



Metropolitan Edison Company  
Post Office Box 542  
Reading Pennsylvania 19640  
215 929-3601

August 29, 1979  
GQL 1126

Writer's Direct Dial Number

Office of Inspection and Enforcement  
Attn: Boyce Grier, Director  
Region 1  
U. S. Nuclear Regulatory Commission  
King of Prussia, Pennsylvania 19406

Dear Sir:

Three Mile Island Nuclear Station Units 1 & 2 (TMI 1 and TMI-2)  
Operating License No. DPR-50 (TMI-1) and DPR-73 (TMI-2)  
Docket No. 50-289 (TMI-1) and 50-320 (TMI-2)

Enclosed please find our response to Inspection Report 50-289/79-03 and  
50-320/79-04.

Sincerely,

J. G. Herbein  
Vice President-Nuclear Operations

JGH:RAL:tas

Enclosure

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RESPONSE TO INSPECTION REPORT  
50-289/79-03 and 50-320/79-04

Infraction A:

- A. Unit 2 - Technical Specifications in Section 6.12.1a, b, and c, and 6.12.2 require that any individual or group of individuals permitted to enter a high radiation area shall be provided with or accompanied by one or more of the following:
1. A radiation dose monitoring device which continuously indicates the radiation dose rate in the area.
  2. A radiation monitoring device which continuously integrates the radiation dose rate in the area and alarms when a pre-set integrated dose is received.
  3. An individual qualified in radiation protection procedures who is equipped with a radiation dose rate monitoring device.

Contrary to this requirement, individuals or groups were permitted, twice on February 13 and once on each day on February 16 and 18, 1979, without a neutron radiation dose rate monitoring device of either required type, to enter high radiation areas in and near the D-rings of Unit 2 wherein the neutron dose rate exceeded 5 rem/hr and constituted, at various locations, up to 80% of the measured radiation dose rate. Survey records indicated that the neutron dose rate increased prior to and possibly during this period of time. The cause of the change had not been determined when these entries were permitted.

Response to Infraction A:

Following the inspection and prior to the incident of March 28, 1979, additional administrative controls were instituted to ensure compliance with the referenced specification. Specifically, approval of the Unit 2 Superintendent was required prior to entry to the operating floor (elevation 348') or within the secondary shield of the reactor building. Additionally, engineering efforts were underway to determine the cause of loss of water from the neutron shield tanks and to implement the necessary modifications to reduce the neutron dose-rates. Due to the March 28 incident, projects in this area have been delayed.

Response to Inspection Report  
50-289/79-03 and 50-320/79-04

Infraction B:

- B. Unit 1 - Technical Specifications in Section 6.11 requires the preparation of procedures for personnel radiation protection and adherence to approved procedures for all operations involving personnel radiation protection.

Station Administrative Procedure 1003 "Radiation Protection Manual" in Section 2.9 "Radiation Work Permit", requires personnel to adhere to the instructions listed in the RWP; and in Section 3.0 "Training and Indoctrination of Radiation Protection" requires training of all individuals to the degree required for the efficient performance of their work.

Contrary to this requirement, on February 13, 1979, at 3:00 p.m., three individuals who were working in the Hot Machine Shop on a RWP did not have the rubber gloves, and two individuals did not have the coveralls, specified by the RWP.

Response to Infraction B:

The individuals involved in work described were contractor personnel who had since terminated their employment at Three Mile Island. In an effort to prevent recurrence and as a result of the TMI-2 incident, of March 28, 1979, increased awareness of Health Physics practices have been emphasized in training programs, selected maintenance procedure review and on the job health physics surveillance. A procedure is in place (HPP 1685) to document any health physics violations and to ensure proper followup action is taken to prevent recurrence.

