January 24, 2003

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

SUBJECT: DUANE ARNOLD ENERGY CENTER
NRC INTEGRATED INSPECTION REPORT 50-331/02-07

Dear Mr. Peifer:

On December 28, 2002, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Duane Arnold Energy Center. The results of this inspection were discussed on January 6, 2003, with you and other members of your staff. The enclosed report documents the inspection findings which were discussed on January 6, 2003 with Mr. J. Bjorseth and other members of your staff.

The inspection examined activities conducted under your license as they relate to 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. Specifically, this inspection focused on reactor, radiation, and safeguards safety.

Based on the results of this inspection, the inspectors identified three issues of very low safety significance (Green) that were determined to involve violations of NRC requirements. However, because of their very low safety significance and because these issues were entered into your corrective action program, the NRC is treating these issues as Non-Cited Violations in accordance with Section VI.A.1 of the NRC's Enforcement Policy. Finally, one violation of very low safety significance (Green) was identified by your staff and is listed in Section 4OA7 of this report.

If you contest the subject or severity of a Non-Cited Violation, you should provide a response within 30 days of the date of this inspection report, with a basis for your denial, to the U. S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission - Region III, 801 Warrenville Road, Lisle, IL 60532-4351; the Director, Office of Enforcement, U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector Office at the Duane Arnold Energy Center.

Since the terrorist attacks on September 11, 2001, the NRC has issued two Orders (dated February 25, 2002, and January 7, 2003) and several threat advisories to licensees of commercial power reactors to strengthen licensee capabilities, improve security force readiness, and enhance access authorization. The NRC also issued Temporary Instruction 2515/148 on August 28, 2002, that provided guidance to inspectors to audit and inspect licensee implementation of the interim compensatory measures (ICMs) required by the February 25th Order. Phase 1 of TI 2515/148 was completed at all commercial nuclear power plants during calendar year (CY) '02, and the remaining inspections are scheduled for completion in CY '03. Additionally, table-top security drills were conducted at several licensees to evaluate the impact of expanded adversary characteristics and the ICMs on licensee protection and mitigative strategies. Information gained and discrepancies identified during the audits and drills were reviewed and dispositioned by the Office of Nuclear Security and Incident Response. For CY '03, the NRC will continue to monitor overall safeguards and security controls, conduct inspections, and resume force-on-force exercises at selected power plants. Should threat conditions change, the NRC may issue additional Orders, advisories, and temporary instructions to ensure adequate safety is being maintained at all commercial power reactors.

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/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

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

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

Enclosure: Inspection Report 50-331/02-07

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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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-331
License No:	DPR-49
Report No:	50-331/02-07
Licensee:	Alliant, IES Utilities Inc.
Facility:	Duane Arnold Energy Center
Location:	3277 DAEC Road Palo, Iowa 52324-9785
Dates:	September 29 through December 28, 2002
Inspectors:	G. Wilson, Senior Resident Inspector S. Caudill, Resident Inspector H. Peterson, Senior Operations Engineer G. Pirtle, Physical Security Inspector T. Ploski, Senior Emergency Preparedness Inspector R. Schmitt, Radiation Specialist R. Walton, Operations Engineer
Approved by:	Bruce L. Burgess, Chief Branch 2 Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000331-02-06, IES Utilities, Inc.; on 09/29-12/28/2002, Duane Arnold Energy Center; Operability Evaluations, Post Maintenance Testing, and Radiation Monitoring Instrumentation and Protective Equipment.

This report covers a 3-month period of baseline resident inspection and announced baseline inspections in operator requalification, radiation protection and security. The inspection was conducted by Region III inspectors and the resident inspectors. Three Non-Cited Violations (NCV), and associated Green findings were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, “Significance Determination Process” (SDP). Findings for which the SDP does not apply may be "Green," or be assigned a severity level after Nuclear Regulatory Commission (NRC) management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. Inspection Findings

Cornerstone: Mitigating Systems

Green. A finding of very low safety significance was identified by the inspectors when the licensee failed to follow Administrative Control Procedure (ACP) 1203.01 “Design Verification” procedure and failed to adequately evaluate the seismic qualification of the jumper cable around cell #53 of the “1D1" 125 Volts Direct Current (Vdc) battery.

The inspectors concluded that the issue was more than minor since the finding had greater safety significance than a similar issue described in IMC 0612, Appendix E, Section 4.a. The finding was determined to be of very low safety significance, since the licensee was able to show operability of the 1D1 battery. A Non-Cited Violation (NCV) of 10 CFR 50, Appendix B, Criterion V, related to the failure to adequately perform ACP 1203.01 “Design Verification” procedure when evaluating the seismic qualification of the jumper cable around cell #53 of the 1D1 battery was identified by the inspectors. (Section 1R15)

Cornerstone: Mitigating Systems

Green. A finding of very low safety significance was identified by the inspectors when the licensee failed to adequately plan the procedure for filling and venting the Reactor Core Isolation Cooling (RCIC) lubricating oil system.

The finding was more than minor since the finding resulted in increased unavailability of the RCIC system. The finding was determined to be of very low safety significance, since the licensee did not exceed the Allowable Outage Time (AOT) and High Pressure Coolant Injection (HPCI) was always available. A NCV of 10 CFR 50, Appendix B, Criterion V, related to inadequate procedure for filling and venting the RCIC lubricating oil system was identified by the inspectors. (Section 1R19)

Cornerstone: Emergency Preparedness

Green. A Non-Cited Violation of 10 CFR 20.1703 (e) was identified for failing to provide for vision correction, when selecting respiratory protective equipment for emergency response staff. The licensee provided Self-Contained Breathing Apparatus (SCBA) equipment for all personnel who would be expected to respond in the event of an emergency. However, the licensee failed to provide vision correction lenses for some eyeglass wearing (i.e., non-soft contact wearing) key emergency response organization personnel.

The finding was determined to be of very low safety significance because the majority of emergency response personnel that wore eyeglasses had been issued vision correction lenses by the licensee. Additionally, an adequate number of SCBA qualified plant personnel/staff with no vision correction needed, wearers of soft contacts, or personnel with vision correction lenses, designated as key emergency responders, were available for actual response in the event of an actual emergency. Therefore, the issue did not result in the failure to meet an emergency planning standard. (Section 2OS3)

B. Licensee-Identified Violations

Violations of very low safety significance, which were identified by the licensee have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and corrective action tracking numbers are listed in Section 40A7 of this report.

REPORT DETAILS

Summary of Plant Status

The plant began the inspection period operating at full power. On October 18, 2002, the plant reduced power to remove the "A" Cooling Tower from service for the installation of four temporary modular cooling tower cells. The plant returned to full power on October 21, 2002 and remained at or near full power for the remainder of the inspection period except for brief down powers to accomplish rod pattern adjustments and conduct planned surveillance testing activities.

1. REACTOR SAFETY

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

1R01 Adverse Weather (71111.01)

a. Inspection Scope

The inspectors conducted a review of the licensee's preparations for winter conditions to verify that the plant's design features and implementation of procedures were sufficient to protect mitigating systems from the effects of adverse weather. Documentation for selected risk-significant systems was reviewed to ensure that these systems would remain functional when challenged by inclement weather. In particular, the inspectors focused on the Condensate Storage Tank (CST) heaters, heat tracing, Control Building Heating Ventilation and Air Conditioning (HVAC) System, Pump House HVAC System, and Reactor Building HVAC System. For these areas, the inspectors reviewed Integrated Plant Operating Instruction (IPOI) 6, "Cold Weather Operations," Revision 22. During the week of October 12, 2002, the inspectors walked down portions of the systems discussed above and verified that the systems had been properly aligned for cold weather operation.

The inspectors conducted a review of the licensee's preparations for adverse weather conditions to verify that the plant's design features and implementation of procedures were sufficient to protect mitigating systems from the effects of adverse weather. In particular, the inspectors focused on defined operator actions and readiness of essential systems associated with tornados. For these areas, the inspectors reviewed Abnormal Operating Procedure (AOP) 903, "Tornado," Revision 12. During the week of October 12, 2002, the inspectors walked down portions of the systems discussed and verified that the systems were properly aligned for operation.

Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

a. Inspection Scope

During the week of November 16, 2002, the inspectors performed a complete system alignment inspection of the Residual Heat Removal (RHR) system. This system was selected because it was considered both safety-significant and risk-significant in the licensee's probabilistic risk assessment. The inspection consisted of the following activities:

- a review of plant procedures (including selected abnormal and emergency procedures), drawings, and the Updated Final Safety Analysis Report (UFSAR) to identify proper system alignment;
- a review of outstanding or completed temporary and permanent modifications to the system; and
- an electrical and mechanical walkdown of the system to verify proper alignment, component accessibility, availability, and current condition.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Quarterly Fire Zone Inspections

a. Inspection Scope

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

During the week of October 19, 2002, areas covered by the following Area Fire Plans (AFP) were reviewed:

AFP-23; "Battery Rooms and Corridor" Revision 22;
AFP-30; "Pump House" Revision 23;
AFP-29; "Fire Pump" Revision 23;
AFP-18; "North Turbine Building Ground Floor" Revision 22;
AFP-19; "South Turbine Building Ground Floor" Revision 22;
AFP-21; "North Turbine Building Operating Floor" Revision 22.

During the week of December 14, 2002:

AFP-25; "Cable Spreading Room" Revision 22.

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

During the week of October 12, 2002, the inspectors reviewed the licensee's flooding mitigation plans and equipment in the Torus area to determine consistency with design requirements and the risk analysis assumptions related to internal flooding. Walkdowns and reviews performed considered design measures, seals, drain systems, contingency equipment condition and availability of temporary equipment and barriers, performance and surveillance tests, procedural adequacy, and compensatory measures.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

.1 Facility Operating History

a. Inspection Scope

The inspectors reviewed the plant's operating history from October 2000 through October 2002, to assess whether the Licensed Operator Requalification Training (LORT) program had addressed operator performance deficiencies noted at the plant.

b. Findings

No findings of significance were identified.

