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

December 1, 2017

MEMORANDUM TO: Sunil Weerakkody, Chief
PRA Operations and Human Factors Branch
Division of Risk Assessment
Office of Nuclear Reactor Regulation

FROM: Alexander Schwab, Project Manager
ROP Support and Generic Communications Branch
Division of Inspection and Regional Support
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF THE NOVEMBER 15, 2017, MEETING BETWEEN STAKEHOLDERS AND THE U.S. NUCLEAR REGULATORY COMMISSION STAFF TO DISCUSS TREATMENT OF MITIGATING STRATEGIES IN RISK-INFORMED DECISION MAKING

On November 15, 2017, a Category 2 public meeting was held between the U.S. Nuclear Regulatory Commission (NRC) staff and external stakeholders, at One White Flint North, in the First Floor Commissioner Hearing Room. The purpose of the meeting was to discuss treatment of Mitigating Strategies in Risk-Informed Decision Making.

The NRC and industry representatives gave presentations on several topics which are listed below with their associated Agencywide Documents Access and Management System (ADAMS) Accession Numbers.

- NRC - "Crediting Mitigating Strategies in Risk-Informed Decision Making" (ADAMS Accession No. ML17312A365)
- NRC - "RASP Handbook Changes and Use of NEI 16-06" (ADAMS Accession Number ML17320A091)
- Industry Representative - "Guidance for Optimizing the Use of Portable Equipment". (ADAMS Accession Number ML17320A146)
- Industry Representative - "Use of NEI 16-08 & NEI 16-06" (ADAMS Accession Number ML17320A193)
- Industry Representative - "Insights from Implementing FLEX in the Peach Bottom Seismic PRA Model" (ADAMS Accession Number ML17320A200)
- Industry Representative - "Modeling FLEX in Surry Power Station Internal Events and Flooding PRA" (ADAMS Accession Number ML17320A201)
- NRC - "Incorporation of FLEX Strategies and Equipment into PRA Models" (ADAMS Accession Number ML17312A366)
- NRC - "Incorporation of FLEX Strategies and Equipment into SPAR Models" (ADAMS Accession Number ML17312A367)
- NRC - "Gaps and Challenges" (ADAMS Accession Number ML17320A220)
- NRC - "FLEX Data needs for PRA and SPAR Models" (ADAMS Accession Number ML17320A232)

- NRC - "NRC's Approach to Resolve HRA Challenges for FLEX" (ADAMS Accession Number ML17320A267)
- Industry Representative - "Modeling of Portable Mitigation Equipment in PRA: Equipment Failure Rates and HRA Approaches" (ADAMS Accession Number ML17320A615)

During the designated time for questions and discussions, the NRC and industry representatives discussed several challenge areas, areas of agreement, and areas where further engagement is needed. One area that was discussed was the potential gap in industry's guidance NEI 16-06, "Crediting Mitigating Strategies in Risk Informed Decision Making" (ADAMS Accession Number ML16286A297). The NRC noted that NEI 16-06 does not explicitly address how to model FLEX equipment in a probabilistic risk assessment (PRA) for applications that are not required to be Regulatory Guide 1.200 compliant (e.g., significance determination process). Since FLEX can be credited in oversight related applications such as the significance determination process, this is an area that the NRC staff would like further engagement with industry.

An area of agreement between the NRC staff and industry representatives was the need for licensees to incorporate FLEX strategies into their PRA models to reflect the as-built as-operated plant. A number of NRC staff as well as industry representatives who participated in the meeting agreed that even with limited data, it is possible to make credible models that are useful, and improve them using additional information such as enhanced equipment failure probabilities, and human error probabilities when they become available.

The NRC staff and industry representatives specifically discussed the two challenge areas of collecting FLEX operational experience data for developing the equipment failure probabilities and the limitations on the current human reliability analysis (HRA) methods for certain FLEX decisions and actions.

As part of these discussions the NRC emphasized the need to access the operational experience data so they could independently generate failure probabilities for their specific applications (SPAR models, risk assessments, etc.). They also discussed how the NRC will make these failure probabilities publicly available so both the licensees and external stakeholders can access them. The Electric Power Research Institute (EPRI), who is collecting and processing the industry's FLEX operational experience data, discussed how there are limitations to what they can share with the NRC because of the agreements they have in place with utilities. The NRC staff mentioned past situations of data sharing that the NRC and industry were able to successfully resolve. The NRC staff noted their intention to engage industry representatives further on this issue by leveraging memorandums of understanding between the NRC's Office of Nuclear Regulatory Research (RES) and EPRI.

