



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, IL 60532-4352

January 31, 2011

Mr. Michael J. Pacilio
Senior Vice President, Exelon Generation Company, LLC
President and Chief Nuclear Officer (CNO), Exelon Nuclear
4300 Winfield Road
Warrenville IL 60555

**SUBJECT: BYRON STATION, UNITS 1 AND 2 INTEGRATED INSPECTION
REPORT 05000454/2010-005; 05000455/2010-005; 07200068/2010003-2**

Dear Mr. Pacilio:

This refers to the inspection completed on December 31, 2010 at your Byron Station, Units 1 and 2. The enclosed report presents the results of this inspection which were discussed on January 14, 2011, with Mr. B. Adams, and other members of your staff.

During this inspection, the NRC staff examined activities conducted under your license as they relate to public health and safety to confirm compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel.

Based on the results of this inspection, the NRC has determined that two Severity Level IV violations of NRC requirements occurred. The NRC has also identified one issue that was evaluated under the risk significance determination process as having very low safety significance (Green). The NRC has determined that one violation is associated with the issue. These violations are being treated as Non-Cited Violations (NCVs), consistent with Section 2.3.2 of the Enforcement Policy. These NCVs are described in the subject inspection report.

If you contest the subject or severity of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the 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, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector Office at the Byron Station. In addition, if you disagree with the cross-cutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region III, and the NRC Resident Inspector at the Byron Station.

M. Pacilio

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In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Eric R. Duncan, Chief
Branch 3
Division of Reactor Projects

Docket Nos. 50-454; 50-455; 72-068
License Nos. NPF-37; NPF-66

Enclosure: Inspection Report 05000454/2010005; 05000455/2010005; 07200068/2010003
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos: 05000454; 05000455; 07200068
License Nos: NPF-37; NPF-66

Report No: 05000454/2010005; 05000455/2010005;
07200068/2010003

Licensee: Exelon Generation Company, LLC

Facility: Byron Station, Units 1 and 2

Location: Byron, IL

Dates: October 1, 2010, through December 31, 2010

Inspectors: B. Bartlett, Senior Resident Inspector
J. Robbins, Resident Inspector
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Approved by: E. Duncan, Chief
Branch 3
Division of Reactor Projects

Enclosure

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SUMMARY OF FINDINGS

IR 05000454/2010005, 05000455/2010005; 07200068/2010003; Byron Station, Units 1 & 2; 10/01/10 – 12/31/10; Routine Integrated Inspection Report; Heat Sink Performance; Operation of an Independent Spent Fuel Storage Installation at Operating Plants

This report covers a 3-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. Two Severity Level IV Violations and one Green finding were identified by the inspectors. The Severity Level IV Violations and Green finding were considered non-cited violations (NCVs) of NRC regulations. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Assigned cross-cutting aspects were determined using IMC 0310, "Components Within the Cross Cutting Areas." Findings for which the SDP does not apply may be Green or be assigned a severity level after 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 4, dated December 2006.

A. NRC-Identified and Self-Revealed Findings

Cornerstone: Mitigating Systems

- Green. A finding of very low safety significance and an associated NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified by the inspectors when licensee personnel failed to establish specific instructions for inspecting the River Screen House and Essential Service Water Cooling Tower. Specifically, the procedure that provided guidance for inspecting these structures lacked specific instructions on how to detect concrete degradation, erosion, corrosion and biological fouling. The licensee entered this issue into their corrective action program and initiated procedure revisions to provide further direction for identifying and documenting the degradation of these structures and related components.

The performance deficiency was determined to be more than minor because if left uncorrected it would have the potential to lead to a more significant safety concern. The finding screened as of very low safety significance because it was a qualification deficiency confirmed not to result in a loss of operability or functionality. Specifically, a qualitative assessment of historic surveillance reports found the documented results acceptable. The inspectors determined that this finding did not represent current licensee performance and therefore no cross-cutting aspect was assigned. (Section 1R07.1)

Miscellaneous Matters

- Severity Level IV: The inspectors identified a Severity Level IV NCV of very low safety significance of 10 CFR 72.150, "Instruction, Procedures, and Drawings." Specifically, the licensee failed to have procedures in place to ensure that the design basis peak fuel cladding limit would not be exceeded during canister loading

operations. The licensee entered this issue into their corrective action program and revised the procedure to provide monitoring criteria.

The violation was determined to be of more than minor significance using IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," Example 2c, in that the procedures failed to incorporate thermal acceptance criteria established by the Holtec Final Safety Analysis Report and that the failure to incorporate thermal acceptance criteria was repetitive. Although the violation contributed to the likelihood of peak fuel cladding temperatures exceeding the safety limit, subsequent analysis by the licensee determined that fuel cladding temperature limits were not exceeded. The violation screened as having very low safety significance. (Section 4OA5.2)

- Severity Level IV: The inspectors identified a Severity Level IV NCV of very low safety significance of 10 CFR 72.150, "Instructions, Procedures, and Drawings." Specifically, the licensee failed to have procedures in place to ensure that heavy loads were operated safely in the Fuel Handling Building. The licensee entered this issue into their corrective action program and revised the procedure to provide monitoring criteria.

The violation was determined to be of more than minor significance because if left uncorrected, it could lead to a more significant safety concern. Consistent with the guidance in Section 2.6.D of the NRC Enforcement Manual, if a violation does not fit an example in the Enforcement Policy Violation Examples, it should be assigned a severity level: (1) commensurate with its safety significance; and (2) informed by similar violations addressed in the Violation Examples. The violation screened as having very low safety significance. (Section 4OA5.2)

B. Licensee-Identified Violations

None

REPORT DETAILS

Summary of Plant Status

Unit 1 operated at or near full power during the inspection period.

Unit 2 operated at or near full power during the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

.2 Winter Seasonal Readiness Preparations

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. During the inspection, the inspectors focused on plant specific design features and the licensee's procedures used to mitigate or respond to adverse weather conditions. Additionally, the inspectors reviewed the Updated Final Safety Analysis Report (UFSAR) and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant specific procedures. Cold weather protection, such as heat tracing and area heaters, was verified to be in operation where applicable. The inspectors also reviewed corrective action program (CAP) items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into their CAP in accordance with station corrective action procedures. Documents reviewed are listed in the Attachment to this report. The inspectors' reviews focused specifically on the following plant systems due to their risk significance or susceptibility to cold weather issues:

- Station Heating System (SH);
- Auxiliary Building Ventilation System (VA); and
- Essential Service Water Valve House Ventilation System (VH).

This inspection constituted one winter seasonal readiness preparations sample as defined in Inspection Procedure (IP) 71111.01-05.

b. Findings

No findings of significance were identified.

.3 Readiness for Impending Adverse Weather Condition – Severe Thunderstorm Watch and High Wind Conditions

a. Inspection Scope

Since thunderstorms with potential tornados and high winds were forecast in the vicinity of the facility on November 22, 2010, and high winds in the area on October 27, 2010, the inspectors reviewed the licensee's overall preparations/protection for the expected weather conditions. On October 27, 2010, and on November 19, 2010, the inspectors walked down the plant outside areas, including the main transformers in addition to the licensee's emergency alternating current (AC) power systems, because their safety-related functions could be affected or required as a result of high winds or tornado-generated missiles or the loss of offsite power. The inspectors evaluated the licensee staff's preparations against the site's procedures. During the inspection, the inspectors focused on plant-specific design features and the licensee's procedures used to respond to specified adverse weather conditions. The inspectors also toured the plant grounds to look for any loose debris that could become missiles during a tornado. The inspectors evaluated operator staffing and accessibility of controls and indications for those systems required to control the plant. Additionally, the inspectors reviewed the UFSAR and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant specific procedures. The inspectors also reviewed a sample of CAP items to verify that the licensee identified adverse weather issues at an appropriate threshold and dispositioned them through the CAP in accordance with station corrective action procedures. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two readiness for impending adverse weather condition samples as defined in IP 71111.01-05.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

The inspectors performed partial system walkdowns of the following risk-significant systems:

- Unit 1 Train A Centrifugal Charging and Safety Injection following Maintenance on the Room Cooler;
- Unit 1 Train A Emergency Diesel Generator (EDG) Air Start System during Train B Maintenance Outage;
- Unit 1 Train A Containment Spray Valve Line-Up during EDG Train B Maintenance Outage;
- Unit 2 Train B Essential Service Water (SX) while Unit 2 Train A SX was Out of Service for Planned Maintenance; and

- Unit 2 Train A Safety Injection (SI) while Unit 2 Train B SI was Out of Service for Planned Maintenance.

The inspectors selected these systems based on their risk significance relative to the Reactor Safety Cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could impact the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, UFSAR, Technical Specification (TS) requirements, outstanding work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment.

These activities constituted five partial system walkdown samples as defined in IP 71111.04-05.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

a. Inspection Scope

The inspectors conducted fire protection walkdowns which were focused on availability, accessibility, and the condition of firefighting equipment in the following risk significant plant areas:

- Auxiliary Building, Electrical Penetration Areas 426' and 414' Elevations (Fire Zone 11.6-2, 11.5A-2 and 11.5B-2);
- Auxiliary Building, General Area 426' Elevation (Fire Zone 11.6-0 South);
- Auxiliary Building, General Area North 364' Elevation (Fire Zone 11.3-0 North);
- Unit 1 Train A Centrifugal Charging Pump Room (Fire Zone 11.3D-1); and
- Auxiliary Building, General Area North 383' Elevation (Fire Zone 11.4-0 North).

The inspectors reviewed areas to assess if the licensee had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant, effectively maintained fire detection and suppression capability, maintained passive fire protection features in good material condition, and implemented adequate compensatory measures for out-of-service, degraded or inoperable fire protection equipment, systems, or features in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as

documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to impact equipment which could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the Attachment, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's CAP. Documents reviewed are listed in the Attachment to this report.

These activities constituted five quarterly fire protection inspection samples as defined in IP 71111.05-05.

b. Findings

No findings of significance were identified.

.2 Annual Fire Protection Drill Observation (71111.05A)

a. Inspection Scope

On October 20, 2010, the inspectors observed a fire brigade activation for a simulated fire on the Unit 2 West Main Power Transformer, and on November 30, 2010, the inspectors observed a portion of a fire brigade activation of a simulated fire in the Condensate Polisher Room. Based on these observations, the inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that the licensee staff identified deficiencies; openly discussed them in a self-critical manner at the drill debrief, and took appropriate corrective actions. Specific attributes evaluated were:

- proper wearing of turnout gear and self-contained breathing apparatus;
- proper use and layout of fire hoses;
- employment of appropriate fire fighting techniques;
- sufficient firefighting equipment brought to the scene;
- effectiveness of fire brigade leader communications, command, and control;
- search for victims and propagation of the fire into other plant areas;
- smoke removal operations;
- utilization of pre-planned strategies;
- adherence to the pre-planned drill scenario; and
- drill objectives.

Documents reviewed are listed in the Attachment to this report.

These activities constituted two annual fire protection inspection samples as defined in IP 71111.05-05.

b. Findings

No findings of significance were identified.

1R06 Flooding (71111.06)

.1 Internal Flooding

a. Inspection Scope

The inspectors reviewed selected risk important plant design features and licensee procedures intended to protect the plant and its safety-related equipment from internal flooding events. The inspectors reviewed flood analyses and design documents, including the UFSAR, engineering calculations, and abnormal operating procedures to identify licensee commitments. Documents reviewed are listed in the Attachment to this report. In addition, the inspectors reviewed licensee drawings to identify areas and equipment that may be affected by internal flooding caused by the failure or misalignment of nearby sources of water, such as the fire suppression or the circulating water systems. The inspectors also reviewed the licensee's corrective action documents with respect to past flood-related items identified in the corrective action program to verify the adequacy of the corrective actions. The inspectors performed a walkdown of the following plant area to assess the adequacy of watertight doors and verify drains and sumps were clear of debris and were operable, and that the licensee complied with its commitments:

- Flood Doors Associated with the Unit 1 Diesel Oil Storage Tank Rooms

This inspection constituted one internal flooding sample as defined in IP 71111.06-05.

b. Findings

No findings of significance were identified.

