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U. S. NUCLEAR REGULATORY COMMISSION  
REGION III

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SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

50-341/84-23  
Inspection Report No.

DETROIT EDISON COMPANY  
Name of Licensee

FERMI 2  
Name of Facility

OCTOBER 1, 1983 - SEPTEMBER 30, 1984  
Assessment Period

## I. INTRODUCTION

The Systematic Assessment of Licensee Performance (SALP) program is an integrated NRC staff effort to collect available observations and data on a periodic basis and to evaluate licensee performance based upon this information. SALP is supplemental to normal regulatory processes used to ensure compliance to NRC rules and regulations. SALP is intended to be sufficiently diagnostic to provide a rational basis for allocating NRC resources and to provide meaningful guidance to the licensee's management to promote quality and safety of plant construction and operation.

A NRC SALP Board, composed of staff members listed below, met on November 30, 1984, to review the collection of performance observations and data to assess the licensee performance in accordance with the guidance in NRC Manual Chapter 0516, "Systematic Assessment of Licensee Performance." A summary of the guidance and evaluation criteria is provided in Section II of this report.

This report is the SALP Board's assessment of the licensee's safety performance at Fermi 2 for the period October 1, 1983 through September 30, 1984.

### SALP Board for Fermi 2:

- L. J. Hueter, Reactor Inspector, DRSS
- L. R. Greger, Chief, FRPS, DRSS
- W. R. Butler, Chief, CSB/NRR
- M. D. Lynch, LPM/LB#1, DL/NRR
- P. M. Byron, Fermi SRI, DRP
- C. E. Norelius, Director, DRP
- E. G. Greenman, Deputy Director, DRP
- C. J. Paperiello, Chief, EPRP Branch, DRSS
- J. W. McCormick-Barger, Fermi Project Inspector, DRP
- R. L. Spessard, Director, DRS
- W. S. Little, Chief, Operations Branch, DRS
- J. J. Harrison, Chief, Engineering Branch, DRS

## II. CRITERIA

The licensee performance is assessed in selected functional areas depending whether the facility is in a construction, preoperational or operating phase. Each functional area normally represents areas significant to nuclear safety and the environment, and are normal programmatic areas. Some functional areas may not be assessed because of little or no licensee activities or lack of meaningful observations. Special areas may be added to highlight significant observations.

One or more of the following evaluation criteria were used to assess each functional area.

1. Management involvement in assuring quality
2. Approach to resolution of technical issues from a safety standpoint
3. Responsiveness to NRC initiatives
4. Enforcement history
5. Reporting and analysis of reportable events
6. Staffing (including management)
7. Training effectiveness and qualification

However, the SALP Board is not limited to these criteria and others may have been used where appropriate.

Based upon the SALP Board assessment, each functional area evaluated is classified into one of three performance categories. The definition of these performance categories is:

Category 1: Reduced NRC attention may be appropriate. Licensee management attention and involvement are aggressive and oriented toward nuclear safety; licensee resources are ample and effectively used so that a high level of performance with respect to operational safety or construction is being achieved.

Category 2: NRC attention should be maintained at normal levels. Licensee management attention and involvement are evident and are concerned with nuclear safety; licensee resources are adequate and are reasonably effective such that satisfactory performance with respect to operational safety or construction is being achieved.

Category 3: Both NRC and licensee attention should be increased. Licensee management attention or involvement is acceptable and considers nuclear safety, but weaknesses are evident; licensee resources appear to be strained or not effectively used so that minimally satisfactory performance with respect to operational safety or construction is being achieved.

Trend: The performance gradient over the course of the SALP assessment period.

### III. SUMMARY OF RESULTS

Overall, the licensee's performance was found to be acceptable and showed an improving trend. The licensee was found to have aggressive management attention and a high level of performance in the Emergency Preparedness area. Performance in the Fire Protection, Electrical Power Supply and Distribution, and Instrumentation and Control areas was found to need increased management attention as well as increased NRC staff attention during subsequent inspections. Significant improvements in management's responsiveness to operational needs have been apparent throughout the assessment period. The licensee's extensive support and followup of the Duke Power Final Assessment of Construction program was an example of management's commitment to ensuring a high level of quality and adequacy of construction.

<u>Functional Areas</u>	<u>Rating Last Period</u>	<u>Rating This Period</u>	<u>Trend Within the Period</u>
A. Soils, Foundations, and Related Subjects	NR	NR	NR
B. Containment and Other Safety-Related Structures	2	NR	NR
C. Piping Systems and Supports	2	2	Same
D. Electrical Power Supply and Distribution	NR	3	Declined
E. Instrumentation and Control Systems	NR	3	Declined
F. Licensing Activities	2	2	Improved
G. Quality Assurance Programs and Administrative Controls Affecting Quality (Construction)	3	2	Improved
H. Preoperational Testing	3	2	Improved
I. Radiological Controls	2	2	Same
J. Fire Protection	NR	3	Improved
K. Emergency Preparedness	NR	1	Same
L. Security and Safeguards	NR	2	Same
M. Operational Readiness	NR	2	Improved

\*NR = not rated or not rated separately

#### IV. PERFORMANCE ANALYSIS

##### A. Soils, Foundations and Related Subjects

###### 1. Analysis

Examination of this functional area consisted of one limited inspection by a regional based inspector. The area examined included a review of the Shore Barrier structure and licensee's action to resolve a previously identified NRC concern relative to this structure.

One item of noncompliance was identified as follows:

Severity Level IV - The as-built configuration of the Shore Barrier structure does not appear to be in accordance with design requirements (Report No. 50-341/84-30).

This violation is indicative of an apparent instance in the civil area where the licensee has not provided adequate documented justification to accept the structure as is. This issue was also identified independently by the Duke Power Construction Assessment Team.

Because of the narrow scope of review and minimal licensee activity in this area during this assessment period, the licensee was not rated in this area.

###### 2. Conclusion

The licensee was not rated in this area due to limited inspection activities. The licensee was not rated in this functional area in the previous assessment period.

###### 3. Board Recommendations

None.

##### B. Containment and Other Safety-Related Structures

###### 1. Analysis

The work activities in this area are essentially complete. Consequently, examination of this functional area consisted of a portion of two inspections by regional based inspectors. One inspection was a field as-built walkdown and related document review performed for some of the fabrication and erection of structural steel in the drywell. The walkdown included a review of concrete wedge-type expansion anchors and the associated torquing records of the Chiller foundation bolts and plant column foundation bolts. The other inspection

reviewed the licensee's actions related to previous inspection findings, 10 CFR 50.55(e) items and IE Bulletins. No items of noncompliance or deviations were identified. The management control systems met regulatory requirements and personnel and equipment certifications were current and complete. Records were found to be complete, well maintained, and available. Observations indicate personnel have an adequate understanding of work practices and that procedures were followed.

In addition to NRC inspection activities in this functional area, the Duke Power Construction Assessment Team (CAT) performed detailed sample inspections of Torus supports; structural steel in the drywell and slab-over-Torus; concrete in the Reactor Building, Auxiliary Building and Residual Heat Removal Building; and containment welds. The CAT found minor discrepancies including drawings with numerous changes, loose structural bolts and minor surface defects in concrete structures. Actions are being taken by the licensee to correct these discrepancies and will be evaluated in subsequent inspections by Region III.

2. Conclusion

The licensee was not rated in this area due to limited inspection activities. The licensee was rated Category 2 in the previous assessment period.

3. Board Recommendations

None.

C. Piping Systems and Supports

1. Analysis

The examination of this functional area consisted of four inspections by regional based inspectors. The inspected areas included: as-built walkdown and related document review for piping systems; testing of pipe support and restraint systems; pipe support calculation review; followup on Region III Confirmatory Action Letter dated December 10, 1982; actions related to previous inspection findings, 10 CFR 50.55(e) items, IE Bulletins; and allegations brought to the attention of the NRC.

