Test Case

c

c --------- Cell Cards

c Detectors

20 38 -0.2677 -30 imp:n,p=1 $ Helium-3 detector 1

21 39 -3.67 -31 imp:n,p=1 $ NaI detector 1

22 38 -0.2677 -32 imp:n,p=1 $ Helium-3 detector 2

23 39 -3.67 -33 imp:n,p=1 $ NaI detector 2

24 30 -11.34 -34 imp:n,p=1 $ Lead Shield, 2 inches

130 6 Density -115 118 -230 113 imp:n,p=1 $ inside Shell 1

131 6 Density -115 230 -231 113 imp:n,p=1 $ inside Shell 2

132 6 Density -115 231 -232 113 imp:n,p=1 $ inside Shell 3

133 6 Density -115 232 -233 113 imp:n,p=1 $ inside Shell 4

134 6 Density -115 233 -234 113 imp:n,p=1 $ inside Shell 5

c BEE chamber

105 0 -40 114 116 113 120 imp:n,p=1 $ room air

106 1 -2.35 40 -41 101 102 103 110 111 112 113 114 imp:n,p=1 $ room walls

107 1 -2.35 -116 115 118 imp:n,p=1 $ BEE walls

108 6 Density -115 234 113 imp:n,p=1 $ inside BEE

109 5 -2.7 -118 117 imp:n,p=1 $ borehole pipe

110 0 -117 119 #20 #21 #22 #23 #24 imp:n,p=1 $ inside borehole

99 0 41 -99 104 105 106 121 imp:n,p=1 $ void

c doors and door shields

120 0 -112 imp:n,p=1 $ inner door void

121 0 -110 imp:n,p=1 $ outer door void

122 0 -111 imp:n,p=1 $ outer door plug

123 3 -1.00 -113 118 imp:n,p=1 $ inner wall shield (12 in)

124 3 -1.00 -119 imp:n,p=1 $ inside borehole shield (11 in)

125 3 -1.00 -114 imp:n,p=1 $ inner door shield (2 in)

126 3 -1.00 -120 imp:n,p=1 $ outer door shield (2 in)

127 3 -1.00 -121 imp:n,p=1 $ top wall shield (5 in)

c roof voids and shields

31 0 -101 imp:n,p=1 $ roof void 1

32 0 -102 imp:n,p=1 $ roof void 2

33 0 -103 imp:n,p=1 $ roof void 3

34 3 -1.00 -104 imp:n,p=1 $ skylight 1 shield

35 3 -1.00 -105 imp:n,p=1 $ skylight 2 shield

36 3 -1.00 -106 imp:n,p=1 $ skylight 3 shield

100 0 99 imp:n,p=0 $ graveyard

c --------- Surface Cards

c -- detectors

30 rcc -25.5 53.34 -12.7 15 0 0 1.9 $ He3, OD 1.5"

31 rcc -50.5 53.34 -12.7 7.5 0 0 3.81 $ NaI, OD 3"

32 rcc -85.5 53.34 -12.7 15 0 0 1.9 $ He3, OD 1.5"

33 rcc -110.5 53.34 -12.7 7.5 0 0 3.81 $ NaI, OD 3"

