50-320

J. Sniezek's, IE, working file 3/28/79 - 4/11/79

7906130255

R

slide 5-6 General Description

3/28/79

4:00 a.m. Unit at 98% power

slide 5 - Secondary pumps tripped due to a feedwater polishing problem.

~~slide 6~~ 6- This resulted in a turbine trip and subsequent reactor trip on High Reactor Coolant Pressure.

~~slide 7~~ 7- A combination Feed Pump Operation and Pressurizer Relief-Steam Generator relief valve operation caused a RCS cooldown.

COMMENTS

- At 1600 psig Emergency Safeguards Situation occurred.
- All ECCS components started and operated properly.
- Water level increased in the Pressurizer and Safety Injection was secured manually approximately 5 minutes after actuation.
- The RCS pumps were secured when low NPSH limits were approached.

7:00 a.m. High activity was noted in the RCS coolant sample lines. A site emergency was the declared.

7:30 a.m. General Emergency was declared.

7:45 a.m. Licensee notified Region of the incident.

8:10 a.m. Region Operations Response Center activated.

8:35 a.m. HQ Operations Center activated.

8:43 a.m. Region I Response Team dispatched to site.

10:05 a.m. Response Team arrives at site.

3:30 p.m. The plant is being slowly cooled down with RCS pressure at 450 psi, slide 8 using normal letdown and makeup flow paths. The bubble has been collapsed in the A RC Loop hot leg, and some natural circulation cooling has been established. Pressurizer level has been decreased to the high range of visible indication, and some heaters are in operation.

178 064

The secondary plant is being aligned to draw a vacuum in the main condenser and use the A Steam Generator for heat removal. The facility slide 5 plans to continue a slow (3oF/hr) cooldoun, until the Decay Heat Removal System can be placed in operation at 350 psi RCS pressure, 350oF RCS temperature in 15-18 hours.

~~As of 3:30 pm, a plume approximately 1/2 mile wide and reading generally~~ slide ~~1 mr/hr was moving to the north of the plant. The ARM,s helicopter is being used to define the length of the plume. Airborne Iodine levels of up to 1 x 10-8 uCi/ml~~ have been detected in Middletown, Pennsylvania, which is located by plant personnel.

4:31 p.m. Decision was made to open the Electro ~~Magnetic~~ atic Relief Valve to depressurize.

4:47 p.m. Plan to put A-loop into service - produce steam - natural circulation and cool primary down to a point that the RHR can be put into service.

- Eary Miller - station super at site plus 6 of unit supers.

5:24 p.m. Just starting to steam on the A SG. Vacuum was established at the condenser of 15".

5:39 p.m. Valve between SG and condenser is not opening - steaming has not really started yet. Sending someone to investigate.

5:50 p.m. Started steaming from the "A" SG. SG level dropped slightly - using some makeup water.

6:02 p.m. Steaming in "A" SG continuing - Plan to raise primary system press to 2000 psig to collapse any existing air/steam bubbles.

6:35 p.m. A-loop appears to have little natural circulation. Indications are that some of the bubbles are collapsing.

7:34 p.m. License has bumped the RCS pump - results appear to be successful - not positive confirmation yet.

7:36 p.m. RCS pump seemed to have pumped successfully for the 10 second bump SG pressure went from 20# to over 200#. Have to wait 15 minutes before bumping the motor again.

7:49 p.m. One RCS pump in A-loop has been reported as running - estimates are it will continue to run.

7:52 p.m. RCS pump continues to run, looks like normal cooldown with one pump will provide.

9:11 p.m. Mobile lab on site and is getting set up.

5:15 p.m. Tc-310 TH-? No bubble yet.
Pressure 1050 - Temperature 520°F
Problem with aux. boiler solved and vacuum back on "Hot Well".
Cool down going well and normal.

9:49 p.m. Licensee is now venting through the aux. bldg. vents.

10:00 p.m. Cooldown rate has now been established at 8°F/hr.

10:04 p.m. Licensee reports he now has PZR level indication and a bubble has been established.

11:04 p.m. Loss letdown flow. All waste tanks are full in both units.

11:13 p.m. Approximately 200,000 gallons of water in the aux. bldg. to get rid of.

12:01 a.m. PZR Pressure - 1010 psig
Tc-292
PZR - Temperature 550°F
No let down established yet.

12:29 a.m. PZR Pressure - 1066 psig
PZR Temperature - 554°F
Tc - 291°F
Planning to open bypass valve around the let-down valve.

4:30 a.m. PZR Pressure - 980 psig
TCA - 286°F
PZR Level - 363"
PZR Level - 545

178 067

Waste transfer started to Unit 1 neutralizing tanks.

Approximately 70,000 gallon capacity left in Bleed Holdup tanks.

5:45 a.m. PZR Pressure - 957 psig

TCA - 285p

PZR Level - 350"

PZR Level - 542

TCB - 285°

SG A Pressure - 33

SG B Pressure - 38

Attempts to open PZR spray valve has caused increase in PZR level.

Steam Generator A - Two Bypass valves are wide open.

Bleed holdup tanks have 75,000 gallon capacity.

Relief Valve Letdown flow - 25 gpm.

Incore Thermocouple readings 207-617° - Profile available.

5:45 a.m. PZR Pressure - 898 psig

TAC - 284

- 366

PZR Temperature - 535

TAB - 284

SG A Pressure - 32

SG B Pressure - 37

Tried spray, however, pressurizer level increased 17" in 15 to 20 seconds. Observed restriction in letdown flow.

178 069

3/28/79

COMMENTS

4:00 a.m. The combination of RCS cooldown and loss of steam through the pressurizer relief valve resulted in shrinkage of the primary coolant until the indicated water level dropped out of the pressurizer, and voiding occurred in other parts of the primary system. slide 5

Apparently the reactor coolant pumps were stopped because of concern for NPSH ~~before enough water had been pumped into the primary system (by the ECCS) to collapse the voids in order to prevent damage to recirculation pump seals~~. slide 6

With the primary pumps stopped, Apparently the voids collected in the primary coolant loops at the highest points in the system, the tops of the steam generators.

These voids result in loss of natural circulation in the core and (probably) inadequate cooling of the fuel and possible fuel damage.

At some later time ECCS was restarted manually in order to improve cooling to the reactor core. Up to 500 gpm of water was pumped into the primary system through the High Pressure Coolant Injection (HPCI) pumps. (These are the same as the makeup pumps.) slide 8

Steam venting was accomplished by opening the electromatic ~~electronic~~ relief valves on top of the pressurizer. This steam blows down to a tank in the containment. When the capacity of this tank is reached (after a very short time) the steam is vented directly into the containment, where it is condensed, a rupture disc fails which ~~the resulting water flows into the containment sump where it is available for recirculation to the primary system~~. slide 9

The source of the HPCI water is the borated water storage tank which is

required (by technical specification) to contain at least 4~~3~~50,000 gallons of borated water. Over 140,000 gallons of this water was pumped into the primary system.

Within Facility

Rx. Bldg. dome	20,000 Rem/hr.
Aux. Bldg.	1 to 10 Rem/hr.

Max dose to individual - at Northgate - outside of shelter <500 mrem
annual limit for individual in population) estimated approx. 100-200 mrem

COLLECTIVE DOSE

Approx. 123,500 persons in three northern sections within 50 miles.
Approx. 2,000 man-rem COLLECTIVE DOSE-FIRST DAY.
Approx. 1% of annual COLLECTIVE dose due to natural bkg.

