

May 25, 2006

Mr. Mark B. Bezilla
Vice President - Nuclear
FirstEnergy Nuclear Operating Company
Davis-Besse Nuclear Power Station
Mail Stop A-DB-3080
5501 North State Route 2
Oak Harbor, OH 43449-9760

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION, UNIT 1 - REQUEST FOR
ADDITIONAL INFORMATION RELATED TO TORNADO MISSILE
PROTECTION (TAC NO. MC5661)

Dear Mr. Bezilla:

By letter to the Nuclear Regulatory Commission (NRC) dated January 11, 2005, FirstEnergy Nuclear Operating Company submitted a request for approval to credit the use of the tornado missile (TORMIS) computer code in determining whether or not it is necessary to protect a number of structures, systems, and components from tornado generated missiles at the Davis-Besse Nuclear Power Station, Unit 1.

The NRC staff is reviewing your submittal and has determined that additional information is required to complete the review. The specific information requested is addressed in the enclosure to this letter. During a discussion with your staff on April 13, 2006, it was agreed that you would provide a response 60 days from the date of this letter.

The NRC staff considers that timely responses to requests for additional information help ensure sufficient time is available for staff review and contribute toward the NRC's goal of efficient and effective use of staff resources. If circumstances result in the need to revise the requested response date, please contact me at (301) 415-1486.

Sincerely,

/RA/

Stephen J. Campbell, Project Manager
Plant Licensing Branch III-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-346

Enclosure:
Request for Additional Information

cc w/encl: See next page

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REQUEST FOR ADDITIONAL INFORMATION

DAVIS-BESSE NUCLEAR POWER STATION, UNIT 1

DOCKET NO. 50-346

By letter dated January 11, 2005, FirstEnergy Nuclear Operating Company (the licensee) requested Nuclear Regulatory Commission (NRC) approval to credit using Electric Power Research Institute (EPRI) computer code, "Tornado Missiles (TORMIS)," in determining whether or not it is necessary to protect a number of structures, systems, and components (SSCs) from tornado generated missiles at the Davis-Besse Nuclear Power Station (Davis-Besse). On October 26, 1983, the NRC staff issued, "Safety Evaluation (SE) of an Electric Power Research Institute (EPRI) Topical Reports Concerning Tornado Probabilistic Risk Assessment Methodology," approving the use of TORMIS for certain limited applications and identified specific information that should be submitted when requesting NRC approval for using TORMIS. Based upon a review of the licensee's request, the following additional information is required:

1. The October 26, 1983, TORMIS SE issued by the NRC specified that data on tornado characteristics should be employed for both broad regions and small areas around the site, and that the most conservative values should be used in the risk analysis.
 - (a) With respect to tornado frequency, the Updated Safety Analysis Report (USAR) value of 6.3×10^{-4} per year is proposed as the more conservative value compared to the estimate for the broader region defined by WASH-1300, "Technical Basis for Interim Regional Tornado Criteria," (NRC Region 1). The following additional information is required in order to demonstrate that the selected frequency estimate meets Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants," General Design Criterion 2, "Design bases for protection against natural phenomena," for SSCs important to safety is designed to withstand the effects of a natural phenomenon such as a tornado:
 - (i) Explain how a tornado frequency of 4.25×10^{-4} per year was determined based upon the NRC Region 1 tornado data. (RAI Category: 2.b.)
 - (ii) The TORMIS methodology defines four broad regions, A through D, and Davis-Besse is located on the border between Regions A and B. Regions A and B are a more discrete partitioning of Region 1. Determine the tornado frequency for Davis-Besse for both Region A and Region B, and explain how these values were calculated. (RAI Category: 2.b.)
 - (iii) The response that was provided to Item 1 of the October 26, 1983, TORMIS SE regarding input parameters indicates that the annual probability of a tornado will be determined for the Fujita wind speeds using regional data available in TORMIS for NRC Tornado Region 1; and that the more conservative of these two values (the other value being the USAR tornado frequency) will be utilized in the Davis-Besse analysis.

ENCLOSURE

Since Regions A and B are a discrete partitioning of a broad area, the analysis over a broader region (Region 1) could result in different strike probabilities. Explain how this analysis differs from the NRC Region 1 tornado frequency estimate and, to assure that the most conservative value is used, perform this analysis for TORMIS Regions A and B, and for the local site area described in the USAR. Provide the results of these analyses, including an explanation of how these values were calculated. (RAI Category: 2.a.)

