U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-331/86009(DRP)

Docket No. 50-331 License No. DPR-49

Licensee: Iowa Electric Light and Power Company
IE Towers, P. O. Box 351
Cedar Rapids, IA 52406

Facility Name: Duane Arnold Energy Center

Inspection At: Palo, IA

Inspection Conducted: May 20 through July 14, 1986

Inspectors: J. S. Wiebe
N. V. Gilles

Approved By: D. C. Boyd, Chief
Reactor Projects Section 2D

7-23-86
Date

Inspection Summary

Inspection on May 20 through July 14, 1986 (Report No. 50-331/86009(DRP))
Areas Inspected: Routine, unannounced inspection by the resident inspectors of licensee action on previous inspection findings, operational safety, maintenance, surveillance, Licensee Event Reports, outage activities, plant trips, low-level radioactive waste storage facility, resolution of Regulatory Effectiveness Review Team comments, generic letters, TMI action items, and licensee response to selected safety issues.
Results: Of the 12 areas inspected, no violations or deviations were identified.

## DETAILS

1. Persons Contacted

R. Anderson, Assistant Operations Supervisor
R. Baldyga, Senior Mechanical Engineer
T. Browning, Senior Licensing Engineer
H. Giorgia, Radiation Protection Supervisor
*M. Grim, Site Licensing Engineer
*R. Hannen, Assistant Plant Superintendent, Operations
*L. Jenkins, Quality Assurance Engineer
*B. Lacy, Maintenance Superintendent (Acting)
*J. Loehrlein, Supervising Engineer, Design Engineering
C. Mick, Operations Supervisor
*W. Miller, Assistant Plant Superintendent, Technical Support
D. Mineck, Plant Superintendent, Nuclear
J. Probst, Technical Support Engineer
*R. Salmon, Technical Services
R. Sharma, Senior Mechanical Engineer
*J. Smith, Technical Support Supervisor
S. Swails, Acting Group Leader, Nuclear Licensing
*K. Young, Assistant Plant Superintendent, Radiation Protection/Security

In addition, the inspector interviewed several other licensee personnel including Operations Shift Supervisors, Control Room Operators, engineering personnel, and contractor personnel (representing the license).

*Denotes those present at the exit interviews.

2. Licensee Action on Previous Inspection Findings

a. (Closed) Open Item (331/85015-04(DRP)): Startup Checklist Not Complete. The inspector has reviewed the startup checklist for the last two startups and has found no further problems. This item is considered closed.

b. (Open) Open Item (331/85015-05(DRP)): Inoperable Alarms and No Operator at Liquid Nitrogen Vaporizer Local Control Panel. The licensee has completed the design change to the nitrogen purge system which consolidated all instrumentation and controls at one location indoors. The design change also encompassed changes to a temperature switch setpoint which causes isolation of the system to protect against cold nitrogen injection to the drywell. This item remains open pending observation of the nitrogen purge system with these changes in place.

c. (Closed) Violation Severity Level V (331/85029-01(DRP)): MARS For Replacement of Locking Hardware on Secondary Containment Interlocking Doors Did Not Include Appropriate Acceptance Criteria. The licensee's task force review of Quality Level IV systems

necessary to support safety-related systems or regulatory requirements has been completed. The task force concluded that activities which have been implemented and are currently being developed will provide adequate controls to assure that post-maintenance testing and inspection will be performed. These activities include a new Corrective Maintenance Action Request (CMAR) procedure which was recently implemented and which contains several controls and reviews not previously in force. The licensee is also developing a Quality Level Determination Effort which will provide pre-identification of certain quality commitments to ensure consistent consideration of the impact of maintenance activities on plant operations and safety. This data is expected to be included in the Computerized History and Maintenance Planning System (CHAMPS) data base by February 1987. The task force also determined that upgrading equipment from Quality Level IV to Quality Level II is not sufficient to ensure adequate post-maintenance testing and inspection. However, the task force did identify several systems currently categorized as Quality Level IV which may require a level of quality control greater than that normally given Quality Level IV equipment. The task force recommended that certain components within these systems be given additional post-maintenance review until the "Quality Level Determination" data becomes available in the CHAMPS data base. It appears that the licensee has adequately addressed this issue. This item is considered closed.