Items of noncompliance identified during these inspections are as follows:

- a. Severity Level IV - Failure to control revisions to design documents (Report No. 50-341/84-09).

- b. Severity Level IV - Six examples of failure to follow procedures for the design of pipe supports (Report No. 50-341/84-09).
- c. Severity Level V - Failure to utilize controlled design documents for establishing design basis (Report No. 50-341/84-38).

These violations did not cause actual plant hardware deficiencies and do not appear to have programmatic implications.

The licensee's specific corrective actions taken in response to the above items were reviewed during a subsequent inspection and found to be adequate and effective. These actions included revision of procedures, reviews of additional calculations including revisions as appropriate, and increased management attention to assure commitments were being met.

A Confirmatory Action Letter (CAL) was issued on December 10, 1982, concerning deficiencies identified by the licensee during review of large bore hangers previously installed and inspected by site contractor Quality Control. During the last SALP assessment period, the licensee's Pipe Support reinspection program was reviewed and accepted. Region III concurred with the licensee's intent to discontinue any further reinspection (after completion of an approximately 26% sampling) except for those areas that had been identified as having generic problems. After all generic problems had been resolved, Region III concurred with the licensee's intent to terminate the reinspection program. During this SALP assessment period, an inspection of Stone and Webster's "Report on the Engineering Evaluation of Pipe Supports (Phase II)," dated April 26, 1984, was completed and accepted. The licensee's corrective actions and evaluations were substantial and effective and the requirements of the CAL were met.

The inspection of an allegation that weld rod request procedures were not being followed on site was partially substantiated. However, the licensee was aware of this matter and had clarified their procedures. The inspectors concluded there was neither safety significance to the allegation nor violation of a Code/NRC requirement.

A detailed sample inspection of piping systems and supports was performed by the Duke CAT during this assessment period. The piping and/or supports sampled included portions of the Nuclear Boiler System, CRD Manual Control System, Standby

Liquid Control system, RHR and LPCI Flush, Core Spray System, High Pressure Coolant Injection, Reactor Core Isolation Coolant, Feedwater System, Turbine Steam and Emergency Equipment Cooling Water System. The Duke CAT found no major deviations from drawings and specifications.

Most major work activities are complete in this area except for resolution of construction changes.

The management control systems met regulatory requirements and equipment and material certifications were current and complete. Except as noted above, records were found to be complete, well maintained and available. Records indicate personnel were properly trained and certified.

2. Conclusion

The licensee is rated Category 2 in this area. This is the same rating as the previous assessment period. The licensee performance has remained essentially constant over the course of the SALP assessment period.

3. Board Recommendations

None.

D. Electrical Power Supply and Distribution

1. Analysis

During this assessment period, licensee activities in this area were observed during four inspections. The areas inspected include: installation and records of equipment, independent design verification of fuses to protect electrical penetrations, investigation of allegations, electrical separation, review of equipment qualification, licensee action on previous inspection findings, review of electrical design calculations, review of training of craftsmen to perform safety-related applications, review of QA installation records, observation of instrument sensing lines and racks, as-built configuration review, and observation of installation activities.

One item of noncompliance was identified as follows:

Severity Level IV - Failure to provide and follow documented procedures. Three of the examples are as follows with the fourth item identified under Section IV.E., Instrumentation and Controls Systems (Report No. 50-341/84-17).

- a. Electrical craftsmen were observed performing a Raychem heat shrink application on electrical wire associated with safety-related valve V4-2080, without previous training to perform this activity. Procedure used was not applicable to activity being performed.
- b. Inadequate design review was performed on DCP T2301E01, Revision A (Penetration backup protective fuses).
- c. Travelers and appropriate documentation were not adequately established to remove valve V13-2322 and install V13-2396.

The item of noncompliance (example b. above) identified during this period resulted in the issuance of two stop work orders and appeared to be indicative of relatively significant inadequacies in the control and implementation of design and QA requirements. Further, the noncompliance (examples a., b., and c. above) appears to be related to the comprehensiveness of the licensee's response to the instances of inadequately controlled design documents discussed in Section 10 (Other Quality Activities) of the previous SALP report.

The Duke Power CAT reviewed portions of the safety-related electrical 4KV switchgear, 480V motor control centers, 260/130VDC batteries, installation of cables, cable trays and conduit, electrical penetrations, and thermal shields. Findings included poor housekeeping, missing/misplaced nameplates, incorrect resistor wattage and fuse sizes, drawing deviations, loose terminations, battery high specific gravity, missing grip type supports for cables entering cabinets, separation violations, cable tray overfill, missing bolts and screws from penetration terminal boxes, improperly installed environmental cable seals, and others. Because many of these findings were limited in scope, most were expeditiously addressed and resolved by the licensee and had no ongoing impact on hardware or documentation. Some findings such as fuse control and drawing deviations substantiates NRC findings concerning design control as mentioned later in this section. Duke provided several recommendations ranging from improving housekeeping to performing a review of all motor control center frontal, schematic, and connection drawings. Recommendations present in the "Fermi 2 Final Assessment of Construction" Report dated July 1984 are being reviewed by Region III in subsequent inspections prior to issuance of an operating license.

Subsequent to this SALP period, and in part in response to the licensee's indication of their readiness for NRC assessment of Electrical and Instrumentation As-Built Configuration control, considerable additional NRC inspection activity has been conducted in this area. While the inspections occurred after the SALP period, the results reflect licensee performance in this area during the period and are included in this report for completeness in assessing this construction area.

In these recent inspections, violations relating to as-built documentation and configuration control were found as follows:

- d. Severity Level V - Design and Construction documents and drawings are internally inconsistent and not mutually in agreement with as-built configuration of electrical thermal overloads (Report No. 50-341/84-45).
- e. Severity Level IV - Three instances were identified wherein the licensee failed to assure that deficiencies in control logic schematic diagrams of the RHR system were properly identified, corrected, and controlled. The discrepancies were identified in the RHR Shutdown Cooling initiation and valve lineup control logic, depicted on schematic diagram 61721-2201-2, Revision J (Report No. 50-341/84-57).

A significant discrepancy in the as-built sizing of fuses relative to the design and circuit requirements was noted by NRC. The licensee has established a program to reinspect this parameter.

The licensee's performance relative to design documents and as-built configuration control is a matter of concern. In two instances (thermal overloads and fuse sizing), major corrective action programs were initiated as a result of NRC findings. While complete acceptance of these programs is still under review, early indications are that corrective action has been adequate in these areas. However, it appears that the action was narrow in its scope and overall effectiveness in correcting the many errors, inconsistencies, and omissions in design document control and as-built configuration has been inadequate. The licensee proposed a "road map" program which would involve the development of a broad document which would identify for each major electrical component the applicable sections of various documents (e.g., specifications, wiring diagrams, schematics, etc). The purpose would be to assure that anyone needing an accurate description of the as-built condition could use the "road map" as a guide. This was proposed as an interim corrective action until such time as the construction drawings could be fully updated

reflecting the detailed changes made during construction. During a recent NRC inspection (Report No. 50-341/84-62), the proposed "road map program" to correct design document errors and omissions was tested by NRC inspectors. Inconsistencies and errors were identified.

As a result of this finding, Region III conducted a management meeting with the licensee on December 5, 1984. During this meeting, the licensee committed to take effective remedial actions to provide accurate as-built documentation that reflects the design and regulatory requirements.

It was indicated by the licensee that senior construction managers at the plant did not place adequate emphasis and attention on the requirement for accurate design documentation, Quality Assurance, and as-built configuration control.

## 2. Conclusion

The licensee is rated Category 3 in this area. The licensee was not rated in the functional area in the previous assessment period. The licensee's performance appears to have generally declined during and following the SALP assessment period.

