

March 14, 2006

MEMORANDUM TO: Michele G. Evans, Deputy Director
Engineering Research Applications
Division of Fuel, Engineering and Radiological Research
Office of Nuclear Regulatory Research

THRU: Anthony H. Hsia, Branch Chief **/RA/**
Mechanical and Structural Engineering Branch
Engineering Research Applications

FROM: Vaughn V. Thomas, Project Manager **/RA/**
Mechanical and Structural Engineering Branch
Engineering Research Applications

SUBJECT: SUMMARY OF FEBRUARY 28, 2006, CATEGORY 2 PUBLIC MEETING
WITH NUCLEAR ENERGY INSTITUTE (NEI) TO DISCUSS
INDUSTRY'S PERFORMANCE-BASED APPROACH USED FOR
ESTABLISHING THE SAFE SHUTDOWN EARTHQUAKE (SSE)
GROUND MOTION DESIGN RESPONSE SPECTRUM (DRS)

On February 28, 2006, a public meeting was held between the U.S. Nuclear Regulatory Commission (NRC) and NEI at NRC Headquarters in Rockville, MD. The purpose of this meeting was to discuss the performance-based approach for establishing the SSE design response spectrum aimed at achieving a seismic core damage frequency (SCDF) less than a target goal for future nuclear power plants. A list of meeting attendees is included as Enclosure 1. The meeting agenda is provided as Enclosure 2.

After introductions, Dr. Robert P. Kennedy, consultant to NEI, proceeded with his tutorial on performance-based approach for establishing SSE DRS. Handouts of his presentation were provided during the meeting. The handouts can be accessed through the Agencywide Documents Access and Management System (ADAMS) under Accession No. Pkg. ML060670160.

Summary of the Meeting

NEI requested the meeting with NRC to give a tutorial on the performance-based approach used to establish the SSE design basis response spectrum. NEI discussed the issues which must be addressed in order to develop a performance-goal based SSE DRS by: 1) selecting an annual probability target of seismic induced unacceptable performance and 2) deciding what minimum seismic margin should be achieved by seismic design criteria. NEI proposed that: 1) the SSE DRS be defined by establishing a seismic core damage frequency (SCDF) target performance goal (P_{FT}); 2) an acceptable seismic margin goal be defined in terms of high confidence-low-probability-of-failure (HCLPF); and 3) a uniform hazard response spectrum (UHRS) seismic hazard exceedance frequency (H) be established.

NEI demonstrated that their proposed approach worked for actual hazard curves for the Central, Eastern U.S. sites and California. NEI recommended that the free field SSE DRS should be defined using the SCDF performance-based approach for designing future nuclear power plants.

During the question and answer session, NRC staff, contractors, and external stakeholders asked Dr. Kennedy to clarify key technical issues in his presentation. In general, the staff had no objection to NEI's approach for establishing the DRS SSE for light water reactor designs, but questioned whether or not NEI's approach would work for other advanced reactor designs such as the Pebble Bed Modular Reactor (PBMR) and the Economic Simplified Boiling Water Reactor (ESBWR).

At the end of the meeting, the staff informed NEI that the NRC is currently in the process of reviewing the preliminary industry reports. The staff also emphasized the need to know NEI's schedule for delivery of responses to staff requests for additional information for the preliminary reports.

Enclosures:

1. List of Attendees
2. Meeting Agenda
3. Presentation material

NEI demonstrated that their proposed approach worked for actual hazard curves for the Central, Eastern U.S. sites and California. NEI recommended that the free field SSE DRS should be defined using the SCDF performance-based approach for designing future nuclear power plants.

During the question and answer session, NRC staff, contractors, and external stakeholders asked Dr. Kennedy to clarify key technical issues in his presentation. In general, the staff had no objection to NEI's approach for establishing the DRS SSE for light water reactor designs, but questioned whether or not NEI's approach would work for other advanced reactor designs such as the Pebble Bed Modular Reactor (PBMR) and the Economic Simplified Boiling Water Reactor (ESBWR).

At the end of the meeting, the staff informed NEI that the NRC is currently in the process of reviewing the preliminary industry reports. The staff also emphasized the need to know NEI's schedule for delivery of responses to staff requests for additional information for the preliminary reports.

Enclosures:

1. List of Attendees
2. Meeting Agenda
3. Presentation material

DISTRIBUTION:

Syed Ali	Goutam Bagchi	Mark Cunningham	Bret Tegler
Michele Evans	Eugene Embro	Michael Mayfield	
Herman Graves	Anthony Hsia	Donald Harrison	
Yong Li	Rebecca Karas	Clifford Munson	
Mahendra Shah	Vaughn Thomas	Andrew Murphy	

DOCUMENT NAME: E:\Filenet\ML060660155.wpd

OAR in ADAMS? (Y or N) Y ADAMS ACCESSION NO.: **Pkg.ML060670160** TEMPLATE NO. 006

Publicly Available? (Y or N) Y DATE OF RELEASE TO PUBLIC 03/14/2006 SENSITIVE? N

To receive a copy of this document, indicate in the box: "C" = Copy without enclosures "E" = Copy with enclosures "N" = No copy

