

SEP 13 1984

MEMORANDUM FOR: Chairman Palladino
 Commissioner Roberts
 Commissioner Asselstine
 Commissioner Bernthal
 Commissioner Zech

THRU: William J. Dircks (Signed) William J. Dircks
 Executive Director for Operations

FROM: Harold R. Denton, Director
 Office of Nuclear Reactor Regulation

SUBJECT: FOLLOWUP TO THE COMMISSION MEETING OF SEPTEMBER 5, 1984,
 ON INDIAN POINT

At the Commission meeting of September 5, 1984, on the staff analysis of the risk posed by accidents at Indian Point, we promised to supply you with hard copies of the two backup slides on our comparisons of the risk with several emergency response models. These are enclosures 1 and 2. In addition, Commissioner Bernthal requested information on the times at which radiation releases take place and the frequency of occurrence estimated for the release categories depicted on slides 7.2, 7.3, and 7.4 of the original handout package. This information is contained in enclosures 3 and 4.

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Original Signed by
 H. R. Denton

Harold R. Denton, Director
 Office of Nuclear Reactor Regulation

Enclosures: (4)
 As stated

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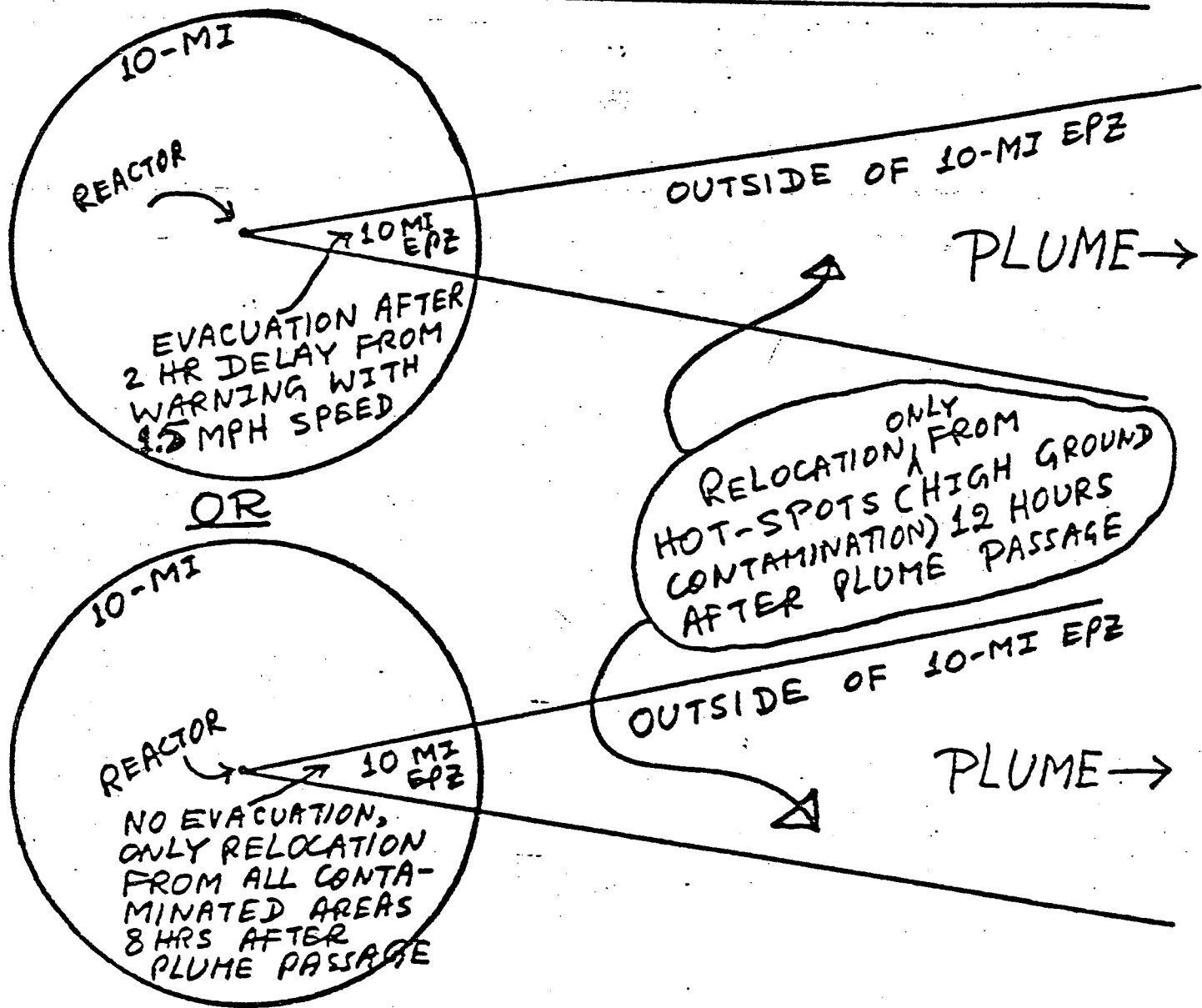
Contact:
 F. Rowsome, NRR
 49-28016