## 3. Board Recommendations

Licensee management should place major emphasis on assessing the extent of the deficiencies in design document control/accuracy and as-built configuration and ensuring a comprehensive corrective action program. Continued NRC scrutiny in this area is required to ensure that an acceptable corrective action program is in place prior to plant operation.

# E. Instrumentation and Control Systems

## 1. Analysis

Licensee activities in this functional area were observed during a significant portion of four inspections by regional personnel during this SALP period and four inspections subsequent to this SALP period. These inspections included reviews of installed instruments, associated cables and their termination, procedures and records, licensee audits, cable pulls, cable routings, instrument calibration, installation of instrument sensing lines, and review of applicable design and associated as-built drawings.

The fourth example of the item of noncompliance listed in Section IV.D. is applicable to this section and is as follows:

Example D - Procedural requirements were not established and followed in that it was not identified that several safety-related transmitters were calibrated to 0.5% accuracy instead of the 0.25% accuracy committed to in the FSAR (Report No. 50-341/84-17).

The licensee indicated that test equipment with the required accuracy to calibrate the instruments identified was not on hand at the time of initial calibration. As a part of the overall corrective action, all safety-related instruments which have not been calibrated to the manufacturer's stated accuracy are being identified and the licensee has committed to recalibrating them. The licensee had not properly noted and handled this issue in terms of engineering and QA documentation requirements.

During this assessment period, the licensee's performance regarding the installation and termination of instrumentation cable sensing lines and components was generally in accordance with the design requirements. However, several significant deficiencies were disclosed by the NRC regarding fuses and design document control.

Selected Mechanical Instrument loops, Electrical Process Instrument loops, Air Operated valves, and Electrical Control Boards and Cabinets were inspected by the Duke Power CAT during this assessment period. Areas sampled include the Core Spray, RHR, HPCI, Main Steam, Reactor Level, Reactor Pressure, Drywell temperature monitoring, Core Spray Flow monitoring, and Radiation monitoring. Only minor discrepancies were found in the mechanical area during the assessment. The five electrical instruments randomly chosen for review with the exception of one were found to be either not completed or to have significant problems. Two significant deviations were found associated with Air Operated valves (improper calibration and improperly adjusted limit switches on scram valves). Review of Electrical Control Boards and Cabinets resulted in numerous findings including loose terminations, nametag and ground bar deviations, incorrect wiring of switches that control the remote opening and closing of valve E'1 50-F009 (RHR system), and housekeeping in control panels. Duke Power recommendations included in part that the licensee perform a comprehensive review of the operability and calibration of all QA1 Air Operated valve limit switches and process instrumentation loops. The licensee response to the Duke Power recommendations are being reviewed by Region III in subsequent inspections.

Subsequent to this SALP period as discussed in Section D., Region III performed four inspections primarily regarding as-built and design documentation control and adequacy. The

items of noncompliances identified during these subsequent inspections and their applicability to this section are as follows:

- a. Severity Level IV - As-built general arrangement drawings 61721-2281-9, Revision J. and 61721-2281-5, Revision H., failed in 33 instances to reflect the as-built condition of instrument racks H21-P021 and H21-P005 (Report No. 50-341/84-50).
- b. Severity Level IV - Errors were identified in control logic schematic diagrams. Note: This item is referenced in Section D.1.e. and is included for information only. It is not being counted twice in this assessment. However, this finding applies equally to the electrical and instrumentation areas assessed (Report No. 50-341/84-57).

A significant discrepancy in the as-built sizing of fuses relative to design and circuit requirements was noted by the NRC. Note: This item is also referenced in Section D.1.f., and is not being counted twice for this assessment. However, the finding applies equally to the electrical and instrumentation areas assessed.

However, the problems related to as-built design documents being inaccurate, inconsistent, and in conflict with the as-built plant configuration as discussed in the previous section are equally applicable to this area. The major portion of construction appears to conform to the requirements.

## 2. Conclusion

The licensee is rated Category 3 in this area. The licensee was not rated in the previous assessment period. Licensee performance appears to have generally declined during and following the SALP assessment period.

## 3. Board Recommendations

Licensee management should place major emphasis on assessing the extent of the deficiencies in design document control/accuracy and as-built configuration and ensuring a comprehensive corrective action program. Continued NRC scrutiny in this area is required to ensure that an acceptable corrective action program is in place prior to plant operation.

## F. Licensing Activities

### 1. Analysis

During the present rating period, licensee management demonstrated active participation in licensing activities and kept abreast of all current and anticipated licensing actions. The licensee's management actively participated in an effort to work closely with the NRC staff to establish integrated schedules for resolving the open issues related to the licensing of the Fermi 2 facility. In addition, management's involvement in licensing activities usually assured a timely response to the requirements of the Commission's rules. The licensee's management usually exercised good control over its internal activities and its contractors, and maintained effective communication with the NRC staff. The management's active participation was evident in its involvement in the issues of significant safety concerns. This was illustrated in DECO management's efforts to resolve almost all of the environmental qualification matters and to clarify the role of DECO management in assuring the successful implementation of its alternative approach to the Independent Safety Evaluation Group (ISEG). Additionally, DECO management has encouraged frequent meetings and telephone conferences with the NRR staff on all safety-related issues. This is one of the stronger characteristics of DECO management.

However, DECO management appeared to lack full control of implementing the matter of fire protection for the Fermi 2 facility. The specific deficiencies are addressed in Section IV.J. of this report. As a result, a significant amount of additional DECO and NRC resources were required to deal with these issues.

The licensee management and its staff have demonstrated sound technical understanding of issues involving licensing action. Its approach to resolution of technical issues has demonstrated technical expertise in all technical areas involving licensing actions. The decisions related to licensing issues have usually exhibited conservatism in relation to significant safety matters. The licensee's frequent visits to the NRC and sound communications during the rating period assured sound technical discussions regarding resolution of safety issues. During the rating period, the licensee effectively resolved complex technical issues, including fire protection, Technical Specifications, and selected items in NUREG-0737, Supplement 1.

On a number of occasions, when the licensee deviated from the staff guidance, the licensee has provided good technical justification for such deviations. The program for environmental qualification of equipment is a good example illustrating

the soundness of the technical justifications for deviations. However, on a number of other issues relating to the safety-related instrumentation and controls and the use of unqualified coatings inside containment, the NRR staff felt obliged to provide additional guidance and seek clarification through a series of telephone conference calls and meetings. This was especially evident in the series of meetings held on June 5, July 10, September 13 and November 2, 1984, on the matter of fire protection. (The last meeting, though outside the reporting period, is mentioned for completeness.)

The licensee has been responsive to NRC initiatives. During the rating period, it has made a significant effort to satisfy the Commission's rules, including compliance with the rules related to fire protection and environmental qualification of safety-related electrical and mechanical equipment. While there may have been differences between the NRR staff and the licensee regarding the appropriate approach to resolve technical issues as discussed above, the licensee has consistently demonstrated a high degree of responsiveness to the NRR staff's initiatives on all matters. As an example of this, the licensee made frequent visits to the NRC to discuss the forthcoming requests for staff actions prior to formal submittals. This approach has been found to be beneficial to both the staff's and licensee's efficiency in processing such actions.

As a result of NRR review of the licensee's shift staffing for the facility, the staff found that the licensee complied with the requirements of NRC regulations. As an example, the licensee has 40 SRO's and RO's qualified for the Fermi 2 facility, 39 of whom passed their qualifying examination on the first try. The addition of five Shift Operating Advisors (SOA) so that each shift would have an SOA experienced in operating a similar nuclear power plant, was a commendable effort by the licensee especially in light of the fact that each of the SOA's holds an SRO for the Fermi 2 facility. Furthermore, the licensee has maintained sufficient licensing staff to assure reasonably timely responses to the NRR staff requests for additional information.