IODINE

One milk sample taken from plume area 21 PCi/I Iodine (MDA 14pCi/I)
FDA Protective Action Guides-
12,000 pCi/I - remove cows from pasture
120,000 pCi/I - control distribution of milk

178 072

Near & Onsite Monitoring Data
March 28, 1979

Time	Location	mrem/hr
0880	Site Perimeter	approx. 1
1000	North Parking Lot	3
	Base of Containment	50
1030	North Gate	approx. 1
1100	SE perimeter	2
1330	400 ft. above cooling towers	10
1400	North Parking Lot	15
	North Gate	3
	300 ft. above containment	20
1430	North Gate	34
1830	North Gate	approx. .05-26
1920	N.W. boundary	3-20

March 29, 1979

0100	North Gate	3.5
0425	North Gate	27
0430	West Boundary	28
	South Boundary	26

Significant Offsite Monitoring Date
March 28, 1979

1400	Middletown (2½mi. North of site)	1-1.5
1500	Harrisburg (approx. 8 miles North of West Site)	Background
	Middletown	approx. 1
1630	ARMS detected plume 16 miles North-North East of Site	.1-.3 Xenon 133
	at approx. 5 miles from site	.3-.8 Xenon 133
1800	Middletown	approx. 1
1930	2 Miles NNW of site	12
2045	ARMS-detected plume over Harrisburg-plume extends to	.1-.3 Xenon 133
	height of 3000 ft. & is 4-5 miles wide at approx. 3-5 miles form site	.3-.8 Xenon 133
2300	Highspere are approx. 6 miles NNW of site	3
	Olmstead Plaze approx. 3 miles NNW of site	5
	approx. 2 miles NNW of site	12

March 29, 197º

0130	3 readings from 2 to 7 miles N	approx. 0.1
0600	Goldsboro - 1 mile due west of site	20

178 073

Offsite measurements of radioactivity have been monitored continuously by federal (NRC and DOE) and state personnel since 9 a.m. on Wednesday, March 28, 1979. All of these measurements (air, water, soil and vegetation) indicate that there is no immediate threat to public health and safety.

The offisite airborne radioactivity is determined to be almost exclusively from noble gases - primarily Xenon-133. There has been small amounts of iodine detected in one of several milk samples. The offsite airborne radioactivity has resulted in minimal exposures to the public in a northerly direction from the plant. The exposures in the air, as measured by a helicopter, are about 0.1 - 0.5 milliroentgen per hour. Natural background is approximately .02 milliroentgen per hour. The highest ground level measurements offsite (about 12 milliroentgens per hour) were measured at about two miles north of the plant. These levels would result in exposures of only a small fraction of the Environmental Protection Agency's recommended protective action guidelines (1000 milli-roentgens).

There have been no known releases of liquid radioactivity.

* 21 picocuries/liter (MDA is 14 pCi/l; FDA protective action guides for peak levels - 12000 pCi/l, remove cows from pasture; 120,000 pCi/l - control distribution of milk)

Status of TMI 2 Incident - 6:00 a.m. 3/29/79 (L. Barrett)

No detectable radiodines in air samples. MDA 1×10^{-9} uci/ml

1 pci/litre
year = 1.5 mrem,

State took 6 milk samples @ approx. 20:00 3/28. Samples were from around the site with the sample taken approx. 5 mi. NW indicating 21 pci/l I-131. Cow on stored feed and in barn. No detectable iodine in any other samples which was expected because plume was toward NNW-NNE.

Region I stated that no apparent steam generator leakage. Air ejector monitor reads background.

Unit 2 vent monitor off scale. Background at monitor 540 mr/hr makes monitor useless. Unit 1 vent monitor indicates low releases from Unit 1. Unit 1 release concentration 1×10^{-6} uci/cc iodine and 3×10^{-7} uci/ml particulates. 84,000 cfm exhaust rate.

ARMS information: 1st flight 16 mi. away approx. 1 mr/hr. NaI instrument calibration for Xn-133 is questionable. Best guess is 0.8-1 mr/hr @ 7 mi. from plant. Plume toward north.

2nd ARMs flight, 8:30 p.m. Harrisburg is few tenths of mrem. (0.1 mrem ?) No iodine detected by ARMs, only Xn-133

The Unit 2 Auxiliary Bldg fans were secured at 00:50 to minimize XN-133 release. This caused an increase in radiation levels in the plant. Unit 1 machine shop 40 r/hr, Unit 2 control room went to respirators approx. 5 mr/hr in control room. Counting room out, using Region I van for counting radiation protection samples. Offsite data @ approx. 1:00 0.1 mr/hr. Fans restarted at 3:30.

Its good to restart fans to prevent iodine exfiltration by pulling a negative pressure in the building and using charcoal filters to absorb the iodine. The Xn-133 with a 5 day half life would get out anyway.

178 075

Light rain started at 1:00. Region to take rain samples to watch for iodine washout expected to occur. Rain ended at approx. 5:00. No data yet.

Weather forecast at 5:00. Wind from the southeast at 5 knots expected to come from the south at 10 knots later in the morning.

04:30 measurement of 20 Mrem /hr at Goldsboro due west. Most likely spike when started auxiliary building ventilation at 3:30. West boundry of Island 28 Mrem/hr at 0405 and 2 Mrem/hr at 0530. North gate (nearest residence) is 27 mrem/hr at 0425.

Apparently primary coolant has been transferred to the auxiliary building at 30 gpm most of the night. At 0400 (and maybe before) it was going to the CVCS bleed (holdup) tank. The bleed tank is vented to the waste gas decay tanks so that the XN-133 should be collected on the tanks for decay.

Failed fuel most likely 1% or could be more based on 0900 3/28 sample and core inventory. No firm containment radiation information.

Offsite Radiation Doses: Based on best available information is that no member of the public should have exceeded the 10 CFR 20 annual limits of 500 mrem over the last 24 hours. Worst location is homes outside of the North Gate. Best estimate is 100-200 mrem range total over the last 24 hours.

Conservatively estimated population doses to be 2,000 man-rems out to 50 miles over the last 24 hours. In the NNW, N, and NNE sectors . See J. Martin notes attached for method of calculation.

These doses are approximately 1% of the annual natural background radiation dose to the population. Asked for radioactivity concentration information in auxiliary building. Can't get ~~x~~ radiation levels. Primary sample sink approx. 200 r/hr. (Auxiliary Bldg Sump)

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF PUBLIC AFFAIRS
WASHINGTON, D.C. 20555

No. 79-65
Contact: Frank L. Ingram
Tel. 301/492-7715

FOR IMMEDIATE RELEASE
(Wednesday, March 28, 1979)

NOTE TO EDITORS: The information below was issued at approximately 5 p.m. EST.

The Nuclear Regulatory Commission has received additional information from its inspectors at the Three Mile Island Power Plant in Pennsylvania where an accident occurred earlier today. This updates the NRC announcement made earlier today.

No injuries have been reported. Low levels of radiation have been measured off the plant site. The maximum confirmed radiation reading was about three milliroentgens per hour about one-third mile from the site. At one mile, a reading of one milliroentgen per hour was measured. It is believed that this is principally direct radiation coming from radioactive material within the reactor containment building, rather than from release of radioactive materials from the containment. Extensive efforts are continuing by the State of Pennsylvania, the Department of Energy, and the NRC to measure the amount of radioactive material which may have been released from the site. A helicopter with special instruments also is being used.

It now appears that the cause of the turbine shutdown at the plant early today was a reduction in flow of feedwater to the steam generators.

The sequence of events which led to the release of radioactivity to the reactor containment building has not been determined. There was a release of primary coolant water to the containment. Emergency core cooling systems are continuing to provide water to cool the fuel. The reactor is shut down. The pressure in the reactor system is being slowly reduced.

NRC has a team of six persons at the site. They will participate in the NRC investigation of the event. The results will be made public. An NRC team also is being formed to monitor the subsequent activities of the licensee, the Matropolitan Edison Company.

#

178 077

3/28/79

10:20 AM

The Nuclear Regulatory Commission has received preliminary information on an emergency situation at the Three Mile Island Nuclear Power Plant near Harrisburg, Pennsylvania. There has been a release of radioactivity inside the reactor containment system. Measurements are still being made to determine if there has been any radioactivity detected off the site. There is no indication of release off the site at this time..

Metropolitan Edison Company, operator of the plant, has reported that the turbine of Unit 2 at the plant tripped off early this morning, closing off the steam flow from the reactor to the turbine. The cause is not known at this time.

There was a release of primary coolant water into the containment. The emergency core cooling systems are being used to provide water to the reactor. The Unit 2 reactor is shut down; Unit 1 at the plant is shut down for refueling.

NRC has dispatched a team from its Regional Office at King of Prussia, PA, and they will be at the site shortly. State and other Federal agencies have been notified.

178 078

Status – STATE data

12:55 Call from DCPA-II – Bayette –
Gave him a status update

1:15 Maggie –
Recap of Sampling Program.

