Westinghouse

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Attn: Document Control Desk
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Our ref: UAM-NRC-06-20

Dear Mr. E. William Brach

November 16, 2006

SUBJECT: Docket # 71-9239, Request for Letter Amendment for One Time Shipment to Certificate of Compliance USA/9239/AF

Westinghouse Electric Co. requests a letter amendment to the Certificate of Compliance No. USA/9239/AF (Docket #71-9239) for the Model MCC shipping package for shipment of VVER-1000 fuel assemblies with annular pellet zones in the MCC5 package. The enrichment does not exceed 3.4 wt% for the solid fuel pellets and 0.74 wt% for the annular pellets. Annular blanket pellets are used only in integral fuel burnable absorber (IFBA) fuel rods. Attached for your review is a technical justification showing that the proposed shipment is bounded by the license application information. The analysis assumes 4.8wt% for all fuel pellets.

This request for letter amendment became necessary when it was realized recently that the criticality analysis for the VVER-1000 fuel in the MCC Safety Analysis Report does not include a provision for annular blankets.

A letter amendment to the CoC is requested rather than a revision for the following reasons:

1. It is desirable to obtain special arrangements only from those few foreign states involved in this shipment without having to apply for revisions to all foreign states where the MCC3 and MCC4 are currently validated. These two packaging types are not impacted by this request.

2. A renewal application has been submitted for a five year renewal of the MCC CoC, which expires March 31, 2007. The renewal application requests provisions for VVER-1000 fuel assemblies with annular pellet zones.

Proposed wording for the letter amendment, including termination date, is included as enclosure 2. Westinghouse regrets the urgency of the request, but a shipment of forty-eight (48) VVER-1000 fuel assemblies with annular blanket pellets is planned for December 20, 2006. In order to obtain the U.S. DoT competent authority certification and endorsements from foreign competent authorities in time to make this shipment, this letter amendment is need by November 21, 2006.

NMSS01

Please direct any questions to Peter Vescovi at (803) 647-3167.

Sincerely,

Peter J. Vescovi
WESTINGHOUSE ELECTRIC COMPANY, LLC
Uranium Asset Management, Regulatory and International Logistics
Transport Licensing and Compliance

Enclosure 1: Technical Justification
Enclosure 2: Proposed Wording of Letter Amendment
Enclosure 3: Input Decks

cc w/ encls: N. Kent, Manager, Transport Licensing and Compliance
B. Bayley, Manager, Regulatory and International Logistics
Richard Boyle, United States Department of Transportation

By Federal Express

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Enclosure 1: Technical Justification

This technical analysis starts with the criticality model found in Table 17 of Appendix 6-2 to the MCC License Application and modifies it to demonstrate that the VVER-1000 fuel satisfies the 0.95 license limit with the addition of annular blankets. Appendix 6-2 contains an extensive analysis of the VVER-1000 fuel assembly in the MCC under hypothetical accident conditions for an infinite array of packages.

Comparison of License Application Results With SCALE4.4

Calculations were first performed to confirm the results found in the License Application for the VVER-1000 fuel assembly under hypothetical accident conditions with water in the pin-gap. These results are given on page 6-2.16. The License Application cases were performed using NITAWL-S, XSDRNPMS, and KENO-Va with cross-sections from the 227 energy group structure generated from ENDF/B-V nuclear data. This analysis used the SCALE4.4 CSAS25 with 238 group cross-sections. The input deck from Table 17 in the License Application was modified to run on SCALE 4.4 for this analysis. Results are given in the table below. It can be seen that the Δk_{eff} values compare favorably.

