, 1996. Attachment 2 contains our response to this violation.

The NRC Inspection Report No. 50-255/95014 also requested Consumers Power to respond to the management oversight issues with these occurrences within 45 days. Our action to ensure effective management oversight of plant activities will be addressed under separate correspondence.

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*A CMS ENERGY COMPANY*

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## SUMMARY OF COMMITMENTS

This letter contains two new commitments and no revisions to existing commitments. Commitments numbered 3 to 6 are included here for completeness, and are restatements of commitments made in LER 96-004.

The commitments contained are:

1. Revise the Cold Weather Check Lists to fully incorporate SOER 82-15 recommendations relevant to Palisades.
2. Revise the Periodic and Predetermined Activity Control (PPAC) DMW002 to require that the heat trace and insulation on the condensate storage tank T-2 and primary makeup water storage tank T-81 level transmitters are specifically checked during the PPAC implementation.
3. Reinforce with Shift Supervisors, Control Room Supervisors and Shift Engineers the expectation to validate and verify information using available references (e.g., Work Order information blocks, procedure prerequisite sections) and sources (Technical Specifications, procedures, Daily Orders, schedules, equipment safe shutdown lists, LCO status boards, etc.) to assist in achieving informed and accurate decision making.
4. Conduct training for licensed operators on the purpose of maintaining operability of equipment listed in Technical Specification Table 3.17.2 when the PCS temperature is greater than or equal to 300°F.
5. Revise the Permanent Maintenance Procedures to disable/enable the Safety Injection System actuation on low pressurizer pressure to align with Technical Specifications.
6. Align the procedures GOP 9, SOP 3 and ESS-E-24 to accurately reflect which procedure controls the activity for disabling SIS.



Richard W Smedley  
Manager, Licensing

CC Administrator, Region III, USNRC  
Project Manager, NRR, USNRC  
NRC Resident Inspector - Palisades  
Attachments

CONSUMERS POWER COMPANY

To the best of my knowledge, the contents of this letter, Reply to Notice of Violation for Two Violations - Inadequate Freeze Protection for Condensate Storage Tank Level Indicator and Safety Injection Low Pressurizer Pressure Signal Disabled with Primary Coolant System Greater than 300°F, are truthful and complete.

By Robert A. Fenech  
Robert A Fenech  
Vice-President, Nuclear Operations Department

Sworn and subscribed to before me this 6<sup>TH</sup> day of MARCH 1996.

Alora M. Davis  
Alora M. Davis, Notary Public  
Berrien County, Michigan  
(Acting in Van Buren County, Michigan)  
My commission expires August 26, 1999

**ATTACHMENT 1**

**CONSUMERS POWER COMPANY  
PALISADES PLANT  
DOCKET 50-255**

**REPLY TO NOTICE OF VIOLATION  
INADEQUATE FREEZE PROTECTION FOR  
CONDENSATE STORAGE TANK LEVEL INDICATOR**

**4 Pages**

**REPLY TO NOTICE OF VIOLATION  
INADEQUATE FREEZE PROTECTION FOR  
CONDENSATE STORAGE TANK LEVEL INDICATOR**

**NRC VIOLATION**

*During an NRC inspection conducted on December 7, 1995, through January 26, 1996, 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:*

*10 CFR 50 Appendix B, Criterion XVI, states, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected.*

*Contrary to the above, adequate freeze protection was not provided to LIA-2022\*, condensate storage tank level indicator, following cold weather freezing on February 11, 1995, until a second occurrence of cold weather freezing on December, 1995.*

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

\* The level instrument listed in the NRC inspection report notice of violation (LIA-2022) is in error. The correct identification number for the instrument which froze is LIA-2021. It will be referred to hereafter as LIA-2021.

**CONSUMERS POWER COMPANY RESPONSE**

We agree that the violation occurred. We have noted an editorial error in the violation, but it does not materially change the facts associated with the violation.

**REASON FOR VIOLATION**

Event Description and Background

On December 9, 1995, at 0744, with the plant at 99% power and above 300°F, one of two channels of instrumentation (LIA-2021) required to monitor condensate storage tank (T-2) level was declared inoperable, due to freezing of the associated sensing lines. This instrumentation was required operable per Technical Specification 3.17.4, Table 3.17.4 Function 8, because the plant was heated above 300°F at the time of occurrence. The violation was issued because this was a repeat occurrence. Previously LT-2021 had frozen and had been declared inoperable on February 11, 1995, and the actions intended to prevent recurrence after that earlier event had not been completed.

### Method of Discovery

Routine monitoring by Nuclear Control Operators (NCO) in the Control Room detected when LIA-2021 failed high. The failure high was due to water freezing in the instrument sensing tubing for level transmitter LT-2021, which provides the input signal to the Control Room mounted LIA.

