UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

September 5, 1979

Charles Bechhoefer, Esq., Chairman
Atomic Safety and Licesning Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Mr. Frederick J. Shon
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dr. David R. Schink
Department of Oceanography
Texas A & M University
College Station, Texas 77840

In the Matter of Detroit Edison Company
(Enrico Fermi Atomic Power Plant, Unit 2)
Docket No. 50-341

Gentlemen:

Enclosed for your information is a copy of a notice of violation and an inspection report dated July 31, 1979. These were issued as a result of an investigation conducted by the NRC in response to allegations of noncompliance with Detroit Edison's Quality Assurance (QA) program by Mr. Frank Kuron, a member of CEE. This investigation revealed that only one allegation was substantiated as an item of noncompliance. Other allegations of deficiencies had been previously identified by the NRC Inspection program or the licensee's QA program and appropriate corrective action was in progress or had been completed.

Sincerely,

Richard L. Black

Richard L. Black
Counsel for NRC Staff

Enclosures: As stated

cc w/enclosures:
Service List

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

JUL 3 1 1979

Docket No. 50-341

Detroit Edison Company
ATTN: Mr. Eward Hines
Assistant Vice President
and Manager Quality
Assurance
2000 Second Avenue
Detroit, MI 48226

Gentlemen:

This refers to the investigation conducted by Messers F. C. Hawkins, R. J. Marsh, H. S. Phillips, and H. M. Wescott of this office on February 15 - March 2, 1979, of activites at Enrico Fermi 2 authorized by NRC Construction Permit No. CPPR-87 and to the discussion of our findings with Messrs. T. A. Allessi. R. W. Barr, W. Fahrner, W. Everett and H. A. Walker, and others of the Enrico Fermi 2 project staff at the conclusion of the investigation.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

Relative to the interviews conducted, friction and incidents between QC inspectors and tradesmen at Wismer and Becker Contracting Engineers were found to be a potential QA problem. Licensee management should assure that such incidents do not impede the identification of quality problems.

During this inspection, certain of your activities appeared to be in noncompliance with NRC requirements, as described in the enclosed Appendix A.

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 thirty days of your receipt of this notice a written statement or explanation in reply, including for each item of noncompliance: (1) corrective action taken and the results achieved; (2) corrective action to be taken to avoid further noncompliance; and (3) the date when full compliance will be achieved.

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, the enclosures, and your response to this letter will be placed in the NRC's Public Document Room, except as follows. If the enclosures contain information that you or your contractors believe to be proprietary, you must apply in writing to this office, within twenty days of your receipt of this letter to withhold such information from public disclosure. The application must include a full statement of the reasons for which the information is considered proprietary, and should be prepared so that proprietary information identified in the application is contained in an enclosure to the application.

We are sorry for the delay in sending this report to you. Staff involvement in the Three Mile Island incident and subsequent investigation contributed to this delay.

We will gladly discuss any questions you have concerning this investigation.

Sincerely,

James G. Keppler
Director

Enclosures:
1. Appendix A, Notice of Violation
2. IE Investigation Report No. 50341/7904

cc w/encls:
Central Files
Reproduction Unit NRC 20b
PDR
Local PDR
NSIC
TIC
Ronald Callen, Michigan Public Service Commission
Eugene B. Thomas, Jr. Attorney

RIII	RIII	RIII	RIII	RIII	RIII
Hawkins/sr	Wescott	Knop	Fiorelli	Ward	Norelius
Hayes	Phillips	7/26/79	Keppler 7/26/79		7/27

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Appendix A

NOTICE OF VIOLATION

Detroit Edison Company Docket No. 50-341

Based on the investigation conducted on February 15 - March 2, 1979, it appears that certain of your activities were not conducted in full compliance with NRC requirements as noted below. This item is an infraction.

10 CFR 50, Appendix B, Criterion XVI states in part that, "Measures shall be established to assure that conditions adverse to quality, . . . are promptly identified and corrected."

The Enrico Fermi Atomic Power Plant Unit 2 Quality Assurance Manual, Procedure No. 17, Sections 17.0 and 17.1 state in part that, "Written procedures shall be implemented to assure . . . prompt corrective action is taken when conditions adverse to quality are identified", and that, ". . . Quality Control personnel shall promptly identify and report on conditions adverse to quality . . . ."

Contrary to the above, the investigators:

1. Observed a void area in the sacrificial shield wall grout (Azimuth 49° 15', elevation 619' 8½"). This void area had not been previously identified by the licensee as nonconforming.

2. Observed that DIC DDR No. 1187 was closed prior to corrective action being taken to complete the grouting repair of sacrificial shield wall Placement No. 2. (Azimuth 286° 30' to approximately 316° 30', elevation 598' 4 1/16"). The licensee was not cognizant of the incomplete corrective action to properly repair this nonconforming void area, prior to this investigation.

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

REGION III

Report No. 50-341/79-04

Docket No. 50-341 License No. CPPR-87

Licensee: Detroit Edison Company
2000 Second Avenue
Detroit, MI 48226

Facility Name: Enrico Fermi 2

Investigation At: Enrico Fermi 2

Investigation Conducted: February 15-March 2, 1979

Investigators: R. C. Knop for F. C. Hawkins, Reactor Inspector — 7/27/79 (date)

C. E. Norelius for R. J. Marsh, Investigator — 7/27/79 (date)

R. C. Knop for H. S. Phillips, Reactor Inspector — 7/27/79 (date)

H. M. Wescott, Reactor Inspector — 7/27/79 (date)

Reviewed By: C. E. Norelius, Assistant to the Director — 7/27/79 (date)

R. C. Knop, Chief, Projects Section 1 — 7/27/79 (date)

Investigative Summary

Investigation on February 15 - March 2, 1979 (Report No. 50-341/79-04)
Areas Inspected: Twenty allegations were made relative to management and construction practice. In many instances these allegations pertained to non-safety related equipment or work. This inspection involved 146 inspector-hours which includes 80 hours on site and 50 hours of investigation time meeting with several allegers at appointed meeting places.

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Results: In most instances, the alleged deficiencies had been previously identified by the NRC Inspection program or licensee's QA program with appropriate corrective action in progress or completed. One allegation was substantiated as an item of noncompliance with the provisions of 10 CFR 50, Appendix B, Criterion XVI, regarding the presence of voids and incomplete corrective action in repair of other nonconforming void areas of the sacrificial shield grout. This item of noncompliance is detailed in the Details section, Paragraph 5, Allegation No. 16, of this report.

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SUMMARY OF FACT

On February 8 and 9, 1979, Mr. Frank Kuron was interviewed by Messrs. Robert Marsh (NRC Investigator, Region III), and Shannon Phillips (NRC Reactor Inspector, Region III), regarding his earlier statements before the Fermi 2 Prehearing Conference.

Mr. Kuron provided the NRC representatives with information on twelve areas which he considered as potential health and safety concerns regarding the construction and future operational capabilities of the Fermi 2 site. Through both question and answer and in narrative statements it was disclosed that Mr. Kuron's concerns covered broad areas and in several cases were dated or were of a nonspecific nature. Mr. Kuron indicated much of his information was second or third hand and/or founded solely on heresay. Mr. Kuron agreed to review his own records and contact his "sources" in an attempt to provide the NRC more definitive information. At the close of the interview, twelve (12) potential areas of investigation were identified. Following a review of Mr. Kuron's allegations, an investigation was initiated on February 15, 1979.

On February 20, 1979, the investigation was continued at the Fermi 2 site. On February 21, 1979, Mr. Kuron was brought on site and in a walking tour of the facility, further defined his allegations.

The orginal list of twelve allegations/areas of concern resulting from the February 8 and 9, 1979, interview of Mr. Kuron was expanded to twenty (20) items and additional detail was aquired from Mr. Kuron and other sources. The areas investigated and the conclusions reached are summarized as follows:

1. Lack of Quality Control - No evidence to support or substantiate this allegation was identified.

2. Destruction of two trailer loads of quality control records - In 1974, documents from two trailers that contained personal records and copies of working drawings, specifications, and milestone charts were burned. No permanent QA records were destroyed. The investigation was unable to substantiate this allegation.

3. A recent fire in Building 45A was more extensive than reported to the NRC - No evidence to support or substantiate this allegation was identified. Continued as open item (341/79-04-02) pending licensee identification of records burned.