Results of Fully Flooded Conditions for Solid Pellets			
Fuel Assembly	**Kavg**	**Sigma**	**K_{eff}** (includes bias and 95/95 uncertainties)
CURRENT LICENSE APPLICATION			
License Application Table 17 Model with Flooded Pin Gap (GEN=900 and NPG=300)			0.9466
SCALE4.4			
SCALE4.4 Table 17 Model with Flooded Pin Gap (GEN=450 and NPG=2000)	0.9318	9.0000e-4	0.9398

Annular Blanket Analysis

The input deck was then modified to include a 10 inch (25.4 cm) annular blanket on the top and bottom of every fuel rod. The enrichment of the blanket was conservatively assumed to be 4.80 wt%. Note that for this shipment the maximum enrichment of all pellets does not exceed 3.4 wt%. Furthermore, the number of rods per fuel assembly with annular pellet zones does not exceed 36. Finally, the maximum enrichment of these annular pellet zones does not exceed 0.74 wt%.

VVER-1000 Fuel Assembly @ 4.800 wt% with Annular Pellet Zones			
Fuel Assembly	**K_{ave}**	**Sigma**	**95/95**
VVER-1000 @ 4.80 wt % with Annular Pellet Zones	0.9320	0.0009	0.9400

Conclusion

Hence it can be seen that the actual contents for the planned shipment is bounded by the criticality analysis for the VVER-1000 fuel assembly.

Enclosure 2: Proposed Wording of Letter Amendment

As requested by your application dated November 16, 2006, and pursuant to 10CFR71, Certificate of Compliance No. 9239, for the MCC Model No. MCC-3, MCC-4, and MCC-5 shipping packages, is amended to authorize contents and Transport Index for criticality control as follows:

Contents

Type and Form

Unirradiated VVER-1000 Type fuel assemblies as authorized in the Certificate of Compliance with the following provisions:

- Annular pellet zones at top and bottom of fuel rods whose length shall not exceed 10.0 inches (25.4 cm). The annular pellet inner diameter shall be 0.155 inches nominal (0.3937 cm)

Maximum quantity of material per package

Two fuel assemblies.

Transport Index for Criticality Control (Criticality Safety Index) 0.4

The contents are authorized for transport in Model MCC-5 shipping package.

All other conditions of Certificate of Compliance No. 9239 remain in effect.

This authorization shall expire March 31, 2007.