The licensee's training program is judged to be uniformly well executed as evidenced by the performance of its SRO's and RO's in their licensing examination. The same comment applies to the performance of the five SOA's who all received their Fermi 2 SRO licenses when first examined.

In the previous rating period, the Board recommended for this functional area that the licensee devote appropriate management attention to significant licensing concerns, with emphasis on assuring that the design criteria are consistent with FSAR commitments. While the licensee complied with this

recommendation for the most part, there were some significant areas where the licensee did not provide the appropriate management attention as previously recommended.

2. Conclusion

An overall rating of Category 2 has been assigned for the current rating period. This is the same rating as was given in the previous assessment period. Despite some specific weaknesses, licensee performance has generally improved over the course of the SALP assessment period.

3. Board Recommendations

None.

G. Quality Assurance Programs and Administrative Controls Affecting Quality (Construction)

1. Analysis

This functional area was examined in one special inspection and in inspections by the resident inspectors during the assessment period. Specific areas reviewed included audit programs and implementation; personnel certification/qualification; mechanical installation activities; design control; calibration control program and implementation; nonconformance control; procurement program and implementation; corrective action system; electrical installation control; and quality assurance program control. A total of seventeen items of noncompliance (six Level V and eleven Level IV) were identified.

- a. Severity Level V - The licensee was using an inactive procedure (Report No. 50-341/83-29).
- b. Severity Level IV - The licensee failed to follow procedures with regard to the storage and handling of safety-related materials (Report No. 50-341/83-29).
- c. Severity Level V - Two examples were identified in which the licensee failed to properly control the storage and handling of safety-related materials (Report No. 50-341/83-30).
- d. Severity Level IV - Five purchase orders were identified where the licensee failed to ensure that commercial grade items, dedicated for safety-related application, were qualified prior to use and that adequate technical and quality reviews were performed (Report No. 50-341/83-31).

- e. Severity Level IV - Four purchase orders were identified where the licensee failed to provide appropriate source selection and evaluation (Report No. 50-341/83-31).
- f. Severity Level IV - Three examples were identified where the licensee failed to take effective corrective action (Report No. 50-341/83-31).
- g. Severity Level IV - Three examples were identified where the licensee failed to perform activities affecting quality in accordance with instructions, procedures, or drawings (Report 50-341/83-31).
- h. Severity Level V - The licensee failed to perform an effective re-audit of a deficient area and to include QA program implementing procedures within the scope of the audit program (Report No. 50-341/83-31).
- i. Severity Level V - The licensee failed to include a written basis for QC inspector certification as a part of the certificate required by ANSI N45.2.6-1973, and to provide adequate backup data to substantiate that basis (Report No. 50-341/83-31).
- j. Severity Level V - The licensee failed to procedurally establish adequate measures to ensure proper control and calibration of measuring and test equipment to evaluate the validity of previous inspections or test results which were accomplished with lost calibrated instruments (Report No. 50-341/83-31).
- k. Severity Level IV - The licensee failed to establish a pipe bending inspection program or monitoring system to ensure that (1) a qualified bending procedure was being employed, (2) a qualified bending machine was being used, and (3) that dimensions for ovality and wall thickness met the ASME code (Report No. 50-341/83-31).
- l. Severity Level IV - Failure to establish and execute an adequate training program for Wismer and Becher supervisory personnel and to ensure that FSAR Chapter 14 commitments were being met for construction completion, prior to jurisdictional transfer of the system (Report No. 50-341/83-31).
- m. Severity Level V - Wismer and Becher circumvented the nonconformance control system by documenting nine nonconforming condition in surveillance reports

and Wismer and Becker replaced a valve seat without the Supplemental Operation Process Traveler as procedurally required (Report No. 50-341/83-31).

- n. Severity Level IV - One example of noncompliance was identified where the licensee failed to provide prompt corrective action on an NRC finding issued in September 1983 (Report No. 50-341/84-32).
- o. Severity Level IV - Seven examples were revealed where the licensee identified nonconforming conditions by means other than nonconformance reports (NCRs) (Report No. 50-341/84-19).
- p. Severity Level IV - Three examples were identified where the licensee failed to use NCRs to document nonconforming conditions (Report No. 50-341/84-20).
- q. Severity Level IV - The licensee failed to take adequate and timely corrective action when conditions adverse to quality were identified (Report No. 50-341/84-20).

Noncompliances d. and e. relate to the control of purchased safety-related material, equipment, and services. The item had potential impact on installed hardware, in that, the ability/suitability of this hardware to perform its safety-related function had not been determined. In response, the licensee initiated an extensive program to evaluate the acceptability of commercial grade items. This item was satisfactorily resolved during the SALP period. As a result of the Fermi material and equipment reverification effort, no procured item was removed from service or found to be unacceptable.

The remaining noncompliances (a. through c. and f. through q.) represented failures to implement the program or deficiencies in the areas of material storage and handling, corrective action, inspector certification, audit, and the inspection program.

The findings of the special inspection, documented in Inspection Report No. 50-341/83-31, were discussed with the licensee during an Enforcement Conference held on April 18, 1984. No escalated enforcement action was taken as a result of the meeting.

The licensee was rated Category 3 in a functional area titled "Other Quality Activities" during SALP 4 as a result of deficiencies found in a large number of areas spanning several functional areas. Although there were a significant number of findings identified during this SALP period, they were not

considered to be of the same magnitude or relative importance because they did not manifest themselves in the same manner or functional areas as those during SALP 4.

The seventeen findings were related to the Fermi construction QA program and its implementation. They were identified at the beginning of this assessment period and related to poor work performed under the construction QA program. At that time, Fermi had both a construction and an operational QA program. Each program was implemented by different line organizations both reporting to the same individual. The Project QA (PQA) organization ceased to exist on March 1, 1984, and the Nuclear QA (NQA) organization which reports to the Vice President of Nuclear Operations assumed QA responsibility for Fermi on that date. Both line organizations reported to the same individual.

The licensee's QA organization has had difficulty in identifying issues. The licensee does, however, address issues once identified and takes prompt corrective action. No significant hardware problems were identified in the corrective action programs initiated to address the identified problems.

The Final Assessment of Construction for Fermi 2 performance by Duke Power Company is another indication of the licensee's responsiveness. The licensee was scheduled to have an NRC Construction Assessment Team (CAT) inspection performed during the assessment period, but the inspection was subsequently canceled. Region III recommended to the licensee that they have a similar inspection performed by an independent organization to demonstrate that the as-built plant reflected the design documents. The licensee took prompt action and contracted with Duke Power Company to perform an independent assessment of construction at Fermi 2. The assessment commenced June 1, 1984, and was completed July 13, 1984. The NRC provided a full-time observer to ensure that Duke maintained its independence and to follow the assessments. The Duke assessment team consisted of nineteen full or part-time members. Duke utilized special in-house expertise on an as-needed basis. The licensee expended a great deal of effort in supporting the Duke effort and was responsive to the needs of the assessment team. The assessment consisted of hardware evaluation in fourteen areas, records evaluation in five areas, and third-party assessment evaluations in six areas. The inspection team covered a wide cross section of activities. Duke presented their findings to the licensee and the NRC on July 31, 1984.

The Duke Final Assessment of Construction at Fermi 2 Report contained 69 concerns and 132 findings, and made 24 recommendations. Duke stated in the final conclusion that, "It is the opinion that when all of the potential findings, as reported on

the CAT-1 forms, are resolved and the recommendations are implemented, there will be reasonable assurance that no significant deviations from the final design disclosure documents will exist." The licensee documented their responses and proposed corrective action to the 24 recommendations in a report to the NRC dated September 20, 1984. Details of the Duke assessment are described in Inspection Report 50-341/84-21.