1R07 Annual Heat Sink Performance (71111.07)

.1 Heat Sink Performance

a. Inspection Scope

The inspectors reviewed the licensee's testing of Unit 2 Train A SX Pump Oil Cooler and Cubicle Coolers to verify that potential deficiencies did not mask the licensee's ability to detect degraded performance, to identify any common cause issues that had the potential to increase risk, and to ensure that the licensee was adequately addressing problems that could result in initiating events that would cause an increase in risk. The inspectors reviewed the licensee's observations as compared against acceptance criteria, the correlation of scheduled testing and the frequency of testing, and the impact of instrument inaccuracies on test results. The inspectors also verified that test acceptance criteria considered differences between test conditions, design conditions, and testing conditions. Documents reviewed are listed in the Attachment to this report.

This annual heat sink performance inspection constituted one sample as defined in IP 71111.07-05.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07T)

.1 Triennial Review of Heat Sink Performance

a. Inspection Scope

The inspectors reviewed operability determinations, completed surveillances, vendor manual information, associated calculations, performance test results and cooler inspection results associated with the 1A EDG jacket water cooler and 1B auxiliary feed pump oil cooler. These heat exchangers/coolers were chosen based on their risk-significance in the licensee's probabilistic safety analysis, their important safety-related mitigating system support functions, their operating history, and their relatively low margin.

For the 1A EDG jacket water cooler and the 1B auxiliary feed pump oil cooler the inspectors verified the methods used to inspect and clean heat exchangers were consistent with as-found conditions identified and expected degradation trends and industry standards. The inspectors verified the licensee's inspection and cleaning activities utilized acceptance criteria generated via methods consistent with industry standards, and that the as-found results were recorded, evaluated, and appropriately dispositioned. The inspectors also verified that the corrective actions program contained guidance requiring characterization and evaluation of any foreign materials identified in the heat exchanger. The inspectors confirmed evaluations were performed to ensure the heat exchanger would remain capable of performing its intended design function. The licensee initiated action-tracking items to generate heat exchanger specific tube plugging and blocking calculations as an enhancement to the heat exchanger monitoring program for the 1B AF lube oil cooler.

In addition, the inspectors verified the condition and operation of the 1A EDG jacket water cooler and the 1B AF pump oil cooler were consistent with design assumptions in heat transfer calculations and Proto HX calculations and as described in the UFSAR. This included verification that the number of plugged tubes was within pre-established limits based on capacity and heat transfer assumptions. In addition, eddy current test reports and visual inspection records were reviewed to determine the structural integrity of the heat exchanger.

The inspectors verified the performance of ultimate heat sinks (UHSs) and safety-related service water systems and their subcomponents such as piping, intake screens, pumps, valves, etc., by tests or other equivalent methods to ensure availability and accessibility to the in-plant cooling water systems.

The inspectors reviewed the results of the licensee's inspection of the UHS and the River Screen House (RSH). At Byron, the UHS is comprised of the essential service water cooling tower (SXCT) basin. The inspectors verified that identified settlement or movement indicating a potential loss of structural integrity was appropriately evaluated and dispositioned by the licensee. The inspectors also performed walkdowns of

accessible portions of components in the SXCT basin to verify the licensee's assessment on structural integrity and component functionality.

The inspectors verified that the licensee's inspection of the SXCT basin and the RSH was comprehensive and of significant depth. The inspectors also verified the licensee ensured sufficient reservoir capacity by trending and removing debris and sediment buildup. In addition, the inspectors confirmed that sediments were maintained at an acceptable level and that water level instruments were functional and routinely monitored in the UHS. This included the review of the licensee's periodic monitoring and trending of sediment build-up and heat transfer capability calculations.

The inspectors verified the licensee's ability to ensure functionality during adverse weather conditions. The inspectors also verified that the licensee had adequately protected against silt introduction during periods of low flow or low level.

The inspectors reviewed available licensee testing and inspections results, licensee disposition of any active thru wall pipe leaks, and the history of thru wall pipe leakage to identify any adverse trends since the last NRC inspection. For the chemical volume control system, a closed-cooling system, the inspectors reviewed related documents and interviewed the system engineer, to identify adverse make-up trends that could be indicative of excessive leakage out of the closed system. For inaccessible piping, the inspectors reviewed the licensee's pipe testing, inspection, or monitoring program to verify structural integrity, and ensured that any leakage or degradation has been appropriately identified and dispositioned by the licensee. The inspectors verified that the periodic piping inspection program adequately detected and corrected protective coating failure, corrosion and erosion. The inspectors verified that the licensee adequately monitored and resolved any adverse trends for pumps by reviewing the operational history and in-service testing (IST) vibration monitoring results.

In addition, the inspectors reviewed condition reports related to the heat exchangers and heat sink performance issues to verify that the licensee had an appropriate threshold for identifying issues and to evaluate the effectiveness of the corrective actions. Documents reviewed are listed in the Attachment to this report.

These inspection activities constituted three heat sink inspection samples as defined in IP 71111.07-05.

b. Findings

(1) Inadequate Instructions for the Inspection of the River Screen House and Essential Service Water Cooling Tower

Introduction: A finding of very low safety significance (Green) and an associated NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," was identified by the inspectors when licensee personnel failed to establish specific instructions for inspecting the RSH and SXCT. Specifically, the procedure that provided guidance for inspecting these structures lacked specific instructions on how to detect concrete degradation, erosion, corrosion and biological fouling.

Description: On November 24, 2010, the inspectors identified that the licensee failed to establish adequate instructions in surveillance procedures used to inspect the RSH and SXCT.

In response to Generic Letter (GL) 89-13, "Service Water Problems Affecting Safety-Related Equipment," the licensee committed to inspect the RSH and the SXCT basin to monitor, trend and evaluate any degradation resulting from erosion, corrosion, silt buildup and biological fouling.

The purpose section of procedure 0BMSR SX-5, "Inspection of River Screen House and Essential Service Water Cooling Tower Basins (CM-4)," states: "This procedure provides guidance for inspection of River Screen House (RSH) Intake Structure and the Essential Service Water Cooling Tower (SXCT) Basins for concrete degradation, silt buildup, erosion, corrosion, and biological fouling." However, the inspectors noted the procedure did not include specific guidance on how to accomplish this purpose. For example, the inspectors noted the procedure contained Step 4.2.3, which required inspection of the SX makeup pump, but did not provide guidance on how to accomplish it or what specific sections of the pump and the basins to inspect. In addition, the procedure did not provide any instructions for what entails degradation of concrete structures or components by erosion, corrosion and biological fouling mechanisms. In addition, the procedure did not provide instructions on when or how to document these types of degradations. The inspectors were concerned that the lack of written instructions to identify and record the as-found condition of the RSH and the SXCT basin could result in the licensee's inability to properly assess the effect of erosion, corrosion, biological fouling and concrete degradation on these structures and related components.

As a corrective action, the licensee initiated Issue Report (IR) 1144584 to revise Procedure 0BMSR SX-5, and provide specific instructions on how to accomplish the purpose of the procedure. These instructions will include criteria for what to look for and how and what to document during these inspections related to component and structural degradation by erosion, corrosion and biological fouling.

Analysis: The inspectors determined that the licensee's failure to establish adequate instructions in surveillance procedures used to inspect the RSH and SXCT was contrary to the requirements of 10 CFR Part 50, Appendix B, Criterion V, and was a performance deficiency.

The performance deficiency was determined to be more than minor because if left uncorrected it would have the potential to lead to a more significant safety concern. Specifically, since the licensee's procedures did not contain instructions to properly inspect the RSH and SXCT, the potential existed for an unacceptable degradation of these structures or related components to go undetected affecting essential service water operability. Inoperable essential service water trains would place the plant at increased risk for core damage, which would affect the safety of an operating reactor.

The inspectors determined the finding could be evaluated using the Significance Determination Process (SDP) in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," Table 4a for the Mitigating System Cornerstone. The finding screened as of very low safety significance (Green) because the finding was a qualification deficiency confirmed not to result in a loss of operability or functionality. Specifically, the licensee performed a history review of the surveillance reports and found the documented results acceptable. A qualitative assessment of the inspections established reasonable assurance that they did not represent a loss of operability. The inspectors did not have further concerns.

The inspectors determined that this finding did not represent current licensee performance and therefore no cross-cutting aspect was assigned.

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," required, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances.

Contrary to the above, as of November 24, 2010, the licensee did not establish RSH and SXCT basin surveillance procedural requirements appropriate to the circumstances. Specifically, procedure 0BMSR SX-5, "Inspection of River Screen House and Essential Service Water Cooling Tower Basins (CM-4)," the procedure used to inspect these structures, was not appropriate for the circumstances. The procedure lacked instructions on detecting or recording concrete degradation, erosion, corrosion and biological fouling. Without these instructions, the effect of any degradation on system operability could not be evaluated. Because this violation was of very low safety significance and it was entered into the licensee's CAP as IR 1144584, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000454/2010005-01; 05000455/2010005-01, Inadequate Instructions for the Inspection of the River Screen House and Essential Service Water Cooling Tower)**

1R11 Licensed Operator Regualification Program (71111.11)

.1 Facility Operating History (71111.11B)

a. Inspection Scope

The inspectors reviewed the plant's operating history from October 26 through October 27, 2010, to identify operating experience that was expected to be addressed by the Licensed Operator Regualification Training (LORT) program. The inspector verified that the identified operating experience had been addressed by the facility licensee in accordance with the station's approved Systems Approach to Training (SAT) program to satisfy the requirements of 10 CFR 55.59(c). Documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

.2 Licensee Regualification Examinations

a. Inspection Scope

The inspectors performed an inspection of the licensee's LORT test/examination program for compliance with the station's SAT program which would satisfy the requirements of 10 CFR 55.59(c)(4). The reviewed operating examination material consisted of two operating tests, each containing two dynamic simulator scenarios and six job performance measures (JPMs). The written examinations reviewed consisted of two written examinations; each exam contained 30 questions. The inspectors reviewed the annual regualification operating test and biennial written examination material to evaluate general quality, construction, and difficulty level. The inspectors assessed the

level of examination material duplication from week-to-week during the current year operating test. The examiners assessed the amount of written examination material duplication from week-to-week for the written examination administered in 2010. 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. Documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

.3 Licensee Administration of Requalification Examinations

a. Inspection Scope

The inspectors observed the administration of a requalification operating test to assess the licensee's effectiveness in conducting the test to ensure compliance with 10 CFR 55.59(c)(4). The inspectors evaluated the performance of two crews in parallel with the facility evaluators during two dynamic simulator scenarios and evaluated various licensed crew members concurrently with facility evaluators during the administration of several JPMs. The inspectors assessed the facility evaluators' ability to determine adequate crew and individual performance using objective, measurable standards. The inspectors observed the training staff personnel administer the operating test, including conducting pre-examination briefings, evaluations of operator performance, and individual and crew evaluations upon completion of the operating test. The inspectors evaluated the ability of the simulator to support the examinations. A specific evaluation of simulator performance was conducted and documented in the section below titled, "Conformance with Simulator Requirements Specified in 10 CFR 55.46." Documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

.4 Examination Security

a. Inspection Scope

The inspectors observed and reviewed the licensee's overall licensed operator requalification examination security program related to examination physical security (e.g., access restrictions and simulator considerations) and integrity (e.g., predictability and bias) to verify compliance with 10 CFR 55.49, "Integrity of Examinations and Tests." The inspectors also reviewed the facility licensee's examination security procedure, any corrective actions related to past or present examination security problems at the facility, and the implementation of security and integrity measures (e.g., security agreements, sampling criteria, bank use, and test item repetition) throughout the examination process. Documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

.5 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 reviewed the licensee's quality assurance oversight activities, including licensee training department self-assessment reports. The inspectors evaluated the licensee's ability to assess the effectiveness of its LORT program and their ability to implement appropriate corrective actions. This evaluation was performed to verify compliance with 10 CFR 55.59(c) and the licensee's SAT program. Documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

.6 Licensee Remedial Training Program

a. Inspection Scope

The inspectors assessed the adequacy and effectiveness of the remedial training conducted since the previous biennial requalification examinations and the training from 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. This evaluation was performed in accordance with 10 CFR 55.59(c) and with respect to the licensee's SAT program. Documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

.7 Conformance with Operator License Conditions

a. Inspection Scope

The inspectors reviewed 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 watch-standing credit for maintaining active operator licenses. 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). Additionally, medical records for 10 licensed operators were reviewed for compliance with

10 CFR 55.21 and 55.53(i). Documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

.8 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, steady state tests, and core performance tests), simulator discrepancies, 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. Open simulator discrepancies were reviewed for importance relative to the impact on 10 CFR 55.45 and 55.59 operator actions as well as on nuclear and thermal hydraulic operating characteristics. The inspectors conducted interviews with members of the licensee's simulator staff about the configuration control process and completed the 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). Documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

.9 Resident Inspector Quarterly Review (71111.11Q)

a. Inspection Scope

On October 26 and October 27, 2010, the inspectors observed two crews of licensed operators in the plant's simulator during licensed operator requalification examinations to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

- licensed operator performance;
- crew's clarity and formality of communications;
- ability to take timely actions in the conservative direction;
- prioritization, interpretation, and verification of annunciator alarms;
- correct use and implementation of abnormal and emergency procedures;
- control board manipulations;
- oversight and direction from supervisors; and
- ability to identify and implement appropriate TS actions and Emergency Plan actions and notifications.