4. Interference fit of a 24" Globe Valve - No evidence to substantiate this allegation or concern regarding improper construction practice was identified.

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5. Poor housekeeping in the drywell area - The investigation was unable to substantiate that overall housekeeping (drywell area included) was unacceptable at the time of this investigation.

6. Improper installation of reflective shielding - The investigation substantiated that this shielding is nonsafety related and therefore it is not a safety concern.

7. Pipe hangers improperly installed - Allegation determined to be valid and previously identified by the NRC. Corrective action is continuing.

8. Reactor Feed Pump Turbine damaged in early fire not properly repaired - Investigation disclosed concerned equipment to be QA Level II, nonsafety related. Allegation considered a nonsafety construction issue.

9. Nozzles in main condenser improperly welded - Insufficient detail available to identify specific piping involved. Investigation disclosed no safety related piping in area designated by alleger.

10. Improper storage of turbine parts - Determined to be nonsafety construction issue.

11. Inadequate posting of work areas as required by 10 CFR 21 (Paragraph 21.6) - Allegation not substantiated.

12. Improper welding of Main Steam Line spool piece - No evidence to support or substantiate this allegation was identified.

13. Use of improper weld rod - Allegation not substantiated. System involved determined to be nonsafety related.

14. Improper pipe whip restraint weld - Allegation was determined to be unsubstantiated.

15. Improper installation of concrete anchors (Red Heads) - The investigation was unable to substantiate this allegation. Continued as open item (341/79-04-03) pending additional testing by licensee.

16. Voids in grout of sacrificial shield wall - Allegation substantiated. Two void areas identified by investigation and licensee DDR 1187 found to have been inadequately completed (incomplete repair). These items cited as items of noncompliance (341/79-04-04).

17. Improper cadweld sleeves in Reactor Building - No evidence found to support or substantiate this allegation.

18. Hairline cracks in Reactor Building structural steel - No evidence found to support or substantiate this allegation.

19. Surplus structural steel from RHR Building considered by alleger to represent construction "short cuts" - No evidence to support or substantiate this allegation was identified.

20. Cracks in the concrete of the base slab of the Reactor Building - The investigation revealed that an early history of cracking had existed with the base slab but that this previously addressed matter had been satisfactorily resolved by licensee action

CONCLUSIONS

One item of noncompliance (341/79-04-04) was identified as a result of this investigation of Mr. Kuron's allegations. In the other nineteen (19) instances, the allegations/areas of concern were found to be either unfounded, previously identified, or addressing nonsafety related areas. In the latter case, the available details of the allegation and findings of the investigative team were provided to the licensee for their information and corrective action as deemed appropriate.

In the identified item of noncompliance (allegation No. 16) the identified voids in the grouting of the sacrificial shield and incomplete corrective action previously initiated by the licensee under DDR 1186 were cited as examples of noncompliance with 10 CFR 50, Appendix B, Criterion XVI.

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DETAILS

1. Background

Detroit Edison Company (Edison) began construction activites at the Enrico Fermi 2 Site on June 1, 1969. General Electric is the nuclear steam system supplier for one Boiling Water Reactor rated at 1123 MWe. Detroit Edison served as the Architect Engineers (AE), however, they contracted a portion of the AE work to Sargent and Lundy.

The Ralph M. Parsons Company (Parsons) had constructor responsibilities and held an N-stamp. In addition, they were responsible for quality assurance/control activites on site. The QA/QC organization was composed of Parsons and Edison personnel. The Parsons' Site QA Manager reported to an Edison Project QA Director who was located at the Edison offices offsite. Parsons was mechanical contractor for piping installations. The Parsons' QA/QC organization arrangement worked satisfactorily according to comment made by licensee management.

In 1974, Edison halted construction activities until additional finances could be obtained to carry on the project. Edison representatives stated that this curtailment allowed Edison to change from the general contractor concept to the construction manager concept. As a result, Daniel Construction Company (Daniel) became the construction manager and assumed Parsons' responsibilities for overseeing construction on site as well as quality assurance responsibility. Wismer and Becker (W&B) Contracting Engineers assumed responsibilities for mechanical piping. This was considered a management improvement and a more efficient operation.

2. Persons Contacted

Principal Licensee Employees

*T. A. Allessi, Edison QA Director
*W. Everett, Project Superintendent
*R. W. Barr, Project QA Manager
*H. A. Walker, Project QA Engineer
C. J. Miller, QA Engineer
*G. Carter, QA Engineer
P. Cribbs, QA Engineer
*A. Alexiou, Assistant Project Superintendent
*W. F. Colbert, Project Engineer
*W. W. White, Assistant Project Manager and Plant Superintendent
*C. R. Bacon, Field Project Engineer
L. E. Schuerman, Licensing Engineer
E. P. Griffing, Assistant Plant Superintendent
A. Godoshian, Assistant Project Manager

Other Personnel

*J. G. Bolt, Project QA Manager Daniel International Corporation (DIC)
*D. E. Seifert, Project Manager (DIC)
*C. B. Bliesener, Administrative Assistant to Project Manager (DIC)
*J. T. Blixt, QC Manager (DIC)
T. Crouse, QA Engineer, Civil, (DIC)
D. Ingmire, Civil Manager (DIC)
J. Cresham, Maintenance Engineer (DIC)
S. Cawood, QC Inspector, Civil, (DIC)
D. Richardson, Administrative Assistant Construction Manager (DIC)
H. Damerson, Documentation Specialist (DIC)
R. Madden, Documentation Specialist (DIC)
L. Osborne, QA Engineer, Wismer and Becker (WB)
*J. R. Dunkleberg, Field Engineer, Sargent and Lundy

The investigators also talked with and interviewed several other licensee and contractor employees, including members of the quality, technical, engineering staffs and craftsmen.

*Denotes those attending the exit interview.

3. Licensee Action on Previously Identified Problems

(Closed) Noncompliance (341/78-09-02): Program adequacy not assessed by higher management. The Director of QA stated that the program is scheduled to be assessed by May, 1979.

(Closed) Noncompliance (341/78-09-03): Followup on Edison QA audits was inadequate in several instances. The investigator reviewed the most recent audit of Sargent and Lundy which closed the corrective action loop.

(Closed) Noncompliance (341/78-09-04): Edison QA had not performed adequate audits of Edison purchasing activities. The investigator reviewed a recent audit (EF2-45020) performed December 21, 1978, and an audit plan for an additional audit outlined in Edison document EF2-45622.

Functional areas inspected during the investigation are recorded in the Details section of this report.

4. Introduction

Mr. Frank Kuron made a limited appearance statement at the Fermi 2 Prehearing Conference on December 18, 1978. At this conference he indicated that he had knowledge of security problems, quality control problems, poor quality of work, questionable licensee credibility, potential radiation leakage, and deliberate destruction of records. He repeatedly said he had stories to tell which would point the NRC

in the right direction if they wished to act further. The information provided at the Prehearing Conference was very general and did not give specific information to support the general allegations.

5. Allegations

Region III investigators subsequently contacted Mr. Kuron on February 8-9, 1979, to gather additional specific information. He gave the same general information as was given at the Prehearing Conference. However, as the interview progressed he started giving general locations of equipment, piping, valves, hangers and material that workmen had told him were deficient or questionable. At the end of these interviews, Mr. Kuron was told that several of the items he had described during the interview were not safety related. A definition of safety essential systems was described to Mr. Kuron as: The necessary design, fabrication, construction, testing and performance requirements for structures, systems and components important to safety, that is, structures, systems, and components that provide reasonable assurance that the facility can be operated without undue risk to the public. Finally, Mr. Kuron was told that the NRC investigators needed more specific details such as exact locations and identification of alleged deficiencies or concerns. He was also told that the areas of concern would be looked at during a routine inspection or a special investigation. Additional review and evaluation of Mr. Kuron's allegations and concerns resulted in the initiation of an investigation to determine their validity on March 15, 1979.

A Region III investigation team went to the Fermi 2 site on February 20, 1979. The alleged deficiencies or concerns were described to the licensee and their response was that the allegations still lacked specific details. The RIII project inspector asked that Mr. Kuron be allowed to come onsite to point out the alleged deficiencies since this was the only sure way to find the deficiencies since he had been unable to give specific system and location identification. The licensee agreed to give the alleger access and complete freedom to identify deficient items, i.e., structure, system, subsystem, subassembly, component part or material.

