April 15, 2002

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

SUBJECT: DUANE ARNOLD ENERGY CENTER
NRC INSPECTION REPORT 50-331/02-03(DRP)

Dear Mr. Van Middlesworth:

On March 30, 2002, the NRC completed an inspection at your Duane Arnold Energy Center. The enclosed report documents the inspection findings which were discussed on April 2, 2002, 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. 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 L. Burgess

Bruce L. Burgess, Chief
Branch 2
Division of Reactor Projects

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

Enclosure: Inspection Report 50-331/02-03(DRP)

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cc w/encl: E. Protsch, Executive Vice President -
Energy Delivery, Alliant;
President, IES Utilities, Inc.
Robert G. Anderson, Plant Manager
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:	50-331/02-03(DRP)
Licensee:	Alliant, IES Utilities Inc.
Facility:	Duane Arnold Energy Center
Location:	3277 DAEC Road Palo, Iowa 52324-9785
Dates:	February 15 through March 30, 2002
Inspectors:	P. Prescott, Senior Resident Inspector M. Kurth, Resident Inspector T. Ploski, Senior Emergency Preparedness Analyst R. Jickling, Emergency Preparedness Analyst R. Schmitt, Radiation Specialist G. Wright, Project Engineer
Approved by:	Bruce L. Burgess, Chief Branch 2 Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000331-02-03(DRP), on 02/15-03/30/2002, IES Utilities, Inc., Duane Arnold Energy Center. Routine safety inspection.

This report covers a 6-week routine inspection. The inspection was conducted by resident inspectors, region-based emergency preparedness specialists, and a radiation protection specialist. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609 "Significance Determination Process" (SDP). The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at **http://www.nrc.gov/NRC/OVERSIGHT/index.html.** Findings for which the SDP does not apply are indicated by "No Color" or by the severity level of the applicable violations.

A. Inspector Identified Findings

No findings of significance were identified.

B. Licensee Identified Findings

No findings of significance were identified.

Report Details

Summary of Plant Status

The plant was operated at the reduced power level of 1770 megawatts thermal (MW_{th}) at the beginning of the inspection period due to oscillations on the "B" feedwater regulating valve. On February 17, 2002, drywell leakage surpassed 1.0 gallons per minute (GPM). Chemical analysis of a drywell floor drain sample indicated the leakage source was well water, used in the drywell air coolers. On February 26, leakage dropped and held steady at approximately 0.8-0.9 GPM through the end of the month. On March 3, at 12:00 p.m., an orderly scheduled shutdown was commenced to identify and repair the source of the drywell leakage. On March 4, at 2:05 p.m., the generator was taken offline and at 3:40 p.m., a reactor scram was inserted. Following completion of the repairs, the reactor was taken critical on March 8, at 1:42 p.m. The generator was synchronized to the grid on March 9, at 2:07 p.m. During the outage, a modification was performed on the feedwater regulating valve to permit full power operation at 1790 MW_{th}. Full power was achieved March 11, at 1:19 p.m. The plant was operated at or near full power for the remainder of the period.

1. REACTOR SAFETY

Cornerstones: Initiating events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness

1R04 Equipment Alignment (71111.04)

a. Inspection Scope

The inspectors performed a partial walkdown of the following redundant equipment trains to verify operability and proper equipment lineup while the counterpart train was disabled due to planned maintenance. These systems were selected due to the increase in core damage frequency caused by rendering one train of emergency core cooling system (ECCS) out-of-service for maintenance.

- High Pressure Coolant Injection System (HPCI)
- Reactor Core Isolation Cooling (RCIC)

The inspectors verified the position of critical redundant equipment and looked for any discrepancies between the existing equipment lineup and the required lineup.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

a. Inspection Scope

The inspectors walked down the following risk significant areas looking for any fire protection issues. The inspectors selected areas containing systems, structures, or components that the licensee identified as important to reactor safety.

- Reactor Building Torus Area and North Corner Rooms
- Reactor Building South Corner Rooms
- Reactor Building HPCI, RCIC, and Radwaste Tank Rooms

The inspectors reviewed the control of transient combustibles and ignition sources, fire detection equipment, manual suppression capabilities, passive suppression capabilities, automatic suppression capabilities, and barriers to fire propagation.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

The inspectors reviewed the licensee's flooding mitigation plans and equipment to determine consistency with design requirements and the risk analysis assumptions. Walkdowns were conducted of the interior and exterior walls of the pump house, reactor building, turbine building, and the low level radiation waste processing and storage facility.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

a. Inspection Scope

The inspectors observed the licensed operator training and evaluation conducted in accordance with requalification scenario guide, “SEG [Simulator Evaluation Guide] 2002C2-3,” Revision 0. The exercise was conducted on March 19, 2002.

The exercise scenario challenged operators to respond to a loss of river water supply and loss of the emergency service water and residual heat removal systems. Also, the crew responded to a security threat. During the course of the scenario, abnormal and emergency operating procedures were used and event classification opportunities occurred. Areas observed by the inspectors included: clarity and formality of

communications, timeliness of actions, prioritization of activities, procedural adequacy and implementation, control board manipulations, managerial oversight, emergency plan execution, and group dynamics. In addition, event classification actions were observed. The classifications were not included as part of the performance indicator data for this scenario.