Milk – 7 sample from 5:00 am 29th milking – negative

River Water – 4 downstream (before 2:30p) – negative

Rain Water – H'Burg – overnite – No I 131
(MDA. 06 nanocif/sq meter)

Wet grass sample – done – no data
or time or place (back burner)

Flour sample – Camp Hill (Bay St Milling) – negative

Air Samples 10 MINS – gleened from Site & Bk'Haven
Goldbars – 10^{-8} uc/cc St negative 28th AM
Rt 441 – 10^{-7} / negative 28th AM
Downtown – will pull soon – BIG ONES

DOE →

~~Downtown Roof – will pull~~
all data passed to Smeyak.

Ap: 50 A.M.
Called
Don Donaldson
PA Rad
Health

They have nothing new to
report sample wise. Will
be doing more milk
Samples.

Results of wet grass
Samples (Bitt is analyzing,
not available yet.

Told them to best of our
knowledge, Industrial
Waste Tank not dumped

178 079

14:50 – [2:50 pm]

30 March

Offsite Surveys (Ground level)

1500	middleton 2½ miles N	< .1 mR/hr
1545	AW 392/262 - 2 miles W	.3 mR/hr
1620	Goldsboro area - 1 mile W	< 1 - 1 mR/hr

ENVIR. SAMPLES

PA. STATE RAD HEALTH REPORT

Water Samples } nothing
Air Samples } except Xe-133/135
nothing milk

telecon with Doc Collins
5:35 PM FRIDAY

178 080

G. Smith -

14:30 - Pa Gerursky - informed him ~~a~~ comment "dump it" and warn downstream users" -

16:20 - Pa - Riley - 2nd in Connect informed her - 200 gpm with dilution - She sees no problem - ? - ^3H - Pa -

Tried to get EPA - 16:50 - not able to ~~so~~ get in touch with -

15:45 Licensees - no dumping in excess of 2×10^{-4} μc/cc - pulling in new Tech. Spec.

Diluting -

Afternoon -

Neeley - answer, plan
Chuck Hallina - Gov.
Phil Stark - Congress. grp
No one on site

178 081

Condensate polisher - Turbine.
Bld - Industrial Waste Tanks -
3
Storage - get off Aux Bld floor -

Hard to take samples
3.4 Rem -
2 - 2:15 Average 56 mrem / indiv.

Feel Dome monitor faulty -

150,000 gal - RW 57 in bottom
of containment

Melted or failed fuel -

Senario - Klinger,
Licensee

178-082

3 Rad Monitors -

80-100 R/hr - Dome

10 " } location?

1/2 " }

No Iodine offsite -

2.8 % failed fuel

1 % " " - Lake

Quex Bld - overflight - 7-9 mr/hr -

	Rm
717-939-9854 -	122
Volmer	121
	119
	120

178 083

G. Smith

H_2O Industrial waste tank - showers, toilets etc in Turbine Bldg:

10^{-3}-10^{4}

Discharged 200 gpm into cooling tower - [275 - dilution]

Wind to NE - slow at surface 15 knots 3000 ft

Time of discharge - after 1430 - Earliest -

Stella saying 400,000 gallons -

178 084

M. Slobodeem R.I -
Unit 2 Control Room
1945 -
Doug Collins -

(A) Confirmed 1×10^3 R/hr of 1° coolant H_2O.

Plants - 2-4 Ci Noble gas -
→ NRC - 150 mCi/ml mixed fiss. prod.

To get sample =
~~[illegible]~~ -

B. Crocker called at 2:00 3/30/78 — 3.1 Rem - Operator
3.5 Rem - Chemist

(B) Charcoal Contin. air Monitor
10:15 - Aux Bld. Vent -
Counted 11:30 - NRC Ge
To hot count quan.
Qual - Xe-133, 135 + I-131, 133,
Xe to I ratio - 100

178 085

(C) 20-25 Entrees Aux Bld
Each a 1 Rem / person

(D) Rad - Level Aux Bld
300-800 mr / hr
Hot Spots 100 R / hr -

Personnel contam - easy
~~to~~ decon.

Ground Radiation Survey - 7 PM -

Ground Level - ~~under plant~~ Survey south
of plant

178 086

Jim Martin - Accident -
340-1676

ARMS - 8:15 -

Circled site at about 8 miles -
1000' ft - Good altitude
Saw no plume -
Residual pockets - 50 μR/hr -
NaI survey meters - 2 higher
than ion. chamber - ∴ 25 μR/hr

N ⊞ →

24-12
20-8 Are standing by for further instructions.

Time - 1646 - lost
1730 - on - [3-28] -
[3-29]

178 087

ARMS ~ 10:30 3/29/79

Dale Donaldson -

NW direction -

Plume touching down 1 miles from Plant - Hill island plume splitting -

- West Section - Hill is + sla
- East - tracing river - touch ground 4 mr/hr - 1 mile from plant -
- 1 mile N of Hill island - 1 mr/hr near air force base at 200 ft - also ground level reading

Met Data - Wind direction ~ three night - ~~[illegible]~~ see creep up river

Morning - N to NE - over Middletown - speed 10-15 knots help dispersion -

Size of plume ~ at 5 miles - mR/hr

Width of Plume = width of river

178 088

Betw. Swatara Creek + end of runway at Olmstead Air Force Base.

~~Wood~~

Ground level Meas. - will go out to 0.5 mr/hr.

Upfast - at 500 ft - below plum -

Plum - 1/4 mile - 4 mr/hr - Top of Shelby island - going off island and then touching down.

178 089

700 / 60 / 42000

6.4×10^{-4} μCi/ml Xe-133

5.4×10^{-4} μCi/ml Xe-135

200 gpm from 2:30pm to 6:00pm

3½ hr at 200 gpm

$200 \text{ gal/min} * 3.5 \text{ hr} * 60 \text{ min/hr} = 4.2 \times 10^4 \text{ gal}$

$4.2 \times 10^4 \text{ gal} * 3.8 \text{ l/gal} * 10^3 \text{ ml/l} * 6.4 \times 10^{-4} \text{ μCi/ml}$

$1 \times 10^2 \times 10^4 \times 10^3 \times 10^{-4}$

1×10^5 μCi = 0.1 Ci

Xe-133

5.4×10^{-4} μCi/ml Xe-135 = 0.086 Ci Xe-135

178 090

Population Dose Status @ 0600, 3/30 by Lake Barrett

The cumulative population dose to people in unrestricted areas since the start of the incident is estimated at less than 2,400 man rems as of 0600 3/30/79.

The radioactive effluents during the period 0600, 3/29 to 0600, 3/30, had ~~dec~~ decreased from the previous day by approximately 80% resulting an (estimated) population dose of 400 man-rems for that 24 hour period. Radiation levels appear to continually decrease.

Lake Barrett

178 091

		→ grew B/f
0600	W side of river	7.47×10^{-8} uCi/cc I^{131}
0650	Control Room	1 mr/hr
0710	• Containment dome	3000 R/hr
	• deck monitor failed and logged out of service	—
	• personnel hatch	10 mr/hr
0715	west side of river	1 mr/hr
0721	" " "	2 mr/hr
0728	" " "	3 mr/hr
0735	W edge of island	3.5 mr/hr
745	Unit 2 control room	1.5 mr/hr
0745	~4 mi N of site	1 mr/hr
0815	wind from 150°↔120° @ 6-8 mph	

178 092

AERIAL MEASURING SYSTEMS (AMS) FLIGHTS DURING THE EVENING OF MARCH29, 1979

Aerial measurments of the airborne radioactivity from the Three Mile Island plant are being measured by a helicopter provided by DOE under their Aerial Measuring System (AMS) program. Two flights were made by the AMS helicopter on the evening of March 29, 1979 at approximately 8:15 and 10:30 p.m.

During the first flight, measurements were made in a circle around the site at a radius of about eight miles. No plume of radioactivity was detected during this flight but residual pockets of radioactivity were measured in the range of 25 to 50 microroentgens per hour.

During the second flight a plume was detected northwest of the plant with a width equal to and confined within the boundaries of the river. This plume was touching down about one mile from the plant at Hill Island and then splitting into two parts - one on each side of Hill Island. Measurements at the east shore line of the opposite Hill Island measured about four milliroentgens per hour and the at the shoreline one mile north of Hill Island near Olmstead Air Force Base was about one milliroentgen per hour. Additional measurements at five miles from the plant were in the tens of microroentgens per hour and are in agreement with the earlier flight.

