

IMMEDIATE

PRELIMINARY NOTIFICATION

April 4, 1979

PRELIMINARY NOTIFICATION OF EVENT OR UNUSUAL OCCURRENCE--PNO-79-67J

This preliminary notification constitutes summary information of an event of safety or public interest significance. The information presented is a summary of information as of 7:00 am on 4/4/79.

Facility: Three Mile Island Unit 2
Middletown, Pennsylvania (DN 50-320)

Subject: NUCLEAR INCIDENT AT THREE MILE ISLAND

Plant Status

The cooling path to remove core decay heat continues to be through "A" steam generator to the main condenser.

Reactor pressure remains near 1000 psi, with bulk core coolant inlet and outlet temperatures at 280 degrees F. Core thermocouple readings are relatively unchanged and indicate a maximum temperature of 466 degrees F which is well below saturation temperature for this pressure. (Only three thermocouples read above 400 degrees F.) Gas is still indicated to be present based on bubble size calculations, but its volume is erratic indicating the effects of solubility and bubble dispersion. Vent valve on pressurizer has been closed and degasification continues through the letdown system.

Containment atmosphere measurements indicate about 2.1% hydrogen. One hydrogen recombiner is operating and an 11-day time period is projected for reduction of the hydrogen concentration to about 1%. At 1430 on April 3, one of three pressurizer level transmitters failed. Alternate methods of level measurements are being developed and procedures reviewed for implementation while calibration can occur with the existing detectors.

Plans to use a robot device to obtain a primary coolant sample are being evaluated. Preop testing with the robot is in progress.

The containment building, April 3, 1979, gas sample results reported on page 2 of PNO-79-67I have been determined to be incorrect and should be disregarded.

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Environmental Status

FDA has reanalyzed the river water sample collected the afternoon of April 2, 1979 at a location 2 miles downstream. The value of 39 picocuries per liter iodine-131 previously reported for this sample (PN-79-67I) has been found to be incorrect; no iodine above minimum detectable levels has been found.

ARMS flights were conducted at 9:00 am and 12:00 noon on April 3, 1979. The maximum radiation levels were detected during the 12:00 noon flight during which a maximum level of 2.0 mR/hr was measured at 1 mile from the plant; the level at 3 miles was 1.2 mR/hr. At a distance of 1 mile the plume was 1 mile wide with centerline about 290°.

Two other flights were conducted at 12:30 a.m. and 3:00 a.m. on April 4. The earlier flight measured radiation levels of 0.3 mR/hr at 1 mile and 0.1 to 0.2 mR/hr at 3 miles at altitudes of 600-700 feet. The plume was 0.3 mile wide at one mile centered at about 210°. Past 3 miles the plume was undefined and radiation levels were about 0.05 mR/hr. The later flight measured radiation levels of 1.1 mR/hr at 1 mile, 0.5 mR/hr at 3 miles and 0.3 mR/hr at 6 miles, at an altitude of about 500 feet. The plume was 0.6 mile wide at a distance of 1 mile from the plant, centered at 235°.

Offsite ground surveys indicated about 0.5 mR/hr for a brief period on the east side of the site. Radiation levels generally ranged from 0.01 to 0.02 mR/hr around the site.

An air sample for iodine-131 was collected in the plume at a location about 0.8 mile SSE of the plant. The iodine concentration in air was less than 1×10^{-10} microcuries per cubic centimeter.

Dose rates in populated areas as measured by NRC thermoluminescent dosimeters (TLDs) showed a slight increase from the previous day. The highest exposure rate was 0.41 mR/hr at a location 1 mile SSE of the plant. Following are the exposure rates for previously reported locations:

	<u>Dose Rate (Milliroentgens per Hour)</u>		
	<u>4/1/79</u>	<u>4/2/79</u>	<u>4/3/79</u>
Falmouth	0.15	0.01	.20
Middletown	0.044	0.01	.02
Goldsboro	0.13	0.05	.07
Goldsboro	0.040	0.02	.05
Lewisberry	0.053	0.02	.04
Pleasant Grove	0.041	0.02	.06
York Haven	0.074	0.02	.10
Conewago Heights	0.044	0.02	.07
Emigsville	0.053	0.02	.07

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Summary of Environmental Monitoring

Data concerning iodine released to the environment has been gathered and evaluated by the NRC, other Federal agencies, the State of Pennsylvania, and by the licensee. Several of the monitoring programs have been ongoing almost since the outset of the incident which began early on 3/28/79.

This information is based on data available to NRC as of 0630, April 3, 1979.

Water

A total of 130 offsite water samples were analyzed by NRC, DOE, and the Commonwealth of Pennsylvania. None of the 130 have shown any detectable radioiodine.

Based on calculations of the radioiodine released from the station to the river, it is estimated that the thyroid dose to any individual drinking the water is less than 0.2 mrem.

Air

152 offsite air samples were taken during the period 3/28-4/2 and analyzed by NRC, DOE, the Commonwealth of Pennsylvania, and by the licensee at distances up to 40 miles from Three Mile Island. The radioactivity in air which has been measured is principally noble gases--xenon isotopes. Eight of the 152 samples have indicated concentrations of radioiodine ranging from 2.7×10^{-13} - 2.4×10^{-11} microcuries/cc. No radioiodine was detected in the other samples. The maximum activity detected is about one-fourth of the permissible concentration established in the NRC "Standards for Protection Against Radiation," in Title 10, Code of Federal Regulations, Part 20 (10 CFR 20).

