February 20, 2001

Mr. Gary Van Middlesworth
Site General Manager
Duane Arnold Energy Center
Nuclear Management Company, LLC
3277 DAEC Road
Palo, IA 52324

SUBJECT: DUANE ARNOLD INSPECTION REPORT 50-331/00-15(DRP)

Dear Mr. Van Middlesworth:

On February 4, 2001, the NRC completed an inspection at your Duane Arnold Energy Center facility. The enclosed report documents the inspection findings which were discussed on February 5, 2001, with Mr. R. Anderson and other members of your staff.

This inspection examined activities conducted under your license as they relate to reactor safety and compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

No findings of significance 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/

Bruce Burgess, Chief
Reactor Projects Branch 2

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

Enclosure: Inspection Report 50-331/00-15(DRP)

See Attached Distribution

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

Docket No:	50-331
License No:	DPR-49
Report No:	50-331/00-15(DRP)
Licensee:	Alliant, IES Utilities Inc.
Facility:	Duane Arnold Energy Center
Location:	3277 DAEC Road Palo, Iowa 52324-9785
Dates:	December 25, 2000 through February 4, 2001
Inspectors:	P. Prescott, Senior Resident Inspector M. Kurth, Resident Inspector
Approved by:	Bruce Burgess, 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	Radiation Safety	Safeguards
● Initiating Events	● Occupational	● Physical Protection
● Mitigating Systems	● Public	
● Barrier Integrity		
● Emergency Preparedness		

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

IR 050-331/00-15, on 12/25/00-02/04/2001; IES Utilities, Inc, Duane Arnold Energy Center, Unit 1. Equipment alignment, fire protection, licensed operator requalification, maintenance rule implementation, maintenance risk assessment, operability evaluations, operator workarounds, post maintenance testing, surveillance testing, temporary plant modifications, emergency action level and emergency plan changes, and performance indicator verification.

The inspection was conducted by resident inspectors. The report covers a 6-week period.

No findings were identified in any cornerstones.

Report Details

Summary of Plant Status: The licensee operated the plant at or near full power at the beginning of the inspection period. On January 12, 2001, at 9:12 p.m., operators initiated a controlled power reduction in order to perform a control rod sequence exchange, enter single loop operation, and remove the "B" recirculation motor-generator set from service to replace the generator and exciter brushes. Minimum reactor power that was reached while in single loop operation was approximately 35 percent power. The "B" recirculation motor-generator was re-started on January 13, at 4:01 p.m., after brush replacement was completed. Operators subsequently commenced a return to full power. During this time, main steam isolation valve and main turbine valve testing was performed. Full power was achieved on January 15, at 4:06 a.m. The plant was essentially at 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: High pressure coolant injection (HPCI) system

a. Inspection Scope

The inspectors performed a complete walkdown of accessible portions of the HPCI system to verify system operability. Items included in the inspectors' walkdown included the following: verification of the correct valve position of all the valves in the primary system flowpath using the system piping and instrumentation drawings (P&IDs) and system mechanical checklist; verification of breaker alignments using the system electrical checklist; observation of instrumentation valve configurations and appropriate meter indications; verification of lubrication and cooling of major components by direct observation of the components; observation of proper installation of hangers and supports during the walkdown; and verification of 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 inspectors reviewed outstanding design issues to verify the system would perform its functions.

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

- P&ID M-122, "High Pressure Coolant Injection Steam Side," Revision 52
- P&ID M-123, "High Pressure Coolant Injection Water Side," Revision 38
- Operating Instruction 152, "High Pressure Coolant Injection System," Revision 46
- Updated Final Safety Analysis Report (UFSAR) 6.3, "Emergency Cooling Systems," Revision 13
- Vendor manual, "HPCI Turbine - Terry Steam Turbine Company"

b. Findings

There were no findings identified.