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation (71111.12)

a. Inspection Scope

The inspectors reviewed the licensee's implementation of the Maintenance Rule (10 CFR 50.65) to ensure rule requirements were met for the selected systems. The following systems were selected based on being designated as risk significant under the Maintenance Rule, or being in the increased monitoring (Maintenance Rule category a(1)) group:

- High pressure coolant injection system
- Instrument air system
- Emergency service water system

The inspectors verified the licensee's categorization of specific issues, including evaluation of the performance criteria. The inspectors reviewed the licensee's implementation of the maintenance rule requirements, including a review of scoping, goal-setting, and performance monitoring; short-term and long-term corrective actions; functional failure determinations associated with the condition reports reviewed; and current equipment performance status.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

a. Inspection Scope

The inspectors reviewed and observed emergent work, preventive maintenance, or planning for risk significant maintenance activities. The inspectors observed maintenance or planning for the following activities or risk significant systems undergoing scheduled or emergent maintenance.

- Weekly Scheduling and Planning Meetings
- Forced Outage Planning and Emergent Work Review

Specifically, the inspectors reviewed the risk assessment of scheduled maintenance activities associated with work weeks 10 and 12. Work week 10 included work for the forced outage to repair the drywell coolers. Work week 12 involved work on the "A" control room standby filter unit.

The inspectors also reviewed the licensee's evaluation of plant risk, risk management, scheduling, and configuration control for these activities in coordination with other scheduled risk significant work. The inspectors verified that the licensee's control of activities considered assessment of baseline and cumulative risk, management of plant configuration, control of maintenance, and external impacts on risk. In-plant activities were reviewed to ensure that the risk assessment of maintenance or emergent work was complete and adequate, and that the assessment included an evaluation of external factors. Additionally, the inspectors verified that the licensee entered the appropriate risk category for the evolutions.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the technical adequacy of the following operability evaluations to determine the impact on TS, the significance of the evaluations, and to ensure that adequate justifications were documented.

- Action Request (AR) 29756, "1LUPSB (Safe Shutdown/SBO [Station Black-Out] MCR [Main Control Room] Lighting UPS [Uninterruptible Power Supply]) Battery Posts Show Signs of Degradation"

- AR 28778, "MO1933 Exhibits Increased Running Load at the End of the Closing Stroke and at the Beginning of the Opening Stroke"

- AR 30204, "Diesel Fuel Oil Transfer Pump Motor Control Center Power Supply to 1G31 Fuel Oil Makeup Pump Wiring is Incorrect"

- AR 30414, "Can the Residual Heat Removal Pump Seals (i.e., 1P229A, 1P229B, 1P229C and 1P229D) Operate Under Accident Conditions Without Seal Cooling"

Operability evaluations were selected based upon the relationship of the safety-related system, structure, or component to risk.

b. Findings

No findings of significance were identified.

1R16 Operator Workarounds (OWAs) (71111.16)

a. Inspection Scope

The inspectors reviewed OWA 27260, “Unplanned Capability Loss Factor (UPCLF) Review - Drywell Cooling.” The inspectors reviewed the workaround’s potential to impact the operators’ ability to cool the drywell.

The inspectors reviewed the workaround for impact on the reliability, availability, and potential for improper operation of the system. Additionally, a review was conducted to determine if the workaround could increase the possibility of an initiating event, affect multiple mitigating systems, or impact the operators’ ability to respond to accidents or transients.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (71111.17)

a. Inspection Scope

The inspectors reviewed the following modification to verify that the design basis, licensing basis, and performance capability of risk significant systems were not degraded by the installation of the modification. The inspectors also verified that the modification did not place the plant in an unsafe configuration.

- Engineered Maintenance Action (EMA) A51490, “Replace TIS4443 Main Steam Line “A” Steam Tunnel High Temperature for Primary Containment Isolation System Channel A1"

The inspectors considered the design adequacy of the modification by performing a review, or partial review, of the modification’s impact on plant electrical requirements, material requirements and replacement components, response time, control signals, equipment protection, operation, failure modes, and other related process requirements.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (PMT) (71111.19)

a. Inspection Scope

The inspectors selected the following post-maintenance activities for review. Activities were selected based upon the structure, system, or component's ability to impact risk.

- Observed surveillance test procedure (STP) 3.5.3-02, “RCIC System Operability Test,” Revision 11, following a RCIC system planned maintenance outage.

- Observed PMT and reviewed corrective work order (CWO) A58840, “Calibrate and Develop Stroke Time Versus Volume Booster Setting Curve [CV1621-0, “B” Feedwater Regulating Valve]”

- Observed mock-up testing and reviewed unidentified drywell leakage data following completion of CWO A58115, “Repair the Leaking 1VCC005B Drywell Cooler”

- Reviewed data from preventive work order (PWO) 1118453, “Complete Mechanical Inspection of 1G021 “B” Emergency Diesel Generator”

The inspectors verified by witnessing the test or reviewing the test data that post-maintenance testing activities were adequate for the above maintenance activities. The inspectors reviews included, but were not limited to, integration of testing activities, applicability of acceptance criteria, test equipment calibration and control, procedural use and compliance, control of temporary modifications or jumpers required for test performance, documentation of test data, TS applicability, system restoration, and evaluation of test data. Also, the inspectors verified that maintenance and post-maintenance testing activities adequately ensured that the equipment met the licensing basis, TS, and USAR design requirements.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors selected the following surveillance test activities for review. Activities were selected based upon risk significance and the potential risk impact from an unidentified deficiency or performance degradation that a system, structure, or component could impose on the unit if the condition were left unresolved.

