

September 1, 2000

Mr. David Wilson
Vice President, Nuclear
IES Utilities, Inc.
Alliant Tower
200 First Street SE
P. O. Box 351
Cedar Rapids, IA 52406-0351

SUBJECT: DUANE ARNOLD INSPECTION REPORT 50-331-00-06(DRP)

Dear Mr. Wilson:

On August 16, 2000, the NRC completed an inspection at your Duane Arnold Energy Center facility. The enclosed report presents the results of that inspection. The results of this inspection were discussed on August 17, 2000, with Mr. R. Anderson and other members of your staff.

This inspection was an examination of activities conducted under your license as they relate to reactor safety, verification of performance indicators, event followup, and compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations of activities, and interviews with personnel. No significant findings were identified.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available **electronically** for public inspection in the NRC Public Document Room **or** from the *Publicly Available Records (PARS) component of NRC's document system (ADAMS)*. *ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/NRC/ADAMS/index.html>* (the Public Electronic Reading Room).

Sincerely,

/RA/

Christine A. Lipa, Acting Chief
Reactor Projects Branch 2

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

Enclosure: Inspection Report 50-331-00-06(DRP)

See Attached Distribution

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D. Wilson

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cc w/encl: E. Protsch, Executive Vice President -
Energy Delivery, Alliant;
President, IES Utilities, Inc.
Richard L. Anderson, Plant Manager
K. Peveler, Manager, Regulatory Performance
State Liaison Officer
Chairperson, Iowa Utilities Board
The Honorable Charles W. Larson, Jr.
Iowa State Representative

ADAMS Distribution:

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SRI Duane Arnold

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report No: 50-331-00-06(DRP)

Licensee: Alliant, IES Utilities Inc.
200 First Street S. E.
P. O. Box 351
Cedar Rapids, IA 52406-0351

Facility: Duane Arnold Energy Center

Location: Palo, Iowa

Dates: July 6 through August 16, 2000

Inspectors: P. Prescott, Senior Resident Inspector
M. Kurth, Resident Inspector

Approved by: Christine A. Lipa, Acting Chief
Reactor Projects Branch 2
Division of Reactor Projects

NRC's REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) recently revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting and assessing safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

Reactor Safety

- Initiating Events
- Mitigating Systems
- Barrier Integrity
- Emergency Preparedness

Radiation Safety

- Occupational
- Public

Safeguards

- Physical Protection

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE findings indicate issues that are of low to moderate safety significance. YELLOW findings are issues that are of substantial safety significance. RED findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. And RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.

More information can be found at: <http://www.nrc.gov/NRR/OVERSIGHT/index.html>.

SUMMARY OF FINDINGS

Duane Arnold Energy Center
NRC Inspection Report 50-331/00-06(DRP)

IR 05000331-00-06(DRP), on 7/6-8/16/2000; IES Utilities, Inc; Duane Arnold Energy Center, Unit 1, Resident Operations Report

The report covers a 6-week period of resident inspection.

No findings were identified in any cornerstones.

Report Details

Summary of Plant Status: The plant operated at or near full power for the entire inspection period. On July 29, 2000, operators commenced a downpower to 55 percent for a control rod sequence exchange and main turbine valve testing. Operators completed a return to full power on July 30. The plant was operated at or near full power for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R04 Equipment Alignment

.1 Complete Walkdown: "A" and "B" Emergency Diesel Generator Systems

a. Inspection Scope

The inspectors performed a complete walkdown of accessible portions of the "A" and "B" emergency diesel generator systems to verify system operability. The inspectors verified the correct valve position of all valves in the primary system flowpath using the system piping and instrumentation drawings (P&IDs), system mechanical checklist, and verified breaker alignments using the system electrical checklist. The inspectors observed instrumentation valve configurations and appropriate meter indications. The inspectors verified lubrication and cooling of major components by direct observation of the components. The inspectors observed proper installation of hangers and supports during the walkdown and verified operational status of support systems by direct observation of various parameters. Control room switch positions for the system were observed. The inspectors also evaluated other conditions such as the adequacy of housekeeping, the absence of ignition sources, and proper component labeling. The walkdowns were performed following a surveillance test to ensure the system was properly restored to standby readiness. The inspectors reviewed outstanding maintenance work requests and outstanding design issues to verify the systems would perform its functions.