Subsequent to the assessment period, Region III evaluated the licensee's corrective actions as described in their response report dated September 20, 1984. Generally the Region found the licensee's responses to the Duke recommendations to be adequate. Additional information was requested for some areas due in part to the licensee's failure to provide specific completion dates for long-term corrective action plans. Followup inspections on the licensee's corrective actions concerning the Duke recommendations will be performed subsequent to this assessment period. The licensee's overall performance in addressing the items identified by Duke is indicative of their responsiveness in correcting problems once identified.

As mentioned earlier, the seventeen items of noncompliance were identified during the beginning of this assessment period. The licensee's corrective actions were acceptable and management involvement in addressing these problems have been timely, thorough, and well planned. The licensee's commitment to ensuring construction quality is evident by their support of the Duke assessment and their timely and comprehensive response to the resulting recommendations.

## 2. Conclusion

The licensee is rated Category 2 in this area. This is a higher rating than was given in the previous assessment period. Licensee performance has generally improved over the course of the SALP assessment period.

## 3. Board Recommendations

Subsequent to the assessment period, the Board noted problems related to as-built documents being inaccurate, inconsistent, and in conflict with the as-built plant configuration in both the Electrical and the Instrumentation areas. These problems will have to be resolved prior to plant operation.

## H. Preoperational Testing

### 1. Analysis

The preoperational and startup phase testing efforts were inspected by both region based and resident inspectors. The

region based inspectors performed thirteen inspections and the resident inspectors performed portions of four inspections during this assessment period. This SALP 5 assessment period reflects increased inspection effort, in response to the Board recommendations and to complete the inspection program, over the SALP 4 period. In SALP 5, 13 region based inspections were performed compared to 9 region based inspections during the SALP 4 period. The inspection effort included indepth reviews of preoperational test procedures and test results, witnessing preoperational test performance, reviews of administrative controls and implementing procedures, observations of corrective actions and independent inspection effort.

Seventeen items of noncompliance were identified as follows:

- a. Severity Level V - The RHR Complex Service Water System preoperational test procedure was changed by an inadequate test change that did not prescribe flow values (Report No. 50-341/83-22).
- b. Severity Level IV - Foreign material and debris was identified in the RHR pump suction line (Report No. 50-341/83-25).
- c. Severity Level V - Core Spray preoperational test procedure was inadequate in that the procedure did not provide sufficient instructions for control of equipment during preoperational tests (Report No. 50-341/83-25).
- d. Severity Level V - Feedwater System preoperational test procedure was inadequate in that requirements from a deleted test were not transferred (Report No. 50-341/83-25).
- e. Severity Level IV - The preoperational test results for the DC power systems did not collect supportive data (Report No. 50-341/83-22).
- f. Severity Level V - The Reactor Recirculation System preoperational test procedure was inadequate in that a certain initial test condition was not required to be verified (Report No. 50-341/83-28).
- g. Severity Level IV - The licensee's corrective actions failed to prevent additional intrusion of foreign material into the RHR test line (Report No. 50-341/83-28).
- h. Severity Level V - Test change to the High Pressure Coolant Injection System preoperational test procedure was inadequate in that valve logic was not verified (Report No. 50-341/83-30).

- i. Severity Level V - The High Pressure Coolant Injection System and Reactor Core Isolation Cooling System preoperational test procedures did not incorporate all valve timing requirements of the FSAR (Report No. 50-341/83-30).
- j. Severity Level V - Emergency Diesel Generator operating procedure was inadequate in that the required fire protection system was not included within the initial conditions (Report No. 50-341/84-04).
- k. Severity Level IV - The 130/260 VDC System preoperational test procedure was inadequate in that the prescribed testing method would not have achieved the test objectives (Report No. 50-341/84-04).
- l. Severity Level V - During the testing of Emergency Diesel Generator #13, the operator failed to place the diesel generator into a standby operating mode by resetting the engine exciter at the local control panel (Report No. 50-341/84-11).
- m. Severity Level IV - The 24/48 VDC System preoperational test procedure was inadequate in that the prescribed testing method would not have achieved the test objectives (Report No. 50-341/84-11).
- n. Severity Level IV - The Diesel Generator Service Water "D" pump was operated with the service water reservoir below the minimum operating level (Report No. 50-341/84-11).
- o. Severity Level IV - The service water reservoir was not maintained in a condition suitable for testing deep draft type pumps in that excessive foreign materials were present (Report No. 50-341/84-11).
- p. Severity Level IV - Personnel failed to establish testing conditions during the Emergency Diesel Generator and Emergency Safeguards Features preoperational tests (Report No. 50-341/84-29).
- q. Severity Level V - Various preoperational test results, exceptions, and changes were not dispositioned in accordance with administrative procedures (Report No. 50-341/84-36).

Noncompliances a., c., d., f., h., i., and j. were programmatic in nature and represented failures to issue adequate procedures and procedure changes.

Noncompliance e. represented an inadequate review of completed preoperational test results by the Startup Technical Review and Nuclear Production organizations. This resulted in retesting of station batteries and the formation of a subcommittee for technical review of test results.

Noncompliance g. was a repeat violation of noncompliance b. The licensee failed to implement its corrective action to all open systems, including those that are designed with open tanks, sumps, or lines.

Noncompliances k. and m. represented inadequate technical reviews by the preoperational procedure approval organization. The licensee improved its technical review of procedures prior to approval and has not had a repeat violation through the later half of the assessment period.

Noncompliances l., n., and p. were personnel errors by startup and operating personnel.

Noncompliance o. was a failure to clean the service water reservoir prior to operating the deep draft pumps. The licensee cleaned the reservoir and restricted construction activities above the reservoir before continuing to operate the pumps. The licensee has also agreed to drain and clean the reservoirs prior to fuel load.

Noncompliance q. was a repeat of noncompliance e. However, the licensee had not reviewed accepted tests that had been approved prior to implementing the new review organization.

The licensee was rated as a Category 3 in the preoperational testing area in the SALP 4 report. That rating was based on management weakness in preoperational testing and review of completed and accepted preoperational test results. The following areas were identified as concerns during the SALP 4 reporting period:

- (1) Weakness of program controls
- (2) Adequacy of test results review
- (3) Maintenance of the FSAR
- (4) Adequately establishing testing prerequisites

In all areas, except that of establishing testing conditions and prerequisites, the licensee has made improvements. In the areas where improvements had been made, only two items of noncompliance have been identified in this assessment period. Additionally, two items were identified during the establishing of prerequisites, which were attributed to personnel errors. These items are not indicative of the licensee's attitude since they have made some improvements in coordination between startup and operating personnel to ensure establishment of initial

testing conditions. Even though 17 noncompliances were identified during this assessment period, they were not considered of major significance because of their nature and the licensee's ability to correct and minimize recurrence as demonstrated by only 2 noncompliances during the second half of the assessment period compared with 15 noncompliances within the first half. It is also significant to note that with the increased activity of both the licensee and the NRC staff during the assessment period, no management meetings were necessary to achieve corrective action.

Major technical problems identified during this assessment period were:

- a. The high vibration conditions of Emergency Diesel Generator #14 and Residual Heat Removal pumps A and D. The licensee has tested both systems and addressed both problems with assistance from the vendors.
- b. High recorded specific gravities in the safety-related batteries. This item was identified and resolved late in the assessment period with assistance from the vendor and licensee's engineering.
- c. Foreign debris found in safety-related piping systems. The licensee has improved administrative controls and increased inspections of systems to prevent recurrence. However, the adequacy of the licensee's measures has not been fully inspected by the regional staff during this assessment and is scheduled during the early portions of the next assessment period.

The licensee's initiative in identifying and resolving technical problems, such as a. and b. above, are indicative of the licensee's ability to correct technical deficiencies. This is considered to be a positive change.

