U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report No. 50-289/79-20
50-320/79-26

Docket No. 50-289
50-320

License No. DPR-50
DPR-73 Priority -- Category C

Licensee: Metropolitan Edison Company

P.O. Box 542

Reading, Pennsylvania 19640

Facility Name: Three Mile Island Nuclear Station, Unit 1 and Unit 2

Inspection at: Middletown, Pennsylvania

Inspection conducted: September 19, 1979 - October 22, 1979

Inspectors: _____ 11/16/79
D. R. Haverkamp, Reactor Operations Inspector — date signed

_____ 11/16/79
R. J. Conte, Reactor Operations Inspector — date signed

_____ 11/16/79
D. R. Neely, Lead Radiation Specialist — date signed

Approved by: _____ 11/19/79
H. B. Kister, Chief Site Operations Section, TMI Recovery Operations Office — date signed

Inspection Summary:
Inspection on September 19 - October 22, 1979 (Report Nos. 50-289/79-20 and 50-320/79-26)
Areas Inspected: Special inspection by NRC TMI Recovery Operations Inspection staff of: licensee action on previous inspection findings (Unit 2), new and revised procedures (Unit 2); plant operations (Units 1 and 2) including records, performance of tests, and general plant tours; in-plant health physics (Units 1 and 2) including documentation, posting and labeling reviews, witnessing of activities, and area tours; licensee event report (LER) No. 79-12/3L (Unit 2); fire barrier penetration seals utilizing silicone foam (Unit 2); and solid radwaste staging facility construction (Unit 2). The inspection included continuous shift coverage by reactor operations and radiation specialist inspectors.
Results: Significant inspection findings were brought to the attention of the licensee management when identified.

DETAILS

1. Persons Contacted

Principal licensee and contractor personnel contacted during this inspection are identified in the exit interview section of this report.

2. NRC Inspection Participants

The following tabulation identifies the personnel participating in this inspection.

S. Bland, IE:HQ, October 11 - October 22, 1979
R. Conte, IE:RI, September 19 - October 22, 1979
N. Dubry, IE:RIII, September 19, 1979
S. Ewald, IE:RII, October 16 - October 22, 1979
R. Fish, IE:RV, September 19 - September 25, 1979
R. Gregor, IE:RIII, October 16 - October 22, 1979
A. Hardin, IE:RII, September 16 - October 22, 1979
D. Haverkamp, IE:RI, September 23 - October 22, 1979
L. Hueter, IE:RIII, September 19 - October 2, 1979
I. Jackiw, IE:RIII, September 19 - September 28, 1979
A. Johnson, IE:RII, September 19 - September 21, 1979
P. Johnson, IE:RV, September 25 - October 5, 1979
R. Keimig, IE:RI, September 19 - September 25, 1979
H. Kister, IE:RI, September 26 - October 22, 1979
P. Koltay, IE:RI, October 2 - October 5, 1979
D. Neely, IE:RI, September 19 - October 1, 1979
R. Nimitz, IE:RI, October 16 - October 22, 1979
K. Plumlee, IE:RI, September 25 - October 9, 1979
W. Raymond, IE:RI, September 19 - October 22, 1979
L. Thonus, IE:RI, October 13 - October 14, 1979
T. Tongue, IE:RIII, October 2 - October 16, 1979
A. Varela, IE:RI, September 24 - September 26, 1979
J. White, IE:RI, October 2, 1979 - October 16, 1979
J. Wray, IE:RII, October 2 - October 10, 1979
G. Wright, IE:RIII, September 28 - October 16, 1979

3. Licensee Action on Previous Inspection Findings

(Open) Inspection Finding (320/79-17-12): Failure to use approved procedures and certified calibration equipment for calibration of portable air samplers. A review of airborne radioactivity sampling equipment on October 18, 1979, indicated NBS traceable flow calibrators were obtained and are in use by the licensee calibration contractor. The licensee has not established and implemented air sampler calibration procedures at this time. Additionally, a review of operational air sampler units on September 21, 1979, identified 6 overdue air samplers (Details paragraph 9.e).

(Open) Inspection Finding (320/79-13-09): Review of facility procedures for consistency with current recovery operations and concerns regarding associated administrative controls. A meeting was conducted on September 27, 1979 with the below listed items/ resolutions discussed. This remains open pending completion of required actions.

-- The use of handwritten copies of procedures (especially in the area of Special Operating Procedures, SOP's) has caused problems in the past with the ability to distinguish pre-approval and post-approval changes.

RESOLUTION: Formal station procedures will be typed as in the past. Temporary procedures such as SOP's are under review for incorporation into existing formal plant procedures or for cancellation. Remaining SOP's will be typed. In the future SOP's that are handwritten (where time considerations preclude typing) will be controlled through the use of photostated copies attached to the original of the SOP Cover Sheets. The adequacy of these measures will be reviewed by NRC staff.

-- Administrative controls are needed to clarify the use of Temporary Change Notices (TCN's) for SOP's.

RESOLTUION: Administrative Procedure, AP 1001, will be revised to clarify this area.

-- SOP's designated Z, EP, R have exceeded 90 day effectiveness. The schedule for review and incorporation into the formal procedure system has yet to be issued. The schedule remains to be implemented.

RESOLUTION: A schedule was issued on October 11, 1979. Schedule implementation will be monitored by NRC staff.

-- Operator training is needed for revised Administrative Procedures as a result of Recovery Technical Specifications (TS).

RESOLUTION: Training should be completed one month after the issuance of Recovery Technical Specifications.

-- A tracking system for inaccessible valves due to ALARA considerations is needed along with its use for procedural implementation.

RESOLUTION: A Process Radwaste Procedure will be prepared by November 15, 1979 to establish this tracking program.

4. Facility Procedure Review (Unit 2)

Operating Procedures (OP), Emergency Procedures (EP), Surveillance Procedures, and Special Operating Procedures (SOP), including subsequent revisions, were reviewed by the NRC on site staff during this inspection. The SOP's are temporary procedures written for the TMI-2 Recovery Program which govern special evolutions and/or use of off-normal plant systems and these are designated "Z" or "R" procedures depending on date of preparation.

Procedure review included both health physics and operations aspects with consideration of the following: (1) the procedure, when implemented, would not degrade the containment of radioactive

material, jeopardize core cooling, or result in excessive personnel exposure; (2) the procedure conforms to the general criteria of TS 6.8, "Procedures", TS 6.11, "Radiation Protection Program," ANSI N-18.7, 1976; (3) the technical content of the procedure is adequate to perform the intended evolution.