- STP 3.3.6.1-10, “Reactor Lo Lo Water Level (ATWS [Anticipated Transient Without Scram]-RPT [Reactor Protection Trip]/ARI [All Rods In] Trip RWCU [Reactor Water Clean-Up] Isolation) and Lo Lo Water Level (Main Steam Line Isolation Trip) Channel Calibration,” Revision 5

- STP 3.3.1.2-01, “Source Range Monitor Channel Functional Test,” Revision 3

- STP 3.5.1-05, “HPCI System Operability Test,” Revision 15

The inspectors observed the performance of surveillance testing activities, including reviews for preconditioning, integration of testing activities, applicability of acceptance criteria, test equipment calibration and control, procedural use, control of temporary modifications or jumpers required for test performance, documentation of test data, TS applicability, impact of testing relative to performance indicator reporting, and evaluation of test data.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP2 Alert and Notification System (ANS) Testing (71114.02)

a. Inspection Scope

The inspectors discussed with Emergency Preparedness (EP) staff the design, equipment, and periodic testing of the public ANS for the Duane Arnold reactor facility emergency planning zone to verify that the system was properly tested and maintained. The inspectors also reviewed procedures and records for an 18-month period ending September 2001, related to ANS testing, annual preventive maintenance, and non-scheduled maintenance. The inspectors reviewed the licensee's criteria for determining whether each model of siren installed in the emergency planning zone would perform as expected if fully activated. Records used to document and trend component failures for each model of installed siren were also reviewed to ensure that corrective actions were taken for test failures or system anomalies.

b. Findings

No findings of significance were identified.

1EP3 Emergency Response Organization (ERO) Augmentation Testing (71114.03)

a. Inspection Scope

The inspectors reviewed the licensee's ERO augmentation testing to verify that the licensee maintained and tested its ability to staff the ERO during an emergency in a timely manner. Specifically, the inspectors reviewed semi-annual, off-hours staff augmentation drill procedures, related September 12 and 26, 2000, April 10, 2001, and August 28, 2001 drill records, primary and backup provisions for off-hours notification of the Duane Arnold reactor facility emergency responders, and the current ERO rosters for Duane Arnold. The inspectors reviewed and discussed with the EP staff the facility's provisions for maintaining ERO call out lists.

b. Findings

No findings of significance were identified.

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

a. Inspection Scope

The inspectors reviewed Revision 22 to Section B and Revision 21 to Section F of the emergency plan to determine whether these revisions reduced the effectiveness of the licensee's emergency planning, pending onsite inspection of the implementation of these revisions.

b. Findings

No findings of significance were identified.

1EP5 Correction of Emergency Preparedness Weaknesses and Deficiencies (71114.05)

a. Inspection Scope

The inspectors reviewed the Nuclear Oversight staff's 2000 and 2001 audits to ensure that these audits complied with the requirements of 10 CFR 50.54(t) and that the licensee adequately identified and corrected deficiencies. The inspectors also reviewed the EP staff's self-assessments and critiques to evaluate the EP staff's efforts to identify and correct weaknesses and deficiencies. Additionally, the inspectors reviewed action requests related to the facility's EP program to determine whether corrective actions were completed.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control to Radiologically Significant Areas (71121.01)

.1 Plant Walkdowns, Radiological Boundary Verifications, and Radiation Work Permit Reviews

a. Inspection Scope

The inspector conducted walkdowns of the radiologically protected area to verify the adequacy of radiological area boundaries and postings. Specifically, the inspector walked down radiologically significant work area boundaries (i.e., radiation, high and locked high radiation areas) in the Reactor Building, Radwaste Building, Spent Fuel Pool area, and the Turbine Building. The inspector performed confirmatory radiation surveys in selected portions of these areas to verify that these areas were properly posted and controlled in accordance with 10 CFR Part 20, licensee procedures, and Technical Specifications. The inspector also examined the radiological conditions of work areas

within those radiation and high radiation areas, to assess contamination controls. Additionally, the inspector reviewed radiation work permits (RWPs) for general tours, access to high radiation /locked high radiation areas (HRA/LHRAs), and for the removal of the shielded lid on a re-useable steel shipping liner (and its pre-use inspection), to verify that work instructions and controls had been adequately specified and that electronic dosimeter set points were in conformity with survey indications.

b. Findings

No findings of significance were identified.

.2 Job-In-Progress Reviews, Observations of Radiation Worker Performance, and Radiation Protection Technician Proficiency

a. Inspection Scope

The inspector observed the following radiological work activity performed during the inspection and evaluated the licensee's use of radiological controls:

- Removal of a shielded lid and pre-use inspection of a re-useable steel liner

The inspector attended the pre-job briefing for the work evolution, reviewed the radiological job requirements for the activity, and assessed job performance with respect to those requirements. The inspector reviewed survey records, including radiation, contamination, and airborne surveys to verify that appropriate radiological controls were effectively utilized. The inspector also reviewed in-process surveys and applicable postings and barricades to verify their accuracy. The inspector observed radiation protection technician and worker performance during the work evolution at the job site to verify that the technicians and workers were aware of the significance of the radiological conditions in their workplace, RWP controls/limits, and that they were performing adequately, given the level of radiological hazards present and the level of their training.

b. Findings

No findings of significance were identified.

.3 Identification and Resolution of Problems

a. Inspection Scope

The inspector reviewed licensee Action Requests (ARs) written since the last assessment (December 2001) to the date of the current assessment, which focused on access control to radiologically significant areas (i.e., problems concerning activities in HRAs, radiation protection technicians performance, and radiation worker practices). The inspector reviewed these documents to verify the licensee's ability to identify repetitive problems, contributing causes, the extent of conditions, and then implement other corrective actions in order to achieve lasting results.

b. Findings

No findings of significance were identified.

Cornerstone: Public Radiation Safety (PS)

2PS2 Radioactive Material Processing and Transportation (71122.02)

.1 Walk-Downs of Radioactive Waste Systems

a. Inspection Scope

The inspector performed walkdowns of the liquid and solid radioactive waste systems to assess their material condition and operability and to verify that radiological hazards were adequately posted and controlled in accordance with 10 CFR Part 20 and the licensee's Technical Specifications. The inspector also discussed the current operation of the systems with a member of the radioactive waste operations crew. Specifically, the inspector reviewed the condition of radioactive waste system components located in the following areas:

- Abandoned evaporator tank room;
- Abandoned Radwaste centrifuge area;
- Abandoned Radwaste hopper room;
- Abandoned Radwaste lanes/capper area;
- Condensate backwash receiving tank room;
- Shipping bay and de-watering processing area;
- Solid radioactive waste handling, storage, and processing areas;
- Spent resin tank room;
- Waste sludge tank room; and
- Waste collector tank room.

