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LIC-10-0098  
November 5, 2010

U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555-0001

- References:
1. Docket Number 50-285
  2. Letter from NRC (T. R. Farnholtz) to OPPD (D. J. Bannister) dated December 30, 2009 (NRC-09-0096)
  3. Letter from NRC (T. R. Farnholtz) to OPPD (D. J. Bannister) dated August 26, 2010 (NRC-10-0067)
  4. Regulatory Conference with Omaha Public Power District (OPPD) at the NRC Region IV Headquarters, Arlington TX, held on August 18, 2010
  5. Letter from NRC (R. J. Caniano) to OPPD (D. J. Bannister) dated July 15, 2010 (NRC-10-0054) (EA-10-0084)
  6. Letter from OPPD (J. A. Reinhart) to NRC Document Control Desk (DCD) dated September 23, 2010 (LIC-10-0091)
  7. Letter from NRC (E. E. Collins) to OPPD (D. J. Bannister) dated October 6, 2010 (NRC-10-0080)(EA-10-0084)
  8. Letter from NRC (E. E. Collins) to OPPD (D. J. Bannister) dated October 7, 2010 (NRC-10-0082)

**SUBJECT: NRC Inspection Report 05000285/2010008, Reply to a Notice of Violation (NOV); EA-10-084**

In Reference 7, the Nuclear Regulatory Commission (NRC) transmitted a Notice of Violation (NOV) to the Omaha Public Power District (OPPD). This Yellow finding involved the failure to maintain procedures for combating a significant flood as required by Fort Calhoun Station (FCS) Technical Specification 5.8.1.a, *Procedures*. Pursuant to the provisions to 10 CFR 2.201, OPPD submits its response to the violation as an Enclosure to this letter. OPPD accepts the violation and has elected not to appeal the staff's final significance determination.

On August 18, 2010, OPPD attended a regulatory conference at NRC Region IV to present its position on the external flooding event apparent violation. During the regulatory conference OPPD provided information on the results of the root cause analysis, corrective actions taken, response to the apparent violation, and the OPPD perspective on the significance determination of the apparent violation.

The protection against and mitigation of an external flooding event are of the utmost importance to OPPD. Actions have been completed to address deficiencies in the station design basis, procedures, equipment and training. Demonstrations were performed to

evaluate the decision making of the emergency response organization (ERO) during an external flooding event and the effectiveness of the ERO in constructing a sandbag berm. Additionally, a timed, videotaped demonstration of the fabrication and installation of selected floodgates was performed to document the ease, timeliness, and ability of craft personnel to perform these activities. Based on these actions OPPD is in full compliance with FCS Technical Specifications.

In Reference 8, the NRC announced that Supplemental Inspection Procedure 95002, *Inspection for one Degraded Cornerstone or any Three White Inputs in a Strategic Performance Area*, will be performed to review the actions taken to address the performance issues noted in Reference 7. To prepare for this inspection additional analysis of the identified performance issues will be performed and if necessary the response to this NOV will be supplemented or revised prior to the NRC performance of Supplemental Inspection Procedure 95002.

This letter contains regulatory commitments that are summarized on the last page of the enclosure. If you should have any questions, please contact me.

  
DM-NPIS  
FOR Jeffrey A. Reinhart  
Site Vice President

Enclosure

JAR/rmc

c: E. E. Collins, NRC Regional Administrator, Region IV  
L. E. Wilkins, NRC Project Manager  
J. C. Kirkland, NRC Senior Resident Inspector

**REPLY TO A NOTICE OF VIOLATION**

**Omaha Public Power District  
Fort Calhoun Station**

**Docket No. 50-285  
License No. DPR-40  
EA-10-084**

**During an NRC Inspection conducted from January 1 to June 21, 2010, one violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:**

**Technical Specification 5.8.1.a, *Procedures*, states, "Written procedures and administrative policies shall be established, implemented, and maintained covering the following activities: (a) The applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, 1978." NRC Regulatory Guide 1.33 *Quality Assurance Program Requirements (Operation)*, Appendix A, *Typical Procedures for Pressurized Water Reactors and Boiling Water Reactors*, section 6, recommends procedures for combating emergencies and other significant events. Section 6.w, *Acts of Nature*, includes, in part, procedures for combating floods.**