### Discussion

On December 9, 1995, LIA-2021 indication failed high due to freezing of water in the instrument tubing of its level transmitter. This is a repeat of an incident that occurred on February 11, 1995, in which LT-2021 output similarly failed due to freezing sensing lines. Coincident with the February 1995 and December 1995 incidents, several other non-safety related plant devices also exhibited the effects of freezing.

Freezing of safety related equipment had previously been identified by INPO as a significant problem. INPO issued SOER 82-15 to address the issue and provide recommendations. Since 1982, Palisades has periodically reviewed our Cold Weather Program against the INPO criteria for dealing with cold weather. No additional or remedial actions resulted from the reassessments in 1990, 1991, or 1995.

In April 1995, two work requests were initiated as follow up from the February 1995 freezing event. These were to permanently improve the insulation box around LT-2021 and LT-2022, including adding more insulation. Contrary to the April 1995 intent, this work was not accomplished prior to winter 95/96. In August 1995, Insulation Request Forms for these two work requests were initiated by Maintenance Planning, and logged in the Insulation Log. The plan in August was to have the onsite insulation contractor perform the work. However, the insulation contractor demobilized and left site without all items on the Insulation Log completed. The information was turned over to Maintenance Work Order Planning, but the actions were not completed.

Cold Weather Check Lists 1 and 2 were completed on 11/2/95 and 10/31/95, respectively. In spite of the inspections performed per the check lists, about one month later, LT-2021 froze due to inadequate insulation.

Subsequently, a review of the Cold Weather Check Lists and cold weather related PPACs against SOER 82-15 identified incomplete inclusion of recommendations appropriate for Palisades.

The safety implications were minimal, because during the entire period this instrumentation was inoperable, the redundant condensate storage tank level instrumentation (LIA-2022) was fully operable. Level was satisfactorily confirmed hourly using this operable redundant instrumentation. This tank LIA monitoring

confirmed that actual tank inventory remained above that level required by Tech Spec 3.5.1.e.

A generic lesson learned from this event is the need to effectively monitor and maintain equipment installed for freeze protection.

### Root Cause

The root cause for the event was an Organization-to-Program interface deficiency, wherein the Operations Department provided insufficient commitment to implementation of the plant's cold weather preparation program. Specifically, the implementation of applicable INPO recommendations from SOER 82-15 was incomplete.

An additional contributing factor for this incident was a failure in the transition of administrative processes used for field implementation of thermal insulation work. The need to refurbish the tank level transmitters' insulation was identified, but a transition from a contractor's Insulation Log back to the plant Maintenance work order was not effective, when the contractor was demobilized after the 1995 Refueling Outage. Individually, both the logging system and the work order system have been successful in ensuring work is done. However, the transition from one method to the other was ineffective for this particular task.

### **CORRECTIVE ACTIONS TAKEN AND RESULTS ACHIEVED**

Immediately upon discovery of the condition, LIA-2021 (and LT-2021) was declared inoperable (0744 on December 9, 1995), and compensatory hourly checks of the redundant and operable channel LIA-2022 were initiated. Actions were initiated to warm LT-2021 using trouble lights (as a heat source), blanket insulation and welding blankets. At approximately 1030 on December 9, 1995, LIA-2021 was functioning and in agreement with its redundant channel LIA-2022. LIA-2021 was closely monitored for the balance of that shift and it continued to function properly. However, a decision was made to have it remain inoperable pending refurbishment of insulation and verification by I&C of operability. Repairs to the insulation box were completed and LT-2021 (LIA-2021 circuitry) was declared operable on December 13, 1995, at 0937.

Similar refurbishment to the insulation to the redundant channel transmitter LT-2022 was accomplished in the same time frame.

I&C has confirmed the adequacy of the current calibration of LIA-2021/LT-2021 instruments which experienced the freezing event. Future confirmation of instrument performance will be in accordance with routine checkout and calibration intervals.

The insulation log was reviewed and the insulation activities have been documented on work orders. In addition, a supervisory tour of the plant was conducted for additional

insulation needs and these were documented on work orders. The insulation contractor has been brought on-site to complete the insulation work.

### **CORRECTIVE ACTIONS REMAINING TO BE TAKEN TO AVOID FURTHER VIOLATIONS**

1. Revise Cold Weather Check Lists to fully incorporate SOER 82-15 recommendations relevant to Palisades. Specific items to be considered for inclusion are:
  - a. Inspections of all insulation on safety related equipment where a potential for freezing or malfunction due to cold weather.
  - b. Acceptance criteria for the inspection of insulation and heat tracing.
  - c. Defining when the frequency for inspections should be increased and what should be inspected, and at what frequency.
  - d. Adding a "Purpose" section on the check list to remind personnel of the significance of the check list, and the standards and expectations.
  - e. Actions to take in the event of extremely cold temperature, such as adding space heaters or providing additional enclosures.
  - f. Creation of a warm weather check list to return equipment to warm weather status and/or address other warm weather issues.
2. Revise the Periodic and Predetermined Activity Control (PPAC) DMW002 (Condensate and Primary Makeup Water Storage Tank Level Instruments' Calibrations) to require that the heat trace and insulation on the condensate storage tank T-2 and primary makeup water storage tank T-81 level transmitters are specifically checked during the PPAC implementation.

