FEB 7 1977

50-289

MEMORANDUM FOR: D. F. Bunch, Chief, Accident Analysis Branch, DSE

FROM: W. F. Pasedag, Safeguards Engineer, Operating Reactors Safeguards Branch, DOR

SUBJECT: THREE MILE ISLAND CONTAINMENT SPRAY

On Friday, February 4, 1977, I attended a meeting with representatives of GPU and Burns and Roe concerning the coverage of the containment achieved with the spray system on Three Mile Island Unit No. 2. With the aid of full size blueprints, and detailed calculation of containment volumes performed by Burns and Roe, a list of unsprayed volumes was reviewed. This list is attached as Table I. In addition the post-accident operation of the containment fan cooling system was discussed.

I recommend that this list be used as a basis for modeling the sprayed and unsprayed regions in the containment. The containment model which would best describe the Three Mile Island containment would consist of three separate regions, with the volumetric distribution and mixing parameters listed in Table II.

/s/

W. F. Pasedag, Safeguards Engineer
Operating Reactors Safeguards Branch
Division of Operating Reactors

Enclosures:
As stated

cc: R. Clark, DOR
H. Silver, DPM
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Form AEC-318 (Rev. 9-53) AECM 0240

TABLE I

THREE MILE ISLAND UNIT NO. 2 CONTAINMENT REGIONS

Description	Volume (ft^3)	Region
1. Above operating floor elevator shaft	8,258	A
2. Inside secondary shield below missile shield and fuel handling bridges total volume	61,840	B1
directly sprayed through openings in bridge structure	5,880	B2
3. Around S.G., shielded by insulation (S.G. compartment open on top)	6,435	C
4. Pressurizer cubicle (pressurizer cubicle closed on top)	9,708	D
5. Below reactor coolant pump motors (open on all sides)	9,149	E
6. Below operating floor, between elevation 305' and 347'		
total volume (includes the following regions)	293,135	F0
elevator shaft	10,285	F1
directly sprayed through open hatches	28,215	F2
stairwell	3,870	F3
below fan coolers*	8,120	F4
7. Below elevation 305' (all unsprayed)	106,250	G

* Fan coolers: minimum of 2 fans (34,000 cfm, ea.) operational. Flow rates distributed as follows:
50,000 cfm mixing of upper region of containment
18,000 cfm mixing between upper region and lower compartments

TABLE II

RECOMMENDED MODELING OF THREE MILE ISLAND UNIT NO. 2 CONTAINMENT

A. Nodes

1. Sprayed region: 1.68×10^6 ft^3
2. Unsprayed regions with good communication with directly sprayed regions: volumes (B1-B2) + C + E + F3 + F4 = 84,000 ft^3
3. Unsprayed regions with poor communication with sprayed regions: volumes A + E + (F0 - F2 - F3 - F4) + G = 395,000 ft^3

B. Mixing Rates

1. Between sprayed and unsprayed regions with good communication:

   1 turnover of unsprayed region per minute
2. Between sprayed and unsprayed regions with poor communication:

   2 turnovers of unsprayed region per hour plus 18,000 cfm enhancement of mixing rate from fan-coolers