

Omaha Public Power District
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402/636-2000

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LIC-95-0011

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-137
Washington, D.C. 20555

- References:
1. Docket No. 50-285
 2. Telephone conversation between NRC (W. D. Johnson and T. F. Westerman) and OPPD (T. L. Patterson) dated November 18, 1994
 3. Notification of Unusual Event (NGUE) at the Fort Calhoun Station pursuant to 10CFR50.72 dated November 14, 1994
 4. LER 94-010 Revision 00, from OPPD (W. G. Gates) to NRC (Document Control Desk) dated December 14, 1994 (LIC-94-0252)
 5. Letter from OPPD (W. G. Gates) to NRC (L. J. Callan) dated November 29, 1994 (LIC-94-0244)

Gentlemen:

SUBJECT: Potential Accident Scenario Involving Loss of Control Room Air Conditioners

As committed to in Reference 5 above, this letter is being sent as an update on the current changes to Omaha Public Power District's (OPPD's) administrative controls regarding the issue of the potential loss of control room air-conditioning due to overheating of Component Cooling Water (CCW) during some accident scenarios. Attachment A to this letter supersedes Reference 5. Revisions to Reference 5 are shown with vertical bars to the right of the text in Attachment A.

On January 12, 1995, modification MR-FC-94-021 was completed. This modification provides a Safety Injection Actuation Signal (SIAS) to open the Raw Water (RW) inlet and outlet valves to each of the four RW/CCW heat exchangers. The CCW system inlet and outlet valves to these heat exchangers have always received open signals on an SIAS. The RW and CCW system inlet and outlet valves for all four of the heat exchangers will now receive signals to automatically open after an accident. Because of this change to system operation the restriction on RW system alignment for these heat exchangers, as discussed in Reference 5, will no longer be required.

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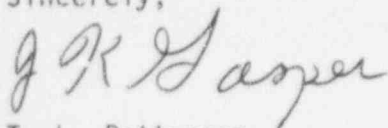
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Safety Analysis for Operability (SAO) 94-02 has been revised to reflect the completion of modification MR-FC-94-021 and to provide additional clarification concerning necessary actions should the protected control room air-conditioning unit become inoperable. All appropriate procedures have been updated as required.

If you should have any questions, please contact me or my staff directly.

Sincerely,

A handwritten signature in cursive script, appearing to read "T. L. Patterson".

T. L. Patterson
Division Manager
Nuclear Operations

TLP/epm

c: LeBoeuf, Lamb, Greene & MacRae
L. J. Callan, NRC Regional Administrator, Region IV
W. D. Johnson, NRC Chief, Reactor Projects Section A
T. F. Westerman, NRC Chief, Engineering Branch
S. D. Bloom, NRC Project Manager
R. P. Mullikin, NRC Senior Resident Inspector

Attachment A

SUBJECT: Potential Accident Scenario Involving Loss of Control Room Air Conditioners

On November 18, 1994, Nuclear Regulatory Commission (NRC) and Omaha Public Power District (OPPD) personnel discussed a potential accident scenario that results in the loss of control room air-conditioning (Reference 2). As requested during that conversation OPPD provides the following information.

During preparation for OPPD's Service Water System Operational Performance Self Assessment, two Design Basis Accident (DBA) scenarios were identified that could result in elevated Component Cooling Water (CCW) temperatures that exceed the control room air conditioners' design conditions.

System Overview

The basic safety-related functions of the control room habitability system are:

- 1) To ensure that control room equipment operating temperature limits are maintained during all modes of plant operation,
- 2) To protect the control room operators from airborne radioactivity and direct radiation from other sources in the event of a Design Basis Accident,
- 3) To protect control room operators from toxic gases from a chemical accident.

The control room habitability system consists, in part, of two air-conditioning units, two emergency filter trains, their associated fans, and ventilation ducting. The system provides a filtered external air supply and recirculation and cooling of the air space. The air-conditioning unit condensers are cooled by CCW which is in turn cooled by the Raw Water (RW) system. The heat transferred to the RW system is discharged to the Missouri River. Besides the control room air conditioners, the CCW system cools a number of engineered safeguards equipment loads.

