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MFN 235-95
Docket No. 52-004

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington DC 20555

Attention: Theodore E. Quay, Director
Standardization Project Directorate

Subject: SBWR - Non-Proprietary Version of Presentation Charts Used During the
GE/NRC Meeting on November 16, 1993

- Reference: 1. Letter from D.C. Scaletti (NRC) to Mr. James E. Quinn (GE), "Request for
Withholding Information from Public Disclosure, General Electric (GE)
Presentation Charts Used During a Meeting with the Nuclear Regulatory
Commission (NRC) on November 16, 1993, dated September 7, 1995.
2. Letter MFN 201-93, P.W. Marriot (GE) to Richard Borchardt (NRC),
"Response to NRC Findings on GIST: GIST Heat Loss, and TRACG
Application to SBWR, dated November 18, 1993.

Enclosed is the non-proprietary version of the subject charts requested by Reference 1
resulting from your review of our Reference 2 transmittal of the corresponding proprietary
presentation charts. In preparing these non-proprietary charts, we reviewed the Reference 2
charts for those that were clearly not proprietary. Further, we reviewed all the charts again
and identified several additional charts that could and have been reclassified as non-
proprietary.

Sincerely,

James E. Quinn

cc: P. A. Boehnert (NRC/ACRS) (2 paper copies plus E-Mail)
I. Catton (ACRS) (1 paper copy plus E-Mail)
A. Drozd (NRC) (1 paper copy plus E-Mail)
S. Q. Ninh (NRC) (2 paper copies plus E-Mail)
D. C. Scaletti (NRC) (1 paper copy plus E-Mail)
J. H. Wilson (NRC) (1 paper copy plus E-Mail)

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GE Nuclear Energy

***Response to NRC Findings on GIST
GIST Heat Loss***

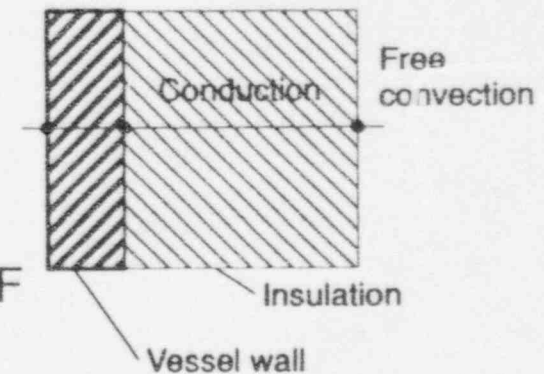
Jens G. Munthe Andersen

November 16, 1993

GIST Heat Loss

Heat Loss does not have a Significant Impact on GIST

- Heat Loss given by conduction through insulation, free convection heat transfer and ambient temperature.



– Conduction: $h_c = k/d = 0.5/2 = 0.25 \text{ Btu/ft}^2\text{-hr-F}$

– Free convection: $h_f = 1 \text{ Btu/ft}^2\text{-hr-F}$

– Net heat transfer coefficient:
$$h_{\text{heatloss}} = \frac{1}{\frac{1}{h_c} + \frac{1}{h_f}} = 0.2 \text{ Btu/ft}^2\text{hrF}$$

– Heat loss dominated by conductivity for insulation.

TITLE OF PRESENTATION CHARTS AND PAGE NUMBERS
INCLUDED AS GE PROPRIETARY INFORMATION IN REFERENCE 2

RPV PRESSURE vs TIME

GDCS FLOW vs TIME

GIST HEAT LOSS (PAGE 2)

GIST Heat Loss

Conclusion

Calculations are Insensitive to Heat Loss

Scaling Study Indicate Heat loss is not Significant

$$\Pi_{PCH} = \frac{\dot{Q}}{\dot{M} \Delta h} = 0.06$$

Heat Loss has been evaluated and it does not Affect the Usefulness of the GIST Data



GE Nuclear Energy

***Response to NRC Findings on GIST
TRACG Application to SBWR***

Jens G. Munthe Andersen

November 16, 1993

TITLE OF PRESENTATION CHARTS AND PAGE NUMBERS
INCLUDED AS GE PROPRIETARY INFORMATION IN REFERENCE 2

TRACG APPLICATION TO SBWR (PAGE 1 and 2)*

BWR - PIRT (PHENOMENA IDENTIFICATION AND RANKING TABLE)
GOVERNING PHENOMENA (PAGE 1 of 9)*

TRACG Application to SBWR

TRACG Applicability

- Most SBWR phenomena similar to BWR
- Major systems/phenomena specific to SBWR
 - Coupled RPV – containment simulation
 - GDCS performance
 - PCCS performance
- TRACG models evaluated against major phenomena
- All major BWR and SBWR systems/phenomena simulated by TRACG