The inspector compared the operations of the liquid/solid radioactive waste systems to the descriptions in the Updated Final Safety Analysis Report and the licensee's process control program. In the case of abandoned equipment (e.g., partially disassembled centrifuge system and evaporators), the inspector reviewed the administrative and physical controls to verify that the equipment would not contribute to an unmonitored release path and would not inadvertently affect operating systems. During this inspection, the licensee was not conducting waste processing.

b. Findings

No findings of significance were identified.

.2 Waste Characterization and Classification

a. Inspection Scope

The inspector reviewed the licensee's method and procedures for determining the classification of radioactive waste shipments, including the licensee's use of scaling factors to quantify difficult-to-measure radionuclides (e.g., pure alpha or beta emitting radionuclides). Specifically, the inspector reviewed the licensee's calender year (CY) Summer 2000 radio-chemical analysis results for condensate resin and dry active waste (DAW). The inspector reviewed the report to verify that the licensee's scaling factors were accurately determined such that waste shipments were classified in accordance with the requirements contained in 10 CFR Part 61 and the licensee's process control program. The inspector also reviewed the methodologies for waste concentration averaging to determine if they contained provisions for representative samples of the waste product for the purposes of waste classification. These reviews were conducted to verify that the licensee's program assured compliance with 10 CFR 61.55 and 10 CFR 61.56, as required by Appendix G of 10 CFR Part 20.

Additionally, the inspector reviewed the licensee's processes employed to ensure that changes in operating parameters (i.e., a recent power upgrade), which may result in changes to the waste stream composition, are identified between the annual or biennial scaling factor updates.

b. Findings

No findings of significance were identified.

.3 Ongoing Shipment Preparation and Radioactive Waste Processing Activities

a. Inspection Scope

The inspector observed an ongoing shipment of effluent release samples (Limited Quantity) to ensure that the shipping activities were performed in accordance with the requirements of 49 CFR Parts 172 and 173. Specifically, the inspector reviewed shipping calculations and paperwork, performed independent radiological surveys, and observed the packaging of the shipment, before final transfer to the carrier. Since direct observations of shipping activities were limited, the inspector examined the training program provided to personnel responsible for the conduct of radioactive waste processing and radioactive material shipment preparation activities to assess the licensee's compliance with 49 CFR Part 172, Subpart H requirements. Specifically, the inspector reviewed the lesson plans, student handouts, and course completion documentation for licensee and vendor-provided courses to ensure that personnel (i.e., warehouse shipping/receiving, Radwaste operators, radiation protection technicians, and managers) had adequately completed both the general awareness/safety training and function specific training applicable for their individual job functions. Additionally, the inspector reviewed training records for subsequent recurrent/refresher training to verify that applicable personnel had completed the training within the last three years.

b. Findings

No findings of significance were identified.

.4 Shipping Records

a. Inspection Scope

The inspector reviewed a selection of non-excepted package shipments completed during CY(s) 2000 - 2001 to verify compliance with NRC and Department of Transportation (DOT) requirements (i.e., 10 CFR Parts 20 and 71; 49 CFR Parts 172 and 173). Specifically, the inspector reviewed the following radioactive materials/waste shipment records:

Radioactive Materials

- RSR 01-35, Refueling/Outage Equipment (SCO II), May 24, 2001
- RSR 01-60, Fuel Scrapings and CAV samples (Rad Mat NOS), October 3, 2000

Radioactive Wastes

- RSR 00-017, Oil, DAW, Sources, Sandblast grit, and Paint chips (LSA II, Class A), October 27, 2000
- RSR 00-21, Condensate Resin (LSA II, Class A), December 14, 2000
- RSR 01-19, Low Pressure MSR bundle (SCO II, Class A), April 30, 2001
- RSR 01-55, DAW (Hot Trash) (LSA II, Class A), October 2, 2001
- RSR 01-64, Condensate Resin (>A LSA II, Class A), December 11, 2001

The inspector also interviewed an Operations Shift Manager (i.e., who would be responsible for answering the licensee's emergency response 24-hour telephone number) to verify that the individual had adequate knowledge concerning the shipment, emergency precautions, and incident mitigation information or that the individual had immediate access to a person who possessed such knowledge.

b. Findings

No findings of significance were identified.

.5 Problem Identification and Resolution

a. Inspection Scope

The inspector reviewed self-assessments, audits, and action requests (AR) completed during the previous 18 months which concerned the areas of radioactive waste processing and radioactive waste/material shipping. The inspector reviewed these documents to assess the licensee's ability to identify repetitive problems, contributing causes, the extent of conditions, and corrective actions which will achieve lasting results.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

Cornerstone: Mitigating Systems

.1 Safety System Unavailability

a. Inspection Scope

The inspectors verified the accuracy and completeness of the "Safety System Unavailability - RCIC system performance indicator data submitted by the licensee from August 1, 2001 through December 31, 2001. The inspectors reviewed data reported to the NRC since the last verification. The review was accomplished, in part, through evaluation of the TS requirements, plant records, procedural reviews, and reactor coolant sample data.

b. Findings

No findings of significance were identified.