In addition, procedural changes are being made to require individuals entering RWP areas to initial the RWP to ensure their awareness of the protection requirements of that RWP. This procedural change is currently being reviewed. Full compliance will be achieved by October 1, 1979.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION I  
631 PARK AVENUE  
KING OF PRUSSIA, PENNSYLVANIA 19406

APR 23 1979

Docket Nos. 50-289  
50-320

Metropolitan Edison Company  
ATTN: Mr. J. G. Herbein  
Vice President - Generation  
P. O. Box 542  
Reading, Pennsylvania 19640

Gentlemen:

Subject: Combined Inspection 50-289/79-03 and 50-320/79-04

This refers to the inspection conducted by Mr. K. Plumlee of this office on February 13-15, 24, 25, 28, and March 1 and 2, 1979 at the Three Mile Island Nuclear Generating Station, Units 1 and 2, Middletown, Pennsylvania of activities authorized by NRC License Nos. DPR-50 and DPR-73 and to the discussions of our findings held by Mr. Plumlee with Messrs. J. Logan and J. Seelinger and other members of your staff at the conclusion of the inspection, and to a subsequent telephone discussion between Mr. Plumlee and Mr. T. Mulleavy on March 19, 1979.

Areas examined during this inspection are described in the Office of Inspection and Enforcement Inspection Report which is enclosed with this letter. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, measurements made by the inspector, and observations by the inspector.

Our inspector also verified the steps you have taken to correct the items of noncompliance brought to your attention in a letter dated November 21, 1978. We have no further questions regarding the steps you took to correct items A and B. Item C was not reviewed on this inspection.

Based on the results of this inspection, it appears that certain of your activities were not conducted in full compliance with NRC requirements, as set forth in the Notice of Violation, enclosed herewith as Appendix A. These items of noncompliance have been categorized into the levels as described in our correspondence to you dated December 31, 1974. This notice is sent to you pursuant to the provisions of Section 2.201 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations. Section 2.201 requires you to submit to this office, within twenty (20)

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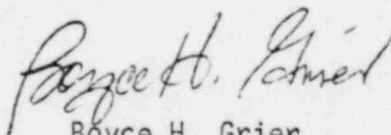
days of your receipt of this notice, a written statement or explanation in reply including: (1) corrective steps which have been taken by you and the results achieved; (2) corrective steps which will be taken to avoid further items of noncompliance; and (3) the date when full compliance will be achieved.

With respect to Appendix A, we note that you have corrected Item No. B, and therefore you need not address yourself to this matter in your response.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosures will be placed in the NRC's Public Document Room. If this report contains any information that you (or your contractor) believe to be proprietary, it is necessary that you make a written application within 20 days to this office to withhold such information from public disclosure. Any such application must be accompanied by an affidavit executed by the owner of the information, which identifies the document or part sought to be withheld, and which contains a statement of reasons which addresses with specificity the items which will be considered by the Commission as listed in subparagraph (b) (4) of Section 2.790. The information sought to be withheld shall be incorporated as far as possible into a separate part of the affidavit. If we do not hear from you in this regard within the specified period, the report will be placed in the Public Document Room.

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,



Boyce H. Grier  
Director

Enclosures:

1. Appendix A, Notice of Violation
2. Office of Inspection and Enforcement Combined Inspection  
Report Numbers 50-289/79-03 and 50-320/79-04

cc w/encls:

E. G. Wallace, Licensing Manager

J. J. Barton, Project Manager

R. C. Arnold, Vice President - Generation

L. L. Lawyer, Manager - Generation Operations

G. P. Miller, Manager - Generating Station - Nuclear

J. L. Seelinger, Unit 1 Superintendent

W. E. Potts, Unit 1 Superintendent - Technical Support

J. B. Logan, Unit 2 Superintendent

G. A. Kunder, Unit 2 Superintendent - Technical Support

I. R. Finfrock, Jr.

Mr. R. Conrad

G. F. Trowbridge, Esquire

Miss Mary V. Southard, Chairman, Citizens for a Safe Environment  
(Without Report)



APPENDIX A

NOTICE OF VIOLATION

Metropolitan Edison Company

Docket Nos. 50-289  
50-320

Based on the results of an NRC inspection conducted on February 13-15, 23, 25, 28, and March 1 and 2, 1979, it appears that certain of your activities were not conducted in full compliance with the conditions of your license as indicated below. Items A and B are infractions.

