



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

January 31, 2023

MEMORANDUM TO: Cindy E. Rosales-Cooper, Acting Branch Chief
Licensing Projects Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

FROM: Siva P. Lingam, Project Manager */RA/*
Licensing Projects Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF JANUARY 11, 2023, PUBLIC MEETING WITH
NUCLEAR ENERGY INSTITUTE, INDUSTRY, AND ELECTRIC
POWER RESEARCH INSTITUTE TO DISCUSS RISK-
INFORMED HIGH ENERGY LINE BREAK METHODOLOGY

On January 11, 2023, the U.S. Nuclear Regulatory Commission (NRC) staff held an observation public meeting with representatives from the Nuclear Energy Institute, industry, and the Electric Power Research Institute to discuss the risk-informed high energy line break methodology covering, but not limited to, overview of supporting topical report, review of relevant regulations, and intended licensing application. The meeting notice and agenda dated December 22, 2022, are available in the Agencywide Documents Access and Management System (ADAMS) under Accession No. ML22362A014. A list of attendees is provided in Enclosure 1.

The slides presented for this public meeting by Constellation and the NRC are available in ADAMS under Accession Nos. ML22010A248 and ML23010A250, respectively. A list of presenters is included in Enclosure 2. The details of the meeting are discussed in Enclosure 3.

No comments were provided by members of the public. No meeting feedback forms from the attendees were received.

CONTACT: Siva P. Lingam, NRR/DORL
301-415-1564

No regulatory decisions or commitments were made at the meeting.

Please direct any inquiries to me at (301) 415-1564 or by email at Siva.Lingam@nrc.gov, or Robert Tregoning at (301) 415-2324 or by email at Robert.Tregoning@nrc.gov.

Enclosures:

1. List of Attendees
2. List of Presenters
3. Meeting Details

LIST OF ATTENDEES

JANUARY 11, 2023, PUBLIC MEETING WITH

NUCLEAR ENERGY INSTITUTE, INDUSTRY, AND

ELECTRIC POWER RESEARCH INSTITUTE

TO DISCUSS THE RISK-INFORMED

HIGH ENERGY LINE BREAK METHODOLOGY

Name	Affiliation
Stewart Bailey	U.S. Nuclear Regulatory Commission (NRC)
Antonio Barrett	NRC
Chakrapani Basavaraju	NRC
Gurjendra Bedi	NRC
Michael Benson	NRC
Mihaela Biro	NRC
Mat Burton	NRC
Nachiketh Chandran	NRC
Stephen Cumblidge	NRC
Gordon Curran	NRC
Matthew Domke	NRC
Carolyn Fairbanks	NRC
Raul Hernandez	NRC
Allen Hiser	NRC
Kaihwa Hsu	NRC
Raj Iyengar	NRC
Lois James	NRC
Nageswara Karipineni	NRC
Bruce Lin	NRC
Siva Lingam	NRC
Shanlai Lu	NRC
Kamal Manoly	NRC
Matthew McConnell	NRC
Ching Ng	NRC
Ryan Nolan	NRC
David Nold	NRC
Carol Nove	NRC
William Orders	NRC
Robert Pascarelli	NRC
Jigar Patel	NRC
April Pulvirenti	NRC
David Rudland	NRC
George Thomas	NRC
Robert Tregoning	NRC
John Tsao	NRC

Name	Affiliation
Harry Waggage	NRC
Sunil Weerakkody	NRC
John Wise	NRC
Antonios Zoulis	NRC
Matthew Chouinard	Constellation
Benjamin Day	Constellation
Roy Linthicum	Constellation
Brian Timothy Madderom	Constellation
Richard Malasics	Constellation
Mitchel Mathews	Constellation
Trupti Narielwala	Constellation
Patrick Simpson	Constellation
Rebecca Steinman	Constellation
Jeffrey Stone	Constellation
Peter Tamburro	Constellation
M. Youssefnia	Contractor (Constellation)
Christopher Nellis	Duke Energy
Christopher Vukonich	DTE Energy
Bradley Wicker Dolan	Tennessee Valley Authority
Ferrante Fernando	Electric Power Research Institute (EPRI)
Nathan Glunt	EPRI
Doug Kull	EPRI
Wynter McGruder	EPRI
Jim Moudy	EPRI
Patrick O'Regan	EPRI
Marko Randelovic	EPRI
Do Jun Shim	EPRI
Victoria Anderson	Nuclear Energy Institute (NEI)
Thomas Basso	NEI
Chris Eng	General Electric - Hitachi (GEH)
Mitchell Johnson	GEH
Morgan Mirin	GEH
George Wadkins	GEH
Brian Mount	Services - 6
George Antaki	Bechtel Nuclear Services
Ivo Garza	Sargent & Lundy
Elizabeth Kurth	Engineering Mechanics
DL Williams	Williams Industrial Services Group
Bill Brey	Florida State University, Tallahassee
Leo Kaushansky	Illinois Institute of Technology
Alyssa Ferianc	Penn State Behrend
Mason Jebbia	Wayne State University
Jana Bergman	Public
Robert Florian	Public
Garcia Heras Maria Luisa	Public
Matthew Hozdic	Unknown
Emily Hunt	Unknown
Michael Nena	Unknown

LIST OF PRESENTERS

JANUARY 11, 2023, PUBLIC MEETING WITH
NUCLEAR ENERGY INSTITUTE, INDUSTRY, AND
ELECTRIC POWER RESEARCH INSTITUTE
TO DISCUSS THE RISK-INFORMED
HIGH ENERGY LINE BREAK METHODOLOGY