.2 Licensee Requalification Examinations

a. Inspection Scope

The inspectors performed a biennial inspection of the licensee's LORT program. The inspectors reviewed the annual requalification operating and written examination material to evaluate general quality, construction, and difficulty level. The operating portion of the examination was inspected during October 28-29, 2002. The operating examination material consisted of two dynamic simulator scenarios and seven job performance measures (JPMs). The biennial written examination was administered on October 30, 2002, and consisted of 35 open reference, multiple choice questions. The

written examination was organized into two parts, Part A and Part B. Part A used the static simulator as an open reference instrument. Part B was an open reference examination on administrative controls and procedural limits. The inspectors reviewed the methodology for developing the examinations, including the LORT program 2 year sample plan, probabilistic risk assessment insights, previously identified operator performance deficiencies, and plant modifications. The inspectors reviewed the licensee's program and assessed the level of examination material duplication during the current year annual examinations as compared to the previous year's annual examinations. The inspectors also interviewed members of the licensee's management, operations, and training staff and discussed various aspects of the examination development.

b. Findings

No findings of significance were identified.

.3 Licensee Administration of Requalification Examinations

a. Inspection Scope

The inspectors observed the administration of the requalification operating test to two operating crews to assess the licensee's effectiveness in conducting the test and to assess the facility evaluators' ability to determine adequate performance using objective and measurable performance standards. The inspectors evaluated the performance of two operating shift crews in parallel with the facility evaluators during four dynamic simulator scenarios. In addition, the inspectors observed licensee evaluators administer five JPMs to ten licensed operators (two operating crews). The inspectors observed the training staff personnel administer the operating test, including pre-examination briefings, observations of operator performance, individual and crew evaluations after dynamic scenarios, and techniques for JPM cuing. The inspectors evaluated the ability of the simulator to support the examinations. A specific evaluation of simulator performance was conducted and documented under Section 1R11.7, "Conformance With Simulator Requirements Specified in 10 CFR 55.46," of this report. The inspectors also reviewed the licensee's overall examination security program.

b. Findings

No findings of significance were identified.

.4 Licensee Training Feedback System

a. Inspection Scope

The inspectors assessed the methods and effectiveness of the licensee's processes for revising and maintaining its LORT program up to date, including the use of feedback from plant events and industry experience information. The inspectors interviewed licensee personnel (operators, instructors, training management, and operations management) and reviewed the applicable licensee's procedures. In addition, the

inspectors reviewed the licensee's quality assurance/quality control oversight activities, including licensee's training and operations department self-assessment reports, to evaluate the licensee's ability to assess the effectiveness of its LORT program and to implement appropriate corrective actions.

b. Findings

No findings of significance were identified.

.5 Licensee Remedial Training Program

a. Inspection Scope

The inspectors assessed the adequacy and effectiveness of the remedial training conducted since the previous annual requalification examinations and the training planned for the current examination cycle to ensure that they addressed weaknesses in licensed operator or crew performance identified during training and plant operations. The inspectors reviewed remedial training procedures and individual remedial training plans, and interviewed licensee personnel (operators, instructors, and training management). In addition, the inspectors reviewed the licensee's previous NRC annual examination cycle remediation packages for unsatisfactory operator performance on the operating test to ensure that remediation and subsequent re-evaluations were completed prior to returning individuals to licensed duties.

b. Findings

No findings of significance were identified.

.6 Conformance With Operator License Conditions

a. Inspection Scope

The inspectors evaluated the facility and individual operator licensees' conformance with the requirements of 10 CFR Part 55. The inspectors reviewed the facility licensee's program for maintaining active operator licenses and to assess compliance with 10 CFR 55.53 (e) and (f). The inspectors reviewed the procedural guidance and the process for tracking on-shift hours for licensed operators and which control room positions were granted credit for maintaining active operator licenses. The inspectors also reviewed six licensed operators' medical records to assess compliance with medical standards delineated in ANSI/ANS-3.4-1983, "American National Standard Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants," and with 10 CFR 55.21 and 10 CFR 55.25. In addition, the inspectors reviewed the facility licensee's LORT program to assess compliance with the requalification program requirements as described by 10 CFR 55.59 (c).

b. Findings

The inspectors identified a potential violation of medical requirement regulations, 10 CFR 55.21, "Medical Examination," and 10 CFR 55.23, "Certification," in that the licensee's medical evaluations appeared to have questionable conditions that may be outside the criteria of ANSI/ANS-3.4-1983. The finding is greater than minor, but is unresolved pending completion of NRC physician's review into the medical conditions, subsequent NRC review, and completion of a significance determination.

On October 30, 2002, during review of six licensed operators' medical records, the inspectors identified conditions noted in the medical records that were not readily identifiable as meeting the ANSI/ANS-3.4-1983 requirements. Of the six records reviewed, the inspectors noted two questionable conditions associated with the type of medications being taken and abnormal electro-cardiogram (ECG) results.

ANSI/ANS-3.4-1983 states, in part, that the primary responsibility for assuring that qualified personnel are on duty rests with the facility licensee. In addition, the health requirements set forth within the standard provided the minimum necessary to determine that the physical condition and general health of the operators were not such as might cause operational errors endangering public health and safety. The specific health requirements and disqualifying conditions are described in Section 5.3, "Disqualifying Conditions," and Section 5.4, "Specific Minimum Capacities Required for Medical Qualifications," of the ANSI/ANS 3.4-1983 standard.

The inspectors identified medical examination records that appeared to indicate certain medical conditions for two operators may be questionably outside the ANSI/ANS-3.4-1983 standard. Based on the review of the information, the inspectors determined that further review by the NRC physician was necessary in order to resolve the questionable conditions noted in the operators' medical records.

The safety significance of this issue was potentially more than minor due to the possibility that licensed operators who may not be medically qualified were performing licensed duties that could potentially affect the health and safety of the public. Accordingly, an Unresolved Item (URI 050-331/02-07-01, Adequacy of Medical Examinations) was opened pending the NRC physician's review of the operators' medical records. In addition, the licensee has entered the added issue of neurological testing into its corrective action program and opened an Action Request AR 32776, to further evaluate the adequacy of its current practice for complying with Section 5.4.14, "Neurological," of ANSI/ANS-3.4-1983.

.7 Conformance With Simulator Requirements Specified in 10 CFR 55.46

a. Inspection Scope

The inspectors assessed the adequacy of the licensee's simulation facility (simulator) for use in operator licensing examinations and for satisfying experience requirements as prescribed in 10 CFR 55.46, "Simulation Facilities." The inspectors also reviewed a sample of simulator performance test records (i.e., transient tests, malfunction tests,

and reactor core performance tests), simulator work order records, and the process for ensuring continued assurance of simulator fidelity in accordance with 10 CFR 55.46. The inspectors reviewed and evaluated the discrepancy process to ensure that simulator fidelity was maintained. This was accomplished by a review of discrepancies noted during the inspection to ensure that they were entered into the licensee's corrective action system and by an evaluation to verify that the licensee adequately captured simulator problems and that corrective actions were performed and completed in a timely fashion commensurate with the safety significance of the item (prioritization scheme). Open simulator discrepancies were reviewed for importance relative to impact on 10 CFR 55.45 and 59 operator actions as well as nuclear and thermal hydraulic operating characteristics. Closed simulator discrepancies were reviewed for the last 12 months for timeliness of resolution.

The inspectors also reviewed the licensee's recent simulator core modeling performance testing to assess the adequacy of the simulator to replicate the actual reactor plant core's performance characteristics. Furthermore, the inspectors conducted interviews with members of the licensee's simulator configuration control group and completed the NRC Inspection Procedure (IP) 71111.11, Appendix C, checklist to evaluate whether or not the licensee's plant-referenced simulator was operating adequately as required by 10 CFR 55.46 (c) and (d).

b. Findings

The licensee is committed to operate and maintain the plant-referenced simulator in accordance with ANSI/ANS-3.5-1985, "American National Standard Nuclear Power Plant Simulators for Use In Operator Training." The inspectors identified an apparent violation of the simulator fidelity regulation, 10 CFR 55.46, in that the licensee's maintenance of simulator performance testing appeared to not comply with ANSI/ANS-3.5-1985. The finding is greater than minor, but is unresolved pending completion of the licensee's simulator testing and investigation, subsequent NRC review of the simulator testing data, and completion of a significance determination for this issue.

On October 31, 2002, the inspectors identified an issue concerning the potential failure to comply with 10 CFR 55.46. The issue concerned the adequacy of the licensee to conduct periodic simulator performance testing in accordance with 10 CFR 55.46(d)(1), "Continued Assurance of Simulator Fidelity."

Periodic Performance Testing

In accordance with regulation, 10 CFR 55.46 (d)(1), the licensee was required to periodically conduct simulator performance testing throughout the life of the simulator. The licensee is committed to ANSI/ANS-3.5-1985, in conducting these simulator performance tests. The ANSI/ANS-3.5-1985 standard required periodic testing under Sections 5.4.1, "Simulator Performance Testing," and 5.4.2, "Simulator Operability Testing." In Section 5.4.1, the licensee was required to conduct simulator performance testing if simulator design changes resulted in significant simulator configuration or performance variations. Also, in Section 5.4.2, the licensee was required to conduct

annually a verification of simulator performance against the steady state criteria of Section 4.1, “Steady State Operation,” and the transient criteria of, Section 4.2, “Transient Operation.” In accordance with Section 4.2, the licensee was required to conduct testing of the simulator to prove the capability of the simulator to perform correctly under the limiting cases of those evolutions identified in Section 3.1.1, “Normal Plant Evolutions,” and Section 3.1.2, “Plant Malfunctions.”

