Hoi Yeung Wong - Monte Carlo Radiation Transport 2018/19 MCNP Assessment 1

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C \_\_\_\_Cells and importance \_\_\_\_

1 1 -1.00 (11 -12 13 -14 15 -16) imp:n=1 $ Water

2 2 -7.92 (21 -22 23 -24 25 -26) (-11:12:-13:14:-15) imp:n=1 $Tank

3 0 (11 -12 13 -14 16 -26) imp:n=1 $ void above water

C imp!=0 to allow neutrons to re-enter the SS can.

4 0 (-21:22:-23:24:-25:26) imp:n=0 $ Void outside

C \_\_\_\_ Surface definitions \_\_\_\_

C Wetted surfaces, and free surface of water.

11 PX -5.0 $ Long side (left )

12 PX 5.0 $ Long side (right)

13 PY -10.0 $ Short side (near side)

14 PY 10.0 $ Short side ( far side)

15 PZ -9.80 $ Base ( internal)

16 PZ 9.00 $ Water level

C Stainless steel tank exterior surface

21 PX -5.2 $ Long side (left )

22 PX 5.2 $ Long side (right)

23 PY -10.2 $ Short side (near side)

24 PY 10.2 $ Short side ( far side)

25 PZ -10.0 $ Base ( external)

26 PZ 10.0 $ Top (of the rims)

C \_\_\_\_Materials definitions\_\_\_\_

C Water

M1 1001.42c -0.11190 $ H-1 and mass fraction

8016.42c -0.88810 $ O-16 and mass fraction

C stainless steel, data retrieved from the endf92 database.

M2 24000.42c -0.18000 $ 18% Cr content

26000.42c -0.74000 $ 74% Fe

28000.42c -0.08000 $ 08% Ni content

C

C \_\_\_\_Mode card\_\_\_\_

C Assume photoneutron production rate is negligible, so ignore photons

Mode N $ Importances has already been defined above

C

C \_\_\_\_Source definitions\_\_\_

C Simple point source 2cm above the internal (wetted) base

SDEF POS=0.0 0.0 -7.8 ERG=D1 PAR=1

SP1 -3 0.988 2.249 $Watt spectrum with param's for n(thm)+U235

C SI1 card not required because the Watt spectrum already defined this.

C

C \_\_\_\_Tallies\_\_\_\_

E0 1E-9 2.15443469E-9 4.64158883E-9 1E-8 2.15443469E-8 4.64158883E-8

1E-7 2.15443469E-7 4.64158883E-7 1E-6 2.15443469E-6 4.64158883E-6

1E-5 2.15443469E-5 4.64158883E-5 1E-4 2.15443469E-4 4.64158883E-4

1E-3 2.15443469E-3 4.64158883E-3 1E-2 2.15443469E-2 4.64158883E-2

1E-1 2.15443469E-1 4.64158883E-1 1E0 2.15443469E0 4.64158883E0 1E1

FC12 Surface neutron fluxes over the long external vertical sides.

F12:N (21 22)

FC22 Surface neutron fluxes over the short external vertical sides.

F22:N (23 24)

FC32 Surface neutron fluxes over the external base.

F32:N 25

C

C \_\_\_\_Other control commands\_\_\_\_

C PRINT 110 $The source location has been confirmed using this card

PRINT 160 161 162

NPS 2800000