TRACG Application to SBWR

Major Phenomena Specific to SBWR

N2 Mixing a: Drywell, Steam – N₂
 b: Wetwell, Thermal stratification

N4 GDCS flow

N5 PCCS performance

N6 Small ΔP driven flows

N7 Condensation heat transfer in the presence
 of non-condensibles
 a: PCC
 b: Free surfaces
 c: Vents and quenchers

N10 Conduction heat transfer in composite walls

TRACG Model

Conservation equations
Mixing model

Conservation equations
Friction and losses

Conservation equations
UCB correlation

Friction and losses

Conservation equations

UCB correlation

Free convection

Bubble condensation

1D conduction model

TRACG Application to SBWR

TRACG Qualification

Test	Test Facilities	Purpose
Separate Effects	17	Individual Controlling Phenomena
Component Performance	10	Performance Data
Integral System Effects	8	System Interactions
Plant Data	7	Full Scale Data

- All major BWR and SBWR systems/phenomena addressed by TRACG qualification basis
- Major new SBWR systems/phenomena addressed by TRACG qualification basis
 - Coupled RPV – containment analysis
 - GDCS performance
 - PCCS performance

TITLE OF PRESENTATION CHARTS AND PAGE NUMBERS
INCLUDED AS GE PROPRIETARY INFORMATION IN REFERENCE 2

MATRIX OF HIGHLY RANKED PHENOMENA vs SYSTEM EFFECTS QUALIFICATION DATA BASE
BWR - PIRT(PHENOMENA IDENTIFICATION AND RANKING TABLE) (PAGE 1 of 4)*

MATRIX OF HIGHLY RANKED PHENOMENA vs QUALIFICATION DATA BASE
BWR - PIRT(PHENOMENA IDENTIFICATION AND RANKING TABLE) (PAGE 1 of 3)*

TRACG APPLICATION TO SBWR (PAGE 6 and 7)*

TRACG Application to SBWR

Conclusion

- All major SBWR phenomena have been identified
- All major SBWR phenomena are simulated by TRACG
- All major SBWR phenomena have been simulated by tests and TRACG have been qualified against these tests
- TRACG adequately simulates all major SBWR phenomena

TRACG is Applicable for SBWR Simulation

TITLE OF PRESENTATION CHARTS AND PAGE NUMBERS
INCLUDED AS GE PROPRIETARY INFORMATION IN REFERENCE 2

BWR - PIRT (PHENOMENA IDENTIFICATION AND RANKING TABLE)
GOVERNING PHENOMENA (PAGE 1 of 9 through 9 of 9)*

BWR - PIRT (PHENOMENA IDENTIFICATION AND RANKING TABLE)
TRANSIENTS GOVERNING PHENOMENA (PAGE 1 of 8 through 8 of 8)*

MATRIX OF HIGHLY RANKED PHENOMENA vs SEPARATE EFFECTS QUALIFICATION DATA BASE
BWR - PIRT(PHENOMENA IDENTIFICATION AND RANKING TABLE) (PAGE 1 of 4 through 4 of 4)*

MATRIX OF HIGHLY RANKED PHENOMENA vs COMPONENT PERFORMANCE QUALIFICATION DATA BASE
BWR - PIRT(PHENOMENA IDENTIFICATION AND RANKING TABLE) (PAGE 1 of 4 through 4 of 4)

BWR - PIRT (PHENOMENA IDENTIFICATION AND RANKING TABLE)
GOVERNING PHENOMENA (PAGE 1 of 9 through 9 of 9)*

MATRIX OF HIGHLY RANKED PHENOMENA vs PLANT DATA QUALIFICATION DATA BASE
BWR - PIRT(PHENOMENA IDENTIFICATION AND RANKING TABLE) (PAGE 1 of 4 through 4 of 4)*

MATRIX OF HIGHLY RANKED PHENOMENA vs QUALIFICATION DATA BASE
BWR - PIRT(PHENOMENA IDENTIFICATION AND RANKING TABLE) (PAGE 1 of 3 through 3 of 3)*