In respect to 10 CFR 55.46 (d)(1), the inspectors found apparent lapses in the licensee's conducted simulator performance testing. The inspectors identified that the licensee’s simulator testing procedure, Simulator Operating Instructions (SOI) No. 8.0, “Certification Testing,” Revision 6, specifically exempted the testing of two test items within Section 3.1.1 of the ANSI/ANS-3.5-1985 standard. The two test items in question were as follows: (1) Item No. 4, “Reactor trip followed by recovery to rated power; and (2) Item No. 9, “Core performance testing such as plant heat balance, determination of shutdown margin, and measurement of reactivity coefficients and control rod worth using permanently installed instrumentation.”

In addition, the inspectors noted that the previously conducted annual simulator performance test, was performed following the actual plant’s power uprate from 1658 to 1912 MW_{th} (Megawatts Thermal) in November 2001. The inspectors noted that the licensee specifically documented the fact that the annual simulator certification testing was completed at the original 1658 MW_{th}. Although the licensee adequately conducted the annual steady state simulator test, it appeared that the simulator change based on the power uprate resulted in significant simulator configuration or performance variations and therefore the simulator should have been tested based on the actual thermal power of 1912 MW_{th} rather than 1658 MW_{th}.

The safety significance of this issues is more than minor due to the apparent failure to meet the requirements of 10 CFR 55.46 with regard to assuring maintenance of the plant referenced simulator fidelity. Accordingly, an Unresolved Item (URI 050-331/02-07-02, Adequacy of the Plant-Referenced Simulator to Conform With Simulator Requirements Specified in 10 CFR 55.46) was opened pending further review by NRC of licensee’s simulator performance testing data and completion of a significance determination. The licensee entered this issue into their corrective action program as AR 33396, “Potential violation of simulator testing requirements.”

.8 Biennial Written Examination and Annual Operating Test Results

a. Inspection Scope

The inspectors reviewed the overall pass/fail results of individual written tests, JPM operating tests, and simulator operating tests (required to be given per 10 CFR 55.59(a)(2)) administered by the licensee during calender year 2002. The overall results were compared with the significance determination process in accordance with NRC Manual Chapter 0609I, “Operator Requalification Human Performance Significance Determination Process (SDP).”

b. Findings

No findings of significance were identified.

.9 Routine Requalification Program Observation

a. Inspection Scope

On October 15, 2002, the inspectors observed a training crew during an evaluated simulator scenario of Evaluated Scenario Guide (ESG) 12, and reviewed licensed operator performance in mitigating the consequences of events.

The inspectors evaluated crew performance in the areas of:

- 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.

The crew performance was compared to licensee management expectations and guidelines as presented in the following documents:

- Administrative Control Procedure (ACP) 110.1, “Conduct of Operations,” Revision 0;
- ACP 101.01, “Procedure Use and Adherence,” Revision 0; and,
- ACP 101.2, “Verification Process and SELF/PEER Checking Practices,” Revision 5.

The inspectors assessed whether the crew completed the critical tasks listed in the above guidelines. The inspectors also compared simulator configurations with actual control board configurations. For any weaknesses identified, the inspectors observed licensee evaluators to verify that they also noted the issues and discussed them in the end of the session critique.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (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 of Maintenance Rule category a(1):

- River Water System during the week of November 2, 2002

The inspectors evaluated the licensee's categorization of specific issues, including the evaluation of 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 the licensee's evaluation of plant risk, scheduling, configuration control, and performance of maintenance associated with planned and emergent work activities and 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 to verify that the licensee's planning, risk management tools, and the assessment and management of on-line risk was adequate.

The inspectors reviewed the licensee actions to address increased on-line risk during these periods, such as establishing compensatory actions, minimizing the duration of the activity, obtaining appropriate management approval, and informing appropriate plant staff, to verify that online risk was being appropriately managed during maintenance on risk-significant structures, systems, and components (SSCs). The following activities were reviewed:

- Maintenance risk assessment for work planned during the week of October 5, 2002.

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Nonroutine Plant Evolutions and Events (71111.14)

.1 Fire in the East Warehouse Break Room

a. Inspection Scope

The inspectors reviewed the circumstances surrounding the fire in the helper break room of the East Warehouse on November 24, 2002. The inspectors reviewed the licensee's apparent cause evaluation, applicable procedures, and the Action Requests (AR) generated to understand and resolve the details of this event. In particular, the inspectors reviewed the operators actions to verify that they were appropriate to the event and in accordance with procedures and training. The fire was identified when annunciators for the East Warehouse Sprinkler System and Electric Fire Pump Running were activated. The fire brigade was activated and the Palo Fire Department was called for assistance. The power was isolated by opening the associated breakers and the fire was extinguished. The cause of the fire was a food preparation appliance being left unattended while in the "On" position. The fire caused smoke and water damage to an extensive portion of the break room and electrician's shop.

b. Findings

No findings of significance were identified.

.2 Annual Evaluation of Licensee Event Reports (LERs)

a. Inspection Scope

The inspectors reviewed all LERs written during the 2002 calender year, focusing on those involving personnel response to non-routine conditions. Where applicable, the inspectors evaluated whether or not licensee personnel responded in accordance with applicable procedures and training.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors assessed the following operability evaluation:

•AR32828, "Temporary Modification 02-059 Seismic Qualification of Cable", during the week of October 5, 2002.

The inspectors reviewed the technical adequacy of the evaluation against the Technical Specification, UFSAR, and other design information; determined whether compensatory measures, if needed, were taken; and determined whether the evaluations were consistent with the requirements of the licensees ACP -114.5, “Action Request System;” Rev. 32.

b. Findings

Introduction

A finding of very low safety significance (Green) and an associated NCV of 10 CFR 50, Appendix B, Criterion V, related to failure to adequately evaluate the seismic qualification of the jumper cable around cell #53 of the “1D1" 125 Volts Direct Current (Vdc) battery and failure to follow ACP 1203.01 “Design Verification” procedure and were identified by the inspectors.

Description

On October 1, 2002, the licensee performed Temporary Modification #02-059 to install a jumper around cell #53 of the “1D1" 125Vdc battery. The inspectors examined the installed jumper cable and questioned the licensee on the seismic evaluation. After reviewing the issue, the licensee agreed that ACP 1203.01 “Design Verification” had not been followed and an appropriate seismic qualification of the 1D1 jumper cable had not been performed. The licensee performed an operability evaluation that was documented on Action Request (AR) 32828. The licensee also applied an intermediate strap to the jumper cable for additional seismic support. The inspectors determined that although the licensee’s seismic evaluation for the jumper was not adequate prior to the installation, the licensee was able to show operability of the 1D1 battery, therefore this finding was determined to be of very low safety significance.

Analysis

The inspectors reviewed this issue against the guidance contained in Appendix B, “Issue Dispositioning Screening,” of Inspection Manual Chapter (IMC) 0612, “Power Reactor Inspection Reports.” The inspectors concluded that the issue was more than minor since the finding had greater safety significance than a similar issue described in IMC 0612, Appendix E, Section 4.a. The licensee has placed jumpers on cells in the 1D1 battery twice in the last 18 months. The first jumper was performed in April 2001 in Corrective Work Order (CWO) A53520 which installed a jumper on cell #51 of 1D1 battery due to low voltage. The second jumper was performed in October 2002 for cell #53 of 1D1battery due to low voltage. The licensee failed to properly perform a seismic evaluation on both work orders for jumper cable installation, thereby routinely failing to perform the required engineering evaluation.

The inspectors reviewed this issue in accordance with Manual Chapter 0609, “Significance Determination Process (SDP)," Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations." The inspectors conducted this review utilizing the “SDP Phase 1 Screening Worksheet For IE [Initiating Events], MS

[Mitigating Systems], and B [Barrier Integrity] Cornerstones." The inspectors determined that the finding affected the Mitigation Systems Cornerstones and since the finding was a design deficiency that did not affect operability per Generic Letter 91-18, that the finding was screened as Green.

Enforcement

10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires that activities affecting quality be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions. The failure to properly perform an adequate seismic evaluation in accordance with ACP 1203.01 "Design Verification" procedure for the jumper of cell #53 on 1D1 battery was an example where the requirements of 10 CFR 50, Appendix B, Criterion V, were not met and was a violation. However, because of its low safety significance and because it was entered into the corrective action program, the NRC is treating this issue as a Non-Cited Violation (NCV) (NCV 50-331/02-07-03), in accordance with Section VI.A.1 of the NRC's Enforcement Policy. This issue was entered into the licensee's corrective action program as AR 32828.

Corrective actions taken for this violation included performing an operability evaluation and adding an intermediate strap, to provide additional safety margin, for the jumper cable for the duration of the temporary modification.

1R16 Operator Workarounds (OWA) (71111.16)

a. Inspection Scope

The inspectors performed a semiannual review of the cumulative effects of operator workarounds, during the weeks of October 19, 2002 and November 16, 2002. The inspectors reviewed the cumulative effects of workarounds on the reliability, availability, and potential for improper operation of the system. Additionally, reviews were conducted to determine if the workarounds 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.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

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

•CWO A60837; Relay C71A-K010H found deenergized; during the week of October 26, 2002

•CWO A6038;Oil is backing up in the System and misting out the Outboard Bearing; during the week of December 7, 2002

The inspectors witnessed the test or reviewed the test data to verify 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, Technical Specification (TS) applicability, system restoration, and evaluation of test data. Also, the inspectors reviewed the maintenance and post-maintenance testing activities to ensure that the equipment met the licensing basis and Updated Final Safety Analysis Report (UFSAR) design requirements.

b. Findings

Introduction

A finding of very low safety significance (Green) and an associated NCV of 10 CFR 50, Appendix B, Criterion V, related to an inadequate corrective maintenance procedure that was used to drain and fill the Reactor Core Isolation Cooling (RCIC) Lubricating Oil System were identified by the inspectors.

