

**NRC Staff Supplemental Request for Information on GE's Partial Response to
ESBWR RAI Letter #66 (MFN 07-168)**

21.6-55

1. Appendix B in the RAI response (Reference 2) shows [] vessel source connections. Explain why there are [] vessel connections. Did you model separate IC (isolation condenser) loops for each IC?
2. When describing the applicability of the PANTHERS IC tests to the SBWR in Section 4.2.3.1 of NEDC-32725P, Rev. 1 (Reference 1) you state that "The IC inlet pressures tested and analyzed by TRACG (Table 4.2-2) span the entire operating range of the SBWR. The SBWR range is bounded by the SRV setpoints..." Table 5.2-2 of Revision 3 of the ESBWR DCD shows the SRV setpoint (8.618 MPa) to be above the tested pressures at PANTHERS []. Justify that the PANTHERS IC test is applicable to ESBWR conditions. Are there other higher pressure tests performed at PANTHERS that can be used for comparison with the TRACG?
3. Provide the applicability range of the []. Section 6.6.11.3 of NEDE-32176P (Ref. 4) suggests pressure conditions that are substantially lower than would be seen during an ESBWR AOO or ATWS. Justify that this correlation is adequate for the pressure conditions seen in an ESBWR AOO/ATWS. Justify that the range of the data used to determine the [] uncertainty cited in Table 4.4-1 in NEDC-33083-P-A (Ref. 3) is applicable to ESBWR conditions.
4. Justify that the modeling of the IC pools as a [] in the AOO/ATWS IC model is adequate and/or conservative. Explain how the heat transfer to the pools [] as compared to the PANTHERS modeling and justify that it is adequately modeled. NEDC-33083P-A (Ref. 3) indicates that you are using the [] correlation. Justify the use of this correlation. Provide comparisons to PANTHERS if available. What model is being used for the IC model for ESBWR LOCA simulations? Justify its use.
5. Provide justification that the nodalization changes from that of the PANTHERS IC modeling summarized in Table 1 of RAI response 21.6-55 (Ref. 2) will adequately represent the ESBWR IC system. For the condenser tube modeling performed for the PANTHERS IC facility, Section 4.2.4.1.3 of NEDC-32725P (Ref. 1) states that a sensitivity study confirmed the adequacy of the [] cell nodalization. Justify that the [] cell nodalization used in the AOO/ATWS TRACG model is adequate.
6. The TRACG nodalization for the LOCA event in Appendix A of the RAI response (Reference 2) does not show the IC drain tank. Update the diagram to show the IC drain tank.
7. The staff is aware that the heat removal capability of the ICS is credited in the simulations of an ESBWR LOCA event in which there are non-condensable gases present due to radiolysis. The comparison of the TRACG results to PANTHERS data in References 1 and 5 show that TRACG does not adequately model the timing of the non-condensable gas transport in the IC. You state that the test conditions are not

representative of the conditions seen in the plant. Justify that the modeling of the IC heat removal capacity in the ESBWR LOCA events is conservative given the presence of non-condensable gases. Provide comparisons to test data that are representative of conditions seen in the ESBWR if available.

References

1. NEDC-32725P, Revision 1, *TRACG Qualification for SBWR*, August 30, 2002 (ADAMS Accession Nos. ML022560558 and ML022560559)
2. Letter from D.H. Hinds (GE) to NRC, MFN 07-168, *Response to Portion of NRC Request for Additional Information Letter No. 66 Related to ESBWR Design Certification Application – TRACG Application – RAI Number 21.6-55*, March 29, 2007. (ADAMS Accession No. ML071010556)
3. NEDC-33083P-A, MFN 05-017, *TRACG Application for ESBWR*, March 2005 (ADAMS Accession No. ML051390265)
4. NEDE-32176P, Rev. 3, *TRACG Model Description*, April 2006. (ADAMS Accession No. ML061160238)

Update of ESBWR TRACG Qualification for NEDC-32725P and NEDC- 33080P Using the 9-Apr-2004 Program Library Version of TRACG04, MFN 04-059, June 6, 2004 (ADAMS Accession No. ML041610037)