- (b) Aside from the tornado frequency estimates discussed above, explain how the most conservative values will be determined for the tornado characteristics that are used in TORMIS based upon regional (WASH-1300 and TORMIS) and local tornado data, including a discussion of how more recent tornado data that is not reflected in TORMIS will be accounted for.

Note that the use of values for tornado characteristics that are not the most conservative based upon the available data must be identified and justification provided for NRC review and approval. (RAI Category: 2.b.)

2. Describe how the exposed areas of unprotected SSCs will be determined to assure conservative results. (RAI Category: 2.b.)
3. In the licensee's request dated January 11, 2005, the licensee referenced NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants, Section 2.2.3, Revision 2. Section II, "Acceptance Criteria," states that the expected rate of exposures in excess of 10 CFR Part 100, "Reactor Site Criteria," guidelines of approximately 10^{-6} per year is acceptable if, when combined with reasonable quantitative arguments, the realistic probability can be shown to be lower. The proposed change indicates that a tornado missile strike on the limited portion of a system or component that is exposed is assumed to result in a radioactive release that exceeds the 10 CFR Part 100 guidelines, rather than performing specific evaluations as to whether the strike can actually cause damage and releases. Confirm that this logic will apply to all SSCs that are listed in proposed USAR Table 3.5-3, "TORMIS Analysis - Essential Safe Shutdown System Tornado Missile Targets," including (for example) the auxiliary building roll up and man doors, auxiliary building emergency diesel generator roof, auxiliary building roof penetrations, and auxiliary building roof drains. Also, revise the USAR to include this clarification. (RAI Category: 2.a.)
4. The response to the fourth item of the TORMIS SE states that the results of a sensitivity study indicates that the probability values are not significantly adversely impacted by an increase in missile population. Discuss the results of this sensitivity analysis, including the basis for the conclusion that was reached. (Category: 2.c.)
5. The Technical Analysis section of the proposed change indicates that upon NRC approval, existing plant conditions, as well as future changes to the facility, could be evaluated using TORMIS. However, the TORMIS SE stated that the use of TORMIS should be limited to the evaluation of specific plant features where additional costly tornado missile protective barriers or alternative systems are under consideration. Therefore, in order to assure that the use of TORMIS will be consistent with the position

that was stated in the TORMIS SE, confirm that: a) TORMIS will not be used to temporarily or permanently eliminate existing barriers that are credited for providing tornado missile protection; b) its use will be limited to demonstrating adequate protection for existing SSCs that were originally required to be protected from tornado missiles in accordance with the plant design basis but due to some oversight, are not adequately protected; and c) identify the specific criteria that will be used for future applications of TORMIS in determining whether or not modifications that are required for protecting SSCs from tornado missiles are too costly such that the use of TORMIS is justified consistent with NRC approval of the TORMIS methodology. Also, revise the USAR to include this clarification. (RAI Category: 3.h.)

RAI CATEGORIES

(Select only one, most dominant category for each RAI question)

1. More information is needed because of:
 - a. complexity of request
 - b. first-of-a-kind nature of request
 - c. NRC change in regulatory significance or focus
 - d. NRC questions on previously used methodology or guidance
 - e. licensee change to previously used methodology
 - f. licensee reduction in current safety margin

2. The review can not be completed without additional explanation or clarification of:
 - a. input variables or analytical assumptions
 - b. methodology used or results obtained
 - c. applicability or bounding nature of third party analyses or data correlations
 - d. differences from NRC guidance documents (SRP, RG, etc.)
 - e. no significant hazards consideration discussion
 - f. environmental considerations discussion
 - g. applicable regulatory requirements discussion
 - h. information that appears to be incorrect and needs to be corrected
 - i. response to previous RAI appears inadequate

3. Reviewer requesting information even though the question is, or the question asks for:
 - a. not directly related to the request
 - b. inconsistent with applicable codes, standards, RGs, or SRP sections
 - c. information accessible from readily available sources and was explicitly referenced
 - d. information does not appear needed given the precedent cases discussed in the request
 - e. information that is not safety significant or pertinent to the regulatory finding
 - f. information that is known to engineers who work in the general technical area
 - g. going beyond the current licensing basis and doesn't need to be asked
 - h. a formal commitment

4. Other (please specify)

Davis-Besse Nuclear Power Station, Unit 1

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