- A. Unit 2 - Technical Specifications in Section 6.12.1.a, b, and c, and 6.12.2 require that any individual or group of individuals permitted to enter a high radiation area shall be provided with or accompanied by one or more of the following:
1. A radiation dose monitoring device which continuously indicates the radiation dose rate in the area.
  2. A radiation monitoring device which continuously integrates the radiation dose rate in the area and alarms when a preset integrated dose is received.
  3. An individual qualified in radiation protection procedures who is equipped with a radiation dose rate monitoring device.

Contrary to this requirement, individuals or groups were permitted, twice on February 13 and once on each day on February 16 and 18, 1979, without a neutron radiation dose rate monitoring device of either required type, to enter high radiation areas in and near the D-rings of Unit 2 wherein the neutron dose rate exceeded 5 rem/hr and constituted, at various locations, up to 80% of the measured radiation dose rate. Survey records indicated that the neutron dose rate increased prior to and possibly during this period of time. The cause of the change had not been determined when these entries were permitted.

- B. Unit 1 - Technical Specifications in Section 6.11 requires the preparation of procedures for personnel radiation protection and adherence to approved procedures for all operations involving personnel radiation protection.

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Station Administrative Procedure 1003 "Radiation Protection Manual" in Section 2.9 "Radiation Work Permit" requires personnel to adhere to the instructions listed in the RWP; and in Section 3.0 "Training and Indoctrination of Radiation Protection" requires training of all individuals to the degree required for the efficient performance of their work.

Contrary to this requirement, on February 13, 1979, at 3:00 p.m., three individuals who were working in the Hot Machine Shop on a RWP did not have the rubber gloves, and two individuals did not have the coveralls, specified by the RWP.



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

Region I

Report No. 50-289/79-03  
50-320/79-04  
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 19603

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

Inspection at: Middletown, Pennsylvania

Inspection conducted: February 13-15, 24, 25, 28, and March 1 and 2, 1979

Inspectors: K. E. Plumlee 4/12/79  
K. E. Plumlee, Radiation Specialist date signed

P. E. Clemons 4/12/79  
P. E. Clemons, Radiation Specialist date signed

Approved by: H. W. Crocker 4/13/79  
H. W. Crocker, Acting Chief, Radiation Support date signed  
Section, FF&MS Branch

Inspection Summary:

Inspection on February 13-15, 24, 25, 28, and March 1 and 2, 1979  
(Combined Report Nos. 50-289/79-03 and 50-320/79-04)

Areas Inspected: Routine, unannounced inspection by regional based inspectors of Unit 2 Biological Shield Surveys, effluent monitoring, and radwaste system operation, and the Units 1 and 2 radiation protection program during routine operation and during Unit 1 refueling, including: qualifications of radiation protection personnel; training; procedures; instruments and equipment; exposure control; posting, labeling, and control of radioactive materials and radiation areas; surveys; and notifications and reports. Upon arrival, areas where work was being conducted were examined to review radiation safety procedures and practices. This inspection involved 81 inspector-hours onsite by two regional based NRC inspectors.

Results: Of the twelve areas inspected, no items of noncompliance or deviations were identified in ten areas. Two items of noncompliance were identified in two areas (Infractions: High radiation area entries without adequate continuously indicating dose rate instruments - paragraph 5, and failure to adhere to procedures - paragraph 6). The neutron radiation levels in Unit 2 were substantially greater than indicated in the FSAR and this was caused by low water levels in the neutron shield tanks - paragraph 4.

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## DETAILS

### 1. Persons Contacted

#### Metropolitan Edison Company (Met-Ed)

J. DeMan, Radiation Protection Foreman, Unit 2  
R. Dubiel, Supervisor of Radiation Protection and Chemistry  
E. Fuhrer, Engineer II, Nuclear  
F. Huwe, Radiation Protection Foreman, Unit 2  
\*G. Kunder, Unit 2 Superintendent, Technical Support  
\*J. Logan, Superintendent, Unit 2  
L. Landry, Radiation Protection Engineer  
R. McCann, Radiation Protection Foreman, Unit 1  
\*T. Mulleavy, Radiation Protection Supervisor  
W. Potts, Unit 1 Superintendent, Technical Support  
M. Ross, Supervisor, Station Operations, Nuclear  
\*J. Seelinger, Unit 1 Superintendent  
P. Velez, Radiation Protection Foreman, Unit 1  
D. Weaver, Unit 2 I&C Foreman

#### Babcock and Wilcox

J. Flint, Startup Test Engineer

\*denotes those present during the exit interview at 5:00 p.m.,  
March 2, 1979.

