



Tim

Department of Energy
Washington, D.C. 20545

Docket No. 50-537
HQ:S:82:006

FEB 19 1982

Mr. Paul S. Check, Director
CRBRP Program Office
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555



Dear Mr. Check:

TRANSMITTAL OF INFORMATION

This letter partially responds to your letter of January 22, 1982, which requested specific information in the area of core energetics. Computer format information requested in Questions 760.1, 760.2, 760.4, and part of 760.5 are enclosed. The enclosure describes the contents of the magnetic tapes and envelopes of microfiche. This information is suitable for transmittal to your LASL consultants now to facilitate their review. The PSAR update documenting responses to the questions and the remaining computer information requested in 760.5 will be provided by March 12, 1982.

Sincerely,

John R. Longenecker

John R. Longenecker, Manager
Licensing & Environmental
Coordination
Office of Nuclear Energy

Enclosure

cc: Service List
Standard Distribution
Licensing Distribution

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TRANSMITTAL OF INFORMATION
Enclosure

I. In response to the referenced letter, Items No. CS760.1 and CS760.2, one copy each of the following is provided:

- 1) Magnetic Tape - 7 track, 800 fpi - Ext BCD
RL = 80, BF = 10
- 2) Microfiche - 21 envelopes - containing the results of SAS3D runs made by LBL by GE for four cases

The contents of these enclosures are described below. The four cases for which this information applies are described in the document CRBRP-GEFR-00523 and are:

- a) BOC-1 TOP best estimate Section 6.1.1
- b) BOC-1 LOF best estimate Section 7.1.1
- c) EOC-4 TOP best estimate Section 6.2.2
- d) EOC-4 LOF best estimate Section 7.2.1

Enclosure No. 1 - Magnetic Tape

7 track, 800 frames/inch, external BCD format
Record length = 80 - 6 bit character
Blocking factor = 10 (800 characters/block)

The information on the tape is organized into eight files. The first four files contain the actual SAS3D input used to initiate each of the four runs transmitted in the order listed above. Changes in input values which occurred during the course of an analysis may be obtained from the enclosed microfiche listings.

The second group of four files consists of card image Fortran listings of each code module which was modified by GE relative to the SAS3D Release 1.0 version as supplied by ANL. Those sections of each which have been modified are delimited by:

```
cc+++++++XYZ MM/DD/YY+++++++
```

- Fortran changes -

```
cz+++++++
```

where XYZ are the initials of the originator and MM/DD/YY is the date the change was finalized.

The four groupings are significant in that they represent three levels of modification permanence and that they are to be loaded in the order presented in the link operation.

File No. 5 contains the changes associated with the fuel vapor pressure model used for pin failure and fuel ejection in the BOC-1 TOP cases. It is associated with the temporary library file LIB1 and the replacement file TEMPS used during the link operation. It is not generally loaded for runs other than fresh fuel where pin rupture is expected.

File No. 6 contains the changes to SLUMPY and CLAZAS required to resolve the mass balance inconsistency in the upper blanket as described in CRBRP-GEFR-00523 Appendix A, page 4. These changes are, of course, not needed in TOP cases and prior to slumping. The linking operation must occur, however, before the first fuel failure occurs. These changes are associated with the replacement file REPLX used in the link operation.

File No. 7 contains those changes to Release 1.0 which are specific to CRBRP heterogeneous analysis (e.g., PSAR property values and correlations, etc.). These changes are associated with the replacement file REPL1 on the link card and must be loaded before the changes in File No. 8.

File No. 8 contains those changes which are regarded as permanent modifications to Release 1.0. They are code fixes, modifications to editing features, changes required by the unique LBL operating system, etc. They are associated with the replacement file REPL2 on the link card and are loaded last.

Enclosure No. 2 - Microfiche

Each fiche is labeled explicitly as to the run and sequence number (e.g., CRBRP EOC-4 TOP case 1.X) where X is the sequence number of the fiche in the run. The complete job control file including input is written to the fiche prior to the output file and the system log ("dayfile") for the run is appended to the end of the output file. Modifications made to the input during the course of a run may be noted by observing the control file. Code modifications actually loaded may be noted by observing the control file or the dayfile.