Enclosure 3: Input Decks

VVER-1000 Solid pellets 4.800 wt.%

(Reference: Appendix 6-2, Table 17 or MCC Application for Package Approval)

```
CSAS25   parm=size=1000000
TITLE-MC4 4.8 W/O VVER-1000 CASK IN 3D
238GROUPNDF5 LATTICECELL
UO2 1 DEN=10.58 1.0 293 92235 4.8 92238 95.2 END
ZR 2 1.0 293 END
H2O 3 1.0 293 END
CARBONSTEEL 4 1.0 293 END
ARBMGD2O3 1.9685 2 0 1 1 64000 2
8016 3 5 1.0 293 END
CARBONSTEEL 6 1.0 293 END
H2O 7 1.0 293 END
END COMP
TRIANGPITCH 1.27500 0.7844  1 3 0.9144 2 0.8001 7 END
TITLE-MC4 4.8 W/O VVER-1000 CASK IN 3D
READ PARAMETERS
TME=400 RUN=YES GEN=450 NPG=2000 NSK=10 NUB=YES
END PARAMETERS
READ GEOMETRY
UNIT 1
COM=" 17OFA FUEL ROD (NOBA) - BOTTOM HALF "
ZHEMICYL-Y 1 1 0.392176 181.5 0.0
ZHEMICYL-Y 7 1 0.40005 181.5 0.0
ZHEMICYL-Y 2 1 0.45720 181.5 0.0
CUBOID 3 1 0.55209 -0.55209 0.00000 -0.63750 181.5 0.0
UNIT 2
COM=" 17OFA FUEL ROD (NOBA) - TOP HALF "
ZHEMICYL+Y 1 1 0.392176 181.5 0.0
ZHEMICYL+Y 7 1 0.40005 181.5 0.0
ZHEMICYL+Y 2 1 0.45720 181.5 0.0
CUBOID 3 1 0.55209 -0.55209 0.63750 0.00000 181.5 0.0
UNIT 3
COM=" VVER 1000 MODIFIED GT/IT - BOTTOM HALF "
ZHEMICYL-Y 3 1 0.4710 181.5 0.0
ZHEMICYL-Y 2 1 0.5400 181.5 0.0
CUBOID 3 1 0.55209 -0.55209 0.00000 -0.63750 181.5 0.0
UNIT 4
COM=" VVER 1000 MODIFIED GT/IT - TOP HALF "
ZHEMICYL+Y 3 1 0.4710 181.5 0.0
ZHEMICYL+Y 2 1 0.5400 181.5 0.0
CUBOID 3 1 0.55209 -0.55209 0.63750 0.00000 181.5 0.0
UNIT 5
COM=" EMPTY WATER CELL - TOP OR BOTTOM HALF "
CUBOID 3 1 0.55209 -0.55209 0.63750 0.00000 181.5 0.0
UNIT 6
COM=" UNISTRUT CHANNEL ASSEMBLY"
CUBOID 3 1 1.799 0.0 3.5 0.7398 181.5 0.0
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CUBOID 4 1 2.539 0.0 3.5 0.0 181.5 0.0
UNIT 7
COM=" REST OF STRONGBACK AND CRADLE"
CUBOID 3 1 7.1051 0.5149 12.1851 0.5149 181.5 0.0
CUBOID 4 1 7.62 0.0 12.70 0.0 181.5 0.0
UNIT 8
COM=" CONTAINER FLANGES AND BRACKET"
CUBOID 4 1 1.285 0.0 22.86 0.0 181.5 0.0
UNIT 9
COM=" SKID ANGLE"
CUBOID 3 1 7.62 0.9652 7.62 0.9652 181.5 0.0
CUBOID 4 1 7.62 0.0 7.62 0.0 181.5 0.0
UNIT 13
COM=" BOTTOM EDGE OF CS STRONGBACK "
CUBOID 4 1 24.95550 0.0 0.0 -0.45720 181.5 0.0
UNIT 14
COM=" VERTICAL EDGE OF CS STRONGBACK "
CUBOID 4 1 0.0 -0.45720 24.13000 -0.45720 181.5 0.0
UNIT 15
COM=" VERTICAL GADOLINIA ABSORBER PANEL "
CUBOID 6 1 0.04445 -0.04445 18.41500 0.0 181.5 0.0
CUBOID 5 1 0.05461 -0.05461 18.41500 0.0 181.5 0.0
UNIT 16
COM=" ONE-SIDED PART-LENGTH GD PANEL UNDER STRONGBACK "
CUBOID 6 1 23.49500 0.0 0.0 -0.08890 33.02 0.0
CUBOID 5 1 23.49500 0.0 0.0 -0.09906 33.02 0.0
UNIT 17
COM=" GAP IN PART-LENGTH GD PANEL UNDER STRONGBACK "