The Technical Specifications (TS) that pertain to the control room habitability system in this instance are TS 2.12 and TS 2.15(3). TS 2.12 applies to the control room air-conditioning and filtering subsystem. TS 2.12 requires, in part, that control room air temperature be maintained below 105°F. If control room air temperature cannot be maintained below 105°F then the temperature within the control room control cabinets must be measured and maintained below 120°F. If the control room cabinet temperatures exceed 120°F and cannot be reduced to less than 120°F within four hours the reactor must be shutdown to hot standby within the next six (6) hours. TS 2.15 applies to plant instru-

mentation. TS 2.15(3) requires certain minimum configurations of instrumentation be available at all times. If these minimum configurations of instrumentation cannot be maintained TS 2.15(3) requires, in part, that the reactor be placed in hot shutdown within 12 hours. There are no specific TS requirements associated with operation or operability of the control room air conditioners.

Issue Summary

A recently completed analysis indicates that within three (3) minutes of a Large Break Loss of Coolant Accident (LBLOCA) or a Main Steam Line Break (MSLB) in containment, the CCW temperature would exceed 106°F. Depending on CCW and RW system alignments, and river temperature, CCW temperature could exceed 130°F. If CCW temperature reaches 106°F, the control room air-conditioning units (VA-46A/B) freon compressors are shutdown by the freon high pressure switches, which are set at 270 psig. If the CCW temperature to the freon condenser heat exchanger exceeds 130°F, which corresponds to a 300 psig saturation pressure for freon-22, a rupture disc would release freon into the control room. Release of this quantity of freon in the control room was previously evaluated and was determined not to be a personnel safety concern. The loss of freon would render the control room air conditioners inoperable and unrecoverable for an indeterminate period.

The TS (2.12) limit of 105°F air temperature in the control room ensures that temperatures within safety-related cabinets remain below 120°F. 120°F is the design basis temperature for electrical and electronic components associated with safety-related functions. In the above scenarios it is postulated that the control room temperature would hinder operations personnel in the performance of their duties and possibly exceed design temperatures for safety-related electrical equipment in the control room cabinets.

On November 14, 1994, at 1349 CST, the Fort Calhoun Station Plant Review Committee (PRC) determined that the VA-46 A/B units were inoperable, which they determined placed the plant in Technical Specification (TS) 2.15(3), due to the potential post-accident impact on the control room instrumentation and the plant's Engineered Safeguards Equipment. TS 2.15(3) specifies that the reactor be placed in a hot shutdown condition within 12 hours. A NOUE was declared based on the entry into TS 2.15(3). Notification to the NRC was made at 1448 CST. At 1850 CST the PRC accepted the technical content of a draft Safety Analysis for Operability (SAO). The PRC determined that with the compensatory actions identified in the SAO, and implemented by an operations memorandum, continued plant operation was acceptable and the NOUE was terminated. SAO 92-02 was subsequently finalized and approved by the PRC on November 18, 1994. Revision 3 to the SAO was approved on January 12, 1995.

Action Summary

OPPD has evaluated the impact of this scenario and has determined there exists a high level of assurance that control room air temperature will be maintained

below 105°F. This conclusion is based on the results of the following evaluations.

1. Analysis has determined that the control room air temperature will not exceed 105°F when outside air temperature is **below** 60°F. This analysis requires that:
 - a) Control room air temperature be maintained below 80°F during normal operation, and
 - b) One control room air-conditioning unit fan is prevented from starting. The operating VA-46 unit fan is secured within 20 minutes of any loss of control room air-conditioning.
2. If outside air temperature is **at or above** 60°F analyses require the following additional compensatory measures or conditions be followed in order to demonstrate an acceptable level of risk.
 - a) Operation when outside air temperature exceeds 60°F is allowed for a cumulative total of not more than 250 hours for the period of operation covered by SAO 94-02. (To remain in effect until the plant enters cold shutdown for the 1995 refueling outage. The outage is currently scheduled to begin on March 11, 1995.)
 - b) CCW flow will be isolated and the corresponding units control switch placed in "STOP" for one (1) VA-46 unit (hereafter referred to as the "protected unit") at all times.
 - c) The in-service VA-46 unit may be inoperable for 24 hours, as long as the control room's temperature is maintained below 80°F.
 - d) The operators are provided guidance on how to minimize CCW temperature following an accident and how and when to restore the protected control room air-conditioning unit.
 - e) Deleted
 - f) Operation is not allowed when river temperature exceeds 50°F.
 - g) Either of the following conditions is allowed:
 - one of the four RW/CCW heat exchangers may be inoperable for 14 days
 - OR

- one RW pump may be inoperable indefinitely, and an additional RW pump (two total) may be inoperable for up to 24 hours.