OFFICE	RES/DFERR/ERA	SISP Review	RES/DFERR/ERA	RES/DFERR/ERA
NAME	V. Thomas /RA/	Originator: V. Thomas /RA/	A. Murphy /RA/	A. Hsia /RA M.E. for/
DATE	03/09/06	03 /09/06	03 /14 /06	03/ 14/06

OFFICIAL RECORD COPY

Memo: ML060660155, Enclosure: ML060670117

List of Attendees

First Name	Last Name	Phone	E-mail	Organization
------------	-----------	-------	--------	--------------

SITAG Members

Syed	Ali	(301) 415-5704	saa3@nrc.gov	RES
Goutam	Bagchi	(301) 415-3305	gxb1@nrc.gov	NRR
Herman	Graves	(301) 415-5880	hlgl@nrc.gov	RES
Yong	Li	(301) 415-4141	yx11@nrc.gov	NRR
Cliff	Munson	(301) 415-2529	cgm1@nrc.gov	NRR
Andrew J.	Murphy	(301) 415-6011	ajm1@nrc.gov	RES
Mahendra J.	Shah	(301) 415-8537	mjs3@nrc.gov	NMSS
Vaughn	Thomas	(301) 415-5897	vxt@nrc.gov	RES

NRC Attendees

Michele G.	Evans	(301) 415-7210	mge@nrc.gov	RES/DFERR/ERAB
Anthony H.	Hsia	(301) 415-6933	ahh@nrc.gov	RES/DFERR/ERAB
Bakr	Ibrahim	(301) 415-6651	aki@nrc.gov	NMSS/DHLWRS
Gene	Imbro	(301) 415-3288	exi@nrc.gov	NRR/DE
Rebecca	Karas	(301) 415-3711	rlk@nrc.gov	NRR/DE
Albert	Wong	(301) 415-7843	axwz@nrc.gov	NRC
Philip	Justus	(301) 415-5669	psj@nrc.gov	NRC
Bret	Tegler	(301) 415-6793	bet1@nrc.gov	RES/DFERR/ERAB
Mysore	Nataraja	(301) 424-4305	msn1@nrc.gov	NRC
Brittan	Hill	(301) 424-5002	beh1@nrc.gov	NMSS
Abdul	Sheikh	(301) 415-6004	axs9@nrc.gov	RES/DFERR/ERAB

Non-NRC Attendees

Bob	Kennedy	(760) 751-3510	bob@rpksstruct.com	RPK Struct. Mechanics
Medhat	Elgohary	(905) 823-9060	elgoharm@aecl.com	AECL
Cedric	Jobe	(202) 739-8128	cij@nei.org	NEI
Jim	Xu	(631) 689-8284	xu@bnl.gov	BNL
Carl J	Constantino	(845) 354-2602	carl@cjcassoc.com	BNL
Joseph	Braverman	(631) 344-2186	Braverman@bnl.gov	BNL
Bruce	Ellingwood	(404) 894-1635	ellingwood@gatech.edu	Georgia Tech
Biswajit	Dasgupta	(210) 522-6815	bdasgupta@swri.org	CNWSA
Martha	Sheilds	(301) 703-8078	martha.sheilds@nuclear.energy.gov	DOE
Bob	Youngblood	(631) 689-2712	ryoungblood@islinc.com	ISL
Joshua	Clark	(301) 255-2266	jclark@islinc.com	ISL
Aoyama	Shin	(202) 216-4372	aoyama.shin@meti.go.jp	NISA
Kasumi	Sugie	(202) 216-4372	Sugie.kazumi@meti.go.jp	NISA
Tomoho	Yamada	(202) 216-4372	yamada.tomoho@jnes.usa.org	JNES

NRC-NEI Meeting: Presentation on Performance-Goal Based Approach
February 28, 2006 at 09:00 – 15:00
Commissioners' Conference Room, NRC

Meeting Objective: Tutorial on Performance-Goal Based Approach (PBA) for Establishing the Safe Shutdown Earthquake (SSE) Design Response Spectrum (DRS)

Industry Participants: Bob Kennedy – Consultant
Cedric Jobe – NEI

Agenda:

09:00 am	1. Introductions and opening remarks – NEI and NRC
09:10 am	2. PBA Used to Establish SSE Design Response Spectrum
	, Issues that must be addressed
	, Defining the SSE DRS
	< Step 1: Establish Target Performance Goal
	< Step 2: Establish Acceptable Seismic Margin Goals
10:15 am	Break
10:30 am	< Step 3: Establish Seismic Hazard Exceedance Frequency
	< Step 4: Define Design-Basis Earthquake Response Spectrum
	, Summary of Proposed Performance-Goal Based Approach
12:00 noon	Lunch
12:45 pm	3. Basis for Design Factor (DF)
	4. Demonstration of Actual Hazard Curves
	5. Recommendations
1:30 pm	Break
1:45 pm	6. Q & A
2:30 pm	7. Summary of meeting action items
3:00 pm	d. Adjourn