CUBOID 3 1 23.49500 0.0 0.0 -0.09906 5.08 0.0
UNIT 18
COM=" HORIZONTAL GAD ABSORBER PLATE"
ARRAY 2 0.0 -0.09906 0.0
CUBOID 3 1 23.49500 0.0 0.0 -0.09906 196.74 0.0
GLOBAL
UNIT 20
COM=" VVER 1000 ASSEMBLY IN CASK "
ARRAY 1 0.0 1.37160 0.0
CUBOID 3 1 41.73728 -2.99720 38.30660 -38.10000 196.74 0.0
HOLE 6 -2.99715 20.61280 0.0
HOLE 7 28.0 -11.6284 0.0
HOLE 8 40.0 -13.6284 0.0
HOLE 9 32.0 -35.6284 0.0
HOLE 13 0.0 0.0 0.0
HOLE 14 0.0 0.0 0.0
HOLE 15 -0.85344 0.81280 0.0
HOLE 18 0.0 -0.457205 0.0
REPLICATE 4 1 0.22606 0.0 0.22606 0.22606 0.22606 0.0 1 END GEOM
READ ARRAY
ARA=1 NUX=21 NUY=42 NUZ=1 COM=" VVER 1000 ASSEMBLY IN H2O"
LOOP
1 1 21 1 1 42 1 1 1 1
2 2 20 2 1 41 2 1 1 1
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```
2 1 21 2 2 42 2 1 1 1
3 5 5 1 21 21 1 1 1 1
4 5 5 1 22 22 1 1 1 1
3 6 6 1 16 26 10 1 1 1
4 6 6 1 17 27 10 1 1 1
3 8 8 1 12 20 8 1 1 1
4 8 8 1 13 21 8 1 1 1
3 8 8 1 30 30 1 1 1 1
4 8 8 1 31 31 1 1 1 1
3 9 9 1 25 25 1 1 1 1
4 9 9 1 26 26 1 1 1 1
3 10 10 1 16 16 1 1 1 1
4 10 10 1 17 17 1 1 1 1
3 11 11 1 11 31 10 1 1 1
4 11 11 1 12 32 10 1 1 1
3 12 12 1 26 26 1 1 1 1
4 12 12 1 27 27 1 1 1 1
3 13 13 1 17 17 1 1 1 1
4 13 13 1 18 18 1 1 1 1
3 14 14 1 12 22 10 1 1 1
4 14 14 1 13 23 10 1 1 1
3 14 14 1 30 30 1 1 1 1
4 14 14 1 31 31 1 1 1 1
3 16 16 1 16 26 10 1 1 1
4 16 16 1 17 27 10 1 1 1
3 17 17 1 21 21 10 1 1 1
4 17 17 1 22 22 10 1 1 1
5 1 10 1 1 42 41 1 1 1
5 1 9 1 2 41 39 1 1 1
5 1 8 1 3 40 37 1 1 1
5 1 7 1 4 39 35 1 1 1
5 1 6 1 5 38 33 1 1 1
5 1 5 1 6 37 31 1 1 1
5 1 4 1 7 36 29 1 1 1
5 1 3 1 8 35 27 1 1 1
5 1 2 1 9 34 25 1 1 1
5 1 1 1 10 33 23 1 1 1
5 12 21 1 1 42 41 1 1 1
5 13 21 1 2 41 39 1 1 1
5 14 21 1 3 40 37 1 1 1
5 15 21 1 4 39 35 1 1 1
5 16 21 1 5 38 33 1 1 1
5 17 21 1 6 37 31 1 1 1
5 18 21 1 7 36 29 1 1 1
5 19 21 1 8 35 27 1 1 1
5 20 21 1 9 34 25 1 1 1
5 21 21 1 10 33 23 1 1 1
END LOOP
ARA=2 NUX=1 NUY=1 NUZ=11 COM=" HORIZONTAL GAD ABSORBER PLATE WITH GAPS"
FILL
17 16 17 17 16 17 17 16 17 17 16
END FILL
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END ARRAY
READ BOUNDS
ALL=SPECULAR
END BOUNDS
READ PLOT
TTL='MAT SLICE THROUGH ASSEMBLY CENTER '
PIC=MAT
NCH='0.ZWSGS'
XUL= 10.75915 YUL= 18.75915 ZUL= 15.0
XLR= 18.75915 YLR= 10.75915 ZLR= 15.0
UAX=1.0 VDN=-1.0 NAX=130
TTL='MAT SLICE THROUGH ASSEMBLY ARRAY '
PIC=MAT
NCH='0.ZWSGS'
XUL= -2.99720 YUL= 28.14660 ZUL= 15.0
XLR= 28.14660 YLR= -2.99720 ZLR= 15.0
UAX=1.0 VDN=-1.0 NAX=130
TTL='MAT SLICE THROUGH CASK MODEL '
PIC=MAT
NCH='0.ZWSGS'
XUL= -2.99720 YUL= 31.80334 ZUL= 15.0
XLR= 41.96334 YLR=-38.32606 ZLR= 15.0
UAX=1.0 VDN=-1.0 NAX=130
END PLOT
END DATA
END
```

