April 15, 1979

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

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 a.m. on April 15, 1979.

Facility: Three Mile Island Unit 2
Middletown, Pennsylvania (DN50-320)

Subject: NUCLEAR INCIDENT AT THREE MILE ISLAND

Plant Status:

As of 0600 on April 15, 1979, primary coolant temperature had stabilized at approximately 250 degrees F. Four of the incore thermocouple readings remain above 300 degrees F with the highest at 348 degrees F.

The hydrogen recombiner that failed on April 13 has been repaired and is in the process of being restored to service.

The staff has completed a preliminary evaluation of TMI-2 fuel damage. Examinations of data from core thermocouples, incore detectors and excore ion chambers, and analyses of core parameters such as primary coolant pressure for the first fifteen hours of the transient show several periods of significant core uncovery. These were time periods during which portions of the fuel elements were cooled by steam rather than pressurized water which is the normal cooling method.

It was during these periods of deficient cooling that extensive damage to the fuel elements occurred. This damage occurred primarily by oxidation of the fuel cladding and other zirconium alloy components, which were embrittled and lost structural integrity in some regions of the core. Estimates of the extent of damage were calculated from fission product and hydrogen releases inside the plant and radiochemical analysis of the reactor coolant water. The analyses indicate that significant cladding oxidation occurred in the upper regions of the core and most fuel rods have some damage. The core geometry in the upper regions of the core, especially near the center, is believed to be severely distorted due to loss of fuel cladding integrity in that region. However, the lower and peripheral portions of the core are believed to have retained their basic structural integrity. The highest fuel temperature during the transient is estimated by these damage mechanism analyses to be well below the 5100 degrees F fuel melting point. Previous results of radiochemical analyses of primary coolant samples support this conclusion of little or no fuel melting.

CONTINUED
IMMEDIATE PRELIMINARY NOTIFICATION

Environmental Status:

Offsite radiation levels identified by NRC survey teams were consistent with normal background levels (0.02 mR/hr maximum). The results were obtained from routine surveys performed on the east and west sides of the Susquehanna River at distances up to five miles north and south of the site.

By 9:30 a.m. on April 14, 1979, 375 local residents were scanned with the whole body counter located in Middletown. Scan results indicate no radiation levels above normal body levels.

The following Aerial Measuring System surveys were conducted on April 14. Wind speed was variable. The principle isotope is Xe-133.

Time	Max. Radiation Level	Sector	Distance from Site
1138 - 1221	0.04 mR/hr	270°	1000 feet

The NRC took a 24-hour air sample near the observation center starting at 1600 hours on April 13, 1979. The results indicated less than 3.0 picocuries per cubic meter of iodine-131. The 10 CFR 20 limit for iodine-131 is 100 picocuries per cubic meter.

Dose rates (47 locations) as measured by NRC thermoluminescent dosimeters for the past 24-hour period of April 14 are near expected natural background levels.

A pressurized primary coolant sample was taken April 13, 1979. The six individuals involved received a total radiation dose of 800 mrem. The highest individual dose was 270 mrem.

During the period of 1600 hours on April 13 to 1600 hours on April 14, DOE collected and analyzed the following samples:

Number/Type	I-131 MDA
4 Water	7×10^{-8} microcuries/cubic centimeter
4 Vegetation	0.04 nanocuries/square meter
4 Air (3 ground level and 1 helicopter)	3×10^{-12} microcuries/cubic centimeter
12 Total	

All water, 3 vegetation, and 1 ground level air samples indicated less than MDA for I-131. One vegetation (grass) sample indicated 0.16 nanocuries/square meter I-131. Two ground level air samples (collected at the same location and time side-by-side on April 13 at 11:45 a.m.) indicated I-131 levels of 9.5 picocuries per cubic meter. An air sample taken by helicopter 100 meters downwind of the auxiliary building stack (within the restricted area) indicated an I-131 activity of 119 picocuries per cubic meter. The 10 CFR 20 limit is 9000 picocuries per cubic meter.

The cause of this increase in radioactivity in certain environmental samples is not known but is under investigation. It is possible that the increase is the result of the change-out of the charcoal filters.

Contact: GCGower, IE x27246 DThompson, IE x28487

Distribution: Transmitted H St 1520

Chairman Hendrie	Commissioner Bradford	S. J. Chilk, SECY
Commissioner Kennedy	Commissioner Ahearne	C. C. Kammerer, CA
Commissioner Gilinsky		

Transmitted: MNBB 15:55

L. V. Gossick, EDO	P.Bldg 1524	J. G. Davis, IE
H. L. Ornstein, EDO	H. R. Denton, NRR	Region I 1600
J. J. Fouchard, PA	R. C. DeYoung, NRR	Region II 16:25
N. M. Haller, MPA	R. J. Mattson, NRR	Region III 16:03
R. G. Ryan, OSP	V. Stello, NRR	Region IV 16:05
H. K. Shapar, ELD	R. S. Boyd, NRR	Region V 16:07
	SS Bldg 15:40	(MAIL)
	W. J. Dircks, NMSS	J. J. Cummings, OIA
	S. Levine, RES	R. Minogue, SD

IE (TMI) Site 16:30 (Provide copy to STATE)
White House Situation Room 16:40
FDAA 17:40 (Provide copies to the Administrator and the Operations Center)
EPA 17:52
DOE/EQS 17:50
PEMA [illegible]
BRP (State of PA) 18:05
DCPA 18:20
HEW (Pickup)

Handcarry (FAA)