

June 16, 2009

MEMORANDUM TO: Gary DeMoss, Chief, Performance and Reliability Branch  
Division of Risk Analysis  
Office of Nuclear Regulatory Research

FROM: Mary Drouin, Performance and Reliability Branch */RA/*  
Division of Risk Analysis  
Office of Nuclear Regulatory Research

SUBJECT: PUBLIC WORKSHOP MEETING BETWEEN THE NUCLEAR  
REGULATORY COMMISSION (NRC), ELECTRIC POWER  
RESEARCH INSTITUTE (EPRI) AND INDUSTRY ON NUREG-1855  
“GUIDANCE ON THE TREATMENT OF UNCERTAINTIES  
ASSOCIATED WITH PRAS IN RISK-INFORMED DECISION  
MAKING” AND EPRI 101673 “TREATMENT OF PARAMETER AND  
MODEL UNCERTAINTY FOR PROBABILISTIC RISK  
ASSESSMENTS”

On May 5-6, 2009, the Nuclear Regulatory Commission (NRC) and the Electric Power Research Institute (EPRI) held a public workshop with industry on NUREG-1855 “Guidance on the Treatment of Uncertainties Associated with PRAS in Risk-Informed Decision Making” (ADAMS Accession No. ML090970525) and EPRI 1016737 “Treatment of Parameter and Model Uncertainty for Probabilistic Risk Assessments” (available at EPRI.com searching for 1016737). A draft version of Appendix A to NUREG-1855 was also discussed (ADAMS Accession No. ML090930698). The meeting had over 70 participants including representatives from industry (owners groups, vendors, utilities, consultants etc.) and National Aeronautics and Space Administration. The enclosure lists the meeting attendees.

A public meeting notice was issued on April 6, 2009 and was posted on NRC’s external (public) web page (ADAMS Accession No. ML090930648). The workshop was held to explain how to use the NRC and EPRI guidance to satisfy the requirement in the PRA standard on uncertainties and how to address those uncertainties in decision making. The workshop involved five sessions. The first provided an overview of the effort. The second was a discussion on the detailed guidance. Third was a walkthrough of an example illustrating how to apply the guidance in the NRC and EPRI reports. The fourth session was on regulatory and industry perspectives of the guidance. The final session was an open discussion on the workshop and future work. The main presentation slides as well as the meeting agenda are available in (ADAMS with Accession No. ML091320229). Perspectives from the Office of New Reactors and industry are available with (ADAMS Accession Numbers ML091320254 and ML091320248 respectively).

Participants indicated that they generally found the workshop useful, though there was some concern that the effort would add substantial additional work for both the industry and the NRC.

CONTACT: Brian Wagner, RES/DRA  
301-251-7595

NRC representatives indicated they believed the additional effort would be reasonable once the guidance is fully understood.

Several participants mentioned areas where the guidance and example application could use additional clarification:

- The use and implications of Table 3.1 in NUREG-1855
- The identification of model uncertainties
- The methods used in screening hazards
- What is meant by realistic vs. conservative models

Another clarification requested was to clarify that in some cases when the results of the sensitivity exceed the acceptance guidelines it will not necessarily lead to a rejection of the application.

There was wide agreement that the example was helpful. It was also repeatedly mentioned that additional examples would be helpful and that they should cover more of the process. The possibility of producing examples for a variety of applications was discussed. Some proposed utilizing a pilot application would serve well as a real life example.