On February 21, 1979, Mr. Kuron entered the site at approximately 9:30 a.m. In a meeting he again repeated the areas of concern to Messers. R. J. Marsh, H. S. Phillips, H. M. Wescott and F. C. Hawkins, NRC investigators. At approximately 10:50 a.m. a tour of the reactor, auxillary and turbine building commenced to physically identify items alledged to be deficient or questionable. The inspection ended at approximately 5:00 p.m. resulting the identification of alleged deficiencies as follows:

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- Reactor Feed Pump Turbine N21-02-C-014; N21-02-C-015 was damaged in a fire.
- RHR building structural steel surplus.
- Pipe hangers, P43-3324-G06 improperly installed.
- Condenser piping nozzles welds improper.
- Turbine generator stop valve bearings improperly maintained.
- Drywell reflective insulation improperly installed.
- Spool piece, B21-3258-4 (2733-126) welding improper.
- Pipe whip restraint welding improper.
- Cracks in reactor basement floor repair questioned.
- Hairline cracks in steel embedded in concrete in drywall floor an improper condition.
- Cadwelds in fifth floor of reactor building questioned.
- Anchors (Red Heads) in concrete improperly installed.
- Reactor building closed cooling water piping, P42-3338-3 misaligned.
- Sacrificial shield grouting voids.
- Poor housekeeping in the drywell.
- 24" Globe valve, E11-50F048B interference fit.

The above items were reviewed with Mr. Kuron at the end of the investigation to assure all deficient items were identified. He was told that several areas still lacked specifics which would allow positive identification of items. He agreed that the above listed items were the total he was able to identify at that time. He stated that other personnel contacted during the tour would contact the NRC after work hours and give additional details which would specifically identify items in the general areas he had pointed out. The NRC did obtain additional information regarding these items from anonymous contacts and personnel interviews.

The above sixteen (16) areas combined with the following four (4) remaining from the original twelve (12) provided by Mr. Kuron on February 8 and 9, 1979, produced a total of twenty (20) areas to be investigated. The four areas not redundant with the sixteen provided by Mr. Kuron on February 21, 1979, were:

- Until recently, there has been no quality control program.
- Two trailer loads of QC records were burned in 1974.
- A recent fire in Building 45A was more severe than reported.
- Posting of signs advising workers where the NRC can be contacted is inadequate.

<u>Allegation No. 1</u>: Lack of a "quality control" program.

Mr. Kuron stated that his conversations with crafts people at the Fermi 2 site had created a concern over what he perceives to be a lack, until recently, of an adequate quality control program. Mr. Kuron bases this concern on the general statements of his associates that they remember QC programs to be "better" at previous work sites. Mr. Kuron was unable to provide any detailed specifics.

Finding: Since the construction permit was issued, the NRC has performed approximately fifty inspections of construction activites. QA specialists and engineers have reviewed quality control procedures and the implementation of procedures. The reviews in each case established that each contractor performing safety related work had a satisfactory quality control program or if not, a noncompliance was issued and corrective action was required. These reviews are documented in NRC reports dating back to 1972.

Information from interviewing NRC, licensee and contractor personnel associated with the Fermi 2 project substantiated that quality control has always been in effect since the beginning of this project. The overwhelming majority of contractor personnel expressed the opinion that the quality of work and the inspection of work is satisfactory.

Based on the above information, the investigator found no evidence to support or substantiate the allegation.

Allegation No. 2: An Edison official asked top supervision to burn two trailer loads of quality records.

Mr. Kuron stated that, "This Edison person asked the top supervision to take those records out in the back 40 and burn them and the man was very skeptical about such an order. After three months this man would not burn those records up. He was then told to either burn them or he would have them burned up. Within four months after they were burned up, the Edison people were in there looking for those records."

In addition to the above information given at the Prehearing Conference, Mr. Kuron gave the name of the person who burned the records and stated that Edison may not have meant to burn permanent QA records that should have been retained but they simply bungled. He stated he did not know who ordered the burning. He emphasized they were looking for piping records (Parsons).

Finding: Licensee representatives stated that in 1974 the Ralph M. Parsons Company was leaving the site after construction on Fermi 2 stopped. Two trailers that contained personal records as well as copies of working drawings, specifications and milestone charts were burned; however, no permanent QA records were destroyed. They admittedly looked for milestone charts concerning scheduling but these were not QA records.

Personnel who worked in the record center during the time the records were burned and personnel who work there now were interviewed. The individual who worked in the center at the time of the burning stated that no permanent QA records were burned but he did say that personal records and other nonpermanent records were burned. The individuals who work in the record center now stated they know of no problem with missing records.

The NRC investigators went to the record center and reviewed QA records that must be maintained for a specified time or for the life of the plant. The following contractor records were found to be on file:

- Nonconformance Log listing project nonconformances starting with No. 1 dated October 9, 1970, through No. 2614 dated March 1, 1979. Nos. 41, 255, 389, 468 and 543 generated during the period February, 1971, through January, 1973, were retrieved and reviewed.

- Parsons QA Manual and the Field QA Plans and Procedures Manual were retrieved and reviewed.

- Chicago Bridge and Iron Company letter dated August 30, 1974, referenced the transmittal of all records to the QA center. Some of these records were also retrieved and reviewed during a previous inspection documented in NRC Report No. 50-341/78-18. Although retrieval was slow in some cases, records were retrieved dating back to 1971.

- Documentation to Monitor Cracks in the Reactor Building Basement Floor Slab and Walls, March, 1973, was retrieved.

- Records on "Slab Over Torus" Forming Edison letters dated May 5, 1972, June 5, 1972, September 11, 15 and 20, 1972; Parsons DDR 474 and 488; Field Instruction No. 45 dated July 28, 1972.

- Proposed Grout Specification May, 1972; Edison letters dated July 3, 10 and 13, 1972, June 23 and 30, 1972; S&L letters dated May 1 and 9, 1972; and The R. H. Dewey Company letter dated September 10, 1971. This correspondence contained all information available regarding the identification, and evaluation and correction of cracks in the base slab of the reactor building. Repair procedures were also inclosed with this correspondence.

- Ralph M. Parsons Records dated 1973.

  . Hydrostatic Test Reports No. 46, 24, 25, 26, 18 and 19.

  . ASME Code, Section III, Pipe Erection Records for RHR (E11-3177-9W10; E11-3181-7W8); Core Spray (E21-3144-0W3; E21-3149-3W4; E21-3149-6W0). The file included process control sheets, weld materials issue slips, NDE reports, repairs and material release reports.

  . Receiving Inspection Report Nos. 737-1, 778-9A, 805-3 and 762-5.

Daniel Construction Company letter to Edison dated August 28, 1974, and Report of Audit of Status of QA Records and Documentation of ASME, Section III, Pipe fabrication/work. This audit documented two audits of QA records performed by Parsons. This audit also documented a very thorough review to assure that all pipe welding records were adequately completed and accounted for.

- Daniel Construction Company letter to Edison dated September 16, 1974, and Audit Followup Report. This report documented corrective action of findings in the report previously described above except welding records is still considered an open item.

- Detroit Edison letters dated August 8 and 13, and September 4, 1974, document Edison's control of the QA record transfer and audit of records.

- Audit and Documentation of Records Turnover (Parsons to Daniel).

  - Ralph M. Parsons letter to Edison dated September 27, 1974, listed records of ASME Section III work performed by Parsons. This letter stated that all welding records except six nuclear welds were accounted for. These six welds were subsequently radiographed and were found acceptable. Walter G. House, Parsons Project QA Manager, (Certificate of Authorization: NA-N-723; NPT-N-724) and F. A. Williams, State of Michigan Authorized Inspector certified that Pipe Erection Status Sheets numbers 1 through 138 conformed to ASME Code, Section III. The ANI certified that work had been accomplished in accordance with the Code.

  - Ralph M. Parsons letter to Boiler Division, Department of Labor, dated September 27, 1974, closed out the documentation of work performed by Parsons.

In addition to record reviews indicated above, the NRC has periodically reviewed QA records pertaining to safety related work performed onsite from the start of the project to date. No real significant problems have been found where large amounts of records were missing. During this investigation, Mr. Wescott, an NRC inspector, found that a Hydro Test Record for E11-2852 could not be retreived. This matter is considered unresolved (341/79-04-01).

