TABLE 14.9-1

DESIGN BASIS ACCIDENT RADIOLOGICAL DOSES
(REM)

	WHOLE BODY		THYROID	
Accident	2 hour (1400 m)	30 day (3218 m)	2 hour (1400 m)	30 day (3218 m)
Loss of Coolant	2.2×10^{-1}	6.1×10^{-1}	2.9×10^{0}	3.6×10^{1}
Refueling	4.9×10^{-2}	1.9×10^{-2}	3.1×10^{1}	4.2×10^{-1}
Control Rod Drop	1.2×10^{-2}	4.3×10^{-2}	6.1×10^{0}	7.0×10^{0}
Steam Line Break	1.7×10^{-2}	8.0×10^{-3}	3.0×10^{1}	1.0×10^{1}

Table 14.9-2
(Sheet 1)

SENSITIVITY OF DOSES TO VARIATION OF ASSUMPTIONS
LOSS-OF-COOLANT ACCIDENT

Assumptions	Design "Base" Case	Assumed AEC Case	Factor Affecting Thyroid Dose	Factor Affecting Whole Body Dose
Fission products released to drywell	1.8 percent noble gases[1] 0.32 percent iodines from 25 percent of the fuel rods which are assumed to be perforated. 1 percent of total iodine in organic form. Negligible solids.	100 percent noble gases 50 percent iodines and 1 percent solids in total core inventory. 5 percent of total iodines in organic form.	625	220
Iodine retained in water	Based on partition factor of 100 between the volumes of air and water in pressure suppression chamber and drywell.	None	12.5[3]	1
Elemental iodine plateout in drywell	50 percent	50 percent	1	1
Leakage rate from primary containment	Function of drywell pressure; peaks close to 0.5 percent volume per day	0.635 percent volume per day, constant throughout accident	1.3 (2-hr)[2] ~1 (30-day)	1.3 (2-hr) ~(30-day)
Uniform mixing in Reactor Building	Yes	No	22 (2-hr) 1.2 (30-day)	28 (2-hr) 1.1 (30-day)
Iodine filter efficiency	99 percent (95 percent for solids)	90 percent	10	1
Effectiveness of stack	Yes	Yes	1	1

NOTE:

[1]1 percent of iodines released in organic form, which is not reduced by fallout or drywell and reactor building. Elemental iodines are carried into pressure suppression pool during blowdown, and a fraction retained according to the assumed equilibrium partition factor of 100. Iodines become airborne in the pressure suppression chamber and drywell before leaking out to the secondary containment.

[2]2-hr dose is evaluated at site boundary of 1400 meters; 30-day dose is evaluated at low-population zone of 3218 meters.

[3]Takes into account the organic iodine fraction.

Table 14.9-2

(Sheet 2)

SENSITIVITY OF DOSES TO VARIATION OF ASSUMPTIONS

REFUELING ACCIDENT

Assumptions	Design "Base" Case	Assumed AEC Case	Factor Affecting Thyroid Dose	Factor Affecting Whole Body Dose
Fission product release to reactor water[1]	1.8 percent noble gases, 0.32 percent iodines from 111 perforated fuel rods, solids negligible	20 percent noble gases, 10 percent iodines from 49 perforated fuel rods[2]	13.8	4.9
Iodines retained in water	Equilibrium partition[4] factor of 100 for iodines and water	90 percent[2]	0.4	1
Plateout of iodines in Reactor Building	None	50 percent	0.5	1
Uniform mixing in refueling chamber	Yes	No	14 (2-hr)[3] ~1.3 (30-day)	18 (2-hr) ~1.1 (30-day)
	Fission Products exponentially released from water to Reactor Building till exhausted	Fission products exponentially released from water in 2 hours		
Iodine filter efficiency	99 percent	90 percent (95 percent for solids)	10	1
Effectiveness of stack	Yes	Yes	1	1

NOTE:

[1]Accident occurs 24 hours after shutdown.

[2]Assumptions in Hatch (Docket No. 50.321) evaluation.

[3]2-hr dose is evaluated at site boundary of about 1400 meters. 30-day dose is evaluated at low-population zone of 3128 meters.

[4]Amount of retention depends on the ratio of air space to water space. In this case, the equivalent value of 75 percent is obtained.

Table 14.9-2

(Sheet 3)

SENSITIVITY OF DOSES TO VARIATION OF ASSUMPTIONS
CONTROL ROD DROP ACCIDENT

Assumptions	Design "Base" Case	Assumed AEC Case	Factor Affecting Thyroid Dose	Factor Affecting Whole Body Dose
Fission products released to water	1.8 percent noble gases, 0.32 percent iodines from 330 perforated fuel rods, solids negligible	100 percent noble gases, 50 percent iodines from 330 perforated fuel rods	156	55
Noble gases carry-over to condenser hotwell	Uniformly mixed with steam, carried over at 5.0 percent steam flow rate, isolation valve closure at 10.5 sec.	100 percent	1	10
Iodine carryover to condenser hotwell	Retention in water,[1] uniform mixing in steam dome, carryover at 5.0 percent steam flow, and isolation at 10.5 seconds	10 percent	2700	1.0
Iodine plateout in condenser hotwell	None	50 percent	0.5	1
Release mechanism	1800 cfm from vapor space of condenser and turbine, stack release	Leak rate of 0.5 percent per day from condenser to environs	5.5×10^{-4} (2-hrs) 1.13×10^{-2} (30-days)	5.5×10^{-4} (2-hrs) 1.13×10^{-2} (30-days)

NOTE:

[1]Amount of retention in condenser hotwell water depends on relative ratio of steam space to water space. The "base" case uses an equilibrium partition factor of 100 and a steam-water space ratio of about 12.

Table 14.9-2

(Sheet 4)

SENSITIVITY OF DOSES TO VARIATION OF ASSUMPTIONS
STEAM LINE BREAK ACCIDENT

Assumptions	Design "Base" Case	Assumed AEC Case	Factor Affecting Thyroid Dose	Factor Affecting Whole Body Dose
Steam and Water Mass Lost in blowdown (10.5 sec. closure)	185,000 lb (25,000 lb steam 160,000 lb water)	185,000 lb	1	1
Total fission gases released	146 curies iodines and 5.7 curies noble gases[1]	Proportional to operating limit, 10.5 times the base case value	10.5	10.5[2]
Concentration in water and steam	Equilibrium separation	Equilibrium separation	1	1
Steam cloud rise	No	No	1	1

NOTE:

[1]Based on fission product concentrations in coolant such that the offgas release rate at stack reaches the maximum expected value of 10,000 FCi/sec.

[2]In the steamline break accident, the noble gases contribution to the whole body dose is insignificant.