The NRC also discussed their plans to address the gaps and limitations in the current HRA methods for their use in regulatory applications. The NRC staff agreed that current HRA methods could handle many simple FLEX decisions and actions, but that there are limitations for more complex FLEX actions that need to be resolved. Representatives from EPRI briefly discussed their plans to modify and use insights from their ongoing Main Control Room Abandonment work to handle these limitations. They also discussed their plan to have a workshop in the first quarter of 2018 to share HRA insights in modelling FLEX, obtain feedback on the insights, and define a path forward. In addition, they mentioned their desire to have one NRC staff from NRR and one NRC staff from RES participate in this workshop.

Industry representatives and NRC staff exchanged ideas on the process for incorporating FLEX into PRA models. The NRC staff presented their work of incorporating plant specific FLEX strategies into a volunteer pressurized water reactor SPAR model. The NRC also mentioned their desire to get a volunteer boiling water reactor plant to incorporate their plant specific FLEX strategies into their SPAR model. Industry representatives discussed their process of incorporating FLEX into both the Peach Bottom Internal Events and seismic PRA model and the Surry Power Station Internal Events and Flooding PRA model. The NRC staff noted that this is an area the NRC would like further engagement with industry to learn more of the specifics on how they incorporated FLEX into their models and how they addressed some of the concerns that the NRC made available in May of 2017 in a publicly available memorandum (ADAMS Accession Number ML17031A269).

The NRC staff pointed out that internal deliberations are continuing on the requested endorsement of NUMARC 93-01 Rev. 4e and that there will be a follow-up meeting on this later.

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 Alexander.Schwab@nrc.gov.

Enclosure:
List of Attendees

ATTENDANCE LIST

MEETING BETWEEN STAKEHOLDERS AND THE U.S. NUCLEAR REGULATORY COMMISSION STAFF TO DISCUSS TREATMENT OF MITIGATING STRATEGIES IN RISK-INFORMED DECISION MAKING
(CATEGORY 2)

November 15, 2017
9:00 a.m. - 1:00 p.m.
ONE WHITE FLINT NORTH, FIRST FLOOR COMMISSIONER HEARING ROOM

NAME	ORGANIZATION
John Hughey	NRC
Jeff Circle	NRC
Eric Bowman	NRC
Michelle Kichline	NRC
Steven Alferink	NRC
Tony Brown	NRC
Jeffery Wood	NRC
Song-Hua Shen	NRC
Mark Thaggard	NRC
Jing Xing	NRC
Matt Humberstone	NRC
Mike Montecalvo	NRC
Andy Rosebrook	NRC
Yung Hsien J. Chang	NRC
John C. Lane	NRC
John Nakoski	NRC
Sean Peters	NRC
Selim Sancaktar	NRC
Steven Ardnt	NRC
Joseph Kanney	NRC
CJ Fong	NRC
Russ Felts	NRC
Mike Cheok	NRC
John Hanna	NRC
Laura Kozak	NRC
Tracy St.Clair	First Energy
Rob Burg	EPM, Inc.
Hiroki Watanabe	JNRA
Justin Hiller	Ameren Missouri
Brenda Kovarik	AEP
William McTigue	AECOM
Mark Brossart	Xcel Energy
Lauren Ning	N/A
Ali Azarm	IESS, LLC

Enclosure

NAME	ORGANIZATION
Steve Vaughn	NEI
Stephen Grier	NEI
Rich Mogavero	NEI
Greg Krueger	NEI
Mike Powell	APS
Paul Farish	Duke Energy
Mike Weber	Duke Energy
Ricardo Davis	Duke Energy
Heather Fox	Jensen Hughes
Don Vanover	Jensen Hughes
Harry Liao	Jensen Hughes
Pamela Burns	Southern Nuclear
Faramarz Pournia	Southern Nuclear
Owen Scott	Southern Nuclear
Fernando Ferrante	EPRI
John Weglian	EPRI
Mary Presley	EPRI
Kelli Voelsing	EPRI
Phil Tardinian	Exelon
William Webster	Dominion Energy
Jana Bergman	Curtiss-Wright/Scientech
Roy Linthicum	PWROG
Mike O'Keefe	Certrec

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ADAMS Accession Nos: Pkg: ML17312A356; Mtg. Notice: ML17279A817; Mtg. Summary: ML17334A927
*Concurrence via e-mail NRR-001

OFFICE	NRR/DIRS/IRGB/PM*	NRR/DPR/PGCB/LA*	NRR/DRA/APHB*	NRR/DRA/APHB/BC*	NRR/DIRS/IRGB/PM
NAME	ASchwab	ELee	MHumberstone	SWeerakkody	ASchwab
DATE	11/30/2017	12/01/2017	11/30/2017	11/30/2017	12/01/2017

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