January 9, 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 50-331/00-14(DRP)

Dear Van Middlesworth:

On December 24, 2000, the NRC completed an inspection at your Duane Arnold Energy Center facility. The enclosed report documents the inspection findings which were discussed on December 21, 2000, 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,

Original signed by
Bruce Burgess, Chief

Bruce Burgess, Chief
Reactor Projects Branch 2

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

Enclosure: Inspection Report 50-331/00-14(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.
Iowa State Representative

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REGION III

Docket No:	50-331
License No:	DPR-49
Report No:	50-331/00-14(DRP)
Licensee:	Alliant, IES Utilities Inc.
Facility:	Duane Arnold Energy Center
Location:	3277 DAEC Road Palo, Iowa 52324-9785
Dates:	November 13 through December 24, 2000
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 050-331/00-14, on 11/13-12/24/2000; IES Utilities, Inc, Duane Arnold Energy Center, Unit 1. Equipment alignment, fire protection, heat sink performance, maintenance rule implementation, maintenance risk assessment, operability evaluations, operator workarounds, permanent plant modifications, post maintenance testing, surveillance testing, temporary plant modifications, 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.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R04 Equipment Alignment

a. Inspection Scope

The inspectors performed a partial walkdown of accessible portions of the systems listed below 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) and 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 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:

- 4160 Volt Essential Switchgear
- "A" and "B" Trains of the Residual Heat Removal Service Water System

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

- P&IDs: BECH-M119 and BECH-M120, "Residual Heat Removal System"
- Procedure Checklist: Operating Instruction (OI) 304.2, "4160/480V Essential Electrical Distribution," Revision 40
- Procedure Checklist: OI 149, "Residual Heat Removal System," Revision 70

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 inspection of plant area fire plan (AFP) zones 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 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:

- Reactor building south corner rooms, using Fire Plan Volume II, "Fire Brigade Organization," AFP-2, Revision 22

- Reactor building north control rod drive (CRD) module area, CRD repair and CRD cable rooms, using Fire Plan Volume II, "Fire Brigade Organization," AFP-4, Revision 23

- Reactor building residual heat removal valve room, using Fire Plan Volume II, "Fire Brigade Organization," AFP-6, Revision 22

b. Findings

There were no findings identified.

1R07 Heat Sink Performance

a. Inspection Scope

The inspectors reviewed and observed the surveillance tests of the residual heat removal heat exchangers IE201A and B that were performed in response to Generic Letter 89-13, "Service Water Problems Affecting Safety-Related Equipment." The inspectors reviewed the completed calculations that determined the heat exchangers'

performance. The inspectors discussed residual heat removal heat exchanger information with the project engineer responsible for the heat exchanger performance program.

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 inspectors selected systems or components 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. The inspectors reviewed the following systems:

- Emergency service water system
- Core spray system
- Fuel pool cooling and cleanup system

The inspectors also reviewed the following documentation:

- Duane Arnold Energy Center (DAEC) Performance Criteria Document, "Emergency Service Water System," Revision 1
- DAEC Performance Criteria Document, "Low Pressure Core Spray," Revision 0
- DAEC Performance Criteria Document, "Fuel Pool Cooling and Cleanup System" 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, and performance of planned maintenance and emergent work activities. The inspectors reviewed the risk assessment of scheduled maintenance activities associated with work week 46 on the "B" residual heat removal (RHR) system and RHR service water system, and work week 49 on the "B" reactor protection system motor-generator and "B" reactor water cleanup system, that included emergent work on the "A" control building chiller. Also, the inspectors reviewed work week 51 on the primary containment isolation nitrogen makeup valves. 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) 22796, "4160 VAC Breaker ['C' General Service Water Pump] Failure to Close"

- AR 23014, "MO2046 (RHR Heat Exchanger 1E-201A Service Water Outlet Isolation) Cycled Excessively During Startup of RHRSW [Residual Heat Removal Service Water]"

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 inspectors reviewed the following OWAs during the inspection period:

- AR 2203, "ECP [Engineering Change Package] 1605: Install Two Vent/Fill Valves for Residual Heat Removal Fuel Pool Cooling Suction Piping"
- AR 3549, "ECP 1560: Appendix R Fire Protection Not Met in Zone 3A"

b. Findings

There were no findings identified.

1R17 Permanent Plant Modifications

a. Inspection Scope

The inspectors reviewed Engineered Maintenance Action (EMA) A34631, associated with the modification to remove the "B" reactor water clean-up pump forced oil lubrication system. The inspectors reviewed the EMA documentation, including the supportive drawings, and appropriate sections of the Updated Final Safety Analysis Report (UFSAR). The inspectors reviewed the work order associated with the EMA. The inspectors reviewed pump test data following the modifications. The inspectors periodically observed the pump in proper operation during plant tours.

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 Orders (CWOs) A51513, "B" RHRSW Discharge Valve V46-0016, Inspect and Repack" and A51514, "B" RHRSW Strainer Bypass Isolation Valve V46-0017, Inspect and Repack"
- CWO A49596, "Replace Actuator Springs, Install Diagnostic Test Connections and Perform Baseline Air Operated Valve Diagnostic Test for CV-4311, Nitrogen Makeup to Drywell and Torus"

- CWO A49186, “Disassemble, Clean, and Inspect Control Building Chiller Control Valve 1956A to Emergency Service Water Isolation 1V-CH-1A”

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

- TS 3.7.5, “Control Building Chiller System”
- UFSAR Section 9.4.4, “Control Room Ventilation System”
- UFSAR Section 9.2.3.2.1, “Residual Heat Removal Service Water System”
- TS 3.7.1, “Residual Heat Removal Service Water System”
- OI 730, “Control Building HVAC System,” Revision 49

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 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:

- Surveillance Test Procedure (STP) 3.4.2-01, “Daily Jet Pump Operability Test,” Revision 5

- STP 3.5.3-01, “RCIC [Reactor Core Isolation Cooling] Operability Test,” Revision 7

- STP NS520002, “HPCI [High Pressure Coolant Injection] Response Time Correction Factor Verification,” Revision 0

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 integrity of secondary containment. The inspectors attended the pre-job brief for installation of the temporary modification. The inspectors discussed the temporary modification with the system engineer.

- Temporary Modification Permit 00-056, “Core Drill in Battery Corridor North Wall in Fire Zone 10A per ECP 1619 (Control Room HVAC Envelope)”

Documents reviewed during the inspection included:

- Modification Work Order 1115092, “Replace/Relocate/Install Detectors in Control Room, Control Building HVAC Area and Non-Essential Switchgear Rooms”

b. Findings

There were no findings identified.

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 from the first quarter of 1999 to the second quarter of year 2000 for the safety system functional failures data to verify that the performance indicator reported to the NRC was accurate. The inspectors also interviewed appropriate licensee personnel responsible for data collection.

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 December 21, 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
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

ACP	Administrative Control Procedure
AFP	Area Fire Plan
AR	Action Request
CFR	Code of Federal Regulations
CRD	Control Rod Drive
CWO	Corrective Work Order
DAEC	Duane Arnold Energy Center
DRP	Division of Reactor Projects
ECP	Engineering Change Package
EDG	Emergency Diesel Generator
EMA	Engineered Maintenance Action
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
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
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
71111-07	Heat Sink Performance	1R07
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
71111-17	Permanent Plant Modifications	1R17
71111-19	Post Maintenance Testing	1R19
71111-22	Surveillance Testing	1R22
71111-23	Temporary Plant Modifications	1R23
71151	Performance Indicator Verification	40A1
(none)	Meetings, Including Exit	4OA6