The crew's performance in these areas was compared to pre-established operator action expectations and successful critical task completion requirements. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one quarterly licensed operator requalification program sample as defined in IP 71111.11-05.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations (71111.12Q)

a. Inspection Scope

The inspectors evaluated degraded performance issues involving the following risk-significant systems:

- Failure of Unit 2 Train A EDG Upper Lube Oil Cooler Fixed End Flange Connection.

The inspectors reviewed events such as where ineffective equipment maintenance had resulted in valid or invalid automatic actuations of engineered safeguards systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- implementing appropriate work practices;
- identifying and addressing common cause failures;
- scoping of systems in accordance with 10 CFR 50.65(b) of the maintenance rule;
- characterizing system reliability issues for performance;
- charging unavailability for performance;
- trending key parameters for condition monitoring;
- ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and
- verifying appropriate performance criteria for structures, systems, and components (SSCs)/functions classified as (a)(2) or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one quarterly maintenance effectiveness samples as defined in IP 71111.12-05.

b. Findings

No findings of significance were documented in this inspection report. Additional follow-up and regulatory conclusions are the subject of NRC IR 05000455/2011011.

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

.1 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed the licensee's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- Work Activities during the Week of November 8 Focusing on Unit 2 Train A SX Outage; and
- Work Activities during the Week of November 29 for Unit 1 Emergent Direct Current (DC) Bus 112 Battery Cell Replacement and Planned Unit 2 Safety Injection Pump work window.

These activities were selected based on their potential risk significance relative to the Reactor Safety Cornerstones. As applicable for each activity, the inspectors verified that risk assessments were performed as required by 10 CFR 50.65(a)(4) and were accurate and complete. When emergent work was performed, the inspectors verified that the plant risk was promptly reassessed and managed. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed TS requirements and walked down portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

These maintenance risk assessments and emergent work control activities constituted two samples as defined in IP 71111.13-05.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

.1 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:

- Unit 2 Train A Pressurizer Safety Valve Due to Identified but Unexpected Leakby;
- Unit 2 Train A SX Foreign Material Discovered within the Lube Oil Pump; and
- Unit 1 Train B Auxiliary Feedwater Pump Oil Cooler Piping Configuration Error.

The inspectors selected these potential operability issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in

risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TS and USAR to the licensee's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Documents reviewed are listed in the Attachment to this report.

This operability inspection constituted three samples as defined in IP 71111.15-05.

b. Findings

No findings of significance were identified.

1R18 Plant Modifications (71111.18)

.1 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the following temporary modifications:

- Unit 2 Temporarily Disconnect Both Sudden Pressure Relays for Main Power Transformer 2MP01E due to Ground Associated with Relay 63-1; and
- Unit 1 Battery Bank 112 Installation of Jumper for Degraded Cell.

The inspectors compared the temporary configuration changes and associated 10 CFR 50.59 screening and evaluation information against the design basis, the UFSAR, and the TS, as applicable, to verify that the modification did not affect the operability or availability of the affected system(s). The inspectors also compared the licensee's information to operating experience information to ensure that lessons learned from other utilities had been incorporated into the licensee's decision to implement the temporary modification. The inspectors, as applicable, performed field verifications to ensure that the modifications were installed as directed; the modifications operated as expected; modification testing adequately demonstrated continued system operability, availability, and reliability; and that operation of the modifications did not impact the operability of any interfacing systems. Lastly, the inspectors discussed the temporary modification with operations, engineering, and training personnel to ensure that the individuals were aware of how extended operation with the temporary modification in place could impact overall plant performance. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two temporary modification samples as defined in IP 71111.18-05.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111.19)

.1 Post Maintenance Testing

a. Inspection Scope

The inspectors reviewed the following post-maintenance activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- Unit 1 Train A Chemical Volume Control Pump Room Cooling Fan Following Motor Replacement;
- Unit 1 Train B EDG Following Planned Maintenance Work Window;
- Unit 1 Battery Bank 112 Installation of Jumper for Degraded Cell;
- Unit 2 Train B Auxiliary Feedwater Pump Following Maintenance;
- Unit 2 Train A Centrifugal Charging Pump Room Cooler Following Maintenance;
- Unit 2 Train A EDG Room Ventilation Damper Following Replacement; and
- Unit 2 Circuit Card Controlling Auctioneered High Average Temperature Selection.

These activities were selected based upon the structure, system, or component's ability to impact risk. The inspectors evaluated these activities for the following (as applicable): the effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed; acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate; tests were performed as written in accordance with properly reviewed and approved procedures; equipment was returned to its operational status following testing (temporary modifications or jumpers required for test performance were properly removed after test completion); and test documentation was properly evaluated. The inspectors evaluated the activities against TS, the UFSAR, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with post-maintenance tests to determine whether the licensee was identifying problems and entering them in the CAP and that the problems were being corrected commensurate with their importance to safety. Documents reviewed are listed in the Attachment to this report.

This inspection constituted seven post-maintenance testing samples as defined in IP 71111.19-05.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

.1 Surveillance Testing

a. Inspection Scope

The inspectors reviewed the test results for the following activities to determine whether risk-significant systems and equipment were capable of performing their intended safety function and to verify testing was conducted in accordance with applicable procedural and TS requirements:

- Unit 2 Local Leakage Rate Test for Primary Containment Purge Supply Isolation Valves; and
- Unit 2 Train A Containment Spray American Society of Mechanical Engineers (ASME) Surveillance Meeting IST Program Requirements.

The inspectors observed in-plant activities and reviewed procedures and associated records to determine the following:

- did preconditioning occur;
- were the effects of the testing adequately addressed by control room personnel or engineers prior to the commencement of the testing;
- were acceptance criteria clearly stated, demonstrated operational readiness, and consistent with the system design basis;
- plant equipment calibration was correct, accurate, and properly documented;
- as-left setpoints were within required ranges; and the calibration frequency were in accordance with TSs, the USAR, procedures, and applicable commitments;
- measuring and test equipment calibration was current;
- test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied;
- test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used;
- test data and results were accurate, complete, within limits, and valid;
- test equipment was removed after testing;
- where applicable for inservice testing activities, testing was performed in accordance with the applicable version of Section XI, ASMEs code, and reference values were consistent with the system design basis;
- where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable;
- where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure;
- where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished;
- prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test;
- equipment was returned to a position or status required to support the performance of its safety functions; and

- all problems identified during the testing were appropriately documented and dispositioned in the CAP.

Documents reviewed are listed in the Attachment to this report.

This inspection constituted one inservice testing sample and one containment isolation valve inspection sample as defined in IP 71111.22, Sections -02 and -05.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstones: Occupational and Public Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)

The inspection activities supplement those documented in Inspection Report 05000454/2010003; 0500455/2010003, and constitute one complete sample as defined in IP 71124.01-05.

.1 Contamination and Radioactive Material Control (02.04)

a. Inspection Scope

The inspectors selected several sealed sources from the licensee's inventory records and assessed whether the sources were accounted for and verified to be intact.

The inspectors evaluated whether any transactions, since the last inspection, involving nationally tracked sources were reported in accordance with 10 CFR 20.2207.

b. Findings

No findings of significance were identified.

.2 Radiological Hazards Control and Work Coverage (02.05)

a. Inspection Scope

The inspectors examined the licensee's physical and programmatic controls for highly activated or contaminated materials (nonfuel) stored within spent fuel and other storage pools. The inspectors assessed whether appropriate controls (i.e., administrative and physical controls) were in place to preclude inadvertent removal of these materials from the pool.

b. Findings

No findings of significance were identified.

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

This inspection constituted a partial sample as defined in IP 71124.06-05.

.1 Inspection Planning and Program Reviews (02.01)

Event Report and Effluent Report Reviews

a. Inspection Scope

The inspectors reviewed the radiological effluent release reports issued since the last inspection to determine if the reports were submitted as required by the Offsite Dose Calculation Manual/TSS. The inspectors reviewed anomalous results, unexpected trends, or abnormal releases identified by the licensee for further inspection to determine if they were evaluated, were entered in the corrective action program, and were adequately resolved.

b. Findings

No findings of significance were identified.

Offsite Dose Calculation Manual and Updated Final Safety Analysis Report Review

a. Inspection Scope

The inspectors reviewed UFSAR descriptions of the radioactive effluent monitoring systems, treatment systems, and effluent flow paths so they can be evaluated during inspection walkdowns.

The inspectors reviewed changes to the Offsite Dose Calculation Manual made by the licensee since the last inspection against the guidance in NUREG-1301 and 0133, and Regulatory Guides 1.109, 1.21 and 4.1. When differences were identified, the inspectors reviewed the technical basis or evaluations of the change during the onsite inspection, to determine whether they were technically justified and maintain effluent releases as-low-as-is-reasonably-achievable.

b. Findings

No findings of significance were identified.

Procedures, Special Reports, and Other Documents

a. Inspection Scope

The inspectors reviewed copies of licensee and third party (independent) evaluation reports of the effluent monitoring program since the last inspection to gather insights into the licensee's program and aid in selecting areas for inspection review (smart sampling).