Procedures reviewed during this report period are listed below together with dates (in parenthesis) on which NRC comments were completed.

-- 2104-4.50, PCR to Fuel Pool Storage System, Revision 0, (September 26, 1979)

-- *Criteria Document and Scope Document for the Mini Decay Heat Removal System, Revision 5, (September 26, 1979)

-- AP-1050, Control of High Radiation Area, PCR No. 79-458, TCN No. 136, (September 21, 1979)

-- Operation of Ultra Sonic Cleaning Unit (Procedure DC-6), Revision 0, (September 25, 1979)

-- Operation of EPICOR I Waste Cleanup Systems, Revision 0, (September 21, 1979)

-- Dropped Prefilter or Demineralizer Liner in the Chemical Cleaning Building, Revision 0, (September 25, 1979)

-- Containment Surveillance Procedure, Revision 0, (September 26, 1979)

-- MU Valve Room TLD Analysis, Revision 0, (September 28, 1979)

-- HPP 1699A, Liquid Release from TMI-Administrative Controls, Revision 0, (September 25, 1979)

-- CG-B.2, EPICOR II Prefilter/Demineralizer Overflow, Revision 0, (September 25, 1979)

-- CG-A.4, CCB Exhaust Radiation Level High, Revision 0, (September 25, 1979)

-- Dropped Prefilter/Liner Outside of the CCB, Revision 0, (September 25, 1979)

-- 2202-4.0, General Emergency Procedure for EPICOR II, Revision 0, (September 21, 1979)

-- Contaminated Laundry Cleaning Facility-Operating Procedure, Revision 0, (September 25, 1979)

-- HP 1618-C, Radioactive Material Handling, Revision 0, (September 21, 1979)

-- SOP 2104-4.8, Transfer Auxiliary Building Sump to MWHUT, PCR No. 2-79-1003, TCN No. 2-79-102, (September 25, 1979)

-- SOP 2104-4.50, Fuel Pool Storage System, (September 26, 1979)

-- 2104-4.12, Operation of EPICOR II Sample System, Revision 0, (September 25, 1979)

-- AP 2203-4.3, Loss of Electrical Power to EPICOR II, Revision 0, (September 21, 1979)

-- Transfer "Out of Spec" Water from Unit 1 to WDL-T-11 A/B to EPICOR II CC-T-1, Revision 0, (October 4, 1979)

-- EP-33, Core Cooling with no RCPs or Natural Circulation, Revision 1, (September 21, 1979)

-- TMI-2 Modification Design Criteria of Reactor Coolant Pressure Control System, Revision 6, (September 26, 1979)

-- Modification to EPICOR II Air Sampling System, Revision 0, (September 26, 1979)

-- 1410-F4, Unit 2 Cartridge Filters Requiring Lead Pig Change-out, Revision 0, (September 26, 1979)

-- P401 RB Sump Level Measurements, Revision 0, (September 27, 1979)

-- EP-33, Core Cooling with No RCP's or Natural Circulation, Revision 1, (October 2, 1979)

-- EP-34, Loss of Natural Circulation, Revision 2, (October 3, 1979)

-- Z-39, Natural Circulation Operation, Revision 3, (October 2, 1979)

-- 2104-4.10, Resin Trap ALC-F-4A, 4B, 4C Changeout, Revision 0, (October 1, 1979)

-- 2107-1.6, (PCR No. 2-79-130 to) Balance of Plant (BOP) DG-A (Gray) Diesel and Auxiliaries, Revision 0, (September 28, 1979)

-- PCR No. 2-79-1005 to OP 2104-4.50 Fuel Pool Storage System (October 4, 1979)

-- 2202-4.1, Loss of Fluid System Integrity for EPICOR II, (October 5, 1979)

-- 2202-4.1, Loss of Fluid System Integrity for EPICOR II, TCN No. 2-79-123, (October 5, 1979)

-- CG-A.4, CCB Exhaust Radiation Level Hi, Revision 0, (October 4, 1979)

-- 2104-4.12, Operation of EPICOR II Sample System, Revision 0, (October 3, 1979)

-- R-2-79-15, RR Pump Seal Leakage Collection and Disposal, Revision 0, (October 4, 1979)

-- *Criteria Document for Mini-DHR System, Revision 5, (October 12, 1979)

-- CG-B-2, Alarm Response-Auxiliary Building Emergency Liquid Cleanup System (EPICOR II), (October 5, 1979)

-- 1618-B, PCR to Receipt of Radioactive Material, (October 10, 1979)

-- 1618-A, PCR No. 79-539 to Shipment of Radioactive Material, (October 10, 1979)

-- 2202-4.3, PCR to High Rad/High Airborne in CCB, (October 11, 1979)

-- 8A.A5, RCS Differential Pressure High, Revision 0, (October 16, 1979)

-- Rupture/Leak in a Waste Gas Decay Tank, Revision 0, (October 19, 1979)

-- Containment Air Sampling Procedure-R626, Revision 0, (October 19, 1979)

-- Transfer of Radioactive Liner From CNSI-14-1956 Shipping Cask to Interim Staging Facility, (October 10, 1979)

-- 2104-4.17, Reactor Building Water Sampling, (October 8, 1979)

-- 2107-1.7, Alternate Electrical Feed to Bus 2-5, (October 12, 1979)

-- 2104-4.3, Waste Gas Disposal System PCR, (October 11, 1979)

-- 2104-4.7, Auxiliary Building Liquid Cleanup, (October 12, 1979)

-- EP-34, Loss of Natural Circulation, Revision 2, (October 11, 1979)

-- Z-39, Natural Circulation Operation, Revision 3, (October 11, 1979)

-- Rupture/Leaks in a Waste Gas Decay TK, (October 19, 1979)

-- Solidification of Radiac Wash Waste Water, (October 19, 1979)

-- EPICOR Resin Column Testing, (October 11, 1979)

-- Demineralized Water Spool Piece Removal, (October 12, 1979)

-- AP 1003, Radiation Protection Manual, (October 10, 1979)

-- 2104-4.23, Auxiliary Building Emergency Liquid Cleanup System Prefilter and Demineralizer Removal, (October 13, 1979)

-- Containment Air Sampling Procedure, (October 19, 1979)

