

March 13, 2006

ORGANIZATION: General Electric Company (GE)

PROJECT: Economic Simplified Boiling Water Reactor (ESBWR) Design Certification

SUBJECT: SUMMARY OF MEETING HELD ON JANUARY 18, 2006, REGARDING THE APPLICATION OF TRACG FOR ESBWR ATWS ANALYSES

The Nuclear Regulatory Commission (NRC) hosted a public meeting with General Electric Company (GE) on January 18, 2006, at NRC Headquarters to discuss NEDE-33083P, Supplement 2, "TRACG Application for ESBWR Anticipated Transient Without Scram Analyses," which was submitted on January 13, 2006, for review in support of the ESBWR design certification application. 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. ML060540317. 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 [pdr@nrc.gov](mailto:pdr@nrc.gov).

Portions of this meeting were closed because the details of the TRACG code and its application to ESBWR ATWS analyses are proprietary information. A non-proprietary summary of the meeting is provided in Enclosure 3.

*/RA/*

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

Docket No. 52-0010

Enclosures: As stated

cc w/encls: See next page

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Amy E. Cabbage, Senior Project Manager  
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ML060580579-Pkg.

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**ATTENDEES FOR MEETING WITH GENERAL ELECTRIC (GE)**  
**TRACG APPLICATION TO ESBWR ATWS ANALYSES**  
**JANUARY 18, 2006**

<b>Name</b>	<b>Organization</b>
Larry Rossbach	NRC/NRR/DNRL/NRBA
Wayne Marquino	GE
Mike Jonzen	AREVA
Jose March-Leuba	ORNL (NRC consultant)
Ralph Landry	NRC/NRR/DSS/SNPB
Jay W. Spore	ISL (NRC consultant)
George Thomas	NRC/NRR/DSS/SBWB
Jim Gilmer	NRC/NRR/DSS/SBWB
Zena Abdullahi	NRC/NRR/DSS/SBWB
Louis Quintana	GE
Greg Cranston	NRC/NRR/DSS/SBWB
Amy Cabbage	NRC/NRR/DNRL/NRBA
Shiva Sitaraman (by phone)	GE
Alan Beard	GE
David Hinds	GE
Veronica Klein	NRC/NRR/DSS/SNPB
Pete Yarsky	NRC/NRR/DSS/SNPB
Tai Huang	NRC/NRR/DSS/SBWB

**AGENDA FOR PUBLIC MEETING WITH GENERAL ELECTRIC (GE)  
TRACG APPLICATION TO ESBWR ATWS ANALYSES  
JANUARY 18, 2006, 1:00 p.m. to 4:30 p.m.  
One White Flint North Room 6-B4**

Introduction	NRC and General Electric
Licensing Requirements and Scope of Application	General Electric and NRC
Phenomena Identification and Ranking Tables (PIRT)	General Electric and NRC
Application of TRACG to ATWS	General Electric and NRC
Model Uncertainties and Biases	General Electric and NRC
Demonstration Analysis	General Electric and NRC
Opportunity for Public Comment	All

Enclosure 2

Enclosure 1

**SUMMARY OF PUBLIC MEETING WITH GENERAL ELECTRIC (GE)  
REGARDING TRACG APPLICATION TO ESBWR ATWS ANALYSES  
JANUARY 18, 2006**

General Electric (GE) submitted NEDE-33083P, Supplement 2, "TRACG Application for ESBWR Anticipated Transient Without Scram Analyses," on January 13, 2006, for review in support of the ESBWR design certification review. The purpose of this meeting was for GE to provide an overview of the topical report to facilitate the staff's review.

GE provided background information regarding BWR ATWS analyses and applications of the TRACG code. The TRACG code has been approved for operating reactor anticipated operational occurrences (AOOs), operating reactor ATWS peak pressure calculation, and for ESBWR loss of coolant accidents (LOCAs). TRACG is currently under review for ESBWR AOOs.

Operating BWR ATWS analyses are currently performed with the ODYN code or the TRACG code for peak pressure calculation. ODYN is used to calculate the steam flow to the suppression pool, the TASC code is used to calculate peak cladding temperature (PCT), and an energy balance is used to calculate suppression pool heatup.

The ESBWR ATWS analyses are performed to demonstrate that ESBWR ATWS mitigation features are adequate to meet the following acceptance criteria: (1) RPV integrity - primary system pressure < 1500 psi; (2) Fuel integrity - PCT < 2200 EF and local cladding oxidation <17 percent; (3) containment integrity - containment pressure less than design limits and suppression pool temperature less than design limits; and (4) long-term shutdown cooling - reactor brought to safe shutdown condition, cooled down and maintained in cold shutdown. For ESBWR, GE is proposing to use TRACG to calculate reactor pressure vessel (RPV) pressure, PCT and suppression pool temperature. GE stated that there are advantages to using TRACG compared to the current process, including better modeling of ATWS phenomena.

GE discussed conformance of this application with the code scaling, applicability and uncertainty (CSAU) approach, including scenario selection and the phenomena identification and ranking tables (PIRT), model qualification, model uncertainties and biases, application uncertainties and biases, combined uncertainties, and demonstration analyses. GE presented numerous plots providing the results of the ESBWR ATWS demonstration analyses. GE stated in conclusion that TRACG models the important ATWS phenomena, the TRACG models have been qualified, and that TRACG provides a conservative estimate of ATWS peak RPV temperature, peak PCT, and suppression pool temperature.

The staff asked GE whether there has been testing of the ESBWR boron mixing and GE stated testing has been performed for BWR/6. The staff asked whether the control blades, if inserted, would impede boron flow, and GE said they would look into this question. There was a staff question regarding the ATWS stability, specifically the staff requested GE to re-plot the figure on presentation slide 126 (Figure 8.2-3, MSIVC Stability Power Comparison: 25s) with a finer timescale. Lastly, the staff stated that in general they would like to see more information regarding ATWS instability.

ESBWR

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