Based on the above, the allegation that QA records were burned in 1974 was not substantiated.

<u>Allegation No. 3</u>: The fire that occurred in building 45A was more extensive than was reported to the NRC.

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Mr. Kuron also raised a new issue regarding the burning of records. He stated that there were also QA records burned in a fire in building 45A on December 16, 1978. The NRC inspector responded that Edison had notified the NRC that the fire had occurred and a few welding process traveler sheets and NDE reports which were in the process of being reviewed were burned. Mr. Kuron stated that the fire was much more extensive than reported to the NRC because whole desks had been burned in the fire.

Finding: The inspector interviewed Mr. H. A. Walker, Edison Project QA Engineer, who inspected the area damaged by the fire immediately after the fire was extinguished. Most of the records were in a steel cabinet and they were protected. Damaged records mainly consisted of Wismer and Becker welding process sheets and NDE test reports that were left in "in baskets" over the weekend.

The records on top of the desks were burned but, even in this case, only records on the top of the stack were severly burned. Records near the center of the stack were salvagable. Wismer and Becker Company is in the process of reviewing the master files where a copy of the welding and NDE records are kept, to determine which records were lost. A Detroit Edison letter from QA directed Wismer and Becker to determine which records were burned. The missing records will be reconstructed to the extent possible. If a record cannot be reconstructed, the weld in question will be nondestructively tested to assure an adequate weldment was made.

An Edison letter was also issued directing all contractors onsite to assure that all QA records, including those in the review process, be stored in steel cabinets instead of leaving them in "in baskets" overnight or over the weekend.

The investigator inspected the area where the fire occurred. The area had been rebuilt or repaired. File cabinets are now being used to store records overnight. Some nonsafety related piping that was in the fire was still stored in the building and appeared to have no damage. Since the building was metal and floor was concrete slab only a limited amount of highly combustibles were in the building when this fire occurred. The fire was caused by a faulty gas heater which was located in the south end of the building.

This fire was reported to the NRC on the same day it occurred. The report appeared to be accurate and the licensee is now taking appropriate steps to have Wismer and Becker identify missing records and prevent similar occurrences. No evidence was found to support the allegation that the fire was more extensive than reported; however, this matter is considered unresolved pending identification of records burned. (341/79-04-02)

Allegation No. 4: The installation of a 24" Globe Valve and the associated piping could not be installed because of interferences with the concrete wall resulting from poor construction practices.

Mr. Kuron was concerned that the 24" Globe Valve, E11-50F048B (#V82140) QA Level I, ASME II, located at line B-10 and elevation 588', could not be installed because it would interfere with the concrete wall by five inches. He stated that a workman had come down off the scaffolding stating that the whole layout was a mess and would require five or six cuts to install the piping.

Finding: The inspector noted the location and valve identification that Mr. Kuron pointed out.

The inspector reviewed the QA records regarding this allegation and found that Design Change Request No. P-1456 had been issued because there was an interference fit. Engineering had reviewed the request and approved the request on December 21, 1978. The change to the drawing was also controlled as required. An Operation Process Traveller was issued on submittal number 35207 along with accompanying Weld Process Control Sheet Travelers 19561, 19562 and 19563. The welding was specified to be in accordance with Welding Procedure Number 103. The Design Change Notice No. 1508 was issued authorizing the work. All changes were controlled.

The inspector found no evidence to substantiate the allegation or concern regarding improper construction practices.

Allegation No. 5: The housekeeping in the drywell is very bad especially in the area between the reflective insulation and the vessel wall.

Mr. Kuron stated that the crews who installed the reflective shielding were required to wash all the metal surfaces with demineralized water prior to installing the panels. Now all kinds of debris and dirt has gotten into this area and the crew wondered why it should have been cleaned in the first place. During the walk through investigation, he pointed out several pieces of lumber and debris on top of the cover which seals off and protects the inside of the reactor pressure vessel.

Finding: The inspector visually inspected the entire drywell area. Some debris was found between the vessel wall and the reflective shielding. A sand blasting operation had been performed on the fifth floor of the reactor building and this dust had drifted down into the drywell and on top of the platform sealing the vessel as well as down the sides of the spaces between the vessel walls to reflective shielding and between the shielding and the outer most wall of the drywell.

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The inside of the vessel is sealed and entry into the vessel is controlled. When one enters the vessel a pass is required and protective clothing must be worn. In the past, NRC inspectors have inspected this area repeatedly and have found no housekeeping problems in this area.

Mr. Kuron's comments concerning housekeeping were unsubstantiated. Although housekeeping has deteriorated somewhat, the housekeeping constitued no noncompliance. Prior to operation all areas will be given a final cleaning. Presently, the licensee has a 30-40 men crew who are cleaning each day. The inspectors will continue to monitor housekeeping to assure that it does not fall below an acceptable level.

The investigator could not substantiate that overall housekeeping is unacceptable at this time.

Allegation No. 6: The reflective shielding was improperly installed.

Mr. Kuron stated that the crews installing this shielding had left out screws which join adjacent shielding panels.

Finding: The investigator visually inspected the shielding which had been installed. In some cases, there were approximately 1/4 to 1/2 inch gaps where the shielding panels join. The investigator was unable to confirm that screws were missing without having the licensee remove the panels.

The investigator reviewed the requirements regarding the subject shielding and found that the reflective shielding is not considered safety related. Detroit Edison Specification 3071-51 (issued May 1, 1971), Paragraph 11.4, classified the shielding QA Level II nonsafety related. Since this item is not safety related, no further action was taken except to advise the licensee that installation may be incorrect.

The investigator substantiated that this shielding is nonsafety related and therefore it is not a safety concern.

Allegation No. 7: Big bore pipe hangers were improperly installed.

Mr. Kuron identified hanger P43-3324-C705 at the 653' elevation in the turbine building as the hanger which was improperly installed.

Finding: The subject hanger identified has been reworked or repaired and was now acceptable. The hanger was supporting a vertical pipe run in the Turbine Building Closed Cooling Water System. This hanger was a part of a nonsafety related system.

Although Mr. Kuron did not point out other deficient hangers, an NRC inspector had previously identified hanger problems in Report No. 50-341/78-03 dated April 27, 1978, and subsequently in Report No. 50-341/78-14 dated September 19, 1978. The first report documented a noncompliance relative to Wismer and Becker Constracting Engineers' failure to establish measures to inspect 375 hangers installed by the Ralph M. Parsons Company. Inspection of hangers installed by Wismer and Becker was considered inadequate because checklists with appropriate qualitative/ quantitative acceptance criteria had not been developed. The second report documented Wismer and Becker's failure to take timely corrective action relative to the installation of hangers and as a result, the W&B Project Quality Manager issued a "Halt Work Directive No. 7" which stopped work on the installation of QA Level I hangers. During the interview, Mr. Kuron was told that this problem had been identified by the NRC. He was also told that an Edison program was in progress to correct hangers which had been improperly installed and to prevent recurrence of improper installation.

The allegation concerning improper installation of pipe hangers was valid; however, the NRC had identified this problem nearly a year ago and the problem is being corrected.

Allegation No. 8: A Fire occurred in the Radwaste Area some years back and equipment was not properly repaired.

Mr. Kuron stated that he was aware of a fire that occurred in the radiation waste area. All Edison did was repaint equipment which was damaged in the fire. They did not disassemble pumps and inspect for damage.

Finding: During the walk through investigation, Mr. Kuron identified Reactor Feed Pump Turbine, N21-02-C-014 and 015, located at column P6 elevation 583'6" as equipment that was involved in the fire.

The investigator found this equipment to be QA Level II, nonsafety related. Since this equipment does not perform a safety function, it is not a safety concern. The radiation waste area does not contain safety related equipment. The only parts of the system that are safety related are the isolation valves located in the drywell.

The investigator substantiated that equipment in the area pointed out and in the radwaste system is not safety related. Therefore, this allegation is not a construction safety issue.

Allegation No. 9: Nozzles located east of the main condenser in the turbine building were welded with the wrong weld rod.