-- Core Drilling Auxiliary Building Elevator Shaft, (October 25, 1979)

-- Hi Rad/Hi Airborne CCB, (October 19, 1979)

-- Transfer of WDL-T-11A/B in Unit 2 to Neut Feek TK in Unit 1, (October 19, 1979)

-- 2204-CG-A4, Ventilation Exhaust Hi Alarm, (October 19, 1979)

-- 2104-4.9 Auxiliary Building Emergency Liquid Cleanup System Prefilter and Demineralizer Installation, (October 12, 1979)

-- Reactor Building Air Sample from R-401, (October 24, 1979)

-- 2301-M8 Containment Integrity Verification, (October 12, 1979)

-- SOP-R-2-79-67, Operating Procedures Standby Pressure Control, (October 12, 1979)

-- Containment Air Sampling Procedure, (October 12, 1979)

-- Radiological Control for B&W Cap-Gun Chemistry Facility, (October 12, 1979)

-- 2107-1.7, 13.2/4KV Alternate Electrical Feed to Bus 2-5, (October 12, 1979)

-- Rupture/Leak in the Miscellaneous Waste Holdup Tank, (October 18, 1979)

-- 2301-M8, Containment Integrity Verification (TCN), (October 12, 1979)

-- SOP-R-2-79-67, Operating Procedure Standby Pressure Control (TCN), (October 12, 1979)

-- SOP-R-2-79-67, Operating Procedure Standby Pressure Control (TCN), (October 16, 1979)

-- 2204-CG-A4, Ventilation Exhaust Hi Alarm (TCN), (October 19, 1979)

-- 2104-4.7, Operation of Auxiliary Building Liquid Clean up (TCN), (October 19, 1979)

-- 2202-4.3, Hi Radiation or Airborne Activity in CCB (TCN), (October 19, 1979)

-- 4302-R1.2, Source Range Neutron Flux and Rate, Revision 0, (September 19, 1979)

-- 4302-R8.2, M/U Storage Tank Level, Revision 0, (September 19, 1979)

-- 4333-3Y2, Fire Station Hose Station Function Test, Revision 0, (September 19, 1979)

-- 4331-5A2, Fire System Halon System Check, Revision 0, (September 19, 1979)

-- 4301-R3, Station Batteries Refueling Check, Revision 0, (September 19, 1979)

-- 4301-W4, On/off Site Power Supply Checks, Revision 0, (September 19, 1979)

-- 4301-M8 Containment Integrity Verification, Revision 0, (September 19, 1979)

-- 4331-R3, Fire Barrier Penetration Fire Seal Inspection, Revision 0, (September 20, 1979)

-- 4301-W2.1, Station Storage Batteries and Charger Weekly Check, Revision 0, (September 28, 1979)

-- 4301-W2.2, BOP Diesel Generator Batteries Weekly Check, Revision 0, (September 28, 1979)

-- 4301-M1, Post Accident Monitoring Instrumentation Channel Check, Revision 0, (September 28, 1979)

-- 4301-M3, Seismic Instruments - Check, Revision 0, (September 28, 1979)

-- 4301-M4, Remote Shutdown Instrumentation-Monthly Checks, Revision 0, (September 28, 1979)

-- 4301-M-13, BOP Diesel Generator Batteries Monthly Check, Revision 0, (September 28, 1979)

-- 4301-Q2, BOP Diesel Generator Batteries Quarterly Check, Revision 0, (September 28, 1979)

-- 4301-R2, BOP Diesel Generator Batteries Refueling Check, Revision 0, (September 28, 1979)

-- 4301-R4, Chlorine Detection System Instrument and Maintenance, Revision 0, (September 28, 1979)

-- 4302-M1, Gas Partitioner Channel Calibration, Revision 0, (September 28, 1979)

-- 4302-R1.1, Intermediate Range Channel, Revision 0, (September 28, 1979)

-- 4302-R5, Seismic System Calibration, Revision 0, (September 28, 1979)

-- 4302-R8.6, Reactor Coolant System Flow, Revision 0, (September 28, 1979)

-- 4302-R14, 4KV Bus 2-1E and 2-2E Undervoltage Relay Calibration, Revision 0, (September 28, 1979)

-- 4302-R15.1, Reactor Building Air Pressure, Revision 0, (September 28, 1979)

-- 4302-R15.2, Core Flood Tank Level and Pressure Calibration, Revision 0, (September 28, 1979)

-- 4302-R15.3, RCS Outlet Temperature, Revision 0, (September 28, 1979)

-- 4302-R15.6, High Pressure Injection Flow Channel Calibration, Revision 0, (September 28, 1979)

-- 4302-R15.7, Low Pressure Injection Flow Channel Calibration, Revision 0, (September 28, 1979)

-- 4302-R15.8, R.B. Spray Pump Flow, Revision 0, (September 28, 1979)

-- 4302-R15.9, Steam Generator Pressure Calibration, Revision 0, (October 1, 1979)

-- 4302-R15.10, Incore Thermocouple Indication Calibration, Revision 0, (September 28, 1979)

-- 4303-M6.1, Intermediate Range Channel, Revision 0, (September 28, 1979)

-- 4302-R1.2, Source Range Neutron Flux and Rate, Revision 0, (October 5, 1979)

-- 4302-R15.5, BWST Temperature and Level, Revision 0, (October 5, 1979)

-- 4301-Q1, Station Storage Batteries, Revision 0, (October 5, 1979)

-- 4302-R15.8, R. B. Spray Pump Flow, Revision 0, (October 10, 1979)

-- 4301-M3, Seismic Instrument-Check, Revision 0, (October 10, 1979)

-- 4302-R15.1, Reactor Building Air Pressure, Revision 0, (October 10, 1979)

-- 4301-R4, Chlorine Detection System Inspection and Maintenance, Revision 0, (October 10, 1979)

-- 4301-M3, 132/4KV Feed to Bus 2-5, Revision 0, (October 12, 1979)

-- 4303-M16A/B/C/D, Emergency Diesel Generator Operability Test, Revision 0, (October 12, 1979)

-- 4303-Q1, B.O.P. Diesel Functional Test, Revision 0, (October 12, 1979)

-- 4303-M18, FHB/AUX Building Air Cleanup Remote Start and Operability Check, Revision 0, (October 12, 1979)

-- 4301-W1, Weekly Surveillance Check, Revision 0, (October 12, 1979)

-- 4303-M22, Secondary Services Closed Cooling Water Pump Operability Test, Revision 0, (October 12, 1979)

*Indicates design criteria for review.

