

December 8, 2016

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 NOVEMBER 15, 2016, PUBLIC MEETING  
BETWEEN U.S. NUCLEAR REGULATORY COMMISSION  
STAFF AND STAKEHOLDERS TO CONDUCT A TABLETOP  
EXERCISE OF THE TORNADO MISSILE RISK EVALUATOR  
APPLICATION

On November 15, 2016, a Category 2 public meeting was held between the U.S. Nuclear Regulatory Commission (NRC) and stakeholders, at Two White Flint North, in the Auditorium. The purpose of the meeting was to seek interested stakeholder input and to conduct a tabletop exercise of the Tornado Missile Risk Evaluator (TMRE) application.

The NRC opened the public meeting with opening remarks from the Division Director from the Division of Safety Systems, who discussed how he and the NRC wanted to continue progression of the topic.

The Nuclear Energy Institute (NEI) then gave a presentation titled "Tornado Missile Protection and the Tornado Missile Risk Evaluator" (Agencywide Documents Access and Management System Accession No. ML16319A267). The presentation began with an overview of the TMRE process, and then details on how the process was developed was discussed.

Next, the presentation described the benchmarking and sensitivity studies that the TMRE process had gone through. It then described the 3 sensitivity studies which had been conducted; one for target size, one for target elevation, and one for uniform vs. zonal missile distribution. The sensitivity study for target size showed that TMRE could be applied to all targets, regardless of size, while the sensitivity study for target elevation showed that use of a lower hit probability for elevated targets was appropriate. For the sensitivity study for uniform vs. zonal missile distribution, the model was not able to give a reasonable output for certain zonal scenarios, so NEI decided no conclusion could be drawn from this sensitivity study. Even with the last sensitivity study being inconclusive, NEI argued that the conservatism included in the TMRE that were shown when it was benchmarked against the High Winds Probabilistic Risk Assessment were enough to show that the TMRE was adequate. The NRC did state that the inconclusive results in the last sensitivity study could possibly be accounted for as uncertainties, and NEI agreed to take back the action to look at that possibility.

Next, NEI described what they planned to include in the NEI guidance document on how to implement the TMRE process. They then described their timeline for implementing the TMRE process and submitting plant's license amendments with the process. They mentioned that this timeline would almost definitely include some plants not meeting their 3 year enforcement discretion period, and discussed some of the details they would have utilize in order to get extra time to account for this, and the reporting requirements they would have to follow as a result.

NEI then discussed action items moving forward. Their first item was making sure the issues with the code used in the TMRE process (i.e., the TORMIS code) that were mentioned in a prior NRC Regulatory Information Summary would have no effect on their sensitivity analyses. They then said they owed a missile speed comparison between Standard Review Plan (SRP) 3.5.1.4, "Missiles Generated by Tornadoes and Extreme Winds," and Regulatory Guide 1.76, "Design-Basis Tornado and Tornado Missiles for Nuclear Power Plants." They also mentioned looking again at the possibility of treating the outputs for the Uniform vs. Zonal distribution as uncertainties. The NRC mentioned that they would like to offer dialogue about that possibility to the extent that they can enhance common understanding. NEI then mentioned that once they make their final TMRE process decisions, they owed the NRC a discussion on how they picked their missile count and how they classified robust vs. non-robust missiles to make sure the NRC agreed with these decisions. NEI also stated that they will provide a draft letter for enforcement discretion extension to support the Enforcement Guidance Memorandum (EGM)/Interim Staff Guidance (ISG) review. The NRC then also clarified that licensees need to submit a schedule of when they expect to submit License Amendment Requests using TMRE or TORMIS to their given NRC Project Manager.

The NRC then discussed their action items moving forward. One was making sure the issuance of the revised ISG/EGM was timely, and the NRC stated there would probably be a letter to NEI pointing to the issuance of both. There was also the acknowledgement of the NRC participating in upcoming spring workshops on the TMRE process submittals. Another action item was providing the titles of several high winds probabilistic risk analysis (PRA) papers to the industry, so NEI could investigate whether there might be any pertinent information in them (these papers were *Twisdale, Lovelace, and Slep. "High Wind PRA Failure Calculations, Error Estimates, and Use of CAFTA." PSA 2015, Sun Valley Idaho* and *Mironenko and Lovelace. "High Wind PRA Development and Lessons Learned from Implementation." PSA 2015, Sun Valley Idaho*). The NRC also stated they would take the action to have an internal discussion on whether a Regulatory Guide or a Safety Evaluation or something similar would be more appropriate to document the acceptance of the TMRE process.

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.

G. Casto

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

Enclosure:  
List of Attendees

G. Casto

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Please direct any inquiries to Alexander Schwab, Project Manager, at 301-415-8539, or Alexander.Schwab@nrc.gov.

Enclosure:  
List of Attendees

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Dave Lochbaum - dlochbaum@ucsusa.org

**ADAMS Accession No:** Pkg.: ML16334A434; Memo: ML16335A067; Meeting Notice: ML16314A849;

Meeting Materials: ML16319A267; concurrence via email\*

NRR-001

OFFICE	NRR/DPR/PGCB	NRR/DPR/PGCB*	NRR/DPR/PGCB*	NRR/DRA/AFP	NRR/DPR/PGCB
NAME	ASchwab	ELee (ABaxter for)	SStuchell	GCasto	ASchwab
DATE	12/01/16	12/01/16	12/01/16	12/08/16	12/08/16

OFFICIAL RECORD COPY

## **ATTENDANCE LIST**

### **PUBLIC MEETING BETWEEN STAKEHOLDERS AND THE U.S. NUCLEAR REGULATORY COMMISSION STAFF TO CONDUCT A TABLETOP EXERCISE OF THE TORNADO MISSILE RISK EVALUATOR APPLICATION (CATEGORY 2)**

**November 15, 2016**

**8:00 a.m. – 5:00 p.m.**

**NRC Two White Flint North, Auditorium**

<b>NAME</b>	<b>ORGANIZATION</b>
Greg Casto	NRC
CJ Fong	NRC
Mehdi Reisifard	NRC
Jim Hickey	NRC
Tim McGinty	NRC
Steven Laur	NRC
Ami Patel	NRC
Alex Schwab	NRC
Rob Kuntz	NRC
Christopher Regan	NRC
Benjamin Mabbott	NRC
Juan Peralta	NRC
Bruce Montgomery	NEI
Ken Lowery	SNC
Alex Gilbreath	SNC
Faramarz Pournia	SNC
Keith Wooten	SNC
Jack Grobe	Exelon
David Gudger	Exelon
Atanya Lewis	NextEra
Larry Nicholson	NextEra
Hasan Charkas	EPRI
Chris Riedl	TVA
Roger Gish	TVA
Leo Shanley	Jensen Hughes
Michael Schoppman	Certrec Corp
William Greeson	Entergy
Melvin Avery	Duke

Enclosure

<b>NAME</b>	<b>ORGANIZATION</b>
Scott Brinkman	Duke
Timothy Brown	Duke
Art Zaremba	Duke
John Caves	Duke
Gary DeMoss	PSEG Nuclear
Frances Pimentel	PSEG Nuclear
Mark Sizwart	Areva
Jana Bergman	Curtiss Wright