Safety Impact

A 10 CFR 50.59 Evaluation has been completed for this potential event. The evaluation demonstrated that with the conditions listed in item 1. above, it can be shown that control room air temperature will not exceed 105°F and consequently equipment operability is not impacted.

This situation has been evaluated from a beyond-design-basis risk perspective. Based on the compensatory measures listed above the resultant change in core damage probability has been determined not to be risk significant. The evaluation assumed that all the actions listed in 1. and 2. above would be in effect at all times. Therefore, operation above 60°F outside air temperature, for the limited period addressed, presents an acceptable level of risk.

Compensatory Action Summary

OPPD has taken conservative interim compensatory measures which implement all the items listed in 1) and 2) above, under an operations memorandum. These compensatory measures are treated as "Administrative Controls" and will be strictly followed until long term resolution of this issue is completed. Failure to maintain compliance with any of the administrative controls will require entering the action statement of TS 2.15(3). The following is a summary of those administrative controls.

1. Deleted |
2. CCW flow will be isolated and the corresponding units' control switch placed in "STOP" to one (1) VA-46 unit at all times.
3. Operation is not allowed when river temperature exceeds 50°F.
4. Outside air temperature cannot exceed 60°F for a cumulative total of more than 250 hours for the period of operation covered by SAO 94-02. |
5. Maintain control room temperature below 80°F at all times during plant Modes 1,2,3 and with RCS temperature greater than 300°F. |
6. As an immediate action, for any event involving a reactor trip, operations' is directed to shutdown the operating VA-46 fan unit.
7. The in-service VA-46 unit may be inoperable for 24 hours, as long as the control room temperature is maintained below 80°F.
8. If the protected VA-46 unit is determined to be inoperable, (e. g. loss |

of a Motor Control Center) for more than 8 hours, then the in-service VA-46 unit shall be isolated to become the one protected VA-46 unit.

9. Either of the following conditions is allowed:

- one of the four RW/CCW heat exchangers may be inoperable for 14 days,

OR
- one RW pump may be inoperable indefinitely, and an additional RW pump (two total) may be inoperable for up to 24 hours.

10. Operators have been provided guidance on minimizing CCW temperature following an accident (LBLOCA or MSLB) when to restore the protected control room air-conditioning unit. This guidance includes:

- a) Maximizing RW flow through the RW/CCW heat exchangers,
- b) Securing one of the three operating CCW pumps,
- c) When to secure containment coolers,
- d) When to use the protected air-conditioning unit and what to do if it cannot be restored.

The plant operations staff has been trained on this issue, associated compensatory measures and the operations memorandum. Additional operator training will be conducted as needed.

Short Term Actions

Applicable plant normal, abnormal and emergency procedures required to assure proper operator action were revised and implemented.

Long Term Actions

In order to provide a timely and satisfactory resolution to this issue, OPPD will conduct design evaluations and supporting analysis of the control room air conditioners, CCW and RW systems to identify and implement needed modifications to either plant equipment or Technical Specifications. Upon completion of the design effort, OPPD will issue a revision to Reference 4 detailing the specific long term corrective actions along with an implementation schedule for any identified changes.

With the actions outlined above all three of the design functions stated earlier in this letter for the control room habitability system will be met.

Additional information regarding this event is contained in LER 94-010 which was issued on December 14, 1994 (Reference 4).

OPPD continues to investigate and evaluate this design basis issue to assure safe operation of the Fort Calhoun Station. Should this ongoing effort identify changes affecting the above administrative controls, OPPD will provide further updates to the NRC. OPPD will not allow startup of the Fort Calhoun Station from the 1995 Refueling Outage until this issue is resolved.