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 ✓
} → BEST8.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 |

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1.5 cores

Take atmosotk.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.our

6.0 cores

Take atmosotk.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 6pϕ.inp → 6pϕ.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 $\lambda = 7.29 \times 10^{-15}/sec$ $t_{1/2} = 3 \times 10^6\ y$

$$\lambda N = Ci$$

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

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

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

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

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

$Cs-135$ activity = .00002 Ci