In addition to the above, the inspector interviewed several individuals regarding their conduct of work under radiation work permits.

### 2. Licensee Action on Previous Inspection Items

(Closed) Infraction (320/78-31-01): Failure to post and barricade a high radiation area. Review on this inspection did not identify any remaining problem in either Unit 1 or 2.

(Closed) Infraction (320/78-31-02): Failure to survey adequately to identify and post a radiation area. Review on this inspection did not identify any remaining problem in either Unit 1 or 2.

(Closed) Inspector Follow Item (320/78-31-03 and 289/78-18-02): Review service histories and calibration records of effluent monitors and area radiation monitors. Review on this inspection did not identify any recent problems involving these instruments.

(Open) Inspector Follow Item (320/78-31-04 and 289/78-18-04): Review records of surveys on roof of containment. The licensee representative stated that no Unit 1 survey records of the roof were found and because no personnel were allowed on the roof of the containment during unit operation no recent surveys were made of either unit.

(Closed) Inspector Follow Item (320/78-19-01 and 320/78-04-05): Review resolution of gaseous effluent monitor tests (TP 360/1A). Review on this inspection indicated that the only remaining item is to obtain, install, and test the replacement isokinetic sample probe.

(Closed) Inspector Follow Item (320/78-19-02): Review records of tests of the reactor coolant waste evaporator. Review indicated that system heat tracing tests (TP 370/1) were completed and the functional tests (TP 230/3) indicated that the system is operable; however, flow transmitter FQI-48 requires correction and a controller, LCV-44, is being reviewed to determine how to improve the operating cycle of a pump.

(Closed) Inspector Follow Item (320/78-19-03): Review of tests performed at 93% power including:

TP 500/3, Initial radiochemistry test

TP 800/3, Biological shield survey (paragraph 4)

TP 800/35, Effluent systems and effluent monitoring

Review of the above records indicated that testing and review was complete, with only a few itemized exceptions and test deficiencies remaining to be corrected, which did not prevent routine operation of Unit 2.

(Closed) Inspector Follow Item (320/78-19-04): Review of the completion of maintenance on secondary chemistry fume hood system, decontamination room floor opening, decontamination room shower, other shower facilities, and a multipoint recorder. Observation during this inspection indicated that the hood operated satisfactorily, adequate shower facilities were provided and the recorder was in operation. The licensee representative stated that a work order was issued to close up the floor opening.

(Open) Infraction (289/78-06-01): Inadequate survey of steam generator. Further information was being obtained on steam generator work during this inspection, which will be evaluated in determining the disposition of this item.

(Open) Inspector Follow Item (289/76-26-05): Temporary locks and doors controlling entrances to high radiation areas. Inspection showed that two newly installed permanent gates could be opened fairly easily without a key. The corrective action on one gate was reviewed and found acceptable but the other was not fixed by the end of the inspection.

3. Licensee Action on Bulletins

Bulletin 78-07, Airline Respirators and Supplied Air Hoods

Observation of airline respirator, training, fitting, and use on February 24 and 25, 1979, did not identify any problems. The licensee informed the inspector by telephone on March 19, 1979, that the replacement regulators, expected during January, 1979, had not arrived.

Respirator use will be reviewed again on a subsequent routine inspection.

4. Unit 2 Neutron Dose Rate

Review of containment survey records dated February 10, 17, and 24, 1979, when Unit 2 was at 93% power, indicated that the neutron dose rate was substantially higher (by a factor of 5 to 10) than indicated in the FSAR description for areas near the entrance on the 282ft. 6in. elevation to the "D-rings," near the reactor cavity on the operating floor, and on the bridge between the tops of the D-rings (i.e., over the cavity). The range of the available neutron survey instrument was exceeded in the above locations. This is a Model PNR-4 Eberline "Rem Counter," maximum range 5 rem/hr. The lack of an adequate survey instrument may have concealed the rate of change in conditions.

