

SALP BOARD REPORT

U. S. NUCLEAR REGULATORY COMMISSION
REGION III

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

50-331/86001
Inspection Report

Iowa Electric Light and Power
Name of Licensee

Duane Arnold Energy Center
Name of Facility

September 1, 1984 through February 28, 1986
Assessment Period

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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 April 18, 1986, to review the collection of performance observations and data to assess the licensee's 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.

SALP Board, for Duane Arnold Energy Center:

<u>Name</u>	<u>Title</u>
J. A. Hind	Director, Division of Radiological Safety and Safeguards
C. J. Paperiello	Director, Division of Reactor Safety
E. G. Greenman	Deputy Director, Division of Reactor Projects
D. R. Muller	Project Director, NRR
W. G. Guldmond	Chief, Reactor Projects Branch 2
L. R. Greger	Chief, Facilities Radiation Protection Section
M. Schumacher	Chief, Radiological Effluents and Chemistry Section
M. A. Ring	Chief, Test Programs Section
D. C. Boyd	Chief, Reactor Projects Section 2D
R. B. Landsman	Project Manager, Reactor Projects Section 2D
M. Thadani	Duane Arnold Project Manager, NRR
J. S. Wiebe	Senior Resident Inspector
N. V. Gilles	Resident Inspector
P. R. Rescheske	Inspector
S. M. Hare	Inspector
P. L. Eng	Inspector
J. P. Patterson	Inspector

II. CRITERIA

Licensee performance is assessed in selected functional areas, depending upon whether the facility is in a construction, preoperational, or operating phase. Functional areas normally represent areas significant to nuclear safety and the environment. 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 and control in assuring quality
2. Approach to the resolution of technical issues from a safety standpoint
3. Responsiveness to NRC initiatives
4. Enforcement history
5. Operational and Construction events (including response to, analyses of, and corrective actions for)
6. Staffing (including management)

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 definitions of these performance categories are:

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 and construction quality 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 so that satisfactory performance with respect to operational safety and construction quality is being achieved.

Category 3: Both NRC and licensee attention should be increased. Licensee management attention and 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 quality is being achieved.

III. SUMMARY OF RESULTS

Based on SALP 3, 4, and 5 ratings, the overall regulatory performance of the Duane Arnold Energy Center has continued to improve. Improved performance in the areas of Emergency Preparedness and Security is noted during the SALP 5 assessment period. The rating in the area of Surveillance and Inservice Testing improved from a Category 3 to a Category 2 this period. Actual improvement is marginal when one considers the weaknesses identified in pump operability and control of instruments. Performance in the area of Maintenance/Modifications is given a Category 2 rating this period. This is an apparent decrease from the Category 1 rating given during the last period. The apparent decrease is a result of more in depth inspection in this area during the SALP period and is not considered an actual decrease in performance.

<u>Functional Area</u>	<u>April 1, 1983- August 31, 1984</u>	<u>September 1, 1984- February 28, 1986</u>
A. Plant Operations	1	1
B. Radiological Controls	2	2
C. Maintenance/Modifications	1	2
D. Surveillance and Inservice Testing	3	2
E. Fire Protection	1	1
F. Emergency Preparedness	2	1
G. Security	3	2
H. Outages	*	2
I. Quality Programs and Administrative Controls Affecting Quality	**	2
J. Licensing Activities	1	1
K. Training and Qualification Effectiveness	*	2

*Not Rated (new functional areas for SALP 5)
 **Not Rated (no basis for evaluation)

IV. PERFORMANCE ANALYSIS

A. Plant Operations

1. Analysis

Portions of nine routine inspections were performed by the resident inspectors covering plant operations. The inspections included observations of control room operations, reviews of logs, discussions with licensed and unlicensed operators, verification of operability of emergency systems, and reviews of reactor building and turbine building equipment status. Three violations were identified as follows:

- a. Severity Level IV - Failure to have two Average Power Range Monitor (APRM) downscale trip functions (331/85021).
- b. Severity Level IV - Two examples of personnel errors (331/85021).
 - (1) Failure to identify Inoperable High Pressure Coolant Injection deluge system.
 - (2) Failure to establish baseline Average Power Range Monitor and Local Power Range Monitor neutron flux noise levels.
- c. Severity Level IV - Violation of secondary containment integrity (331/84012).

The first two violations resulted from personnel errors during recovery from the 1985 refueling outage. Although these errors were identified by the licensee, the violations were issued as a result of reoccurrence of personnel errors. The licensee took extensive corrective action to reduce the administrative work load and distractions of the Shift Supervisor so that he was free to supervise plant operations. The action included designating an off-duty Shift Supervisor to screen all personnel and paperwork going to the control room to ensure that personnel had a need to go to the control room and that all administrative requirements were met prior to requesting Shift Supervisor's approval to commence work. The corrective action was very successful and no further personnel errors occurred during the recovery. In addition, no significant personnel errors occurred in this area during the rest of the assessment period.

The third violation occurred prior to the assessment period but was not addressed in the last SALP report. The licensee's corrective action was prompt and effective. This instance is considered an isolated case and is not representative of licensee performance during this assessment period.

The small number of violations is a result of an aggressive effort by plant management to ensure operations are conducted only after proper planning and establishment of priorities. This was evident during the period by the prior planning of control rod sequence changes, a power reduction to evaluate and repair a reactor feed pump, and the removing from and placing in service of the Condensate Demineralizer and Reactor Water Cleanup Demineralizers. Corporate management is frequently involved in site activities and visits the site regularly. During recovery from the 1985 refueling outage, several personnel errors prompted management to take timely and effective action to correct the trend. Action was effective as evidenced by the sudden reduction in errors.

Only two scrams from power occurred during this assessment period. These scrams occurred in 1984 as a result of equipment problems. In addition, the licensee's success in this area is demonstrated by a plant record of 234 days of continuous operation during the assessment period. The run was terminated by a scheduled outage for technical specification required surveillance testing.

The licensee demonstrated a clear understanding of technical issues. Conservatism is routinely exhibited during application of technical specification requirements and in determining operability of equipment as was evidenced by licensee response to an inadvertent relief valve lift due to an apparent ground and the licensee response to a design anomaly which would prevent sequencing of loads onto the Emergency Diesel Generators during certain conditions. In both cases, the affected equipment was declared inoperable and the action statement entered until a thorough review by operators, engineers, management, the Operations Review Committee, and the Safety Review Committee showed that action was taken to ensure proper operation of the affected equipment.

The licensee is responsive to NRC initiatives and timely and technically sound responses are given in almost all cases.

The operations area staffing is adequate and the positions are identified with authorities and responsibilities well defined. Overtime is controlled and not excessive.

Plant Management places importance on the professional conduct of operating personnel. A dress code has been established and is usually adhered to. Control Room atmosphere, although improving, needs further work. At times the noise level becomes slightly elevated. Although no effect on plant safety or operator awareness has been noted, this detracts from the overall professionalism of the Control Room.

2. Conclusions

The licensee is rated Category 1 in this area which is the same rating as the last assessment.

3. Board Recommendations

None.

B. Radiological Controls

1. Analysis

Seven inspections were conducted during this assessment period by region based inspectors. These inspections included operational and outage radiation protection, plant chemistry/radiochemistry, confirmatory measurements, environmental protection, effluent releases, TMI action plan items, radiological waste management, and transportation activities. The resident inspectors also reviewed this area during routine inspections including frisking techniques, anti-contamination clothing use, radiological barrier use, step-off pad use, and radiation surveys. Five violations were identified as follows:

- a. Severity Level IV - Failure to follow the proper procedure for work in a locked high radiation work area, resulting in unnecessary radiation exposure (331/85012).
- b. Severity Level IV - Failure to adequately evaluate radiation hazards associated with entering a locked high radiation area (331/85012).
- c. Severity Level V - Failure to identify the waste classification for a drum of radioactive waste on the shipping manifest (331/85005).
- d. Severity Level V - Failure to follow release procedures when releasing (to the river) circulating water system contents which had been slightly contaminated with water from the condenser hot well (331/85022).
- e. Severity Level V - Failure to collect one of the wildlife samples for the second half of 1983 and one for the first half of 1984, and one of the triannual soil samples during the growing season (May-September) in 1984 for the radiological environmental monitoring program (REMP) (331/85009).

The licensee was responsive to these violations; corrective actions were timely and appeared to be effective as recurrence of the problems have not been evident. The violations appear to be isolated incidents rather than indications of programmatic weaknesses.