Composite NRC comments on procedures were forwarded to the licensee. No instances of failure to resolve NRC comments were identified.

5. Review of Plant Operations

a. Unit 1

(1) Logs and Records

-- The Jumper/Bypass Log was reviewed between September 23 and September 28, 1979;

-- Shift Foreman's Log for period August 15 to September 15, 1979; and,

-- Control Room Log for period July 1 to July 18, 1979.

(2) Status Meetings

NRC personnel attended the following licensee meetings to observe and ascertain additional plant status information. The meetings attended included discussions of: plant status; specific system operation; pending or planned construction activities; radioactive waste management and plant radiological status:

-- Unit 1 Plan of the Day/Maintenance Review on September 24, September 26, September 28, October 1, October 3, October 12, and October 14, 1979;

-- Physical Security Management Review on October 10, 1979; and,

-- Unit 1 Restart Modification/Startup Testing/Management Review on September 20, October 1, October 4, and October 22, 1979.

(3) Plant Tours

-- General Plant Tour including the Control Room during the Week of September 19 through September 22, 1979; and,

-- Reactor Building on October 12, 1979.

b. Findings, Unit 1 Operations Review

(1) Temporary Mechanical Modification Log Tag No. 3 was used to jumper an air solenoid to keep valve SR-V-25C closed during Work Request No. 25222. This jumper was in effect since September 16, 1979. AP 1013 requires that engineering personnel having cognizance over a jumper shall perform an evaluation on the jumper in effect longer than 12 months. No evaluation for this jumper was completed as of September 22, 1979. An evaluation was completed by the licensee on September 27, 1979.

Further review of the Unit 1 Jumper Log by NRC for similar discrepancies will occur in a subsequent inspection (289/79-20-01).

(2) On September 18, 1979, during the fill of the Unit 1 Cask Loading Pit (adjacent to Unit 1 Spent Fuel Pool) from the Borated Water Storage Tank, approximately 3-5 gallons of water inadvertently spilled into the pit adjacent area through a vent line from the cask loading pit. The spent fuel pool high level alarm did properly function, however, the corresponding alarm for the cask loading pit did not function. This was due to the vent line tap to the cask loading pit being located below the high level alarm setpoint. This was not discovered previously since the cask loading pit was not normally filled with water.

The spilled water was cleaned up with resulting contamination to the pit adjacent area at approximately 3300 dpm. The area was decontaminated.

A modification to redirect the subject vent line has been initiated to assure the high level alarm functions before overflow through the vent.

This is unresolved pending NRC review of licensee proposed action to prevent recurrence of this event (289/79-20-02).

Further, during a review of this event, it was determined that the associated level switches (LS-160 and LS-199) were last calibrated August 14, 1972. Based on discussions with the licensee representative it was not clear as to whether or not these switches were used to comply with Technical Specification (TS) limits for Spent Fuel Pool Level. The inspector stated that if these switches were used to comply with TS limits they were to be incorporated into the Calibration Program required by Regulatory Guide 1.33-1976. The licensee representative stated these switches are not presently in the required calibration program and that this area would be reviewed further.

This is unresolved pending completion of action as stated above and subsequent review by NRC staff (289/79-20-03).

c. Unit 2

(1) Test Performance/Procedure Implementation

-- 2303 M16-C, Emergency Diesel Generator and Cooling Water Valve Operability Test (A Diesel), Revision 9, March 26, 1979 on September 24, 1979;

-- 2303 M16-D, Emergency Diesel Generator and Cooling Water Valve Operability Test (B Diesel), Revision 9, March 26, 1979 on September 27, 1979 and October 11, 1979;

-- R-2-79-67, Operating Procedure, Standby Pressure Control System, Revision 0, October 11, 1979, on October 18, 1979.

(2) Logs and Records

-- Shift Foreman's Log for periods October 11-12, 1979, and October 12-15, 1979;

-- Control Room Operator's Log for periods October 11-12, 1979 and October 12-15, 1979.

(3) Plant Tours

During the period September 19, 1979 through October 22, 1979, tours of the following areas were conducted. Cleanliness/housekeeping conditions were observed along with radiological and fire protection measures. In addition, for the specific areas listed, construction status and testing progress were noted.

-- General plant area including outside and inside of the protected area;

-- Fuel handling building accessible areas on elevation 331';

-- Chemical cleaning building including the auxiliary building emergency liquid cleanup system (EPICOR II);

-- Turbine building, accessible areas on elevation 280', elevation 305' and elevation 331';

-- Diesel generator building accessible areas on elevation 305' and elevation 280';

-- Balance-of-Plant Diesel generator trailers and fuel storage area;

-- Control building accessible areas on elevation 280', elevation 305' and elevation 331', including the control room;

-- Auxiliary building control point on elevation 280'; and,

-- Service building accessible areas on elevation 280', elevation 305', and elevation 331'.

(4) Status Meetings

NRC personnel attended licensee meetings to observe and ascertain additional plant status information. The meetings attended included those listed below, and involved discussions of: plant status; specific system operation; pending or planned construction activities; radioactive waste management and plant radiological status:

-- Daily Plant Status Meetings;

-- Standby Pressure Control Meetings;

-- Mini-Decay Heat Removal Meetings;

-- Radioactive Waste Management Meetings; and,

-- Management Cleanliness Tours.

No discrepancies were identified for the Unit 2 Operations Review.

6. Solid Waste Staging Facility - Inspection of Rebar Installation and Concrete Placement for Long Term Radwaste Structure (Unit 2)

The purpose of this inspection (September 24-26, 1979) was to provide direct observation and independent evaluation of work performance, work in progress and completed work to ascertain whether activities in construction of the Solid Waste Staging Facility are being accomplished according to applicable specifications, codes, standards, drawings, and procedures. On September 24, 1979, the inspector reviewed the project specifications and drawings and discussed with cognizant personnel the requirements and criteria necessary for adequate construction control.

These significant elements were reviewed:

-- Qualification tests, approval of concrete ingredients and certification of cement and admixtures;

-- Design and tests of concrete mixer, approval of mix proportions, and records of compressive strength cylinders taken from the basemat concrete, using approved ingredients;

-- Batch plant and delivery fleet certification and conformance to ASTM C-94;

-- Reinforcing steel certification and material physical test reports;

-- Qualifications of inspection personnel; and

-- Review of deficiency and adequacy of disposition by engineering of dowel mislocations.

