



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

July 26, 2016

**MEMORANDUM TO:** Gregory T. Bowman, Chief  
Hazards Management Branch  
Japan Lessons-Learned Division  
Office of Nuclear Reactor Regulation

**FROM:** Joseph M. Sebrosky, Senior Project Manager */RA/*  
Hazards Management Branch  
Japan Lessons-Learned Division  
Office of Nuclear Reactor Regulation

**SUBJECT:** SUMMARY OF JULY 21, 2016, PUBLIC MEETING  
TO DISCUSS NUCLEAR REGULATORY COMMISSION  
STAFF'S PRELIMINARY ASSESSMENT OF FUKUSHIMA  
LESSONS LEARNED RELATED TO EVALUATION OF  
NATURAL HAZARDS OTHER THAN SEISMIC AND FLOODING

On July 21, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16181A321), the U.S. Nuclear Regulatory Commission (NRC) staff held a Category 2 public meeting to discuss the NRC staff's preliminary assessment of a post-Fukushima recommendation related to the evaluation of natural hazards other than seismic and flooding. The staff's initial assessment of this recommendation was provided as Enclosure 1 of SECY-15-0137, "Proposed Plans for Resolving Open Fukushima Tier 2 and 3 Recommendations" (ADAMS Accession No. ML15254A006). The staff provided an updated assessment in SECY-16-0074, "Assessment of Fukushima Tier 2 Recommendation Related to Evaluation of Natural Hazards other than Seismic and Flooding" (ADAMS Accession No. ML16102A297).

The purpose of the July 21, 2016, meeting was to provide the NRC staff's preliminary perspectives related to snow loads and high winds. A list of individuals in attendance at the meeting can be found as an enclosure to this summary. The NRC meeting handouts are available in ADAMS under Accession No. ML16201A145.

#### Highlights of Meeting

The staff provided an overview of its assessment of natural hazards other than seismic and flooding. SECY-15-0137 and SECY-16-0074 provide the following four step process for reviewing natural hazards other than seismic and flooding:

1. Define natural hazards other than seismic and flooding to determine those hazards that could potentially pose a threat to nuclear power plants and perform a screening to determine which of those should be reviewed generically.

2. Determine and apply screening criteria to appropriately exclude certain natural hazards from further generic evaluations, or exclude some licensees from considering certain hazards.
3. Perform a technical evaluation to assess the need for additional actions if the hazard or licensee was not screened out generically in Task 2.
4. Based on the results of Task 3, determine if additional regulatory actions are needed.

As stated in SECY-16-0074, the staff concluded that other than seismic and flooding, only snow loads and high winds warranted further assessment in accordance with Step 3 of the process outlined above.

During the meeting the staff provided an update regarding its evaluation of snow loads and high winds, including preliminary results of deterministic calculations that have been performed in these areas, and additional factors that the staff is considering as part of its evaluation. For both snow loads and high winds, the NRC staff is reviewing current operating plants against guidance that has been issued in these areas after the majority of the operating plants received their operating licenses. For snow loads, the staff presented a preliminary assessment that there does not appear to be a concern that roofs over safety-related equipment will collapse using the revised snow load guidance assumptions. However, the staff is reviewing severe weather procedures at some northern sites to provide additional confidence that additional regulatory actions to prevent snow-load induced roof failures are not needed.

For high winds, the staff outlined the deterministic evaluations that it has performed to date and noted the licensing basis for many sites compares favorably with the new guidance for high wind loading and the ability of tornado and hurricane-born missiles to penetrate structures protecting safety-related systems and components. The staff is still reviewing new guidance for tornado and hurricane-born automobile missiles against the licensing basis for operating plants. Preliminary structural calculations suggest that many operating plants have a licensing basis that provides protection against the criteria provided in new guidance for tornado and hurricane-generated automobile missiles. The staff is reviewing insights from individual plant examination of external events and recent high wind probabilistic risk assessments because the staff's preliminary assessment is that dominate risk contributors are not from tornadoes and hurricanes with a 1E-7 frequency (which is the basis for the new guidance), but rather from higher frequency events with lower wind speeds.

