

August 11, 2003

ORGANIZATION: General Electric Nuclear Energy (GE)

SUBJECT: SUMMARY OF MEETING HELD ON JULY 9, 2003, TO DISCUSS
REQUESTS FOR ADDITIONAL INFORMATION (RAIs) RELATED TO
ESBWR PRE-APPLICATION SUBMITTALS

The Nuclear Regulatory Commission (NRC) hosted a public meeting with General Electric Nuclear Energy (GE) on July 9, 2003, at NRC Headquarters to discuss requests for additional information (RAIs) related to ESBWR pre-application submittals. A list of attendees is provided as Enclosure 1. Enclosure 2 contains the agenda for the meeting.

By letter dated April 18, 2002, GE requested a pre-application review of the reactor design — ESBWR. The ESBWR is a 1390 MWe, natural circulation, boiling water reactor design which utilizes passive safety systems. GE has submitted eight topical reports in support of the ESBWR pre-applications review. The staff has requested GE to provide additional information related to these topical reports. The purpose of the July 9, 2003, meeting was to discuss RAIs related to NEDC-33083P, "TRACG Application for ESBWR," NEDC-33082P, "ESBWR Scaling Report," and NEDC-33079P and Supplement 1, "ESBWR Test and Analysis Program Description." The RAIs that were discussed during the meeting can be accessed through the Agencywide Documents Access and Management System (ADAMS). This system provides text and image files of NRC's publicly available documents. The RAIs mentioned above may be accessed through the ADAMS system under Accession No. ML032170686. If you do not have access to ADAMS or if there are problems in accessing the documents located in ADAMS, contact the NRC Public Document Room (PDR) Reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to NRC pdr@nrc.gov. The final RAIs were forwarded to GE in two letters dated July 17, 2003, and can be access under Accession Nos. ML031960034 and ML031960142.

During the closed portion of the meeting, GE discussed the details of their proprietary submittals. A non-proprietary summary of these discussions is provided as Enclosure 3.

/RA/

Amy E. Cubbage, ESBWR Project Manager
New Reactors Section
New, Research and Test Reactors Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Project No. 717

Enclosures: As stated

cc w/encls: See next page

August 11, 2003

ORGANIZATION: General Electric Nuclear Energy (GE)

SUBJECT: SUMMARY OF MEETING HELD ON JULY 9, 2003, TO DISCUSS
REQUESTS FOR ADDITIONAL INFORMATION (RAIs) RELATED TO
ESBWR PRE-APPLICATION SUBMITTALS

The Nuclear Regulatory Commission (NRC) hosted a public meeting with General Electric Nuclear Energy (GE) on July 9, 2003, at NRC Headquarters to discuss requests for additional information (RAIs) related to ESBWR pre-application submittals. A list of attendees is provided as Enclosure 1. Enclosure 2 contains the agenda for the meeting.

By letter dated April 18, 2002, GE requested a pre-application review of the reactor design — ESBWR. The ESBWR is a 1390 MWe, natural circulation, boiling water reactor design which utilizes passive safety systems. GE has submitted eight topical reports in support of the ESBWR pre-applications review. The staff has requested GE to provide additional information related to these topical reports. The purpose of the July 9, 2003, meeting was to discuss RAIs related to NEDC-33083P, "TRACG Application for ESBWR," NEDC-33082P, "ESBWR Scaling Report," and NEDC-33079P and Supplement 1, "ESBWR Test and Analysis Program Description." The RAIs that were discussed during the meeting can be accessed through the Agencywide Documents Access and Management System (ADAMS). This system provides test and image files of NRC's publicly available documents. The RAIs mentioned above may be accessed through the ADAMS system under Accession No. ML032170686. If you do not have access to ADAMS or if there are problems in accessing the documents located in ADAMS, contact the NRC Public Document Room (PDR) Reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to NRC pdr@nrc.gov. The final RAIs were forwarded to GE in two letters dated July 17, 2003, and can be access under Accession Nos. ML031960034 and ML031960142.

During the closed portion of the meeting, GE discussed the details of their proprietary submittals. A non-proprietary summary of these discussions is provided as Enclosure 3.

