



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
WASHINGTON, D.C. 20555-0001

August 17, 2018

LICENSEES: Duke Energy Progress, LLC; Southern Nuclear Operating Company, Inc.; and Entergy Operations, Inc.

FACILITIES: Vogtle Electric Generating Plant, Units 1 and 2; Shearon Harris Nuclear Power Plant, Unit 1; and Grand Gulf Nuclear Station, Unit 1

SUBJECT: SUMMARY OF JANUARY 18, 2018, TELECONFERENCE WITH DUKE ENERGY PROGRESS, LLC; SOUTHERN NUCLEAR OPERATING COMPANY, INC.; AND ENTERGY OPERATIONS, INC., TO DISCUSS DEVELOPMENT OF TORNADO MISSILE EVALUATOR METHODOLOGY (EPID L-2017-LLA-0350, L-2017-LLA-0355, AND L-2017-LLA-0371)

On January 18, 2018, the U.S. Nuclear Regulatory Commission (NRC) staff conducted a Category 1 public teleconference with the Nuclear Energy Institute (NEI), Duke Energy Progress, LLC, Southern Nuclear Operating Company, Inc., and Entergy Operations, Inc., at NRC Headquarters, 11555 Rockville Pike, One White Flint North, Rockville, Maryland. The purpose of the meeting was to discuss NRC's feedback in support of the development of the NEI's Tornado Missile Risk Evaluator tool described in Revision 0 of NEI 17-02, "Tornado Missile Risk Evaluator (TMRE) Industry Guidance Document," June 2017. This document was provided in support of a previous meeting and is available in the Agencywide Documents Access and Management System (ADAMS) under Accession No. ML17181A307. The industry's presentation is available in ADAMS under Accession No. ML18017A938. The meeting notice and agenda are available in ADAMS under Accession No. ML17356A196.

BACKGROUND:

In a July 6, 2017,¹ public meeting with the NRC staff, NEI provided an overview of the TMRE development and planned schedule for receipt of pilot plant amendments and eventual submittal of a final TMRE industry implementation guide. The NRC had a number of comments and questions during industry's presentation, including how the TMRE process categorized elevated versus near-ground targets, as well as how missiles and targets were categorized. The NRC also indicated it had a strong interest in how licensees categorized the penetrations as too small to exclude from consideration in the TMRE calculation. Subsequent public meetings were held which addressed specific NRC feedback items related to concerns regarding robust missile and targets, as well as the accuracy of various tables in Appendices B and C of NEI 17-02, Revision 0. In the November 8, 2017,² public meeting, NRC feedback topics (4(f), 5(d), and (g), 7(b), 10(c) and (d), and 11(a) - (g) and (i)) were discussed.

¹ The meeting summary dated August 11, 2017, is publicly available in ADAMS under Accession No. ML17207A064.

² The meeting summary dated December 8, 2017, is publicly available in ADAMS under Accession No. ML17340A061.

DISCUSSION:

The January 18, 2018 public meeting focused on the probabilistic risk assessment NRC staff feedback items. The industry summarized changes made in Revision 1 of NEI 17-02, which were responsive to portions of NRC feedback topics 1, 3, and 8. Additionally, changes were made in Section 5 to permit increased conservatism when developing exposed equipment failure probabilities as well as shielding guidance. The revision also reflected correction of typographical, editorial, and calculational errors identified.

Discussion topic 4(e) is associated with the guidance including an appropriate discussion of the treatment of operator actions that should be performed within 1 hour of a tornado event. The NRC staff questioned the assertion (in the methodology) that conservatism, if any, for the compliant case would not lead to any significant non-conservatism in the delta risk calculation. A change was proposed such that sensitivity studies would be added to address any overreliance on operator actions and a better description would be provided to support the degree of conservatism in the compliant case.