.2 Emergency Preparedness

a. Inspection Scope

The inspectors verified that the licensee had accurately reported these indicators: ANS, ERO Drill Participation, and Drill and Exercise Performance (DEP) for the EP cornerstone. Specifically, the inspectors reviewed the licensee's PI records, data reported to the NRC, and action requests for the period April 2000 through September 2001. Records of relevant Control Room Simulator training sessions, periodic ANS tests, and excerpts of drill and exercise scenario and evaluations were also reviewed to identify any occurrences that were not identified by the licensee and entered into the station corrective action program.

b. Findings

No findings of significance were identified.

.3 Radiation Protection

a. Inspection Scope

The inspector reviewed the licensee's assessment of the performance indicator (PI) for the Reactor Safety, Barrier Integrity Cornerstone, Reactor Coolant System (RCS)

Specific Activity element. No reportable elements were identified by the licensee for the 1st, 2nd, 3rd, and 4th quarters of 2001. The inspector compared the licensee's data with calender year (CY) 2001 ARs to verify that there were no occurrences concerning the Barrier Integrity cornerstone, RCS Specific Activity element. The inspector also observed licensee staff (i.e. chemistry technicians) collecting RCS samples to verify that the technicians had complied with the applicable procedures during the collection and processing of the samples.

b. Findings

No findings of significance were identified.

4OA6 Meeting

Exit Meeting

The inspectors presented the inspection results to Mr. R. Anderson and other members of licensee management on April 2, 2002. 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.

Interim exits related to the Emergency Preparedness Program, Access Control to Radiologically Significant Areas, Radioactive Material Processing and Transportation, and associated performance indicators inspections were conducted on November 2, 2001 and March 1, 2002 with Mr. G. Van Middlesworth and Mr. R. Anderson respectively. 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.

KEY POINTS OF CONTACT

Licensee

D. Allison, Radioactive Waste Shipping Coordinator
R. Anderson, Plant Manager
B. Bernier, System Engineer Supervisor
J. Bjorseth, Manager, Engineering
D. Brigl, Long Term Program Engineer
R. Brown, Nuclear Oversight Manager
E. Christopher, Program Engineer
D. Curtland, Site Support Manager
K. Dunlap, Emergency Preparedness Planner
J. Ertman, Team Leader-Engineer
T. Evans, Operations Manager
L. Gibney, Emergency Preparedness Planner
H. Giorgio, Manager, Radiation Protection
A. Johnson, Operations Training Supervisor
R. Johnson, Emergency Preparedness Scenario Developer
D. Johnson, Emergency Preparedness Specialist
J. Karrick, Licensing
B. Kindred, Security Manager
L. Kriege, Chemistry Supervisor
J. Lohman, Communications Manager
S. McVay, System Engineer
S. Nelson, Health Physics Supervisor
J. Newman, Radiological Engineering Supervisor
K. Putnam, Licensing Manager
B. Richmond, Radioactive Waste Supervisor
A. Roderick, Principal Mechanical Engineer
W. Simmons, Maintenance Superintendent
P. Sullivan, Emergency Planning Manager
R. Titus, Emergency Preparedness Planner
G. Van Middlesworth, Site Vice-President Nuclear
C. Vogeler, Emergency Preparedness Specialist
G. Whittier, RHR System Engineer
K. Williams, Senior Emergency Planning Specialist

NRC

B. Burgess, Chief, Branch 2, DRP
M. Kurth, Resident Inspector
P. Prescott, Senior Resident Inspector
R. Reynolds, Deputy Division Director, DRP

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

Discussed

None

LIST OF ACRONYMS USED

ADAMS	NRC's Document System
AFP	Area Fire Plan
ALARA	As Low As Reasonably Achievable
ANS	Alert and Notification System
AR	Action Request
ARI	All Rods In
ATWS	Anticipated Transient Without Scram
CAV	Crack Arrest Verification
CFR	Code of Federal Regulations
CWO	Corrective Work Order
CY	Calender Year
DAEC	Duane Arnold Energy Center
DAW	Dry Active Waste
DEP	Drill and Exercise Performance
DOT	Department of Transportation
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
ECCS	Emergency Core Cooling System
EMA	Engineered Maintenance Action
EP	Emergency Preparedness
ERO	Emergency Response Organization
HPCI	High Pressure Coolant Injection
HRA	High Radiation Area
LHRA	Locked High Radiation Area
LSA	Low Specific Activity
MCR	Main Control Room
MSR	Main Steam Re-Heat
MWt	Megawatt Thermal
NOS	Not Otherwise Specified
NRC	Nuclear Regulatory Commission
OI	Operating Instruction
OWA	Operator Work-Around
P&IDs	Piping and Instrumentation Drawings
PARS	Public Availability Records
PI	Performance Indicator
PMT	Post Maintenance Test
PS	Public Radiation Safety
PWO	Preventive Work Order
Rad Mat	Radioactive Material
Radwaste	Radioactive Waste
RCIC	Reactor Core Isolation Cooling
RCS	Reactor Coolant System
RFO 17	Refueling Outage 17
ROP	Reactor Oversight Process
RP	Radiation Protection
RPT	Reactor Protection Trip
RWCU	Reactor Water Clean-Up

RWP	Radiation Work Permit
SBO	Station Black-Out
SCO	Surface Contaminated Object
SDP	Significance Determination Process
SSCs	Structure, System, or Components
STP	Surveillance Test Procedure
TEDE	Total Effective Dose Equivalent
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
UPCLF	Unplanned Capacity Loss Factor

LIST OF DOCUMENTS REVIEWED

The following documents were selected and reviewed by the inspectors to accomplish the objectives and scope of the inspection and to support any findings.