Description

During the week of December 7, 2002, the inspectors reviewed the performance of CWO A60308, “Oil is backing up in the system and misting out the Outboard Bearing” on RCIC to evaluate the adequacy of the procedure and the associated post maintenance testing. The RCIC Limiting Condition of Operation (LCO) was entered on August 19, 2002 for planned maintenance that would take two days. On August 21, 2002, RCIC failed post maintenance testing when level in the inboard bearing sight glass level went low and oil was observed leaking out of the outboard bearing during the pump run. It was also noted at that time that only 3½ gallons of oil were put back into the system after 5 gallons had been removed. The licensee wrote AR 32234, “RCIC Lube Oil unable to be filled completely after maintenance” to document the discrepancy. The problem was identified as air entrainment in the RCIC lubricating oil system. The air entrainment issue was corrected and the post maintenance testing for RCIC was satisfactorily completed on September 9, 2002. The review of the issue showed that operating experience was not properly utilized to ensure that the procedure was adequate to perform the task. The information in the operating experience data indicated that a detailed procedure should have been utilized for the oil drain and refill of the RCIC lubricating system due to potential air entrainment that could cause equipment damage and impact operability. The RCIC system’s unavailability was extended from a scheduled 2 days to 17 days due to the inadequate procedure. This finding was determined to be of very low safety significance. High Pressure Coolant Injection (HPCI)

was always available and the Technical Specification (TS) Allowed Outage Time (AOT) was not exceeded.

Analysis

The inspectors reviewed this issue against the guidance contained in Appendix B, "Issue Dispositioning Screening," of IMC 0612, "Power Reactor Inspection Reports." The inspectors determined that finding affected the mitigating system attribute of equipment performance by increasing the unavailability. This safety significance was attributed to the fact that the inadequate procedure resulted in a loss of availability of RCIC.

The failure of CWO A6038, "Oil is backing up in the System and misting out the Outboard Bearing," to provide an adequate procedure to drain and fill the RCIC lubricating oil system resulted in additional unavailability of RCIC, warranting further review in accordance with IMC 0609, "Significance Determination Process (SDP)." The inspectors conducted this review utilizing the "SDP Phase 1 Screening Worksheet For IE [Initiating Events], MS [Mitigating Systems], and B [Barrier Integrity] Cornerstones." The inspectors determined that the finding affected the Mitigation Systems Cornerstones; however, since the loss of RCIC did not exceed the TS Allowed Outage Time (AOT), that the finding was screened as Green.

Enforcement

10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires in part that activities affecting quality be prescribed by procedures of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions.

The failure to have an appropriate procedure to drain and fill the RCIC lubricating oil system was an example where the requirements of 10 CFR 50, Appendix B, Criterion V, were not met and was a violation. However, because of its low safety significance and because it was entered into the corrective action program, the NRC is treating this issue as a Non-Cited Violation (NCV 50-331/02-07-04), in accordance with Section VI.A.1 of the NRC's Enforcement Policy. This issue was entered into the licensee's corrective action program as AR 32350.

Corrective actions taken for this violation included the development of an organizational procedure for complex troubleshooting, the development of an effective process for evaluating system related operating experience, and system engineering training.

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.

- Surveillance Test Procedure (STP) 3.8.1-04; Standby Diesel Generators Operability Test; Revision 10; during the week of October 26, 2002.

- STP 3.5.3-02; RCIC System Operability Test; Revision 12; during the week of November 16, 2002.

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.

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

a. Inspection Scope

The inspector reviewed the following revisions to portions of the Duane Arnold Energy Center's Emergency Plan and the associated Emergency Action Level (EAL) Technical Bases document to determine whether changes identified reduced the effectiveness of the licensee's emergency planning, pending onsite inspection of the implementation of these changes:

Revision 21 to Section A and Appendix 6 of the Plan;
Revision 22 to Section H of the Plan;
Revision 23 to Section B of the Plan;
Revision 2 to the Organization Section of the EAL Technical Bases;
Revision 4 to Sections A and H of the EAL Technical Bases; and
Revisions 3 and 4 to Section S of the EAL Technical Bases.

b. Findings

No findings of significance were identified.

1EP6 Emergency Preparedness Drill Evaluation (71114.06)

a. Inspection Scope

On October 23, 2002 the inspectors observed an operating crew participate in an emergency preparedness simulator drill. The inspectors monitored the operations crew respond to a loss of the "B" emergency diesel generator, failure of a river water supply valve, feedwater control problems, failure of control rods to rapidly insert (scram), and eventual fuel failure and an off-site radiation release. The monitoring activities were performed to verify that appropriate actions were taken by the operators, the proper

emergency procedures were implemented, and that the crew made the proper emergency classifications in a timely manner. The inspectors also attended the licensee's critique to verify that personnel adequately evaluated the crew's emergency plan implementation.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety (OS)

2OS1 Access Control to Radiologically Significant Areas (71121.01)

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

a. Inspection Scope

The inspectors conducted walkdowns of the radiologically protected area to verify the adequacy of radiological area boundaries and postings. Specifically, the inspectors walked down radiologically significant work area boundaries (radiation, high and locked high radiation areas) in the Reactor Building, Radwaste Building, and the Turbine Building (interior and exterior). The inspectors 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 TS. The inspectors also examined the radiological conditions of work areas within those radiation and high radiation areas to assess contamination controls. Additionally, the inspectors reviewed radiation work permits (RWPs) for general tours, access to high radiation areas (HRAs), inspection/repair of demineralizers, transferring of condensate resin to a high integrity container (HIC), and subsequent HIC de-watering operations. The RWPs were evaluated for protective clothing requirements, respiratory protection concerns, electronic dosimetry alarm setpoints, use of remote telemetry dosimetry, radiation protection (RP) hold points, and As-Low-As-Is-Reasonably-Achievable (ALARA) considerations, to verify that work instructions and controls had been adequately specified and that electronic dosimeter set points were in conformity with survey indications. The inspectors also reviewed the licensee's dosimetry procedures and practices which included the use of multiple dosimetry for work in high radiation areas having significant dose gradients, use of extremity monitoring, and alternate dosimetry placement when necessary.

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 inspectors observed the following radiologically significant work activities performed during the inspection and evaluated the licensee's use of radiological controls:

- Transferring condensate resin to a HIC; and
- De-watering operations for the HIC.

The inspectors reviewed the pre-job briefing package for the work evolution, reviewed the radiological requirements for the activity, and assessed the licensee's performance with respect to those requirements. The inspectors reviewed survey records, including radiation, contamination, and airborne surveys, to verify that appropriate radiological controls were effectively utilized. The inspectors also reviewed in-process surveys and applicable postings and barricades to verify their accuracy. The inspectors observed radiation protection technician (RPT) 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 and 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 inspectors reviewed licensee ARs written since the last assessment (April 2002) 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 inspectors also reviewed the 2nd and 3rd Quarter 2002 Action Request Radiological Occurrence Trend Reports. The inspectors reviewed these documents to assess the licensee's ability to identify repetitive problems, contributing causes, and the extent of conditions, and implement corrective actions to achieve lasting results.

b. Findings

No findings of significance were identified.

2OS2 As-Low-As-Is-Reasonably-Achievable (ALARA) Planning and Controls (71121.02)

.1 ALARA Planning

a. Inspection Scope

The inspectors examined the station's procedures for radiological work/ALARA planning and scheduling and evaluated the dose projection methodologies and practices implemented for Calender Year (CY) 2002, to verify that sound technical bases for dose estimates existed. The inspectors reviewed the station's collective exposure histories from 1990 to the present, current exposure trends from ongoing plant operations, and completed radiological work activities for CY 2002 to assess current performance and radiation exposure challenges. The inspectors selected a number of CY 2002 high exposure or high radiation area work activities and evaluated the ALARA plans and the licensee's use of ALARA controls for each activity. Additionally, the inspectors reviewed a representative sampling of radiologically significant RWP/ALARA planning packages to verify that adequate person-hour estimates, job history files, lessons learned, and industry experiences were utilized in the ALARA planning process. As part of the reviews of the planning packages, the inspectors reviewed Total Effective Dose Equivalent (TEDE) ALARA evaluations developed for: (1) decontamination of RCIC valve pit; (2) hydrolazing of floor drains; and (3) Reactor Water Clean-Up (RWCU) demineralizer work. The inspectors examined the TEDE ALARA evaluations to assess the licensee's analysis for the potential use of respiratory protection equipment and to verify the adequacy of the licensee's internal dose assessment processes/program for the aforementioned work evolutions.

b. Findings

No findings of significance were identified.

.2 Radiological Work Planning and ALARA Implementation

a. Inspection Scope

The inspectors selected the following CY 2002 work activities that were of highest exposure significance, or were otherwise conducted in the drywell, and assessed the adequacy of the radiological controls and work planning:

- Intermediate and Source Range Monitor Removal Forced Outage; and
- Fuel Test Pin Shipment.

The inspectors reviewed the RWPs and the ALARA reviews developed for each of the aforementioned jobs. The inspector examined the radiological engineering controls and other dose mitigation techniques specified in these documents and reviewed job dose history files to verify that licensee and industry lessons learned were adequately integrated into each work package. The inspectors reviewed the exposure results for the selected activities to evaluate the accuracy of exposure estimates in the ALARA plan.

b. Findings

No findings of significance were identified.