/RA/

Amy E. Cubbage, ESBWR Project Manager
New Reactors Section
New, Research and Test Reactors Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Project No. 717

Enclosures: As stated

cc w/encls: See next page

ADAMS ACCESSION NUMBER: ML032180189-Pkg.

OFFICE	RNRP/PM	RNRP/(A)SC
NAME	ACubbage	JWilliams
DATE	8/6/2003	8/8/2003

OFFICIAL RECORD COPY

Distribution for July 9, 2003, Meeting Summary Dated August 11, 2003

Distribution

Hard Copy
RNRP Rdg.
ACubbage
JWilliams

E-mail

PUBLIC
JCraig
DMatthews
FGillespie
RNRP Grp.
DE Branch Chiefs
DE Section Chiefs
GBagchi
ESullivan
CAbbott
MBennett
AThadani
CAder
FEltawila
OPA
NRC Participants
JJolicoeur, EDO
TMensah
OGC
ACRS/ACNW
bhupinder.singh@hq.doe.gov
tom.miller@hq.doe.gov
bill.ascroft-hutton@hse.gsi.gov.uk
rzentkowskig@cnsccsn.gc.ca
kcrogers@aol.com
mod@inel.gov
FAkstulewicz
RLandry
SLu
GThomas
MRazzaque
EThrom
ALevin
ADrozd
RMcIntyre
JStaudenmeier
JHan
RHogan
JRosenthal

**MEETING WITH GENERAL ELECTRIC
ESBWR PRE-APPLICATION REVIEW
July 9, 2003
ROOM T10A1, 8:30 AM - 5:00 PM**

Name	Affiliation
Edward D. Throm	NRR/DSSA/SPSB
Ralph Landry	NRR/DSSA/SRXB
George Thomas	NRR/DSSA/SRXB
Shanlai Lu	NRR/DSSA/SRXB
Atambir Rao	GE
Alan Levin	NRC/RES
James Han	NRC/RES
Yee K. Cheung	GE
Joseph Staudenmeier	NRC/RES
Muhammad Razzaque	NRR/DSSA/SRXB
Bharat Shiralkar	GE
Robert Gamble	GE
Marcos Ortiz (via telephone)	ISL
Amy Cubbage	NRC/NRR/NRLPO

**General Electric ESBWR Pre-application Meeting
July 9, 2003
Room T-10A1**

8:30 a.m.	Introductory Remarks	NRC	Open
8:40 a.m.	Introduction	General Electric	Open
8:50 a.m.	Schedule/Status	GE/NRC	Open
9:00 a.m.	Opportunity for Stakeholder Comment	Public	Open
9:05 a.m.	Requests for Additional information Test and Analysis Program Description (NEDE-33079P and Supplement 1)	General Electric	Closed
10:30 a.m.	Requests for Additional Information ESBWR Scaling (NEDC-33082P)	General Electric	Closed
12:00 p.m.	Lunch Break		
1:00 p.m.	Requests for Additional Information TRACG Application for ESBWR (NEDC-33083P)	General Electric	Closed
2:30 p.m.	Requests for Additional Information TRACG Qualification for SBWR (NEDC-32725P Vol. 1 and 2)	General Electric	Closed
4:30 p.m.	Summary and Conclusions	GE/NRC	Closed
5:00 p.m.	Adjourn		

Non-Proprietary Summary of Closed Portion of July 9, 2003, Meeting

In a number of the staff's requests for additional information (RAIs), General Electric (GE) was requested to modify the topical reports that were submitted in support of the ESBWR pre-application review. GE and the staff agreed that GE would respond to these RAIs by providing the revised text, tables, or figures for the staff's review during the pre-application review, and GE would incorporate the changes into the approved versions of topical reports that are required to be submitted after the pre-application review is completed.

During the meeting, RAI Nos. 201, 205, 251, 302, and 303 were resolved. It was agreed that GE would not respond to these RAIs in writing. The disposition of these RAIs is provided as follows:

- RAI 201: Page 2-27 - The first paragraph states, "A smaller subset actually turned out to be important after the tests and sensitivity studies were analyzed." While the historical development aspect of the phenomena identification and ranking table (PIRT) is of interest, it would be most helpful if the most current ranking were included here in some way. The presence of a unduly large number of highs and mediums tends to obscure the items of greater importance for those of lesser importance. Subsequent ESBWR reporting should preferably be based on the latest PIRT. This same comment extends to "3.3 Results," and so on.