VVER-1000 Annular blanket pellets 4.80 wt %

```
=CSAS25   parm=size=1000000
TITLE-MC4 4.8 W/O SU-3 LTA CASK IN 3D
238GROUPNDF5 LATTICECELL
UO2 1 DEN=10.58 1.0 293 92235 4.8 92238 95.2 END
ZR 2 1.0 293 END
H2O 3 1.0 293 END
CARBONSTEEL 4 1.0 293 END
ARBMGD2O3 1.9685 2 0 1 1 64000 2
8016 3 5 1.0 293 END
CARBONSTEEL 6 1.0 293 END
UO2 7 DEN=10.58 1.0 293 92235 4.8 92238 95.2 END
ZIRC4 8 1.0 293 END
END COMP
TRIANGPITCH 1.27500 0.7844 1 3 0.9144 2 0.8001 3 END
MORE DATA RES=7 CYLINDER 0.39218 0.19685
DAN(7)=0.37801673
RES=8 CYLINDER 0.4572 0.40005
DAN(8)=0.43692386 END MORE
MCC-5 PACKAGE,SU NPP-3 CONTENTS AT 4.0 W/O
READ PARAMETERS
TME=400 RUN=YES GEN=450 NPG=2000 NSK=50 NUB=YES
END PARAMETERS
READ GEOMETRY
UNIT 1
COM=" SU-3 LTA FUEL ROD (NOBA) - BOTTOM HALF "
ZHEMICYL-Y 1 1 0.392176 156.1 0.0
ZHEMICYL-Y 3 1 0.40005 156.1 0.0
ZHEMICYL-Y 2 1 0.45720 156.1 0.0
CUBOID 3 1 0.55209 -0.55209 0.00000 -0.63750 156.1 0.0
UNIT 2
COM=" SU-3 LTA ROD (NOBA) - TOP HALF "
ZHEMICYL+Y 1 1 0.392176 156.1 0.0
ZHEMICYL+Y 3 1 0.40005 156.1 0.0
ZHEMICYL+Y 2 1 0.45720 156.1 0.0
CUBOID 3 1 0.55209 -0.55209 0.63750 0.00000 156.1 0.0
UNIT 3
COM=" SU-3 LTA MODIFIED GT/IT - BOTTOM HALF "
ZHEMICYL-Y 3 1 0.4710 156.1 0.0
ZHEMICYL-Y 2 1 0.5400 156.1 0.0
CUBOID 3 1 0.55209 -0.55209 0.00000 -0.63750 156.1 0.0
UNIT 4
COM=" SU-3 LTA MODIFIED GT/IT - TOP HALF "
ZHEMICYL+Y 3 1 0.4710 156.1 0.0
ZHEMICYL+Y 2 1 0.5400 156.1 0.0
CUBOID 3 1 0.55209 -0.55209 0.63750 0.00000 156.1 0.0
UNIT 5
COM=" EMPTY WATER CELL - TOP OR BOTTOM HALF "
CUBOID 3 1 0.55209 -0.55209 0.63750 0.00000 156.1 0.0
UNIT 6
COM=" UNISTRUT CHANNEL ASSEMBLY"
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CUBOID 3 1 1.799 0.0 3.5 0.7398 181.5 0.0
CUBOID 4 1 2.539 0.0 3.5 0.0 181.5 0.0
UNIT 7
COM=" REST OF STRONGBACK AND CRADLE"
CUBOID 3 1 7.1051 0.5149 12.1851 0.5149 181.5 0.0
CUBOID 4 1 7.62 0.0 12.70 0.0 181.5 0.0
UNIT 8
COM=" CONTAINER FLANGES AND BRACKET"