d. (Closed) Open Item (331/86002-03(DRP)): Information Notice 85-75: Improperly Installed Instrumentation, Inadequate Quality Control and Inadequate Post-Modification Testing. The licensee's technical support department has reviewed the subject Information Notice for applicability to their facility. The licensee concluded that systems and procedures in place along with the Quality Level IV Task Force review and review of the Surveillance Test Program show that they are aware of problems noted in the subject Information Notice and have necessary programs in place to correct these deficiencies. This item is considered closed.

e. (Closed) Open Item (331/86002-06(DRP)): Information Notice 85-89: Potential Loss of Solid-State Instrumentation Following Failure of Control Room Cooling. The licensee's technical support department has reviewed the subject Information Notice for applicability to their facility. Through review of plant operating history and discussions with operating, maintenance, and training personnel the reviewer determined that overheating and loss of control room instrumentation caused by a loss of control room cooling is not a known problem at DAEC. Safety-related control equipment is environmentally qualified for continuous operation at 104 degrees F. When loss of cooling to the control room does occur, repairs are initiated promptly. Upon loss of cooling operations personnel will open doors to the computer room, which has a separate cooling system, and set up fans to facilitate air movement. The control room doors may also be opened to provide access to outside windows in the adjoining corridor. Thus, when control room cooling is lost, personnel are aware of measures which can be taken to maintain an adequate environment. This item is considered closed.

f. (Open) Open Item (331/86006-02(DRP)): Inadequate Inspection Procedure for Residual Heat Removal (RHR) Check Valve. The inspector reviewed procedures used to inspect the RHR check valve during the refueling outage in 1985 and during the maintenance/ surveillance outage in March 1986. In April 1985 the check valve was inspected under a maintenance instruction form which required inspection of the seating surfaces of the valve body and disc only. In March 1986 the valve was inspected using a repair procedure which had been implemented since the previous refueling outage. The repair procedure called for inspection of all valve parts. During the March 1986 inspection a small shoulder was found on a hinge pin in the valve which was causing the valve disc to bind on the seat. The valve was repaired and successfully leak tested. However, upon startup of the plant following the outage, the valve was again found to be leaking, and a new Maintenance Action Request was written to inspect and repair the valve in the upcoming refueling outage beginning in February 1987. While the new repair procedure used during the March 1986 outage is a significant improvement over the maintenance instruction form used to previously inspect this valve, problems with this valve still exist. This item remains open pending review of the licensee's actions to address repairs to this valve in the upcoming refueling outage.

3. Operational Safety Verification

The inspector observed control room operations, reviewed applicable logs and conducted discussions with control room operators during the inspection period. The inspector verified the operability of selected emergency systems, reviewed tagout records and verified proper return to service of affected components. Tours of the reactor building and turbine building were conducted to observe plant equipment conditions, including potential fire hazards, fluid leaks, and excessive vibrations and to verify that maintenance requests had been initiated for equipment in need of maintenance. The inspector, by observation and direct interview, verified that the physical security plan was being implemented in accordance with the station security plan.

The inspector observed plant housekeeping/cleanliness conditions and verified implementation of radiation protection controls. During the inspection, the inspector walked down the accessible portions of the Standby Liquid Control and Residual Heat Removal Service Water systems to verify operability.

These reviews and observations were conducted to verify that facility operations were in conformance with the requirements established under technical specifications, 10 CFR, and administrative procedures.

No problems or concerns were identified.

4. Monthly Maintenance Observation

Station maintenance activities of safety related systems and components listed below were observed/reviewed to ascertain that they were conducted in accordance with approved procedures, regulatory guides and industry codes or standards and in conformance with technical specifications.

The following items were considered during this review: the limiting conditions for operation were met while components or systems were removed from service; approvals were obtained prior to initiating the work; activities were accomplished using approved procedures and were inspected as applicable; functional testing and/or calibrations were performed prior to returning components or systems to service; quality control records were maintained; activities were accomplished by qualified personnel; parts and materials used were properly certified; radiological controls were implemented; and, fire prevention controls were implemented.

Work requests were reviewed to determine status of outstanding jobs and to assure that priority is assigned to safety related equipment maintenance which may affect system performance.

The following maintenance activities were observed/reviewed:

HPCI Outboard Steam Supply Isolation Valve Testing and Repairs
Limitorque Valve Operator Wire Replacement
MSIV Limit Switch Repair
Neutron Monitoring System Flow Unit Voltage Adjustments

No problems or concerns were identified.