Based on calculations of the radioiodines released from the station to the atmosphere, it is estimated that the thyroid dose to an individual at the site boundary is less than 50 mrem over a 5-day period.

Milk

A total of 56 samples were collected from about 20 farms, located up to 13 miles in all directions from Three Mile Island. Of these, 38 showed no detectable radioiodine and 18 were reported as "no data." These analyses were conducted by the Commonwealth of Pennsylvania.

FDA has conducted an analysis of 9 milk samples collected April 1, 1979 and reported "positive" results ranging from 14 to 40 picocuries

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of I-131 per liter of milk. A sample of goat's milk, collected on March 30, 1979, contained 41 picocuries per liter. By comparison, the U.S. Department of Health, Education and Welfare recommends placing dairy herds on stored feed when I-131 in milk reaches 12,000 pCi/liter. Local herds are on stored feed because this is not the pasture season.

Based on measurements of the maximum concentration of radioiodine in all milk samples, the thyroid dose to any individual drinking milk is less than 0.5 mrem/day.

Vegetation

One hundred seventy-one vegetation samples have been collected and analyzed by DOE, NRC, and the Commonwealth of Pennsylvania. None showed any detectable radioiodine. These samples were taken at various locations within 2 miles of the site.

Soil

One hundred forty-seven soil samples were collected and analyzed by NRC and DOE. None showed any detectable radioiodine.

Inventory of Iodine in Plant

The greatest quantity of iodine in the plant is contained in the core and the coolant. The following table shows the inventory as of 0001 on 4/3/79.

	<u>Core*</u>	<u>Coolant**</u>
I-131	49 x 10 ⁶ Ci	3.2 x 10 ⁶ Ci
I-133	2.1 x 10 ⁶ Ci	0.12 x 10 ⁶ Ci

*Based on computer projections of Penn State University

**Based on primary coolant analysis decayed to the above date and time

A small source of iodine is from the industrial waste treatment system (IWTS) which presently contains 272,000 gallons of water having an iodine content as follows:

I-131	0.234 Ci
I-133	<u>0.00087 Ci</u>
TOTAL	0.23487 Ci

As of 2400 on 4/2/79, there were approximately 240,000 gallons of liquid in the IWTS with approximately 280,000 gallons of available storage

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space. Currently, the turbine building sump is filling at a rate of approximately 30 gpm; however, over the last 3-day period the liquid has accumulated in the system at an average rate of 143 gpm. At the later accumulation rate, the IWTS would overflow at approximately 11:00 am on April 4, 1979 unless other action is taken. Efforts are underway by the licensee to obtain state approval for discharge.

The maximum concentration of radioiodine in the IWTS was 1.5×10^{-3} $\mu\text{Ci/ml}$ at 1000, March 31, 1979. That value has steadily decreased since that time. As of 1600, April 2, 1979, radioiodine concentration in the IWTS was 4.2×10^{-5} $\mu\text{Ci/ml}$ which, when diluted in the plant discharge water, would be about 1/3 off the technical specification limit of 3×10^{-7} microcuries per milliliter at the plant discharge.

Other Information

The attached table of collective doses was prepared by a joint NRC/HEW/EPA study group.

Contact: DThompson, IE x28487 NCMoseley, IE x28160

Distribution: Transmitted H St 8:18 - AM
Chairman Hendrie Commissioner Bradford
Commissioner Kennedy Commissioner Ahearne
Commissioner Gilinsky

S. J. Chilk, SECY
C. C. Kammerer, CA
(For Distribution)

Transmitted: MNBB 8:39
L. V. Gossick, EDO
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H. K. Shapar, ELD

P. Bldg 9:00
H. R. Denton, NRR
R. C. DeYoung, NRR
R. J. Mattson, NRR
V. Stello, NRR
R. S. Boyd, NRR
SS Bldg 8:30
W. J. Dircks, NMSS

J. G. Davis, IE
Region I
Region II
Region III } Q:45
Region IV
Region V
(MAIL)
J. J. Cummings, OIA
R. Minogee, SD

White House Situation Room 10:20

~~(Handcarry)~~
EPA 11:20 AM
FDA/BRH 12:10 PM
DOE/EOC 12:30 PM
FAA HANDCARRY
FDAA 12:10 PM
BRP 12:50 AM
DCPA 1:00 PM

IMMEDIATE

PRELIMINARY NOTIFICATION

COMPARISON OF COLLECTIVE DOSES TO POPULATION
 WITHIN 50 MILES OF THREE MILE ISLAND
 NUCLEAR GENERATING STATION

Source	Whole-Body Collective Dose (man-rem)	Average Dose to Individual (mrem/year)
Natural Background		
One year's exposure (FES) (1970 population)	233,000	125
(1980 population)	270,700	
Normal Operation (FES) (1970 population)		
One year's exposure (all sources)	31	0.017
Gaseous effluents	2.05	0.0011
30-year operation	930	0.017
Preliminary Estimate of Accident Dose		
Cumulative up to noon 4/2/79	1,800	0.83
1970 population	1,868,000	
1980 census projections	2,165,651	

Note: 1 mrem (millirem) = 0.001 rem
 FES = Final Environmental Statement