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES (OA)

4OA1 Performance Indicator Verification (71151)

.1 Mitigating Systems Performance Index - Emergency Alternating Current Power System

a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index (MSPI) - Emergency AC Power System performance indicator (PI) for Unit 1 and Unit 2 for the period from October 1, 2009 through September 30, 2010. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, was used. The inspectors reviewed the licensee's operator narrative logs, MSPI derivation reports, issue reports, event reports and NRC Integrated Inspection Reports for the period of October 1, 2009, through September 30, 2010, to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, whether the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two MSPI emergency AC power system samples as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

.2 Mitigating Systems Performance Index - High Pressure Injection Systems

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - High Pressure Injection Systems PI for Unit 1 and Unit 2 for the period from October 1, 2009, through September 30, 2010. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, was used. The inspectors reviewed the licensee's operator narrative logs, issue reports, MSPI derivation reports, event reports, and NRC Integrated Inspection Reports for the period of October 1, 2009, through September 30, 2010, to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, whether the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two MSPI high pressure injection system samples as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

.3 Mitigating Systems Performance Index - Heat Removal System

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - Heat Removal System PI for Unit 1 and Unit 2, for the period from October 1, 2009, through September 30, 2010. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, was used. The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports, MSPI derivation reports, and NRC Integrated Inspection Reports for the period of October 1, 2009, through September 30, 2010, to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, whether the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two MSPI heat removal system samples as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

.4 Mitigating Systems Performance Index - Residual Heat Removal System

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - Residual Heat Removal System PI for Unit 1 and Unit 2, for the period from October 1, 2009, through September 30, 2010. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, was used. The inspectors reviewed the licensee's operator narrative logs, issue reports, MSPI derivation reports, event reports, and NRC Integrated Inspection Reports for the period of October 1, 2009, through September 30, 2010, to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, whether the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two MSPI residual heat removal system samples as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

.5 Mitigating Systems Performance Index - Cooling Water Systems

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - Cooling Water Systems PI Unit 1 and Unit 2, for the period from October 1, 2009, through September 30, 2010. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, was used. The inspectors reviewed the licensee's operator narrative logs, issue reports, MSPI derivation reports, event reports, and NRC Integrated Inspection Reports for the period of October 1, 2009 through September 30, 2010, to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, whether the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two MSPI cooling water system samples as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

.6 Reactor Coolant System Specific Activity

a. Inspection Scope

The inspectors sampled licensee submittals for the Reactor Coolant System (RCS) Specific Activity PI for the period from July 2009 through September 2010. The inspectors used PI definitions and guidance contained in the NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee's RCS chemistry samples, TS requirements, issue reports, event reports, and NRC Integrated IRs for the period of July 2009 through September 2010 to determine if indicator results were accurately reported. Documents reviewed are listed in the Attachment to this report

This inspection constituted two reactor coolant systems specific activity sample as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

.7 Occupational Exposure Control Effectiveness

a. Inspection Scope

The inspectors sampled licensee submittals for the Occupational Radiological Occurrences PI for the period of July 2009 through September 2010. The inspectors used PI definitions and guidance contained in the NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed electronic dosimetry dose rate and accumulated dose alarm and dose reports and the dose assignments for any intakes that occurred for selected dates between July 2009 and September 2010 to determine if indicator results were accurately reported. The inspectors also conducted walk downs of numerous locked high and very high radiation area entrances to determine the adequacy of the controls in place for these areas. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one occupational radiological occurrences sample as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

.8 Radiological Effluent Technical Specification/Offsite Dose Calculation Manual Radiological Effluent Occurrences

a. Inspection Scope

The inspectors sampled licensee submittals for the Radiological Effluent Technical Specification (RETS)/Offsite Dose Calculation Manual (ODCM) Radiological Effluent Occurrences performance indicator for the period of July 2009 through September 2010. The inspectors used PI definitions and guidance contained in the NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee's issue report database and selected individual reports generated since this indicator was last reviewed to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose. The inspectors reviewed gaseous effluent summary data and the results of associated offsite dose calculations for selected dates from July 2009 through September 2010 to determine if indicator results were accurately reported. The inspectors also reviewed the licensee's methods for quantifying gaseous and liquid effluents and determining effluent dose. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one RETS/ODCM radiological effluent occurrences sample as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Physical Protection

.1 Routine Review of Items Entered into the Corrective Action Program

a. Inspection Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's CAP at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. Attributes reviewed included: the complete and accurate identification of the problem; that timeliness was commensurate with the safety significance; that evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent-of-condition reviews, and previous occurrences reviews were proper and adequate; and that the classification, prioritization, focus, and timeliness of corrective actions were commensurate with safety and sufficient to prevent recurrence of the issue. Minor issues entered into the licensee's CAP as a result of the inspectors' observations are included in the attached List of Documents Reviewed.

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure they were considered an integral part of the inspections performed during the quarter and documented in Section 1 of this report.

b. Findings

No findings of significance were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's CAP. This review was accomplished through inspection of the station's daily condition report packages.

These daily reviews were performed by procedure as part of the inspectors' daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

b. Findings

No findings of significance were identified.

.3 Semi Annual Trend Review

a. Inspection Scope

The inspectors performed a review of the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment issues, but also considered the results of daily inspector CAP item screening discussed in Section 4OA2.2 above, licensee trending efforts, and licensee human performance results. The inspectors' review nominally considered the 6 month period of June 1, 2010, through November 30, 2010, although some examples expanded beyond those dates where the scope of the trend warranted.

The review also included issues documented outside the normal CAP; including major equipment problem lists, repetitive and/or rework maintenance lists, departmental problem/challenges lists, system health reports, quality assurance audit/surveillance reports, self assessment reports, and Maintenance Rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's CAP trending reports. Corrective actions associated with a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

This review constituted a single semi-annual trend inspection sample as defined in IP 71152-05.

b. Findings

No findings of significance were identified.

.4 Annual Sample: Review of Operator Workarounds

a. Inspection Scope

The inspectors evaluated the licensee's implementation of their process used to identify, document, track, and resolve operational challenges. Inspection activities included, but were not limited to, a review of the cumulative effects of the Operator Workarounds (OWAs) on system availability and the potential for improper operation of the system, for potential impacts on multiple systems, and on the ability of operators to respond to plant transients or accidents.

The inspectors performed a review of the cumulative effects of OWAs. The documents listed in the Attachment were reviewed to accomplish the objectives of the inspection procedure. The inspectors reviewed both current and historical operational challenge records to determine whether the licensee was identifying operator challenges at an appropriate threshold, had entered them into their CAP, and proposed or implemented appropriate and timely corrective actions which addressed each issue. Reviews were conducted to determine if any operator challenge could increase the possibility of an initiating event, if the challenge was contrary to training, required a change from long-standing operational practices, or created the potential for inappropriate

compensatory actions. Additionally, all temporary modifications were reviewed to identify any potential effect on the functionality of Mitigating Systems, impaired access to equipment, or required equipment uses for which the equipment was not designed. Daily plant and equipment status logs, degraded instrument logs, and operator aids or tools being used to compensate for material deficiencies were also assessed to identify any potential sources of unidentified operator workarounds.

This review constituted one operator workaround annual inspection sample as defined in IP 71152-05.

b. Findings

No findings of significance were identified.

4OA3 Followup of Events and Notices of Enforcement Discretion (71153)

.1 (Closed) Licensee Event Report 05000455/2010-001-00: Reactor Protection and Auxiliary Feedwater Actuation Signals from Low Steam Generator (S/G) Level Due to Inadequate Surveillance Testing

On April 19, 2010, Unit 2 was in the process of shutting down and cooling down in order to enter a planned refuelling outage. At 5:03 am with the unit in Mode 4, Hot Shutdown, a feedwater isolation valve (FWIV) surveillance was in progress and the 2D S/G secondary side water level lowered to the low S/G water level setpoint, which resulted in a valid FWIV actuation. All equipment actuated properly and due to the plant condition, the control rods were already fully inserted with the reactor trip breakers open.

The licensee's apparent cause evaluation determined that the operators had received Just-In-Time training immediately prior to the refuelling outage. However, inadequate oversight combined with an inadequate procedure had resulted in inadequate control of the surveillance test activity. The licensee determined that the surveillance procedure did not allow for S/G levels to be recovered between the testing of the two trains, performance of the test during the outage was not performed at the optimum time based on plant parameters, and no pre-job briefing was performed the night of the test. The licensee had determined that while the test was performed during a time in the outage that it was usually performed that it had been performed when the RCS was hotter than it had been before, which resulted in the S/G water level steaming off at a faster rate than previously experienced.

The inspectors reviewed the Licensee Event Report (LER), licensee procedures, and performed interviews of selected licensee personnel. The inspectors agreed with the licensee's apparent cause evaluation conclusion regarding the three causes of the FWIV actuation. The inspectors reviewed the licensee's corrective actions and verified that the corrective actions addressed the causes and were implemented. Corrective actions included revising the FWIV surveillance procedure, strengthening pre-job briefs, and reinforcing the roles and responsibilities of key outage operations positions.

Although this issue was corrected, it constituted a performance deficiency and a minor violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings." However, it is not subject to enforcement action in accordance with Section 2.3.1 of the Enforcement Policy. Because the performance deficiency was not

more than minor and not a finding per IMC 0612, Appendix B, "Issue Screening," a cross-cutting aspect was not assigned to this violation.

This event follow-up review constituted one sample as defined in IP 71153-05.

40A5 Other Activities

.1 Review of Institute of Nuclear Power Operations Report

The inspectors reviewed the Institute of Nuclear Power Operations July 2010 Evaluation Report, Byron Station, dated December 10, 2010.

.2 Operation of an Independent Spent Fuel Storage Installation at Operating Plants (60855.1)

a. Inspection Scope

The inspectors observed and evaluated the licensee's loading operations of the first and second multi-purpose canisters (MPC) during the licensee's initial spent fuel loading campaign to verify compliance with the Certificate of Compliance, TS, NRC Regulations, and associated procedures. The inspectors observed heavy loads movements inside the Fuel Handling Building (FHB) including: lifting of the transfer cask (HI-TRAC) into the spent fuel pool, lifting of the HI-TRAC from the spent fuel pool to the decontamination stand, and transfer of the MPC from the HI-TRAC to the storage cask (HI-STORM) while the casks are stacked on one another in a laterally restrained configuration. The inspectors observed loading of spent fuel assemblies from the spent fuel pool into the MPC. The inspectors observed MPC processing operations including: decontamination and surveying, canister welding, non-destructive weld examinations, hydrostatic testing, canister draining, vacuum drying, and helium backfilling. The inspectors observed heavy loads operations outside of the FHB including: transfer of the HI-STORM from inside of the FHB to outside of the FHB on a low profile transporter, and transfer of the HI-STORM to the Independent Spent Fuel Storage Installation (ISFSI) pad using a vertical cask transporter.

During performance of the activities, the inspectors evaluated the licensee staff's familiarity with procedures, supervisory oversight, and communication and coordination between the different groups involved. The inspectors reviewed loading procedures and evaluated the licensee's adherence to these procedures. The inspectors also observed the licensee's process to verify that the contamination and radiation levels from the transfer cask and storage cask were below the regulatory and TS limits. The inspectors attended various pre-job briefs to assess the licensee's ability to identify critical steps of the evolution, potential failure scenarios, and tools to prevent errors.

The inspectors reviewed issue reports and the associated follow-up actions that were generated during the loading campaign as well as 10 CFR 72.48 screenings.

On Saturday, August 28, 2010, the licensee's first MPC containing spent nuclear fuel was left unmonitored during processing operations at the end-of-shift operations. The MPC had been undergoing vacuum drying throughout the day and at the end of shift was left under vacuum. While the canister was under vacuum, cooling of the fuel was significantly reduced, and subsequently fuel temperatures were elevated. The licensee's

safety analysis for the spent fuel cask system required that the MPC shell temperature be maintained below 125 degrees Fahrenheit (°F) while the MPC is under vacuum. A MPC shell temperature of 125°F corresponds to a design basis limit of 1040°F for fuel cladding temperature as discussed in the Holtec HI-STORM 100 FSAR, Revision 5. Cooling of the water contained within the HI-TRAC annulus, the area between the MPC and the HI-TRAC, is provided by a chiller unit when required. For the fuel selected, annulus cooling would be required to maintain the MPC shell temperature below 125°F. Prior to the end of shift on August 28, 2010, the inspectors asked the licensee what plans were in place for monitoring the MPC overnight. The inspectors were informed that various options were being considered for monitoring the MPC overnight and that a final decision on the exact method of monitoring and specific staffing had not been determined. Later that evening, the licensee discussed the importance of the chiller with technical experts and determined that, due to the heat loads selected for this canister, heat rates were not high enough to exceed fuel temperature limits even in the event of a chiller shut off. Therefore, the licensee concluded that no monitoring was necessary overnight. No specific analysis was performed to support this determination.

On the morning of August 29, 2010, the licensee identified that the chiller had unexpectedly shut off overnight; however, the licensee failed to recognize that the annulus water temperature corresponded to a safety limit for fuel cladding temperature as discussed in the FSAR. A back-up chiller was placed in service promptly; however, the licensee did not recognize the importance of determining the current water temperature to ensure that no safety limits were exceeded. The inspectors notified the licensee of the design basis annulus water temperature limit of 125°F, which was specified in the FSAR. The inspectors estimated that the 125°F limit was likely exceeded by several degrees.

The licensee began a prompt evaluation to determine if any fuel cladding safety limits were exceeded. Working with the licensee's vendor, Holtec, the prompt evaluation concluded that no fuel cladding safety limits were exceeded.