The following documents were reviewed and used to conduct the system walkdown:

- P&ID M-113, "Residual Heat Removal Service Water Systems and Emergency Service Water Systems," Revision 54
- P&ID M-132(1), "Diesel Generator Systems," Revision 8
- P&ID M-132(2), "1G031 Standby Diesel Generator," Revision 9
- P&ID M-132(3), "1G021 Standby Diesel Generator," Revision 10
- Operating Instruction 324, "Standby Diesel Generator System," Revision 47
- Abnormal Operating Procedure (AOP) 301, "Loss of Essential Electrical Power," Revision 26

- AOP 301.1, "Station Blackout," Revision 16
- Vendor manual, "Standby Emergency Diesel Generator Unit - Colt Industries"

b. Findings

There were no findings identified.

.2 Partial Walkdown: "B" Emergency Service Water System

a. Inspection Scope

The inspectors performed a partial walkdown of accessible portions of the "B" emergency service water system to verify system operability. The inspectors verified the correct valve position of all the valves in the primary system flowpath using the system piping and instrumentation drawings (P&IDs), system mechanical checklist, and verified breaker alignments using the system electrical checklist. The inspectors observed instrumentation valve configurations and appropriate meter indications. The inspectors verified lubrication and cooling of major components by direct observation of the components. The inspectors observed proper installation of hangers and supports during the walkdown and verified operational status of support systems by direct observation of various parameters. Control room switch positions for the system were observed. The inspectors also evaluated other conditions such as adequacy of housekeeping, the absence of ignition sources, and proper component labeling. The walkdowns were performed while maintenance was being performed on systems supported by the other train of emergency service water.

The following documents were reviewed and used to conduct the system walkdown:

- P&ID: BECH-M113 and BECH-M117
- Procedure checklists: Operating Instruction 454, Revision 34

b. Findings

There were no findings identified.

1R05 Fire Protection

a. Inspection Scope

The inspectors walked down the following risk significant areas looking for any fire protection degraded conditions. The inspectors reviewed open fire protection impairment requests to prioritize the plant area fire plan (AFP) zones inspected and conducted discussions with the fire protection program engineer. The inspectors placed emphasis on control of transient combustibles and ignition sources; area material condition; operational lineup, and operational effectiveness of the fire protection systems, equipment, and features; and the material condition and operational status of fire barriers used to prevent fire damage or fire propagation.

In particular, the inspectors verified that all observed transient combustibles were being controlled in accordance with the licensee's administrative control procedures. In addition, the inspectors observed the physical condition of fire detection devices, such as overhead sprinklers, and verified that any observed deficiencies did not impact the operational effectiveness of the system. The inspectors also observed the physical condition of portable fire fighting equipment, such as portable fire extinguishers. The inspectors verified the equipment was located appropriately and that access to the extinguishers was unobstructed. The inspectors verified that fire hoses were installed at their designated locations and the physical condition of the hoses was satisfactory and access unobstructed. The inspectors observed and verified the physical condition of passive fire protection features such as fire doors, ventilation system fire dampers, fire barriers, and fire zone penetration seals and verified the items were properly installed and in good physical condition. The areas inspected were:

- Emergency diesel generator rooms and diesel fuel oil day tank rooms using Fire Plan Volume II, "Fire Brigade Organization," AFP-20, Revision 22
- Essential switchgear rooms 1A-3 and 1A-4 using Fire Plan Volume II, "Fire Brigade Organization," AFP-24, Revision 22
- Battery rooms 1D-1, 1D-2, and 1D-4 using Fire Plan Volume II, "Fire Brigade Organization," AFP-23, Revision 22
- Reactor building standby gas treatment system and motor-generator set rooms using Fire Plan Volume II, "Fire Brigade Organization," AFP-8, Revision 22

b. Findings

There were no findings identified.

1R12 Maintenance Rule Implementation

a. Inspection Scope

The inspectors reviewed the licensee's implementation of the maintenance rule requirements for the systems or components listed below. Documentation reviewed in performance of the inspection is also listed below. The systems or components were selected based upon recent performance problems and the risk significance classification of the systems in the maintenance rule program. The inspectors independently verified the licensee's implementation of the maintenance rule for these systems by verifying that these systems were properly scoped within the maintenance rule in accordance with 10 CFR 50.65; that all failed structures, systems, or components (SSCs) were properly categorized and classified as (a)(1) or (a)(2) in accordance with 10 CFR 50.65; the appropriateness of performance criteria for SSCs classified as (a)(2); and the appropriateness of goals and corrective actions for SSCs classified as (a)(1). The inspectors also verified that identified issues were identified at an appropriate threshold and entered in the corrective action program.

- Secondary containment

- “A” and “B” control building chillers
- Fire pumps
- Reactor core isolation cooling system

The following documentation was also reviewed:

- Duane Arnold Energy Center (DAEC) Performance Criteria Document, “Secondary Containment/Standby Gas Treatment,” Revision 1
- DAEC Performance Criteria Document, “Control Building Heating Ventilation and Air-Conditioning System,” Revision 4
- DAEC Performance Criteria Document, “Fire Protection,” Revision 0
- DAEC Performance Criteria Document, “Reactor Core Isolation Cooling System (RCIC),” Revision 2

b. Findings

There were no findings identified.