Mr. Kuron stated during the first interview that nozzles located east of the condenser had been welded sometime in 1974, just prior to the project shutdown. He stated that he was told that the wrong

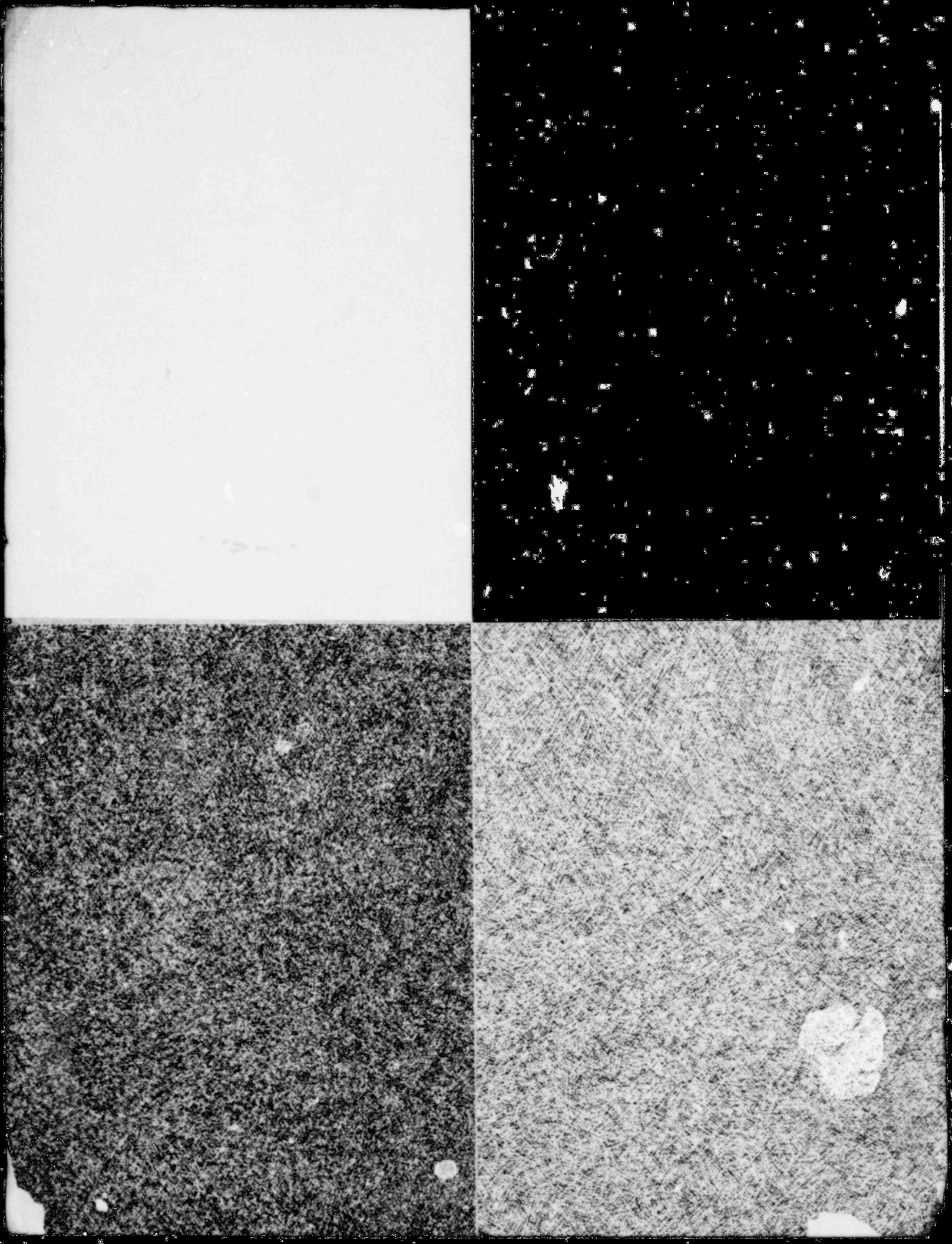


IMAGE EVALUATION TEST TARGET (MT-3)

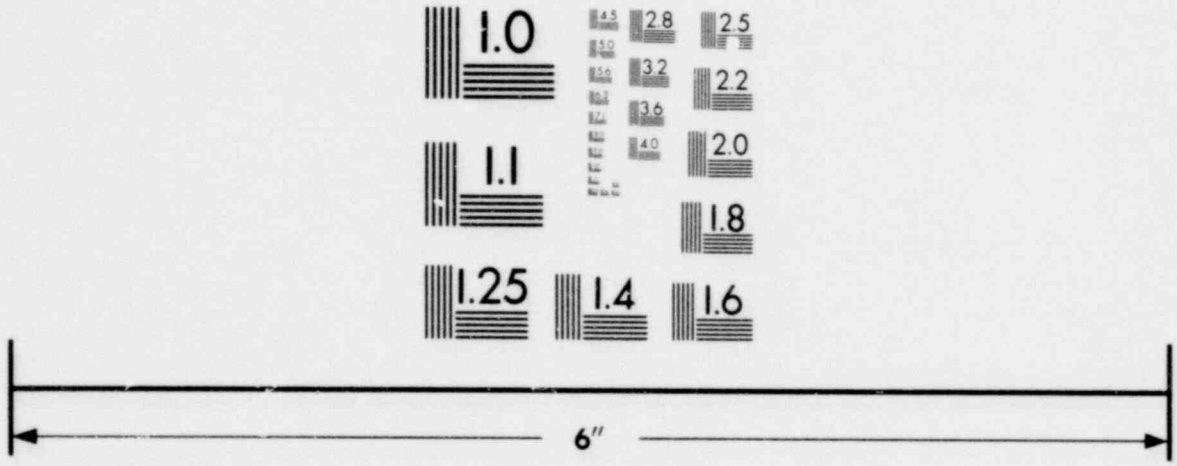


IMAGE EVALUATION
TEST TARGET (MT-3)

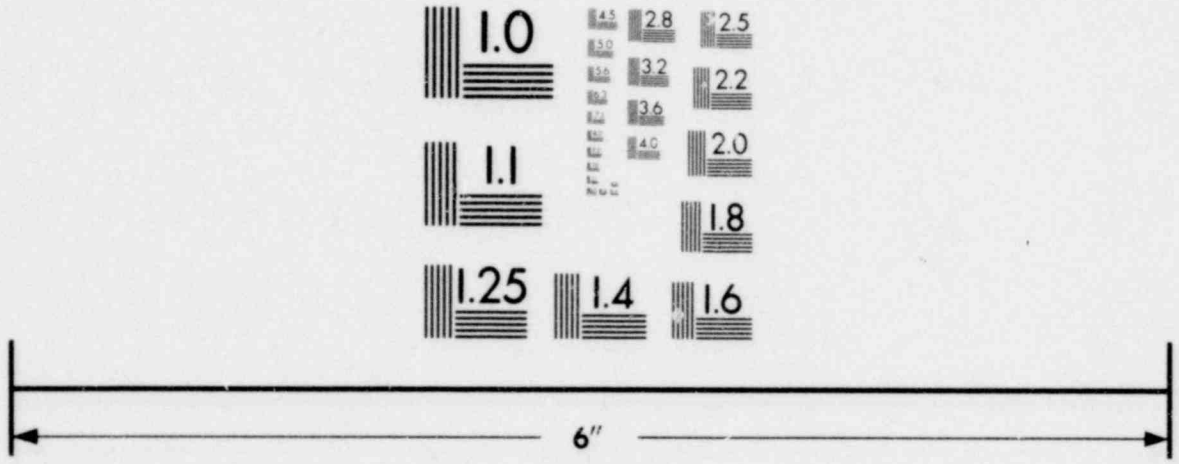
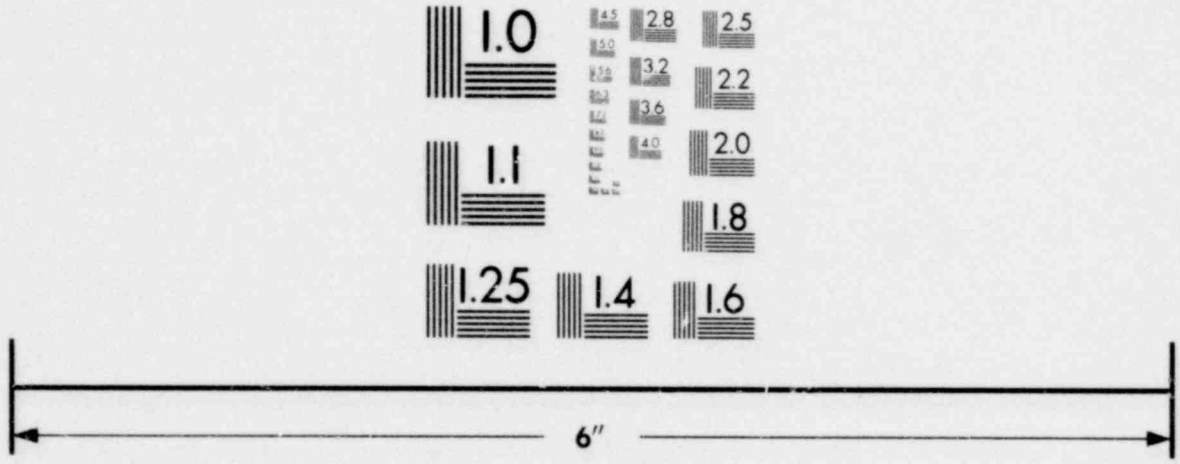