### **DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED**

Completion of the items above will be accomplished by October 15, 1996.



**ATTACHMENT 2**

**CONSUMERS POWER COMPANY  
PALISADES PLANT  
DOCKET 50-255**

**REPLY TO NOTICE OF VIOLATION  
SAFETY INJECTION LOW PRESSURIZER PRESSURE SIGNAL DISABLED WITH  
PRIMARY COOLANT SYSTEM GREATER THAN 300°F**

**REPLY TO NOTICE OF VIOLATION  
SAFETY INJECTION LOW PRESSURIZER PRESSURE SIGNAL DISABLED WITH  
PRIMARY COOLANT SYSTEM GREATER THAN 300°F**

**NRC VIOLATION**

*During an NRC inspection conducted on December 7, 1995, through January 26, 1996, 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:*

*10 CFR 50 Appendix B, Criterion V, states, in part, that 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 these instructions, procedures, or drawings.*

*General Operating Procedure (GOP-9), Plant Cooldown from Hot Standby/Shutdown, step 4.4, states "WHEN PCS is less than 210°F (i.e., Cold Shutdown) THEN initiate work order to disable Safety Injection actuation circuits (refer to SOP 3, Step 7.7.1)."*

*System Operating Procedure (SOP-3), Safety Injection and Shutdown Cooling System, step 7.7.1, states that the safety injection actuation circuits shall only be disabled when the reactor is in cold or refueling shutdown.*

*Contrary to the above, on January 18, 1996, the low pressurizer pressure function of the safety injection system was deenergized with the primary coolant system above cold shutdown conditions.*

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

**CONSUMERS POWER COMPANY RESPONSE**

We agree that the violation occurred as stated.

**REASON FOR VIOLATION**

Event Description and Background

On January 18, 1996, the reactor was being placed in cold shutdown conditions due to faulted 2400 VAC cables that supply 1D Bus. During the "C" shift (1600-2400 hrs) a

work order for disabling the safety injection low pressurizer pressure signal was noted by the Electrical Maintenance Supervisor during his review of upcoming work. A review of the Electrical Maintenance Daily Schedule and the forced outage schedule did not indicate that this work order was to be performed on that shift. After a discussion with the Shift Supervisor, a review of plant conditions and what was thought to be the applicable requirement, the work order was released at 2046 hours. Primary coolant temperature at that time was approximately 364°F. The work order activity was completed at 2130 hours. Therefore, this work disabled the Safety Injection System actuation on low pressurizer pressure when the Primary Coolant System (PCS) temperature was approximately 364°F. This was a violation of Technical Specification section 3.17.2 which requires these Engineered Safety Feature logic channels and associated instrumentation to be operable whenever PCS temperature is greater than or equal to 300°F. Disabling the low pressurizer pressure safety injection actuation signal at a PCS temperature greater than 300°F went unnoticed until 0615 hours on January 19 when the Planning and Scheduling Manager questioned the completion of the activity.

#### Method of Discovery

This event was detected when the Planning and Scheduling Manager questioned the completion of the activity during his morning review of the previous nights activities.

#### Discussion

Various references provide the necessary information to identify the applicable requirements for disabling SIS. However, all relevant references were not utilized to validate the decision to allow the disabling of the low pressurizer pressure safety injection actuation signal. The applicable Technical Specification requirement was not utilized and the maintenance procedure prerequisites were not met.

When the Electrical Maintenance Supervisor noted the work order to disable SIS and went to seek more information as to when it was required, a series of miscommunications, improper verification of plant requirements, and lack of attention to detail resulted in a decision to perform the work order activity prematurely. The required preestablished plant conditions and sequence were unknowingly altered for this activity.

Various program and process barriers to prevent this occurrence were broken. They were:

1. The Work Order "Technical Specification Involvement" block referenced Technical Specification 3.17. However, this section was not referred to and Technical Section 3.16 was thought to be the applicable requirement.
2. General Operating Procedure (GOP) 9, Attachment 1 "Plant Cooldown (Hot Standby/Shutdown Checklist)" section 4.4 states "When PCS is less than 210°F

(i.e., Cold Shutdown), then initiate work order to disable Safety Injection actuation circuits [refer to System Operating Procedure (SOP) 3, step 7.7.1].” This step went unheeded in the decision making process to disable SIS since it appears on page 4 of the checklist and the plant conditions at the time had only taken the operating crew through page 2 of the checklist.