178 093

Pennsylvania Dept. of Health

Time (3/31/79)	Location (West shore)	Reading	mR/hr.
0111	Exit 16 Route 83	.01	[0.35 1359 3/30]
0122	Goldsboro	.01	[1.5 1315 3/30]
0129	Rt 362 + 382 junction	.01	
0132	Yorkhaven	.01	
0139	Manchester	.01	
0143	Emigsville (Rt 11, 83)	.01	
0151	Exit 12 Route 83	.02	
0155	Exit 13 "	.01	
0157	Exit 14 "	01	

(EAST SHORE)

(3/31/79)			
~~0035~~	Airport	.01	[0.3 2220 3/30
0038	Downtown Middletown	.01	
0044	TMI Observation Center	.01	
0046	Falmouth	.01	
(3/31/79) 0100	Bainbridge	.01	
0104	Marietta	.01	
0107	Mt. Joy	.01	
0115	Elizabethtown	.01	
0133	~~Exit~~ Vine St. Exit 283	.1	[0.3 0022 3/3

7:15 am 3/31

Gross $\gamma = 2.0 \times 10^{10}$ cpm/ml

Gross $\beta = 1.6 \times 10^{10}$ dpm/ml

I-131*	8.1×10^{5}	μCi/cc
I-133*	3.9×10^{5}	μCi/cc
Sr-89,90	3.2×10^{2}	μCi/cc
Cs-134	3.8×10^{3}	μCi/cc
Cs-136	1.1×10^{4}	μCi/cc
Cs-137	1.7×10^{4}	μCi/cc
Ba-140	1.2×10^{3}	μCi/cc
U (total)	< 0.1	ppm

* calculated for 1200 hrs 3/30/79.

7:00 3/31

H_2 - 1.7%

O_2 - 16.5%

N_2 81.8%

~~25 cc sample~~

~~@ contact 320 mR/hr~~

~~50 μCi/cc~~

8:16 Crocker isodose 145-510

routing

Start Observation Center

441 N to Middletown

at Route 230 south few mile

Double back 230 thru

Middletown pass Airforce base

at Highspine on Eisenhower blvd

going N

stayed to turnpike exit 19 on

turnpike went west across

River off turnpike Exit 18

Highway 83 S at Limkin

to 262 went Exit 262

over to Yocmkintown into

Goldsboro (262) down dine cly

262 to 382 south to

York haven - 181 South to York

at York Highway 30 across to

E side river back on 441 N

up 441 to Observation center

.05 mR/hr at cly .2 mR/hr .15 mR/hr

178 096

Radiation and radioactivity are a natural part of man's environment. The average person in the United States receives over 100 millirem per year from natural radioactivity and an equal additional amount from medical and dental use of x-rays. In the population within 50 miles of the Three Mile Island nuclear plant, i.e.~670,000, these two sources of radiation alone would result in a collective exposure of 13400 person rem every year, or 780,000 person rem over a 60 year life span. This can be compared with a calculated value of 2500 person rem due to the accident at the station, so that the single event has added an increment of only 0.3% to the average lifetime exposure of the individuals in the area.

Although at these very low levels of exposure it is not known that radiation is harmful, it is conservatively assumed that harm that can be measured at very much higher exposure rates can be used to predict harm at the low rates that are associated with background, and the releases of radioactivity from the Three Mile Island plant. On that basis, the possible number of eventual latent cancer deaths that might result in the 50 mile population from the plant release is 1/4 of a death over the entire lifetime of that population group. In that same population, over 20%, or 130,000 people will eventually die if cancer from all cuases, based on current cancer deathrate data.

It can be noted that there are over 12000 person-rem/yr added to the exposure of that portion of the U.S. population that travels in high altitude aircraft during a year.

178 098

Licensee Info — 3 Mile Is.

18:50 - 6:50 p.m

Control Room - Unit 1 -

*Kr85 - 5×10^{-4} μCi/ml - immediately

Particulate - 1.54×10^{-7} μCi/ml -

may be high → Iodine - 1.67×10^{-7} μCi/ml

Aux Bld + Fuel Handling Bld

*Kr85 8×10^{-3} μCi/ml

- Everyone respiratory probe.

Kr85 - [Xe-133 + Xe-135]

Continuous air monitoring of licensee

178 099

Environmental Status

at 5:30 pm., March 30, 1979, the Pennsylvania State Radiation Health Department reported that environmental water and air samples collected in the vicinity of Three Mile Island showed no detectable activity except for some xenon-133 and xenon-135. Milk sample analyses were negative.

Offsite ground level gamma surveys ~~from~~ ~~to~~ between 3:00 and 4:00 p.m. on March 30, 1979 provided the following results: (1) at Middleton 2½ miles north of the site less than 0.1 mR/hr; (2) at the intersection of Highways 392 and 262 two miles west of the site, 0.3 mR/hr; and (3) in the Goldsboro area one mile west of the site levels ~~reg~~ ranged to 1 mR/hr. at 5:00 pm, gamma radiation levels for the Goldsboro area were reported as 6 mR/hr by the Metropolitan Edison Co. helicopter and as 1 mR/hr at ground level.

At 5:00 p.m winds were reported at 2-3 miles per hour from east to west. Forecast indicate ~~precipitation in the form of~~ thunderstorms moving in after ~~midnight~~ 12:00 midnight, March 30, 1979.

178 100

Bettis readings — Ground
Yorkhaven — .5-1 mr/hr
295 + 382 — .05-.1 mr/hr ~~[illegible]~~
Royalton — .03 μr/hr (Note
observation center — .13 μr/hr (micro r/hr)

Met Ed helicopter

500 ft	1058 hr	over island	130 mrem/hr
700 ft	1100	E side of isl.	.8 mr/hr
700 ft		N bridge	.7 "
700		NW side of isl.	.7 "
700		warehouse S of aux bldg	2 "

RC team

2.5 mr/hr highest	S of Goldsboro on rt 262
.6	entering Cly on 262
2.6	1 mi into Cly
0.1	N of plant on rt 441 in Middletown
0	intersection of 230 + 283
0	W from intersection on 283
0	turnpike ~~[illegible]~~ + 283
0	S on rt 283 from intersection

RMS

1045-1145 hrs 2 copters

1/4 mi radius	300 ft	peak in W quadrant	20-30 mr/hr	
"	500		8 "	✓
1/2 mi radius	500	peak SSE sector	1 "	✓
	1000			
1 mi radius	500	peak SW & NNE	1/2-1 "	✓
	1500		100-150 μr/hr	
3 mi radius	600	peak SE	1/2-1 mr/hr	✓

flew from site out following plume in SE direction to distance of 5-6 mi where plume disappeared

178 101

Vented from letdown makeup tank to vent header
site boundary level increased from 2 mr/hr to 30-100 mr/hr

in Trailer Cong. Walker — NRC van
~20 press etc outside van — want to know what
NRC is recommending now.

NRC survey team data
from 3 ~~E~~ 1 mr/hr — out to 5 mi. S of plant
S on Rt 441 9 mr/hr 1½ S of obser. center at bridge
no real evidence of plume onto Island. —
on way back
was ~ 3 mr/hr

178 102

Population Doses

As of 0600, 3/30/79, the estimated cumulative population dose from the radioactive effluents is less than 2400 man-rems. The ~~estimated~~ population dose from the period 0600, 3/29/79 to 0600, 3/30/79 is estimated at 400 man-rems which is a 80% reduction from the estimated population dose from the previous day

In-Plant Exposure Data

General - ~25-1 Rem dose being received per entry into Aux. Bldg.
20-25 entries

3/29/79 - ~1600 hrs operator + chemist collected 1° samples
operator - 3.1 Rem
chemist - 3.5 Rem

Aux Bldg. - 300-800 mr/hr
± 100 R/hr [illegible]
personnel contamination - easy to decon

Waste Gas Decay Tank — Releases

3/30/79 - ~ 0240
0800
1109
1450 ~ 100 mr/hr B & - Wood side of vessel.