During the comment period for high winds it was pointed out (and the staff agreed) that slide 17 of the staff's presentation contained an error. The slide contains the following bullet:

- Dominate risk contributors are not from 1E-7 tornadoes, but rather from lower frequency tornadoes

The bullet should have stated:

- Dominate risk contributors are not from 1E-7 tornadoes and hurricanes, but rather from higher-frequency lower-speed wind events.

G. Bowman

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The staff noted that it was reviewing procedures in place for some sites associated with hurricane protection to understand the steps licensees take to reduce the chance of a crushable missile (represented by the automobile missile) being generated and other risk reduction steps licensees take (e.g., shutting down a plant prior to hurricane-force winds impacting the site) based on hurricane warning times.

The NRC staff stated that it was targeting mid-September to issue a draft white paper that will provide the staff's preliminary assessment of snow loads and high winds. This timeline supports a meeting with the Advisory Committee on Reactor Safeguards Fukushima Subcommittee in mid-October on this subject.

Please direct any inquiries to me at (301) 415-1132 or [joseph.sebrosky@nrc.gov](mailto:joseph.sebrosky@nrc.gov).

Enclosure:  
List of Attendees

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**ADAMS Accession No. ML16207A436**

<b>OFFICE</b>	NRR/JLD/JHMB/PM	NRR/JLD/LA	NRR/JLD/JHMB/BC	NRR/JLD/JHMB/PM
<b>NAME</b>	JSebrosky	SLent	GBowman	JSebrosky
<b>DATE</b>	07/26/2016	07/26/2016	07/26/2016	07/26/2016

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Public Meeting to Discuss Nuclear Regulatory Commission Staff's  
Preliminary Assessment of Fukushima Lessons Learned Related to  
Evaluation of Natural Hazards other than Seismic and Flooding

July 21, 2016

Attendance List

<b>Name</b>	<b>Organization</b>	<b>Name</b>	<b>Organization</b>
Greg Bowman	NRC/NRR/JLD	Tim Dodson*	Engineering Planning Management Inc.
Joe Sebrosky	NRC/NRR/JLD	Brenda Kovarik*	American Electric Power
Brett Titus	NRC/NRR/JLD	Eric Hohman*	FirstEnergy
Anthony Minark	NRC/NRR/JLD	Tracy StClair*	FirstEnergy
Greg Casto	NRC/NRR/DRA	David Petro*	FirstEnergy
CJ Fong	NRC/NRR/DRA	Colin Keller*	FirstEnergy
Mehdi Reisi Fard	NRC/NRR/DRA	Steve Osting*	FirstEnergy
Coree Forrester	NRC/NRR/DRA	Bob Coad*	FirstEnergy
Reynold Bartel	NRC/NRR/DRA	Michael Greg*	FirstEnergy
George Thomas	NRC/NRR/DLR	Heather Szews*	Duke Energy
Kim Green	NRC/NRR/DORL	Paul Guill*	Duke Energy
Kamal Manoly	NRC/NRR/DE	Jim Perchel*	Certrec
Nilesh Chokshi	NRC/NRO	Rick Rohrer*	Xcel Energy
Brad Harvey	NRC/NRO	Dale Shepherd*	Florida Power and Light
Mike Mazaika	NRC/NRO	Sergio Chaviano*	Florida Power and Light
Patrick Castleman	NRC/OCM/KLS	Dale Vines*	Tobolski Watkins Engineering
Andrew Mauer	Nuclear Energy Institute	Wayne Fromm*	NextEra Energy
Deann Raleigh	Curtiss Wright	Ross Gardner*	Talen Energy
John Richards*	Electric Power Research Institute	John Emmett*	Talen Energy
Ken Huffman*	Electric Power Research Institute	Jim Hickey*	NRC/NRR/DSS
Steven Dolley*	S&P Global	Mark Moenssens*	Westinghouse

\* indicates individual registered for webinar

Enclosure