

Table 14.8-1

CHARACTERISTICS OF NUCLEAR EXCURSIONS  
WATER-MODERATED OXIDE CORES

<u>Range</u>	<u>Reactivity Insertion Rate (\$/sec)</u>	<u>Minimum Period (ms)</u>	<u>Peak Energy Density (cal/gm)</u>	<u>Principal Shutdown Mechanisms</u>
Low	<2.5	>4	<120	Doppler Effect Moderator Effects
Medium	2-25	7-2	100-425	Doppler Effect
High	>20	<3	>380	Doppler Effect Core Disassembly

Table 14.8-2

DOSE COMPUTATIONAL METHODS WIND DIRECTION PERSISTENCE

<u>Station</u>	<u>Direction*</u>	<u>Frequency of Duration in Hours</u> (One Sector - 22 1/2°)				<u>Longest No. Hours</u>	<u>Longest No. Hours** in any Direction</u>	
		<u>50%</u>	<u>10%</u>	<u>1%</u>	<u>0.1%</u>			
Augusta, Georgia	W	2	3	8	13	18	W	18
Birmingham, Alabama	S	2	4	9	16	16	SSE	20
Chicago, Illinois	SSW	2	5	12	21	22	NSE	25
Little Rock, Arkansas	SSW	2	4	9	17	28	SSE	28
Phoenix, Arizona	E	2	3	6	9	12	E	12
Rochester, New York	WSW	2	6	13	23	28	WSW	28
Salt Lake City, Utah	SSE	2	4	7	13	15	S	17
San Diego, California	NW	2	6	12	16	17	WSW	33
Tampa, Florida	ENE	2	3	7	13	14	SSW	18
Yakima, Washington	W	2	5	8	14	17	WNW	19

\*Direction examined is the one showing greatest frequency of persistent winds.

\*\*Longest number of hours observed may not be same direction as direction showing most frequency of persistent winds.

Table 14.8-3

## METEOROLOGY APPLICABLE TO DESIGN BASIS ACCIDENTS

<u>Time After Accident</u>	<u>Diffusion Conditions Investigated</u>		<u>Wind Variance During Indicated Time Period</u>	<u>Breathing Rate M<sup>3</sup>/sec</u>
	Stability Category*	$\sigma \propto \bar{u}$		
0-8 hrs	VS-1, MS-1, N-1, N-5, U-1, U-5	0.1 for $\bar{u} = 1.0$ 1.0 for $\bar{u} = 5.0$	None (centerline concentration)	$3.47 \times 10^{-4}$
8-24 hrs	VS-1, MS-1 N-1, N-5 U-1, U-5	0.1 for $\bar{u} = 1.0$ 1.0 for $\bar{u} = 5.0$	None (centerline concentration)	$1.75 \times 10^{-4}$
>24 hrs	VS-1, MS-1 N-1, N-5 U-1, U-5	0.1 for $\bar{u} = 1.0$ 1.0 for $\bar{u} = 5.0$	Wind assumed to blow in 22.5° sector 1/4 of the time	$2.32 \times 10^{-4}$

\*VS denotes very stable meteorological conditions.

MS - moderately stable, N-neutral, and U - unstable meteorological conditions. 1 and 5 denotes wind speed in meters/second.

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Table 14.8-4

## CALCULATED AIR CONCENTRATION FOR 183 METER RELEASE HEIGHT

Distance (meters)	Activity of Interest	(Curie-sec/m <sup>3</sup> /curie released) Meteorological Conditions					
		VS-1	MS-1	N-1	N-5	U-1	U-5
1,400	Noble Gases	0	$5.3 \times 10^{-18}$	$2.1 \times 10^{-7}$	$2.3 \times 10^{-9}$	$4.0 \times 10^{-6}$	$4.3 \times 10^{-7}$
	Halogens	0	$5.3 \times 10^{-18}$	$2.1 \times 10^{-7}$	$2.3 \times 10^{-9}$	$3.9 \times 10^{-6}$	$4.2 \times 10^{-7}$
3,000	Noble Gases	0	$4.2 \times 10^{-12}$	$1.7 \times 10^{-6}$	$1.5 \times 10^{-7}$	$1.9 \times 10^{-6}$	$2.9 \times 10^{-7}$
	Halogens	0	$4.2 \times 10^{-12}$	$1.7 \times 10^{-6}$	$1.5 \times 10^{-7}$	$1.9 \times 10^{-6}$	$2.8 \times 10^{-7}$
8,000	Noble Gases	$1.8 \times 10^{-36}$	$1.4 \times 10^{-8}$	$9.8 \times 10^{-7}$	$1.7 \times 10^{-7}$	$4.7 \times 10^{-7}$	$8.4 \times 10^{-8}$
	Halogens	$1.8 \times 10^{-36}$	$1.4 \times 10^{-8}$	$9.4 \times 10^{-7}$	$1.6 \times 10^{-7}$	$4.4 \times 10^{-7}$	$7.9 \times 10^{-8}$
16,000	Noble Gases	$1.9 \times 10^{-22}$	$1.3 \times 10^{-7}$	$4.1 \times 10^{-7}$	$8.2 \times 10^{-8}$	$1.7 \times 10^{-7}$	$3.2 \times 10^{-8}$
	Halogens	$1.9 \times 10^{-22}$	$1.3 \times 10^{-7}$	$3.9 \times 10^{-7}$	$7.6 \times 10^{-8}$	$1.6 \times 10^{-7}$	$2.9 \times 10^{-8}$