Staffing in this functional area has generally improved. The staff appears to be experienced and competent. Efforts are continuing to reduce reliance on contractor personnel. The Dosimetry Coordinator, formerly a contractor position, was filled internally during this assessment period. Additionally, the licensee has reduced the number of contract radiation protection engineers and HP technicians during this assessment period. Contractor health physics technicians are scheduled to be replaced by licensee technicians as the licensee technicians become shift qualified. A new position, Corporate Chemist, was created and filled by the former Chemistry Coordinator. Several additional staffing changes including the ALARA Coordinator, Assistant Radwaste Coordinator, Acting Chemistry Coordinator, and Assistant Chemistry Coordinator positions, were necessitated by internal reassignments during this assessment period. These positions were expeditiously filled with no observed lack of continuity.

Management involvement in the functional area is evident. There is consistent evidence that managers and supervisors are involved in the day-to-day activities of the plant. The radiation protection group is represented at a weekly plant planning meeting, where representatives from all plant areas discuss work scheduled for the next week and the support required from other plant groups. Representatives from health physics, dosimetry, decontamination, radwaste, ALARA, and chemistry meet daily to discuss problem areas, activities in progress, and activities scheduled. These types of meetings are indicative of positive management involvement in the coordination of plant activities.

Responsiveness to NRC initiatives has been adequate during this assessment period. The licensee made significant progress in reducing reliance on contractor personnel in both technical and supervisory positions, was responsive to a gaseous effluent monitor alarm setpoint problem, and resolved previous discrepancies in the laboratory intercomparison analyses.

A conservative approach to resolution of radiological control issues is routinely exhibited. Personnel radiation exposures during 1984, an onoutage year, were considerably lower than the U.S. average for BWRs. Exposures for 1985, however, were significantly elevated due to the licensee's ten-year Inservice Inspection (ISI) of the drywell and torus, the Induction Heating Stress Improvement program (IHSI) in the drywell, and the recirculation piping weld overlay repair, in addition to the work normally performed during routine outages. The ISI/IHSI, drywell, torus, and weld overlay doses contributed approximately 740 person-rem of the 1500 person-rem dose for 1985. The licensee's dose average over the last five years has been approximately 800 person-rem. The U.S. average for BWRs over this period was approximately 1000 person-rem. An Exposure Goals Program was implemented during this assessment period as part of a continuing effort to reduce radiation exposure to as low as reasonably achievable (ALARA). This program sets annual exposure goal limits by work groups and is intended to provide a method to

measure cost-effective results in exposure reduction and ensure supervisory awareness of personnel exposure. The licensee has placed a considerable and continuing effort into reducing the number of contaminated areas in the turbine building, reactor building, and the radwaste building during this assessment period.

The licensee continues their conservative policy of prohibiting routine liquid radioactive releases. There were two liquid releases during this assessment period: (1) a small planned release of about one liter of water occurred during condenser tube leak repair, and (2) a release of about a million gallons of water occurred after the circulating water system inadvertently received about 8,000 gallons of slightly contaminated water from the condenser hotwell during the refueling outage. Concentrations of liquid as well as gaseous effluents have remained well below applicable release limits during this assessment period. A minor problem with the procedure for calculating the alarm setpoint for normal range gaseous effluent monitors was identified. In response, a timely change was made to the procedure.

The volume of solid radioactive waste shipments, normally elevated because of the restriction on liquid radioactive releases, was further increased this assessment period by the extensive plant cleanup program and efforts to ship as much radwaste as possible prior to possible burial site restrictions after January 1, 1986. The licensee has implemented methods of reducing solid radwaste, including compacting, hand sorting, and segregation. The licensee appears to have adequately implemented the 10 CFR Part 61 and 10 CFR Part 20.311 requirements for radwaste classification and form. Radwaste procedures were appropriately modified to include these requirements and suitable correlation factors.

Licensee chemistry and radiochemistry programs were satisfactorily implemented with no apparent problems in meeting regulatory requirements. Laboratory equipment was of generally good quality and adequate to perform required analyses. Quality controls were in place for major analytical equipment with results indicating stable operation. Supervisory personnel were well acquainted with the instruments and aware of operating problems and limitations. Technicians observed were proficient and knowledgeable in the analyses performed. The licensee has a generally satisfactory program for testing technician competence using vendor supplied blind samples and results have generally agreed with vendor values. Two small problems noted in this program were the generous ($\pm 30\%$) deviations accepted by the licensee for metals analyzed by atomic absorption spectroscopy and a systematic bias (about 10%) in radioactive sample comparisons with the vendor.

Laboratory space is quite crowded but the laboratory appeared to be efficiently run. Climate control remained poor with unreliable air conditioning, minimal air movement, and temperatures higher than optimal for analytical instruments and personnel. The licensee is aware of the ventilation problems, having identified them in a 1982 internal audit, but the design change package for corrective action was given a low priority.

In confirmatory measurements the licensee achieved generally satisfactory results, with 36 out of 39 comparisons in agreement with the NRC. During the previous assessment period a continuing problem was noted with Sr-89 and Sr-90 analyses comparison. During this assessment period licensee performance improved in this analysis.

Other than the failure to perform certain technical specification required sampling and analyses (see violation above), implementation of REMP was generally satisfactory during this assessment period. As a result of a licensee audit of the REMP, management control over the program was improved to minimize errors and omissions. The improvement included assigning specific responsibility for the program and developing a method to keep management informed of the program status.

2. Conclusions

The licensee is rated Category 2 in this area. Licensee performance was determined to be improving.

3. Board Recommendations

None.

C. Maintenance/Modifications

1. Analysis

Portions of nine routine inspections were performed by the resident inspectors covering this area. In addition, one inspection was performed by a resident inspector from another plant and two regional based inspections were performed in this area. The inspections included reviews of normal maintenance and modification activities to ensure that approvals were obtained prior to initiating work, activities were accomplished using approved procedures, post maintenance testing was completed prior to returning components or systems to service, and parts and materials were properly certified. In addition, work planning and scheduling was reviewed as well as the effectiveness of administrative controls to ensure proper priority is assigned. Five violations were identified as follows:

- a. Severity Level V - Failure to follow Main Steam Line Isolation Valve (MSIV) repair procedure (331/85010).

- b. Severity Level IV - Failure to perform post maintenance testing on secondary containment interlocks (331/85029).
- c. Severity Level IV - Equipment drain sump pump timers installed incorrectly (331/85029).
- d. Severity Level IV - Inadequate engineering review of field change request (331/85029).
- e. Severity Level IV - Failure to conduct maintenance trending (331/85032).

Item a. was a minor instance where the maintenance procedure required certain data to be taken on Main Steam Line Isolation Valve (MSIV) stems. This type of data was previously used to evaluate MSIV performance improvement actions. In this instance, the MSIV stems were being replaced with improved stems, and therefore, the data was not taken. The licensee took action to ensure that the workers are aware that procedures should be changed in such cases.

Item b. was a result of not specifying a post maintenance test after repairs to a secondary containment interlock. The licensee has made major changes to the method used to specify post maintenance testing.

Item c. was a result of a modification made in 1974 and is not considered representative of present performance in this area.

Item d. was a result of a reviewing engineer's failure to recognize the effect of changing the orientation of a flow detector. The licensee changed the administrative requirements to ensure that whenever possible the engineer that approves such changes is the same engineer who initially approved the design.

Item e. was previously identified by the licensee and corrective actions have been in progress since 1983 to complete a historic computerized trending system.

There were no major violations. There were several minor violations which may indicate minor programmatic breakdown in this area. The licensee has taken action to perform a major revision to the administrative controls for maintenance activities which should correct this minor breakdown.

No significant events occurred relevant to this functional area. Events are promptly reported, and in most cases completely reported and analyzed. A large number of equipment failures occurred which may be indicative of the adequacy of the corrective and preventative maintenance program. Several reportable events were the result of the High Pressure Coolant Injection or Reactor Core Isolation Cooling systems being inoperable. Some of these, however, were the result of the licensee intentionally removing

the system from service for corrective maintenance in order to improve the system's reliability. The licensee has also formed a task force to review and recommend corrective action covering these systems' reliability. The licensee has greatly reduced the number of Reactor Water Cleanup Isolations which were caused by false signals.

There has been increasing evidence of prior planning and assignment of priorities. Corporate management is usually involved and decision making is usually at a level that ensures adequate review. As evidenced by spare parts problems with the drywell Hydrogen-Oxygen analyzers (caused unusual event and start of required shutdown) and the Electric Fire Pump (caused pump to twice exceed seven day out-of-service limit), increased management attention appears to be warranted.