Note: See previous concurrences.*

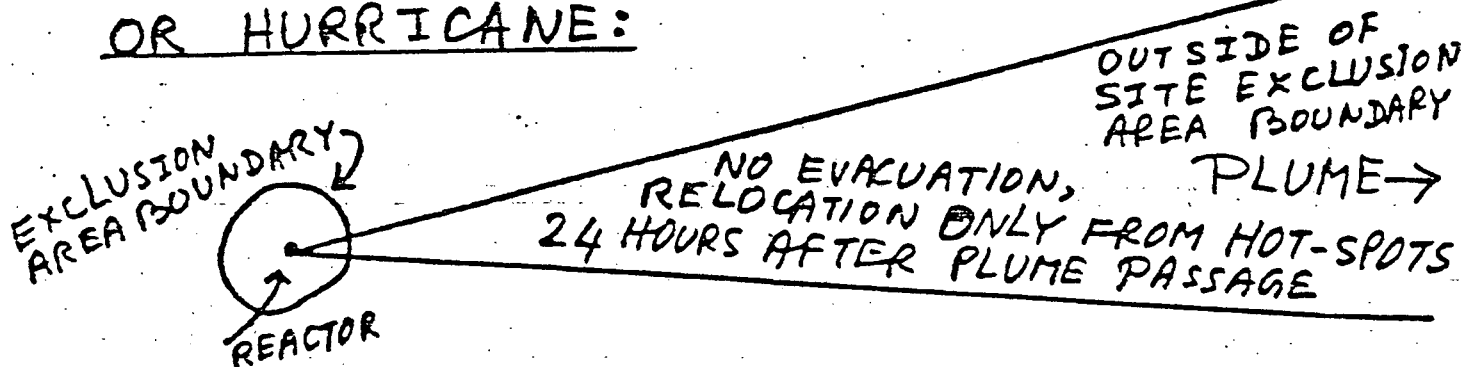
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SURNAME	FRowsome/jm	TSpeis	ECASE	HDenton	WDircks	
DATE	9/10/84	9/10/84	9/11/84	9/11/84	9/11/84	

EMERGENCY RESPONSE MODES

A. DURING CONDITIONS OTHER THAN SEVERE EARTHQUAKES OR HURRICANES:



B. DURING A SEVERE EARTHQUAKE OR HURRICANE:



~~B.7.0~~
B5.1

TABLE IV.B.1
Expected Risks for Indian Point Unit 2
vs. Emergency Response Model

Risk type	evac-reloc ⁽¹⁾	early reloc ⁽¹⁾⁽³⁾	late reloc
Early fatalities w ⁽²⁾	0.0148	0.0149	0.0252
Early fatalities wo ⁽²⁾	0.0360	0.0361	0.0634
Early injuries	0.115	0.115	0.166
Total cancer fatalities	0.209	0.210	0.228
Person rem	2619.	2610.	2810.
Property damage (\$)	281,000	263,000	262,000
Source table	III.C.6	III.C.13	III.C.20

- (1) late relocation is applied to accidents caused by earthquakes and hurricanes in each case.
 (2) w = with supportive medical treatment, wo = without.
 (3) Release Category C is modeled with evacuation for those occurrences not caused by earthquakes or hurricanes.