5. Monthly Surveillance Observation

The inspector observed technical specifications required surveillance testing on the Local Power Range Monitors (LPRM), Average Power Range Monitors, (APRM), High Pressure Coolant Injection System and APRM/LPRM Operating Noise Data Collection for Single Loop Operation and verified that testing was performed in accordance with adequate procedures, that test instrumentation was calibrated, that limiting conditions for operation were met, that removal and restoration of the affected components were accomplished, that test results conformed with technical specifications and procedure requirements and were reviewed by personnel other than the individual directing the test, and that any deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel.

No problems or concerns were identified.

6. Licensee Event Reports Followup

Through direct observations, discussions with licensee personnel, and review of records, the following event reports were reviewed to determine that reportability requirements were fulfilled, immediate corrective action was accomplished, and corrective action to prevent recurrence had been accomplished in accordance with technical specifications.

a. (Closed) Licensee Event Report (LER) 86-010 (331/86-010-LL): High Pressure Coolant Injection (HPCI) System Inoperability Due to a Turbine Control Problem. The cause of the HPCI system inoperability was a component in the turbine governor control system which was out of calibration. The licensee recalibrated the component and determined the probable cause of the drift to be sensitivity of the instrumentation to ambient temperatures. The licensee's task force on HPCI/Reactor Core Isolation Cooling (RCIC) reliability is addressing the problem of moving or upgrading control instrumentation. During subsequent post-maintenance testing on the HPCI system, the overspeed trip failed to automatically reset. The cause of the failure was a small burr on a hydraulic control tappet which prevented movement and would not allow the trip to reset. Once the tappet was repaired, the HPCI system was tested satisfactorily and declared operable. The licensee has informed the manufacturer of the sensitivity of the overspeed trip reset mechanism to small deficiencies, and the HPCI/RCIC task force will be examining the problem in more detail. This LER is considered closed.

b. (Closed) Licensee Event Report (LER) 86-012 (331/86-012-LL): Reactor Water cleanup (RWCU) System Isolation Due to Failed Temperature Differential Switch. The cause of the isolation was a failed temperature differential switch which indicated an erroneous high temperature. The licensee believes the failure to be random as no root cause could be determined. The licensee replaced the switch and returned the RWCU system to service. The licensee will continue to monitor the performance of this type of switch for any failure trends. This LER is considered closed.

c. (Closed) Licensee Event Report (LER) 86-013 (331/86-013-LL): Temperature Switch Design Problem Causes Isolation of Reactor Core Isolation Cooling (RCIC). The cause of the isolation was an internal design problem with a temperature differential switch in the Steam Leak Detection System (SLDS). This event is identical to one that the licensee reported in LER 86-007 (see Inspection Report 331/86006). The licensee has installed a short time delay in the RCIC SLDS circuitry to prevent further spurious isolations of this type. This LER is considered closed.

d. (Open) Licensee Event Report (LER) 86-014 (331/86-014-LL): HPCI and RCIC Inoperabilities for Planned Valve Maintenance. This LER and Revision 1 to this LER address several instances between April 28 and May 28, 1986, where the HPCI or RCIC system was taken inoperable for planned maintenance activities. In each case where a technical specification Limiting Condition for Operation (LCO)

was entered, the licensee complied with the applicable action statement.

The maintenance activities described in this LER cover repairs of two valves, the HPCI test discharge valve and the HPCI outboard steam supply isolation valve. The HPCI test discharge valve had been subjected to vibration-induced damage caused by its use as a throttling valve for HPCI testing over its greater than ten year lifetime. Repairs to the valve required the installation of flanges in place of flow orifices in both the HPCI and RCIC test return lines to the condensate storage tank to isolate the valve during maintenance. Installation and removal of the flanges accounted for a number of the HPCI and RCIC inoperabilities. Long-term corrective actions will include overhaul or replacement of the valve and installation of an additional valve downstream more suited to throttling. Installation of the additional valve will take place prior to startup from the next refueling outage in the spring of 1987.