These significant elements were inspected prior to placement of concrete on September 25, 1979 for the first lift in the walls and surrounding the cells of the radwaste structure:

-- Cleanliness alignment and rigidity of formwork;

-- Reinforcing steel - properly placed, secured, conforming to specified size and grade, and proper clearance to forms;

-- Top of basemat construction joint properly prepared;

-- Batch plant (located in Hummelstown, Pennsylvania, about twenty miles from TMI) - storage of concrete materials, calibration of batch plant weight scales, efficiency of operating parts and dispensing equipment;

-- Quality control preplacement inspection and check-off;

-- Adequacy of equipment and manpower; and,

-- Review of concrete placement technique and provision for emergencies.

On September 25, 1979, approximately 370 cubic yards of 3,000 psi/28 day concrete were observed mixed, transported by agitator (9 cubic yards) trucks to the site, remixed and pumped within the forms to complete the first of four lifts for the radwaste structure. These significant elements were observed and evaluated for conformance to GPU QC Procedure QCP-M-013, Civil Construction Inspection:

-- In process inspection of fine and coarse aggregate for gradation and moisture content;

-- Batch Plant Operation - Quality Control inspector controlled for accuracy of ingredient weighing, temperature, mixing time and accuracy of automatic print-out verified by visual observation of weight scales and dispensers;

-- Transporting concrete trucks controlled prior to discharge for time, temperature, revolutions turned and slump;

-- Testing of concrete at placement location (from end of 6" steel pipe with rubber hose) - conforming to ANSI 45.2.5 as to frequency, type and using calibrated equipment, (concrete compressive test cylinders taken for each 100 cubic yards or fraction);

-- Preparation and control of batch plant records and inspection of batch plant performed by qualified QC personnel;

-- Delivery and placement within the forms were observed and controlled for height of free fall, horizontal travel, thickness of layers and adequacy of consolidation by qualified personnel;

-- Preparation of the construction joint was observed, performed by green-cutting, timed to permit the initial set of concrete, and mortar was removed sufficiently to expose the coarse aggregate without undercutting; and,

-- Curing was observed to assure adequate mositure by application of saturated burlap.

No items of noncompliance were observed in the above activities.

7. Licensee Event Report (LER) Followup (Unit 2)

a. Reporting Requirements

LER No. 79-12/3L for Unit 2 deals with fire barrier penetration seals installed at the facility utilizing Firewall 50 sealant -

a trade name for the Chemtrol Corporation. The sealant is installed to the full depth of the penetrated fire barriers.

The inspector reviewed specifications, drawings and records pertaining to the installation of the sealant and conducted a visual inspection of approximately 30% of the sealed penetrations located in accessible areas of the facility. The inspector also reviewed the licensee's Surveillance Procedure SP-2331-R3, Revision 1, dated November 6, 1978, and the licensee's surveillance report dated March 5, 1979.

The inspector verified that the penetration seals have developed cracks within the sealant material, and that separation of the sealant material from the reinforced concrete borders of the penetration openings has occurred.

The licensee stated that initial repairs have been made, however, subsequent inspections of the penetrations revealed new cracks and separation of the sealant material.

The inspector verified that the licensee's report accurately describes the condition of the fire barrier penetrations utilizing the Firewall 50 sealant.

b. Corrective Action

The inspector verified that personnel within the licensee's organization were notified of the event by Nonconformance Report (NCR) No. 78-132, dated June 15, 1978.

The inspector verified that the licensee performed temporary repairs by filling the cracks in the penetration sealant with silicone foam. The repairs were performed in accordance with licensee's Maintenance Procedure MP-1410-Y43, Fire Barrier Penetration Fire Seal Repair.

Direct observation of the fire barrier penetrations by the inspector revealed the formation of new cracks and increased separation of the sealant from the reinforced concrete, which occurred since the licensee's last inspection and repair effort in March, 1979.

The status of the Firewall 50 penetrations was discussed with the licensee. The licensee agreed to take the below listed corrective measures.

-- The licensee will reinspect all Firewall 50 penetrations located in accessible plant areas, following Surveillance Procedure SP 2331-R3, Fire Barrier Seal Inspection, and repair all cracks and separation openings in the sealant which penetrate the entire depth of the seal. These repairs will be termed as temporary and will be accomplished in accordance with Maintenance Procedure MP-1410-43, Fire Barrier Penetration Fire Seal Repair.

-- The licensee will submit by December 31, 1979, a course of action which will outline the licensee's plan to permanently repair all Firewall 50 seals at the facility.

These temporary and permanent corrective measures will be reviewed by NRC on a subsequent inspection (320/79-26-05).

8. Fire Barrier Penetration Seals Utilizing Silicone Foam (Unit 2)

The inspector reviewed Chemtrol Corporation's "Design FC 225 - Guide Specifications for Fire Rated Penetration Seals, Fire Stops, Seismic Gap Seals Utilizing Silicone Elastomers" dated November 25, 1975. Design FC 225, Section 3 requires in part that for cable penetrations through fire barriers a foam depth of 7 inches must be achieved for penetrations less than 80 square inches in size, and a foam depth of 11 inches must be achieved for penetrations greater than 80 square inches in size. As per licensee drawing No. SK-A-1058, a mineral wool chafing guard was installed in electrical cable floor penetrations.

The inspector reviewed the licensee's report NCR No. 78-146 and verified that due to the placement of the chafing guard a uniform foam depth of minimum 7 or 11 inches, based on penetration size, may not have been maintained for all penetrations.

The inspector also verified the licensee's findings by physical inspection of several foam penetration seals utilizing the chafing material. The licensee agreed to submit a plan for corrective action by December 31, 1979. NRC review of the licensee's corrective measures in this area will be reviewed further (320/79-26-06).

9. In-Plant Health Physics (Units 1 and 2)

a. Solid Radioactive Waste

Shipping, handling, storage and analysis of solid radioactive waste was reviewed for compliance with the following:

-- 10 CFR 20, "Standards for Protection Against Radiation";

-- 10 CFR 71, "Packaging of Radioactive Material for Transport and Transportation of Radioactive Material Under Certain Conditions";

-- Station Health Physics Procedure 1618A, Revision 0, "Radioactive Material Shipping", dated September 13, 1979; and

-- Special Operating Procedure (SOP), No. R-2-79-6, Revision 1, "On-Site Solid Waste Storage for TMI-2", dated May 8, 1979

The review included documentation, truck placarding, package labeling and the performance of independent radiation intensity measurements were necessary to determine compliance with the above.