1R04 Equipment Alignment

Operating Instruction (OI) 152	High Pressure Coolant Injection System	Revision 51
P&ID (Piping & Instrumentation Diagram) M-122	HPCI (Steam Side)	Revision 52
P& ID M-123	HPCI (Water Side)	Revision 37
OI 150	Reactor Core Isolation Cooling System	Revision 41
P&ID M-124	RCIC (Steam Side)	Revision 45
P&ID M-125	RCIC (Water Side)	Revision 31

1R05 Fire Protection

Area Fire Plan (AFP)-3	Reactor Building HPCI, RCIC and Radwaste Tank Rooms	Revision 22
AFP-2	Reactor Building South Corner Rooms	Revision22
AFP-1	Reactor Building Torus Area and North Corner Rooms	Revision22
Fire Plan - Volume II	Fire Brigade Organization	Revision 32

1R06 Flood Protection Measures

UFSAR 9.2.3.5.2	Emergency Service Water System	Revision 14
Individual Plant Examination Section 3.3.6	Internal Flooding Analysis	

1R11 Licensed Operator Requalification Program

	SEG 2002C2-3	Revision 0

1R12 Maintenance Rule Implementation

Performance Criteria Basis Document	High Pressure Coolant Injection	Revision 2
Performance Criteria Basis Document	Instrument Air System	Revision 1
NG-97-1440, Expert Panel Meeting Minutes, Attachment 1	Data for Systems/Plant in Red - 10 CFR 50.65 (a)(1)	February 7, 2002
Performance Criteria Basis Document	Essential Service Water	Revision 1

1R13 Maintenance Risk Assessments and Emergent Work Control

	Planned Outage Look-Ahead Report	February 27, 2002
	Online Look-Ahead Agenda (Week 10)	February 28, 2002
	Online Look-Ahead Agenda (Week 12)	March 14, 2002

1R15 Operability Evaluations

AR 29756	1LUPSB (Safe Shutdown/SBO MCR Lighting UPS) Battery Posts Show Signs of Degradation	February 01, 2002
AR 29562	1LUPSB YUSA Battery Cell Positive Strap Connection is Beginning to Heave on Cells A3 and B3. The B3 Strap may be Beginning to Crack	January 17, 2002
AR 28778	MO1933 Exhibits Increased Running Load at the End of the Closing Stroke and at the Beginning of the Opening Stroke	November 14, 2001
AR 30414	Can the Residual Heat Removal Pump Seals (i.e., 1P229A, 1P229B, 1P229C and 1P229D) Operate Under Accident Conditions Without Seal Cooling	March 28, 2002

1R16 Operator Workarounds

AR 27260	Unplanned Capability Loss Factor (UCLF) Review - Drywell Cooling	September 28, 2001

1R17 Permanent Plant Modifications

EMA	Replace TIS4443 [Main Steam Line "A" Steam Tunnel High Temperature for Primary Containment Isolation System Channel A1	January 22, 2002
Safety Evaluation 99-011	Replace Existing Obsolete Chromalox Model 3000 Process Alarm Monitors with the Newer Chromalox Model 3421 Process Alarm Monitors	April 13, 2001
Engineering Calculation CAL-239-406-018	Re-Evaluation of Masonry Walls, Wall C-406-18	October 4, 2001
USAR Change Request #01-012	Add Short Statement to the Effect that the MSL Area High Temperature Isolation will take Approximately 1.5 Seconds of the Available 5.5 Second Margin Assumed in the Accident Analysis	April 11, 2001

1R19 Post-Maintenance Testing

STP 3.5.3-02	RCIC System Operability Test	Revision 11
A58840	Calibrate and Develop Stroke Time Versus Volume Booster Setting Curve [CV1621-0, "B" FRV]	March 4, 2002
A58839	Calibrate and Develop Stroke Time Versus Volume Booster Setting Curve [CV1579-0, "A" FRV]	
A58115	Repair the Leaking 1VCC005B Drywell Cooler	March 5, 2002
1118453	Complete Mechanical Inspection of 1G021 "B" Emergency Diesel Generator	February 28, 2002

1R22 Surveillance Testing

STP 3.3.6.1-10	Reactor Lo Lo Water Level (ATWS-RPT/ARI Trip RWCU Isolation) and Lo Lo Water Level (Main Steam Line Isolation Trip) Channel Calibration	Revision 5

STP 3.3.1.2-01	Source Range Monitor Channel Functional Test	Revision 3
STP 3.5.1-05	HPCI System Operability Test	Revision 15

1EP2 Alert and Notification System (ANS) Testing

EPDM 1013	Emergency ANS and Siren Sign Program	Revision 0
	Siren Trouble Shooting Guide	
	Monthly Siren Test Polls, August - October 2001	
	Letter of Understanding Between the DAEC Electrical Shop and the EP Department	September 16, 1999
Memorandum	AR #21434, Siren Battery Failures	December 28, 2000
	Preliminary Report For AR #16385, Emergency Siren Inoperability	
	Justification for the Addition of Addendum 'A' to the FEMA-43/REP-10 Report	
	An Offsite Emergency Plan Prompt ANS Addendum For The DAEC	Revision 4A
AR#20804	EP Siren 15J Reported as Inoperable	July 18, 2000
AR#20829	DAEC Siren Operability Reports Show a Significant Negative Trend For June and July	July 6, 2000
AR#20823	Need to Purchase a Portable Test Box for Whelen Emergency Siren System	August 1, 2000
AR#20825	EP Siren Test Report for August 2000	August 3, 2000
AR#23299	Benton County Microwave to Sheriff and EOC Is Not Working	December 13, 2000

1EP3 Emergency Response Organization (ERO) Augmentation Testing

Memorandum	Off-hours Callout	October 3, 2000
Section C	Emergency Plan	Revision 20
	Emergency Telephone Book	
	April 10, 2001 Semi-Annual Off-hours Callout Test Results	
	August 28, 2001 Semi-Annual Off-hours Callout Test Results	