~~B. Beverly~~

Jack Davis 488-1329

Please ask Charcoal cartridge HPR 219

so hot couldn't detect Aux Bld vent -

178 106

3/3/79

	distance	direction	TIME 940	1000	1015	1102	1117
GE 1	1375 ft	North		0.1-0.2			
2	1,750 ft	between NNE+NE					
3	1,375 ft	NE					
4	1,125 ft	E-SE					
5	1,000 ft	SSE-SE	4.0 β 30 1.0 γ	0.5 0.1			0.8 0.2
6	2,250	SSE					
7	2,150	S					
8	875	SW	0.3 β 0.1 γ		17.0 β 6.0 γ		8.0 β 3.5 γ
9	650	WSW	0.5 β 0.2 γ	7.0 β 4.1 γ	250 β 9.0 γ	6.0 β 9.0 γ	5.0 β 1.5 γ
10	625	W-NW					

Met Ed measurements

Reference - unit 1 Containment

1130 3/30/79

		distance	direction
GE	1	1,375 ft	North
	2	1,750 ft	between NE & NNE
	3	1,375 ft	NE
	4	1,125 ft	E-SE
	5	1600 ft	SSE-SE
	6	2250	SSE
	7	2,150	S
	8	875	SW
	9	650	WSW
	10	625	W-NW

1500

Met Ed measurements

Reference - unit 1 Containment

River Water morning of 29th
~~[illegible]~~ 1 Samples ~~[illegible]~~ downstream - NDA

Rain Water collected Harrisburg evening 28-29 - NDA I'131

~~West~~
~~Flow Samp~~

Air Samples
Goldsboro morning 28 NDA
441 NDA

178 109

TYPE

Penna Dept of Health

Information received 0638

Milk samples collected in evening 3/30 at following locations

Middletown
York
Bainbridge
Ethers
Harrisburg (2)

No detectable ~~activity~~ radioiodine.

Water downstream two filtration plants at Columbia, PA for City of Lancaster and Wrightsville, no detectable activity. Samples taken Friday AM and early afternoon.

178 110

3/31/79

NRC Survey team – Offsite

1920	200 yds North of Visitor Center	3 mR/hr	
2034	Inside Van – 500 yds East of plant	.03	<.01
2045	Zion Rd – 3/4 mile East of plant	4.5	.6
	Inside Van – 500 yds E of plant	5.0	.6
2130	Gurnee/Zion Rd (~2-3 mi NE of plant)	.6	
2215	NRC Van – 500 yds E of Plant	5.0	1.0
2258	Visitors Center – 500 yds E of Plant	7.5	1.2

178 111

3/31/79

Data from DOE Survey Team — Offsite
1950 — 2020

Goldsboro ~ 1 mile west of Plant ~~5 mi~~ <.1 mR/hr

Highway 262/392 2½ mi NW of plant ~~5 mi~~ <.1 mR/hr

Highway 262/83 7 mi NW of Plant ~~8 mi~~ <.1 mR/hr

Travers 262/83 traveling south to 382/83 (~5 miles west of plant) ~~8 mi~~ <.1 mR/hr

Highway 382/262 3 miles SW of plant <.1 mR/hr

178 112

Containment Gas Analysis

Isotope		Result (d/m/ml)
Xe-133	676 μCi/ml	1.5×10^9
Xe-133m	16 "	3.5×10^7
Xe-135	8.1 "	1.8×10^7
I-131	1.4	1.4×10^5
I-133	< 6E4	(LLO) <.03 μCi/ml

Above results decayed to 0700, 3-31-79, the time the sample was taken.

In the update report received, it was noted that the sample also contained I-133 with an activity less than 6×10^4 d/m/ml.

Also reported were analyses on the primary coolant sample taken 3-30-79:

Gross alpha (two measurements on sample) - 8.4×10^5 d/m/
- 1.0×10^6 d/m/

Differences in the gross alpha analyses considered statistically insignificant

Wet chemistry analysis for uranium showed none above minimum detectable of 250 ppm.

Results on all analyses given to Grier, Denton & Met. Ec

178 113

3/31/79 22:30

Bob Bores Region I

Primary Coolant Sample - Bettis Analysis

Gross Alpha Data

2 samples

mmts of sand 8.4 x10^5 dpm/ml = 0.38 μCi

1.0 x10^6 " = 0.45 "

Uranium Chemistry - ND uranium means < 250 ppm.

Containment samples - Not available next couple hours.

178 114

State of Pennsylvania Data -

Water Samples - Susquehanna River

LOCATION	DATE	TIME	ACTIVITY
Lancaster	3/30	6 p.m. to 12 p.m.	NDA*
Harrisburg	3/31	2 a.m to 8 a.m.	NDA*
Harrisburg	3/31	No time	NDA*

Milk Samples -

LOCATION	DATE	SAMPLES	ACTIVITY (pCi/l)	
Etters, Pa.	3/31	2	< 28	NDA*
			< 30	NDA*
New Cumberland	3/31	1	< 27	NDA*
Elizabethtown	3/31	1	< 32	NDA*
Middletown	3/31	1	< 26	NDA*
			< 30	NDA*
Mountwolf	3/31	2	< 26	NDA*
			< 27	NDA*
Hummelstown	3/31	1	< 26	NDA*

* NDA - No detectable activity

3-31-79

1920 hrs. ---- George Smith reported:

DOE team survey report:

across rive from cooling 8 mrad/hr (β/γ)
tower (West side) — general area 1.5 mR/hr (γ)

1930 Series of readings in Goldsboro area, by DOE, uR ranges

178 116

3-31-79

1905 George Smith report!

Licensee informed NRC in-plant HP that routine venting again at 1855 hr. Licensee did not pick up any increase in environmental activity as a result.

3/31/79

1900 Report from Georg Smith:

- NRC survey team reporting background readings because wind is shifting so rapidly that teams cannot move under cloud. Wind at about 2 mph

They are trying to get in contact with in-plant HP to ask him to make a tour around the plant to see if, perhaps, the gases are just spilling over the sides of the bldg.

Still raining —

3-31-79

1815 hrs : Report from Bruce Ricey

NRC team on Race Street headed towards Maytown

Stone Mill + Race St Maytown Smith	0.17 mR/hr γ
Race St + 441	0.4 " "
Bainbridge	0.2 " "
Wickersham Rd - just off 441	0.12
In front of Greenhouse across from river rear	1.0 mR/hr γ
NRC Trailer (reading taken at 1815 hrs)	1.0 " "

3/31/79

(*)

1735 hrs Bruce Dicey report:

Chasing plume headed SSE:

at King's Rd - 441 intersection	0.12	γ
at Amos Site Road (0.3 mi east of 441)	0.6	γ
at Intersection of 441 + 241	0.4	γ

Report received from Plumley?, in-plant HP ....

10.7 mR/hr at the door of Unit #2 Equipment Containment Shed

(Dicey noted he had poor telecon connection but unable yet to confirm the above location.)

178 120

03-31-79 → (X)

1710: Bruce Dicey report:

Reading taken at 1710,
5 miles south: β-γ 2.8 mR/hr
γ 0.5 mR/hr

at this time Governor's Road appear
to be at the eastern edge of the plume.

In response to your (Knapp) question,
the readings for the last hour
have been typical readings for
the area the surveyors passed through

178 121

cont. gas sample at

Montgomery

answer to question

03-04 AM Met Ed Operator
Aux Bldg 4.1 Rem
(500 mrem) TLD

3:44 from 315 (12)

		Bγ	γ
4:30	~~B~~ 4 mile south	4 mR	0.6 mR/h
	Falmouth General area	2 mR	0.3

178 122

3/31 ~~344~~
344 PM wind from 315° @ 12 mph ✓

~~430~~

		$\beta\gamma$	γ
4:30 pm	3/4 mile south of site	4	0.6 mR/h
	Falmouth 2 miles S of site	2	0.3 mR/h

178 123

3/31/79

Offsite

1300 — wind from SSW → NNE
at 10-20 mph

Hillsdale Rd ½ mile E 2 mR/hr

~~SE~~ Bunger Road ½ mile SE .5 mR/hr

1335 Hamilton pike - geiger Rd intersection 3 miles NE .3 mR/hr

1520 started raining

Observation Center ½ mile E 1.5 mR/hr

1:00 PM ground level

Hillsdale Rd ½ mile E 2 mr/h

.6 mile SE Bunga Rd .5 mr/h

1355 H'burg pike 1 mi E intersection 0.3 mr/hr
Geyers church road

1335 10-20 mph 225→240

178 125

corrected
1200
32c

Bettis

I 131	3.0×10^{10}	dpm/ml
33	1.5×10^{10}	
Sr 89/90	1.2×10^{7}	
Cs 134	1.4×10^{8}	
Cs 136	3.9×10^{8}	
Cs 137	6.1×10^{8}	
Ba 140	4.7×10^{7}	

U_{tot} < 0.1 ppm (MDA) ≈ 1,250 ppm in

Mastic at Bettis

3:20 trailer 1½ mr/hr

15 mr/hr mobile lab 38 } stated today

Discharging water!