The HPCI outboard steam supply isolation valve required maintenance to repair packing leaks. This valve has had a history of packing leaks. The licensee determined that the cause of the recent leaks was the use of incorrect packing material which had been taken from an unlabelled container from shop stock when the valve was repacked in the March 1986 maintenance outage. Earlier problems are thought to be due to inadequate packing techniques. Additional testing during the June 1986 maintenance outage confirmed that stem problems were not contributing to packing leakage, as was originally thought, and it was determined that stem replacement was not warranted. The licensee's plans for corrective action include additional training to personnel concerning valve packing, revision of the maintenance procedure for valve packing to provide more detailed instructions, and revision of maintenance practices to ensure all packing will be issued out of the warehouse in lieu of shop stocks. The licensee is evaluating redesigning the packing arrangement of this valve. This LER remains open pending completion of modifications to the HPCI system during the Spring 1987 refueling outage.

e. (Closed) Licensee Event Report (LER) 86-015 (331/86-015-LL): Fire Suppression System Isolation Due to Inadequate Administrative Procedures. A portion of the fire suppression system was isolated for five hours while performing a surveillance test on the system. The isolation occurred when two valves were closed per the surveillance procedure. Unknown to personnel performing the surveillance, two other valves on the main header were already closed due to the installation of two new fire hydrants. During this time, a technical specification required fire watch was not established due to inadequate administrative controls. The licensee has revised the Control Room Panel Shift Check List procedure to include any abnormal valve positions in the fire suppression system. The surveillance procedure was also revised to require a walk down of the fire suppression system prior to performing the surveillance

test. A status board is being developed to provide current status of fire system operability, and is expected to be completed by August 1986. This LER is considered closed.

f. (Closed) Licensee Event Report (LER) 86-016 (331/86-016-LL): Reactor Water Cleanup (RWCU) System Isolation Due to Misleading Electrical Schematic. The isolation was caused by a high temperature indication from the non-regenerative heat exchanger, generated when a lead was lifted for planned maintenance. A misleading electrical schematic led personnel to believe lifting the lead would have no effect other than disabling the non-safety related isolation function. An Engineering Work Request was submitted to revise the misleading schematic. This LER is considered closed.

g. (Closed) Licensee Event Report (LER) 86-017 (331/86-017-LL): Manual Scram in Response to Feedwater Level Control Problems During Reactor Startup. Refer to paragraph 8 for the details of this event. Problems associated with the manual scram have been addressed by the licensee. This LER is considered closed.

No problems or concerns were identified.

7. Outage Activities

On June 9, 1986, the licensee entered a scheduled maintenance outage. Major activities included replacement of the auxiliary transformer which was destroyed by fire on November 4, 1984; rewiring of two Limitorque valve motor operators; diagnostic testing of the HPCI outboard steam supply isolation valve; and a minor modification to the Post Accident Sampling System (PASS). Outage work was scheduled to last for three days. Plant startup was begun on June 12, 1986, but was halted when the reactor was manually tripped on June 13, 1986, due to decreasing reactor water level (paragraph 8). A post-trip review and applicable maintenance activities were performed and on June 16, 1986, plant startup was initiated with no further problems.

No problems or concerns were identified.

8. Plant Trips

Following the plant trip on June 13, 1986, the inspector ascertained the status of the reactor and safety systems by observation of control room indicators and discussions with licensee personnel concerning plant parameters, emergency system status and reactor coolant chemistry. The inspector verified the establishment of proper communications and reviewed the corrective actions taken by the licensee.

All systems responded as expected, and the plant was returned to operation on June 16, 1986.

On June 13, 1986, at 3:22 a.m., an operator manually tripped the reactor due to reactor water level approaching the low level trip setpoint. The licensee had just completed a scheduled maintenance outage and startup activities were in progress with the reactor at about 5% power when the manual trip occurred. The "B" reactor feed pump had been started approximately 16 minutes before the trip. The operator was attempting to control water level with a feedwater block valve, since the feedwater regulating valve was leaking in the closed position. When the operator saw level increasing due to the leaking feedwater regulating valve, he throttled the block valve closed. However, when level began decreasing, the operator was unable to reopen the block valve because of the differential pressure which had built up across the valve, causing a thermal overload trip. The same was true of the block valve in the "A" feedwater line. When it was realized that the block valves could not be opened, and level decreased to within inches of the automatic low level trip setpoint, the reactor was manually tripped. Following the trip, level continued to drop and Containment Isolation Groups II, III, IV, and V isolated on low water level. Subsequently, the "B" reactor feed pump was tripped, the thermal overload breakers for the two block valves were reset and the valves opened, and level was recovered using condensate and control rod drive flow. Once level exceeded the low level trip point, the reactor trip and all isolations were reset.