In addition to the output file, a separate fiche is provided containing a brief summary of each run. This is produced by a postprocessor operating on the SAS plot tape (TAPE10). It contains in brief format for each timestep:

- 1) Power and reactivity summary
- 2) Individual channel reactivity values for
 - a) sodium
 - b) clad
 - c) fuel
- 3) Lower sodium slug mass velocity in each channel
- 4) Lower sodium interface elevation by channel
- 5) Peak fuel temp./melt fraction by channel
- 6) Peak clad temp./melt front by channel

TRANSMITTAL OF INFORMATION
Enclosure

II. In response to the referenced letter, Item No. CS760.4, one reel of magnetic tape containing the SAS3A-to-SAS3D input deck translation routines is provided. The tape is unlabeled, 9-track, 1600 BPI, written in EBCDIC at 80 characters per logical record and 3200 characters per block. The first file of the tape contains the FORTRAN source for a SAS3A input deck preprocessor which reads a deck from TAPE1 and writes the resequenced deck on TAPE9. The second file on the tape contains the source for the SAS3A-to-SAS3D translation program, which reads the SAS3A input deck from TAPE9 and writes the SAS3D input deck on TAPE7. The translation table required as input to this program on TAPE 8 is recorded on the third file of the tape.

Experience with this program at ANL has indicated several areas which may require attention after translation due to differences in SAS3A and SAS3D input assumptions, defaults, etc. There are:

<u>Block</u>	<u>Loc.</u>	<u>Name</u>	<u>Comment</u>
11	8	TMARS	Not defaulted, must be supplied
11	9	ALMARS	Not defaulted, must be supplied.
12	17-22	DKYLD	Not defaulted, must be supplied.
12	23-28	DKLAM	Not defaulted, must be supplied/
51	19	IFUELV	Check property tables for consistency.
51	20	ICLADV	Check property tables for consistency.
51	21	IFUELC	Check property tables for consistency.
51	22	IFUELE	Check property tables for consistency.
51	23	IFUELU	Check property tables for consistency.
51	24	IFUELB	Check property tables for consistency.
61	1-24	RINFP	No defaults, all values must be supplied.
61	25-48	ROUTFP	No defaults, all values must be supplied.
63	39-43	FDENS	No defaults, check for consistency.

III. Attached is the neutronics information for End of Cycle 4 (EDC-4) requested in NRC Question CS760.5.

The information is based on the three-dimensional VENTURE computer code. The following information is attached:

- 1) A magnetic tape containing card images in the format specified by F. Parker of LASL (7 track, 800 bpi, BDC, 80 characters per card). These are blocked into 45 card blocks.
- 2) A computer output listing of the card images on the tape.
- 3) A table of nuclear number densities that are used to produce the macroscopic cross sections for this case.

CRBRP

NUCLEAR NUMBER DENSITIES

($\times 10^{24}/\text{CC}$)

Fe	Cr	Ni	Mo	Mn	Na	B-10	B-11	C	
.1287-1	.3735-2	.2552-2	.2892-3	.3535-3	.9188-2				Stainless Steel-Fuel 36" Region
.1290-1	.3746-2	.2560-2	.2900-3	.3545-3	.9443-2				Stainless Steel-Lower Axial Blanket
.1412-1	.4099-2	.2800-2	.3174-3	.3879-3	.8453-2				Stainless Steel-Upper Axial Blanket
.9314-2	.2704-2	.1847-2	.2094-3	.2559-3	.6149-2				Stainless Steel-Inner and Radial Blanket 36" Region
.9343-2	.2712-2	.1853-2	.2100-3	.2570-3	.6250-2				Stainless Steel-Inner & Radial Blanket, Lower Extension
.1056-1	.3064-2	.2095-2	.2374-3	.2902-3	.5558-2				Stainless Steel-Inner & Radial Blanket, Upper Extension
.1742-1	.5058-2	.3455-2	.3916-3	.4787-3	.7907-2	.2698-1	.2470-2	.7713-2	Primary Control Assembly
.1761-1	.5113-2	.3493-2	.3958-3	.4839-3	.8381-2	.2378-1	.2177-2	.6754-2	Secondary Control Assembly
.5201-2	.1510-2	.1032-2	.1169-3	.1429-3	.2041-1				Sodium Channel
.4530-1	.1272-1	.7944-2	.1012-2	.1412-2	.4165-2				Radial Shield
.3437-1	.9577-2	.5983-2	.7619-3	.1063-2	.8549-2				Axial Shield
.1611-1	.4678-2	.3196-2	.3622-3	.4427-3	.8904-2				Fuel Fission Gas Plenum
.1254-1	.3757-2	.2567-2	.2909-3	.3556-3	.6126-2				Blanket Fission Gas Plenum