Technical issues are generally understood and conservatism is generally exhibited. The licensee is responsive to NRC initiatives with acceptable resolutions proposed initially in most cases. This is evidenced by licensee response to problems concerning control of maintenance activities, NRC concerns about High Pressure Coolant Injection and Reactor Core Isolation Cooling reliability, and trending of corrective maintenance.

During the special inspection of the licensee's reliability program for HPCI and RCIC, it appeared that the licensee (1) was not using trend information that was available in their deviation report listings, (2) had excessively used cause codes "unknown" and "other," (3) had a weak corrective maintenance policy regarding root cause determinations, and (4) had an apparent need for more QC or peer type inspections on maintenance work involving technical specification required equipment.

In regards to these concerns, the licensee did provide generally timely resolutions to quality related technical issues; however, corrective action to preclude recurrence was weak. Corrective action was usually taken but was not always effective at correcting the root cause of the problems in the HPCI and RCIC systems as indicated by their occasional repetition. On some occasions, proposed corrective action was delayed or found to be not effective in producing the desired reliability improvement in HPCI and RCIC. This observation was limited to the apparent conditions and work related to HPCI and RCIC systems and may not apply to other areas. The licensee has responded very well to these areas of concern and have a reliability improvement program underway for HPCI and RCIC.

A high percentage of Main Steam Isolation Valves (MSIVs) have repeatedly failed local leak rate tests. The licensee has replaced the stems and disks of these valves in an attempt to improve their reliability. Although the MSIVs were leak tested immediately following this replacement, they have not been tested

after placing the plant in service following the 1985 refueling outage. The next required test is during the 1987 refueling outage and the NRC has requested the licensee to consider leak testing at least one of these valves on a noncontrolling basis during an outage prior to the 1987 refueling outage. During the only outage since the replacement stems and disks were installed, the licensee considered and rejected the testing of these valves. The rejection was based on (1) the licensee's confidence that the replacement stems and disks will increase valve reliability, and (2) the leak testing could not be performed on a noncontrolling basis.

Key positions are filled on a priority basis with experienced personnel. This is evidenced by the prompt filling of the Maintenance Engineering Supervisor position with a former Operations Shift Supervisor (Senior Reactor Operator Licensee). The Maintenance Superintendent is in Senior Reactor Operator training, and the acting Maintenance Superintendent has taken an aggressive role in improving prior planning of maintenance activities and overall maintenance performance. Permanent plant staffing is marginally adequate. Maintenance has approximately a three month backlog of work and high reliance is placed on contractor help to keep the backlog manageable. The licensee is reducing dependence on contractor help by hiring more maintenance personnel.

Equipment problems were the cause of a high number of LERs which could be reduced by improvement in preventive and corrective maintenance practices; however, the long continuous run (234 days) supports the conclusion that material conditions are not significantly affecting plant operation. The licensee has repeatedly demonstrated this commitment to maintaining the plant by delaying recovery from outages until all necessary maintenance is complete.

2. Conclusions

The licensee is rated Category 2 in this area, which is a change from the last SALP rating. In hindsight, and after more indepth inspection the Board concluded that the prior Category 1 rating may have been too high. However, improvement has been noted during this period, especially in the area of prior planning.

3. Board Recommendations

None.

D. Surveillance and Inservice Testing

1. Analysis

During the assessment period, the resident inspectors routinely inspected this area. These inspections included observations of technical specification required surveillance testing to verify adequate procedures were used, that instruments were calibrated,

and that test results conformed with technical specification and procedure requirements. In addition, several regional inspections were conducted in this area. These inspections included startup core performance, Containment Integrated Leak Rate Tests, and inservice testing. Eight violations were identified as follows:

- a. Severity Level V - Maintenance and test equipment not adequately controlled by surveillance procedures (331/85001).
- b. Severity Level V - Failure to document equipment use history evaluation (331/85001).
- c. Severity Level IV - Failure to perform as found Containment Integrated Leak Rate Test (331/85017).
- d. Severity Level IV - Failure to determine safety-related pump operability via vibration measurements as delineated in the ASME Code (331/85024).
- e. Severity Level V - Failure to properly implement surveillance procedures (331/85025).
- f. Severity Level IV - Use of defective flow meter to obtain surveillance data (331/85026).
- g. Severity Level IV - Inadequate surveillance on drywell equipment drain sump timers (331/85029).
- h. Severity Level IV - Use of an unidentified instrument to determine equipment operability (331/85026).

Items a., b., f., and h. are examples of insufficient control of instruments used for equipment operability determinations. In response to this issue, the licensee established a program to identify inoperable or degraded instruments using tags and to specify required instruments in appropriate procedures; however, it is noted that communications among Operations, Plant Performance and Instrument and Controls personnel must be improved to assure use of proper instruments for surveillance and inservice testing. The licensee is encouraged to pursue this concern aggressively.

Item c. resulted from the licensee's failure to follow their technical specifications in the area of Containment Testing, specifically the requirement for an as found Type A test. While the licensee has the largest allowable containment leakage in Region III, they also have had consistent difficulty with excessively leaking containment isolation valves, the primary source of containment leakage. Any lack of containment integrity due to excessively leaking isolation valves or personnel error

may not have been realized because of their incorrect practice of performing maintenance and repairing leaky containment isolation valves prior to the performance of Type A tests. The licensee is presently pursuing an exemption from these requirements that will allow them to perform containment leak tests at the end instead of the beginning of outages. The exemption will require that they keep detailed records of containment leakage path repairs to facilitate the calculation of an as found Type A test result.

Item d. identifies the licensee's failure to determine safety-related pump operability in accordance with the methods delineated in the ASME Code for vibration monitoring. The licensee subsequently verified the operability of all safety-related pumps and has agreed to revise the appropriate procedures to ensure future compliance with Code requirements; however, due to past plant practices, valid vibration histories for six out of 18 safety-related pumps, including all the ECCS pumps, do not exist.

Item e., as well as several open and unresolved items identified in the areas of Integrated Leak Rate Testing, inservice testing and portions of the startup test programs, are evidence of the licensee's failure to follow procedures and properly record test data. Inconsistencies regarding procedural requirements and plant practices as well as the licensee's interpretation of the term "operable" as it relates to inservice testing requirements were also noted. Although inspections of the licensee's surveillance programs were not conducted by Region based inspectors during the last SALP period, the number and scope of the problems identified indicate that identified deficiencies have existed for an extended period of time.

Item g. is a result of a surveillance test not adequately testing the technical specification required alarm function of the drywell equipment drain sump timers. This resulted in this alarm function being inoperable since a modification was made to the timers in 1974. The licensee has initiated action to review all surveillances to ensure adequate testing is performed.

There are multiple violations which do not indicate a major programmatic weakness. Corrective actions are timely and in most cases effective. However, in the case of Item d., the licensee's actions were inadequate and resulted in Violation f.

There is evidence of prior planning and assignment of priorities; however, as evidenced by two missed surveillances, additional attention is warranted. Improvement has been noted as not as many surveillances were missed in this assessment period compared with last assessment period. Decision making is usually at a level that ensures adequate management review; however, inservice testing problems sometimes do not receive timely management

review and therefore, questionable equipment may not be declared inoperable. Repeated difficulties resulting from test instrument inadequacy have been noted. This problem has not caused any technical specification action statements to be exceeded. The licensee has taken action to correct this problem.

Attention to detail is sometimes lacking in record keeping, procedure compliance, and testing techniques. This is evidenced by violations for failure to follow procedures, and failure to take proper vibration measurements. Corrective action is usually taken but is not effective in all cases in correcting the root cause as evidenced by occasional repetition of problems.

Understanding of issues is generally apparent, and conservatism is generally exhibited. The licensee's surveillance program is conservative with respect to technical specification requirements. Conservatism is demonstrated by: (1) except for the physics area several systems/instruments are surveilled at a frequency greater than required by technical specifications; (2) all core cooling pumps (RCIC, HPCI, RHR, Core Spray) and many valve monthly surveillances also include the performance of the quarterly surveillance requirements of the technical specifications; and (3) the licensee routinely implements and enforces surveillance requirements prior to the technical specification amendment issuance which requires the surveillance.

There were two reportable events related to this functional area during SALP 5. One of these was caused by personnel error (1.5% of all LERs). The other event was caused by an inadequate surveillance procedure. During SALP 4 there were five events related to this functional area that were caused by personnel error (7.4% of all LERs). The above data indicates improvement has been made in this area.