1EP4 Emergency Action Level and Emergency Plan Changes

Section B	DAEC Emergency Plan	Revision 22
Section F	DAEC Emergency Plan	Revision 21

1EP5 Correction of Emergency Preparedness Weaknesses and Deficiencies

ACP 114.5	Action Request System	Revision 28
Section B	DAEC Emergency Plan	Revision 21
Memorandum	Results of the 2000 ERO Survey	April 3, 2000
	ERO Training and Qualification Survey	April 3, 2000
	DAEC EP 71114 Assessment Report, August 27-31, 2001	
	Quality Assurance Quarterly Assessment Reports, Second - Fourth Quarters 2000	
	Nuclear Oversight Quarterly Assessment Reports, First - Second Quarters 2001	
AR#20393	Action Items Generated During the EP Self-Assessment Have No Actions Taken	June 22, 2000
AR#21433	Restore Rad Protection ERO Positions to 3 Deep	October 3, 2000
AR#22207	Operations Training Comprehensive Self-evaluation Team Concern	October 17, 2000
AR#22624	Year 2000 Evaluated Exercise: All Required Information Not Provided When Alert Declared	October 18, 2000
AR#22641	Year 2000 Evaluated Exercise: EOF Was Misinformed of a Hard Pipe Release by the TSC	October 19, 2000
AR#23739	Determine Method of Updating EP Call Out Board Listing Immediate Responders for Control Room	January 24, 2001
AR#23861	Review EP Notification Per Recommendations	February 6, 2001
AR#24234	Perform an Assessment of EP Program to Verify Conformance to NRC 71114	February 20, 2001
AR#24234	Create a Formal EP Siren Program Procedure	February 20, 2001
AR#24485	Review of the Kewaunee Extent of Condition Root Cause Evaluation for Applicability to DAEC	March 6, 2001

AR#26299	Requalification of ERO Responders From Security, Rad Pro, and Maintenance Exceeds Window	May 30, 2001
AR#26558	The TSC ENS Communicator Position is One Deep	June 26, 2001
AR#27668	Verify EPIP 1.1 Requires EAL Declaration Within 15	September 28, 2001
AR#27670	Benchmark To Determine How Numbers of Opportunities Are Measured for ERO PIs	September 28, 2001
AR#27674	Evaluate Actions Necessary For 30-60 Minute Responders Who Cannot Respond in 30-60 Minutes	September 28, 2001
AR#27676	Review EPDM 1008.1 to Determine if EALs Should Be Reviewed with Offsite Authorities	September 28, 2001
AR#27678	Evaluate Need to Collect All Documentation During LOR for ERO Classification, Notification PIs	September 28, 2001
AR#27786	Write a Procedure Encompassing All Areas of ERO Drill and Exercise Program Including Augmentation Drills and Documentation	September 18, 2001

2OS1 Access Control to Radiologically Significant Areas

Action Request items		
AR 29130	Revise High Radiation controls posting procedure, (i.e., response to Apparent Cause Evaluation of AR 29052 “Failure to properly barricade access to HRA on turbine building roof”)	December 11, 2001
AR 29280	Unauthorized entry into Torus (i.e. HRA), by Operations Technician, during a HPCI run, (Root Cause Report included).	December 19, 2001
AR 29409	Request for evaluation and establishment of expected dose rates for steam area entries, while at power.	January 4, 2002
AR 29867	Requirements for “Procedure use and adherence” clarified.	February 12, 2002
Procedures		
ACP 1411.22	Control of Access to Radiological Areas	Revision 9
ACP 1411.23	Equipment and Material Controls in Radiological Areas	Revision 9

Miscellaneous Data		
IE01-P-01-100 (Vendor procedure)	ALARA lid installation/removal and inspection instruction	Revision 0
RWP25	Radwaste specific HRA and LHRA jobs	Revision 4
RWP 32	Routine NRC tours and surveillance	Revision 12
02-445	Survey of re-useable steel liner, #02-R-002	February 28, 2002
	ALARA	
	"Daily Focus," daily plant status briefing sheet	February 26, 2002
	DAEC weekly schedule for Health Physics Department	February 25, 2002

2PS2 Radioactive Material Processing and Transportation

Action Request items		
AR 22683	"Green is Clean" LSA box found with 25 mr/hr contact dose rate	October 26, 2000
AR 24515	Unqualified truck driver arrived on-site to haul radioactive shipment	March 3, 2001
AR 24526	Evaluate ownership and pre-job briefs for emergent Radwaste shipping	March 8, 2001
AR 24682	Failure to properly survey in-coming radioactive shipment (i.e. truck), prior to off-loading.	March 24, 2001
AR 25121	Radioactive shipment package opened in warehouse, without Health Physics personnel authorization.	April 24, 2001
AR 29873	Contaminated radioactive shipment received at DAEC that require security search.	February 2, 2002
Procedures		
RWH 3402.21	IT-60 Evaporator bottom tank resin transfer and de-watering	Revision 18
RWH 3403.1	Collection and control of miscellaneous liquid waste	Revision 15
RWH 3404.1	General requirements for cask handling	Revision 13
RWH 3404.4	Cask handling requirements for HN-190-2, HN-100 series 3, and 14-215	Revision 7