The licensee is continuing to improve administrative controls and technical review. They have recently established a technical subcommittee review devoted only to performing technical review of completed test results. The subcommittee has already rejected one test, Standby Liquid Control System, because of inadequate data. Additionally, the licensee stopped testing to conduct training on concerns identified by the subcommittee. These are considered to be positive changes.

In the SALP 4 assessment, the inspector identified concerns that because of the number of consultants utilized by the licensee, there would not be an adequate transfer of knowledge

from the preoperational program to the operating program. To ensure that this would not occur, the licensee has transferred various permanent personnel from the preoperational group to the operational technical group. Additionally, the licensee has retained a number of consultants for the operational phase to ensure that the plant operating knowledge obtained during testing is transferred to permanent personnel. This is considered an improvement.

2. Conclusion

The licensee is rated Category 2 in this area based on the management improvements in implementation of corrective actions during the second half of the assessment period. The licensee was rated Category 3 in the previous assessment period. Licensee performance has generally improved over the course of the SALP assessment period.

3. Board Recommendations

None.

I. Radiological Controls

1. Analysis

Five inspections were performed during the assessment period by region based inspectors. These inspections included preoperational radiation protection; preoperational gaseous, liquid, and solid radwaste; preoperational environmental monitoring; confirmatory measurements; and TMI Action Plan Items. No items of noncompliance were identified.

Staffing, training, and qualifications of the radiation protection organization appear adequate. In response to previous NRC concerns that few in-house health physics technicians had operating nuclear power plant experience, and most of the experience possessed was PWR experience, the licensee sent in-house health physics technicians to an operational BWR during a refueling and maintenance outage for several weeks to gain operating experience.

Delays, which can be attributed to scheduling decisions, have been experienced in calibrating and preoperationally testing effluent and process monitors, and in preoperationally testing gaseous, liquid, and solid radwaste systems. Upon recognizing the delays, the licensee demonstrated a good response in the last half of the assessment period by applying additional resources to expedite calibrations and testing, and to prevent these items from impacting on the fuel load date.

During the latter part of this assessment period, inspectors identified several problems regarding drain systems and sampling and monitoring equipment and related procedures intended to satisfy NUREG-0737 action items for containment and primary system sampling; effluent sampling and monitoring; and high range containment monitoring. The licensee responded to these identified problems in a positive manner and appears to be making good progress towards their resolution.

The licensee has made satisfactory progress in developing the chemistry and radiochemistry measurements program. Laboratory administration, including responsibilities, has been clearly established. Procedures for sampling, analysis, instrument calibration, and quality control have been developed and satisfactorily implemented. A quality control cross check program for nonradiological and radiological samples has been established, using samples provided by an outside vendor. Results have been satisfactory.

The licensee achieved all agreements in gamma analysis of a spiked liquid sample, particulate filter, and charcoal absorber, as well as beta analysis of a spiked liquid.

The training program for chemistry personnel appears good and the licensee expects to meet its commitment to have three chemistry technicians fully qualified by fuel load date. The chemistry training program appears well managed and the subject material comprehensive.

The January-February 1984 inspections (50-341/84-03) revealed that significant progress had been made to resolve problems and open items concerning the Radiological Environmental Monitoring Program (REMP) identified during a previous SALP period (50-341/82-04). Management controls for implementing the REMP were decidedly strengthened by establishing the Environmental Engineer position responsible for managing the contract with Nuclear Utilities Services, Inc. (NUS). Sample collection and analysis performed by NUS appeared satisfactory. This REMP contractor also performed an adequate Environmental Protection Agency inter-laboratory cross check program. In mid 1984, the licensee was arranging to change the REMP contractor since the NUS laboratory in Pittsburgh was being shutdown.

Management support in these programs appears adequate. Responsiveness to NRC concerns has improved during the assessment period and now appears adequate.

In response to board recommendations during the previous SALP period, the licensee has made satisfactory progress regarding radiation protection procedural controls, training weaknesses and open items in radiochemistry and confirmatory measurements.

2. Conclusion

The licensee is rated Category 2 in this area. This is the same rating as was given in the previous assessment period. Licensee performance has remained essentially constant over the course of the SALP assessment period.

3. Board Recommendations

None.

J. Fire Protection

1. Analysis

During this assessment period one comprehensive team inspection was conducted by Region III and NRR personnel to assess conformance of the as-built plant conditions to FSAR commitments, fire protection program implementation and post fire safe shutdown capability.

Two deviations were identified during the inspection as follows:

- a. The control room panels containing the controls, instrumentation and associated cables for all required post fire safe shutdown systems did not conform to the design configurations described by the applicant in the FSAR SSER No. 2, and other submittals to the NRC (Report No. 50-341/84-16).
- b. The diesel fire pump installation was not installed in accordance with National Fire Protection Association Standard No. 20 as committed to by the applicant in that the diesel fire pump fuel oil storage tank was installed above ground outside the fire pump house and exposed to freezing temperatures and subsequent gelling of the diesel fuel (Report No. 50-341/84-16).

Numerous other significant deficiencies were discovered in hardware, program development, and program implementation. These deficiencies included failure to install fire protection systems in accordance with commitments, failure to separate/protect redundant safe shutdown equipment, failure to develop procedures for safe shutdown which specified all actions to be taken for loss of equipment and failure to perform several analyses committed to in the FSAR and SER.

The scope and nature of the deficiencies identified by the NRC inspection team were indicative of a lack of management understanding of its commitments to the NRC, compounded by management's failure to properly implement those commitments which it understood.

In subsequent meetings with the NRC, the licensee has proposed corrective actions for the identified deficiencies. Management has been aggressively involved in the resolution of these issues. These issues are still being reviewed by the NRC staff.

2. Conclusions

The licensee is rated a Category 3 in this area based primarily on lack of management involvement in this area as evidenced by the significant deficiencies discussed above. The licensee was not rated separately in this functional area in the previous SALP reports wherein fire protection was included in the support system functional area. While management appears to be taking aggressive actions to correct the deficiencies identified, they were taken in response to NRC inspection findings. Licensee performance has generally improved over the course of SALP assessment period.

3. Board Recommendations

The Board recommends that the licensee continue to devote recently instituted comprehensive management attention to its commitments in this area. Particular focus should be placed on understanding and fulfilling commitments made to the NRC. The NRC should dedicate the necessary resources to follow up in this area.

K. Emergency Preparedness

1. Analysis

Two inspections were conducted during the assessment period to evaluate compliance with 10 CFR Part 50 and procedures, and evaluate the licensee's readiness for fuel load. No items of noncompliance were identified in either inspection. The emergency preparedness appraisal in October 1983, identified 16 items which required completion prior to fuel load or full power operation. Five of those items had been completed by the June 1984 emergency exercise. Of the remaining areas to be completed, the applicant has postponed site accountability provisions until security computer problems are resolved. For those areas in the emergency preparedness program where the applicant's activities had been completed, programs were properly established and comprehensive training had been provided. The appraisal showed licensee's management to be well informed on program status.

The emergency planning management and staff have made viable and generally sound and thorough responses to improve their program based on the findings of the appraisal. They have established good communications with Region III and do not

hesitate to contact the NRC for advice and guidance on particular aspects of the program. Staffing level for the emergency preparedness program is very good. Key positions are identified and authorities and responsibilities are well defined. The licensee's emergency response facilities are spacious and well equipped. Two exercise weaknesses were identified as a result of the June 1984 exercise to which the licensee provided an adequate response.

The exercise scenario was well prepared and tested the plant's response functions. The scope and objectives of the exercise were submitted on a timely basis. The applicant's performance in the exercise demonstrated good coordination, training, and knowledge needed to mitigate a nuclear emergency. The performance of the exercise participants was among the best observed for all exercises conducted in the Region.