IMAGE EVALUATION
TEST TARGET (MT-3)



rod had been used. When construction on the project resumed, this deficiency was pointed out to the appropriate personnel but instead of removing the weld "they" just "doctored" up the paper work. At the time of the interview, the investigator indicated these welds would probably be considered nonsafety related but the investigator would followup to assure that was the case.

Finding: Mr. Kuron, during a walk through investigation pointed out an area where he thought the deficient welds were located. There were so many pipes in the area, he said he was unsure where the alleged deficient welds were. The investigators interviewed another individual and substantiated Mr. Kuron's story concerning the weld. He attempted to describe the area. He was asked to give the number of the spool piece by calling the investigator after work hours, however, the investigators never received the call.

The investigator inspected the area east of the main condenser twice to insure that the pipe was not safety related. All pipes visually inspected in this area were nonsafety related. The investigator found that the piping could only be identified as safety related or nonsafety related by reviewing the following drawings which showed all pipes in the condenser area:

Basement Drawings No. 7M-721-2981, 3634, 3100, 3265, 3609, 3621, 3608, 2208, 3616, 3820, 3645, 3637, 3819, 3818 and 3822.

First Floor Drawings No., 583; elevation, 7M-721-2372, 3106, 3218, 3223, 3222, 3214, 3219, 3211, 3635, 3213 and 3216.

Second Floor Drawings No. 7M-721-2376, 3220, 3212, 3221, 3393, 3396, 3394, 3395, 3397, 3967, 3198, 3810, 3199, 3638 and 3813.

None of the above drawings showed safety related piping. Mr. B. Buchanan, Detroit Edison Engineer, stated there was no safety related piping in the area. Regardless, Edison was advised that there may be improper welding on nonsafety related piping in the subject areas.

The investigator found that the alleged deficient welding is nonsafety related. Therefore, this matter is not a construction safety issue.

Allegation No. 10: Stop valves for the turbine generator had been improperly stored and maintained resulting in major repair.

Mr. Kuron stated that the throttle valves (stop valves) had not been properly stored and protected resulting in major maintenance problems. The investigator informed the alleger during the first interview that this item is not a safety related piece of equipment.

Finding: Mr. Kuron could not identify the item by number so he was requested to point out the equipment he knew to be a problem. This was done to eliminate potential misidentification. He pointed out a Turbine Stop Valve in the turbine building that was being reworked. Valve Assembly No. 5 A30-00-0-000-QX-049 was identified as a nonsafety related piece of equipment. This matter was brought to the attention of the licensee.

The inspector substantiated that rework was in progress, however, this valve did not constitute a construction safety issue.

Allegation No. 11: Signs are not posted telling workers where the NRC can be reached to report contruction deficiencies.

During the first interview, Mr. Kuron stated tl signs should be posted prominently to let workers know where and how constructions deficiencies could be reported. He did not think such notices were posted.

Finding: The investigator verified that notification was posted at 37 locations as required by 10 CFR 21, Paragraph 21.6. All of these were located at licensee and contractor offices; however, none were posted in the Reactor, Auxillary and RHR Service buildings. The investigator questioned this practice. The licensee volunteered to post the notification in the lunch area inside the Reactor/Auxillary building.

The investigator found that the subject notifications were posted, however, the investigator recommended that posting be more prominent in certain areas. The allegation cannot be substantiated.

No items of noncompliance or deviations were identified concerning the allegation findings described under Allegations No. 1-11.

Allegation No. 12: Weldment of Main Steam Line spool to inlet of the external Main Steam Isolation Valve (MSIV).

- A verbal allegation was made on February 21, 1979, by Mr. Kuron stating that a weld in the steam tunnel had been "doctored." He further pointed out the location of the weld in question to the investigation team.

  Finding: The investigation identified the weldment to be weld identification number B21-3258-4WO to F028C. This weldment is a twenty-six inch (26") main steam pipe spool to the 26" external MSIV. The investigation included a review of weld records and documentation as follows:

  - Review of the Detroit Edison Company, Design Change Request (Field), written on July 17, 1978, Document Control-Site No B21-01-0 and N30-11-0.

This document stated that "The inside diameter of spool pieces B21-325-1 through 4 do not match the ID's of their MSIV's. Field requests permission to weld build-up the ID's of the spools to match the MSIV's to allow proper fit-up of the MSIV to spool joint." This request was approved by the Daniel Discipline Engineer, Daniel - Engineering Manager, Edison Field Engineer, and the Edison Field Project Engineer to allow joint fitup to meet the ASME Code tolerances.

- Review of Wismer and Becker Weld Process Control Sheet Traveler, Submittal No. 16975, dated May 2, 1978, for weld build-up of I.D. for Weld Identification No. B21-3258-4WO(A) including:

  (a) Liquid Penetrant Examination Record (Wismer and Becker) 000916 dated November 29, 1978, showing the build-up to be acceptable.

  (b) Review of seven (7) Wismer and Becker Weld Filler Material Issue (Nuclear) slips used for build-up of ID.

- Review of Wismer and Becker Weld Process Control Sheet Traveller, Submittal No. 20762, dated August 14, 1978, which supersedes WPCS submittal No. 13663, including nineteen (19) Wismer and Becker Weld Material Filler Material Issue (Nuclear) slips.

- Review of Nuclear Energy Services, Incorporated, Radiography Reports of the root pass Report No. 1993 dated January 16, 1979, and the final report of the completed weldment, Report No. 2274, dated February 13, 1979. Both were considered acceptable. The final radiographs were accepted by the Level III Wismer and Becker examiner on February 15, 1979.

No items of noncompliance or deviations were identified

- Mr. Kuron also expressed concerns as to length of time it took to complete this weldment.

  Finding: The investigator discussed this concern with Detroit Edison QA personnel. As a result of the discussion, it was learned that a stop work order was in effect for two (2) weeks in September, 1978, due to welding problems. When welding resumed, the major effort was concentrated in the drywell area. The welding problem is discussed in NRC Region III Report No. 341/78-18, Section IV, Paragraph 1.d. No items of noncompliance or deviations were identified.

- Mr. Kuron also stated that the subject main steam pipe spool had been removed from this location in the steam tunnel to be cut and that he was not certain that the spool installed was the same spool. The alleger related a story wherein the individual cutting the spool was lax while performing the cut and made an error, and that the individual was fired as a result.

  Finding: The investigator discussed the above with the Foreman of Pipe Cutting Incorporated (PCI), and was informed that the piece of pipe being cut was not for the main steam line, however, it was for the RHR system. The individual performing the cut was sent back to PDI's home offices. This section of pipe was recoverable. No items of noncompliance or deviations were identified.

Allegation No. 13: Improper weld material used in the Chemical Cleaning and Flushing System.

A verbal allegation was made by Mr. Kuron on February 21, 1979, by pointing at a system and stating that weld rod had been used in the system that was not supposed to be. The alleger could not identify any specific weldments where incorrect weld filler material had been used.

Finding: The investigator identified the system as Job No. 4500, A 35-3628-40, which was later identified as the "Chemical Cleaning and Flushing System." This system was being built to ANSI B31.1 Pressure Piping (Class D) and is a QA Level II and III system. Therefore, as this system is not nuclear safety related, the investigator did not pursue this allegation further. However, the investigator made this allegation known at the exit meeting held on February 23, 1979. It was stated at that time that this was a temporary system and would eventually be removed. No items of noncompliance or deviations were identified.