0120	441 & G Church Rd	-1.2
0120	N gate	2.8 BS
0150	R 230 & Geyer Ch Rd	0.2
0155	Center Geyer Ch Rd	0.2
0236	N Gate	<0.1 BS
0255	Geyers Ch Rd	0.2
0545	N Gate	5

178 127

Date: 3/31/79

OFF-SITE DATA

ARMS overflight report for 3/31/79, 1200 to 0115 hours:

Essentially no change from earlier two overflights.
Plume direction is from 030° to 060°.
Maximum readings observed (beta-gamma):
1.5 mR/hr at 1 mile at 500'
1.5 mR/hr at 3 miles at 300'
At 3 miles plume top observed at 2,800'.
Plume is on the ground at 3 miles.

No iodine observed; xenons are the only activity.

ON-SITE DATA ~~(6)~~

3-31-79

2335 hrs : Report Bruce Davey :

Received report at 2300 with update report at 2320 hrs from Ed Berg, Bettis (412-462-5000, ext. 6779) on the containment gas analysis as follows:

Containment Gas Analysis

Isotope	Result (d/m/ml)
Xe-133	1.5×10^9 (676 μCi/ml)
Xe-133m	3.5×10^7 (16 μCi/ml)
Xe-135	1.8×10^7 (8.1 μCi/ml)
I-131	1.4×10^5 (6.3E-2 μCi/ml)
I-133	< 6 E4, (LLD) < .03 μCi/ml

corrected

Above results ~~decayed~~ to 0700, 3-31-79, the time the sample was taken.

~~In the update report received, it was noted that the sample also contained I-133 with an activity less than 6×10^4 d/m/ml.~~

also reported were analyses on the primary coolant sample taken 3-30-79 :

Gross Alpha (two measurements on sample) · 8.4×10^5 d/m/ml
· 1.0×10^6 d/m/ml

Differences in the gross alpha analyses considered statistically insignificant

Wet chemistry analysis for uranium showed none above minimum detectable of 250 ppm.

Results on analyses given to Ginier, Denton & Met. Ed.

178 129

Off-Site Data

1915

Time	Place	Instr.	Reading	Remarks
1620	Goldsboro 1 mi W		6 mr/hr β-γ	Ground
			<1 – 1 mr/hr γ	Ground
1625	Goldsboro		1 mr/hr β-γ	
			<1 mr/hr γ	
1510	Middletown		0.05 β-γ	
1545	392-262 2mi W		Bkgd γ	
1605	1 mi N past Goldsboro on 262 (gd)		0.3 β-γ	
			<0.3 γ	
1700	Goldsboro Helicopter		4.0 β-γ	
			6 mr/hr γ (air)	Met Helicopter
			1 mr/hr γ (gd)	Ground

178 130

rec'd 0900 18/1/79

0600 ARMS

120° radial 500 ft.
max. 2-3 mr/hr @ 0610 1/2-1 mi.

3 mi .3-.6 mr/hr

top of plume @ 800 ft clearly defined

at 3 mi out plume edges @ 130° + 170°
with poorly defined edges.

next @ 0900 or 15 min. motion for
gas sample

Ind. Waste Tank Discharge ~ PRC Van

location 107 - 3/31/79 @ 2200
I-131 1.48 E^{-3} μCi/ml
I-133 3.07 E^{-4}
location 107 - 3/31 @ 0800
I-131 - 7.56 E^{-4}
I-133 - 1.62 E^{-4}
@ 2400 midnight
I-131 - 8.7 E^{-5}
I-133 - 2.5 E^{-5}

178 131

@ 0400

I-131 - 2.42 E^{-4}

I-133 - 5.83 E^{-5}

@ 0600

I-131 - 3.82 E^{-4}

133 - 9.0 E^{-5}

3/30 - location 107 @ 1200

I - ~~133~~ - no detectable

~~I-131~~ @ 2000

I-131 - 5.4 E^{-5}

133 - 2.0 E^{-5}

@ 1600

no det.

location 104 - no det act.

for same sample times

location 104 assumed to be downstream

178 132

data provided to LLR.
based on Bettis 1° ambient analysis
80,000 gals 1° system vol.

I-131	3.1 E^7	Ci
133	1.55 E^7	
Cs 134	1.4 E^5	
136	4.0 E^5	
137	6.3 E^5	
Sr 89-90	1.2 E^4	
Ba 140	4.5 E^4	

based on Penn State model - Hayes
25% failed fuel
assumed - 9c d full power
3 d after shutdown
total Esp'd. - 1.75 E^9 Ci

Core inventory - I-131 61 E^6 Ci
133 16 E^6
Cs 134 .256 E^6
136 .62 E^6
137 .935 E^6
Ba 140 136 E^6
Sr 89-90 78 E^6

178 133

SITE RELEASE DATA

Msg from Frank Costello

liquid releases

Secondary neutralizing tank 3/30/79 2024 → 2330
total of 20,000 gal
dilution (begin) 56,000 gpm (end) 92000 gpm

IWTS 3/30/79 started 0300 still releasing
105 gpm, sampling each 2 hours

IWFS 3/30/79 ~~*~~ 0400 has been secured since

Plant has 1 liquid waste release permit recorded
~~for 3/30/79 volume 6521 gal~~

3/30/79 0240 to 0710 volume 6521 gal
total of 4.518×10^{-4} Ci

Co^{58}	1.4×10^{-4}	Cs^{137}	2.8×10^{-6}
Co^{60}	1.4×10^{-5}	I^{131}	1.4×10^{-4}
Cs^{134}	1.4×10^{-5}	I^{133}	1.4×10^{-4}

178 134

G Bidinger

~~Bill G~~

NRC DATA 4-1-79

0406 S of Ops Center on 441
.1 mi x0.4 γ

0415 Rt 441 + substation 500 ft South 4.5 mr βγ

0435 " " 30 mr βγ

0437 " " 20 βγ 2γ

0450 Park + Engle 0.4 γ
1.8 mi ESE

0503 Falmouth + Govern Stable
2.4 m ESE 0.3 γ

0508 Covered Bridge
2.2 mi ESE 0.5 γ

0529 Rt 441 + substation 1.5 γ
500' S of Op Cent

~~ANOTHER SAMPLE PLANNED; ARMS~~

Bill Grant reported at 0600 4-1-79

178 135

4/11/77

[illegible]

Exact venting path of gas from PER

Helicopter picked up increase @ 0223 directly over aux bldg stack — no other readings inside bldg to confirm increase — delaying Decay Tank sample.
→ Believe problem may be caused by change in wind direction. Max reading was at 700'

Sample of waste decay tank started

Readings at 700' elevation
1/4 mi E of Op Cent. 15 mr
1/2 mi E of Op Cent 14 mr.
Over [illegible] 11 mr
→ Final grass 14 min [illegible] 4 mr

178 136

Report by BRH Headquarters 0730 4/2/79

Reported 18 additional samples (4/1/79) taken by Kenn for I131. by FDA. 9 milk samples analyzed, all positive. Highest sample 36 pCi/l I^{131} and 29 pCi/l Cs^{137}.

Taken by D. Sharby

These are duplicates of samples also analyzed by Pa Dept. of Natural Resources. The results are only slightly above the minimum detectible amounts and are consistent within statistical accuracies of the negative results reported by Pa. DNR. Further when compared to the Protective Action Guide of 12,000 pCi/l the results are only of academic interest.