.3 Verification of Exposure Goals and Exposure Tracking System

a. Inspection Scope

The inspectors evaluated the licensee's effectiveness in exposure tracking for CY 2002 to verify that the licensee could identify problems with its collective exposure and take actions to address them. The inspectors reviewed the exposure history for each activity to determine if management had monitored the exposure status, if in-progress ALARA job reviews were properly performed, if additional engineering/dose controls had been established, and if required corrective documents had been generated. The inspectors compared exposure estimates, exposure goals, job dose rates, and person-hour estimates for consistency to verify that the licensee could project, and thus better control radiation exposure. The inspectors examined job dose history files and dose reductions anticipated through the licensee's implementation of lessons learned to verify that the licensee could accurately forecast yearly exposure dose goals. The inspectors examined the actual CY 2002 radiation dose exposure data to date (i.e., ≈35 person-REM versus the projected dose ≈40 person-REM).

b. Findings

No findings of significance were identified.

.4 Job Site Inspections, Radiation Worker Performance, and ALARA Controls

a. Inspection Scope

The inspectors observed work activities in the radiologically controlled areas that were performed in radiation areas, HRAs, and locked HRAs to evaluate the use of ALARA controls. Specifically, the inspectors reviewed the adequacy of RWPs, radiological surveys and pre-job radiological briefings packages and assessed job site ALARA controls, in part, for the following work activities:

- Inspect/Repair Demineralizer on Reactor Building 833' Level; and
- Condensate Resin Transfer to HIC.

The inspectors examined worker instruction requirements which included protective clothing, engineering controls to minimize dose exposures, the use of predetermined low dose waiting areas, and the on-the-job supervision by the work crew leaders to verify that the licensee had maintained the radiological exposure for these work activities ALARA. The inspectors evaluated RPT performance for each of the aforementioned work evolutions, and observed and questioned workers at each job location, to verify that they had adequate knowledge of radiological work conditions and exposure controls. Enhanced job controls including RPT use of electronic teledosimetry and remotely

monitored cameras were also evaluated to assess the licensee's ability to maintain real time doses ALARA in the field.

b. Findings

No findings of significance were identified.

.5 Source Term Reduction and Control

a. Inspection Scope

The inspectors evaluated the licensee's source term reduction program to verify that the licensee had an effective program in place, was knowledgeable of plant source term reduction opportunities, and that efforts were being taken to address them. Work control mechanisms for CY 2002 were evaluated to ensure that source term reduction plans had been appropriately implemented.

b. Findings

No findings of significance were identified.

.6 Declared Pregnant Workers

a. Inspection Scope

The inspectors reviewed the controls implemented by the licensee for two workers who voluntarily declared a pregnancy during CY 2002. The inspectors reviewed the licensee's adherence to the requirements contained in 10 CFR 20.1208 and station procedures, and reviewed the licensee's evaluation of the dose to the worker's embryos/fetus. Specifically, the inspectors examined the licensee's program to ensure that the declared pregnant worker's monthly and cumulative exposure limits for the gestation period were established so as not to exceed regulatory limits.

b. Findings

No findings of significance were identified.

.7 Identification and Resolution of Problems

a. Inspection Scope

The inspectors examined the "2002 Radioactive Materials Shipment Post-Job Narrative Summary" prepared by the licensee which detailed the dispositioning of three spent fuel pins from the spent fuel pool to an off-site vendor. The inspectors reviewed lessons learned from the Forced Outage 02-4. The inspectors reviewed Nuclear Oversight Department field observations and licensee generated ARs which focused on ALARA planning and controls. Additionally, the inspectors reviewed the licensees CY 2002 Radiation Protection Summary self-assessment. The inspectors evaluated the

effectiveness of the licensee's problem identification and resolution program to verify that the licensee could adequately identify individual problems/trends, determine contributing causes, extent of conditions, and develop corrective actions to achieve lasting results.

b. Findings

No findings of significance were identified.

2OS3 Radiation Monitoring Instrumentation and Protective Equipment (71121.03)

.1 Self-Contained Breathing Apparatus (SCBA) Program

a. Inspection Scope

The inspectors reviewed the licensee's respiratory protection program for compliance with the requirements of Subpart H of 10 CFR Part 20. The inspectors performed walkdowns of the SCBA storage locations and inspected a sampling of the units to verify the material condition of the protective equipment, to ensure that it was properly maintained and stored, and to ensure that SCBAs were properly staged and ready for use. The inspectors evaluated the licensee's capability to refill and transport SCBA air bottles throughout the plant, in the event of an emergency response. The inspectors examined the licensee's shiftly crew staffing (i.e., control room as well as other key emergency response personnel) of SCBA qualified personnel to verify an adequate number of plant personnel could respond in the event of an emergency. The inspectors reviewed the manufacturer-certified training/qualification of personnel allowed to perform maintenance and repairs on SCBA components vital to the unit's function. The inspectors assessed maintenance procedures governing vital component work and periodic air cylinder hydrostatic testing documentation to verify consistency between licensee procedures and SCBA manufacturer's recommended practices. The inspectors reviewed the CY 2002 monthly testing records for SCBAs located in various areas within the site. Specifically, the inspectors reviewed the licensee's current SCBA training and qualification records to verify that control room personnel, fire brigade staff, and other key emergency response organization personnel were properly equipped with necessary protective equipment, currently trained, and qualified for SCBA use (including personal bottle change-out), as required by the Code of Federal Regulations, the licensee's Emergency Plan, UFSAR, and plant procedures.

b. Findings

Introduction

The inspectors identified a Green finding and an associated Non-Cited Violation (NCV) for failing to provide for vision correction, as required by Subpart H of 10 CFR 20, when selecting respiratory protective equipment for emergency response staff.

Description

On November 6, 2002, during an interview with a licensee self-contained breathing apparatus (SCBA) instructor, the inspectors identified that the licensee was not providing vision correction lenses for all eyeglass wearing personnel (i.e., non-soft contact wearers) that were on the licensee's emergency response roster and were SCBA qualified. The licensee had provided, upon voluntary request, the respirator corrective lens kits (a.k.a. spectacle adapter kits) to Licensed Operators, Reactor Operations crews, Radiation Protection Technicians, and other station staff that were key emergency responders. The spectacle kits provide for proper vision correction while the employee is wearing the SCBA.

Approximately 10 percent of key (potential first responders) emergency response organization staff that were qualified for SCBA use (e.g., licensed operator reactor operations staff, electricians, and instrumentation technicians) and that wore standard eyeglasses, were not provided vision correction.

Analysis

This failure represented a performance deficiency associated with the Emergency Preparedness Cornerstone attribute for providing equipment necessary to protect personnel in the event of a radiological emergency. Specifically, emergency preparedness Planning Standards (PS) in 10 CFR 50.47(b)(10) and 50.47(b)(11) require the protection of emergency workers from radiological exposure (i.e., those that would respond in the event of a radiological emergency), which includes the equipment necessary for personnel protection. The consequences of some of the emergency responders having inadequate vision would challenge the licensee's state of operational readiness and emergency response capabilities. Consequently, the performance deficiency adversely affects the cornerstone objective to protect the health and safety of the emergency workers.

Since the issue affects the cornerstone objective, it represents a finding that is more than minor and which was evaluated using the Emergency Preparedness Significance Determination Process contained in Appendix B to Manual Chapter 0609. Since the finding involved a failure to meet a regulatory requirement (respiratory protection) but did not represent a failure to meet the planning standards of 10 CFR 50.47(b) or those of Appendix E to 10 CFR Part 50, the finding was determined to be of very low safety significance (Green).

Enforcement

10 CFR 20.1703(e) requires that the licensee shall provide for vision correction when selecting respiratory protective equipment. However, the licensee failed to provide spectacle adapter kits for all eyeglass wearers (i.e., non-soft contact wearers) that were key emergency response organization personnel and that were SCBA qualified, in order to fulfill emergency response functions. However, since the licensee documented this issue in its corrective action program (AR #33392) and because the violation is of very

low safety significance, it is being treated as a Non-Cited Violation (NCV 50-331/02-07-05).

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, and Occupational Radiation Safety

.1 Initiating Events, Mitigating Systems and Barrier Integrity Performance Indicator Verification

a. Inspection Scope

The inspectors reviewed Licensee Event Reports (LERs), licensee memoranda, plant logs, and NRC inspection reports to verify the following performance indicators through the 2nd quarter of 2002.

- Safety System Unavailability, Residual Heat Removal (RHR) System, during the week of October 12, 2002.

The inspectors verified that the licensee accurately reported performance as defined by the applicable revision of Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline."

b. Findings

No findings of significance were identified.

.2 Occupational Exposure Control Effectiveness

a. Inspection Scope

The inspectors reviewed the licensee's determination of the Performance Indicator (PI) for the occupational radiation safety cornerstone (Occupational Exposure Control Effectiveness) to verify that the licensee accurately determined this performance indicator and had identified all occurrences relative to the indicator. The accuracy and completeness of the data was assessed against the criteria specified in Nuclear Energy Institute 99-02, Revision 1 and 2, "Regulatory Assessment Performance Indicator Guideline." Specifically, the inspectors reviewed the licensee's ARs for CY 2002 and Quarterly Radiological Occurrence Trend Reports (i.e., 1st, 2nd, and 3rd Quarters of 2002) to ensure that there were no PI occurrences that were not identified by the licensee. The inspectors interviewed members of the licensee's staff who were responsible for performance indicator data acquisition, verification, and reporting to verify that their review and assessment of the data was adequate. Additionally, as part of plant walkdowns (Section 2OS1.1), the inspectors selectively examined the adequacy of

posting and controls for locked HRAs to verify the current Occupational Exposure Control Effectiveness performance indicator.

4OA2 Identification and Resolution of Problems (71152)

The inspectors selected the issues identified below for additional review.

In conducting the review, the inspectors considered the nature and significance of the issue with respect to safety, risk, and licensee corrective action procedural requirements. Attributes considered during the review of licensee actions included complete and accurate identification of the problem; timeliness was commensurate with the safety significance; evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent of condition reviews, and previous occurrence reviews were proper and adequate; and that the classification, prioritization, focus, and timeliness of corrective actions.