The licensee's investigation subsequent to the trip revealed fine desiccant particles in the instrument air system trapped in the Moore positioners feeding the valve actuators. This was causing excessive valve fluctuations near the closed position. Although the air dryers in the instrument air system were changed to a non-desiccant type in 1984, the licensee suspects that small amounts of fine desiccant particles are still present in the system. The licensee replaced the positioner on one feedwater regulating valve and cleaned the positioner on the other. Subsequently, the valves successfully passed post-maintenance test requirements. A work request has been issued to install in-line air filters in the air supply lines by the end of the Spring 1987 refueling outage to correct this problem. During the interim, the licensee plans to clean out, adjust, or change out the Moore positioners on the feedwater regulating valves and on the feedwater minimum flow line valves every time the plant is shutdown.

Additional corrective actions include an Engineering Work Request which had been previously written recommending a design change to install a smaller regulating valve bypassing the present large regulating valve. This would allow easier feedwater system operation under low pressure conditions. Also, the licensee has revised the startup procedure to provide additional direction to operators for this situation.

After maintenance was performed on the feedwater regulating valves, the reactor was taken critical at 19:52 on June 13, 1986. However, problems with Main Steam Isolation Valve (MSIV) limit switches forced the plant subcritical on June 15, 1986, in order to make a drywell entry to repair the MSIVs. Additional problems with the feedwater regulating valves were also experienced. Adjustments to the boosters on these valves eliminated the problem. The plant was again taken critical on June 16, 1986 with no further problems.

No problems or concerns were identified.

9. Low-Level Radioactive Waste Storage Facility

The inspector held discussions with the licensee and reviewed documentation concerning the licensee's Low-Level Radioactive Waste Storage Facility (LLRWSF) to obtain the following information:

a. The licensee is presently building a low-level waste storage and processing facility on site. Construction is expected to be complete about January 1, 1987.

b. The general method of construction is reinforced concrete.

c. The facility is designed to hold 12,750 cubic feet of resin and 23,520 cubic feet of dry active waste.

d. The new structure will be attached to the existing radwaste building.

e. The licensee has performed a 50.59 evaluation of the structure. The evaluation concluded that: (1) the facility operating license and technical specifications do not prohibit increased onsite radioactive waste storage capacity; (2) the proposed storage does not exceed the expected amount of radioactive waste generated at the plant for 5 years; and (3) no unreviewed safety questions exist.

f. The licensee's design criteria for offsite dose to the "maximum individual" is less than or equal to 5 mrem/year. Based on the final shielding design offsite doses from onsite storage of resins and dry active waste in the LLRWSF would be less than 1 mrem/year. Radioactive release quantities from potential airborne sources is expected to be insignificant, i.e., slightly higher than background radiation. Liquid releases to the environment will be consistent with 10 CFR 50 Appendix I. Regulatory limits used to judge the acceptability of the estimated dose rates were 40 CFR 190 and 10 CFR 50 Appendix I.

g. The LLRWSF will house low-level waste processing equipment.

No problems or concerns were identified.

10. Resolution of Regulatory Effectiveness Review Team Comments

During the Regulatory Effectiveness Review (RER) of the licensee's facility in April 1986, the RER team had occasion to study portions of the licensee's Updated Final Safety Analysis Report (UFSAR) and drawings and to discuss issues with operations personnel. Several apparent discrepancies were noted at that time. The inspector brought these discrepancies to the licensee's attention. The licensee has responded to each of these items with the following resolutions.

a. Concern: The "Single Line Diagram Station Connections", drawing E-1, Revision 6, incorrectly shows MCC1B43 as being located at elevation 812 feet of the reactor building. It is really at elevation 757 feet.

Response: This has since been corrected. Revision 8 of this document shows the correct location of MCC1B43.

b. Concern: "Single Line Meter and Relay Diagram 125 VDC System", drawing E-27, Revision 7, lists batteries 1D1 and 1D2 as "498AH, 8 HR. RATE". The Updated Final Safety Analysis Report (UFSAR) states that the batteries have only four hour capacity, and this is also what site personnel said.