34 RPP 8.5 13.58 49.84 56.84 -16.2 -9.2 $ Pb Block

c -- Barriers

40 RPP -152.40 396.24 -426.72 152.40 -114.30 193.04 $inside room

41 RPP -182.88 441.96 -457.20 182.88 -175.26 223.52 $outside room

c

c -- roof voids

101 RPP -152.40 396.24 30.48 152.40 193.04 223.52 $ skylight void 1

102 RPP -152.40 396.24 -175.26 -53.34 193.04 223.52 $ skylight void 2

103 RPP -152.40 396.24 -381.00 -259.08 193.04 223.52 $ skylight void 3

c -- roof shields

104 RPP -167.64 411.48 15.24 167.64 223.52 238.76 $ 6" poly over 1

105 RPP -167.64 411.48 -190.5 -38.1 223.52 238.76 $ 6" poly over 2

106 RPP -167.64 411.48 -396.24 -243.84 223.52 238.76 $ 6" poly over 3

c -- doors and door shields

110 RPP 421.64 441.96 -188.54 -85.72 -114.30 99.06 $ outer door void

111 RPP 396.24 421.64 -188.54 -85.72 -114.30 99.06 $ outer door plug

112 RPP -182.88 -152.40 -188.54 -85.72 -114.30 99.06 $ inner door void

113 RPP -152.40 -121.92 7.62 99.06 -114.30 129.54 $ inner wall shield

114 RPP -152.40 -147.32 -198.12 -76.20 -114.30 129.54 $ inner door shield

120 RPP 391.16 396.24 -198.12 -76.20 -114.30 129.54 $ outer door shield

121 RPP -35.56 86.36 182.88 195.58 -114.30 129.54 $ top wall shield

c -- enclosure walls

115 RPP -152.4 91.44 -45.72 152.4 -114.30 88.90 $ inside BEE walls

116 RPP -152.4 111.76 -66.04 152.4 -114.30 88.90 $ outside BEE walls

c -- borehole pipe

117 RCC -152.4 53.34 -12.7 264.16 0 0 10.16 $ inside borehole

118 RCC -152.4 53.34 -12.7 264.16 0 0 10.80 $ outside borehole

119 RCC -152.4 53.34 -12.7 27.94 0 0 10.16 $ shielding inside borehole

99 SO 800 $ problem boundary

c -- tally surfaces

230 C/X 53.34 -12.7 20.80 $Shell 1

231 C/X 53.34 -12.7 30.80 $Shell 2

232 C/X 53.34 -12.7 40.80 $Shell 3

233 C/X 53.34 -12.7 50.80 $Shell 4

234 C/X 53.34 -12.7 60.80 $Shell 5

c

c --------- Material Cards

c ------------------------------------------

c NBS Concrete (density = 2.35 g/cm^3)

c ------------------------------------------

m1 1001.60c -0.0056 $ hydrogen

16032.60c -0.0012 $ sulfur

8016.60c -0.4983 $ oxygen

14000.60c -0.3158 $ silicon

13027.60c -0.0456 $ aluminum

26000.55c -0.0122 $ iron

20000.60c -0.0826 $ calcium

19000.60c -0.0192 $ potassium

11023.60c -0.0171 $ sodium

12000.60c -0.0024 $ magnesium

c

c \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

c AIR: ANSI/ANS-6.4.3, Dry air; density = 0.0012 g/cm^3

c Composition by mass fraction

c \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

m2 7014.60c -.75519

8016.60c -.23179

6000.60c -.00014

18000.35c -.01288

c

c --------------------------------------------------------------------

c material: borated polyethylene d=1.00 g/cm^3 CH2 + 8 wt% B4C

c B-11 5.029; B-10 1.234; C 80.595; H 13.143

c --------------------------------------------------------------------

m3 1001.60c -0.13143

5010.60c -0.01234

5011.60c -0.05029

6000.60c -0.80594

c

c --------------------------------------------------------------------

c material: polyethylene d=0.95 g/cm^3 CH2

c --------------------------------------------------------------------

m4 1001.60c 2

6000.60c 1

c

c --------------------------------------------------------------------

c material: aluminum 6061; density=2.7 g/cm^3

c --------------------------------------------------------------------

m5 12000 -0.01000 $ Mg

13027 -0.97200 $ Al

14000 -0.00600 $ Si

22000 -0.00088 $ Ti

24000 -0.00195 $ Cr

25055 -0.00088 $ Mn

26000 -0.00409 $ Fe

29000 -0.00275 $ Cu

30000 -0.00146 $ Zn

c ---------------------------------------------------------------------

c Element; density = Density g/cm^3

c ---

m6 Composition

c ---------------------------------------------------------------------

c ------------------------------------------------------------------

c ------------------------------------------------------------------

c ---- Lead, Inert: Density (11.34 g/cm3)

m30 82000 -1.000000 $ He

c ------------------------------------------------------------------

c ---- Helium-3, Proportional: Density (0.2677 g/cm3)

m38 2003 -1.000000 $ He

c ------------------------------------------------------------------

c --------- NaI Crystal: Density (3.67 g/cm3)

m39 11023.60c 0.500 $ Na

53127 0.500 $ I

c --------------------------------------------------------------------

c --------- Nickel Additive: Density (8.908 g/cm3)--------------------

m40 28058.60c -0.68077

28060.60c -0.26223

28061.60c -0.01139

28062.60c -0.03635

28064.60c -0.00926

c --------- DATA CARDS

SDEF par=n erg=4.4 POS 25.4 53.34 -12.7 WGT=12653259

PHYS:N 6j 3

PHYS:p 100 0 0 0 0 j 0

CUT:N 2j 0

c

c ctme 4400

nps 300000000

mode n p

c

c --- NEUTRON TALLIES

f12:n 118.1 230 231 232 233 234

sd12 14478 27884 41289 54695 68101 81507

f22:n 118.1 230 231 232 233 234

sd22 1 1 1 1 1 1

c --- He3 Near (Gauss Distribution)

f8:N 20

ft8 geb -0.0078 0.067 0.02 $

E8 0 1024i 10

c --- He3 Far (Gauss Distribution)

f18:N 22

ft18 geb -0.0078 0.067 0.02

E18 0 1024i 10

c --- He3 Near

f28:N 20

E28 0 1024i 10

c --- He3 Far

f38:N 22

E38 0 1024i 10

c --- NaI Near (Gauss Distribution)

f48:P 21

ft48 geb -0.0078 0.067 0.02 $

E48 0 1024i 10

c --- NaI Far (Gauss Distribution)

f58:P 23

ft58 geb -0.0078 0.067 0.02

E58 0 1024i 10

c --- NaI Near

f68:P 21

E68 0 1024i 10

c --- NaI Far

f78:P 23

E78 0 1024i 10