2. Conclusion

The licensee is rated a Category 1 in this area. The licensee was not rated in this functional area in the previous assessment period. Licensee performance has remained essentially constant over the course of the SALP.

3. Board Recommendations

None.

L. Security and Safeguards

1. Analysis

Seven security inspections were conducted during the assessment period. These inspections were preoperational inspections to determine the licensee's progress in the implementation of the security program. No items of noncompliance were identified. A review of the acceptance testing program for security-related equipment was also conducted.

The licensee's Physical Security Plan, Safeguards Contingency Plan, and Security Force Training and Qualification Plan will become effective upon issuance of an operating license. Therefore, no violations were identified during the assessment period. Twenty-four open items were identified which must be corrected or resolved prior to fuel load. Three potential design deficiencies pertaining to the personnel access control facilities, testing of some alarm equipment, and closure problems on some vital area doors were identified. The licensee is working to correct these deficiencies.

The preoperational inspection program identified four areas that warrant senior management involvement. These include assurance that all required open items are closed prior to

fuel load, training of security force personnel, adherence to planning and scheduling for security program implementation, and adequate security indoctrination of site personnel.

The projected security implementation schedule appears to address all major elements necessary to implement the security program.

The licensee has been responsive to the concerns identified by the NRC. The licensee has established a security system task force to monitor open items and implementation of the security program. The task force has been successful in identifying problem areas and recommending solutions. Most essential security equipment testing (site acceptance testing) has been completed. The licensee initially experienced operational problems with the computer access system. Licensee progress in correcting the computer problems will be monitored very closely by NRC.

The security force appears to be of sufficient size to implement the security program; however, the licensee has experienced a "turnover" rate in excess of 25 percent per year. More management attention is necessary to reduce this turnover. The majority of required training and personnel screening for the security force has been completed. Schedules for completion of training have been prepared and appear to be within the security force's capability to implement. Supervision and administrative support of the security force appears adequate to implement the security program. Most procedural guidance required for effective utilization of the security force has been completed.

In summary, the licensee's management/supervisory staff has been adequate in planning for implementation of the security program and in identifying most problem areas during the implementation phase of the program. Senior site management appears willing to commit the necessary resources to ensure the timely implementation of the security program. The licensee's implementation of major portions of the security program remains to be demonstrated. The critical elements for implementing the security program will extend into the next assessment period.

## 2. Conclusion

The licensee is rated Category 2 in this area. The licensee was not rated in this functional area in the previous assessment period. Licensee performance has remained essentially constant over the course of the SALP.

3. Board Recommendation

None.

M. Operational Readiness

1. Analysis

During this assessment period, the Region performed a number of inspections of the licensee's readiness for operation. The Region followed the licensee's development of their operational related activities to ensure that the plant and staff are ready to assume the responsibilities of an operating facility.

The analysis below extends beyond the appraisal period to the date the Board convened, November 30, 1984, and is based upon observations made during tours and segments of other inspections.

Five items of noncompliance were identified which do not pertain to any other functional area, but which are within the area of operations and are listed here for convenience:

- a. Severity Level V - The licensee failed to adequately review Alarm Response Procedures (Report No. 50-341/84-20).
- b. Severity Level IV - The Emergency Diesel Generator start-failure logs did not contain data to independently determine the acceptance of valid tests or failures (Report No. 50-341/84-36).
- c. Severity Level V - Maintenance surveillance on the reactor crane was not conducted in accordance with maintenance procedures (Report No. 50-341/84-36).
- d. Severity Level IV - The licensee failed to provide and follow procedures during maintenance on safety-related equipment (Report No. 50-341/84-29).
- e. Severity Level IV - Conditions adverse to quality were not identified, dispositioned, or corrected prior to turnover (Report No. 50-341/84-36).

The five items of noncompliance contain no repetitive issues and appear to be isolated occurrences.

In addition to the above, Quality Assurance programs and Administrative Controls affecting quality for operations were examined in three inspections during the assessment period. Specific areas reviewed included management of the

preoperational testing quality assurance program, surveillance, inspection, audits, calibration, M&TE, safety committee, tests and experiments, maintenance, design changes and modifications, and receipt and storage. Two items of noncompliance were identified.

- f. Severity Level IV - A failure to maintain a correct and current temporary modification log (Report No. 50-341/84-25).
- g. Severity Level V - Failure to implement a trending program in accordance with their quality assurance program requirements (Report No. 50-341/84-32).

Based on these three Operations QA inspections, the operational QA program appeared to be sufficiently developed and implemented to provide a basis for conducting an operating program.

At the start of the assessment period, Fermi 2 was under the jurisdiction of two organization, Nuclear Operations and Projects Management Organization (PMO) each headed by a vice president of equal stature. The facility went through a transitional phase during the assessment period, in which Nuclear Operations went from a support to a controlling mode. Nuclear Operations assumed complete responsibility for Fermi 2 on August 1, 1984, and the PMO organization was absorbed into Nuclear Operations.

The Startup Organization was absorbed by Nuclear Production which changed Startup's role to a support function. This shift in responsibilities has allowed Nuclear Production (the plant) to allocate and prioritize the resources needed to get systems tested and turned over and the plant ready for fuel load. The transition has had the additional benefit of allowing plant personnel to debug procedures and gain experience operating the plant. The transition by Nuclear Operations from a support function to a controlling function resulted in a number of personnel errors by plant personnel. This is not unexpected for a plant at this stage.

A large number of procedures remained to be written and/or reviewed at the end of the assessment period. The licensee has chosen to field verify surveillance procedures before they are approved which should minimize potential performance problems. Maintenance has had a program whereby all work has been done in accordance with procedures and the procedures have been revised, as necessary, to reflect workability. This, too, should ensure minimal procedural problems.

The licensee has had some difficulty in closing out both licensee and NRC identified open items in a timely manner. Early in the assessment period, corrective actions were not always completed and many items required more than one attempt by the licensee to achieve acceptable corrective action. The licensee has expended much effort in trying to resolve the outstanding items after prompting from Region III. The completeness of licensee actions improved toward the end of the assessment period resulting in a significantly lower number of outstanding items at the end of the assessment period.

Subsequent to the assessment period, the licensee has continued to make progress in accomplishing those tasks necessary to achieve fuel load. The licensee has all the programs in place which are necessary for the safe operation of the plant. The licensee's efforts have been directed to implementing those programs which include implementation of operating procedures, surveillances, quality assurance and control, and administrative controls among others. The licensee has expended a great deal of effort in implementing the required programs. Some of their efforts were started later than normal, but once the lack of timeliness had been identified, they adequately addressed and prioritized the issues. The licensee's performance in this functional area has steadily improved.

2. Conclusion

The licensee is rated Category 2 in this area. The licensee was not rated in this functional area in the previous assessment period. Licensee performance has generally improved over the course of the SALP assessment period.

3. Board Recommendations

The licensee should maintain its present effort to reduce the number of outstanding deficiencies. The licensee should also increase its efforts to improve operator performance to minimize personnel errors. Improved performance should minimize those errors which normally occur at a newly licensed facility.

V. SUPPORTING DATA AND SUMMARIES

A. Licensee Activities

The construction of Fermi 2 at the close of this assessment period was approximately 99.8 percent complete (all major construction activities are complete). Major activities performed during the assessment period were related to the completion of construction, construction tests (checkout and initial operation), preoperational/acceptance testing, system turnover, operator training, and implementation of security systems and controls. Specific activities include:

1. Construction Activities

Installation of site security system - construction was completed.

Radioactive waste modifications - construction was completed.

Drywell modifications - modifications were completed.

Training simulator installation - installation and testing was completed.

Erection of the Availability Improvement Building (AIB) - construction was completed.

