

December 4, 2002

ORGANIZATION: General Electric Nuclear Energy (GE)

SUBJECT: SUMMARY OF MEETING HELD ON OCTOBER 3 AND 4, 2002, TO
DISCUSS ESBWR DESIGN AND PRE-APPLICATION SUBMITTALS

The Nuclear Regulatory Commission (NRC) hosted a public meeting with General Electric Nuclear Energy (GE) on October 3 and 4, 2002, at NRC Headquarters to discuss the ESBWR design and pre-application submittals. A list of attendees is provided as Enclosure 1. Enclosure 2 contains the agenda for the meeting.

GE provided handouts during the meeting which 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 handouts mentioned above may be accessed through the ADAMS system under Accession No. ML022800333. If you do not have access to ADAMS or if there are problems in accessing the handouts 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 pdrc@nrc.gov.

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. During the open portion of the meeting, GE provided an overview of the ESBWR design and discussed the testing and analyses that provide the technical basis for the design. During the remainder of the meeting, which was closed to the public, GE presented the details of proprietary pre-application reports submitted on August 30, 2002, related to qualification of the TRACG analysis method and the supporting test programs. A non-proprietary summary of these discussions is provided as Enclosure 3. Lastly, GE discussed plans to submit two additional reports in support of the ESBWR pre-application review, the scaling report and the TRACG application report.

/RA/

Amy E. Cubbage, Project Manager
New Reactor Licensing Project Office
Office of Nuclear Reactor Regulation

Project No. 717

Enclosures: As stated

cc w/encls: See next page

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Distribution for October 3-October 4, 2002 Meeting Summary Dated December 4, 2002

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JKelly

GBagchi

GThomas

MJohnson

KManoly

FEltawila

DMatthews

JFlack

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DBesette

TQuay

RLandry

JHannon

MRubin

GImbro

**MEETING WITH GENERAL ELECTRIC
TO DISCUSS ESBWR PRE-APPLICATION**

October 3 and 4, 2001

ATTENDANCE LIST

Name	Affiliation
Amy Cubbage	NRR/NRLPO
Ralph Landry	NRR/DSSA/SRXB
James T. Han	RES/DSARE/SMSAB
Shanlai Lu	NRR/DSSA/SRXB
Goutam Bagchi	NRR/DE
Joe Sebrosky	NRR/NRLPO
J. M. Kelly	RES/DSARE/SMSAB
M. Ishii	Purdue University
B. Shiralkar	GENE
David Terao	NRR/DE/EMEB
George Thomas	NRR/DSSA/SRXB
U.S. 'Kumar' Rohatgi	Brookhaven National Laboratory
Richard McIntyre	NRR/DIPM/IEHB
Edward D. Throm	NRR/DSSA/SPLB
Kevin Coyne	NRR/DIPM/IEHB
David Bessette	RES/DSARE/SMSAB
Donald Helton	RES/DSARE/SMSAB
Jim Strnisha	NRR/DE/EMEB
Frank Grubelich	NRR/DE/EMEB
John Huang	NRR/DE/EMEB
Steven Unikewicz	NRR/DE/EMEB
Gurjendra Bedi	NRR/DE/EMEB

Name	Affiliation
William K. Poertner	NRR/DE/EMEB
Mike Schoppman	Framatome (Rockville)
Charles Brinkman	Westinghouse
Harry A. Wagage	NRR/DSSA/SPLB
Edmund Sullivan	NRC/NRR/DE/EMCB
Thomas Cheng	NRC/NRR/DE/EMEB
Ken Chang	NRC/NRR/DE/EMEB
Steve Bajorek	NRC/RES/DSARE
Robert Gamble	GE
Muhammad Razzaque	NRC/NRR/SRXB
Andrzej Drozd	NRR/SPSB
Weidong Wang	NRC/RES/DSARE
Stuart Rubin	NRC/RES/DSARE
Ralph Caruso	NRC/NRR/SRXB
Jerry N. Wilson	NRC/NRLPO
N. K. Trehan	NRC/NRR/DE
M. DiMarzo	NRC/RES/DSARE
Atam Rao	GE
Richard Lee	NRC/RES/DSARE

General Electric ESBWR Pre-application Meeting
Room O-16 B4

October 3, 2002

1:00 p.m.	Introductory Comments	NRC
1:05 p.m.	Overview and Design Report NEDC-33084P	General Electric
2:00 p.m.	Testing and Analysis Program (TAPD) NEDC-33079P	General Electric
3:00 p.m.	Break	
3:15 p.m.	TAPD continued and RAI's	General Electric
4:00 p.m.	Passive System Summary Report NEDC-32606P	General Electric
5:00 p.m.	Adjourn	