CUBOID 4 1 1.285 0.0 22.86 0.0 181.5 0.0
UNIT 9
COM=" SKID ANGLE"
CUBOID 3 1 7.62 0.9652 7.62 0.9652 181.5 0.0
CUBOID 4 1 7.62 0.0 7.62 0.0 181.5 0.0
UNIT 13
COM=" BOTTOM EDGE OF CS STRONGBACK "
CUBOID 4 1 24.95550 0.0 0.0 -0.45720 196.74 0.0
UNIT 14
COM=" VERTICAL EDGE OF CS STRONGBACK "
CUBOID 4 1 0.0 -0.45720 24.13000 -0.45720 196.74 0.0
UNIT 15
COM=" VERTICAL GADOLINIA ABSORBER PANEL "
CUBOID 6 1 0.04445 -0.04445 18.41500 0.0 196.74 0.0
CUBOID 5 1 0.05461 -0.05461 18.41500 0.0 196.74 0.0
UNIT 16
COM=" ONE-SIDED PART-LENGTH GD PANEL UNDER STRONGBACK "
CUBOID 6 1 23.49500 0.0 0.0 -0.08890 33.02 0.0
CUBOID 5 1 23.49500 0.0 0.0 -0.09906 33.02 0.0
UNIT 17
COM=" GAP IN PART-LENGTH GD PANEL UNDER STRONGBACK "
CUBOID 3 1 23.49500 0.0 0.0 -0.09906 5.08 0.0
UNIT 18
COM=" HORIZONTAL GAD ABSORBER PLATE"
ARRAY 2 0.0 -0.09906 0.0
CUBOID 3 1 23.49500 0.0 0.0 -0.09906 196.74 0.0
UNIT 19
COM=" SU-3 LTA FUEL ROD (NOBA) - BOTTOM HALF "
ZHEMICYL-Y 3 1 0.19685 25.4 0.0
ZHEMICYL-Y 7 1 0.392176 25.4 0.0
ZHEMICYL-Y 3 1 0.40005 25.4 0.0
ZHEMICYL-Y 8 1 0.45720 25.4 0.0
CUBOID 3 1 0.55209 -0.55209 0.00000 -0.63750 25.4 0.0
UNIT 20
COM=" SU-3 LTA FUEL ROD (NOBA) - TOP HALF "
ZHEMICYL+Y 3 1 0.19685 25.4 0.0
ZHEMICYL+Y 7 1 0.392176 25.4 0.0
ZHEMICYL+Y 3 1 0.40005 25.4 0.0
ZHEMICYL+Y 8 1 0.45720 25.4 0.0
CUBOID 3 1 0.55209 -0.55209 0.63750 0.00000 25.4 0.0
UNIT 21
COM=" SU-3 LTA MODIFIED GT/IT - BOTTOM HALF "
ZHEMICYL-Y 3 1 0.4710 25.4 0.0
ZHEMICYL-Y 2 1 0.5400 25.4 0.0
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CUBOID 3 1 0.55209 -0.55209 0.00000 -0.63750 25.4 0.0
UNIT 22
COM=" SU-3 LTA MODIFIED GT/IT - TOP HALF "
ZHEMICYL+Y 3 1 0.4710 25.4 0.0
ZHEMICYL+Y 2 1 0.5400 25.4 0.0
CUBOID 3 1 0.55209 -0.55209 0.63750 0.00000 25.4 0.0
UNIT 23
COM=" EMPTY WATER CELL - TOP OR BOTTOM HALF "
CUBOID 3 1 0.55209 -0.55209 0.63750 0.00000 25.4 0.0
UNIT 24
COM=!SU-3 ASSEMBLY SECTION IN CASK - SOLID FUEL!
ARRAY 1 0.0 0.73410 0.0