Allegation No. 14: Improper weldment of pipe whip restraints.

A verbal allegation was made on February 21, 1979, by the alleger stating that stainless steel weld rod was used that should not have been used in a weld which was pointed out to the investigators.

Finding: The investigation identified the weld as FW7E, a weld joint in a pipe whip restraint structure. Weld records and documentation were reviewed as follows:

- Review of Wismer and Becker Weld Process Control Sheet (WPCS) Submittal No. 12446 for weld identification No. FW7E, dated December 12, 1977. This WPCS specified E-7018 filler material. The Weld Filler Material Issue (Nuclear) slips were attached and indicated that E7018 filler material was used.

- Review of Wismer and Becker DDR No. 175, date issued October 13, 1978. This DDR notes a deviation in that during a repair of FW7 a 1" linear indication was discovered adjacent to FW7. The final disposition of this weld is to excavate the indication its full depth and reweld. During this investigation, the final disposition had not been completed.

The inspector requested the licensee to obtain a sample of weld FW7E to be analyzed to assure that components of stainless steel were not present in the weld. Results of this analysis indicated that no stainless steel is present in the weld. No items of noncompliance or deviations were identified.

Allegation No. 15: Improper installation of concrete anchors.

A verbal allegation was made on February 21, 1979, by Mr. Kuron stating that Red Head concrete anchors had not been properly installed. The anchors were sometimes substituted with shorter anchors (Dutchman Anchors) because of rebar interference and in some cases the anchors were not installed at all but that bolts were tack welded in place to make it look as if they had been properly installed. The majority of these bad installations were alledged to be in the turbine room with some in the reactor building. Mr. Kuron could not point out any specific anchors where the above had been done.

Finding: The inspector reviewed anchor installation records, documents and observed testing of installed anchors, as follows:

- Review of thirteen (13) Wismer and Becker, Concrete Anchor Test Reports, retrieved from the records storage vault. These reports had been accepted by Daniel International.

- Review of approximately thirty-five (35) Wismer and Becker Concrete Anchor Test Reports that had not been turned over to Daniel International for final acceptance.

- Review of Daniel International Procedure No. WP-I-01 "Installation and Testing of Concrete Anchors," Revision 5, dated January 11, 1979, including Appendix I and Wismer and Becker Revision 8. This procedure states that the testing requirements apply to QA Level I system structures unless directed otherwise by Daniel. The procedure further states that QA Level I installations, 10% of the anchors shall be tested at the time of installation. Wismer and Becker personnel stated that 100% testing was being performed as evidenced by item (2) above.

- The inspector observed the testing of four (4) anchors for installation No. IW-P50-7001-G25. These met the required test pressure.

At the exit meeting held on February 23, 1979, the licensee stated that approximately 50% of the hangers would be replaced due to modating of the hanger design and at that time the anchors would be inspected visually and by the use of ultrasonic testing to verify the length of anchor installations. No items of noncompliance or deviations were identified, however, this item is considered to be unresolved pending the satisfactory completion of testing of the anchors by the licensee. (341/79-04-03)

Allegation No. 16: Voids in the grouting of the sacrificial shield wall.

Based on information given him by Fermi 2 craft personnel, Mr. F. Kuron expressed his concern to the RIII investigator that voids existed in the sacrificial shield wall grout. He maintained that several areas in the shield wall were devoid of grout due to the inaccessability of the placement areas and improper placing/consolidation techniques.

Finding: The history of the sacrificial shield wall grout mix design, development, approval and in-process testing was reviewed by the NRC investigative team. Specific items reviewed were as follows:

- Initial test performed by Erlin, Hime and Associates of the four proposed grout mix designs were reviewed and found to include test for Flow (ASTM C109-75, Paragraph 8.3), Density (ASTM C138-75), Air Content (ASTM C138-75 and C231-75), Compressive Strength (ASTM C109-75), Shrinkage (ASTM C157-75), Early Volume Change (ASTM C827-75T) and Bleeding Characteristics (ASTM C232-71).

- Final approval of the mix designs for project use was given by Sargent and Lundy.

- In-process compressive strength test results of grout as required by Daniel International Corporation (DIC) QCP-IV-118, Rev. 0 were reviewed and found in each case to exceed the minimum 6000 psi compressive strength requirement.

Initially, the NRC representatives were given no specific location of the potential void areas. Subsequently, on February 22, 1979, an investigation of the sacrificial shield wall was initiated by NRC and licensee personnel. Utilizing a "sounding technique," four potential void areas were identified. (Wall skin plates No. 613PL1, 631PL1, 643PL3 and 651PL5A.) DIC DDR No. 2600 was then issued to identify and request investigation of these areas. Six 3/8" diameter holes were drilled at the request of DIC Engineering in the skin plates at specified locations. All holes drilled revealed that the shield wall compartments were filled with grout and that the hollow sound was attributable to minute shrinkage of the grout mix away from the wall skin plate.

The inspector requested and was given copies of all DIC DDR's which identified compartments in the sacrificial shield wall which were not properly filled with grout during placement. Following is a chronological list of the shield wall DDR's and a brief description of each:

- DDR No. 1187, Rev. A, October 7, 1977. Identified a void area in Placement No. 2 (Azimuth 286°-30' to 329°-30', elevation 598'-4" to 604'-10") and a void area in Placement No. 4 (Azimuth 342°-30' to 17°-45', elevation 598-4" to 610'-7"). Disposition stated that the voids were to be filled using various grouting methods, depending on location.

- DDR No. 1226, October 12, 1977. Stated that the repair to Placement No. 4 was incomplete due to the inaccessability of the shield wall compartment in which the void existed. A 3 inch grout access hole was drilled per DCR No. D-0037 and the repair of Placement No. 4 completed in accordance with DIC WP-I-03, Rev. 1.

- DDR No. 1402, February 7, 1978. Identifies a void area in Placements No. 7 and 8 at Azimuth 225°, elevation 615'-0", located behind wall skin plate No. 648PL1 and the adjacent column No. 210 C1. A 3" grout access hole was provided per DCR No. C-0393 and the area was satisfactorily repaired in accordance with DIC WP-I-03, Rev. 1.

- DDR No. (C)2610, February 28, 1979. Identifies two void areas confirmed to exist on Feburary 28, 1979, during investigations associated with this allegation. The first area is located at Azimuth 49°-15', elevation 619'-8 1/2" (this area was previously unidentified) and the second is located at Azimuth 286°-30' to approximately 316°-30', elevation 598'-4 1/16" (previously identified on DDR 1187 as Placement No. 2). The following paragraphs discuss these two void areas in detail.

During interviews with selected crafts personnel on February 28, 1979, the inspector was informed of one area in which voids were alledged to exist in the sacrificial shield wall grout. Subsequent investigation, on that date, revealed two void areas, one located at Azimuth 49°-15', elevation 619'-8 1/2" and another at Azimuth 286°-30' to approximately 316°-30', elevation 598'-4 1/16".

The investigator reviewed the DIC procedure of Testing and Inspection of Sacrificial Shield Grout, No. QCP-IV-118, for requirements to assure that shield wall compartments are completely filled during grout placement. QCP-IV-118, Rev. 0, Section 3.6 states that, "Placing procedures and inspection points shall be in accordance with DIC WP-I-03." WP-I-03, Rev. 0, Section 4.2.8, requires that during grout placement the contractor's QC representative will monitor "breather" or "weep" holes for evidence of concrete or grout.

Review of the Sargent and Lundy shop drawings indicated that "weep holes" and 1 1/16" bolt holes, to monitor the progress of grout placement and facilitate trapped air removal were specified as part of the wall skin plate, girder and column fabrication requirements. In addition, the licensee issued DCR No. C-0169B to require additional 3/8" "weep holes" in congested areas to assure complete grout placement.

DECo representatives confirmed that the first void area addressed by DIC DDR No. 2610, located at Azimuth 49°-15;, elevation 619;-8 1/2", had not been previously identified as nonconforming by the responsible inspection personnel. Consequently, no corrective action was scheduled to adequately repair the nonconforming area.

