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From: Sebrosky, Joseph
Sent: Tuesday, July 23, 2013 5:57 PM
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Subject: Fort Calhoun Tornado Missile Protection Request for Additional Information (MF2469)

Mr. Hanshar,

By letter dated July 21, 2013, (Agencywide Documents Access and Management System (ADAMS) Accession No ML13203A136) Omaha Public Power District, (the licensee) submitted a license amendment request (LAR) that proposes to revise the Fort Calhoun Station, Unit 1 (FCS) Updated Safety Analysis Report (USAR) for the design basis tornado and tornado missiles to include U.S. Nuclear Regulatory Commission (NRC) Regulatory Guide 1.76, Revision 1, "Design-Basis Tornado and Tornado Missiles for Nuclear Power Plants," and Bechtel Power Corporation, Topical Report BC-TOP-9A, Revision 2, September 1974, "Design of Structures for Missile Impact."

Based on a review of the submittal, the NRC staff has determined that the following additional information (RAI) is required in order to complete its review. The request for additional information was discussed with you on July 23, 2013. It was agreed that a response to these RAIs would be provided by July 24, 2013. Should the NRC determine that this RAI is no longer necessary prior to the scheduled date, the request will be withdrawn. If circumstances result in the need to revise the requested response date, please contact me at (301) 415-1132 or via e-mail at joseph.sebrosky@nrc.gov. The NRC staff has determined that no security-related or proprietary information is contained herein.

Request for Additional Information

MECHANICAL AND CIVIL ENGINEERING (EMCB)-RAI-1

Regarding the modification of the current licensing basis (CLB) requirements related to the FCS design basis tornado (DBT) and tornado missiles, the Reference indicates that the guidance of Regulatory Guide (RG) 1.76, Revision 1, "Design-Basis Tornado and Tornado Missiles for Nuclear Power Plants," will be implemented as part of the proposed LAR. Please address the following as they relate to the use of RG 1.76, Revision 1, as part of the proposed LAR:

- a. Clarify whether the appropriate DBT and DBT missile input parameters found in RG 1.76, Revision 1, will be applied only to new structures, systems, and components (SSCs) or will apply to both new and existing SSCs.
- b. If the RG 1.76, Revision 1, parameters denoted in part a. above will be utilized for existing SSCs, provide a technical justification which demonstrates that the design margins will be maintained for the existing SSCs that must withstand tornado loads (i.e., the ability of these SSCs to withstand a DBT and tornado-generated missile is not reduced as a result of this change).
- c. Confirm that the design margins for the FCS containment structure will be maintained following implementation of the revised tornado loading parameters, including those for tornado-generated missiles.

EMCB-RAI-2

The CLB methodology used for evaluating the impacts of tornado missiles at the FCS is documented in NAV DOCKS P-51, August 1950, "Design of Protective Structures (A New Concept of Structural Behavior)." The Reference indicates that the proposed method for determining the impact of tornado missiles on SSCs will be based on Bechtel Power Corporation's Topical Report BC-TOP-9A, Revision 2, September 1974, "Design of Structures for Missile Impact," which was reviewed and approved by the Atomic Energy Commission ((AEC), the predecessor of the NRC). Please address the following as they relate to the use of BC-TOP-9A:

- a. Tables 1 and 2 of the Reference provide a comparison between the CLB and RG 1.76, Revision 1, criteria for DBT missiles. Please provide a similar comparison of the key portions of the methodologies used for evaluating missile impacts in both NAV DOCKS P-51 and BC-TOP-9A.
- b. Section 4.1.3 of the Reference denotes Section 3.5.3 of the Standard Review Plan ((SRP) or NUREG-0800) as an approved methodology for the design of structures, shields, and barriers for use in nuclear power plants. Discuss the relationship between the criteria and methods found in SRP Section 3.5.3, Revision 3, and the criteria and methods found in BC-TOP-9A.

Balance of Plant Branch (SBPB)-RAI 1

Regulatory Guide (RG) 1.76, "Design-Basis Tornado and Tornado Missiles for Nuclear Power Plants", states that "the automobile missile is considered to impact at all altitudes less than 30 feet (9.14 meters) above all grade levels within 0.5 miles (0.8 kilometers) of the plant structures." As stated in the license amendment request (LAR), the grade levels within 0.5 miles of the plant structures are as high as 1,070 feet mean seal level (MSL). Per the direction of RG 1.76, an automobile missile from this elevation must be postulated to impact the auxiliary building roof at elevation 1,044 MSL. The licensee has proposed to eliminate this impact by implementing procedural controls that will prevent automobiles from being staged at or crossing through elevations high enough to require postulating an impact with the auxiliary building roof during severe thunderstorm warnings and tornado watches/warnings.

In order to determine the acceptability of this departure from RG 1.76, the staff requires the following information:

- a) Is the impact of an automobile missile with the auxiliary building roof the only interaction that is being eliminated by procedural controls?
- b) Identify any structures, parking areas, storage locations, staged equipment, or access roads located with a grade elevation sufficient to require the postulation of an automobile impact with the auxiliary building roof. How will these areas be controlled such that no automobile or equipment of similar mass and dimensions will be located within these areas?
- c) The LAR states the entrance road runs from Highway 75 to the protected area. Does Highway 75 pass through the 0.5 mile radius of the plant structures?
- d) The site entrance road must be closed in the event of a severe thunderstorm warning or tornado watch/warning. Are personnel regularly stationed at the access control point such that the site entrance road can be closed promptly upon receipt of a weather notification?
- e) Are the procedural controls intended to be permanent to the facility? The LAR indicates that the analysis of the impact of an automobile missile with the auxiliary building roof is ongoing. Will the auxiliary building roof be reinforced if the analysis determines that the structure is not sufficient to withstand this impact?
- f) Are there any components important to safety located on the auxiliary building roof (exposed)? If so, are these components protected against the pipe and steel sphere missiles identified in RG 1.76?