In response to the circumstances of August 28 and 29, 2010, the NRC increased the oversight of the ISFSI project at the Byron Station and began a reactive inspection on September 1, 2010. The results of this reactive inspection are documented in NRC IR Nos. 05000454/2010007; 05000455/2010007; and 07200068/2010002.

Following completion of the reactive inspection the inspectors reviewed the licensee's corrective actions that had been completed and subsequent procedure changes. The ISFSI inspectors remained onsite for the licensee's second MPC loading operations. Following the second MPC loading, ISFSI inspectors monitored loading operations from the regional office.

b. Findings

(1) Inadequate Procedures for Implementing Final Safety Analysis Report Required Annulus Cooling

Introduction: The inspectors identified a Severity Level IV NCV of very low safety significance of 10 CFR 72.150, "Instructions, Procedures, and Drawings." Specifically,

the licensee failed to have procedures in place to ensure that the design basis peak fuel cladding temperature limit would not be exceeded during canister loading operations.

Description: The licensee revised their ISFSI loading procedures following the circumstances of August 28 and 29. During review of the revised procedures, the inspectors identified three examples where the licensee failed to meet the requirements in 10 CFR 72.150, "Instructions, Procedures, and Drawings."

1. Byron Fuel Handling Procedure BFP FH-71, "MPC Processing", Revision 8, provides guidance for the licensee to complete MPC processing operations.

The Holtec FSAR, Revision 5, Chapter 4, discussed how the fuel cladding temperature limits and associated hoop stress calculation requirements were consistent with the guidance in Spent Fuel Storage and Transportation (SFST) Interim Staff Guidance (ISG) - 11 during vacuum drying operations. Specifically, the Holtec FSAR, Revision 5, Section 4.5.1.1.4.1, "Vacuum Drying" states, in part:

"The initial loading of Spent Nuclear Fuel in the MPC requires that the water within the MPC be drained and replaced with helium. For MPCs containing moderate burn-up fuel assemblies only, this operation may be carried out using the conventional vacuum drying approach. In this method, removal of the last traces of residual moisture from the MPC cavity is accomplished by evacuating the MPC for a short time after draining the MPC."

"For any decay heat load in an MPC-32, vacuum drying of the MPC is performed with the annular gap between the MPC and the HI-TRAC continuously flushed with water. The water movement in this annular gap will maintain the MPC shell temperature at about the temperature of flowing water. Thus, the thermal analysis of the MPC during vacuum drying for these conditions is performed with cooling of the MPC shell with water at a bounding maximum temperature of 125°F."

"To avoid excessive conservatism in the computed FLUENT[®] solution, partial recognition for higher axial heat dissipation is adopted in the peak cladding calculations. The boundary conditions applied to this evaluation are: ii. The entire outer surface of the MPC shell is postulated to be at a bounding maximum temperature of 125°F."

As described in the Holtec FSAR, the intent of flushing water through the annulus region between the HI-TRAC and the MPC is to maintain the surface of the MPC shell below 125 °F. The Holtec FSAR states that if MPC shell temperature remains below 125 °F, the peak fuel cladding temperatures, for moderate burn-up fuel, during short-term vacuum drying operations, in an MPC with design basis maximum heat loads, are calculated to be less than the SFST ISG-11 safety limit of 1058°F.

During vacuum drying operations at the Byron Station, the seal that maintains water inside the annulus region is removed and allowed to flood several inches over the top of the MPC. The licensee's procedures required the annulus water to be cooled with a submersible pump, heat exchanger, and chiller. The submersible pump took a suction of water above the MPC lid and discharged water on the other side of the

MPC lid. Temperature measurements were recorded near the suction and discharge locations. The licensee failed to have an analysis demonstrating that temperatures measured at the top of the MPC where water was being continuously flushed by a submersible pump was indicative of canister shell temperatures on the side of the MPC where water was not being continuously flushed. The licensee failed to configure the intake and discharge of the submersible pump to ensure that all regions of the MPC were continuously flushed with water and subsequently failed to ensure that temperature measurements taken were indicative of the highest shell temperatures present. The licensee entered these issues into its CAP (IR 1131564) and initiated actions to evaluate the condition. Following the event, the licensee contacted the cask vendor, Holtec, and completed an analysis to show that peak fuel cladding temperature limits were not exceeded. The licensee revised the configuration of the pump such that the pump intake was at the top of the annulus and the pump discharge was through the annulus drain line near the bottom of the annulus.

2. The BFP FH-71, "MPC Processing", Revision 8, provides guidance for the licensee to complete MPC processing operations.

As previously discussed in 4OA5.2.b.1.1, the annulus between the MPC and the HI-TRAC is required to be continuously flushed with water to ensure that the MPC shell temperature is maintained below the design basis limit of 125 °F in order to maintain fuel cladding peak temperatures under design limits as described in the Holtec FSAR, Revision 5.

The BFP FH-71 contained guidance of when to initiate temperature monitoring of the annulus region; however the procedure failed to contain guidance of when temperature monitoring was to be terminated. On October 17, 2010, during MPC processing operations, the licensee completed vacuum drying operations and subsequently terminated, without procedural guidance, monitoring of annulus temperature. At the time monitoring was terminated, the canister was still under vacuum and annulus temperature requirements were still required by the licensee's design basis. The inspectors brought this discrepancy to the attention of the field supervisor and the licensee reinitiated temperature monitoring until the MPC was filled with helium. The licensee entered this issue into in its CAP (IR 1131564) and completed procedural revisions.

3. The BFP FH-71, "MPC Processing," Revision 8, provides guidance for the licensee to complete MPC processing operations.

On October 15, 2010, an unanalyzed condition was identified regarding spent fuel peak cladding temperatures while a MPC was filled with nitrogen. The Holtec FSAR Revision 5 has a thermal analysis for water, helium, and vacuum to exist in the MPC, however nitrogen, which is used to force water out of the MPC and provide a temporary inert atmosphere prior to vacuum drying, is unanalyzed. The procedures section of the Holtec FSAR stated that helium or nitrogen can be used as a gas for water blowdown operations; however the FSAR did not provide a thermal analysis for nitrogen. The licensee failed to have an independent thermal analysis for this condition. The licensee determined that the vacuum thermal analysis bounded the condition; however this analysis required annulus cooling and imposed MPC shell

temperature limits. The licensee initiated annulus cooling, however when the system actuated, the MPC shell temperature design limit of 125°F was exceeded by several degrees. Several hours later, the licensee lost function of a chiller in support of annulus cooling which caused the FSAR temperature limit of 125°F to again be exceeded for a short period of time. The licensee implemented contingency actions for the annulus chiller failure, which consisted of a feed of plant demineralized water into the annulus region and out to plant water treatment to reduce the temperature.

The licensee failed to maintain MPC shell temperatures in accordance with an associated bounding design basis. The licensee entered this issue into its corrective action program (IR 1127060). Following the event, the licensee contacted the cask vendor, Holtec, and completed an analysis to show that peak fuel cladding temperature limits were not exceeded and initiated procedural changes.

Analysis: The inspectors determined that the licensee's failure to have adequate procedures was a violation that warranted a significance evaluation. Consistent with the guidance in Section 2.2 of the NRC Enforcement Policy, ISFSIs are not subject to the SDP and, thus, traditional enforcement will be used for these facilities. The violation was dispositioned using the traditional enforcement process using Section 2.3 of the Enforcement Policy.

Example 1 was determined to be of more than minor significance using IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," Example 3i, in that the licensee's lack of evaluation did not assure spent fuel cladding temperatures during vacuum drying would remain less than SFST ISG-11 safety limits and an additional calculation was required to evaluate the condition. Examples 2 and 3 were determined to be of more than minor significance using IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," Example 2c, in that the procedures failed to incorporate thermal acceptance criteria established by the FSAR and that the failure to incorporate thermal acceptance criteria was repetitive.

Consistent with the guidance in Section 2.6.D of the NRC Enforcement Manual, if a violation does not fit an example in the Enforcement Policy Violation Examples, it should be assigned a severity level: (1) commensurate with its safety significance; and (2) informed by similar violations addressed in the Violation Examples. The inspectors found no similar violations in the Violation Examples. Subsequent analysis by the licensee indicated that fuel cladding temperature safety limits were not exceeded; therefore, the violation was determined to be of very low safety significance (Severity Level IV).

Enforcement: 10 CFR 72.150, "Instructions, Procedures, and Drawings," states, in part, that the licensee shall prescribe activities affecting quality by documented instructions, procedures, or drawings of a type appropriate to the circumstances and shall require that these instructions, procedures, and drawings be followed. The instructions, procedures, and drawings must include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.

Contrary to the above,

1. On October 15, 2010, Procedure BFP FH-71, "MPC Processing," Revision 8, was identified to not contain adequate instructions, since the procedure failed to configure the intake and discharge of the submersible pump to ensure that all regions of the MPC were continuously being flushed with water and subsequently failed to ensure that temperature measurements taken were indicative of the highest MPC shell temperatures present.
2. On October 15, 2010, Procedure BFP FH-71, "MPC Processing," Revision 8, was identified to not contain adequate instructions, since the procedure failed to contain guidance of when temperature monitoring was to be terminated. During MPC processing operations, the licensee completed vacuum drying operations and subsequently terminated, without procedural guidance, monitoring of annulus temperatures when annulus temperature requirements were still required by the licensee's design basis.
3. On October 15, 2010, Procedure BFP FH-71, "MPC Processing," Revision 8, was identified to not contain adequate instructions, since the procedure failed to maintain MPC shell temperatures in accordance with an associated bounding design basis analysis while the MPC was filled with nitrogen.

This is a violation of 10 CFR 72.150, "Instructions, Procedures, and Drawings." This Severity Level IV Violation is being treated as a NCV consistent with Section 3.1.1 of the NRC Enforcement Manual. The licensee documented these issues in its corrective action program as IR 1131564 and IR 1127060. **(NCV 05000454/2010005-02; 05000455/2010005-02; 07200068/2010003-1, Inadequate Procedures for Implementing FSAR Required Annulus Cooling)**

(2) Inadequate Procedural Guidance for Heavy Loads Operations

Introduction: The inspectors identified a Severity Level IV NCV of very low safety significance of 10 CFR 72.150, "Instructions, Procedures, and Drawings." Specifically, the licensee failed to have procedures in place to ensure that heavy loads were operated safely in the Fuel Handling Building.

Description: The inspectors identified two examples where the licensee failed to meet the requirements of 10 CFR 72.150, "Instructions, Procedures, and Drawings."

1. On August 24, 2010, the inspectors observed that the crane operator did not check the hoist brakes on the Fuel Handling Building crane while lifting a HI-TRAC and an empty MPC from the decontamination stand to the cask wet pit in the spent fuel pool. The lifted load at the time was approximately 90 tons. The next load to be lifted, a HI-TRAC with a fully loaded MPC, would be just under the maximum critical load of the crane, 125 tons.

The Byron Station is committed to following the requirements of ASME B30.2.0-1976, "Overhead and Gantry Cranes (Top Running Bridge, Multiple Girder)." In ASME B30.2.0-1976, Section 2-3.2.3.g, it states "The operator shall check the hoist

brakes at least once each shift if a load approaching the rated load is to be handled. This shall be done by raising the load a short distance and applying the brakes.”

The inspectors brought the requirements of ASME B30.2.0-1976 to the attention of the field supervisor and the crane operator checked the crane brakes. The inspectors reviewed licensee procedures related to heavy loads operations and determined that no procedural guidance existed to instruct crane operators to check holding brakes or defined a specific weight as “approaching the rated load.” The licensee documented the issue in its corrective action program (IR 1106006), and added procedural guidance.