**Contrary to Technical Specification 5.8.1.a, since 1978, written procedures and administrative policies were not maintained covering the applicable procedures recommended by NRC Regulatory Guide 1.33, Revision 2, Appendix A. Specifically, the licensee failed to maintain written procedures for combating a significant external flood as recommended by NRC Regulatory Guide, Appendix A, Section 6.w, *Acts of Nature*. The licensee's written procedures did not adequately prescribe steps to mitigate external flood conditions in the auxiliary building and intake structure up to 1014 feet mean sea level, as documented in the Updated Final Safety Analysis Report.**

**This violation is associated with a Yellow significance determination process finding in the Mitigating Systems Cornerstone.**

## OPPD Response

### 1. Reason for the Violation

During the design phase (mid-1960s) of Fort Calhoun Station (FCS), communication between the United States Army Corp of Engineers (CoE), the Atomic Energy Commission (AEC), and the Architect Engineer (AE) Gibbs, Hill, Durham & Richardson (GHDR) determined that permanent external flood protection should be installed up to elevation 1009.5-ft mean sea level (msl) and would have provided temporary flood protection up to an elevation of 1014-ft msl. This flood protection, both permanent and temporary, would allow FCS to be maintained in a safe shutdown condition during a Missouri River flooding condition.

The Updated Safety Analysis Report (USAR) Section 2.7.1.2, *River Stage and Flow*, discussed external flooding events and flooding levels from 1001.3-ft msl to 1014-ft msl. The discussions of flooding levels in Section 2.7.1.2 did not provide clear direction for the temporary flood elevation protection (sandbagging) that was required.

USAR Section 9.8.6, *Availability and Reliability*, of the Raw Water System applies only to the intake structure, but provides a more concise and clear discussion on requirements and elevations related to flood protection. Section 9.8.6 provides three elevations of flood protection and contains clearer statements, with respect to flood protection for the intake structure, than USAR Section 2.7.1 does for the plant as a whole; however, there were apparent discrepancies between the two sections.

Although the USAR description was unclear, from the early 1970s through 1995 FCS procedures provided instructions for external flooding protection to the 1014-ft msl elevation. It appears personnel knowledge of the evolution of the flooding bases and licensing commitments compensated for lack of USAR clarity related to flooding requirements. Then in 1995 procedures no longer treated the 1014-ft msl elevation as a level for which flood protection was required and began treating any elevation greater than 1009.5-ft msl elevation as a level for which flood protection would be provided only as an extraordinary measure. Then, in subsequent years, the mention and treatment of the 1014-ft msl elevation continued to diminish in plant procedures. The USAR was still unclear at this time. Additionally, direct knowledge of the flooding requirements was lost and plant personnel began to rely on the wording in the USAR which was unclear. Additionally, due to the lack of clarity in the USAR wording, the understanding of flooding commitments and requirements was open to interpretation. Many individuals equated the combination of events that would yield flood elevations to 1014-ft msl as "catastrophic" or "incredible" with events that are beyond-design-basis (dam failure, not snow melt or rain) and therefore

not requiring administrative control for protection. This led to the erosion of the understanding of the 1014-ft msl elevation as a licensing basis requirement and erosion of its treatment in procedures.

The reason the violation occurred was because the OPPD commitment to protect the plant against external flooding to an elevation of 1014-ft msl was not clearly translated into the Final Safety Analysis Report (FSAR) Section 2.7, *Hydrology*.

There were missed opportunities that directly contributed to the failure to implement appropriate corrective actions when new external flood information was available. They include:

- Regulatory Guide (RG) 1.59, *Design Basis Floods for Nuclear Power Plant*, was misinterpreted during the resolution of a 1997 condition report that identified new CoE flooding information.
- The USAR Verification Project incorrectly categorized the flooding level issue to clarify the “maximum river level that the plant can withstand and still safely shutdown” as a “wording improvement” rather than an internal discrepancy.