Staffing is adequate; however, responsibility for ASME Code compliance, including program implementation and decision making regarding inservice testing matters, is delegated to a contractor employee. The licensee has recently hired an individual to assume these duties, but increased management attention is warranted to ensure improvement in this area while this employee gains experience in this position.

2. Conclusions

The licensee is rated Category 2 in this area. While this is an improvement from the Category 3 given in the last period, the actual improvement is marginal when one considers the concerns identified in pump operability and control of instruments.

3. Board Recommendations

None.

E. Fire Protection

1. Analysis

During this assessment period, the resident inspectors performed routine inspections in this area, including evaluation of potential fire hazards, plant housekeeping and cleanliness, and compliance with the plant fire protection plan. The inspections showed that housekeeping and cleanliness is very good in readily accessible areas of the plant, but improvement in equipment rooms is desirable. One special inspection was conducted by Region III personnel to assess the licensee's compliance with 10 CFR 50, Appendix R, close out previously identified open items and verify compliance with routine fire protection program requirements. The inspection showed that implementation of the Appendix R requirements was the best observed in Region III. One violation in this area was identified:

Severity Level V - Failure to control aerosol cans of flammable spray paint in reactor building (331/85003).

The violation occurred at the beginning of an extended refueling outage. Extensive and effective corrective actions were taken including administrative procedure changes and tours which prevented additional problems during the outage with many additional contractors onsite and extensive maintenance and construction work in progress.

On two separate occasions the Electric Fire Pump was out of service for greater than seven days. In both cases this resulted from maintenance and spare parts problems. The licensee has taken corrective action in this area and on another occasion extensive effort was made to ensure the Diesel Fire Pump was restored to service in the required seven days even though extensive repair by a vendor was required.

Most of the responsibility for the fire protection program implementation and Appendix R compliance was assigned to contractor employees. Although management and station technical staff were actively involved in the decision making process regarding these matters, the licensee acknowledged the need for greater involvement by members of their staffs and voluntarily implemented positive corrective actions prior to the inspection by Region III.

The licensee resolved technical issues with appropriate justification and documentation and was enthusiastically cooperative with regard to concerns raised by the NRC. Response time was appropriate and communications were positive.

Licensee personnel that were observed appeared to be knowledgeable of their assigned responsibilities in most areas. Some concerns were raised regarding training and experience of some individuals and their overall qualifications to perform assigned duties. The licensee acknowledged these concerns and agreed to make additional efforts to provide required training and experience for identified areas of weaknesses, thereby developing a higher degree of in-house expertise in this area. The level of staffing appeared to be adequate.

2. Conclusions

The licensee is rated Category 1 in this area. This is the same rating as the last assessment.

3. Board Recommendations

None.

F. Emergency Preparedness

1. Analysis

Three inspections were conducted during the period to evaluate the following aspects of the licensee's emergency preparedness program: emergency detection and classification; protective action decision making; notifications and communications; implementation of changes to the emergency preparedness program; shift staffing and augmentation; emergency preparedness training; public information program; and independent audits of the emergency preparedness program. One inspection involved the observance of the annual exercise.

No violations were identified in the two routine inspections conducted in January 1985 and January 1986.

Three weaknesses in the October 29, 1985, exercises were identified as follows: (1) an unsatisfactory demonstration of the Post Accident Sampling System (PASS) in both preparation and timeliness; (2) one of the two offsite Radiological Monitoring Teams (RMT) lost communications with the Emergency Operations Facility (EOF) and the other RMT for approximately one and a half hours; and (3) one of the two offsite RMTs failed to follow the Emergency Plan Implementing Procedures (EPIPs) in the collection, packaging and identification of soil, water, and vegetation samples. The licensee's overall performance in the October 1985 exercise was still rated above average. The Control Room, the EOF, and the Emergency News Center performed very well. The Technical Support Center (TSC) demonstrated an above average performance with only minor problems. Subsequent to this exercise an unannounced PASS drill demonstrating sample acquisition and analysis was conducted successfully and monitored by the Senior Resident Inspector. Therefore, the response to this exercise weakness is considered satisfactory.

In the previous SALP report, concern was raised by the NRC regarding dose calculation and assessment capabilities. Licensee performance in the October 1985 annual exercise and in "hands-on" walkthroughs in the January 1986 inspection clearly indicated an improvement and satisfactory competency in using the MIDAS computer system for obtaining dose assessment values for potential radiation release values based on in-plant radiation levels. In addition, all licensee representatives observed by NRC on both these inspections properly used a flow chart with various plant conditions listed to "trigger" Protective Action Recommendations (PARs) in conjunction with the dose assessment values. The NRC's concern from the previous SALP period regarding dose calculation and assessment capabilities for potential release situations has been resolved by the licensee.

In June 1985, the licensee completed training, including simulator training, for all Operations Shift Supervisors (OSSs) and other key Control Room personnel, on the six new Symptomatic Emergency Operating Procedures (EOPs). These Symptomatic EOPs have been revised to incorporate accident classification references to assist the OSS as initial Emergency Coordinator to better mitigate and classify accidents and cross-reference the EOPs with the EPIPs. These new EOPs, integrated with the EPIPs, should be helpful to OSS's from a cause and effect standpoint in classifying an accident correctly and without undue delay.

The licensee has improved in their response to activations of the Emergency Plan. A total of 20 emergency occurrences (activations of the Emergency Plan) were evaluated by Region III in two inspections during the SALP rating period. In each case the appropriate EAL was chosen, and notifications were made to State and local governmental agencies within the required time. This improvement is partially due to a revised notification form and also to continued training emphasis on emergency detection, classification, and notification. Management has demonstrated responsiveness to NRC emergency preparedness issues whether a violation, major issue or minor issue is involved.

The licensee has hired two staff assistants to assist the Corporate Emergency Planner. One will be assigned to the plant on a full time basis, while the other will be located at the corporate office. A full time person at the site should improve the interaction and cooperation for emergency preparedness from the operating divisions and the health physics group.

Presently the licensee has been maintaining nine key staff positions with 13 additional emergency support personnel available for duty within 30 minutes. Shift augmentation was successfully demonstrated in the October 1985 exercise. The licensee improved its method to assure that individuals assigned to Emergency Response Organization (ERO) positions were trained annually.

Lesson plans have been improved to include suggestions from drill and exercise critiques. Two instructors are currently assigned as full time EP instructors in the Training Center, which was not the case earlier in the SALP period.

In summary, the licensee is continuing their effort to improve the emergency preparedness program. Corporate and plant management have demonstrated their involvement in this area and have projected a positive attitude and response to our concerns. Continued vigilance is needed in initiating action to correct and improve the emergency plan implementing procedures. Also effort should continue in improving the quality of the drills and the annual exercise as a vital part of emergency preparedness training.

2. Conclusions

The licensee is rated Category 1 in this area which is an improvement over the previous SALP rating.

3. Board Recommendations

None.

G. Security

1. Analysis

Five security inspections were conducted by region based physical security inspectors during the assessment period. Three of these inspections were special and two were routine. Additionally, the Resident Inspector routinely conducted observations of security activities. Two violations were identified relative to the security program as follows:

- a. Severity Level IV - Some security officers had not fulfilled training in some tasks required by the Training and Qualification Plan. Additionally, supervisory personnel failed to document the completion of training for certain tasks (331/84015).
- b. Licensee identified item - The licensee failed to conduct maintenance in a timely manner (331/85031).

Allegations from a former licensee security guard were received by Region III that dealt with security at the Duane Arnold facility. The inspectors determined that the licensee took adequate and immediate followup action after receiving the information. Although the allegations could not be fully substantiated, there was an apparent lack of communications, and loss of some documents.

With respect to the licensee identified item the following actions were taken: (1) a security preventative maintenance program was implemented; (2) a security equipment history file was established; and (3) corrective maintenance was completed in a timely manner.

Information received from the monthly reports indicated that the corrective maintenance turnaround has improved. The licensee sent a security force representative to another facility to gather additional information which may help them to further improve their maintenance program. Additionally, the licensee has two maintenance technicians dedicated to security maintenance.

The corrective action for violations is timely and effective in most cases.

One identified weakness pertained to onsite organizations' participation in security contingency drills. The licensee was receptive to the NRC's recommendation for improvement in this area.

Two weaknesses were identified with the licensee's security force training program. One weakness pertained to the nonuniformity in the training received by guards. The second weakness pertained to the significant reduction in the number of licensee-conducted security related drills.