(1) Shipments

The following shipments of radioactive material were reviewed during the reporting period.

Shipment #	Date	Item	Total mCi
79-120	September 17, 1979	Liquid Sample	8.89
79-121	September 19, 1979	Laundry	7.73
79-123	September 27, 1979	Laundry	6.47
79-124	September 27, 1979	Calibration Source	551.40
79-125	October 1, 1979	Non-compacted Waste	215.64
79-126	October 2, 1979	Misc. Liquid Samples	31.45
79-127	October 2, 1979	Non-compacted Waste	267.66
79-128	October 3, 1979	Charcoal Filters	16.0
79-129	October 4, 1979	Laundry	6.71
79-130	October 5, 1979	Liquid Sample	0.0084
79-131	October 8, 1979	Liquid Sample	31.3
79-132	October 12, 1979	Liquid Sample	0.0154
79-133	October 15, 1979	Liquid Sample	8.42
79-134	October 18, 1979	Laundry	7.719

No unacceptable conditions or discrepancies were identified.

(2) Storage of Solid Radioactive Waste

Tours of solid radioactive waste storage areas were made to review, access control, posting and barricading of storage areas.

No unacceptable conditions or discrepancies were identified.

b. Radioactive and Contaminated Material Control

Radioactive and contaminated material control were reviewed for compliance with 10 CFR 20.203, "Caution signs, labels, signals and controls," and Station Health Physics Procedure 1682, Revision 2, "Control of Contaminated Tools, Equipment and Material", dated April 28, 1977.

No unacceptable conditions or discrepancies were identified.

c. Posting and Area Control

Tours of controlled and non-controlled areas were made to verify licensee compliance with the following:

-- 10 CFR 20.203, "Caution signs, labels, signals and controls";

-- Technical Specification 6.8, "Procedures";

-- Technical Specification 6.12, "High Radiation Area";

-- Station Health Physics Procedure 1610, Revision 7, "Establishing and Posting Areas," dated September 30, 1977; and,

-- Station Health Physics Procedure 1613, Revision 9, "Radiation Work Permits", dated October 11, 1979

(1) The licensee has established Station Administrative Procedure 1050, Revision 0, "Control of High Radiation Areas," dated August 17, 1979. The procedure provides for control of High Radiation Areas greater than 1000 mrem/hr by means of a separate lock and key for each access.

The implementation of procedure 1050 was reviewed on September 26, 1979. As a result of this review, one Significant Inspection Finding was identified. The item, failure to implement Procedure 1050, is attached to this report as Significant Inspection Finding No. 320/79-26-01.

(2) The licensee's procedure HPP 1613, "Radiation Work Permits," provides a means of controlling access to areas where personnel are subject to occupational radiation exposure.

The implementation of this procedure was reviewed on October 17, 1979. As a result of the review, one Significant Inspection Finding was identified. The item, failure to adhere to procedures is attached to this report as Significant Inspection Finding No. 320/79-26-04.

This finding revealed that on October 17, 1979, resin liners and other Cap-Gun 1 components were being moved to allow construction of a building enclosing the system for winter operations. As the first liner was raised from the concrete shield, a worker had to wipe down the outside of the liner due to water that had collected in the shield. A Health Physics Technician with a teletector was on the other side of the fence in the liner storage area. No survey to assess radiation levels was made as the liner was pulled out while the worker wiped down the liner. Subsequntly, measurements indicated maximum contact dose rates of 800 mrem/hr. This work, and all resin liner transfers, were performed under the Standing Radiation Work Permit, SRWP No. 28741, dated October 17, 1979, which authorizes workers to "Operate and Inspect Radioactive Waste System."

This deviation from the original concept of the SRWP as it is defined in Section 5.4 of HPP 1613 was brought to the licensee's attention on October 31, 1979. Resolution of this item is expected by November 9, 1979 at which time the finding will be reviewed for inclusion in a subsequent report.

d. Radioactive Effluent Releases

Plant effluent releases, including sewage disposal, were reviewed. The review included: procedure adherance, calculations, documentation and adequacy of analysis methods. The releases and disposal were reviewed against the following:

-- 10 CFR 20.106, "Radioactivity in Effluents to Unrestricted Areas";

-- 10 CFR 20.303, "Disposal by Release into Sanitary Sewage Systems";

-- Station Health Physics Procedure 1621.2, Revision 4, "Releasing Radioactive Liquid Waste from Unit 2,", dated January 5, 1979;

-- Special Operating Procedure SOP No. Z-33, Revision 2, "Water Sump Discharges to IWTS and IWFS," dated May 18, 1979;

-- Special Operating Procedure SOP No. Z-51, Revision 4, "Liquid Releases from TMI," dated August 14, 1979; and,

-- Special Operating Procedure, SOP No. Z-46, Revision 1, "Sewage Disposal," dated May 1, 1979.

No unacceptable conditions or discrepanices were identified.

e. Airborne Radioactivity Sampling

The licensee's airborne radioactivity sampling program was reviewed against the requirements of 10 CFR 20.201, "Surveys" and 10 CFR 20.103, "Exposure of Individuals to Concentrations of Radioactive Materials in Air in Restricted Areas."

An inspector tour of the Unit 2 auxiliary building was conducted on September 21, 1979. As a result of this tour, one Significant Inspection Finding was identified. The item, failure to utilize calibrated equipment for airborne radioactivity sampling, is attached to this report as Significant Inspection Finding No. 320/79-26-02.

f. Plant Tours

Daily tours of the various areas in the plant, including all control points, the auxiliary and fuel handling buildings were made to examine: access control; personnel frisking; use of survey meters; adherence to radiation work permit (RWP) requirements and the proper use of respiratory protection equipment. Additionally, the following items were reviewed:

-- Performance of radiation dose rate measurements of the MU-V-17 valve room, 281' elevation fuel handling building, on September 19, 1979;

-- The decontamination efforts of the 281' elevation fuel handling building annulus area on October 5-7, 1979. A wet vacuuming technique was utilized by the licensee;

-- Licensee response and actions during following drills: fire drill on October 11, 1979; and emergency drill, i.e., contaminated and injured workers, at EPICOR II liquid treatment facility on October 19, 1979;

-- Drawing of reactor building water sample on October 20, 1979 at M-20 area. Licensee utilized Procedure 2104-4.17, dated October 10, 1979, for guidance.