Additionally, FCS personnel did not understand the terminology concerning “incredible” and “not credible” discussed in USAR Section 2.7. Section 2.7 stated that events leading up to a flood elevation of 1014-ft msl are “not credible” and considered to be “incredible” (dam failure, not snow melt or rain) and a flood elevation of 1014-ft msl is not considered design basis. These discrepancies in the USAR led plant personnel to believe that the word “incredible” equates to an event that is “beyond-design-basis” and therefore something that does not require protecting against.

## **2. Corrective Steps Taken and the Results Achieved**

- USAR Section 2.7, *Hydrology*, was revised to describe the physical protection of vital structures and vital equipment from flooding to a river level of 1014-ft msl including the basis for the maximum probable flood (1009.3-ft msl) and 1014-ft msl level. Elevation 1009.3-ft msl is consistent with the documents that formed the original design basis flood levels.
- Appropriate procedures were revised to include the external flooding protection strategies described in revised USAR Section 2.7. This included the redesign and manufacture of improved flood gates for selected doors, up to elevation 1014-ft msl, such that they will not require the use of sandbagging.
- An external flooding action plan was developed and implemented in January 2010 that tracks external flooding corrective actions. Completed key actions include:

- Four new gasoline-fueled portable pumps that will provide emergency feedwater to the steam generators in the event of a flood induced station blackout were purchased and staged.
  - Procedures, equipment, and materials used for filling the emergency feedwater tank were inspected and verified to be acceptable for use.
  - Procedures were revised and training completed to ensure that the fire water storage tank could be used as a long term source of make-up water to support decay heat removal in the event of an interruption in the commercial water supply.
  - Training was provided for FCS craft personnel that included both classroom and hands on training for external flooding protection procedures, floodgate installation, and sandbagging and earthen berm construction.
  - A new sandbagging machine was purchased to augment the existing machine. Additionally, sandbagging material was purchased and staged.
  - A walkdown was performed to identify openings below elevation 1009.5-ft msl that required sealing. The walkdown also identified openings that required additional protection to elevation 1014-ft msl. Identified discrepancies were entered into the station corrective action program and corrected.
  - A flooding exercise using the ERO validated the decision making needed to protect the health and safety of the public. Emergency implementing procedures, abnormal operating procedures, flooding procedures, and methods needed to protect vital equipment needed for long term core cooling were evaluated. Additionally, a practical demonstration of sandbagging processes was demonstrated. A formal critique determined that the exercise met the stated objectives.
- A timed, videotaped demonstration was performed of the fabrication and simulated installation of selected floodgates to document the ease, timeliness, and ability of craft personnel to perform these activities.
  - Site awareness briefings on the FCS external flooding strategies were provided through the site wide information communication process.

### **3. Corrective Steps That Will be Taken**

- Engineering changes are being developed that will install improved intake structure and auxiliary building flood plates or gates to protect vital structures and vital equipment to elevation 1014-ft msl. These changes will be implemented by February 28, 2011.
- An evaluation to determine if training on the requirements of Regulatory Guide 1.59 is necessary is being performed and is expected to be completed by December 31, 2010. The evaluation results may require the performance of additional actions.

- An evaluation to determine if there is a gap in the knowledge proficiency in the understanding of the terms “licensing basis, design basis and beyond design basis” is being performed and is expected to be completed by December 31, 2010. The evaluation results may require the performance of additional actions.

**4. Date When Full Compliance Will be Achieved**

OPPD is in full compliance with Technical Specification 5.8.1.a, *Procedures*. Appropriate procedures that describe steps to mitigate external flood conditions in the auxiliary building and intake structure up to 1014-ft msl, as documented in the USAR, have been developed or revised.

**Regulatory Commitments**

<b>Commitment</b>	<b>Due Date</b>	<b>CR Number</b>
Engineering changes are being developed that will install improved intake structure and auxiliary building flood plates or gates to protect vital structures and vital equipment to elevation 1014-ft msl.	2/28/1011	2010-2387
An evaluation to determine if training on the requirements of Regulatory Guide 1.59 is being performed. The evaluation results may require the performance of additional actions.	12/31/2010	2010-2387
An evaluation to determine if there is a gap in the knowledge proficiency in the understanding of the terms "licensing basis, design basis and beyond design basis" is being performed. The evaluation results may require the performance of additional actions.	12/31/2010	2010-2387