

August 11, 2017

MEMORANDUM TO: Greg A. Casto, Chief  
Fire Protection Branch  
Division of Risk Assessment  
Office of Nuclear Reactor Regulation

FROM: Alexander H. Schwab, Project Manager /RA/  
Generic Communications Branch  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF THE JULY 6, 2017, PUBLIC MEETING  
BETWEEN THE U.S. NUCLEAR REGULATORY COMMISSION  
STAFF AND STAKEHOLDERS TO DISCUSS TORNADO  
MISSILE RISK EVALUATOR USE

On July 6, 2017, a Category 2 public meeting was held between the U.S. Nuclear Regulatory Commission (NRC) and stakeholders, at NRC One White Flint North, in the 1st Floor Commission Hearing Room. The purpose of the meeting was to discuss working group coordination efforts concerning the use of the Tornado Missile Risk Evaluator (TMRE) in future license amendments.

The NRC opened the public meeting with opening remarks from the Deputy Division Director from the Division of Risk Assessment, who discussed the general history of the issue. A branch chief from the Division of Operating Reactor Licensing also made some remarks. The branch chief mentioned that the fee waiver for the three pilot plants submitting license amendments for the tornado missile issue had been approved, and also mentioned that when plants are submitting license amendments they should start with what the original design basis was for the plant and describe the history of how they got from there to their present day licensing basis.

The Nuclear Energy Institute (NEI) then gave a presentation titled "NEI 17-02, Revision 0, Tornado Missile Risk Evaluator (TMRE) Guidance Document" (the actual document is available in the Agencywide Documents Access and Management System (ADAMS) at Accession No. ML17181A307, while the presentation is available at ADAMS Accession No. ML17207A067). The presentation began with an overview of the TMRE development and planned schedule for implementation, and then moved on to describing the various aspects of the TMRE guidance document, such as the determination of Tornado Hazard Frequency, the determination of Missile Impact Parameter (MIP) and Missile Characteristics, the determination of Targets, the PRA Modeling of the TMRE, the Quantification or Risk and Sensitivity Analyses, and lastly, the TMRE License Amendment Request process and development.

The NRC had a number of comments and questions during industry's presentation. For example, the NRC and industry had some discussion on how the TMRE process categorized elevated vs ground targets, as well as how missiles and targets were categorized as robust or not. The NRC also indicated they had a strong interest in how licensees categorized the

penetrations as too small to exclude from consideration in the TMRE calculation. The NRC also voiced some concerns that since the TMRE process categorized a loss of offsite power as non-recoverable, the delta core damage frequency may be non-conservative as a result of the base case being too conservative. Specific to this staff comment, the industry replied that they felt the loss of offsite power being non-recoverable was actually more realistic in a tornado scenario, and that they would provide more evidence of this being the case. The NRC also mentioned that industry should make sure the licensees include all five principles of risk informed regulation in their license amendment applications as detailed in Regulatory Guide 1.174, including mentioning their plant specific defense in depth credit for the applicable PRA evaluation. The NRC also commented that there should be appropriate demonstration of TMRE elements among the three pilot plant license amendment requests. Industry replied that they would supply a hypothetical plant example that did meet the threshold if that were the case for any aspect of the TMRE, so that the NRC could feel comfortable in reviewing all aspects of a license amendment that uses the TMRE process after the review of the pilot plants is completed. The NRC also asked for some uncertainty data to be included in the sensitivity analyses moving forward, as well as mentioned it would be helpful for any license amendment using the TMRE process to have a section detailing any deviations from the TMRE process they have taken.

During the meeting the attendees were reminded that although their comments were discussed with the staff, no decisions would be made at the meeting.

A list of meeting attendees is enclosed.

Please direct any inquiries to Alexander Schwab, Project Manager, at 301-415-8539, or by electronic e-mail to [Alexander.Schwab@nrc.gov](mailto:Alexander.Schwab@nrc.gov).

Enclosure:  
As stated

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STAFF AND STAKEHOLDERS TO DISCUSS TORNADO  
MISSILE RISK EVALUATOR USE DATED: AUGUST 11, 2017

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**Meeting Materials: ML17207A067, ML17181A307; \*concurrence via e-mail NRC-001**

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DATE	7/26/2017	7/26/2017	7/27/2017	7/21/2017	8/11/2017

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## LIST OF ATTENDEES

### PUBLIC MEETING BETWEEN THE U.S. NUCLEAR REGULATORY COMMISSION (NRC) STAFF AND STAKEHOLDERS TO DISCUSS TORNADO MISSILE RISK EVALUATOR USE

(CATEGORY 2)

July 6, 2017

8:00 a.m. – 3:00 p.m.

NRC One White Flint North, 1st Floor Commission Hearing Room

NAME	ORGANIZATION
Greg Casto	NRC
CJ Fong	NRC
Mehdi Reisifard	NRC
Russ Felts	NRC
Ed Miller	NRC
Gordon Curran	NRC
Thomas Dodamead	NRC
Nageswara Karipineni	NRC
Mike Markley	NRC
Alex Schwab	NRC
Bruce Montgomery	NEI
Steve Vaughn	NEI
Ken Lowery	SNC
Alex Gilbreath	SNC
Jack Grobe	Exelon
Chris Riedl	TVA
Leo Shanley	Jensen Hughes
Jim Hallenbeck	Entergy
Vincent P. Bacanskas	Entergy
Scott Brinkman	Duke
Tim Brown	Duke
Mel Arey	Duke
John Caves	Duke
Lauren Zalesny	First Energy
Justin Hiller	Ameren Missouri
Brian Schafer	WCNOC
Jim Peschel	Certrec

Enclosure