Response: The 125 VDC batteries are designed to provide emergency power for four hours. UFSAR 8.3.2.1.2 and licensee training materials state that the batteries are sized to supply emergency DC power for four hours. No statement about battery capacity is made in the UFSAR. The 125 VDC batteries are, however, designated by their manufacturer as 498 amp-hour, eight hour discharge rate. Drawing E-27 is therefore correct and not in conflict with the UFSAR.

c. Concern: "Single Line Meter and Relay Diagram 250 VDC and 24 VDC Systems", drawing E-28, Revision 4, lists battery 1D4 as "664AH, 8 HR. RATE". The UFSAR states this battery has only four hour capacity. Site personnel said there is no time specification on this battery.

Response: The 250 VDC batteries are designed to provide emergency power for four hours. UFSAR 8.3.2.1.2 and licensee training materials state that these batteries are sized to supply emergency power for four hours. No statement about battery capacity is made in the UFSAR. The 250 VDC batteries are, however, designated by their manufacturer as 664 amp-hour, eight hour discharge rate. Drawing E-28 is therefore correct and not in conflict with the UFSAR. The misinformation by site personnel cannot be fully addressed, as the position and required training of the personnel involved was not stated.

d. Concern: An Operational Shift Supervisor (OSS) informed the RER team that 120 VAC Instrumentation Power panel 1Y23, the Uninterruptable Power Supply (UPS) panel, was more essential to safe shutdown than instrumentation power panels 1Y11 and 1Y21. The UFSAR says that UPS loads are "not essential to plant safety" but are loads "for which power interruption should be avoided". This might indicate a weakness in training.

Response: The UPS panel provides power for feedwater regulation valves, the plant paging system, and the NRC ENS and control room telephones. The two instrument AC panels provide power to the Reactor Water Cleanup pumps, Off-Gas discharge valve (which will

close on loss of power), and the Recirculation Pump speed control (the scoop tube will lock up "as is" on loss of power). Many of the loads are separated among the two Instrument AC panels to provide for greater redundancy. Neither system is designated as safety-related.

The statement of the OSS was reviewed by the Training and Operations Departments, and both concurred with his assessment. Loss of the UPS would incur feedwater control problems and severely hamper control room communication. Loss of either or, in an extreme case, both Instrument AC panels would not as severely hamper the control room staff during an event requiring reaching a safe shutdown condition. Review of the UFSAR found that it neither states nor implies loss of either or both Instrument AC panels would be a greater burden than loss of the UPS panel when trying to achieve safe shutdown. Therefore, the OSS was correct, and no training weakness is indicated.

e. Concern: An OSS stated that a diesel generator fuel oil day tank contained about 850 gallons of fuel which would last eight hours. The UFSAR says the tanks are 1,000 gallon capacity and will last four hours each.

Response: Each diesel fuel day tank has a nominal capacity of 1,000 gallons. However, day tank level switches are set to turn off the diesel fuel transfer pumps at greater than or equal to 850 gallons day tank level. This volume provides for slightly under four hours of full load run consumption at the rate of 3.8 gal/min noted in UFSAR 9.5.4.2. The OSS was correct about the 850 gallon level, but incorrect about the diesel full run time. The Training Department has reviewed the training given on this subject and found it to be correct. They do not believe any change in training is warranted.

No problems or concerns were identified.

11. Generic Letter Followup

For the Generic Letter listed below the inspector verified that the Generic Letter was received by licensee management and reviewed for its applicability to the facility.

a. (Closed) Generic Letter 85-03: Clarification of Equivalent Control Capacity for Standby Liquid Control Systems. This Generic Letter was sent for information only. The licensee had addressed the subject of this Generic Letter previously during review of Anticipated Transients Without Scram (ATWS) events and concluded their facility does meet equivalent control capacity requirements.

12. TMI Action Items

a. (Open) TMI Action Items (I.C.1.2.B and I.C.1.3.B) Short-Term Accident and Procedures Review. These items remain open pending

completion of the NRC's review of the licensee's Procedures Generation Package (PGP) and subsequent inspector review of the procedures written under this package. Review of the PGP by the Office of Nuclear Reactor Regulation (NRR) is expected to be completed by January 31, 1987.

b. (Open) TMI Action Item (II.K.3.57) Manual Actuation of the Automatic Depressurization System. Implementation of this item is to be consistent with Item I.C.1 and inspector review will take place coincident with review of Item I.C.1.