Enclosures:

As stated

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Enclosures:

As stated

**DISTRIBUTION:**

G. Parry, NRR	D. Dube, NRO	K. Canavan(EPRI)
A. Howe, NRR	K. Coyne, RES	C. Lui, RES
DRA r/f	T. Clark, NRO	D. Coe, RES

**ADAMS Accession No.: ML091660460**

Office	RES/DRA/PRB	RES/DRA/PRB
Name	BWagner	MDrouin
Date	06/16/09	06/16/09

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Treatment of Uncertainty Workshop Attendee List  
May 5-6, 2009

<u>Name</u>	<u>Organization</u>
Andersen, Vince	ERIN
Baranowsky, Pat	ERIN
Boyer, Robert P.	Duke Energy
Bradley, Biff	NEI
Burns, Ed	ERIN
Canavan, Ken	EPRI
Cavedo, Robert	Constellation
Czysz, Frank	Susquehanna
Dezfuli, Homayoon	NASA
Dolan, Brad	ERIN
Dunn, Roland F.	STP Nuclear Operating Company
Fine, Raymond	FENOC
Groen, Frank	NASA
Hong, Kou-John	Entergy
Isbell, Robert	Progress Energy
John, Tommy	Dominion
Kitlan, Michael	Duke Energy
Krantz, Eddie A.	Scientech
Krueger, Greg	Exelon
Lavelline, Joe	DTE Energy
LaChance, Jeffrey	SNL
Lehner, John	BNL
Lutz, Bob	Westinghouse
McCoy, Steve	Progress Energy
Mirizio, Damian	Westinghouse
Morgan, Tom	Maracor Software
Olson, Ole	NPPD, Cooper Nuclear Station
Phillips, Mike	Scientech
Prassinios, Peter	NASA
Pyo, John	PG&E
Ramirez, Jorge	ERIN
Reinert, Joshua	Areva
Riley, Jeff	EPRI
Rohrer, Rick	Xcel Energy
Rozga, Greg	Maracor Software
Schroeder, John	INL
Severson, Russ	FPL
Sharpe, J. Russell	Maracor Software
Shtaih, Habib	Energy NW (CGS)
Sloane, Barry	ERIN
Stamatelatos, Michael	NASA
True, Doug	ERIN
Vanover, Don	ERIN
Wheeler, Timothy	SNL
Wright, Mike	Jacobsen Eng
Zucal, Greg	ERIN
Chung, Jin	MNES
Levinson, Stanley	Areva
Beasley, Ben	NRC/RES
Chelliah, Erul	NRC/RES

Enclosure

<u>Name</u>	<u>Organization</u>
Chow, Ed	NRC/RES
Clark, Theresa	NRC/NRO
Coe, Doug	NRC/RES
DeMoss, Gary	NRC/RES
Drouin, Mary	NRC/RES
Gallucci, Ray	NRC/NRR
Ghosh, Tina	NRC/NRR
Howe, Andrew	NRC/NRR
Hwang, Tae Suk	Korea
Hyslop, J.S.	NRC/RES
Lui, Christiana	NRC/RES
Malliakos, Asimios	NRC/RES
Marksberry, Don	NRC/RES
Mrowca, Lynn	NRC/NRO
Parry, Gareth	NRC/NRR
Patel, Jigar	NRC/NRR
Siu, Nathan	NRC/RES
Vogt-Lowell, Rene	NRC/NRR
Wagner, Brian	NRC/RES
Wong, See-Meng	NRC/NRR
Wood, Jeff	NRC/RES
Kratchman, Jessica	NRC/RES
Laur, Steven	NRC/NRR
El-Bassioni, Adel	NRC/NRR
Nicholson, Tom	NRC/RES
Hilsmeier, Todd	NRC/NRO
Ibarra, Jose	NRC/RES
Bonnett, Paul	NRC/DIRS
Stambaugh, Margaret	NRC/NRR

NRR = Office of Nuclear Reactor Regulation  
RES = Office of Nuclear Regulatory Research  
ERIN = Engineering and Research Inc.  
NEI = Nuclear Energy Institute  
NASA = National Aeronautics and Space Administration  
EPRI = Electric Power Research Institute  
FENOC = FirstEnergy Nuclear Operating Company  
SNL = Sandia National Laboratories  
BNL = Brookhaven National Laboratory  
INL = Idaho National Laboratory  
PG&E = Pacific Gas & Electric  
MNES = Mitsubishi Nuclear Energy Systems  
FPL = Florida Power & Light