Name	Affiliation
Stewart Bailey	U.S. Nuclear Regulatory Commission (NRC)
Nachiketh Chandran	NRC
Bruce Lin	NRC
Robert Tregoning	NRC
Roy Linthicum	Constellation
Patrick O'Regan	Electric Power Research Institute (EPRI)
Jim Moudy	EPRI

MEETING DETAILS
JANUARY 11, 2023, PUBLIC MEETING WITH
NUCLEAR ENERGY INSTITUTE, INDUSTRY, AND
ELECTRIC POWER RESEARCH INSTITUTE
TO DISCUSS THE RISK-INFORMED
HIGH ENERGY LINE BREAK METHODOLOGY

Purpose

The purpose of this public meeting between the U.S. Nuclear Regulatory Commission (NRC) staff, and representatives from the Nuclear Energy Institute (NEI), industry, and the Electric Power Research Institute (EPRI) was to discuss the risk-informed high energy line break (HELB) methodology covering, but not limited to, overview of supporting topical report, review of relevant regulations, and intended licensing application.

Background

As a result of industry ongoing activities such as power uprates, license renewal, and subsequent license renewal, a number of deterministic requirements are being challenged as to their efficiency in maintaining and improving plant safety while providing flexibility in plant operations and resource allocation. As an example, for a couple of operating sites, attempting a measurement uncertainty recapture (MUR) uprate identified the potential for a system to be re-classified from a moderate energy system to a high energy system due to increases in the subject system's operating temperature and pressure after MUR. Having to meet current deterministic HELB requirements would entail significant plant reanalysis and substantial plant modification. Discussions with the new build fleet have also identified these deterministic HELB requirements contributing to capital cost and engineering difficulties.

The NRC held two public meetings, one on June 11, 2019, discussing NRC Branch Technical Position (BTP) 3-4 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML19156A031 and ML19161A105); and the other on March 1, 2021, addressing HELB (ADAMS Accession Nos. ML21050A345 and ML21057A162). The meeting summaries for these two meetings can be found under ADAMS Accession Nos. ML19217A002 and ML21089A005, respectively.

Subsequently, this follow-up meeting was held on January 11, 2023.

Details

Roy Linthicum of Constellation, Patrick O'Regan, and Jim Mody of EPRI provided their presentation covering the following topics:

- Scope of effort such as safety and/or non-safety related piping
- Form of endorsement like topical report versus plant specific approval

- Leverage both industry and NRC research
- Schedule

Robert Tregoning, Bruce Lin, and Nachiketh Chandran of the NRC presented the NRC staff's alternative framework covering scope, objectives, applicability, screening evaluation, additional measures, requirements, additional considerations, advanced leak before break (LBB) evaluation, advanced LBB analysis approach, initial results, and the path forward.

Path Forward

The NRC staff will continue to work with industry on developing risk-informed approach, review relevant operating experience, broaden scope beyond light water reactors welded piping systems, and update regulatory guidance documents.

Stewart Bailey of the NRC briefly explained the NRC's intentions on this topic during opening remarks and concluded the meeting with closing remarks.

SUBJECT: SUMMARY OF JANUARY 11, 2023, PUBLIC MEETING WITH NUCLEAR ENERGY INSTITUTE, INDUSTRY, AND ELECTRIC POWER RESEARCH INSTITUTE TO DISCUSS RISK-INFORMED HIGH ENERGY LINE BREAK METHODOLOGY DATED JANUARY 31, 2023

DISTRIBUTION:

PUBLIC	MDomke, RIII	CNove, RES
RidsACRS_MailCTR	CFairbanks, NRR	WOrders, NRR
RidsNrrDexEmib	RHernandez, NRR	JPatel, NRR
RidsNrrDorLLpb	AHiser, NRR	APulvirenti, NRR
RidsNrrDraApla	KHsu, NRR	DRudland, NRR
RidsNrrDraApob	Rlyengar, RES	GThomas, NRR
RidsNrrLADHarrison	LJames, NRR	RTregoning, RES
ABarrett, NRR	NKariipineni, NRR	JTsao, NRR
CBasavaraju, NRR	BLin, RES	HWaggage, NRR
GBedi, NRR	SLingam, NRR	SWeerakkody, NRR
MBenson, NRR	SLu, NRR	JWise, NRR
MBiro, NRR	KManoly, NRR	JRankin, NRR
MBurton, NRR	MMcConnell, NRR	SLay, NRR
NChandran, RES	CNg, NRR	NMorgan, NRR
SCumblidge, NRR	RNolan, NRR	DJohnson, OEDO
GCurran, NRR	DNold, NRR	MFerdas, OEDO

ADAMS Accession Nos.:**Package: ML23025A368****Meeting Notice: ML22362A014****Meeting Summary: ML23025A369****Meeting Slides: ML23010A248 (Constellation) and ML23010A250 (NRC) *by email**

OFFICE	NRR/DORL/LLPB/PM*	NRR/DEX/EMIB/TR*	NRR/DORL/LLPB/LA*
NAME	SLingam	RTregoning	DHarrison
DATE	1/20/2023	1/24/2023	1/26/2023
OFFICE	NRR/DEX/EMIB/BC*	NRR/DORL/LLPB/BC (A)*	NRR/DORL/LLPB/PM*
NAME	SBailey	CRosales-Cooper	SLingam
DATE	1/31/2023	1/31/2023	1/31/2023

OFFICIAL RECORD COPY