October 4, 2002

8:00 a.m.	Test Reports for Passive Safety Systems	General Electric
8:15 a.m.	ESBWR Test Report - NEDC-33081P	General Electric
9:00 a.m.	TRACG Qualification for Passive Systems NEDC - 32725P	General Electric
10:00 a.m.	Break	
10:15 a.m.	TRACG Qualification for ESBWR - NEDC-33080P	General Electric
11:00 a.m.	Discussion	All
12:00 p.m.	Adjourn	

Non-Proprietary Summary of Closed Portion of October 3 and 4 ESBWR Meeting

Test and Analysis Program

The test and analysis program (TAPD) report, NEDE-33079P, submitted on August 30, 2002, provides the plan used to address the testing and analysis elements needed for the analysis of ESBWR steady state and transient performance. The ESBWR TAPD is based on the simplified boiling water reactor (SBWR) TAPD reviewed by the Nuclear Regulatory Commission (NRC) during the SBWR design certification review which was subsequently terminated. The SBWR TAPD has been updated to reflect design differences between the SBWR and the ESBWR and to address open items identified by the NRC staff during the review of the SBWR TAPD. General Electric Nuclear Energy (GE) has concluded that the design differences between the SBWR and ESBWR do not affect the governing phenomena for transients and accidents. The TAPD report provides a description of the SBWR and ESBWR-specific tests that have been conducted and how these tests provide the information necessary to qualify the TRACG computer code for application to ESBWR transient and accident analysis, including containment performance. The TAPD report includes anticipated transients without scram (ATWS) and stability. However, during the meeting, GE confirmed that the application of TRACG for ATWS and stability calculations is not part of the scope of the pre-application review and will be deferred to the design certification review phase.

SBWR Test Program

The SBWR passive safety systems tests which have been completed by GE are described in NEDE-32606P, "SBWR Testing Summary Report," submitted on August 30, 2002. These tests include component tests (passive containment cooling and isolation condenser), integral tests, and tests used to qualify the TRACG computer code. During the meeting, GE provided a description of the test objectives and test facility configurations. GE also provided an overview of the test results and conclusions.

ESBWR-Specific Test Program

ESBWR-specific tests were performed by GE to extend databases to demonstrate the ESBWR passive safety system performance and to qualify TRACG for ESBWR analyses. These tests are described in NEDE-33081P, "ESBWR Test Report," submitted on August 30, 2002. The important design differences between ESBWR and SBWR are that the gravity driven cooling system (GDCS) pools are now part of the wetwell volume instead of the drywell volume which increases the wetwell to drywell volume ratio and the power was increased from 670 MWe to 1390 MWe. To accommodate this increase in power, the number of isolation condensers (ICs) was increased from 3 to 4, the number of passive containment cooling (PCC) units was increased from 3 to 4, and the cooling capacity of each unit was increased. GE described the ESBWR test matrix, facility configuration, and test results. GE stated that the conclusion of the ESBWR test program is that the performance of the ESBWR containment was demonstrated and data was obtained for the qualification of TRACG. The staff questioned the quality assurance (QA) program and oversight of the PANDA-P series long term containment response tests and the CRIEPI SIRIUS loop hydrodynamic stability tests. GE committed to provide additional information related to QA for these tests.

TRACG Qualification

GE informed the staff that all of the qualification activities identified in the TAPD report have been satisfactorily completed. The ESBWR-specific qualification of TRACG, as described in NEDE-33080P, "TRACG Qualification for ESBWR," submitted on August 30, 2002, supplements the qualification of TRACG for SBWR and for operating BWRs. The staff questioned how the ESBWR design would meet Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix A, General Design Criteria (GDC) 38 which states in part that "A system to remove heat from the reactor containment shall be provided. The system safety function shall be to reduce rapidly, consistent with the functioning of other associated systems, the containment pressure and temperature following any loss-of-coolant accident and maintain them at acceptably low levels." Although there is substantial margin to containment design pressure limits, it does not appear that the ESBWR containment performance is consistent with the requirement in GDC 38 to rapidly reduce containment pressure. The staff and GE agreed that it would be prudent to resolve this potential policy issue during the pre-application phase.

The ESBWR reactor coolant system (RCS) and containment system response are coupled. The staff questioned how the uncertainty analysis would be performed for integrated reactor coolant system and containment analyses. GE and the staff agreed that this issue should be addressed during the pre-application phase.

ESBWR

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ESBWR (continued)

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