Previously, Inspection 320/78-31, paragraph 7, identified the neutron dose rate in Unit 2 as being as high at 40% power as in Unit 1 at 100% power.

Review records of TP 800/3, "Biological Shield Surveys," indicated that after the measurement at 40% power the licensee discovered that the neutron shield (water) tanks were not filled. The measurement at 40% power was determined not to be representative of the proper operating conditions. The neutron shield tanks were filled and a survey on December 27, 1978, at 93% power (listed as 100%) indicated reasonable agreement with the FSAR description and with experience in Unit 1.

TP 800/3 exception and deficiency resolution 3E indicated that the HP Department accepted the 100% power survey; and that monitoring of dose rates would continue.

The inspection indicated that both of the above statements were factual but did not identify the assignment of any responsibility. The inspection indicated that the Radiation Protection Supervisor, Foremen, and Technicians were neither informed of any problem with the shield water level, nor given any specific instructions to follow in the event the neutron dose rate changed. (These individuals were acquainted with Unit 1 which does not use water in the neutron shield at the location where Unit 2 uses water tanks.)

The neutron shield tanks were rechecked on March 9, 1979, following a reactor trip. Several tanks were dry and the remainder had low water levels. The licensee is investigating the cause and planning corrective action to prevent any further problem. The licensee representative stated that no level indication and no provision to refill these tanks at power was included in the design.

This item will be followed up on a subsequent routine inspection (320/79-04-01).

5. Entries Into High Radiation Areas that Exceeded the Range of the Neutron Survey Instrument

Unit 2 Technical Specifications in Sections 6.12.1.a, b, and c, and 6.12.2, require that any individual or group of individuals permitted to enter a high radiation area shall be provided with or accompanied by one or more of the following:

- a. A radiation dose monitoring device which continuously indicates the radiation dose rate in the area.
- b. A radiation monitoring device which continuously integrates the radiation dose rate in the area and alarms when a preset integrated dose is reviewed.
- c. An individual qualified in radiation protection procedures who is equipped with a radiation dose rate monitoring device.



On Saturday, February 24, 1979, the inspector overheard comments and subsequently contacted individuals who apparently knew of, but did not participate in, entries into areas described in paragraph 4 where the neutron dose rate exceeded the range of the neutrons survey instrument.

The inspector informed the Radiation Protection Foremen, who were on site, of this item and stated that he would follow up as soon as feasible. The inspector reviewed numerous radiation work permits (RWP) records, the containment entry log, and survey records. The inspector contacted personnel identified on these records as feasible.

The inspector determined that on each of the following: February 13, 1979, on RWP No. 14529 and again on No. 14535; February 16, 1979, on RWP No. 14548; and February 18, 1979, on RWP No. 14555, one or more individuals apparently entered high radiation areas without any continuously indicating neutron dose rate monitoring device, alarming device, or individual who was equipped with such a device. The areas that they entered had not been adequately surveyed because the neutron survey instrument range was exceeded. A licensee representative stated that a factor of two was allowed using a gamma radiation dose rate instrument.

The inspector noted that in these areas the neutron dose rate was unknown and unpredictable, which is evident in paragraph 4, and that the neutron radiation dose rate was, in some locations, 5 times the gamma radiation dose rate.

The inspector identified these instances as examples of noncompliance with the above requirements (320/79-04-02).

#### 6. Training, Qualifications, and Procedures

Part of the inspection effort was to review the selection of temporary personnel to fill responsible positions during the Unit 1 outage; preplanning of work; procedures to be used during the outage; and the training of personnel for radiation work.

Technical Specifications Section 6.11 requires the preparation of procedures for personnel radiation protection and adherence to approved procedures for all operations involving personnel radiation protection.

Station Administrative Procedure 1003, "Radiation Protection Manual," in Section 2.9, "Radiation Work Permit," requires personnel to adhere to the instructions listed on the RWP; and in Section 3.0, "Training and Indoctrination of Radiation Protection," requires training of all individuals to the degree required for the efficient performance of their work.