Resolution: In the GE report NEDC-33079P, "Test and Analysis Program Description (TAPD)," phenomena are discussed which were considered to be of potential importance to the ESBWR, and were later found to be unimportant. The composite lists of the PIRTs do not contain those phenomena found to be unimportant. The staff determined that it is not necessary for GE to revise the TAPD report to remove the discussions on those phenomena that were later found to be unimportant.

- RAI 205: NEDC-33079P, Page 3-1, Section 3.1 - Was the same expert group used in both the bottom-up and top-down approaches? Were the two approaches done at the same time or apart in time?

Resolution: GE informed the staff that the PIRT panels were composed of GE employees and other experts, and that the PIRT panels were conducted at different times. It was determined by the staff that the composition and timing of the PIRT panels was not relevant to the review of NEDC-33079P, "ESBWR test and Analyses Program Description." Therefore, the staff did not request any further response from GE.

- RAI 251: Pages S-30 and S-31 of Supplement 1 - Please provide drawings to show where counter current flow (CCFL) may occur for PIRT Ref. Nos. A3, A6, A7, B4, and B5.

Resolution: The CCFL phenomenon is a high-ranked phenomenon in the PIRTs. Drawings to show where CCFL may occur would help the staff to understand the ESBWR design, however, the staff agreed that this information was not necessary to complete the pre-application review.

- RAI 302: In NEDC-32725P, PIRT phenomena "XC7 - Early Containment Response" is identified as a high ranked phenomena under "Systems Interactions." XC7 is not identified in Table 3.4-1 of NEDC-33083P, or in Table 2.3-2 of "ESBWR Test and Analysis Program Description," NEDC-33079P, August 2002. Provide a discussion for XC7 as it relates to the ESBWR including a justification that the TRACG modeling for the early containment response is treated in a conservative manner and that the conditions at the end of blowdown are appropriate for the evaluation of the long term response evaluation.

Resolution: XC7 - Early Containment Response is identified in Table 3.2-1 of NEDC-33083P as a high ranked phenomena. GE explained that since no new models are needed to address the systems interactions, XC7 was dropped from the remaining tables in NEDC-33083P. The staff accepted this explanation and did not request any further response.

- RAI 303: The temperature differential between wetwell level 7 ring 5 and ring 6 is maintained over the long-term at more than 20° F, while at level 6 there is a small differential temperature (Fig. 3.7-8 and 3.7-14, NEDC-33083P). Explain the mass and heat transport processes in TRACG which sustain this differential temperature. Are there integral or separate effects test which show this sustained differential temperature?

Resolution: In the ESBWR TRACG model, the drywell-to-wetwell bypass is modeled as going into level 7, ring 5 of the wetwell. In addition, based on test data from the PANDA M6/8 test, which included this bypass flow, the ESBWR TRACG model includes a model to inhibit flow between the two rings to produce conservative results. The staff did not request any further response to this issue.

- RAI 260 and 261: These RAIs were re-numbered as 259.1 and 259.2.

The following RAIs were determined to be outside the scope of the pre-application review: 197, 198, 202, 204, 219.1, and 226. The staff agreed that GE could respond to the RAIs by deferring these RAIs until the design certification review phase.

There are several paragraphs providing general comments and questions before the RAIs related to NEDC-33082P, "ESBWR Scaling Report." The staff confirmed that all of the issues raised in these paragraphs were addressed in specific RAIs, and that it was not necessary to respond to the general comments.

The following RAIs were discussed in more detail to provide GE clarification of the intent of the staff's RAIs:

- RAI 182: GE stated that the TRACG code is not considered a best-estimate code for application to containment analyses. The staff suggested that GE use the term "conservative" rather than "bounding" to describe the calculation of containment parameters of interest. The staff requested GE to provide a discussion to explain the approach used by GE to address uncertainties for the TRACG analysis of the integrated reactor coolant system and containment response during a loss of coolant accident. The staff also stated that nodalization and sensitivity studies would be reviewed by the staff as part of the review of the ESBWR accident analyses during the design certification stage.