.1 AR 32350: Greater than 50% of the allowable RCIC LCO (14 days) has been exceeded

a. Introduction

The inspectors selected the corrective actions associated with the August 19, 2002, air entrainment of the RCIC lubricating oil system event for a more in-depth review.

b. Effectiveness of Problem Identification

(1) Inspection Scope

The inspectors evaluated whether the licensee's identification of the problems were complete, accurate, and timely, and that the consideration of extent of condition review, generic implications, common cause and previous occurrences was adequate.

(2) Issues

As discussed in Section 1R19 of this report, the licensee determined that the event was caused by excessive air entrainment into the RCIC lubricating oil system. After RCIC failed the post maintenance test on August 21, 2002, the licensee commenced troubleshooting. Several AR's were written to capture problems throughout the process. Various modifications were made during the troubleshooting process. The modifications included adding vents to the inboard bearing, outboard bearing, and drain line; the diameter of the drain line was increased to 1½ inches; and the equalizing line was replaced with the pump taking suction from the bottom of the pipe. RCIC was restored to service on September 9, 2002. The scheduled 2 day maintenance activity lasted for 21 days. The licensee wrote AR 32350 which performed a root cause to address the issue. The root cause identified that operating experience was not properly utilized during the process.

A review of the operating experience showed that various recommended design improvements to prevent air entrainment into the system had not been implemented.

The information contained in NRC Information Notice 94-84 regarding air entrainment issues had not been integrated into the licensee's procedures or system including increasing the diameter of the drain line to 1½ inches and adding a vent on the drain line. These were two of the modifications that were made by the licensee to fix the air entrainment issue. The operating experience information also showed that procedures providing detailed guidance for refilling the RCIC oil system had to be used to prevent air entrainment. The inadequate procedure used to refill the oil resulted in an increased inoperability and unavailability of RCIC.

The licensee developed a plan to prevent further occurrences. AR 32940 was written to develop a process to distribute, screen, and use system related operating experience to prevent further occurrences. AR 32680 was written to develop and implement a formal troubleshooting procedure.

.2 AR 32762: While Performing Control Rod Drive (CRD) Exercise Surveillance Test Procedure (STP), Control Rod 26-31 Was Inadvertently Withdrawn From Position 14 to Position 16

a. Introduction

The inspectors selected the corrective actions associated with the September 27, 2002 control rod mispositioning.

b. Effectiveness of Problem Identification

(1) Inspection Scope

The inspectors evaluated whether the licensee's identification of the problem was complete, accurate, and timely, and that the consideration of extent of condition, generic implications, common cause and previous occurrences was adequate.

(2) Issues

The inspectors reviewed the licensee's corrective actions to address inadequate self checking/peer checking by the operations department during the performance of the STP 3.1.3-01, Rev. 4, "CRD Exercise". The procedure contains steps to satisfy three different Technical Specification surveillance requirements. Surveillance requirement 3.1.3.2 requires the licensee to demonstrate the capability to insert each fully withdrawn rod every 7 days. Surveillance requirement 3.1.3.3 requires a similar demonstration every 31 days for partially withdrawn rods. Surveillance requirement 3.1.3.5 requires a coupling check for rods withdrawn to the full out position, and is done in conjunction with surveillance requirement 3.1.3.2.

Plant staff were performing surveillance requirement 3.1.3.3 for partially withdrawn rods, and the operator inserted the control rod from position 14 to position 12 after confirmation with the peer checker. Subsequently, the operator withdrew the control rod back to position 14, again with peer checker confirmation. At this point, the operator, apparently forgetting that he was performing a partially withdrawn control rod surveillance

requirement, initiated a continuous out signal for the rod, without receiving peer checker confirmation to do so. The operator and peer checker immediately recognized the error, and the rod settled after only traveling one extra notch to position 16. After immediate notification to the Operations Shift Supervisor and Operations Shift Manager, plant staff entered the appropriate abnormal operating procedure and returned the rod to position 14. Core power increased by 10 Megawatts Thermal (MWth), but no adverse consequences resulted from this error. The remainder of the STP was completed without incident.

The corrective actions consisted of crew briefs to reiterate the importance of self and peer checking during control rod movements and a procedure revision to separate out the actions for partially and fully withdrawn control rods. To address the extent of condition of the problem, plant staff reviewed the internal AR database and Operating Experience for similar events, to look at common factors for rod mispositioning events.

4OA3 Event Follow-up (71153)

Cornerstones: Mitigating Systems

.1 (Closed) Licensee Event Report (LER) 50-331/2002-002-00: "Technical Specification Required Shutdown Due to Residual Heat Removal Service Water (RHRSW) Strainer Plugging Caused by Algae Intrusion from the Cedar River"

On August 5, 2002, with one loop of RHRSW already inoperable, the other redundant loop was declared inoperable and a plant shutdown was initiated and completed in accordance with the plant's Technical Specifications. The event was caused by the introduction and accumulation of large amounts of bryozoa from the Cedar River which caused the RHRSW Strainers to become clogged. The clogging of the strainers resulted in the strainers being inoperable and, per plant procedures, required the RHRSW loops to be declared inoperable. The safety significance of the event was minimal, since the RHRSW loops were able to achieve TS required flow rates and procedural steps were in place to bypass the strainers had the need arisen. Corrective actions included the cleaning of the strainers, chemical treatment of the incoming river water, and inspections and cleaning of service water pits. The LER was reviewed by the inspectors and no additional findings beyond those documented in Inspection Report 50-331/2002006 were identified. This issue was entered into the licensee's corrective action program as AR 32127. This LER is closed.

.2 (Closed) LER 50-331/2002-003-00: "Technical Specification Required Shutdown Due to Reactor Core Isolation Cooling (RCIC) Inoperability Caused by Air Entrainment in the RCIC Oil System"

On August 19, 2002, the RCIC System was declared inoperable for two days of planned maintenance. The RCIC system operability testing failed on August 21, 2002 due to air entrainment in the lube oil system. Troubleshooting activities continued for the next 12 days on the RCIC lube oil system. The plant was subsequently shut down to investigate drywell leakage on August 29, 2002, while troubleshooting the RCIC air entrainment issue. Various modifications were made to the RCIC lube oil system that

reduced and provided release points for the entrained air during the troubleshooting activities. On September 9, 2002, RCIC system testing was performed satisfactorily and the Technical Specification was exited. The safety significance of the event was minimal, since the HPCI was always available. Corrective Actions included the various modifications on the lube oil system, developing a process for the distribution of operational experience, and the development of a systematic troubleshooting procedure. The LER was reviewed by the inspectors and no findings of significance were identified. This issue was entered into the licensee's corrective action program as Action Request (AR) 32234. This LER is closed.

4OA4 Cross-Cutting Issues

.1 A finding described in Section 1R15 of this report had, as its primary cause, a human performance deficiency, in that, the licensee failed to perform an adequate seismic evaluation in accordance with ACP 1203.01 "Design Verification."

.2 A finding described in Section 1R19 of this report had, as its primary cause, a human performance deficiency, in that, the licensee failed to adequately plan a maintenance work order to fill and vent the RCIC lubricating oil system.

4OA5 Other Activities

.1 Completion of Appendix A to TI 2515/148, Rev 1

The inspectors completed the pre-inspection audit for interim compensatory measures at nuclear power plants, dated September 13, 2002.

4OA6 Meetings

.1 Exit Meeting

The inspectors presented the inspection results to Mr. J. Bjorseth and other members of licensee management at the conclusion of the inspection on January 6, 2003. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

.2 Interim Exit Meetings

Interim exits were conducted for:

- Temporary Instruction 2515/145 with Mr. **????** on , 2002.
- Results of an Inspection of the Licensee's Licensed Operator Requalification Program with Mr. M. Peifer on November 1, 2002; subsequent telephone exit with Mr. P. Hansen on November 27, 2002 and with Mr. G. Fuller on December 19, 2002.
- Radiation Protection inspection with Mr. G. Pry on November 8, 2002.

4OA7 Licensee-Identified Violations

The following violation of very low significance was identified by the licensee and is a violation of NRC requirements which meets the criteria of Section VI of the NRC Enforcement Manual, NUREG-1600, for being dispositioned as NCVs.

Cornerstone: Mitigating Systems

10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires that activities affecting quality be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions. On December 3, 2002, licensee personnel identified that HPCI Pressure Setpoint Valve (PSV)-2223 was not tested in accordance with approved written procedure STP NS590006. The Relief Valve was tested with water instead of air which was the required media. The failure to perform the step in accordance with the procedure resulted in a failure to obtain concurrent pressure lift settings and resulted in additional unplanned unavailability of HPCI. This issue was entered into the licensee's corrective action program as AR 33735. Since the allowed outage time was not exceeded and RCIC was always available, this violation is not more than of very low safety significance, and is being treated as a Non-Cited Violation (50-331/02-07-06).