3. SOP 3, “Safety Injection And Shutdown Cooling System,” section 7.7.1 notes “This procedure shall only be performed when the Reactor is in Cold or Refueling Shutdown . . .” This procedure was not referenced for guidance.
4. Electrical Maintenance Procedure, ESS-M-24 “Disable/Enable the Safety Injection System Actuation on Low Pressurizer Pressure,” prerequisite section 3.3, specifies plant condition to be “cold shutdown.” Procedure step 5.1 requires the assigned supervisor ensure all prerequisites are completed. The plant condition of cold shutdown was not verified.
5. Technical Specification 3.16 “Engineered Safety Features System Instrumentation Settings” was referenced as the controlling requirement. Technical Specification 3.16 applicability statement indicates that Technical Specification 3.16 is applicable when associated ESF or Isolation Function Instrumentation is required to be operable by Technical Specification 3.17.2 or 3.17.3. Technical Specification 3.17.2 requires SIS to be operable when the PCS is greater than or equal to 300°F. This information was not recognized and verified.
6. The Equipment Safe Shutdown Operations General Outage Information list contained an entry indicating Safety Injection Actuation Signal (SIAS) will be disabled at less than 210°F for low pressure only. Containment High Pressure will still result in an SIAS. This information was available but was not referred to as a reference source.

There was no safety significant condition which resulted from disabling of the SIS on low pressure during plant cooldown on January 18, 1996. The SIS low pressure signal was blocked by design during plant cooldown before PCS pressure decreased below 1593 psia. The plant average temperature and pressure were 364°F. and less than 600 psia when the maintenance was performed disabling SIS on low PCS pressure. The Low Temperature Overpressurization Protection (LTOP) set point of about 1000 psia would have prevented an auto-reset on increasing pressure above 1593 psia. Whether the SIS on low pressure is available or disabled is not significant to the plant condition because the plant would have been relying on a Containment High Pressure (CHP) signal or operator action to start High Pressure Safety Injection (HPSI) to maintain or recover PCS inventory for a large break Loss of Coolant Accident (LOCA). The SIS on containment high pressure was still available to start all available safety injection pumps. With the saturation pressure of about 160 psia, the PCS inventory could be quickly recovered with one HPSI pump for both large break and small break LOCAs. At this pressure, Low Pressure Safety Injection (LPSI) pumps would also be

able to supply PCS makeup since they remain aligned to the Safety Injection and Refueling Water (SIRW) tank when the PCS temperature is greater than 300°F.

The plant response to small break LOCAs with the SIS low pressure signal blocked or disabled requires operator action to start available HPSI and Charging pumps. Throttling of the safety injection pumps would be required to maintain the PCS pressure within the acceptable range below the LTOP set point curve. Also, the probability of a large or small break LOCA occurring after full power operations when the PCS pressure has been reduced to less than 600 psia is very small. The consequences of an accident were not changed by this event.

### Root Cause

All relevant information was not used in the decision making process and pertinent procedures were violated. Therefore, the root cause of the event was personnel error.

### **CORRECTIVE ACTIONS TAKEN AND RESULTS ACHIEVED**

Management has discussed this event with the Maintenance Supervisors stressing their responsibility to assure procedure prerequisites are met prior to authorizing a work activity.

### **CORRECTIVE ACTIONS REMAINING TO BE TAKEN TO AVOID FURTHER VIOLATIONS**

The following corrective actions will be taken:

1. Reinforce with Shift Supervisors, Control Room Supervisors and Shift Engineers the expectation to validate and verify information using available references (e.g., Work Order information blocks, procedure prerequisite sections) and sources (Technical Specifications, procedures, Daily Orders, schedules, equipment safe shutdown lists, LCO status boards, etc.) to assist in achieving informed and accurate decision making.
2. Conduct training for licensed operators on the purpose of maintaining operability of equipment listed in Technical Specification Table 3.17.2 when the PCS temperature is greater than or equal to 300°F.
3. Revise the Permanent Maintenance Procedure to disable/enable the Safety Injection System actuation on low pressurizer pressure to align with Technical Specifications.
4. Align the following procedures to accurately reflect which procedure controls the activity for disabling SIS.

- a. General Operating Procedure 9, Attachment 1 "Plant Cooldown (Hot Standby/Shutdown Checklist)," step 4.4 which refers to System Operating Procedure 3, step 7.7.1
- b. System Operating Procedure 3 "Safety Injection And Shutdown Cooling System" section 7.7.
- c. Permanent Maintenance Procedure ESS-E-24, "Disable/Enable the Safety Injection System Actuation On Low Pressurizer Pressure."

**DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED**

Completion of the above items will be accomplished by August 1, 1996.