In 1984 and 1985, both the NRC and the licensee had identified the need for a dedicated security training individual. The licensee temporarily filled the position on January 6, 1986. On March 12, 1986, the same individual accepted the official position.

Although weaknesses had been identified with the training program, it is a defined program and contributes to an adequate understanding of work responsibilities. One unresolved item was identified regarding the licensee's capability to maintain the required minimum response force while in compensatory measures. This issue has been forwarded to NRC Headquarters for resolution.

The construction activities onsite have impacted on the security program. The licensee has taken the additional steps necessary to maintain an adequate level of plant security during this phase.

There were no technical issues involving physical security from a safety standpoint which required resolution during this assessment period.

Events reported under 10 CFR 73.71 were properly analyzed and reported in a timely manner.

Positions within the security organizations are identified and responsibilities are defined. There is good communication between the security supervisor and the security force.

The records are generally complete, well-maintained and available.

Good communications exist between site security, plant upper management, and Region III.

Plant management's support for the security program has increased and was made evident by the purchasing of new CCTV cameras; computer software modifications; handguns and walkthrough explosive detectors.

In summary, the plant management's support for the program has increased. This has been shown in the upgrading of some security equipment and positive actions taken to improve the security maintenance program.

2. Conclusions

The licensee is rated Category 2 in this area which is an improvement from the previous SALP 3 rating achieved in the last SALP assessment period. That rating was primarily based on the enforcement history during the rating period which totaled two Severity Level III violations and three Severity Level IV violations. A positive trend has been identified during this assessment period in that management support for security has increased, and the licensee continues to increase its efforts in upgrading security.

3. Board Recommendations

None.

H. Outages

1. Analysis

The resident inspectors performed routine inspections during outages and four regional based inspections were performed concerning outage related work. These inspections included observation of maintenance activities including administrative requirements, review of planning activities, refueling activities, major plant modifications including the ARTS (Average Power Range Monitor, Rod Block Monitor, and the associated Technical Specification Improvements) Modification, weld overlays of recirculation piping welds, and post outage testing. Five violations were identified as follows:

- a. Severity Level IV - Numerous examples of failure to have or follow written procedures during the ARTS Modification (331/85035).

- b. Severity Level V - Failure to maintain tool and material logs during weld overlays (331/85011).
- c. Severity Level IV - Failure to conduct Type B testing on drywell penetration CV-4305 (331/85028).
- d. Severity Level IV - Failure to control activities affecting quality (removal of plug from CV-4305) (331/85028).
- e. Severity Level IV - Failure to have an appropriate procedure and failure to follow a hydrostatic test procedure valve lineup for the Residual Heat Removal System (331/85028).

With respect to item a., the safety-related portion of the modification (APRM's) constituted a very small portion of the modification, and no problems were found in this area. The main problems were identified in the Rod Block Monitor modifications which, while not safety-related, are considered important to safety by virtue of minimizing conditions where plant safety could be jeopardized. These problems were due to the following weaknesses: (1) a high level of quality was not maintained during the activities; (2) resolutions generally addressed symptoms rather than root causes and a clear understanding of significance and implications of technical issues was lacking; (3) responses to inspector-identified concerns were generally not timely or thorough, and frequently lacked technical depth; and (4) the personnel responsible for or involved in the modification activities frequently lacked the knowledge to adequately respond to questions posed by the inspectors. It should be noted that these observations are based on a narrow, non safety-related area, and are not indicative of the entire outage area.

Item b. appears to be an isolated case which was promptly corrected by the licensee. Item c. resulted from not having appropriate procedures for designation of post maintenance testing. The licensee has extensively revised the administrative requirements for designation of post maintenance testing to ensure that knowledgeable individuals in the appropriate departments specify appropriate post maintenance testing.

Items d. and e. resulted from inattention to detail by workers and insufficient supervision to ensure attention to detail. Contractors were primarily involved with this work. The licensee is reducing dependence on contractors by increasing the number of utility maintenance workers. Although contractors cannot be completely eliminated from the workforce during outages, additional utility maintenance workers will allow closer supervision of the contractors. The licensee plans to utilize more utility workers in the future.

No major violations were identified. Item d. did result in an uncontrolled unauthorized breach of containment integrity; however, the plant was not in a mode that required containment integrity. Several examples of failure to follow procedures is not indicative of a programmatic problem but is evidence of inattention to detail and insufficient supervision. Corrective action for the potential programmatic problem concerning post maintenance testing was extensive and effective.

Increased evidence of prior planning and setting priorities has been noted. The 1985 refueling outage was one of the best planned outages in plant history. The outage included refueling, 10 year Inservice Inspection Activities, inspection and refurbishing of several Control Rod Drive Mechanisms, rebuilding of Main Steam Isolation Valves with new stems and disks, and Induction Heating Stress Improvement of recirculation piping welds. When cracks were identified in recirculation piping welds, the additional work was integrated into the schedule. The schedule was continually updated as work and conditions changed. The effectiveness of the maintenance is evidenced by the long run after the outage. The outage group was established prior to the start of the SALP period, but during the SALP period has gained new prominence as the authority concerning the outage schedule. The outage group obtains input from the work group concerning various activities and integrates them into the schedule. Since the input comes from the work group, the work group is expected to meet the schedule except for unforeseen circumstances. As work groups have gained experience in forecasting activity resource requirements, the schedules have become better.

Refueling activities were conducted in an excellent manner. The core was completely off loaded and reloaded without difficulty. Communication between the control room and the refueling floor was excellent. Continuous communications ensured that the control room knew where each fuel bundle was at all times.

Decision making is generally at a level that ensures adequate management review, and corporate management is frequently involved in site activities. Management is kept informed of maintenance status by a daily meeting at which all the new maintenance requests are discussed and priorities evaluated. Management is therefore able to obtain consistent information and revise priorities as necessary. A weekly planning meeting also provides a forum for discussion of complex activities involving several departments to assign responsibilities and track open items. This meeting also allows management to follow priority maintenance. Corporate management is kept informed by frequent plant visits and discussions with plant management.

In some cases records are not complete and not well-maintained as evidenced by problems noted with the ARTS modification documentation and the unauthorized and undocumented removal of a plug from containment isolation valve CV-4305. Minor procedure violations occasionally occur but have not resulted in safety significant events. Corrective action concerning programmatic problems is prompt and effective, but minor procedure violations continue.

The licensee generally demonstrates a clear understanding of technical issues, and conservatism is normally exhibited. This is demonstrated by the licensee's approach to the recirculation piping cracks and the problems associated with the CV-4305 valve and penetration. The licensee is generally responsive to NRC initiatives as evidenced by the extensive, prompt, and effective corrective action taken to improve the Maintenance Action Request (MAR) procedure.

Occasional events, attributable to causes under the licensee's control, have occurred that are relevant to this functional area. Examples of such events are: (1) A vent plug was removed and not reinstalled in CV-4305; (2) Plugs were not reinstalled on Residual Heat Removal relief valves following removal of gags after a hydrostatic test; and (3) Failure to perform a Type B test on the CV-4305 penetration. The first two events resulted in a failure of a Type A Containment Integrated Leak Rate Test (CILRT). The plugs were removed during the outage, and therefore, drywell integrity was not required while the plugs were removed. A Type B test was subsequently performed successfully on CV-4305 penetration, thereby showing that this item had no effect on drywell integrity. As a result of these events, the licensee has improved the maintenance procedures writer's guide to provide guidance on procedure specificity and quality checks, has revised the hydrostatic test procedure, and has revised the MAR procedure to provide more extensive review for designation of post maintenance testing. The corrective action appears to be extensive and appropriate.

Staffing is adequate with contractor support required during outages and to support modification work. Key positions are identified and responsibilities are defined. The licensee is reviewing methods to minimize contractor dependency and to integrate contractor and utility work force activities.

2. Conclusions

The licensee is rated Category 2 in this area. This is a new area that was not included in the last SALP.

3. Board Recommendations

None.

I. Quality Programs and Administrative Control Affecting Quality

1. Analysis

During the assessment period, the resident inspectors routinely inspected this area, which included administrative controls for maintenance and operations as well as deviation reports and quality control department involvement in accordance with the Quality Assurance Plan. In addition, this functional area was examined as part of an inspection of QA programs in procurement, offsite support staff, and receipt, storage and handling. Two violations were identified as follows:

- a. Severity Level V - Violation of secondary containment integrity occurred as a result of inadequate post maintenance testing of secondary containment door interlocks (331/85029).
- b. Severity Level V - Failure to identify a condition adverse to quality (inadequate post maintenance testing) (331/85029).