KEY POINTS OF CONTACT

Licensee
M. Peifer, Site Vice-President Nuclear
J. Bjorseth, Plant Manager
D. Curtland, Training Manager
T. Evans, Manager, Engineering
P. Hansen, Operations Manager
B. Kindred, Security Manager
S. Nelson, Manager, Radiation Protection
K. Putnam, Licensing Manager
W. Simmons, Maintenance Manager
D. Wheeler, Chemistry Manager

Nuclear Regulatory Commission
D. Hood, Project Manager, NRR
B. Burgess, Chief, Reactor Projects Branch 2

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-331-2002-007-01	URI	Adequacy of Medical Examination for Licensed Operators
50-331-2002-007-02	URI	Adequacy of Plant Referenced Simulator to conform with 10 CFR 55.46
50-331/2002-007-03	NCV	Inadequate Seismic Evaluation on 1D1 Cell #53 Battery Jumper
50-331/2002-007-04	NCV	Inadequate RCIC Troubleshooting Procedure
50-331/2002-007-05	NCV	Failure to provide vision correction for respirator users
50-331/2002-007-06	NCV	HPCI Pressure Relief Valve PSV-2223 Testing Error

Closed

50-331/2002-007-03	NCV	Inadequate Seismic evaluation on 1D1 Cell #53 Battery Jumper
50-331/2002-007-04	NCV	Inadequate RCIC Troubleshooting Procedure
50-331/2002-007-05	NCV	Failure to provide vision correction for respirator users
50-331/2002-007-06	NCV	HPCI Pressure Relief Valve PSV-2223 Testing Error
50-331/2002-002-00	LER	Technical Specification Required Shutdown Due to Residual Heat Removal Service Water (RHRSW) Strainer Plugging Caused by Algae Intrusion from the Cedar River
50-331/2002-003-00	LER	Technical Specification Required Shutdown Due to Reactor Core Isolation Cooling (RCIC) Inoperability Caused by Air Entrainment in the RCIC Oil System

LIST OF ACRONYMS USED

ACP	Administrative Control Procedures
ADAMS	NRC's Document System
AFP	Area Fire Plan
ALARA	As Low As Reasonably Achievable
AOP	Abnormal Operating Procedures
AOT	Allowable Outage Time
AR	Action Request
ARM	Area Radiation Monitor
CAMS	Continuous Air Monitor
CRD	Control Rod Drive
CFR	Code of Federal Regulations
CS	Core Spray
CST	Condensate Storage Tank
CWO	Corrective Work Order
CY	Calender Year
DAEC	Duane Arnold Energy Center
DOT	Department of Transportation
DP	Differential Pressure
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
ECP	Engineering Change Package
EDG	Emergency Diesel Generator
ESG	Evaluated Scenario Guide
ESW	Emergency Service Water
GPM	Gallons Per Minute
HIC	High Integrity Container
HPCI	High Pressure Coolant Injection
HRA	High Radiation Area
HRCQ	Highway Route Controlled Quantity
HSAS	Homeland Security Advisory System
HVAC	Heating Ventilation and Air Conditioning
ICDP	Incremental Core Damage Probability
IMC	Inspection Manual Chapter
IPOI	Integrated Plant Operating Instruction
LER	Licensee Event Report
LCO	Limited Condition Of Operation
LPCI	Low Pressure Coolant Injection
MOV	Motor Operated Valve
Mwth	Megawatts Thermal
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
OI	Operating Instruction
OS	Occupational Radiation Safety
OWA	Operator Work Arounds
P&IDs	Piping and Instrumentation Drawings
PARS	Public Availability Records

LIST OF ACRONYMS USED (cont'd)

PDIC	Pressure Differential Input Controller
PI	Performance Indicator
PM	Preventive Maintenance
PWO	Preventive Work Order
PS	Public Radiation Safety
PSID	Pounds Per Square Inch Differential
PSV	Pressure Setpoint Valve
PTAT	Plant Transient Assessment Tree
Radwaste	Radioactive Waste
RB	Reactor Building
RCA	Radiologically Controlled Area
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
RIS	Regulatory Information Summary
ROP	Reactor Oversight Process
RP	Radiation Protection
RPT	Radiation Protection Technician
RWCU	Reactor Water Clean Up
RWP	Radiation Work Permit
SCBA	Self Contained Breathing Apparatus
SDC	Shutdown Cooling
SDP	Significance Determination Process
SER	Safeguard Event Report
SGI	Safeguards Information
SRA	Senior Reactor Analyst
SSCs	Structure, System, or Components
STP	Surveillance Test Procedure
TEDE	Total Effective Dose Equivalent
TMP	Temporary Modification Permit
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
VDC	Volts Direct Current
VOTES	Valve Operation Test and Evaluation System

LIST OF DOCUMENTS REVIEWED

1R01 Adverse Weather Protection
Abnormal Operating Procedure (AOP) 903; Tornado; Revision 12
Integrated Plant Operating Instruction (IPOI) 6; Cold Weather Operations; Revision 22
Operating Instruction (OI) 985; Plant Cathodic and Freeze Protection System; Revision 13
OI 985A1; Cathodic Protection System Electrical Lineup; Revision 0
OI 985A2; Freeze Protection System Electrical Lineup; Revision 3
OI 537; Condensate/Demin Service Water; Revision 32
OI 730; Control Building HVAC System; Revision 54
OI 734; Reactor Building HVAC System, Revision 34
OI 711; Pump House HVAC System; Revision 6

1R04 Equipment Alignment
P&ID BECH-M119, Residual Heat Removal System; Revision 76
P&ID BECH-M120, Residual Heat Removal System; Revision 58
OI 149, Residual Heat Removal System; Revision 78

1R05 Fire Protection
Fire Plan; Volume II - Fire Brigade Organization; Revision 32
AFP-23; Battery Rooms and Corridor; Revision 22
AFP-30; Pump House; Revision 23
AFP-29; Fire Pump; Revision 23
AFP-25; Cable Spreading Room; Revision 22
AFP-18; North Turbine Building Ground Floor; Revision 22
AFP-19; South Turbine Building Ground Floor; Revision 22
AFP-21; Turbine Building North Operating Deck; Revision 22

1R06 Flood Protection Measures
Individual Plant Examination Section 3.3.6;Internal Flooding Analysis; November 1992
AOP 902; Flood; Revision 19

1R11 Licensed Operator Requalification Program
ESG 12 Scenario Guide; Revision 1
EOP 3; Secondary Containment Control; Revision 15
EOP 1; Reactor Pressure Vessel Control; Revision 9
EOP 2; Primary Containment Control; Revision 9
ED; Emergency Depressurization; Revision 2
ALC; Alternate Level Control; Revision 2
EAL; Emergency Action List Table 1; Revision 2
ACP 110.1; Conduct of Operations; Revision 0
ACP 101.01; Procedure Use and Adherence; Revision 19
ACP 101.2; Verification Process and SELF/PEER Checking Practices; Revision 5

1R12 Maintenance Effectiveness

NEI 93-01; "Nuclear Energy Institute Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants; Revision 2
AR32669; “B” River Water Supply Pump did not meet ASME criteria; September 22, 2002
AR30956; “C” River Water Supply Pump did not meet minimum differential pressure; May 16, 2002
Maintenance Rule Data; River Water System; October 29, 2002

1R13 Maintenance Risk Assessments and Emergent Work Control

Online Look-Ahead Agenda; Week of October 05, 2002

1R14 Personnel Performance During Nonroutine Plant Evolutions and Events

AR33260; Fire in East Warehouse Helper Break Room; November 24, 2002
Fire Plan Volume I; Program; Revision 41
Fire Plan Volume II; Fire Brigade Organization; Revision 32
AFP 67; East Warehouse; Revision 0
Annunciator Response Procedure 1P49; Diesel Fire Pump Running; Revision 12
Annunciator Response Procedure 1P48; Electric Fire Pump Running; Revision 6
Annunciator Response Procedure 1P46; East Warehouse Sprinkler System Initiated; Revision 9
Abnormal Operating Procedure 913; Fire; Revision 30

1R15 Operability Evaluations

AR32828; Temporary Modification 02-059 Seismic Qualification of Cable; October 1, 2002
Dedication Package D2001-009; Battery Jumper Cable Dedication; January 11, 2002
ACP 1203.31; Design Verification; Revision 10
Corrective Work Order A60657; Jumper Low Voltage Cell #53 out of 1D1; September 30, 2002
Corrective Work Order A53520; Jumper Low Voltage Cell #51 out of 1D1; April 11, 2001
Battery-C173-01; Batteries; Revision 20

1R16 Operator Workarounds

AR32235; Provide Noise/EMI/RFI suppression to annunciators; August 21, 2002
AR28711; Replace Honeywell load controllers with Moore controllers for the Chillers; November 9, 2001
AR30778; Eliminate spurious alarms caused by cycling CV2436; April 29, 2002
AR32422; Revision of CRANE-GO82-01 Refueling Platform; September 5, 2002
AR32480; Steam Seal System unable to automatically control; September 10, 2002
AR26120; Seat Leakage; May 24, 2001
AR32757; Double notching control rods; September 27, 2002
AR27206; Main Condenser Mechanical Vacuum Pump; September 20, 2001

1R19 Post-Maintenance Testing

CWO A60837; Relay C71A-K010H found deenergized; October 19, 2002
CWO A6038;Oil is backing up in System and misting out the Outboard Bearing; August 23, 2002
AR 32234; RCIC Lube OIL unable to be completely filled after maintenance; August 21, 2002

1R22 Surveillance Testing

STP 3.8.1-04; Standby Diesel Generators Operability Test; Revision 10
STP 3.5.3-02; Reactor Core Isolation Cooling System Operability Test; Revision 12

1EP4 Emergency Action Level and Emergency Plan Changes

Duane Arnold Energy Center Emergency Plan; Revision 21 to Section A and Appendix 6, Revision 22 to Section H, and Revision 23 to Section B
Emergency Action Level Technical Bases Document; Revision 2 to the Organization Section, Revision 4 to Sections A and H, and Revisions 3 and 4 to Section S

1EP6 Drill Evaluation

EPIP 1.1; Emergency Plan Implementing Procedure; Revision 19
EAL; Determination of Emergency Action Levels; Revision 2
EOP1; RPV Control; Revision 9
ATWS; RPV Control; Revision 10
EOP2; Primary Containment Control; Revision 9