2. On September 4, 2010, the licensee was performing MPC transfer operations from the HI-TRAC to the HI-STORM in a restrained stack configuration using BFP FH-69, “HI-TRAC Movement within the Fuel Building,” Revision 5. During withdrawal of the mating device tongue, the bottom HI-TRAC pool lid became mispositioned in the mating device when one of the air bags did not fully deflate. The licensee was unaware this mispositioning placed the edge of the HI-TRAC pool lid in the travel path of the MPC when it was to be downloaded. The licensee continued and began to lower the MPC from the HI-TRAC into the HI-STORM. The inspectors observed that a momentary unexpected load decrease was registered on the Fuel Handling Building crane load cell from approximately 38 tons to approximately 19 tons. As the signalman instructed the crane operator to cease lowering, a loud noise was heard, and the load cell indicated a rapid rise in load back up to approximately 38 tons. Heavy loads operations were immediately stopped, and plant notifications were made. The licensee determined that the safest configuration for the MPC would be inside the HI-STORM and subsequently continued the transfer operation. The HI-TRAC pool lid had damage to its protective coating. The licensee performed a walkdown of the crane, inspected the slings for damage, and performed a structural analysis to show that the MPC could still perform its design function. The licensee failed to have procedures in place to ensure the mating device air bags properly deflated and that the HI-TRAC pool lid was correctly positioned on the mating device. The licensee failed to have procedures that would ensure that interference points such as the HI-TRAC bottom pool lid did not exist during MPC transfer operations. The licensee documented the issue in its corrective action program (IR 1109925), and added procedural guidance.

Analysis: The inspectors determined that the licensee’s failure to have adequate procedures was a violation that warranted a significance evaluation. Consistent with the guidance in Section 2.2 of the NRC Enforcement Policy, ISFSIs are not subject to the SDP and, thus, traditional enforcement will be used for these facilities. The violation was dispositioned using the traditional enforcement process using Section 2.3 of the Enforcement Policy.

The examples were determined to be of more than minor significance because if left uncorrected, these could lead to a more significant safety concern. Consistent with the guidance in Section 2.6.D of the NRC Enforcement Manual, if a violation does not fit an example in the Enforcement Policy Violation Examples, it should be assigned a severity level: (1) Commensurate with its safety significance; and (2) informed by similar violations addressed in the Violation Examples. The violation screened as having very low safety significance (Severity Level IV).

Enforcement: 10 CFR 72.150, "Instructions, Procedures, and Drawings," states, in part, that the licensee shall prescribe activities affecting quality by documented instructions, procedures, or drawings of a type appropriate to the circumstances and shall require that these instructions, procedures, and drawings be followed. The instructions, procedures, and drawings must include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.

Contrary to the above,

1. On August 24, 2010, Procedure FH-20; Operation of Fuel Handling Building Crane; Revision 24, was identified to not contain adequate instructions, since the procedure failed to establish procedural guidance to instruct crane operators to check holding brakes or define a specific weight as "approaching a rated load." The licensee documented the issue in its corrective action program.
2. On September 4, 2010, Procedure BFP FH-69, "HI-TRAC Movement within the Fuel Building," Revision 5, was identified to not contain adequate instruction, since the procedure failed to have steps in place to ensure the mating device air bags properly deflated and that the HI-TRAC pool lid was correctly positioned on the mating device. The licensee failed to have procedures that would ensure that interference points such as the HI-TRAC bottom pool lid did not exist during MPC transfer operations.

This is a violation of 10 CFR 72.150, "Instructions, Procedures, and Drawings." This Severity Level IV Violation is being treated as a NCV consistent with Section 3.1.1 of the NRC Enforcement Manual. The licensee documented these issues in its corrective action program as IR1106006 and IR1109925. **(NCV 05000454/2010005-03; 05000455/2010005-03; 07200068/2010003-2, Inadequate Procedural Guidance for Heavy Loads Operations.)**

4OA6 Meetings

.1 Exit Meeting Summary

On January 13, 2011, the inspectors presented the inspection results to Mr. B. Adams, and other members of the licensee staff. The licensee personnel acknowledged the inspection results presented. The inspectors confirmed that all proprietary material reviewed during the inspection was returned to the licensee staff.

.2 Interim Exit Meetings

Interim exits were conducted for:

- The results of the LORT Program inspection with Ms. L. Bogue on October 29, 2010.
- The results of the Heat Sink inspection to Mr. B. Adams on December 3, 2010.
- The results of the Radioactive Gaseous and Liquid Effluent Treatment and Performance Indicator Verification inspection with Mr. D. Enright on December 14, 2010.

- The results of the ISFSI Initial Cask Loading Campaign inspection with Mr. D. Enright on December 20, 2010.

The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

- D. Enright, Site Vice President
- B. Adams, Plant Manager
- L. Bogue, Training Director
- A. Daniels, Nuclear Oversight
- C. Gayheart, Operations Director
- D. Gudger, Regulatory Assurance Manager
- B. Youman, Work Management Director
- T. Spelde, ISFSI Project Manager

Nuclear Regulatory Commission

- E. Duncan, Chief, Reactor Projects Branch 3
- A.M. Stone, Chief, Engineering Branch 3

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000454/2010005-01 05000455/2010005-01	NCV	Inadequate Instructions for the Inspection of the River Screen House and Essential Service Water Cooling Tower (Section 1R07.1.b)
05000454/2010005-02 05000455/2010005-02 07200068/2010003-01	NCV	Inadequate Procedures for Implementing FSAR Required Annulus Cooling (Section 4OA5.2.b.1)
05000454/2010005-03 05000455/2010005-03 07200068/2010003-02	NCV	Inadequate Procedural Guidance for Heavy Loads Operations (Section 4OA5.2.b.2)

Closed

05000454/2010005-01 05000455/2010005-01	NCV	Inadequate Instructions for the Inspection of the River Screen House and Essential Service Water Cooling Tower (Section 1R07.1.b)
05000455/2010-001-00	LER	Reactor Protection and Auxiliary Feedwater Actuation Signals from Low Steam Generator Level Due to Inadequate Surveillance Testing (Section 4OA3.1)
05000454/2010005-02 05000455/2010005-02 07200068/2010003-01	NCV	Inadequate Procedures for Implementing FSAR Required Annulus Cooling (Section 4OA5.2.b.1)
05000454/2010005-03 05000455/2010005-03 07200068/2010003-02	NCV	Inadequate Procedural Guidance for Heavy Loads Operations (Section 4OA5.2.b.2)

LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety, but rather, that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

Section 1R01: Adverse Weather Protection

- IR 1130413; Unsecured Items Under 345KV Lines SW of Plant, October 25, 2010
- IR 1131473; TB South Wall Louvers Cannot be Closed, October 27, 2010
- IR 1136634; Antifreeze Not at Correct Concentration 0SX02PB, November 06, 2010
- IR 1138951; Wrong Revision of TB Louver TCCP Installed in Plant, December 01, 2010
- IR 1146976; NOS ID: Winter Readiness Evaluation on TR Tanks, December 01, 2010
- IR 1153775; Winter Readiness Issue – SH Shutdown in January-C&T Level 4, December 17, 2010
- IR 1154164; 0BOSR XFT-A1 Freeze Protection Discrepancies, December 19, 2010
- OP-AA-108-111-1001; Severe Weather and Natural Disaster Guidelines, Revision 5
- IR 1122947; NRC Walkdown of ISFSI Storage Pad Area, October 06, 2010
- 0BOSR XFT-A1; Freezing Temperature Equipment Protection SH and Department Support Requirements, Rev. 13
- 0BOSR XFT-A3; Freezing Temperature Equipment Protection Plant Ventilation Systems, Rev. 7
- 0BOSR XFT-A4; Freezing Temperature Equipment Protection Protected Area Buildings Ventilation Systems and Tanks, Rev. 7
- 0BOSR XFT-A5; Freezing Temperature Equipment Protection Non-Protected Area Buildings Ventilation Systems, Rev. 5

Section 1R04: Equipment Alignment (Quarterly)

- IR 113291; Review CS009 Concern for Past Reportability, October 27, 2010
- IR 146420; 1B SX Motor Oil Level Too High, November 30, 2010
- IR 146423; 2A SX Motor Oil Level Too High, November 30, 2010
- Drawing M-61; Diagram of Safety Injection, Revision AE
- Drawing M-64; Diagram of Chemical & Volume Control & Boron Thermal Regeneration, Revision AY
- IR 1125754; Broken Finder Base Assemblies and Cracked Rotor, October 13, 2010
- IR 1128753; Unplanned LCOAR, 1A CV PP CLR Significant SX Leak, October 20, 2010
- IR 1140870; Normal Valve Position Incorrect on P&ID M-136 SH. 1 - CCP
- BOP CV-1a; Startup of the CV System (Unit 1), Revision 22
- OP-AA-103-102; Watch-Standing Practices, Revision 8
- OP-AA-108-101; Control of Equipment and System Status, Revision 8
- OP-AA-10; Clearance and Tagging Process Description, Revision 2
- M-46; Diagram of Containment Spray, Sheets 1A, 1B, and 1C; Revision AN, AR, and AL
- BOP DG-M1; Diesel Generator System Valve Line-Up, Rev. 19
- BOP DG-21; Diesel Generator Air Receiver Pressure Control, Rev. 5

Corrective Action Documents As a Result of NRC Inspection

- IR 1148096; NRC Identified Oil Leak on 2SI8924A Valve, December 2, 2010
- IR 1148603; Clarification Needed for ECCS LCOAR Applicability, December 2, 2010
- IR 1462222; NRC Concern Being Addressed for SX Oil Reservoir Breather, November 30, 2010

Section 1R05: Fire Protection (Quarterly)

- Byron Pre-Fire Plan Layout; Unit 2 Auxiliary Building General Area – South-426' Elevation, Fire Area/Fire Zone: 11.6-0 South
- Byron Pre-Fire Plan Layout; Auxiliary Building General Area – North-383' Elevation, Fire Area/Fire Zone-11.4-0 North
- Byron Pre-Fire Plan Layout; Unit 1 Auxiliary Building 1A Centrifugal Charging Pump Room-364' Elevation, Fire Area/Fire Zone: 11.3D-1
- Byron Pre-Fire Plan Layout; Unit 2 Auxiliary Building General Area – North-364' Elevation, Fire Area/Fire Zone: 11.3-0 North
- Fire Drill 10-04 Minutes; Condensate Polisher Room, December 7, 2010
- Fire Drill 10-04 Minutes; CP Room, November 30, 2010
- Fire Drill 10-04 Minutes; CP Room, November 23, 2010
- OP-AA-201-003; Fire Drill Performance, Revision 11
- Byron/Braidwood Fire Protection Report; Section A5.7-20

Corrective Action Documents As a Result of NRC Inspection

- IR 1135638; NRC Identified Missing Hardware on 1AP26E, November 04, 2010
- IR 1135645; NRC Identified Missing Hardware on 1RY01ED, November 04, 2010
- IR 1137859; NRC Identified Issue with Conduct of 4th Quarter fire Drills, November 09, 2010
- IR 1140585; NRC Identified Degraded Sealant on Concrete Floor Covers, November 15, 2010

Section 1R06: Flood Protection Measures

- IR 648543; Hinge Slade Needs to be Replaced 0DSSD192, July 9, 2007
- IR 878278; MM IR for Weekly and Daily Schedule Adherence, February 2, 2009
- IR 1023213; 0DSSD191 Door Binding in Door Frame, January 29, 2010

Section IR07: Heat Sink

- 0BMSR SX-5, Inspection of River Screen House and Essential Service Water Cooling Tower Basins (CM-4), Revision 2
- 0BOL 7.9, LCOAR UHS TS LCO #3.7.9, Revision 12
- IR 1098065, 0BMSR SX-5 Did Not Pass Acceptance Criteria, August 4, 2010
- IR 1111893, Very Minor Leaking, September 9, 2010
- IR 1147407, GL 89-13 HX Acceptance Criteria Still at 10% for some HX's, December 2, 2010
- IR 311626, As-Found Accept Criteria Not Met for 1AF01ABHX; March 11, 2005
- IR 396735, SXCT Fan Gear Box Oil Level W.O. Instructions Need Changing, November 8, 2005
- IR 581931, Eddy Current Results on 1A DG Upper Jacket Water Cooler, January 22, 2007
- IR 656533; Replace 10 percent Tube Fouling A.c. w/ design-based for 89-13 HX's, August 2, 2007
- IR 865370, Degraded 1A DG JW Cooler Stationary End Divider Plate, January 12, 2009