1R13 Maintenance Risk Assessment and Emergent Work Evaluation

a. Inspection Scope

The inspectors reviewed the licensee’s evaluation of plant risk, scheduling, configuration control, and performance of planned maintenance and emergent work activities. Emergent work activities reviewed were the valve stem replacement for the “A” core spray motor cooling water isolation valve V13-0059. The inspectors reviewed the risk assessment of scheduled maintenance activities associated with work week 31 on the “A” river water system, 1K09 instrument air compressor and emergent work on the 161 KV West offsite line. Also, the inspectors reviewed the risk assessment of scheduled maintenance activities associated with week 33 on the 161 KV East offsite line. The inspectors verified that scheduled and emergent work activities were adequately managed. In particular, the inspectors reviewed the licensee’s program for conducting maintenance risk safety assessments and verified the licensee’s planning, risk management tools, and the assessment and management of online risk. The inspectors also verified those licensee actions to address increased online risk during these periods, such as establishing compensatory actions, minimizing the duration of the activity, obtaining appropriate management approval, and informing appropriate plant staff, were accomplished when online risk was increased due to maintenance on risk-significant SSCs. The inspectors observed portions of the maintenance activities to ensure proper management oversight and return to service of the SSCs in a timely manner.

b. Findings

There were no findings identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the technical adequacy of operability evaluations to ensure that the system operability was properly justified and the system remained available, such that no unrecognized increase in risk occurred. The inspectors reviewed the following operability evaluations:

- Action Request (AR) 10946, "Switchgear and Battery Rooms Low Air Flow"
- AR 20520, "Post Scram Pressure/Temperature Curve Violation"
- AR 21293, "Potential Overloading of the Startup Transformer"

b. Findings

There were no findings identified.

1R16 Operator Workarounds (OWAs)

.1 Routine Operator Workarounds Review

a. Inspection Scope

The inspectors reviewed operator workarounds to identify any potential effect on the function of mitigating systems, or the operators' ability to respond to an event and implement abnormal and emergency operating procedures.

The inspectors reviewed the following OWAs during the inspection period:

- AR 13486, "Possible Modifications to Create DP [Differential Pressure] Across the LPCI [Low Pressure Coolant Injection] Inject Check Valves"
- AR 14069, "Track Completion of Corrective Maintenance Action Request (CMAR) A39181 to Repair MO-1909, RHR [Residual Heat Removal] Shutdown Cooling"

b. Findings

There were no findings identified.

.2 Semi-Annual Cumulative Effect Review of Operator Workarounds

a. Inspection Scope

The inspectors performed a review of OWAs for the potential cumulative effect on the ability of operators to respond in a correct and timely manner to plant transients. Also, considered in this review were items on the licensee's longstanding equipment issues, degraded instrumentation, and long-term tagout lists.

b. Findings

There were no findings identified.

1R19 Post-Maintenance Testing

a. Inspection Scope

The inspectors observed the post-maintenance tests and reviewed test data for the following activities:

- Preventive Work Orders 1113301, 1113383, and 1113302: Inspectors reviewed post-maintenance testing activities. Routine preventive maintenance inspections were performed on several valve motor operators and associated breakers for the "A" core spray system. Post-maintenance testing verified that motor operated "A" core spray valves stroked within specified time intervals.
- Corrective Work Order (CWO) A51397 (including associated troubleshooting instruction forms (TIFs)): Troubleshoot and repair "D" well water variable speed motor controller.
- CWO A51055: Disassemble, inspect, clean, and adjust IV-CH-IA cooling water discharge temperature control valve for the "A" control building chiller.

The inspectors verified that the post maintenance tests observed demonstrated the systems and components were capable of performing its intended safety function. Also, the inspectors reviewed the applicable sections of Technical Specifications (TS) requirements and the Update Final Safety Analysis Report (UFSAR), and the following plant procedure:

- Operating Instruction 408, "Well Water System," Revision 47

b. Findings

There were no findings identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors observed surveillance testing on risk-significant equipment and verified that the SSCs selected were capable of performing their intended safety function. The inspectors verified that the surveillance tests satisfied the requirements contained in TS, the UFSAR, and licensee procedures. During surveillance testing observations, the inspectors verified that the test was adequate to demonstrate operational readiness consistent with the design and licensing basis documents, and that the testing acceptance criteria were clear. The inspectors also verified that the impact of the testing had been properly characterized during the pre-job briefing; the test was performed as written and all testing prerequisites were satisfied; and that the test data was complete, appropriately verified, and met the requirements of the testing procedure. Following the completion of the test, the inspectors verified that the test equipment was removed and that the equipment was returned to a condition in which it could perform its safety function.