RWH 3404.5	Cask handling requirements for the 10-142B shipping cask	Revision 5
RWH 3404.8	NLI-1/2 cask operating procedure	Revision 0
RWH 3406.1	Waste classification and characterization	Revision 5
RWH 3406.6	Characterizing radioactive material for transport	Revision 5
RWH 3406.8	Packaging radioactive material for shipment	Revision 4
RWH 3406.9	Marking and labeling for radioactive material and Radwaste packages	Revision 5
RWH 3409.2	Sampling instructions and analysis of Radwaste streams	Revision 7
RWH 3410.1	Process control program	Revision 9
STP NS790401	Surveillance Test Procedure, Air filter Quarterly composite analysis	Revision 2
STP NS790401	Surveillance Test Procedure, Results of air filter Quarterly composite analysis, February 27, 2002	Revision 2
TBD #8	Technical Basis Document, Surface contaminated object (SCO) classification and characterization.	Revision 0
00-003-R	Radiological engineering calculation cover sheet-10CFR61 compliance data technical basis for DAEC, dry active waste (DAW)	Revision 0
00-004-R	Radiological engineering calculation cover sheet-10CFR61 compliance data technical basis for DAEC, condensate resin	Revision 0
Self - Assessments		
2001-003-1-029	Monitoring and control of plant effluents	November 8, 2001
	Section 6. Report A: Transfer, packaging, and storage of LLRW	
	Section 6. Report I: Process control program	

Miscellaneous Data		
ER-99-028	Conformance of CNS 14-215-H Series A cask with specifications for Industrial Packaging Type A and Type 2	
IG 20003, 02	Task performance procedure training for temporary technicians	Revision 3
IG 30075, 01	Lesson plan, “Radioactive material receipt and transfer”	Revision 5
IG 60045, 01	Lesson plan, “General awareness and safety training”	Revision 1
IG 60045, 02	Lesson plan, “Warehouse personnel function specific”	Revision 1
IG 60045, 03	Lesson plan, “Radwaste function specific”	Revision 1
NG-00-1500	Memorandum, Radwaste operator 49 CFR 172.704	August 28, 2000
NG-01-0258	Memorandum, DAEC Subpart “H” training	February 26, 2001
NG-01-0491	Memorandum, Authorization to prepare and verify radioactive material/waste shipping paperwork	April 12, 2001
NG-01-1451	Function specific tasks for health physics technicians	December 21, 2001
RW-S-28	Waste processor shipment pre-release checklist	Revision 3
STD-R-02-050	Test and evaluation document US DOT Specification 7A, type A packaging for ATG casks	
Radioactive Material Shipment, RSR #00-17	Miscellaneous waste	October 24, 2000
Radioactive Material Shipment, RSR #00-21	Condensate Resin	December 13, 2000
Radioactive Material Shipment, RSR #01-19	Low Pressure MSR bundle	April 30, 2001
Radioactive Material Shipment, RSR #01-35	Refueling equipment	May 24, 2001

Radioactive Material Shipment, RSR #01-55	Dry Active Waste	October 2, 2001
Radioactive Material Shipment, RSR #01-60	Fuel scrapings/CAV sample	November 2, 2001
Radioactive Material Shipment, RSR #01-64	Condensate Resin	December 10, 2001
02-438	Survey of Limited quantity shipment package, Composite air filter samples	February 28, 2002
	Course 70001LAUNDRY, Radwaste shipper function specific, Laundry shipment exam	Revision 0
	Listing of all Non-Excepted package shipments since August, 2000	
	Memorandum, Course 70001RADMAN, Subpart "H" training	March 29, 2001
	Print-out of currently qualified 49CFR172 Subpart "H", DAEC personnel	February 22, 2002

40A1 Performance Indicator Verification

Radiation Protection PI

Action Request Items

AR 25447	Revise OI 261 procedure (RWCU) to limit flow with both demineralizer beds in operation	May 4, 2001
AR 25918	Valve line-up in OI 261 (RWCU) is incorrect	May 19, 2001
AR 29650	Dose conversion factors for calculation of dose equivalent I-131 revised	January 25, 2002

Procedures

ACP 1402.4	NRC Performance Indicator collection and reporting. Attachment 1, PI data calculation, review and approval. First, Second, Third and Fourth Quarters, 2001 data.	Revision 0
PCP 1.2	DAEC Chemistry quality assurance program	Revision 16
PCP 1.9	Water chemistry guidelines	Revision 21
PCP 2.	Plant chemistry sampling program guidelines	Revision 8
PCP 2.13	Reactor water sampling	Revision 11
PCP 2.2	Collection of liquid grab samples from sample stations and local sample points	Revision 1
PCP 6.11	Gross Gamma activity	Revision 1
PCP 6.13	Reactor water Iodine	Revision 2
PCP 7.3	Nuclear data spectroscopy system operation	Revision 21
STP 3.4.6-01	DAEC Reactor coolant Iodine activity, results of sampling, February 26, 2001	Revision 1

Miscellaneous Data

	Plant chemistry procedures, 3200 Manual Index	February 8, 2002
Emergency Preparedness PI		
	1999 DAEC Siren Monthly Operability Report	
	2000 DAEC Siren Monthly Operability Report	
	2001 DAEC Siren Monthly Operability Report	
ACP 1402.4	NRC Performance Indicator Collection and Reporting - PI Data Calculation, Review and Approval 4th Quarter 1999 Through 3rd Quarter 2001	
EPDM 1010	EP Department Performance Indicators (PIs)	Revision 0
Unavailability PI		
Memo	DAEC 4th Qtr. 2001 PI Summary	January 25, 2002
Memo	DAEC 3rd Qtr. 2001 PI Summary	October 19, 2001
AR 26830	Review Events for 2/99 (FIC3509 OOT), 10/99 (FIC2509 OOT), 7/99 (V24-0058 Repair) and 4/01 (MO2401 Failure) to Determine if MPFFs [Maintenance Preventable Functional Failures]	August 3, 2001

AR 27449	RCIC Steam Supply Isolation Valve MO2401 (RCIC Steam Supply Outboard Isolation) Failed to Meet ASME for Opening	August 30, 2001
	Operator Logs	July 1 through December 31, 2001
AR 27423	RCIC Flow Controller Indicates 15 GPM in Standby Following Maintenance	August 30, 2001