The review of reactor building water sampling on October 20, 1979 identified two discrepancies. These were brought to the attention of licensee representatives prior to sample collection. The discrepancies and corrective action taken prior to sampling were as follows:

-- One self-contained breathing apparatus (SCBA) on standby for the sampling was found not to have been certified for use. The SCBA was replaced with a certified operable unit; and,

-- An in-field procedure change for backflushing the sample line was planned. No documentation for the procedure change was on hand. A licensee representative subsequently obtained Temporary Procedure Change Notice (TCN) No. 2-79-144 to procedure 2104-4.17, step 4.2.4.

Additionally, a tour conducted on October 15, 1979 identified one Significant Inspection Finding. The item, failure to follow Radiation Work Permit (RWP) requirements, is attached to this report as Significant Inspection Finding No. 320/79-26-03.

10. Exit Interviews

Meetings were held with licensee management to discuss inspection findings and concerns as noted below.

Meeting on September 26, 1979

Licensee Representatives

J. Flynn, Resident Engineer - General Public Utilities (GPU)
W. Gunn, Construction/Engineering Manager
S. Palmeter, Manager of Construction - GPU
D. Shibinski, Quality Assurance Engineer - GPU
J. Wright, Site Quality Assurance Manager - GPU

NRC Representative

A. Varela, Reactor Inspector

Review of Solid Waste Staging Facility was discussed.

Meeting on October 5, 1979

Licensee Representatives

T. O'Conner, Senior Technical Analyst
W. Potts, Superintendent Technical Support
J. Seelinger, Superintendent Unit 1
J. Logan, Superintendent Unit 2 (items discussed separately, not present at meeting)

NRC Representative

P. Koltay, Reactor Inspector

Findings associated with fire barrier penetrations were discussed.

Meeting on October 31, 1979

Licensee Representatives

R. Dubiel, Health Physics Supervisor, Unit 1
J. Herbein, Vice President - Nuclear Generation
D. Limroth, Superintendent Administrative/Technical Support
J. Logan, Superintendent, Unit 2
P. Ruhter, Health Physics Supervisor, Unit 2

NRC Representatives

J. Collins, Deputy Director NRC TMI Recovery Operations Office
R. Conte, Reactor Inspector
D. Haverkamp, Lead Reactor Inspector
R. McGaughy, Chief Site Operations Section
J. White, Lead Radiation Specialist

Findings in the Operations and Health Physics areas were discussed.

ENCLOSURE (1) to TMI-2 STANDING ORDER NO. 2

Enclosure 2

SIGNIFICANT INSPECTION FINDING NO. 320/79-26-01

SHORT TITLE: Failure to Implement Station Administration Procedure 1050, "Control of High Radiation Areas" dated August 17, 1979

DESCRIPTION:

See Attached

	IDENTIFYING NRC OFFICIAL	LICENSEE REP. NOTIFIED	NOTIFICATION ACCOMPLISHED BY
SIGNATURE	G P Greger for		G P Greger
NAME	R. Fish/L. Hueter	R. Dubiel	G. P. Greger
TITLE	Radiation Specialist	Radiation Protection Supv.	Radiation Specialist
DATE/TIME	9/24/79 / @1300		

LICENSEE ACTION TAKEN: VERIFICATION DATE/TIME N/A

Licensee corrective action has been initiated.

Verified by: G P Greger for R Fish / L Hueter
Name/Title and Signature

Disposition Recommendation

[XX] Document in Inspection Report.

[ ] Additional Enforcement Action because of inadequate licensee action.

[ ] Cancel. Does not warrant inspection documentation.

[XX] Carry as outstanding item for further inspection.

[ ] _____

G. P. Greger
Lead Ops or HP Inspector

Disposition

B W McDaniel
Chief, Site Operations Support
TMI Recovery Operations Office

Oct 31, 1979
Date

Significant Inspection Finding No. 320/79-26-01(CONT)

DESCRIPTION:

Technical Specification 6.8 requires that written procedures be established, implemented and maintained covering the applicable procedures recommended in Appendix "A" of Regulatory Guide (Reg. Guide) 1.33, November, 1972. Reg. Guide 1.33 recommends, in Section G.5.a, that procedures be written covering restrictions and activities in High Radiation Areas.

(1) Section 3.2.3 of Administrative Procedure 1050 requires that "the contents of the Controlled Key Locker will be audited by a Lead Radiation Protection Foreman every other day, and by the Radiation Protection Supervisor or his designee every week. Audit results will be noted on the Key Log."

Contrary to the above, no indication of audits performed by the Lead Radiation Protection Foreman could be verified for the period September 1 through 26, 1979. Additionally, although audits performed by the Radiation Protection Supervisor on September 1, 11, 19 and 24, indicated that the required foreman audits were not being completed, no corrective action appeared to be taken.

(2) Section 3.2.3 of Administrative Procedure 1050 requires that "locks and keys are to be unique, i.e., one key will unlock only one high radiation area."

Contrary to the above, as of approximately September 16, 1979 only 15 out of 37 doors were equipped with unique locks, as required. Additionally, discussions indicated approximately 5 keys are in circulation that unlock multiple high radiation area doors.

(3) Section 3.2.2 of Administrative Procedure 1050 requires that "the Radiation Protection Foreman shall prepare and maintain a current list of keys stored in the High Radiation Area Key Locker. The list shall contain: ...the number of such keys assigned to the High Radiation Area Key Locker."

Contrary to the above, as of September 26, 1979, the key locker list did not contain the number of such keys assigned to the High Radiation Area Key Locker.

(4) Section 3.3.2 of Administrative Procedure 1050 requires that "the integrity of barricades shall be verified and logged once per shift by the Radiation Protection Department." Additionally, Section 3.3.3 requires that "each lock to a high radiation area shall be verified as to locked or unlocked status and logged once per shift by the Radiation Protection Department."

Contrary to the above, documentation of the required checks could not be located for the day radiation protection shift through September 26, 1979.