The following surveillance testing activities were observed:

- Equipment Monitoring Procedure 1E053-HT, "Emergency Diesel Generator 1E-53A & B Coolers Heat Transfer Test," Revision 5, which was performed concurrently with Surveillance Test Procedure (STP) 3.8.1-05, "Standby Diesel Generators Operability Test (Slow Start From Emergency Start Air)," Revision 4
- STP 3.3.5.1-03, "Functional Test of Low Pressure Coolant Injection System Loop Select - Reactor Vessel Water Level Low-Low Instrumentation," Revision 3
- STP 3.1.7-01, "SBLC [Standby Liquid Control] Pump Operability Test," Revision 3
- STP NS490003, "RHR System Leakage Inspection Walkdown," Revision 2 concurrently with STP 3.5.1-02, "LPCI System Operability Tests," Revision 7

b. Findings

There were no findings identified.

R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the following temporary modification package, safety evaluation, and installation work order associated with the integrity of secondary containment. The inspectors attended the pre-job brief for installation of the temporary modification. The temporary modification was discussed with the system engineer.

- Temporary Modification Permit 00-025, "Repair to SBGT [Standby Gas Treatment] Sump Drain Line"
- Temporary Modification Permit 00-037, "Recorder Monitoring Equipment on the Output of the 1D4 250VDC Battery Charging System"

Documents reviewed during the inspection included:

- CWO A49728, "4" Diameter Outlet Pipe From SBGT Sump Sheared Off at 40 Degree Elbow"
- CWO A50805, "Temp Mod Installed for Temp Repair. This WO Initiated for Permanent Repair"
- UFSAR Section 6.5.3
- CWO A46346, "Installing Monitoring Equipment on 1D4 250VDC Battery Charging System"

b. Findings

There were no findings identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification

Cornerstone: Mitigating Systems

Safety System Unavailability, Emergency AC Power System, Emergency Diesel Generators

a. Inspection Scope

The inspectors verified the emergency AC power system performance indicator data reported by the licensee for the first quarter of the year 2000. This was accomplished through review of control room operator logs, action request system work order history, and the "DAEC 1st Quarter 2000 NRC PI Summary" document. The inspectors also held discussions with the system engineer.

b. Findings

There were no findings identified.

4OA6 Management Meetings

Exit Meeting Summary

The inspectors presented the inspection results to Mr. R. Anderson and other members of licensee management at the conclusion of the inspection on August 17, 2000. The licensee acknowledged the findings presented. The inspectors asked the licensee

whether any materials examined during the inspection should be considered proprietary.
No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

R. Anderson, Plant Manager
J. Bjorseth, Maintenance Superintendent
D. Curtland, Operations Manager
R. Hite, Manager, Radiation Protection
M. McDermott, Manager, Engineering
K. Peveler, Manager, Regulatory Performance
G. Van Middlesworth, Site General Manager
D. Wilson, Vice President Nuclear

LIST OF ACRONYMS USED

AFP	Area Fire Plan
AOP	Abnormal Operating Procedure
AR	Action Request
CFR	Code of Federal Regulations
CMAR	Corrective Maintenance Action Request
CWO	Corrective Work Order
DAEC	Duane Arnold Energy Center
DRP	Division of Reactor Projects
IR	Inspection report
LPCI	Low Pressure Coolant Injection
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
OWA	Operator Workaround
P&ID	Piping and Instrumentation Drawing
RCIC	Reactor Core Isolation Cooling
RHR	Residual heat removal
SBGT	Standby gas treatment
SSC	Structure, System, or Component
STP	Surveillance Test Procedure
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report

LIST OF BASELINE INSPECTIONS PERFORMED

The following inspectable-area procedures were used to perform inspections during the report period. Documented findings are contained in the body of the report.

<u>Inspection Procedure</u>		
<u>Number</u>	<u>Title</u>	<u>Report Section</u>
71111-04	Equipment Alignment	1R04
71111-05	Fire Protection	1R05
71111-12	Maintenance Rule Implementation	1R12
71111-13	Maintenance Risk Assessment and Emergent Work Evaluation	1R13
71111-15	Operability Evaluations	1R15
71111-16	Operator Workarounds	1R16
71111-19	Post Maintenance Testing	1R19
71111-22	Surveillance Testing	1R22
71111-23	Temporary Plant Modifications	1R23
71151	Performance Indicator Verification	40A1