Erection of the Technical Assistance Center - construction in progress.

Slab-over-Torus steel modification - modifications were completed.

2. Construction Tests

Checkout and Initial Operations testing is essentially complete.

3. Preoperational/Acceptance Tests

One hundred fifteen preoperational/acceptance tests of the required 131 had been started at the close of the assessment period. Of those tests started, 89 were completed and 56 were final approved by the licensee. Twenty preoperational tests had been reviewed by the NRC at the close of the assessment period.

B. Inspection Activities

1. Noncompliance Data

Facility Name: Enrico Fermi Nuclear Power Station, Unit 2      Docket No. 50-341

Inspections: No. 50-341/83-22 through 50-341/83-31  
 No. 50-341/84-01 through 50-341/84-36, 50-341/84-38,  
 50-341/84-41, 50-341/84-42, 50-341/84-45\*, 50-341/84-50\*,  
 and 50-341/84-57\*.

\*Inspections performed subsequent to this assessment period,  
 but included in the assessment.

Functional Areas Assessment	Noncompliances and Deviations Severity Levels					DEV
	I	II	III	IV	V	
A. Soils, Foundations, and Other Subjects				1		
B. Containment and Other Safety-Related Structures						
C. Piping Systems and Supports				2	1	
D. Electrical Power Supply and Distribution				2*	1	
E. Instrumentation and Control Systems				1		
F. Licensing Activities						
G. Quality Assurance				11	6	
H. Preoperational Testing				8	9	
I. Radiological Controls						
J. Fire Protection						2
K. Emergency Preparedness						
L. Security and Safeguards						
M. Operational Readiness				<u>4</u>	<u>3</u>	—
TOTALS				29	20	2

\*One of the noncompliances included an example that falls in Functional Area E. (Instrumentation and Controls System)

## 2. Inspection Activities

The composite inspection effort by the NRC consisted of 49 inspections during the assessment period and 3 subsequent to the assessment period. Portions of the inspection effort were dedicated to allegations and the NRC observation and followup of Duke Power's Final Assessment of Construction activities. The scope of these inspections included quality assurance program effectiveness in areas inspected, corrective action systems, design change control, material traceability, electrical cable installation, in-process inspections, effectiveness of quality control inspectors, preoperational testing control, and control of analysis associated with pipe support design changes. Within these areas, the inspections consisted of selective examinations of procedures and representative records, observations, and interviews with personnel.

### C. Investigations and Allegations Review

A formal investigation, involving potential wrong doing, was initiated during the assessment period, and will be completed in the next assessment period. In addition, fifteen allegations relating to deficient construction and Quality Assurance practices and deficient conditions at Fermi 2 were received by the NRC during this period. All but five allegations received during the assessment period have been inspected, dispositioned, and documented in NRC inspection reports. The inspection of the remaining five allegations had not been completed during the assessment period. Those items which were substantiated and resulted in items of noncompliance are included in the appropriate functional areas in Section IV. of this report.

The licensee initiated a program called SAFETEAM which allows departing employees the opportunity to state any concerns they may have regarding Fermi 2. The interviews are conducted by an independent outside organization who maintains the confidentiality of the individual. The concern is investigated by the licensee and a response is transmitted to the concerned individual through the independent organization.

All SAFETEAM concerns and investigation results were reviewed by the resident inspectors for proper licensee action and found to be adequate. Twelve concerns given to the SAFETEAM, which relate to potential wrongdoing, were provided to the NRC during the assessment period for review and possible additional investigation.

### D. Escalated Enforcement Action

There were no escalated enforcement actions during this assessment period.

E. Management Conferences

The following management meetings were conducted during this period:

- December 14, 1983\* - A management meeting was conducted at Region III to discuss findings of a QA inspection and Region III concerns regarding several segments of the preoperational test program.
- January 6, 1984\* - A management meeting was conducted at Region III to discuss findings of a QA inspection.
- March 29, 1984\* - A management meeting was held to discuss the use of commercial grade (CQ) material in QA level 1 applications at Fermi 2.
- April 18, 1984\* - An Enforcement Conference was held at Region III to discuss possible enforcement actions which could occur as a result of findings of the Regional QA inspection conducted November 1983.
- May 17, 1984 - A management meeting was held to discuss the work plan which delineates the tasks necessary to perform an independent construction assessment.
- July 31, 1984 - A management meeting was conducted at Fermi at which the Duke Power Company presented their independent Final Construction Assessment of Fermi 2.

\* These four meetings were the result of inspections documented in Report No. 50-341/83-31.

F. Licensee Report Data

1. Construction Deficiency Reports (CDRs)

During this SALP period, thirty-five 10 CFR 50.55(e) items were reported and corrective actions were initiated by the licensee. Twenty-four of these items are considered to be under the control of the licensee. The nature of these reports covers a broad range of material and construction problems as listed below by the licensee's sequential number.

- \*104 Premature Resetting of Automatic Digital Load Sequencer System
- \*105 Electrical Cable Thermal Separation Criteria Violations
- \*106 Deficiencies Involving Reactor Building Crane
- \*107 Mechanical Problems with RHR Pumps
- \*108 Missing RHR 4160V Switchgear Installation Records
- \*109 Broken Valve Stem and Guide Pin on 24 Inch Globe Valve
- 110 Linear Cracking in Unistrut
- \*111 Design Deficiency Which Allowed the RHR Reservoir to Freeze Over
- 112 Loose Wiring Lugs on EDG #14 Control Panel
- 113 Linear Indications Discovered in Seams of ASTM A50J Grade B Tube Steel
- \*114 North RHR Heat Exchanger Overpressurized During Test
- \*115 Potential Impingement of Instrumentation Tube/Conduit in the Drywell due to Pipe Whip
- \*116 Freezing of Buried Piping Systems
- \*117 Commercial Grade Items in QA Level I applications
- \*118 Deficiency in Design of Nitrogen Inerting System Isolation Valves
- \*119 Design Deficiency of Standard E14-3 Conduit Support
- 120 NPS Change of Part Sizes Utilizing the Same Part Number
- \*121 Water in HPCI Lube Oil Reservoir
- 122 Linear Indications Found in Installed 5/8 Inch Seamless Tubing
- \*123 Inadequate Weld Symbol on a S&L Cable Tray Support Data
- 124 Lamination found in ASTM-A516 GR 70 Steel Plate
- \*125 Environmentally Unqualified Terminal Block in Limitorque Valve Operators

- \*126 Underated Motor Termination Blocks
- \*127 Debris Found in RHR Reservoir
  - 128 Loctite 242 in Scram Pilot Solenoid Valves
- \*129 Lack of Design Calculations for QA Level I HVAC Duct Supports
- \*130 Insufficient Clearance on Main Steam Line Pipe Whip Restraints
- \*131 Incomplete Documentation for Weld-O-Lets
  - 133 Improper Welds on Pipe Whip Restraints
- \*134 Improperly Analyzed Conduit Support Specified in Conduit Support Standard ED-2-3
- \*135 Design Deficiency of Conduit Support Weld Details
  - 136 Failure of CR-8 Rectifier in EDGs
  - 137 Cracked Tack Welds in Powell Valves
- \*138 Lack of Design Documentation of As-Built Condition for Combination Operating Panel Welds
  - 139 Deficient Shop Weld in Flued Head Structure

\*Denotes those items under direct licensee control.

The number of Construction Deficiency Reports (CDRs) issued during this assessment period was approximately 144 percent of the number issued during the previous period. A review of the nature and details of the items reported and the timeliness of the reporting indicates that the licensee maintains a proper reporting threshold and is responsive to the 10 CFR 50.55(e) reporting requirements.

Thirty-three CDRs remained open at the close of the assessment period. Based on the licensee's QA review, all but twelve open CDRs require some additional licensee actions.