Paul D. Schmidt
4/2/79/0930

178 137

WEAC Sample Analysis
Samples of (collected) 4/1/79

Milk

No./Location		Activity pCi/l	
		I-131	Cs-137
79-142-774	York	14±10	-
79-169-892	Elizabethtown	18±10	-
79-142-776	Hummelstown	17±10	14±10
79-142-778	Middletown	-	15±10
79-169-920	Ethers	22±10	12±10
79-142-775	Middletown	19±10	-
79-169-919	Middletown	23±10	11±10
79-142-779	York	14±10	-
79-169-918	Mount Wolf	36±10	29±10

1979

84 hrs decay

AS OF 1600 hrs 3-31

Coolant Core, μCi/ml	Coolant Inventory, Ci	Core Inventory, Ci	Fraction of Core, %
131 1.3×10^4	4.4×10^6 (1.4×10^7)	5×10^7	8.8 (28.0)
133 6.5×10^3	2.2×10^6 (7.2×10^6)	9.3×10^6	23.7 (77.4)
134 6.3×10^1	2.1×10^4 (6.9×10^4)	3.7×10^5	5.7 (18.6)
136 1.8×10^2	6.1×10^4 (2.0×10^5)	6.3×10^5	9.7 (31.7)
137 2.8×10^2	9.5×10^4 (3.1×10^5)	9.3×10^5	10.2 (37.6)
89-90 5.5×10^2	1.8×10^3 (5.8×10^5)		
106 2.0×10^{-4}	6.8×10^{-2} (2.2×10^{-1})	3.5×10^6	1.9×10^{-6} (6.2×10^{-6})
140 2.0×10^2	6.8×10^4 (2.2×10^5)	1×10^8	0.07 (0.22)
138 2.0×10^2	6.8×10^4 (2.2×10^5)	4.6×10^7	0.15 (0.48)

178 139

Roster boards — accountability

110

Inventory of vehicles

not more than 50% on site at one time

150 CD film badges ✓

(CD)

150 CD 0-200 dosimeters ✓

150 5 (10) R dosimeters ✓

(dosimeter control point) ✓

24 ff face resp w/ chart *

178 140

rec'd 0900 [illegible]

0600 ARMS

120° radial 500 ft.
max. 2-3 mr/hr @ 0610 ½-1 mi.

3 mi .3-.6 mr/hr

top of plume @ 800 ft clearly defined

at 3 mi out plume edges @ 130° & 170°
with poorly defined edges.

next @ 0900 or 15 min. motion for
gas sample

Ind. Waste Tank Discharge ~ PRC 1 in

location 107 - 3/31/79 @ 2200
I-131 1.48 E^{-3} μCi/ml
I-133 3.07 E^{-4}

location 107 - 3/31 @ 0800
I-131 - 7.56 E^{-4}
I-133 - 1.62 E^{-4}

@ 2400 midnight
I-131 - 8.7 E^{-5}
I-133 - 2.5 E^{-5}

178 141

@ 0400

I-131 - 2.42 E^{-4}

I-133 - 5.83 E^{-5}

@ 0600

I-131 - 3.82 E^{-4}

133 - 9.0 E^{-5}

3/30 - location 107 @ 1200

I - ~~133~~ - no detectable

~~I-131~~ @ 2000

I-131 - 5.4 E^{-5}

133 - 2.0 E^{-5}

@ 1600

no det.

location 104 - no det act.

for same sample times

location 104 assumed to be downstream

178 142

data provided LLR.
based on Bettis 1° coolant analysis
80,000 gals 1° system vol.

I-131	3.1 E^7	Ci
133	1.55 E^7	
Cs 134	1.4 E^5	
136	4.0 E^5	
137	6.3 E^5	
Sr 89-90	1.2 E^4	
Ba 140	4.5 E^4	

based on Penn State model — Hayes
25% failed fuel
assumed - 9c d full power
3 d after shutdown
total Fission. - 1.75 E^9 Ci

Core inventory - I-131 61 E^6 Ci
133 16 E^6
Cs 134 .256 E^6
136 .62 E^6
137 .935 E^6
Ba 140 136 E^6
Sr 89-90 28 E^6

178 143

EMT → DENTON → GOV.

Bernie → DOE Buses etc Earlitse Barracks

Man – 1 10
2 — helicopter
2

Day Shift –

4 HP 2 in each CR

2 Eff Control

8 7 Rich Kenny

NRR

100 yds off

16:15 Falmouth 0.03 0.01 mR

1427 West side River 295/262 <.01 mR

1438 382/362 .03 mR

1458 Business .5 mR

441/SGD TMI 0.1 mR

1447 River/Falmouth

1442 River Rd/King Rd 0.05 mR/h

River Rd/Kenner Rd 0.02

178 144

1452	River/Engles	0.3
1475	River/Engl	<.05
1100	Rt 441 1 mile S	0.25
	191/382	

178 145

Three Mile Island

BRH Area Monitoring Network

Dosimeters - TLD packets (BH - 8 chips each)

Time - March 31, 8:00 PM through April 1, 1979

Coordination - With Penna Rad Program

Locations 1. At populated areas, public facilities such as hospitals etc.

2. Indoors at outdoors.

3. Within 10 miles

High Pop. Density - 4 packets per sq mile

Medium Pop " - 2 " " " "

Low Pop. " - 1 " " " "

4. 10-20 miles - At major population centers (some 28 locations identified)

Total Units - about 250

178 146

Gail D. Schmidt
EDO/BRH Liaison

Date: 4-1-79

OFF-SITE DATA

ARMS Flight Data from 1800-1900 hrs:

On a one mile radius ~~[illegible]~~ flight around plant at 500', plume was at 220° to 250° ~~[illegible]~~ with a max. reading of 0.5 mR/hr.

On a three mile radius at 500', plume was at 240° to 260° with max. reading of 0.1 mR/hr.

at 3 miles, top of plume observed at 600'

all readings with hand-held GM.

Visibility dropping; not sure of time of next flight

178 147

4-1-79

1730 hrs: Jerry Smith reporting:

with respect to iodine results, we are checking with DOE to see what they are doing.

are ~~[illegible]~~ trying to arrange with Met. Ed. for splitting of any milk samples they collect.

Procedures still being worked on by Met Ed. for transfer of Rcw waste tanks to containment.

Survey data results:

1100	[illegible] Rt 441 .. 1 mi south of NRC trailer		0.025 mR/h
"	Intersection 382/1P1		0.05 "
1427	West side of river - intersection ~~285~~ 295/262		< 0.1 "
1430	" " - - [illegible]	382/262	0.3 "
1438	" " " - N end of Brunner Island (~3 mi south of plant)		0.5 "
1435	East side of river -	441 + South State	0.1 "
1437	" " " "	River Rd + Falmouth	0.1 "
1442	" " " "	River Rd + Kings Rd.	0.05 "
1445	" " " "	" " + Kraner Rd	0.02 "
1455	" " " "	" " + Engle Rd	0.3 "
1505	" " " "	" " + Engle Rd	< 0.1 "

148

1615 100 yds off 441 on Pelham Rd - right off south end of Orlando 0.01 mR/hr

NRC TLD's for 1st day ~~since~~ since being put out on 3-31-79 have been returned and result should be available in 2 hrs.

178 149

Wayne Kerr Reporting 0700 4-1-79

IN BLOG

Control Bldg < .1 mr/hr
Aux + Fuel Handling area 400 mr/hr
Gross Airparticulate 10^{-8} μCi/cc
Hall Gross Smear 60 K dpm/100 cm²
Control Tower Unit 1 < .1 mr/hr

Unit 2 aux Bldg
Waste ~~Tank~~ 60 R/hr contact
Gas Decay Tank

Reactor Coolant Bleed Tank 300 R/hr

1 ARC Makeup Pump 10 R/hr
B Spray Vault 175 R/hr

General area on Site

E of Unit 2 Control 3.5 mr/hr
adjacent to Bldg .3 mr/hr

Unit 1
Turbine Bldg .1 - .2 mr/hr

South end
of Unit 2 Turbine Bldg 1.5 + .5 mr/hr

178 150

Darrell

Bettis analysis of 3/29 primary coolant sample indicates $< 5 \times 10^{-2}$ uci/gm gross α activity. For comparison the highest LaCrosse PCA when it had failed fuel was 6×10^{-5} α or 1000 times less than TMI.

Lake Barrett
11:00 4/1/79

178 151

Dorrell - Info

RHR Operation

Based on actual RHR system leakage, iodine primary coolant measurement of 0700, March 30; Xe-133 measurements in containment and April 1 core inventory based on the Oregon code, the estimated doses are:

Total body - 0.1 mrem/hr from Xe-133,
Thyroid - 0.15 mrem/hr from I-133, 131.

These are very small doses, and these leakages should not result in any evaluation for periods in excess of a year.

