6/23/99

Look at impact of Cs on offsite consequences

Rerun Base Case: atmos76.inp ✓
early299.inp ✓
chrncl_n.inp ✓
SURSIT.INP ✓
METSUR.INP ✓
} BEST B.OUT ✓

Remove only Cs-134 atmos134.inp ✓ → 134.out ✓
Remove only Cs-136 atmos136.inp ✓ → 136.out ✓
Remove only Cs-137 atmos137.inp ✓ → 137.out ✓
Remove all 3 Cs's atmosall.inp ✓ → all.out ✓

Remove all other isotopes
besides 3 Cs's atmosoth.inp → oth.out

Cs inventory in above runs corresponds to 3 cores.
How much consequences with 1.5 cores?
How much consequences with 6 cores?

Isotope	Half-life	1.5 cores	6 cores
Cs-134	2.1 yr	same as 3 cores	same as 3 cores
Cs-136	13 days	same as 3 cores	same as 3 cores
Cs-137	30 yrs	x.5	x2

C/99

1.5 cores

(Take atmosoth.inp.)
Reduce the Cs-137 inventory by factor of 2.

Cs-137 $8.58 \times 10^{17} \times .5 = 4.29 \times 10^{17}$ Bq

atmos 1p5.inp → 1p5.out

6.0 cores

(Take atmosoth.inp.)
Increase Cs-137 inventory by factor of 2.

Cs-137 $8.58 \times 10^{17} \times 2 = 1.72 \times 10^{18}$ Bq

atmos 6pØ.inp → 6pØ.out

Why no Cs-135 in MACCS? Ans: $t_{1/2} = 3 \times 10^6$ yrs

Xe-135 53,630 Ci $\lambda = 2.09 \times 10^{-5}$/sec $t_{1/2} = 9.2$ h

Cs-135 .03 Ci $\lambda = 7.29 \times 10^{-15}$/sec $t_{1/2} = 3 \times 10^6$ y

$$\lambda N = Ci$$

$$\lambda_{Xe-135} N_{Xe-135} = \text{Activity}$$
(Ci)

$$53{,}630 \text{ Ci} = 2.09 \times 10^{-5} \frac{}{\text{sec}} \cdot N$$

Xe-135 $$N = \frac{53{,}630 \text{ Ci}}{2.09 \times 10^{-5}/\text{sec}}$$

Cs-135 $$N = \frac{53{,}630 \text{ Ci}}{2.09 \times 10^{-5}/\text{sec}}$$

$$\text{Cs-135 activity} = \lambda_{Cs-135} \cdot N = 7.29 \times 10^{-15} \frac{}{\text{sec}} \cdot \frac{53{,}630 \text{ Ci}}{2.09 \times 10^{-5} \frac{}{\text{sec}}}$$

$$\text{Cs-135 activity} = .00002 \text{ Ci}$$