13. Survey of Licensee's Response to Selected Safety Issues

An inspection of selected safety issues was requested to determine what actions the licensee is taking to address these issues and to determine whether the NRC should take additional action on these issues.

a. Reliability of High Pressure Coolant Injection (HPCI)/Reactor Core Isolation Cooling (RCIC)

The inspector reviewed the licensee's response to the following items:

(1) Are HPCI and RCIC systems tested for operational readiness by cold, quick-start testing at appropriate intervals and after specified types of maintenance?

Although the licensee does not presently test the HPCI and RCIC systems using cold, quick starts, a modification is scheduled for the Spring 1987 refueling outage which would permit use of cold, quick-start testing.

The procedure governing cold quick-start testing was issued by General Electric Corporation (GE) in GE Service Information Letter (SIL) 336. Discussions between the industry expert on GE SIL 336, licensee personnel, and others determined that the testing method in use at DAEC for the HPCI and RCIC systems meets the intent of GE SIL 336 and demonstrates satisfactory system operability.

(2) Is a documented, comprehensive preventive maintenance program carried out for HPCI and RCIC systems, including records kept of maintenance and surveillance activities, and are records of these activities used for scheduling and trend analysis?

The licensee does have a preventive maintenance program as described above. A HPCI/RCIC task force has been formed which reviews maintenance and surveillance activities and is involved in scheduling and trend analysis. When the task force completes their review of these systems, the licensee has designated a systems engineer to take over the activities of the task force.

(3) Is a formal program for review of vendor service information for plant-specific applicability established?

The licensee does have a program for review of vendor service information and the HPCI/RCIC task force specifically looks at vendor information for these two systems.

(4) Are the trip and isolation signals tested and calibrated as often as initiation signals?

The licensee tests isolation and initiation signals at the same frequency. Some protective trip signals, however, are not tested as frequently.

(5) Are HPCI and RCIC rooms inspected every shift, and are the humidity and temperature monitored and controlled?

The HPCI and RCIC rooms are inspected every shift as part of operator rounds. The humidity and temperature are monitored and controlled for equipment protection. A design change is planned to change the source of water to the room coolers from emergency service water to a continuous water source. This will help to prevent the rooms from heating up when the systems are not running. There are also plans to relocate some electronic hardware on the turbines to more environmentally suitable locations.

(6) Have monitoring of HPCI and RCIC systems performance and maintenance, vendor operating experience recommendations, and problems at other plants been assigned to a qualified engineer?

These activities are performed by the HPCI/RCIC task force and will be taken over by a qualified systems engineer when the task force completes their review.

(7) Is management review of systems performance, including tracking of implementation of remedial measures and effectiveness of those measures, being performed on a routine basis?

Management review of systems performance, normally accomplished by the Deviation Report review process, has been intensified for the HPCI and RCIC systems since the formation of the HPCI/RCIC task force.

(8) Are any of the following NUREG-0737 (TMI) items not closed?

(a) II.K.3.13
(b) II.K.3.15
(c) II.K.3.22
(d) II.K.3.24

All of these NUREG-0737 items have been closed.

b. Biofouling of Cooling Water Heat Exchangers

The inspector reviewed the licensee's response to the following items:

(1) Is instrumentation available on safety-related equipment cooled by open-cycle service water systems for monitoring changes in flow and determining degradation of heat exchanger performance?

Instrumentation is available on safety-related equipment cooled by open-cycle service water systems for monitoring of these types of problems.

(2) Are instrument readings on safety-related equipment cooled by open-cycle service water systems recorded and reviewed against design parameters (e.g. flow, delta p) on a routine basis?

Because the licensee does not have evidence of biofouling problems, they do not currently record instrument readings for review against design parameters on a routine basis.

(3) Do procedures and training address operator actions if significant heat exchanger performance degradation resulting from fouling is detected?

Procedures and training do address monitoring of heat exchanger performance in general and operator actions if problems arise. However, no changes to procedures or training have been made as a result of the biofouling issue.

(4) Are periodic inspections performed to detect fouling in service water and fire protection systems?

Periodic flush tests are run on fire protection systems and service water heat exchangers are inspected during outages.

No problems or concerns were identified.

14. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) throughout the inspection period and at the conclusion of the inspection on July 14, 1986, and summarized the scope and findings of the inspection activities. The inspector also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspector. The licensee did not identify any such documents or processes as proprietary.