- BMP 3000-15, Application of Palmer International's Tubesheet Cladding System, Revision 1
- BMP 3000-16, Application of Ceramalloy Thin-Film Coating System, Revision 3
- BOP AF-7T1, Diesel Driven Auxiliary Feedwater Pump Operating Log, Revision 21
- BOP SX-12, Makeup to an Essential Service Water Mechanical Draft Cooling Tower Basin, Revision 9
- BOP SX-13, Initiating and Terminating Essential Service Water System Blowdown, Revision 9
- BOP SX-T2, SX Tower Operation, Revision 14
- BYR 96-277, Determination of Maximum Allowable Silt Depth in River Screen House, December 10, 1996
- BYR 96-301, Minimum SX Cooling Tower Basin Water Level for Anti-Vortex Duct Flow, January 8, 1997
- BYR04-055, Determination of Tube Plugging Limits for DG Jacket Water Coolers, September 15, 2010
- CC-AA-309-101, Engineering Technical Evaluations, Revision 11
- EC 339308, Acceptance Criteria for As-Found Heat Exchanger Tube Blockage, Revision 0
- EC 341227, Evaluation Repair of the upper Jacket Water Cooler East Side Divider Plate for the 1A Diesel Generator Jacket Water Heat Exchanger, Revision 01
- EC 345255, Acceptance Criteria for As-Found Heat Exchanger Tube Blockage, 1/2AF01AB Heat Exchanger, Revision 0
- EC 355109, 1B AF Pump Oil Cooler (1AF01AB) Tube Blockage Evaluation, June 1, 2005
- EC 365231, Establish Tube Plugging Criteria for Eddy Current Testing for 1/2DG01KA/B, 1/2VP01AA/B/C/D, 0/1/2CC01A, 0WO01C A/B, 1/2VA 01/2/3/4/6S A/B, and 1/2V A08S Heat Exchangers
- ER 1147389, Less than adequate Application of EC #355109, December 2, 2010
- ER-AA-340-1002, Service Water Heat Exchanger Inspection Guide, Revision 4
- KSV-20-T, Jacket Water Heat Balance Rev, February 9, 1978
- NDIT BYR97-156, Evaluation of the Ceramalloy Protective to the inlet and floating end channels of the DG Jacket Water Coolers per ER9701078
- NED-M-MSD-014, Byron Ultimate Heat Sink Cooling Tower Basin Makeup Calculation, April 6, 2008
- NED-Q-MSD-001, ESW Cooling Tower Transient Model: Part I, Revision 0
- SX-TH01, Water Volume in SX System Outdoor Piping and SX Tower Basin, Revision 0
- WO 1050672, EPP GL 89-13 Heat Exchanger Inspection For DG, January 12, 2009
- WO 1218253, Support Diver Insp/Cleaning SXCT South 0B Basin/Sed PM ID 13, June 9, 2009
- WO 1232201, SXCT A Cell Inspection Per TRM, May 5, 2010
- WO 1236817, SXCT C Cell Inspection Per TRM, March 3, 2010
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- WO 1339209, 1SX01PB Comprehensive IST Req for Essential Service Water Pu, August 5, 2010
- WO 1342305, Support Diver Insp/Cleaning RSH South 0B Intake/Sed PM ID 30, July 21, 2010
- WO 601958, 1AF01AB - HX Inspection Per Generic Letter 89-13, October 25, 2004
- WO 722875, Exelon Byron Personal Service Report Analytical Report 1B DG Jacket Water Deposit Sample, December 18, 2006
- WO 799802, Eddy Current Examination Final Report, January 22, 2010
- WO 840626, EPP GL 89-13 Heat Exchanger Inspection for DG, January 21, 2007
- WO 961095, 1AF 01AB – HX Inspection Per Generic Letter 89-13, February 18, 2008

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- IR 1142249, Revise Procedure BVP 800-30 to Update Attachment 8, November 18, 2010
- IR 1144559, NRC ID'D: Work Package Documentation, November 24, 2010
- IR 1144584, NRC ID'D: Surveillance Criteria Needs Better Detail, November 24, 2010
- IR 1146808, NRC ID: Enhancement to Rock River Level Monitoring/Silting, December 1, 2010
- IR 1147389, Less Than Adequate Application of EC #355109, December 2, 2010
- IR 1147407, GL 89-13 HX Acceptance Criteria Still at 10% for Some HX's, December 2, 2010
- IR 1147478, NRC Question on SXCT Fan Oil Level Operability, December 2, 2010

Section 1R12: Maintenance Effectiveness

- WO 1206254; Clean Tube Side of Lube Oil Coolers, January 10, 2010
- WO 1387717; Clean Tube Side of Lube Oil Coolers, November 17, 2010
- IR 1141902; 2B DG Upper Lube Oil Hx Check Bolt Torque Tightness, November 17, 2010
- IR 1141905; 2B DG Lower Lube Oil Hx Check Bolt Torque Tightness, November 17, 2010
- IR 1141932; 1A DG Upper Lube Oil Hx Check Bolt Torque Tightness, December 7, 2010
- IR 1141934; 1A DG Lower Lube Oil Hx Check Bolt Torque Tightness, December 7, 2010
- IR 1141936; 1B DG Upper Lube Oil Hx Check Bolt Torque Tightness, December 7, 2010
- IR 1141939; 1B DG Upper Lube Oil Hx Check Bolt Torque Tightness, December 7, 2010
- WO 1387939; Check the Torque on 2B D/G Upper and Lower Lube Oil Cooler, November 18, 2010
- WO 1393985; Proof Torque 1B D/G Lower Lube Oil Cooler Stationary Head Bolts, December 29, 2010
- WO 1393989; Proof Torque 1B D/G Upper Lube Oil Cooler Stationary Head Bolts, December 15, 2010
- WO 1393999; Proof Torque 1A D/G Lower Lube Oil Cooler Stationary Head Bolts, January 4, 2011
- WO 1394004; Proof Torque 1A D/G Upper Lube Oil Cooler Stationary Head Bolts, December 15, 2011
- List of Run Times for 2A D/G from January to November of 2010

Section 1R13: Maintenance Risk Assessments and Emergent Work Control (Quarterly)

- Draft Risk Assessment for Week of November 29, 2010
- Risk Assessment for Week of November 29, 2010; Revision 1
- Risk Assessment for Week of November 29, 2010; Revision 2
- Risk Assessment for Week of November 29, 2010; Revision 3
- Risk Assessment for Week of November 29, 2010; Revision 4
- Risk Assessment for Week of November 29, 2010; Revision 5
- Risk Assessment for Week of November 29, 2010; Revision 6
- Operations Logs November 29 – December 3, 2010
- WC-AA-101; On-line Work Control Process; Revision 17
- ER-AA-600-1042; On-line Risk Management; Revision 7

Section 1R15: Operability Evaluations (Quarterly)

- IR 709005; 1B Diesel Oil Shows Copper Trending Up – No Threat to Equipment, October 07, 2010
- IR 1120751; Pressurizer Steam Space Sample Line Leakage, October 01, 2010

- IR 1128756; Unplanned Entry Into 1BOA RCP-12 for #2 Seal Leakoff 1C RCP, October 20, 2010
- IR 1133944; Settings on Woodward Governor, November 02, 2010
- Prompt Investigation; Parts of 7L Piston Pin Bushing Found in Engine Crankcase
- IR 1112655; Engineering NSRB Subcommittee Observation and Conclusion, September 13, 2010
- IR 1128753; Unplanned LCOAR, 1A CV Pump Cub CLR Significant SX Leak, October 20, 2010
- IR 1133944; Settings on Woodward Governor, November 02, 2010
- IR 1149417; Inconsistent SX Piping Configuration for 1B AF PP Lube Oil Cooler, December 07, 2010
- Licensee E-Mail from Richard Campbell dated October 26, 2010; Diesel Generator Crank Case Oil Copper Trends
- BFP FH-63; Hi-Storm Inspection, Revision 1
- EC 379956; CV Pump Capability with No Cubicle Cooler, August 23, 2010
- Letter from U.S. NRC to Mr. T.E. Herrmann, Chairman, Pressurizer Safety Valve Working Group, Westinghouse Owners Group, Subject: Safety Evaluation of Westinghouse Electric Corporation Topical Report WCAP - 12910 dated February 19, 1993
- EC 381932; Op Eval 10-005, 2RY8010A Leakage Concerns, Rev. 0
- M-2544A; Unit 1 Essential Service Water Connections for Auxiliary Feedwater , Rev. C
- EC 382473; Op Evaluation 10-008, 1B AF Pump Lube Oil Cooler Piping Wrong, December 10, 2010
- IR 1138222; Found FME in the 2A SX Shaft Driven Lube Oil Pump, November 10, 2010
- EC 382534; Evaluation of FME Plug Found in the 2SX01PA Shaft Driven Lube Oil Pump, December 14, 2010

Section 1R18: Temporary Modifications

- EC 380566; Temporarily Disconnect Both Sudden Pressure Relays for Main Power Transformer 2E Due to Ground Associated with Sudden Pressure Relay 63-1, Rev. 0
- EC 382399; Temporarily Jump Out Cell 42 of ESF Battery 112 to allow 125 VDC ESF Battery Operation with 57 Cells, December 3, 2010
- BYR 97-204/BRW-97-0384-E; 125 VDC Battery Sizing Calculation, June 10, 1997
- IEEE STD 485-1983; IEEE Recommended Practice for Sizing Large Lead Storage Batteries for Generating Stations and Substations
- BYR97-005-3; C&D Battery Discharge Characteristic Curve, November 18, 1997

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- IR 1123778; NRC Concerns with Timeliness & Pipe Supports, September 30, 2010

Section 1R19: Post Maintenance Testing

- WO 1375300; 1B Diesel Generator Operability Surveillance, October 31, 2010
- WO 1395304; Auctioneer High Tave Function Failed High on Unit 2, December 16, 2010
- IR 1133944; Settings on Woodward Governor, November 2, 2010
- MA-BY-721-061; 125 Volt Battery Bank Quarterly Surveillance, Rev 12
- WO 99070876; Jumper Out Degraded Battery Cell – Battery 112, December 2, 2010
- MA-MW-726-605; 125 Volt DC ESF Battery Cell Jumpering, Rev. 0

- EC 398100; Verify that NDIT BYR-2001-009, Rev. 0 can be Utilized to meet the Limitation Listed in Step 3.2.4 of MA-MW-726-605 for Jumpering Out Cell 42 of Battery 112, December 1, 2010
- IR 1146614; 112 Battery Cell 42 Low Cell Voltage, November 30, 2010

Section 1R22: Surveillance Testing

- IR 1122192; GL 08-01 Check-In deficiency – CS full of Water Technical Specifications, October 5, 2010
- IR 1122200; GL 08-01 Check-In deficiency – CS Eductor Additive Line, October 5, 2010
- IR 1122268; GL 08-01 Check-In deficiency – BOP CS-5, October 5, 2010
- IR 1122270; GL 08-01 Check-In deficiency – CS NAOH Line, October 5, 2010
- IR 1122272; GL 08-01 Check-In deficiency – CS019 Margin, October 5, 2010
- IR 1131291; Review CS009 Concern for Reportability, October 27, 2010
- IR 1131567; Technical Specifications Bases pH Range Discrepancy, October 27, 2010
- CS System Health Report, Last Updated on June 30, 2010
- IR 1152791; Missing Screw, December 15, 2010
- 2BOSR 6.3.7-1; Unit Two Primary Containment Type C Local Leakage Rate Tests of Containment Purge Supply Isolation Valves, Rev. 6
- WO1348943; LLRT for P-97 - 2VQ001A and 2VQ001B, December 15, 2010

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- IR 1159250; NRC Questioned Clearance Between Scaffolds and Unit 2 Containment, December 15, 2010

Section 40A1: Performance Indicator Verification

- IR 1094565; SX MSPI Data Discrepancy, July 26, 2010
- IR 1140964; NOS ID Winter Readiness Requirements Not Met, November 16, 2010
- IR 1152376; Unit 2 CWS MSPI Exelon At-Risk, December 14, 2010