During a tour of the Unit 1 facility, at ~3:00 p.m. on February 13, 1979, the inspector observed three individuals working in the hot machine shop under RWP No. 21088, "Testing RCU Valve," which required them to wear coveralls and rubber gloves on this job. The Hot Machine Shop was posted as a High Radiation Area.

Two individuals wore lab coats but not coveralls. None wore rubber gloves.

The inspector identified these as examples of noncompliance with the above requirements (289/79-03-01).

The licensee representative stopped the job and required full compliance with the terms of the RWP before resuming work.

Interviews with these individuals (contractor employees), indicated that they worked previously on the same job on a RWP that did not require coveralls and rubber gloves and they failed to change their work practice on February 13, 1979, when the RWP required coveralls and rubber gloves. The licensee representative instructed these individuals that they are to comply with all instructions on the RWP or get the RWP changed.

Review of training records indicated that each of these individuals had received the required training and had passed a written examination before working on RWPs.

#### 7. Qualifications of Contract Radiation Protection Personnel

Part of the inspection effort was to determine the licensee's adherence to the qualifications required in ANSI N18.1-1971, Section 4.5.2, for technicians in responsible positions, who were hired to perform surveys and to man control points as well as to monitor certain radiation jobs during the outage.

Review of resumes and Form NRC-4 information, and interviews with individuals, did not identify any problems. The inspector had no further questions on this item.



8. Advanced Planning and Preparation for the Unit 1 Outage

Part of the inspection effort was to review the planning and preparation for the Unit 1 outage. A factor in the outage was the necessity to start earlier than originally planned, because the Unit 1 operating experience had not involved as much down time as expected during the preceding nine months. This resulted in the fuel cycle ending earlier than anticipated.

The licensee designated individuals to prepare procedures and train personnel for each major job to be done. Equipment and appropriate shielding were provided for these jobs. Personnel having recent experience at other facilities were hired to carry out jobs they were experienced in.

The inspector observed that on February 14, 1979, there were 20 or more survey instruments awaiting servicing or calibration. The Unit 1 personnel subsequently borrowed instruments from Unit 2 and placed further effort on instrument repair.

The licensee also ordered a modification for the PNR-4 Eberline "Neutron Rem Counter" to extend its range.

No shortages of protective clothing, respirators, dosimeters or instruments was identified during tours of the facilities. The inspector had no further questions on this item.

9. Control of Contaminated Equipment

The inspector observed the control of contaminated equipment and tools, the management of discarded protective clothing and respirators, and the disposition of waste. The inspector also observed the labels on containers of radioactive materials.

10. Posting of Radiation Areas, High Radiation Areas and Control of Access to Contaminated Areas

The inspector made confirmatory measurements of radiation levels and observed the posting and control of access to Radiation Areas, High Radiation Areas, Contaminated Areas, and Airborne Radioactivity Areas.

The inspector noted that smoking areas were designated at locations where there were no nearby friskers, thus a smoker would have to walk past the smoking area to a frisker, 100 to 300 feet distance, if he wished to frisk before smoking. One smoking area was identified in the Unit 1 Heat Exchanger Vault and others in the Auxiliary Building.

Moreover, there were posted contaminated areas in these vicinities where there were no friskers. An individual leaving one of these contaminated areas would walk through a smoking area en-route to the frisker.

The licensee representative stated that an insurance representative required the establishment of no smoking and smoking areas.

The licensee's disposition of this item will be followed up on a subsequent inspection (289/79-03-02).

#### 11. Exit Interview

The inspector met with the licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on March 2, 1979 at 5:00 p.m.

The inspector reviewed the scope of the inspection.

The inspector reviewed the items of noncompliance.

The inspector described regulatory guides and standards on ventilation controls, radiation hoods, and radiation work practices.

Smoking areas, the provision of friskers, and the need to frisk on leaving contaminated areas were reviewed.

The inspector stated that the FSAR indicated better control of the neutron dose rate in Unit 2 containment than was being maintained on March 2, 1979.

The licensee representative stated that the neutron shield water would be checked as soon as feasible. (A check was made on March 9, 1979 and the tanks were low or empty - paragraph 4.)