- RAI 183: The staff stated that this RAI, regarding the bottom drain line break (BDLB), was the most important of the RAIs related to NEDC-33079P.
- RAI 184: This RAI relates to inadvertent actuation of the automatic depressurization system (ADS). GE indicated that they analyze this event if a single failure could cause inadvertent ADS actuation.
- RAI 203: This RAI is related to the ranking of phenomenon related to the anticipated transient without scram (ATWS) event. The RAI stated that the fine motion control rod drive (FMCRD) could play an important role in the ATWS event. This statement is not correct, because failure of the FMCRD is assumed in an ATWS event. Therefore, the reference to the FMCRD was deleted from the final RAI.
- RAI 278: GE informed the staff that additional information regarding this issue is contained in the SBWR scaling report, and that GE will provide a specific reference to this information.
- RAI 317: The staff agreed to provide references to reports which document the comparison of containment performance computer program results, such as CONTAIN, to the data from integral tests such as the Marviken tests. References to the Marviken/CONTAIN reports were provided following the meeting.

GE committed to respond to the RAIs by August 15, 2003, to allow the staff to complete the review of the ESBWR submittals in a timely manner.

ESBWR

cc:

Mr. J. Alan Beard
GE Nuclear Energy
13113 Chestnut Oak Drive
Darnestown, MD 20878-3554

Dr. Atambir S. Rao
Project Manager, ESBWR
GE Nuclear Energy
175 Curtner Avenue, MC 365
San Jose, CA 95125 USA

Mr. George B. Stramback
Manager, Regulatory Services
GE Nuclear Energy
175 Curtner Avenue, MC 747
San Jose, CA 95125

Mr. David Lochbaum, Nuclear Safety Engineer
Union of Concerned Scientists
1707 H Street, NW., Suite 600
Washington, DC 20006-3919

Dr. Gail H. Marcus
U.S. Department of Energy
Office of Nuclear Energy, Science
& Technology
1000 Independence Avenue, SW
Washington, DC 20585

Mr. Paul Gunter
Nuclear Information & Resource Service
1424 16th Street, NW, Suite 404
Washington, DC 20036

Mr. James Riccio
Greenpeace
702 H Street, Suite 300
Washington, DC 20001

Mr. Ron Simard
Nuclear Energy Institute
Suite 400
1776 I Street, NW
Washington, DC 20006-3708

Mr. Thomas P. Miller
U.S. Dept. of Energy, NE-20, Rm. A286
Headquarters - Germantown
19901 Germantown Road
Germantown, MD 20874-1290

Mr. Paul Leventhal
Nuclear Control Institute
1000 Connecticut Avenue, NW
Suite 410
Washington, DC 20036

Mr. Jack W. Roe
SCIENTECH, INC.
910 Clopper Road
Gaithersburg, MD 20878

Mr. David Ritter
Research Associate on Nuclear Energy
and Environmental Program
215 Pennsylvania Avenue, SE
Washington, DC 20003

Mr. Tom Clements
6703 Gude Avenue
Takoma Park, MD 20912

Patricia Campbell
Winston & Strawn
1400 L Street, NW
Washington, DC 20005

Mr. James F. Mallay, Director
Regulatory Affairs
FRAMATOME, ANP
3315 Old Forest Road
Lynchburg, VA 24501

Mr. Vince Langman
Licensing Manager
Atomic Energy of Canada Limited
2251 Speakman Drive
Mississauga, Ontario
Canada L5K 1B2

Mr. Gary Wright, Director
Division of Nuclear Facility Safety
Illinois Emergency Management Agency
1035 Outer Park Drive
Springfield, IL 62704

Mr. Charles Brinkman
Westinghouse Electric Co.
Washington Operations
12300 Twinbrook Pkwy., Suite 330
Rockville, MD 20852

ESBWR (continued)

Mr. Michael M. Corletti
Passive Plant Projects & Development
AP600 & AP1000 Projects
Westinghouse Electric Company
Post Office Box 355
Pittsburgh, Pennsylvania 15230-0355

Mr. Ed Rodwell, Manager
Advanced Nuclear Plants' Systems
Electric Power Research Institute
3412 Hillview Avenue
Palo Alto, CA 94304-1395

Mr. Ed Wallace, General Manager
Projects
PBMR Pty LTD
PO Box 9396
Centurion 0046
Republic of South Africa