20S1 Access Control to Radiologically Significant Areas

AR 29129; Revise HPP 3103.03 to include direction for barricading High Radiation Areas; dated January 25, 2002
AR 30762; Worker entry into a High Radiation Area on a RWP that does not allow HRA entry, with Apparent Cause Evaluation report; dated April 25, 2002
AR 32386; Failure to perform neutron monitoring for entry into drywell, with Apparent Cause Evaluation; dated September 2, 2002
AR 32697; Failure to follow requirements of RWP; dated September 25, 2002
AR 32907; Particles found from and in the Low Level Laundry room; dated October 7, 2002
AR 33050; High Radiation Area posting required on Reactor Building sample sink; dated October 17, 2002
AR 33395; Evaluate adequacy of posting and access controls of the two High Radiation Areas postings adjacent to the Turbine front standard; dated November 7, 2002
RWP 25; Radwaste Specific HRA and LHRA Jobs; Revision 5
RWP 32; NRC Surveillance and Tours; Revision 0
RWP 158; Inspect/Repair Demineralizers on RB 833' Level; Revision 7
ACP 114.5; Action Request System; Revision 33
HPP 3105.09; Personnel Dosimetry for External Exposure; Revision 12
HPP 3101.05; Administration of Radiation work Permits (RWPS); Revision 18
Personnel Contamination Event (PCE) reports, multiple events, July through October 2002
Form HP-55, "Radiological Work Screening Form", March 31, 2000

2OS2 ALARA Planning and Control

AR 32947; Worker exposed to 5.6E-8 uCi/cc(0.9 DAC) while making repairs on refuel bridge mast grapple air connectors; October 10, 2002
ACP 101.20; Radiation Protection Oversight Committee; Revision 4
ACP 1203.54; ALARA Design Considerations; Revision 0
ACP 1411.1; The ALARA Emphasis Program; Revision 10
ACP 1411.17; Occupational Dose Limits and Upgrades; Revision 15
HPP 13102.02; ALARA Job Planning; Revision 12
HPP 3103.04; Hot Spot Tracking; Revision 7
PCP 9.13; Operation of the Zinc Injection System; Revision 13
RWP 246; NMCA Test Pin Shipment; Revision 2
RWP 1057; Forced Outage - Drywell - Routine Work & Inspections; Revision 12
RWP 1062; IRM/SRM Removal Forced Outage; Revision 7
ALARA Review 02-004; Spent Fuel Pin Shipment; dated August 1, 2002
ALARA Review 02-005; SRM 'B' Replacement; dated August 9, 2002
Declaration of Pregnancy letters: dated August 3 and September 26 of 2002
Daily Exposure Report for: 11/04/2002; dated November 5, 2002
Forced Outage 02-4, Outage Exposure Report
North American Technical Center, Information System on Occupational Exposure report; Duane Arnold Energy Center, Three Year Rolling Average Radiation dose (person-Rem./unit),1999-2001; dated July, 2002
Nuclear Oversight Observation Report, Observation Reports #2002-003-1-036 and #2002-003-1-037; dated August 9 -23, 2002
Respiratory Protection Evaluation Worksheets; Decon RCIC Valve Pit; dated January 25, 2002
Respiratory Protection Evaluation Worksheets; RWCU Demineralizer Inspection; dated June 13, 2002
RP activities work schedule, week of November 4 - 8; dated November 5, 2002
2002 Radioactive Materials Shipment, Post Job Narrative Summary

2OS3 Radiation Monitoring Instrumentation and Protective Equipment (71121.03)

AR 12507; Problems with emergency preparedness respiratory protection programs; dated July 17, 1998
AR 29663; Inadequate SCBA mask maintenance, dated January 27, 2002
AR 31265; Workers received improper SCBA qualification (i.e., without face fit test), dated June 10, 2002
AR 32368; SCBA air quality out of specification; dated August 31, 2002
AR 33392; Expectations for Wearing Corrective Lenses when using SCBA; dated November 7, 2002
ACP 1411.20; Respiratory Protection; Revision 11
CGA C-5; Cylinder service life seamless steel high pressure cylinders; dated 1991
CGA C-6.2; Guidelines for visual inspection and re-qualification of fiber reinforced high pressure cylinders; dated 1996
CGA C-7.1; Commodity specification for air; dated 1997
EPIP 2.1; Activation and Operation of the Operational Support Center (OSC); Revision 13
EPIP 2.5; Control Room emergency Response Operation; Revision 14
EPIP 4.2; First Aid, Decontamination, and Medical Support; Revision 6

EPIP 4.3; Rescue and Emergency Repair Work; Revision 10
HP-RESP.005; On-The-Job Training and Task Performance Evaluation Guide, "Fill SCBA bottles", with Current Listing of DAEC Qualified Personnel (November 5, 2002); Revision 4
HPP 3106.04; Inspection, Maintenance and Quality Assurance of Respiratory Protection Equipment; Revision 8
HPP 3109.84; Operation of the TSI Model 8020 PORTACOUNT "PLUS"; Revision 9
IG 1009,1.1; SCBA Usage (Initial Qualification); Revision 7
IG 1009R, 01; SCBA Usage (Refresher training); Revision 0
Alphabetical listing of all SCBA qualified personnel at DAEC; dated November5, 2002
Alphabetical listing of all SCBA qualified personnel at DAEC, with annotation of specific respiratory sub-qualification dates of completion; dated November5, 2002
Alphabetical listing of all SCBA qualified personnel at DAEC, with annotation of vision correction aids listed by eyeglasses, contacts, and possession of respiratory eyeglasses; dated November 11, 2002
CY 2002, Red Team Evaluated Exercise, PowerPoint slides, with specification for wearing respirator glasses when reporting to the OSC
DAEC Emergency Plan, Emergency Response Organization, Section "B", Table B-1, On-Shift Staffing & Staff Augmentation Assignments; Revision 22
DAEC shiftly manning roster, with cross-check for SCBA qualification and minimum staffing requirements (i.e., Control Room and other support departments shown)
Operating Order 02-133, Operator License and Qualification Restrictions, with specification for wearing corrective lenses while performing licensed activities; dated October 30, 2002
Hawkeye Fire & Safety Co. Hydrostatic re-test data sheets for DAEC SCBA air cylinders; dated September 11, 2001 to September 27, 2002
Inspection & Maintenance check list for SCBA SN# NI207314, weekly and monthly checks; dated January, 2002 to current date of inspection
Memorandum from Dosimetry Program Owner, Respirator Qualification Questionnaire, Request for worker information pertaining to possession of respirator glasses; dated November 20, 2002
Memorandum from Dosimetry Program Owner, Answer to NRC Respirator Qualification Questionnaire; dated November 20, 2002
MSA Certificates of Attendance, Certified Air Mask Repair Education Course, two DAEC employees; dated July 21, 1999
Narrative summary of SCBA protective equipment at DAEC and SCBA unit and breathing air requirements for DAEC
National Compressed Air Certification Program documents, CGA Type I, Grade D and E air certification certificates; dated September 16, 2002
Special Order, Number 02-01; Respiratory Qualifications, with listing showing DAEC job classifications, needing to be SCBA qualified; dated January 8, 2002

4OA1 Performance Indicator Verification

NEI 99-02; Regulatory Assessment Performance Indicator Guideline; Revision 2
Memo; DAEC 2nd Quarter 2002 PI Summary; July 19, 2002
Memo; DAEC 1st Quarter 2002 PI Summary; April 20, 2002
Memo; DAEC 4th Quarter 2001 PI Summary, January 25, 2002
Memo; DAEC 3rd Quarter 2001 PI Summary; October 19, 2001

Memo; DAEC 2nd Quarter 2001 PI Summary; July 20, 2001
Memo; DAEC 1st Quarter 2001 PI Summary; April 17, 2001
ACP 1402.4; NRC Performance Indicators Collection and Reporting; Revision 3
ACP 1402.4; NRC Performance Indicators Collection and Reporting, Attachment #1, PI Data Calculation, Review, and Approval; dated CY 2001, 4th Quarter through CY 2002, 3rd Quarter.
NG 02-0306; 1st , 2nd , and 3rd Quarter Cy 2002 Action Request Radiological Occurrence Trend Reports; dated April - October 2002

4OA2 Identification and Resolution of Problems

AR 32350; Greater than 50% of the allowable RCIC LCO (14 days) has been exceeded; August 29, 2002
AR 32940; Process for distribution, screening, and use of operating experience is ineffective; October 10, 2002
AR 32680; Organizational Structure and decision making during plant events; September 23, 2002
AR 32941; Process of training and qualification and system familiarization; October 10, 2002
AR 32239; Oil leak from RCIC north turbine seal; August 21, 2002
CWO A60296; Replace PSV2475; September 5, 2002
CWO A60432; Increase Outboard Reservoir Drain, September 5, 2002
CWO A60297; Replace Equalizing Header and add Vents; September 5, 2002
CWO A60308; Add Vent to Governor Bearing Cap; August 25, 2002
CWO A58569; Reroute PSV2475 discharge piping; August 28, 2002
NRC Information Notice 94-84; Air Entrainment in Terry Turbine Lubricating Oil System
AR 33430: "1P250 (Auxiliary Boiler Chemical Injection Recirculation Pump) Tripped due to Isolated Discharge Path;"
AR 33355: "While Attempting to Swap Room Cooling Units, 1P052B (Plant Heating System Hot Water Circulating Pump) Was Inadvertently Secured;"
AR 33612: "Trend in Failure of Self Checking."

4OA3 Event Follow-up

LER 50-331/2002-002-00; Technical Specification Required Shutdown Due to Residual Heat Removal Service Water (RHRSW) Strainer Plugging Caused by Algae Intrusion from the Cedar River; August 5, 2002
LER 50-331/2002-003-00; Technical Specification Required Shutdown Due to Reactor Core Isolation Cooling (RCIC) Inoperability Caused by Air Entrainment in the RCIC Oil System; September 2, 2002