ENCLOSURE (1) to TMI-2 STANDING ORDER NO. 2

SIGNIFICANT INSPECTION FINDING NO. 320/79-26-02

SHORT TITLE: Failure to utilize calibrated equipment for airborne radioactivity sampling

DESCRIPTION:

SEE ATTACHED

	IDENTIFYING NRC OFFICIAL	LICENSEE REP. NOTIFIED	NOTIFICATION ACCOMPLISHED BY
SIGNATURE	T M Regan for		T M Regan for
NAME	D. R. Neely	R. Clements	D. R. Neely
TITLE	Radiation Specialist	Contractor H.P. Foreman	Radiation Specialist
DATE/TIME	9/21/79 - 0900		9/21/79 - 1100

LICENSEE ACTION TAKEN: VERIFICATION DATE/TIME 9/23/79 - 0900

The overdue for calibration airborne radioactivity sampling equipment was removed and calibrated.

Verified by: T M Regan for
R. Fish / Radiation Specialist
Name/Title and Signature

Disposition Recommendation

- [XX] Document in Inspection Report.
- [ ] Additional Enforcement Action because of inadequate licensee action.
- [ ] Cancel. Does not warrant inspection documentation.
- [ ] Carry as outstanding item for further inspection.
- [ ] _____

T M Regan
Lead Ops or HP Inspector

Disposition

B W McDonald
Chief, Site Operations Support
TMI Recovery Operations Office
October 31, 1979
Date

DESCRIPTION:

10CFR20.103(a)(3) requires that "for purpose of determining compliance with the requirements of this section, the licensee shall use suitable measurements of concentrations of radioactive materials in air for detecting and evaluating airborne radioactivity in restriced areas".

Contrary to the above, suitable measurements of airborne radioactivity were not assured for the periods shown below due to the fact that the air sampling equipment used was overdue for calibration.

Auxiliary Building Sampler Location	Calibration Due Date	Days Overdue
305' el. Location 1	8/13/79	39
305' el. Location 2	8/13/79	39
305' el. Location 5	8/13/79	39
328' el. Location 1	8/1/79	51
328' el. Location 2	8/10/79	42
281' el. Location 5	9/1/79	20

ENCLOSURE (1) to TMI-2 STANDING ORDER NO. 2

SIGNIFICANT INSPECTION FINDING NO. 320/79-26-03

SHORT TITLE: Failure to follow RWP - Contaminated Individual

DESCRIPTION:
Failure to comply with protective clothing required by RWP #28777 resulted in one individual receiving contamination below left knee. The RWP called for coveralls and wet suit; paper coveralls were substituted for the wet suit by the shift H.P. Foreman for the U-2 Control Post. Only dry decon was to be performed; wet suits were not thought to be necessary. During the decon, the individual accidentally knelt in a wet/oily spot, feeling slight wetness through the coveralls. The RWP substitution is in violation with the plant procedure 1613, Section 5.0(d) which requires changes to RWP's be approved and reflected on all copies by the Radiation Protection Supervisor/Foreman or the Shift Supervisor or their designees.

	IDENTIFYING NRC OFFICIAL	LICENSEE REP. NOTIFIED	NOTIFICATION ACCOMPLISHED BY
SIGNATURE	JR Creger for	X	JR Creger for
NAME	James Stewart Bland	Bill Craft	James Stewart Bland
TITLE	Health Physicist	H.P. Supervisor NSS	Shift H.P.
DATE/TIME	10/15/79 - 2315	X	10/18/79 - 1100

LICENSEE ACTION TAKEN: VERIFICATION DATE/TIME 10/19 - 1000
The matter was discussed with the shift H.P. resulting in the H.P. being removed from the U-2 H.P. foreman capacity. Management positions on the matter was that such an individual should not be in a decision making position, such as H.P. foreman.

JR Creger for
Verified by: James Stewart Bland/Health Physicist
Name/Title and Signature

Disposition Recommendation

- [XX] Document in Inspection Report.
- [ ] Additional Enforcement Action because of inadequate licensee action.
- [ ] Cancel. Does not warrant inspection documentation.
- [ ] Carry as outstanding item for further inspection.
- [ ] _____

JR Creger
Lead Ops or HP Inspector

Disposition

RW McDaniel
Chief, Site Operations Support
TMI Recovery Operations Office
October 31, 1979
Date

ENCLOSURE (1) to TMI-2 STANDING ORDER NO. 2

SIGNIFICANT INSPECTION FINDING NO. 320/79-26-04

SHORT TITLE: Failure to Make Dose Rate Measurements Incident to EPICOR I Liner Changeout.

DESCRIPTION:
Standing RWP's require workers to have a dose rate instrument for entry to an area controlled by a SRWP (ref H.P. Procedure 1613, Sec 5.4) on 10/17/79, workers in the Cap Gun I area, controlled by SRWP 28741, did not have a dose rate instrument during moving and wipe down of resin liners. Failure to have a dose rate instrument for an operation where high radiation levels are likely, resulted in the inability for a proper evaluation of the radiation hazards to be performed as required by 10 CFR 20.201(b). Radiation levels were later measured by licensee personnel up to 0.8 R/hr contact.

	IDENTIFYING NRC OFFICIAL	LICENSEE REP. NOTIFIED	NOTIFICATION ACCOMPLISHED BY
SIGNATURE	S R Brady for		S R Brady for
NAME	Steven C. Ewald	Dale Ferguson	Steven C. Ewald
TITLE	Shift Inspector	NSS Supervision	Shift Inspector
DATE/TIME	10/17/79 2100		10/18/79

LICENSEE ACTION TAKEN: VERIFICATION DATE/TIME 10/28/79
Discussed the event with Mr. Ferguson who agreed a special survey should be performed for these operations. He stated he would discuss this item with the H.P. foreman to assure surveys would be performed as the liners are lifted from the shields. A liner changeout was observed on 10/28. The required dose rate measurements were made.

Verified by: G P Lukas for R. Nimitz, Shift Radiation Specialist
Name/Title and Signature

Disposition Recommendation

- [XX] Document in Inspection Report.
- [ ] Additional Enforcement Action because of inadequate licensee action.
- [ ] Cancel. Does not warrant inspection documentation.
- [ ] Carry as outstanding item for further inspection.
- [ ] _____

G P Lukas
Lead Ops or HP Inspector

Disposition

B W McDaniel
Chief, Site Operations Support
TMI Recovery Operations Office
October 31, 1979
Date