The corresponding results for Unit 3 are shown in Table IV.B.2, which summarizes Dr. Achary's tables III.C.7,14, and 20.

TABLE IV.B.2
Expected Risks for Indian Point Unit 3
vs. Emergency Response Model

Risk type	Expected (average) evac-reloc ⁽¹⁾	casualties ⁽¹⁾⁽³⁾ per unit year early reloc	late reloc
Early fatalities w ⁽²⁾	.00375	.00390	.0125
Early fatalities wo ⁽²⁾	.0111	.0113	.0353
Early injuries	.0409	.0412	.0762
Total cancer fatalities	.1138	.1144	.1292
Person rem	1430	1440	1600
Property damage (\$)	165,000	145,000	144,000
Source table	III.C.7	III.C.14	III.C.20

- (1) Late relocation is applied to accidents caused by earthquakes and hurricanes in each case.
 (2) w= with supportive medical treatment, wo= without.
 (3) Release category C is modeled with evacuation for those occurrences not caused by earthquakes or hurricanes.

ENCLOSURE 3

Release Characteristics for Indian Point

Table III.B.3 Radiological Releases from the Containment Building - CRAC Input
(Abstract from Indian Point Testimony)

Release Category	A	B	C	D	E	F	G	H	I
Associated Failure Mode	β	V, α	δ , TR	γ	γ	γ	β	ϵ	NF
Release Time (hours)	3	1	13	9.4	12	3.0	2	72.0	Leakage Through-out
Release Duration (hours)	2.0	0.5	0.5	0.5	0.5	0.5	8.0	8.0	8.0
Release Energy (BTU/hr x 10 ⁶)	5.0	0.5	98	137	180	180	0.3	0	0
Warning Time (hours)	1	1	8	1	1	1	1	67	1

III.C-4

Table III.C.4 Summary of the calculated probabilities of atmospheric release categories (RC) for the alternative design scenarios

Scenario	RC-A	RC-B	RC-C	RC-D	Calculated Probability per Reactor Year					Total
					RC-E	RC-F	RC-G	RC-H	RC-I	
Unit 2										
Before Fix										
Earthquake										
and Hurricane	7.0(-7)*	3.20(-8)	1.28(-4)	0.0**	0.0	1.6(-6)	3.2(-7)	1.6(-4)	1.92(-5)	3.10(-4)
Other causes	0.0	4.68(-7)	1.68(-4)	1.01(-6)	1.64(-7)	6.91(-6)	6.78(-7)	2.51(-4)	2.44(-4)	6.72(-4)
After Fix										
Earthquake										
and Hurricane	7.0(-7)	4.30(-9)	1.72(-5)	0.0**	0.0	2.15(-7)	4.3(-8)	2.15(-5)	2.58(-6)	4.22(-5)
Other causes	0.0	4.30(-7)	1.8(-5)	1.01(-6)	1.64(-7)	5.03(-6)	3.02(-7)	6.27(-5)	2.21(-4)	3.09(-4)
Unit 3										
Before Fix										
Earthquake										
and Hurricane	3.5(-8)	1.32(-9)	4.8(-6)	0.0**	0.0	9.6(-8)	1.32(-8)	6.24(-6)	1.68(-6)	1.29(-5)
Other Causes	0.0	4.66(-7)	1.47(-4)	1.02(-6)	1.0(-7)	7.90(-6)	1.11(-6)	2.31(-4)	2.74(-4)	6.63(-4)
After Fix										
Earthquake										
and Hurricane	3.5(-8)	1.32(-9)	4.8(-6)	0.0**	0.0	9.6(-8)	1.32(-8)	6.24(-6)	1.68(-6)	1.29(-5)
Other Causes	0.0	4.33(-7)	1.26(-5)	1.02(-6)	1.0(-7)	6.23(-6)	3.30(-7)	6.39(-5)	2.54(-4)	3.39(-4)

*7.0(-7) = 7.0 x 10⁻⁷

**Calculated probability is very small and is neglected in consequence analysis.