The violations resulted from the licensee's QA Program not assuring proper quality for non safety-related equipment which may affect the performance of safety-related equipment or structures. In regards to Violation a., the maintenance error, without adequate post maintenance testing, allowed a violation of secondary containment. The condition adverse to quality was not identified since the licensee's QA Program did not require post maintenance testing for this equipment. The licensee initiated broad corrective action by establishing a review group to identify equipment in this category. The QA Program is being changed to apply the appropriate quality controls. The ARTS modification, discussed in Section H. (Outage), is also indicative of an occasion where appropriate quality assurance was not applied to a non safety-related system which affects safety-related equipment.

Administrative control procedures which implement management control, verification and oversight activities continue to be improved. Administrative procedures which control maintenance activities have been significantly improved while problems in the areas of Surveillance and Inservice Testing indicate that further attention is necessary in these areas.

The Operations Committee and Safety Review Committee review of plant activities is detailed and effective. Additional attention is necessary to define and implement the training program referred to by the Operations Committee charter. Control of the design change process is generally good with major TMI modifications

being implemented without problems; however, problems have been identified with documentation and review of minor modifications. The licensee has developed a minor modifications procedure to improve control in this area. Corrective action systems are excellent in identifying and documenting problems, but weaknesses in determining root causes of problems have been noted. Requirements for records are adequate; however, many examples have been noted where insufficient attention to detail has resulted in an incomplete or inaccurate records.

Decision making is usually at a level that ensures adequate management review and corporate management is usually involved in site activities.

2. Conclusions

The licensee is rated Category 2 in this area.

3. Board Recommendations

None.

J. Licensing Activities

1. Analysis

a. Methodology

The basis for this appraisal was the licensee's performance in support of significant licensing actions that were either completed or had a substantial level of activity during the current rating period. Some of these actions, consisting of amendment requests, exemption requests, responses to generic letters, and TMI items, are listed below as either multiplant actions or plant specific actions.

(1) Multiplant Actions - included in this category were:

- Inspection of BWR Stainless Steel Piping (Complete)
- Environmental Qualification of Electrical Equipment (Complete)
- Post Accident Sampling Modifications (Complete)
- Appendix I Technical Specification Implementation Review (Complete)
- Detailed Control Room Design Review (Complete)
- Mark I Containment Long Term Program Implementation (Complete)
- Masonry Wall Design
- Procedures Generation Package Review
- Salem ATWS Related items
- Technical Support Center-0737 Supplement 1
- Operations Support Center-0737 Supplement 1

- Emergency Operations Facility-0737 Supplement 1
- Hydrogen Recombiner Capability
- Safety Parameters Display System (Complete)
- Safety Concerns Associated with Pipe Breaks in the BWR Scram System

(2) Plant Specific Actions - included in this category were:

- Update NDT Operating Limits (Complete)
- Thermal Hydraulic Stability and Single Loop Operation (Complete)
- Reactor Power Uprate (Complete)
- Amendment to Security Plan (Complete)
- Lead Test Assembly Review (Complete)
- ARTS Improvement Modifications (Complete)
- Stainless Steel Piping Repair and Plant Restart (Complete)
- Technical Specification Changes Related to NUREG-0737 Modifications
- ASME Code Relief Applications
- Extension of Alternate Safe Shutdown Capability Deadline
- Exemption from the requirements of 10 CFR 50.48 Appendix R, Section III J

b. Management Involvement and Control in Assuring Quality

During the present rating period, the licensee's management demonstrated active participation in licensing activities and kept abreast of all current and anticipated licensing actions, making effective use of its plan for integrated schedules of actions, and its licensing commitments tracking system. Licensee management actively participated in an effort to work closely with the NRC staff to establish realistic and integrated schedules for all modifications of the DAEC facility. In addition, the management's involvement in licensing activities assured timely response to the requirements of the Commission's rules related to Fire Protection and Environmental Qualification of Electrical Equipment. The implementation schedules for compliance with the rules were fully met by the licensee. During its refueling outage early in 1985, the licensee's management took an aggressive part in assuring (1) thorough inspection of the plants stainless steel piping, (2) completion of repairs of all detected cracks in the stainless steel piping, (3) completion of fire protection related modifications, (4) completion of modifications related to environmental qualification of electrical equipment, and (5) modification related to TMI action items. All the modifications fully met and some exceeded the Commission's requirements. An example of exceeding the requirements was noted by the Region III fire protection inspection team, which found that the modifications of the plant and the procedures exceeded the Commission's requirements, and the fire

protection measures at the DAEC were the best of all the plants seen by Region III inspection team. The licensee's management consistently exercised good control over its internal activities and its contractors to assure quality, and maintained effective communication with the NRC staff. The management's active participation was evident in its firm involvement in the issues of significant potential safety impacts. This was illustrated throughout this rating period in the management's initiatives to seek early staff guidance on the scope of the safety reviews required for future actions involving complex licensing issues.

c. Approach to Resolution of Technical Issues from a Safety Standpoint

The licensee's management and its staff have demonstrated sound technical understanding of issues involving licensing actions. Its approach to resolution of technical issues has demonstrated extensive technical expertise in all technical areas involving licensing actions. The decisions related to licensing issues have routinely exhibited conservatism in relation to significant safety matters as illustrated by the approach taken by the licensee to exceed the Commission's requirements related to rules for fire protection and environmental qualification of electrical equipment.

On occasions, when the licensee deviated from the staff guidance, the licensee has consistently provided good technical justification for such deviations. The Fire Protection Program and the program for Environmental Qualification of equipment are good examples illustrating the soundness of the technical justifications for deviations from the guidance. When unusual events have occurred at the Duane Arnold Energy Center, the licensee has invariably used conservative approaches in dealing with the situations, and performed in-depth analyses of safety issues raised by such events. The licensee has consistently monitored itself to assure that the safety systems function as designed and the plant's technical specifications are well-maintained. An example of a response to unusual events and self-monitoring was the thoroughness with which the licensee identified and dealt with the concerns raised by its own training staff related to a potential problem of diesel generator load sequencer bypass. As a result of the licensee's efforts and communications to the staff, an information notice was sent to other licensees for a potential diesel generator sequencer problem. As stated above, the licensee made frequent visits to NRC to discuss the forthcoming requests for staff actions prior to formal submittals. This approach has been consistently found to improve both the staff's and licensee's efficiency in processing such actions.

d. Responsiveness to NRC Initiatives

The licensee has been consistently responsive to NRC initiatives. During the rating period, it has made every effort to meet or exceed the established commitments as illustrated by its responses to TMI action items, Appendix J requirements and compliance with the rules related to Fire Protection and Environmental Qualification of safety-related electrical equipment. Perhaps the most significant demonstration of the licensee's responsiveness to NRC initiatives is its leadership of the industry in developing and adopting an integrated schedule plan for all safety-related modifications, and renewal of its license amendment to continue to follow the integrated schedule plan. Since establishing the integrated schedule plan over two and a half years ago, the licensee has faithfully followed the elements of the plan enhancing the ease with which it can respond to NRC initiatives.

e. Enforcement History

This area is addressed in the other functional areas of this report.

f. Reporting and Analyses of Reportable Events

The Duane Arnold Energy Center operated at power during the first five months of the period and the last 7 1/3 months of the period. The plant was in a scheduled refueling outage during the 5 2/3 month period between February 3, 1985 and July 18, 1985.

In the first five month operating phase, the unit operated with a reactor service factor* of 78% and reported 25 events** to the NRC Operations Center per 10 CFR 50.72. Three events involved reactor scrams, two of which involved transients from operating power levels. The third occurred inadvertently from less than 1% power while shutting down.

*Reactor Service Factor = (Hours of Critical Reactor Operation/Possible Hours) x100%

**The number of events reported to the operations center may not be the same as the number of License Event Reports because of different reporting criteria and in some cases an event initially reported to the operations center may be reassessed as not reportable.

Twelve reported events involved inadvertent actuations of Engineered Safety Features (ESF) equipment and are considered to have low safety significance. Nine reported events involved temporary inoperability of safety-related equipment requiring entry into a Technical Specification Action Statement. In all cases, the equipment was made operable within time limits, and plant shutdown was not required. Two events reported during this period were discussed at the Operating Reactor Events Briefings. They were the Auxiliary Transformer Fire on November 4, 1984, and Failure of the Start-up Transformer on November 22, 1984. Two events reported during the period involved fires onsite.