UNIT 25
COM=!SU-3 ASSEMBLY SECTION IN CASK - ANNULAR FUEL!
ARRAY 3 0.0 0.73410 0.0
GLOBAL
UNIT 26
COM=" VVER 1000 ASSEMBLY IN CASK "
ARRAY 4 0.0 1.37160 0.0
CUBOID 3 1 41.73728 -2.99720 38.30660 -38.10000 196.74 0.0
HOLE 6 -2.99715 20.61280 0.0
HOLE 7 28.0 -11.6284 0.0
HOLE 8 40.0 -13.6284 0.0
HOLE 9 32.0 -35.6284 0.0
HOLE 13 0.0 0.0 0.0
HOLE 14 0.0 0.0 0.0
HOLE 15 -0.85344 0.81280 0.0
HOLE 18 0.0 -0.457205 0.0
REPLICATE 4 1 0.22606 0.0 0.22606 0.22606 0.22606 0.0 1 END GEOM
READ ARRAY
ARA=1 NUX=21 NUY=42 NUZ=1 COM=" SU-3 LTA ASSEMBLY IN H2O-SOLID"
LOOP
1 1 21 1 1 42 1 1 1 1
2 2 20 2 1 41 2 1 1 1
2 1 21 2 2 42 2 1 1 1
3 5 5 1 21 21 1 1 1 1
4 5 5 1 22 22 1 1 1 1
3 6 6 1 16 26 10 1 1 1
4 6 6 1 17 27 10 1 1 1
3 8 8 1 12 20 8 1 1 1
4 8 8 1 13 21 8 1 1 1
3 8 8 1 30 30 1 1 1 1
4 8 8 1 31 31 1 1 1 1
3 9 9 1 25 25 1 1 1 1
4 9 9 1 26 26 1 1 1 1
3 10 10 1 16 16 1 1 1 1
4 10 10 1 17 17 1 1 1 1
3 11 11 1 11 31 10 1 1 1
4 11 11 1 12 32 10 1 1 1
3 12 12 1 26 26 1 1 1 1
4 12 12 1 27 27 1 1 1 1
3 13 13 1 17 17 1 1 1 1
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4 13 13 1 18 18 1 1 1 1
3 14 14 1 12 22 10 1 1 1
4 14 14 1 13 23 10 1 1 1
3 14 14 1 30 30 1 1 1 1
4 14 14 1 31 31 1 1 1 1
3 16 16 1 16 26 10 1 1 1
4 16 16 1 17 27 10 1 1 1
3 17 17 1 21 21 10 1 1 1
4 17 17 1 22 22 10 1 1 1
5 1 10 1 1 42 41 1 1 1
5 1 9 1 2 41 39 1 1 1
5 1 8 1 3 40 37 1 1 1
5 1 7 1 4 39 35 1 1 1
5 1 6 1 5 38 33 1 1 1
5 1 5 1 6 37 31 1 1 1
5 1 4 1 7 36 29 1 1 1
5 1 3 1 8 35 27 1 1 1
5 1 2 1 9 34 25 1 1 1
5 1 1 1 10 33 23 1 1 1
5 12 21 1 1 42 41 1 1 1
5 13 21 1 2 41 39 1 1 1
5 14 21 1 3 40 37 1 1 1
5 15 21 1 4 39 35 1 1 1
5 16 21 1 5 38 33 1 1 1
5 17 21 1 6 37 31 1 1 1
5 18 21 1 7 36 29 1 1 1
5 19 21 1 8 35 27 1 1 1
5 20 21 1 9 34 25 1 1 1
5 21 21 1 10 33 23 1 1 1
END LOOP
ARA=2 NUX=1 NUY=1 NUZ=11 COM=" HORIZONTAL GAD ABSORBER PLATE WITH GAPS"
FILL
17 16 17 17 16 17 17 16 17 17 16
END FILL