Wayne Britz
Lake 15:00
4/2/79

RECOMBINER LEAK

@ 15:05, 4/2/79 Klinger @ NRC on site stated that the releases (if there really were any) from the recombiner have stopped. The high reading may have been a stagnant air pocket stirred up by the 'copter. Recombiner heating up OK. Lake 15:1

178 152

120 gal/m -- 58000 combined total

Dilution high by 30%

Inadvertent Waste Tank Discharge

		(I-131)	(Conc. with Dil)	(X MPC)
4-1	0200	9.2×10^{-5}	[illegible]	0.83
	0400	2.0×10^{-4}	5.4×10^{-7}	1.8
	0600	1×10^{-4}	2.7×10^{-7}	0.9
	0800	1.1×10^{-4}	3.0×10^{-7}	1.0
	1000	8.5×10^{-5}	2.3×10^{-7}	.77
	1200	7.1×10^{-5}	1.9×10^{-7}	.63
	1400	7.3×10^{-5}	2.0×10^{-7}	.67
	1600	7.1×10^{-5}	1.9×10^{-7}	.63
	1800	5.1×10^{-4}	1.4×10^{-6}	4.7
4-2	0010	1.6×10^{-4}	4.3×10^{-7}	1.4
	0200	6.3×10^{-5}	1.7×10^{-7}	.51
	0400	5.8×10^{-5}	1.6×10^{-7}	.53

178 153

MARTIN
4/3/79
11:50 AM
Jam

BETA DOSE RATE TO EQUIPMENT IN CONTACT WITH PRIMARY COOLANT WATER

$$\frac{\dot{D}}{\chi} = \frac{E}{4} \frac{\text{rad/sec}}{\text{Ci/m}^3} = \frac{E_{prod}}{3} \cdot \frac{1}{4} = \frac{0.6}{12} = \frac{6}{12}$$

$$\frac{\dot{D}}{\chi} = \frac{1}{20} \frac{\text{rad/sec}}{\text{Ci/m}^3} = \frac{180 \text{ R/hr}}{\text{Ci/m}^3}$$

FROM 3/29 CONTAINMENT SAMPLE

$$\text{CONC} = 1.3 \times 10^{-4} \mu\text{Ci/ml} = 1.3 \times 10^{-4} \frac{\text{Ci}}{\text{m}^3}$$

$\dot{D}_{BETA}$ BETA DOSE RATE

$$= 1.3 \times 10^{-4} \times 1.8 \times 10^{2}$$

$$\dot{D}_{BETA} \doteq 2.5 \times 10^{-6} \frac{\text{RAD}}{\text{HR}}$$

FROM PRIMARY COOLANT (CONTACT) 178 154

Release Data Unit 2 Aux, Ventilation

charlod NRC ?

0600 — 0600 - ~~06~~ 4/1/79

0315 4/3/79

1.4×10^{-7} μci/cc

0100 3/31

0325 ~~0~~4/3 > 1.4×10^{-7} μci/cc

Sent to typing 4/3/79 0915

178 155

4/4/79 - 2320hrs - per Gen Roy (site)
Correction to 3/31/79 1st containment gas sample

	previously reported	corrected value	error should be 740
Xe-133	1.5×10^9 dpm/ml	5.8×10^7 dpm/ml or	26 μCi/ml
Xe-133m	3.5×10^7 "	1.75×10^7 "	7.9 "
Xe-135	1.8×10^7 "	7.8×10^6	3.5 "
I-131	1.4×10^5 "	5.6×10^4	0.025 "

Reason for change - used wrong base volume

178 156

April 1 evening + from Met Ed

4/ρCu/l I^{131} mx

MDA .5

Hummelstown <.6/.7

Met Ed tritium → 31

Disc can

upstream

downstream

Iodine 60 ρC/l discharge Canal

Penz

Iodine – 3/21 – 4/2 [11 day supply]

2×10^{-12} μc/cc

1.1×10^{-14}

178 157

Radiological Update 13:30 4/4

Cummulative Doses 3/28 → ~4/3 12:00

Population ~ 2,000 man Rems*
(up ~ 250 man rems from 4/2)

Max. offs. to Indiv. Dose: <100 mrem

Unconfirmed FDA milk samples indicate I-131 in the 10-30 pci/ml range. For reference an infant drinking 30 pci/ml milk would receive ~ 0.4 mrem thyoid dose per day.

L Barrett
13:30 4/4

* OSD analysis

4/4/79 cont

10 15 per Don Collins, just talked to Joel Lieberman. Pennsylvania has OKed liquid release to the river. Also, has OKed taking air sample from —— but if significant release to the atmosphere must discontinue the sampling.

4/4/79 11 12 [illegible] SP on line [illegible] [illegible] to [illegible] samples [illegible] to [illegible] so that [illegible] NRC [illegible] samples to be analyzed [illegible] grab samples of [illegible] and flow line every 2 hours during discharge. Point of [illegible] IWFS concentration is $4.1 \times 10^{-5} \pm 3\%$ µCi/ml [illegible] were scheduled to start at 11:00.

Potential Political flap

[illegible] — Release [illegible] ~150 gpm IWFS [illegible] [illegible] (sight) [illegible] tank is backflush from recirc. [illegible]

4/4/79 12 30 [illegible] R 239

4/4/79 12 55 [illegible] [illegible] the NRC.

178 159

7:15 am

Gross γ = 2.0×10^{10} cpm/ml

Gross β = 1.6×10^{10} dpm/ml

I-131*	8.1×10^5	μCi/cc
I-133*	3.9×10^5	μCi/cc
Sr-89,90	3.2×10^2	μCi/cc
Cs-134	3.8×10^3	μCi/cc
Cs-136	1.1×10^4	μCi/cc
Cs-137	1.7×10^4	μCi/cc
Ba-140	1.2×10^3	μCi/cc
U (total)	< 0.1 ppm	

* Calculated for 1200 hrs 3/30/79.

7:00 3/31

H_2 - 1.7%

O_2 - 16.5%

N_2 81.8%

~~25 cc Sample~~

~~@ Contact 320 ml~~

~~50 μCi/cc~~

1045 H_2 in Containment = 1% (licensee data)

178 160

Current

1. Characterize in plant exposures; overexposures

↳ 3 exposures > 3 rem

plant personnel
visitors (all)
contractors
} ~ 500 mrem
jan 1 to April 4

PN.

PLANT STATUS:

AT approximately 1955 hrs. on APRIL 7, 1979, the licensee began lowering Reactor coolant system pressure in 50 psi. increments at a maximum rate of 5 psi per minute. This procedure will continue until Reactor Coolant System pressure reaches 500 psia, which allows for a 100 lb safety margin above saturation temperature of the highest reading thermocouple. The purpose of this procedure is to degas and check for bubbles in the Reactor Coolant System. During the pressure reduction to 700 psi, the Aux. building stack monitors showed an increase by a factor of 10; At 2213 hours, APRIL 7. The ARMS helicopter reported a slight increase in readings. The highest reading Thermocouple is 440°F at position H-8. ~~During the next pressure reduction.~~ The plant held steady for a short period and the Aux Stack monitors readings decreased back to its original reading. During the next pressure reduction there was no increase in the readings. The highest reading thermocouple is ~~the~~ 440°F at position H-8. Bulk Core coolant inlet and outlet temperature is 280°F.

Hydrogen Concentration at the recombiners is 1.97%

AT ~~2130~~ 2130 PST, APRIL 7, 1979, the first Aircraft ~~left~~ Carrying the Nuclear Safety filters for Auxiliary building Stack left ~~the facilities~~ the Pasco, Washington Airport. Estimated Arrival at Harrisburg, PA is for the first plane is 0500 EST, 8 APR 79, and at a staggered basis thereafter.

AT ~~1617 hours~~ 1617 hours, 9 APR ~~79~~, 97 gallons of concentrated Boric Acid was added to the Reactor Coolant

178 162

AT 1005 hrs, 7 APR, it was reported that RCS boron concentration had been changed during the time period 1917 hrs to 1925 hrs, Apr 6,. 97, gals of 12,750 ppm Boric Acid was added which changed RCS Concentration from 2217 ppm to 2229 ppm.

At 0900 the misc. waste tank is being dumped to the bleed holdup tank to make room for the water in the Aux. building Sump. AT 1056 pumping Aux Sump tank to misc. waste Tank.

1ST NRC analyzed sample

3/29 1300 hrs sample coll. time

1700 ⇒

/30 1200

1600

IWFS 0905 3/29 no iodine

1×10^{-5} uc/ml Xe

(primarily backgd)

1225 3/29 no iodine

(same high Xe bkgd)

1/ 1430