Discussion topics 4(c) and 9(a) are related to an analyses assumption related to non-recoverable offsite power. The NRC staff was concerned that the basis for this assumption was not sufficiently detailed and that the assumption could be conservative for estimating the core damage frequency, but non-conservative when calculating the change in risk. The staff stated that no credit would be expected to be taken for the recovery of offsite power and that operational experience (OpE) related to offsite power recovery is sparse. The NRC staff questioned the assumptions related to assumed safety-related battery life. It was indicated by NEI that additional information regarding known OpE and justification supporting current assumptions regarding non-recovery of offsite power would be included in the next revision, of NEI 17-02.

Discussion topic 5(e) is related to contribution of each missile type to the overall tornado missile population related to the percentage of missiles capable of damaging robust targets or barriers. The NRC staff questioned the generic applicability of the Tables 5-2 and B-17 in Revision 0, if the tornado missile population is not nominal, such as at sites with construction activities onsite or nearby. It was discussed by NEI that there would be high level validation of assumptions in those anomalous cases. The NRC staff questioned how the threshold for anomalous would be defined. The participants agreed that additional discussion on this topic in a future public meeting would be required.

Discussion topic 5(h) is related to the appropriate level of detail regarding the use of correlated targets. The NRC staff discussed the concern that the guidance currently does not ensure consistent use as correlated targets throughout the analyses. It was indicated that additional guidance would be provided in the next revision to NEI 17-02 by NEI to ensure consistent treatment.

Discussion topics 2(b) and 10(a) are associated with the applicability of the 30-foot demarcation height for missile impact parameters (MIPs). The NRC staff discussed the need to clarify the guidance related to the proper application for this assumption.

Discussion topic 10(b) is related to the derivation of the MIP for near ground targets. It was discussed that additional justification for MIP development would be included in the next revision to NEI 17-02. The NRC staff expressed concern that the assumptions appear to make

the average MIP nonconservative. The participants agreed that additional discussion would be required in a future public meeting on this topic.

Discussion topic 4(b) is related to the assumption that openings less than a certain dimension are excluded from needing evaluation. It was indicated by NEI that this concept, known as de minimis, is intended to be removed in the next revision to the methodology. One of the pilots has already submitted a supplement withdrawing the use of the concept from the pilot application and the remaining pilots have indicated that similar supplements would be made removing the concept from those requests.

Members of the public attended the teleconference. No public meeting feedback forms nor comments that required additional NRC staff action were received. The NRC did not communicate or make any decisions or conclusions during the meeting.

Sincerely,

/RA/

Eva A. Brown, Senior Project Manager
Special Projects and Process Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-400, 50-416,
50-424, and 50-425

Enclosure:
List of Attendees

cc: Listserv

Attendees
U.S. Nuclear Regulatory Commission
Public Meeting Concerning Tornado Risk Evaluator Methodology
January 18, 2018

U.S. NUCLEAR REGULATORY COMMISSION

Greg Casto
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Doug Broaddus
G. Ed Miller
Nageswara Karipineni
Gordon Curran
Alex Schwab
Mehdi Reisi-Fard
Shilp Vasavada
Eva Brown

EXTERNAL STAKEHOLDERS

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Scott Brinkman, Duke Energy
James Hallenbeck, Entergy
Ken Lowery, Southern Nuclear
Alex Gilbreath, Southern Nuclear
Justin Huber, Southern Nuclear
Jack Grobe, Exelon
Leo Shanley, Jensen-Hughes
Stephen Vaughn, Nuclear Energy Institute
Christopher Riedl, Tennessee Valley Authority
Richard Harris, Enercon
Dana Millar, Entergy Operations
Randall Wilson, Ameren
James Kovar, Ameren
Atanya Lewis, Florida Power and Light
James Peschel, Certrec
Michael Richardson, Pacific Gas and Electric
Deann Raleigh, Curtiss-Wright Corporation
Deepak Rao, Entergy Operations
Christopher J. Riedl, Tennessee Valley Authority
Michael Kitlan, Duke Energy
Stephen Geier, Nuclear Energy Institute
Hasan Charkas, Electric Power Research Institute

Enclosure

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ADAMS Accession No.: ML18094A263

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DATE	4/6/18	4/5/18	8/17/18	

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