.2 Partial Walkdowns

a. Inspection Scope

The inspectors performed a partial walkdown of accessible portions of the following systems listed below to verify system operability. Items included in the inspectors' walkdown included the following: verification of the correct valve position of all the valves in the primary system flowpath using the system piping and instrumentation drawings (P&IDs) and system mechanical checklist; verification of breaker alignments using the system electrical checklist; observation of instrumentation valve configurations and appropriate meter indications; verification of lubrication and cooling of major components by direct observation of the components; observation of proper installation of hangers and supports during the walkdown; and verification of 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 the corresponding train or following a surveillance test to ensure the system was properly restored to standby readiness. The following systems were selected for a walkdown:

- "A" emergency diesel generator

- "A" emergency service water (ESW) system

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

- P&ID M-132, "Diesel Generator Systems," Revision 8
- P&ID M-146, "Service Water Systems Pumphouse," Revision 63
- Procedure Checklist: Operating Instruction (OI) 324A10, "SBDG Standby/Readiness Condition Checklist," Revision 1
- Procedure Checklist: OI 454, "'A' ESW System Valve Lineup," Revision 1

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. During the

walkdowns, emphasis was placed on the following items: 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. Included in the inspectors' observations were the following items: the physical condition of portable fire fighting equipment, such as fire extinguishers, to verify that the equipment was located appropriately and that access to the extinguishers was unobstructed; the verification that fire hoses were installed at their designated locations and the physical condition of the hoses was satisfactory and access unobstructed; and the verification of the physical condition of passive fire protection features such as fire doors, ventilation system fire dampers, fire barriers, and fire zone penetration seals to ensure that the items were properly installed and in good physical condition. The areas inspected were:

- South hydraulic control units module area, off-gas combiner room, and railroad airlock, using Fire Plan Volume II, "Fire Brigade Organization," AFP-5, Revision 22

- Turbine building lower switchgear room, using Fire Plan Volume II, "Fire Brigade Organization," AFP-15, Revision 22

- North turbine building - feedwater regulator valves and cardox system, using Fire Plan Volume II, "Fire Brigade Organization," AFP-18, Revision 22

b. Findings

There were no findings identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

The inspectors observed simulator training on January 31, 2001. The scenario observed included a seismic event, partial loss of the reactor protection system power supply, reactor recirculation pump runaway, fuel damage, loss of the emergency diesel generators, and a breach in primary containment. The inspectors observed communications, procedure adherence, implementation of emergency operating procedures, event classification (although the classifications were not included as part of performance indicator data for this scenario), and reporting actions.

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 issues were identified at an appropriate threshold and entered in the corrective action program. The following systems were reviewed:

- General service water system
- Residual heat removal service water system
- Standby liquid control system

The following documentation was also reviewed:

- Duane Arnold Energy Center (DAEC) Performance Criteria Document, "General Service Water," Revision 1
- DAEC Performance Criteria Document, "Residual Heat Removal Service Water," Revision 3
- DAEC Performance Criteria Document, "Standby Liquid Control (SBLC)," Revision 1

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, performance of planned maintenance and emergent work activities, and the risk assessment of scheduled maintenance activities associated with work week 2 for operating in single loop operations to replace the brushes on the "B" recirculation pump motor-generator and exciter. Also reviewed were activities associated with work week 5 on the "A" standby diesel generator and "A" emergency service water system. The

inspectors verified that scheduled and emergent work activities were adequately managed. This included observation of the licensee's program for conducting maintenance risk safety assessments and verification of 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. Finally, portions of the maintenance activities were observed 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 following operability evaluations were reviewed:

- Action Request (AR) 23590, "Design Adequacy of Torus Vent and Purge Containment Isolation Valves"

- AR 12126, "Further Analysis of Several Valves in the Air Operated Valve Program"

b. Findings

There were no findings identified.

1R16 Operator Workarounds (OWAs)

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 following OWAs were reviewed during the inspection period:

- AR 22375, "Track Refurbishment of the Four Safety-Related Breakers that have been Identified with Rubbing Between the Lower Links"

- AR 23477, “Place Spurious (125 VDC) Signal Suppression Devices in Affected Annunciator Panels”

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:

- Corrective Work Order A53378, “Inspect and Adjust as needed the Trip Arm Screw and Linkage in Compliance for Reactor Protection Trip Breaker 1A602"

- Preventive Work Order (PWO) 1115329, “Calibrate the “A” Standby Gas Treatment System Flow Controller”

- PWO 1115599, “Disassemble and Inspect Vertical Drive Coupling. Replace Wear Plates” (“B” emergency diesel generator)

The inspectors verified that the post-maintenance tests observed demonstrated that the systems and components were capable of performing their intended safety function. Included in the review were the applicable sections of Technical Specifications (TS) requirements, the UFSAR, and the following plant procedures:

- TS 3.6.4.3, “Standby Gas Treatment System”
- TS 5.5.7, “Ventilation Filter Testing Program”
- UFSAR Section 6.5.3.3, “Standby Gas Treatment System”
- UFSAR Section 8.3.1, “AC Power Systems”
- DAEC System Description SD-324, “Standby Diesel Generator System”

Following the completion of the tests, 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.

b. Findings

There were no findings identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors observed surveillance testing on risk-significant equipment, verified that the SSCs selected were capable of performing their intended safety function and verified that the surveillance tests satisfied the requirements contained in TS, the

UFSAR, and licensee procedures. During surveillance testing observations, the inspectors verified the following items: the test was adequate to demonstrate operational readiness consistent with the design and licensing basis documents; the testing acceptance criteria were clear; .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:

- Surveillance Test Procedure (STP) 3.5.1-01, "'B' Core Spray System Operability Test," Revision 7
- STP 3.4.1-02, "Single Loop Operation," Revision 4
- STP 3.8.1-04, "Standby Diesel Generators Operability Test (Slow Start From Normal Start Air)," Revision 9

b. Findings

There were no findings identified.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the following temporary modification package, safety evaluation, and installation work order associated with the offgas system. The inspectors verified revisions made to drawings and procedures and the installation of the temporary modification. The temporary modification was discussed with the system engineer.

Documents reviewed during the inspection included:

- Temporary Modification Permit No. 01-01, "Bypass the Interlock Between CV1379, CV4126, and MO4151"
- Affected Drawing APED-N62-025-08
- OI 672, "Offgas and Recombiner System," Revision 55
- Abnormal Operating Procedure 672.1, "Loss of Offgas System," Revision 19

The licensee had not updated the P&ID drawings in the work control center after installing the temporary modification. The licensee took corrective action by updating the affected P&IDs. The safety significance was very low because it was determined to be an isolated administrative control issue.

b. Findings

There were no findings identified.

3. REACTOR SAFETY

Cornerstone: Emergency Preparedness

1EP4 Emergency Action Level and Emergency Plan Changes

a Inspection Scope

The inspector reviewed individually numbered revisions to each section and appendix of the licensee's Emergency Plan, which were submitted in September 2000, in order to determine whether they included changes that might decrease the emergency plan's effectiveness. The inspector also reviewed Revision 2 to Section EBD-A of the "Emergency Action Level (EAL) Technical Bases Document", which was submitted in November 2000, to determine whether it included changes that might decrease the licensee's capability to correctly classify an emergency event. The aforementioned revisions were submitted in accordance with 10 CFR 50.54(q).

b. Observations and Findings

There were no findings identified. Implementation of these changes will be subject to future inspection.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification

Cornerstone: Mitigating Systems

a. Inspection Scope

The inspectors reviewed control room operator logs, monthly operating reports, licensee event reports, and performance indicator data packages for the third quarter of the year 2000 for the safety system unavailability of reactor core isolation cooling system to verify that the performance indicator reported to the NRC was accurate. Appropriate licensee personnel responsible for data collection were interviewed.

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 on February 5, 2001. 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
W. Simmons, Maintenance Superintendent
D. Curtland, Operations Manager
R. Hite, Manager, Radiation Protection
J. Bjorseth, Manager, Engineering
K. Peveler, Manager, Regulatory Performance
G. Van Middlesworth, Site General Manager
D. Wilson, Vice President Nuclear

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

Discussed

None

LIST OF ACRONYMS USED

AFP	Area Fire Plan
AR	Action Request
CFR	Code of Federal Regulations
DAEC	Duane Arnold Energy Center
DRP	Division of Reactor Projects
ESW	Emergency Service Water
HPCI	High Pressure Coolant Injection
IR	Inspection Report
NRC	Nuclear Regulatory Commission
OI	Operating Instruction
OWA	Operator Workaround
P&IDs	Piping and Instrumentation Drawings
PWO	Preventive Maintenance Order
SSCs	Structure, System, or Components
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.

Inspection Procedure		
Number	Title	Report Section
71111-04	Equipment Alignment	1R04
71111-05	Fire Protection	1R05
71111-11	Licensed Operator Requalification	1R11
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
71114.04	Emergency Action Level and Emergency Plan Changes	1EP4
71151	Performance Indicator Verification	40A1
(none)	Meetings, Including Exit	4OA6