This failure to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected is considered an item of noncompliance with 10 CFR 50, Appendix B, Criterion XVI (341/79-04-04) as described in Appendix A.

DECo representatives also confirmed that the second void area addressed by DIC DDR No. 2610, located at Azimuth 286°-30' to approximately 316°-30;, elevation 598'-4 1/16", was Placement No. 2 which was originally identified by DIC DDR No. 1187. DECo representatives stated further that both Placement No. 2 and Placement No. 4 were incompletely repaired per DIC DDR No. 1187. DIC DDR No. 1226 was then issued to complete the repairs, however, it included only Placement No. 4 for final disposition. DIC DDR No. 1187, which identifies Placement No. 2 as nonconforming, was observed to be closed prior to completion of the specified repair. No corrective action was scheduled to repair this nonconforming void area, prior to its identification during this investigation.

This failure to assure that conditions adverse to quality are promptly identified and corrected is considered another example of noncompliance as cited previously in this section. (341/79-04-04)

Detroit Edison Company representatives stated in a phone conversation with the inspection team on March 6, 1979, that it is their intent to inspect 100% of the "weep" holes and 1 1/16" bolt holes present in the outer surface of the sacrificial shield wall to verify that all shield wall compartments are completely filled with grout. The NRC investigative team was also informed that subsequent inspections by the licensee had identified at least one additional void area in the shield wall.

<u>Allegation No. 17</u>: Improper cadweld splicing of Reactor Building Rebar.

This allegation concerns the mechanical splicing of No. 18 bars in the fifth floor of the Reactor Building at elevation 684'-6". Mr. F. Kuron stated that several reinforcing bars "pulled out" of

the cadweld sleeves and failed to meet the minimum yield strength requirements during physical testing of splices representative of this area in the reactor building.

Finding: The 684'-6" elevation in the Reactor Building contains 327 No. 18 cadwelds located in Placements No. 428 North, 428 South, 429 and 430. Inspector and crew qualifications, inspection, sample frequency and testing were accomplished in accordance with Regulatory Guide 1.10, Rev. 1.

Review of the tensile test results of No. 18 reinforcing bar cadwelds representative of these placements did reveal that two individual splices failed to equal or exceed 125 percent of the minimum yield strength (75,000 psi) as specified in ASTM A615. This observed rate of failure did not exceed one for each fifteen consecutive test samples and at no time did the average tensile strength of each group of fifteen consecutive samples fail to equal or exceed the guaranteed ultimate tensile strength (90,000 psi). This meets the requirements specified in Regualtory Guide 1.10, Sections 3 and 5 for mechanical splice tensile test results. No items of noncompliance or deviations were identified.

Allegation No. 18: Hairline cracks in Reactor Building structural steel.

Mr. F. Kuron stated that through trades and labor personnel, he had learned of "hairline cracks present in some of the Reactor Building structural steel." He was unable to identify specific areas in which these "hairline cracks" existed. Through discussions with the licensee, the investigator learned of a previously identified problem concerning the cracking of clip angles in the slab-over-torus-substructure of the reactor building. When approached, Mr. Kuron stated that these areas "must be the ones."

Finding: The structural steel framing for the "Slab-Over-Torus" (elevation 536'-6") of which the clip angles are a part, consists of radial girders which are shop welded from heavy plates. In the field, the ends of these girders are welded to clip angles which in turn are welded to embedded plates in the inner (circular) and outer (octogonal) wall of the reactor building concrete structure.

During routine QA inspection, it was noted that certain clip angles had developed cracks. The following actions were taken by DECo to resolve the clip angle cracking problem:

- Sargent and Lundy re-evaluated the design of the welded connections of the clip angles to the steel girders and confirmed that the design was adequate. Excessive weld metal on certain clip angles was removed by arc-air gouging and chipping to assure compliance with Taylor and Gaskin drawing FWI, Rev. 2.24-72.

- The cause of the cracking of the rolled angles was determined by metallographic and chemical analysis performed by DECo Reasearch Department to be defective hot rolling.

- All welded clip angles which were not embedded in concrete were tested by liquid penetrant for cracks.

- Clip angles which were not embedded in concrete were replaced or repaired in the field.

  Sargent and Lundy designed 27 saddle supports to be installed under girders where concrete had been placed. These supports, detailed in S&L drawing No. B-56 are designed to bear the full load of the girders.

Approximately ten clip angles were visually investigated by the RIII team. No evidence of cracking was found. The installation of the 27 saddle supports in the specified locations was also verified.

Allegation No. 19: Excess structural steel after completion of the RHR Building.

The allegation concerned approximately 40-50 tons of excess reinforcing steel left over after the completion of the RHR Building. The alleger was concerned this excess might represent essential structural components that were left out of the RHR building during construction. Mr. Kuron was unable to provide any specific location in the RHR Building in which reinforcing steel was known to have been left out.

Finding: During construction of the RHR Building, DECo requested that Daniel International QA take photographs of the placement area to verify proper size and spacing of in-place reinforcing steel. DECo representatives stated that this policy was initiated due to similiar allegations being made at another nuclear power plant under construction.

The NRC team compared the photographs taken of RHR Placements No. SS2, W-1-15 and WP-10 with the appropriate reinforcing steel design drawings. In each case, the investigator was able to correlate the design drawings and photographs to verify that no major errors were made during reinforcing placement.

An investigation of the steel laydown areas revealed approximately 20 tons of RHR Building stock reinforcing steel and one 45 bar bundle of reinforcing steel tagged for use in the 617', elevation RHR slab. It is common construction practice to have this amount of stock steel for field fabrication of miscellaneous steel shapes and to accomodate reinforcing design changes. The 45 bar bundle was determined to be excess reinforcement due to a design change which deleted these bars for the 617' slab.

The investigation associated with this allegation did not reveal any evidence that would lead to the conclusion that reinforcing steel was omitted from the RHR Building. No items of noncompliance or deviations were identified.

Allegation No. 20: Cracks in the concrete base mat of the Reactor Building.

Mr. Kuron expressed his concern of the concrete cracks which developed in the reactor building base mat at elevation 540'. He felt that the cracking might "allow radiation to leak out of the reactor building" and that the structural integrity of the base mat may have been impaired.

Finding: DECo had previously identified the cracks in the reactor building base slab in accordance with 10 CFR 50, Paragraph 50.55(e)(3). The final technical report from DECo was dated November 8, 1974, No. EFZ-29,537.

DECo summarized the reactor building base mat cracking problem as being one of ground water, which was seeping through the radial and circumferential cracks present in the base slab. Evaluation and disposition of the cracking problem by the licensee included the following actions:

- Building Outleakage - In the case of a pipe rupture in the Reactor Building, there would be no outward leakage of radioactive water through the cracks in the floor of the building unless the basement areas became flooded to such a depth that the head of water inside was equal to or higher than that of the ground water outside. Under normal plant operation conditions, this would require flooding in the basement to a depth of approximately 30 feet before reaching the same head at the normal external ground water. If this flooding began to occur, the reactor would be brought to a safe shutdown and the water contained within the building would be processed through the radwaste system. It should be noted that this case is only valid if the cracks were not repaired.

- Sargent and Lundy, the structural designers for the reactor building, performed a thorough anlysis and concluded that the observed cracks did not impair the structural strength of the base slab.

- A program was initiated to monitor the width and length of selected cracks for an increase in length or width and to identify any new cracks which might develop.

- Crack width and the penetration into the base slab was determined by taking random concrete cores at various specified locations.

- Developed, approved and execute procedures for the drilling, pressure testing and grouting of all cracks present in the base mat.

As of the date of this investigation, DECo personnel indicated that they felt the grouting program had effectively sealed the cracks in the base slab due to the lack of infiltrating ground water. The NRC team toured the elevation 540 base slab on February 22, 1979, and found no evidence of continued water seepage. No items of noncompliance or deviations were noted.

6. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance, or deviations. Unresolved items disclosed during the investigation are discussed on pages 12 and 13 (Allegations 2 and 3), and on page 22 (Allegation No. 15) of this report.

7. Exit Interview

The investigators met with site staff representatives (denoted in the Persons Contacted paragraph) at the conclusion of the investigation on March 2, 1979. The investigators summarized the scope and findings of the investigation, including the apparent items of noncompliance identified in the Results section of this report. The licensee acknowledged the findings.

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