

Monthly Highlights

for

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Application of RAMONA-3B to BWR ATWS*
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Application of RAMONA-3B to BWR ATWS

This project provides detailed, best-estimate, BWR ATWS analyses for the NRC Severe Accident Sequence Analysis (SASA) Program. In particular, several Browns Ferry Unit 1 MSIV closure ATWS analyses are being performed using the RAMONA-3B code with three-dimensional neutron kinetics. These calculations will not only improve understanding of the BWR behavior during an ATWS, but they can also be used for benchmarking similar calculations performed elsewhere by using the point kinetics codes such as RELAP5 and BWR-LACP.

The major activities performed during June 1984 are noted below.

1. Browns Ferry MSIV Closure ATWS Calculation (G. Slovik, E. Cazzoli and L. Neymotin)

Based on the information in a General Electric report, and discussions with M. Harrington of ORNL, the following arrangement of the feedwater spargers is used in the new RAMONA-3B HPCI/RCIC jet condensation model:

- a. 96 nozzles each 1.75" I.D. in the feedwater spargers
- b. the nozzles are directed horizontally towards the standpipes,
- c. the effective length of the free jet is taken to be three feet before it mixes with the return flow from the separator. This value is based on the Browns Ferry reactor vessel geometry.

2. Generation of Browns Ferry Cycle 5 Nuclear Data (G. Slovik and P. Konut)

Five major fuel types were identified in Cycle 5 of the Browns Ferry Nuclear Reactor. Macroscopic cross sections for all of these fuel types have been calculated with the CASMO computer code which is a multigroup two-dimensional transport theory code for burnup calculations on BWR (and PWR) assemblies. Approximately 200 CASMO calculations were required for each fuel type to generate the macroscopic cross sections over the typical range of exposures and void histories found in Cycle 5.

Work is in progress in collapsing these macroscopic cross sections around specific exposure and void history combinations of Browns Ferry, Cycle 5 core using the BLEND code developed at BNL. Approximately twenty collapsed sets of cross sections will be generated and used in RAMONA-3B as the Browns Ferry Cycle 5 cross sections.