ARA=3 NUX=21 NUY=42 NUZ=1 COM=" SU-3 LTA ASSEMBLY IN H2O-ANNULAR"
LOOP
19 1 21 1 1 42 1 1 1 1
20 2 20 2 1 41 2 1 1 1
20 1 21 2 2 42 2 1 1 1
21 5 5 1 21 21 1 1 1 1
22 5 5 1 22 22 1 1 1 1
21 6 6 1 16 26 10 1 1 1
22 6 6 1 17 27 10 1 1 1
21 8 8 1 12 20 8 1 1 1
22 8 8 1 13 21 8 1 1 1
21 8 8 1 30 30 1 1 1 1
22 8 8 1 31 31 1 1 1 1
21 9 9 1 25 25 1 1 1 1
22 9 9 1 26 26 1 1 1 1
21 10 10 1 16 16 1 1 1 1
22 10 10 1 17 17 1 1 1 1
21 11 11 1 11 31 10 1 1 1
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22 11 11 1 12 32 10 1 1 1
21 12 12 1 26 26 1 1 1 1
22 12 12 1 27 27 1 1 1 1
21 13 13 1 17 17 1 1 1 1
22 13 13 1 18 18 1 1 1 1
21 14 14 1 12 22 10 1 1 1
22 14 14 1 13 23 10 1 1 1
21 14 14 1 30 30 1 1 1 1
22 14 14 1 31 31 1 1 1 1
21 16 16 1 16 26 10 1 1 1
22 16 16 1 17 27 10 1 1 1
21 17 17 1 21 21 10 1 1 1
22 17 17 1 22 22 10 1 1 1
23 1 10 1 1 42 41 1 1 1
23 1 9 1 2 41 39 1 1 1
23 1 8 1 3 40 37 1 1 1
23 1 7 1 4 39 35 1 1 1
23 1 6 1 5 38 33 1 1 1
23 1 5 1 6 37 31 1 1 1
23 1 4 1 7 36 29 1 1 1
23 1 3 1 8 35 27 1 1 1
23 1 2 1 9 34 25 1 1 1
23 1 1 1 10 33 23 1 1 1
23 12 21 1 1 42 41 1 1 1
23 13 21 1 2 41 39 1 1 1
23 14 21 1 3 40 37 1 1 1
23 15 21 1 4 39 35 1 1 1
23 16 21 1 5 38 33 1 1 1
23 17 21 1 6 37 31 1 1 1
23 18 21 1 7 36 29 1 1 1
23 19 21 1 8 35 27 1 1 1
23 20 21 1 9 34 25 1 1 1
23 21 21 1 10 33 23 1 1 1
END LOOP
ARA=4 NUX=1 NUY=1 NUZ=2
FILL 24 25
END FILL
END ARRAY
READ BOUNDS
ALL=SPECULAR
END BOUNDS
READ PLOT
TTL='MAT SLICE THROUGH ASSEMBLY CENTER '
PIC=MAT
NCH='0.ZWSGS'
XUL= 10.75915 YUL= 18.75915 ZUL= 15.0
XLR= 18.75915 YLR= 10.75915 ZLR= 15.0
UAX=1.0 VDN=-1.0 NAX=130
TTL='MAT SLICE THROUGH ASSEMBLY ARRAY '
PIC=MAT
NCH='0.ZWSGS'
XUL= -2.99720 YUL= 28.14660 ZUL= 15.0
```

```
XLR= 28.14660 YLR= -2.99720 ZLR= 15.0
UAX=1.0 VDN=-1.0 NAX=130
TTL='MAT SLICE THROUGH CASK MODEL '
PIC=MAT
NCH='0.ZWSGS'
XUL= -2.99720 YUL= 31.80334 ZUL= 15.0
XLR= 41.96334 YLR=-38.32606 ZLR= 15.0
UAX=1.0 VDN=-1.0 NAX=130
END PLOT
END DATA
END
```