Symbols refer to stability and wind speed, i.e., VS, MS, N, U, means very stable, moderately stable, neutral and unstable respectively and 1 and 5 means 1 meter/sec and 5 meters/sec, respectively. The diffusion parameter  $\Delta \varnothing u$  assumed is 0.1 radian-meter/sec for the 1 meter/sec cases and 1.0 radian-meter/sec for the 5 meter/sec cases.

Table 14.8-5

## CALCULATED AIR CONCENTRATION FOR 183 METER RELEASE HEIGHT

Distance (meters)	Activity of Interest	(Curie-sec/m <sup>3</sup> /curie released) Meteorological Conditions					
		VS-1	MS-1	N-1	N-5	U-1	U-5
1,400	Noble Gases	$3.9 \times 10^{-5}$	$7.2 \times 10^{-5}$	$3.9 \times 10^{-5}$	$1.1 \times 10^{-5}$	$7.5 \times 10^{-6}$	$2.0 \times 10^{-6}$
	Halogens	$3.7 \times 10^{-5}$	$7.0 \times 10^{-5}$	$3.7 \times 10^{-5}$	$1.1 \times 10^{-5}$	$6.9 \times 10^{-6}$	$1.8 \times 10^{-6}$
3,000	Noble Gases	$1.1 \times 10^{-5}$	$4.2 \times 10^{-5}$	$1.1 \times 10^{-5}$	$3.5 \times 10^{-6}$	$1.9 \times 10^{-6}$	$5.2 \times 10^{-7}$
	Halogens	$1.0 \times 10^{-5}$	$3.8 \times 10^{-5}$	$1.0 \times 10^{-5}$	$3.1 \times 10^{-6}$	$1.7 \times 10^{-6}$	$4.6 \times 10^{-7}$
8,000	Noble Gases	$2.1 \times 10^{-6}$	$1.5 \times 10^{-5}$	$2.1 \times 10^{-6}$	$6.5 \times 10^{-7}$	$3.3 \times 10^{-7}$	$8.9 \times 10^{-8}$
	Halogens	$1.8 \times 10^{-6}$	$1.2 \times 10^{-5}$	$1.8 \times 10^{-6}$	$5.6 \times 10^{-7}$	$2.9 \times 10^{-7}$	$7.5 \times 10^{-8}$
16,000	Noble Gases	$6.2 \times 10^{-7}$	$6.8 \times 10^{-6}$	$6.2 \times 10^{-7}$	$1.9 \times 10^{-7}$	$9.6 \times 10^{-8}$	$2.5 \times 10^{-8}$
	Halogens	$5.2 \times 10^{-7}$	$4.7 \times 10^{-6}$	$5.2 \times 10^{-7}$	$1.6 \times 10^{-7}$	$8.0 \times 10^{-8}$	$2.0 \times 10^{-8}$

Symbols refer to stability and wind speed, i.e., VS, MS, N, U, means very stable, moderately stable, neutral and stable respectively and 1 and 5 means 1 meter/sec and 5 meters/sec, respectively. The diffusion parameter  $\Delta \varnothing u$  assumed is 0.1 radian-meter/sec for the 1 meter/sec cases and 1.0 radian-meter/sec for the 5 meter/sec cases.

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Table 14.8-6

## THYROID DOSE CONVERSION FACTORS

Isotope	Effective 1/2 Life (Days)	$f_a$	E (Mev/dis)	$C'_i$ Rad/ curie inhaled)
I-131	$7.6 \times 10^0$	$2.3 \times 10^{-1}$	$2.3 \times 10^{-1}$	$1.48 \times 10^6$
I-132	$9.7 \times 10^{-2}$	$2.3 \times 10^{-1}$	$6.5 \times 10^{-1}$	$5.65 \times 10^4$
I-133	$8.7 \times 10^{-1}$	$2.3 \times 10^{-1}$	$5.4 \times 10^{-1}$	$4.21 \times 10^5$
I-134	$3.6 \times 10^{-2}$	$2.3 \times 10^{-1}$	$8.2 \times 10^{-1}$	$2.64 \times 10^4$
I-135	$2.8 \times 10^{-1}$	$2.3 \times 10^{-1}$	$5.2 \times 10^{-1}$	$1.30 \times 10^5$