Section 40A2: Problem Identification and Resolution

- OP-AA-102-103-1001; 2010 Quarter 4 Assessment, Operator Burden/Degraded Equipment Aggregate Assessment, Revision 3
- OP-AA-111-101; Operating Narrative Logs and Records, Revision 7
- Plant Health Committee; Red/Yellow System Action Plan, December 12, 2010
- Letter from HOLTEC International to Exelon Generation Company, LLC, Dated November 11, 2010
- SM-AA-102; Warehouse Operations, Revision 14
- Unit 1 & 2 Standing Order; Interim RH Restrictions until Procedures can be Revised, December 2, 2010
- Section XI Equipment in Double Frequency, December 14, 2010
- Equipment Important to Emergency Response (EITER) in Degraded Status, December 14, 2010
- Equipment Important to Emergency Response (EITER) in Degraded Status Requiring Comp Measures, December 14, 2010
- Operator Challenges; December 13, 2010
- Plant Health Committee Agenda, November 29, 2010
- HC Minutes, November 08, 2010

- Issue 1157146; Effectiveness Review of CCA 644073, December 30, 2010
- IR 699347; Discrepancy Between Shielding Calculation and Wall Thickness, November 14, 2007
- IR 729631; Apparent Failure to Update Fire Protection Report, January 30, 2008
- IR 723573; Discrepancy in UFSAR Table 3.9-16 Classification, January 17, 2008
- IR 753012; During 1B AFW Pump Test an Oil Leak Developed with Flames, March 21, 2008
- IR 761313; BaR15 Coating Inspection Does Not Meet Acceptance Criteria, April 8, 2008
- IR 765900; Incorrect Emergency Exit Criteria 1BOSR 3.2.8-609D, April 21, 2008
- IR 771208; EC's for Equipment Stored in Containment Due to GSI-191, May 2, 2008
- IR 773725; Request Documented Clarification of Coating Requirements, May 9, 2008
- IR 785911; Undocumented SH to WO System Crosstie Pipes found in Auxiliary Building, June 12, 2008
- IR 790335; Need Engineering to Provide Required Reference Dose Rates, June 25, 2008
- IR 799561; Tube Material Discrepancy in CV and SI Pump Lube Oil Coolers, July 23, 2008
- IR 828275; Tech Spec 4.12 and TRM 5.A Compliance, October 8, 2008

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- IR 1138034; NRC Discovered Dried Boric Acid on 1FC8762B, November 9, 2010
- IR 1156959; NRC Questions Aging Engineering, Supply and Operations Actions, December 30, 2010

Section 40A5: Other Activities

- HI-2104725; Vacuum Drying Fuel Temperature Calculation of Byron Cask 1 Under Loss of Annulus Circulation; Revision 0
- IR 1104940; FME – Spent Fuel Pool Cask Pit; August 23, 2010
- IR 1105064; Review of Performance on ISFSI FHB / Crane Calculations; August 23, 2010
- IR 1105388; ISFSI Transporter Failure; August 24, 2010
- IR 1105670; South Bridge L/S Stops Crane before Desired Destination; August 25, 2010
- IR 1105686; Spent Fuel Pit Bridge Crane Delay to Dry Cask Storage; August 25, 2010
- IR 1105741; FI-LL, ISFSI Lesson Learned Suggestions, Decon Improvement; August 25, 2010
- IR 1106006; NRC Identifies Procedure Improvements LL; August 26, 2010
- IR 1106593; NRC ISFSI Inspector 8/26/10 Observations; August 26, 2010
- IR 1107172; FI-LL, BFP FH-78 for WM CLG Option HI-TRAC Annulus Vacuum Drying System Operations; August 29, 2010
- IR 1107675; Holtec FSAR Table 1.2.2 Contains Incorrect Value for MPC 32; September 29, 2010
- IR 1108142; Discrepancy in BFP FH-71; August 31, 2010
- IR 1108196; SAM #556 Needs Moved Into FHB to Support ISFSI; August 31, 2010
- IR 1108234; Who is in Charge: Exelon Nuclear or Contractors; August 31, 2010
- IR 1108255; ISFSI NRC Communications; August 31, 2010
- IR 1108790; Holtec ISFSI Letter on Vacuum Drying was Revised; September 1, 2010
- IR 1109916; ISFSI Observations and Lessons Learned; September 4, 2010
- IR 1109925; Momentary Load Decrease During Multi Purpose Canister Download; September 4, 2010
- IR 1110070; ISFSI HI-STORM Transporter Shutdown; September 5, 2010
- IR 1114568; BWR ISFSI MPCs Require Analysis-Cantera; September 17, 2010
- IR 1114739; Firewatch Response Requirements need Defined for ISFSI; September 18, 2010
- IR 1116408; NRC Potential URIs From ISFSI Reactive Inspection; September 17, 2010

- IR 1119586; Procedure Problems Delay ISFSI Project Startup; September 29, 2010
- IR 1121882; FHB Overhead Crane Operating Temperature Outside Procedure; October 4, 2010
- IR 1121913; Procedure Changes Needed; October 4, 2010
- IR 1122498; NRC Questioned Items Apparently Stored Near ISFSI Pad; October 5, 2010
- IR 1122947; NRC Walkdown of ISFSI Storage Pad Area
- IR 1123339; FHB Crane Girder Temperature not met Before Use; October 7, 2010
- IR 1123564; ISFSI Mating Device Bolt Stuck
- IR 1124377; Need Temperature Instrument to meet FSAR Requirement; October 9, 2010
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- IR 1126491; ISFSI Bolts Need Evaluation to Establish Criteria; October, 12, 2010
- IR 1127060; ISFSI Annulus Cooling; October 15, 2010
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- IR 1134848; NSRP Ops Subcommittee – ISFSI IPA Briefing; November 3, 2010
- IR 1135839; NOS Identified Issues with ISFSI Related Test Equipment; November 4, 2010
- IR 1138033; NRC Identified Rust Spots in Vents of HI-STORMS; November 9, 2010
- IR 1139597; Continuation of Root Cause Actions for IR 1107151; November 12, 2010
- IR 1139650; ISFSI Fuel Selection Gives Incorrect Max Assembly Enrichment, November 12, 2010
- IR 1146205; Engineering Manager needs to Assign 72.212 Coordinator; November 30, 2010
- IR 1146276; Exelon Needs a Common 72.212 Report Change Process; November 30, 2010
- IR 1147090; NRC Identifies Procedure Enhancement; November 24, 2010
- 72.48-001; 72.212 Evaluation Report Change; Revision 0
- 72.48-002; 72.212 Evaluation Report Change 002; Revision 0
- 72.48-003; HI-TRAC Movement within the Fuel Building; Revision 0
- 72.48-004; Spent Fuel Cask Site Transportation; Revision 0
- 72.48-005; HI-TRAC Loading Operations; Revision 0
- 72.48-006; MPC Inspection; Revision 0
- 72.48-007; Transporter Operations; Revision 0
- 72.48-008; MPC Alternate Cooling; Revision 0
- 72.48-009; MPC Processing; Revision 0
- 72.48-010; Spent Fuel Cask Contingency Actions; Revision 0
- 72.48-011; MPC Processing; Revision 0
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- 72.48-013; HI-TRAC Movement within the Fuel Building; Revision 0
- 72.48-014; HI-TRAC Loading Operations; Revision 0
- 72.48-015; MPC Alternate Cooling; Revision 0
- 72.48-016; Spent Fuel cask Contingency Actions; Revision 0
- 72.48-017; MPC Processing; Revision 0
- 72.48-018; HI-TRAC Movement within the Fuel Building; Revision 0
- 72.48-019; HI-TRAC Loading Operations; Revision 0
- 72.48-020; MPC Processing; Revision 0
- 72.48-021; MPC Alternate Cooling; Revision 0
- BFP FH-64; Transporter Operations; Revision 4
- BFP FH-65; Spent Fuel Cask Site Transportation; Revision 6
- BFP FH-68; HI-TRAC Preparation; Revision 2
- BFP FH-69; HI-TRAC Movement within the Fuel Building; Revision 4
- BFP FH-70; HI-TRAC Loading Operations; Revision 1
- BFP FH-71; MPC Processing; Revision 5
- BFP FH-71; MPC Processing; Revision 6

- BFP FH-71; MPC Processing; Revision 7
- BFP FH-71; MPC Processing; Revision 8
- BFP FH-71; MPC Processing; Revision 9
- BFP FH-71; MPC Processing; Revision 10
- BFP FH-71; MPC Processing; Revision 11
- BFP FH-72; HI-STORM Processing; Revision 0
- BFP FH-78; Vacuum Drying System Operation; Revision 2
- BFP Fh-80; Haul Path and ISFSI Dry Run Operations; Revision 0
- BFP FH-83; Spent Fuel Cask Contingency Actions; Revision 1
- BFP FH-84; HI-TRAC Operations within the Fuel Handling Building; Revision 0
- BFP-FH-20; Operation of Fuel Handling Building Crane; Revision 24
- LS-BY-105; 72.48 Review Process for Dry Cask Storage; Revision 1
- NF-AP-622; Fuel Selection and Documentation for Dry Cask Storage; Revision 22
- Byron Nuclear Power Station, Units 1 and 2; 10 CFR 72.212 Evaluation Report; Revision 0
- Holtec Document 1676066; Responses to Potential URIs on Vacuum Drying / Annulus Flush; September 30, 2010
- Holtec Document 1676066 R1; Responses to Potential URIs on Vacuum Drying / Annulus Flush; October 6, 2010
- Apparent Cause Report 1100370; ISFSI Seismic Restraint Bumper Detached from Support Arm
- ISFSI Campaign Risk Matrix
- Root Cause Report 1107151; Annulus Chiller Unit Trip and Associated Organization and Programmatic Issues
- 2008 ISFSI Audit Comparative Report; November 6, 2008
- ISFSI Cask Loading Recovery Action Plan; August 30, 2010
- Registration of Use of Cask to Store Spent Fuel ; October 6, 2010
- Expectation for ISFSI Pad Cleanliness; October 15, 2010
- Holtec Document 1678064; VCT Tower Offset; October 22, 2010
- Holtec Document 1678064; Vacuum Drying/Annulus Flush of 21.22 kW MPC; Revision 1

LIST OF ACRONYMS USED

AC	Alternating Current
ADAMS	Agencywide Document Access Management System
ASME	American Society of Mechanical Engineers
AF	Auxiliary Feedwater
CAP	Corrective Action Program
CFR	Code of Federal Regulations
°F	Degree Fahrenheit
DC	Direct Current
EDG	Emergency Diesel Generator
FHB	Fuel Handling Building
FSAR	Final Safety Analysis Report
FWIV	Feedwater Isolation Valve
GL	Generic Letter
HI-STORM	Storage Cask
HI-TRAC	Transfer Cask
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Issue Report
ISFSI	Independent Spent Fuel Storage Installation
ISG	Interim Staff Guidance
JPM	Job Performance Measure
LER	Licensee Event Report
LORT	Licensed Operator Requalification Training
MPC	Multi-Purpose Canister
MSPI	Mitigating Systems Performance Indicator
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
ODCM	Occupational Dose Calculation Manual
OWA	Operator Workaround
PARS	Publicly Available Records System
PI	Performance Indicator
RCS	Reactor Coolant System
RETS	Radiological Effluence Technical Specification
RSH	River Screen House
SAT	Systematic Approach to Training
S/G	Steam Generator
SI	Safety Injection
SPST	Spent Fuel Storage and Transportation
SX	Essential Service Water
SXCT	Essential Service Water Cooling Tower
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
USAR	Updated Safety Analysis Report
UHS	Ultimate Heat Sink

M. Pacilio

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Sincerely,

/RA/

Eric R. Duncan, Chief
Branch 3
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SUBJECT: BYRON STATION, UNITS 1 AND 2 INTEGRATED INSPECTION
REPORT 05000454/2010-005; 05000455/2010-005; 07200068/2010003-2

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