## 4 Review of Methods of Calculations

In this chapter a short review of the cross-section processing procedure and the different codes used in the seven solutions will be given. The references given here will be limited to the main reports of the contributions, where detailed information can be found.

Germany, Ref. 6

The 26 group cross-sections of the IAENDFB library were used, which was processed from non-adjusted ENDF/B-4 and -5. No streaming correction for diffusion theory calculations was applied.

Three different codes have been applied: the three-dimensional coarse-mesh diffusion code DEGEN which uses mesh-internal cubic flux approximations and mesh-size corrected macroscopic cross-sections, the three-dimensional nodal transport code HEXNOD and the three-dimensional Monte Carlo code MOCA.

India, Ref. 7

The IGCAR 25 group library was used, which is based on the Cadarache,version2 library with some replacements from JENDL-2. Radial and axial diffusion coefficients of voided control rod followers were calculated according to the methods of Bonalumi and Rowlands, respectively.

The evaluation was performed in two-dimensional RZ-geometry using the code ALCIALMI and three-dimensional Tri-Z-geometry with the code 3DB.

Japan 1, Ref. 8

Basis of the study was the adjusted 70-group cross-section set JFS-3-J2 (ADJ 91) which was processed from the JENDL-2 evaluated nuclear data library. Cross-section condensation to 18 groups (for standard calculations) and 7 groups (for transport calculations) was performed with help of flux spectra from RZ diffusion calculations.

The basic calculations were performed in Tri-Z-geometry with the diffusion code CITATION using 18 energy groups. Transport corrections for the SVE were deduced by comparing CITATION and TRITAC results both in 7 energy groups.

Japan 2, Ref. 9

The 70-group JENDL-3 cross-sections were condensed to 16 groups with help of RZ-spectra from CITATION.

The three-dimensional coarse-mesh diffusion code ICOM with mesh-size corrected cross-sections and the three-dimensional Hex-Z transport code HEXTR were used.

Russian Federation, Ref. 10

The cross-sections were taken from the ABBN-78 library in 26 energy groups. For some applications they were condensed to 4 groups with help of fundamental mode spectra.

Six different codes have been used:

- the RZ diffusion codes SYNTEX (4 energy groups), RBR-80 (26 energy groups) and RADAR (26 energy groups for perturbation breakdown of the SVE)

- the HEX-Z diffusion code TRIGEX (4 energy groups)

- the RZ discrete ordinates nodal transport $S_N$ code KINRZ with P1 approximation and correction of the elastic slowing down cross-sections (this code has been used by the Keldysch Institute of Applied Mathematics, Moscow)

- the Monte Carlo code MMCFK (26 energy groups) which allows an approximated three-dimensional treatment of the core where the radial boundaries between sub-zones are made cylindrical and the absorber positions are presented as small cylinders at their real place in the core.

United Kingdom, Ref. 11

The fast reactor library FD5 in 37 energy groups was the basis for the condensation to 13 groups with help of RZ-spectra.

The evaluation was performed with the three-dimensional code MARC/PN using its diffusion and transport (up to P3-approximation) option.

United States, Ref. 12

Group constants were generated from ENDF/B-V.2 in 230 energy groups and condensed to a 21 energy structure using one-dimensional spectra from a radial heterogeneous core.

Calculations were performed with different three-dimensional codes: the nodal and finite difference diffusion options of DIF3D, the Hex-Z variational nodal transport code VARIANT and the continuous energy Monte Carlo code VIM.