During the 5 2/3 month refueling outage, 23 events were reported to the NRC Operations Center. Almost all of these events involved inadvertent actuations of ESF equipment during testing and maintenance operations. One event reported during this period was discussed at the Operating Reactor Events Briefings. This event involved Failure of Leak Rate Tests on four of eight MSIVs on February 6, 1985.

In the past 7 1/3 months, the plant has operated relatively trouble-free with a reactor service factor of 100%. Accordingly, there have been no reports of reactor scrams. Twenty events have been reported to the NRC Operations Center during this period. Seventeen of these events involved temporary inoperability of safety-related equipment requiring entry into Technical Specification Action Statements. In all cases, the equipment was made operable within time limits and plant shutdown was not required. Three events involved inadvertent actuation of ESF equipment and were considered to be of low safety significance. One event reported during the period was discussed at the Operating Reactor Events Briefings. This event involved discovery of a Design Deficiency with the Emergency Diesel Generator (EDG) Load Sequencer.

Licensee events at the Duane Arnold Energy Center appear to have been reported promptly, accurately, and conservatively in the case of entry into Technical Specification Action Statements. Performance during the past seven months has been very good with a frequency of event reports of less than three per month and no reactor scrams.

g. Staffing

The licensee maintains a large licensing staff. The licensing staff is rotated through tours of duty at the plant to gain first hand experience of plant operations. The licensee's management key staff are identified with well defined authority and responsibility. The plant shift staff exceeds the Commission's requirements by having extra operators on shift during refueling in addition to those specified in the Commission's rule.

h. Training and Qualification Effectiveness

There is no basis for evaluating this attribute during the reporting period.

i. Housekeeping

The DAEC site and the facility continues to be maintained at a high level of cleanliness. The plant is maintained with clear markings, well organized storage of supplies, and color coded signs which constantly caution workers about safety significance of various areas of the facility. The workers have been observed to behave in a disciplined manner in conformance with good housekeeping practice. The plant engineering and operating staff have been found to conduct themselves in a highly professional manner, and no adverse behavior of plant operators and other personnel was observed during this reporting period.

2. Conclusion

An overall performance rating of Category 1 has been assigned in the licensing area.

Notwithstanding, we plan to give no less attention by NRC to the DAEC licensing submittals. We further believe that no less management effort on the part of the licensee should be exerted in licensing activities.

3. Board Recommendations

None.

K. Training and Qualification Effectiveness

1. Analysis

Resident and regional inspectors have evaluated training and qualification effectiveness during inspection of specific program areas. No violations were identified in this area.

During inspection of operations activities; non-licensed operators, control room operators, senior control room operators (shift supervisors), and shift technical advisors were generally knowledgeable and effective in carrying out their duties. Examples of cases where knowledge and training appeared to be deficient were: (1) Failure to have the required number of APRM

downscale trip functions; and (2) Failure to obtain baseline APRM and LPRM flux levels. These examples appeared to be isolated cases and not programmatic. During the assessment period, examinations were administered to 12 senior reactor operator and five reactor operator applicants. The overall pass rate for these candidates was 70%. This passing rate is lower than the national average. During the last assessment period, the pass rate was above the national average. With the small number of examinations, the significance of the pass rate cannot be determined. The operating history during the assessment period does not reflect any adverse effect.

During inspection of maintenance and outage activities, instrument and control technicians, electrical maintenance personnel, and mechanical maintenance personnel were generally knowledgeable of their responsibilities. On several occasions contractor personnel demonstrated inadequate knowledge of the importance of equipment and administrative controls. Examples of lack of contractor knowledge discussed in other sections of this report were: (1) Unauthorized removal of a plug from drywell isolation valve CV-4305; and (2) Improper implementation of the return to normal valve lineup following residual Heat Removal hydrostatic test. The problem with contractor knowledge may be indicative of a programmatic problem since contractor personnel do not usually receive the plant experience or the plant specific training that is normally given to utility personnel.

During inspection of the radiological chemistry areas, regional inspectors evaluated training and qualification effectiveness. Licensee training and qualification programs generally improved during this assessment period. A step training program for new HP technicians was implemented. The training program consists of practical and academic tasks and represents the licensee's plan for HP technician staffing for future needs. Despite some early schedule slippage, the licensee plans to have their training program INPO accredited by September 1986. Chemical Technician training is also being improved by implementation of an eight step program designed to be completed over a four-year period. The program, under the direction of the licensee's Joint Apprenticeship Training Committee, leads to a journeyman status and appears quite adequate. Four of the eight chemistry technicians completed the program by the summer of 1985. Development of the program is directed toward eventual INPO accreditation. Currently, training and qualification effectiveness are characterized by an adequate understanding of work and adequate adherence to procedures.

During routine inspections, the knowledge of the technical staff and managers appeared adequate. The licensee sends as many of the technical staff to Senior Reactor Operator training as possible. This takes knowledgeable individuals away from the organization for long periods of time, but in the long run this practice will improve performance overall. The licensee also places design engineers in the quality assurance organization for periods of time. This reinforces the importance of quality assurance within the design engineering organization and will lead to an overall improvement in this area. The Maintenance Engineering Supervisor was a Senior Reactor Operator and the Maintenance Superintendent is presently in Senior Reactor Operator training. This further demonstrates the licensee's commitment to training.

The licensee is making good progress towards INPO accreditation of training programs. Accreditation of the Shift Technical Advisor, Senior Reactor Operator, Reactor Operator, Second Assistant Nuclear Station Operating Engineer, and Nuclear Station Auxiliaries Engineer training programs are expected in the near future (May 1986) and the remaining training programs are expected to be accredited by September 1986.

2. Conclusions

The licensee is rated Category 2 in this functional area.

3. Board Recommendations

None.

V. SUPPORTING DATA AND SUMMARIES

A. Licensee Activities

The unit engaged in routine power operation throughout most of SALP 5. A major scheduled outage for plant refueling, modification, maintenance, induction heating stress improvement treatment, and weld overlays of recirculation piping began on February 3, 1985 and was completed on July 18, 1985. After this outage the plant operated for 234 consecutive days.

The remaining outages throughout the period are summarized below:

September 29 - October 25, 1984	Routine Maintenance
November 4 - November 11, 1984	Auxiliary Transformer Failure
November 23 - November 26, 1984	Fire Suppression Deluge System Tripped Startup Transformer

The plant scrammed nine times (seven occurred while shutdown). In 1984, two at power scrams were caused by a short circuit in the auxiliary transformer and a spurious fire protection deluge system activation on the startup transformer. Six of the remaining scrams were caused by spurious signals on the LPRM, IRM, or APRM channels. One scram was caused by a failure to bypass the high Scram Discharge Volume Level signal while resetting the RPS logic after another scram.

B. Inspection Activities

A special team inspection was conducted by Region III on November 24, 1984 to assess the licensee's actions in regard to the auxiliary transformer failure. The inspectors found the licensee's staff to function effectively in dealing with this emergency.

Additionally, a special in depth assessment of engineering, maintenance, and surveillance testing activities associated with the High Pressure Coolant Injection and the Reactor Core Isolation Cooling systems was performed. The inspectors identified some concerns in this area and the licensee initiated a reliability improvement program for these two systems.

Violation data for the Duane Arnold Energy Center is presented in Table 1, which includes Inspection Reports No. 84012 through 86005.

TABLE 1
ENFORCEMENT ACTIVITY

FUNCTIONAL AREA	NO. OF VIOLATIONS IN EACH SEVERITY LEVEL				
	V	IV	III	II	I
A. Plant Operations		3			
B. Radiological Controls	3	2			
C. Maintenance/Modifications	1	4			
D. Surveillance and Inservice Testing	3	5			
E. Fire Protection	1				
F. Emergency Preparedness					
G. Security		1			
H. Outages	1	4			
I. Quality Programs and Administrative Controls Affecting Quality	2				
J. Licensing Activities					
K. Training and Qualification Effectiveness					
TOTALS	11	19	0	0	0

C. Investigations and Allegations Review

1. A worker alleged that work hours were reduced as a result of workers questioning why the chemical decontamination of the recirculation system piping was cancelled. The chemical decontamination was scheduled to reduce radiation levels to workers. Inspection showed that the reduction in work hours appeared to be unrelated to the concerns raised about the decontamination cancellation. The inspection also showed that the decontamination was cancelled as a result of possible pitting and sensitization of piping. No violations were identified.
2. A private citizen alleged certain individuals had never been qualified as welders, but had "bought" their union cards. Licensee records did not show that these individuals had ever been to DAEC. No violations were identified.
3. While the unit has shutdown, an employee alleged that the southeast corner room was flooded with three to four inches of water and referred to the incident as an operations department "screw-up." Inspection substantiated that the flooding had occurred and further established that the cause was procedural inadequacy and poor communications which led to personnel errors in the system lineup. The licensee addressed this incident along with several other personnel errors and initiated corrective actions to prevent occurrence. No violations were identified.

4. An anonymous allegation stated that the auxiliary transformer had a history of problems and management had a "cavalier" attitude towards the problems and made no attempt to investigate or correct them. Inspection showed that the allegations were not substantiated. No violations were identified.
5. A security guard alleged 12 security and one radiation protection problems. Inspection showed the allegation to be unsubstantiated. The individual also filed a complaint of discriminatory employment practices with the Department of Labor. The complaint was determined unproved. No violations were identified.
6. A contractor employee alleged harassment and employment discrimination and identified four specific "defects." Inspection showed the allegation concerning the four "defects" to be unsubstantiated. Concerning harassment and employment discrimination, the employee was informed how to file the complaint with the Department of Labor. The complaint was never filed. No violations were identified.

D. Escalated Enforcement Actions

There were no escalated enforcement actions during the assessment period.

E. Licensee Conferences Held During Appraisal Period

1. November 27, 1984 (Glen Ellyn, Illinois)

Meeting to review Systematic Assessment of Licensee Performance (SALP 4).

2. October 16, 1985 (Glen Ellyn, Illinois)

Meeting requested by the licensee to address concerns expressed in recent NRC inspection reports.

F. Confirmation of Action Letters (CALs)

There were no CALs issued during this SALP assessment.

G. Review of Licensee Event Reports, Construction Deficiency Reports, and 10 CFR 21 Reports Submitted by the Licensee

1. Licensee Event Reports (LERs)

LERs issued during the 18 month SALP 5 period are presented below:

LERs No.

84-31 through 84-45
85-01 through 85-47
86-01 through 86-04

<u>Proximate Cause Code*</u>	<u>Number During SALP 5</u>	
Personnel Error (A)	1	(9)
Design Deficiency (B)	11	(13)
External Cause (C)	1	(1)
Defective Procedure (D)	4	(8)
Management/Quality Assurance Deficiency (E)	5	(5)
Others (X)	24	(30)
<u>No Cause Code Marked**</u>	<u>20</u>	<u>(0)</u>
Total	66	(66)

*Proximate cause is the cause assigned by the licensee according to NUREG-1022, "Licensee Event Report System."

**NUREG-1022 only requires a cause code for component failures. The numbers in parenthesis are the LERs in each category when all the LER's are assigned cause codes.

In the SALP 4 period, the licensee issued 67 LERs in 17 months for an issue rate of 3.94 per month. In the SALP 5 period the licensee issued 66 LERs in 18 months for an issue rate of 3.67 per month. For most of the SALP 5 period, the technical specifications prohibited any loss of secondary containment thus requiring an LER to be issued regardless of the duration of the loss. In January 1986, the NRC approved a revision to the technical specifications to make them consistent with most other technical specifications, and allow loss of secondary containment for short periods of time without violation of technical specifications. An LER, therefore, is no longer required if secondary containment is restored within the required time period. If the LER's which would not be issued under the revised technical specifications were deleted, the SALP 4 period would have included 65 LER's for an issue rate of 3.82 per month, and the SALP 5 period would have included 56 LER's for an issue rate of 3.1 per month. The reduction in overall LERs and the reduction in personnel errors is indicative of an improving trend.

The office for Analysis and Evaluation of Operational Data (AEOD) reviewed the LERs for this period and concluded that, in general the LERs are of above average quality based on the requirements contained in 10 CFR 50.73; however, they identified some minor deficiencies. A copy of the AEOD report has been provided to the licensee so that the specific deficiencies noted can be corrected in future reports.

2. Construction Deficiency Reports

No construction deficiency reports were submitted during the assessment period.

3. 10 CFR 21 Reports

No 10 CFR 21 reports were submitted during the assessment period.

H. Licensing Activities

1. NRR/Site Visits/Meetings

a. Site Visits

March 20, 1985 - Detailed Control Room Design Review (DCRDR) In Progress Audit

September 17, 1985 - Visual Inspection of the Impact of Cooling Tower Drift on Vegetation

January 28, 1986 - Site Visit and Progress Meeting

b. Meetings

October 30, 1984 - SALP Board Meeting at Region III

November 27, 1984 - SALP Meeting with the Licensee at Region III

January 24, 1985 - Technical Specification Change Request

January 30, 1985 - Technical Specification Change Request

February 22, 1985 - TMI Modifications Related Technical Specification Changes

March 7, 1985 - Technical Specification Changes for Lead Test Assemblies (LTA's), Power Uprate, ARTS, and Reload

April 12, 1985 - DCRDR Program Change

April 22, 1985 - Stainless Steel Piping Inspection Results

June 14, 1985 - Emergency Technical Specification Change Request

July 30, 1985 - Technical Specification Change Errors and Actions to Prevent Them

October 3, 1985 - Meeting on Pipe Cracks and Technical Specification Improvements

October 31, 1985 - Hydrogen Recombiner Capability

November 18, 1985 - Appendix I and Hydrogen Control

2. Commission Briefings

None.

3. Schedular Extension Granted

May 30, 1985 - extension of Alternate Shutdown Capability requirements of 10 CFR 50, Appendix R to March 1987

4. Relief Granted

June 10, 1985 - Relief granted from ASME Code Section XI requirements related to torus-drywell vacuum breaker leakage testing

5. Exemption Granted

July 1, 1985 - Exemption from the requirements of 10 CFR 50.48 and 10 CFR 50 Appendix R Section III J

6. License Amendments

Amendment No. 107, dated September 4, 1984, incorporated the containment high range monitor technical specifications.

Amendment No. 108, dated October 29, 1984, revised the technical specifications to permit reduction in RHR service water flowrate requirement.

Amendment No. 109, dated January 14, 1985, incorporated the Radiological Effluent Technical Specifications (RETS).

Amendment No. 110, dated February 1, 1985, incorporated technical specifications for Automatic Depressurization System (ADS) valve automatic actuation.

Amendment No. 111, dated February 5, 1985 revised the setpoint for turbine trip and low power load rejection reactor scrams.

Amendment No. 112, dated February 26, 1985, revised the Security Plan, and the guard training and qualifications.

Amendment No. 113, dated March 12, 1985, revised snubber testing requirements.

Amendment No. 114, dated March 14, 1985, incorporated administrative changes.

Amendment No. 115, dated March 27, 1985, incorporated technical specification changes to permit uprating of the reactor rated power.

Amendment No. 116, dated April 11, 1985, incorporated changes to permit storage of new and spent fuel Lead Test Assemblies in the fuel pool.

Amendment No. 117, dated April 17, 1985, incorporated changes to permit Cycle 8 reload.

Amendment No. 118, dated April 18, 1985, incorporated changes to permit loading of the Lead Test assemblies in the core.

Amendment No. 119, dated May 28, 1985, incorporated changes to assure thermal hydraulic stability and permit single loop operation.

Amendment No. 120, dated May 28, 1985 incorporated extended load limit line, and APRM and RBM technical specification improvements.

Amendment No. 121, dated May 28, 1985, revised the NDT operating limits.

Amendment No. 122, dated May 28, 1985, incorporated changes to conform to 10 CFR 50 Appendix J Type C testing.

Amendment No. 124, dated June 20, 1985, revised the effective date of Amendment No. 121.

Amendment No. 125, dated July 9, 1985, extended the effective date of the license condition for integrated schedule.

Amendment No. 126, dated October 10, 1985, incorporated the operator overtime restriction.

Amendment No. 127, dated December 5, 1985, incorporated additional leak testing requirements for ADS accumulator check valves.

Amendment No. 128, dated January 4, 1986, incorporated corrections to RETS.

Amendment No. 129, dated January 9, 1986, incorporated an action statement for maintaining pump discharge line filled.

Amendment No. 130, dated February 18, 1986, deleted the terrestrial monitoring requirement and Appendix B to the Technical Specifications.

7. Emergency/Exigent Technical Specification Changes

Emergency Amendment No. 124, dated June 20, 1985, revised the effective date of Amendment No. 121 to permit testing against previous NDT operating limits.

8. Orders Issued

None

9. NRR/License Management Conferences

None

10. Issues Pending

- (a) Hydrogen recombiner capability.
- (b) Appendix R exemptions.
- (c) ATWS rule.
- (d) Technical Specification changes for TMI Item III.D.3.4.