

May 15, 2007

Mr. Christopher M. Crane
President and Chief Nuclear Officer
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: BYRON STATION, UNITS 1 AND 2 NRC INTEGRATED INSPECTION
REPORT 05000454/2007002; 05000455/2007002

Dear Mr. Crane:

On March 31, 2007, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Byron Station, Units 1 and 2. The enclosed report documents the inspection findings which were discussed on April 6, 2007, with Mr. Dave Hoots and other members of your staff.

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

This report documents two NRC-identified findings of very low safety significance (Green). One finding involved a violation of NRC requirements. In addition, one licensee-identified violation which was determined to be of very low safety significance is listed in this report. However, because of the very low safety significance of the violations and because they were entered into your corrective action program, the NRC is treating these violations as non-cited violations (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy.

If you contest the subject or severity of a Non-Cited Violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 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, D.C. 20555-0001; and the Resident Inspector office at the Byron Station.

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Sincerely,

/RA/

Richard A. Skokowski, Chief
Branch 3
Division of Reactor Projects

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

Enclosure: Inspection Report 05000454/2007002; 05000455/2007002;
w/Attachment: Supplemental Information

cc w/encl: Site Vice President - Byron Station
Plant Manager - Byron Station
Regulatory Assurance Manager - Byron Station
Chief Operating Officer
Senior Vice President - Nuclear Services
Vice President - Operations Support
Vice President - Licensing and Regulatory Affairs
Director Licensing
Manager Licensing - Braidwood and Byron
Senior Counsel, Nuclear
Document Control Desk - Licensing
Assistant Attorney General
Illinois Emergency Management Agency
State Liaison Officer, State of Illinois
State Liaison Officer, State of Wisconsin
Chairman, Illinois Commerce Commission
B. Quigley, Byron Station

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Vice President - Licensing and Regulatory Affairs
Director Licensing
Manager Licensing - Braidwood and Byron
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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos: 50-454; 50-455
License Nos: NPF-37; NPF-66

Report Nos: 05000454/2007002; 05000455/2007002

Licensee: Exelon Generation Company, LLC

Facility: Byron Station, Units 1 and 2

Location: Byron, IL 61010

Dates: January 1 through March 31, 2007

Inspectors: B. Bartlett, Senior Resident Inspector
R. Ng, Resident Inspector
J. Cassidy, Health Physicist
A. Dahbur, Reactor Engineer
G. O'Dwyer, Engineering Specialist
C. Thompson, Illinois Emergency Management Agency

Approved by: R. Skokowski, Chief
Reactor Projects Branch 3
Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000454/2007002; 05000455/2007002; on 01/01/2007-03/31/2007; Byron Station, Units 1 and 2; Equipment Alignment and Fire Protection.

This report covers a 3-month period of baseline resident inspection and announced baseline inspections on radiation protection and on biennial heat sink performance. These inspections were conducted by regional inspectors and the resident inspectors. Two Green findings, one of which was a non-cited violation (NCV), were identified. The significance of most findings is indicated by their color (Green, White, yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be "Green" or be assigned a severity level after NRC management review. NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. Inspector-Identified and Self-Revealed Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a Non-Cited Violation (NCV) of the Byron Station Operating License for the failure to have adequate alternate safe shutdown procedure. Specifically, licensee's procedure BOP FR-1, "Fire Response Guidelines," did not include adequate steps and instructions to prevent the draining of the refueling water storage tank (RWST) into the containment sump in the event of a fire in the auxiliary electrical equipment room (AEER) or the control room. The licensee implemented appropriate procedure changes for both the AEER and control room fire zones to isolate all potential RWST drain paths.

The finding is greater than minor because it affected the attribute of procedure quality for protection against external factors and it impacted the objective of the mitigating systems cornerstone. The failure to provide adequate instructions in the alternate shutdown procedure to promptly prevent the draining of the RWST to the containment sump could have adversely impacted the operators' ability to promptly take appropriate actions and could have complicated safe shutdown in the event of a fire. The finding was of very low safety significance based on Phase 2 and Phase 3 SDP evaluations completed by the Region III senior reactor analyst (SRA) in accordance with IMC 0609, Appendix F, "Fire Protection Significance Determination Process." (Section 1R05.2)

- Green. The inspectors identified a finding for the licensee's failure to maintain setpoint control of the constant level oilers. Specifically, the licensee did not incorporate the vendor's recommendation on setting the oil level for the essential service water pumps. This condition increased the challenges to the proper functioning of the lubricating oil and thus to the bearings of the safety-related pumps. The licensee subsequently reset the oil level for the pumps to the recommended setting and entered this issue into their corrective action program.

This finding is more than minor because of the potential for degradation of oil and bearings to safety related components, which could adversely affect their availability and reliability. This finding is of very low safety significance because no bearings had been damaged due to the high oil levels despite operating in this condition for many years and no significant oil degradation had occurred. The inspectors did not identify a violation of regulatory requirements. However, the cause of the finding is related to the cross-cutting element of problem identification and resolution, particularly the thoroughness of the extent of condition review. (Section 1R04.2)

B. Licensee Identified Violations

One violation of very low safety significance, which was identified by the licensee, has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and the corrective actions are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

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

Unit 2 operated at or near full power throughout the inspection period with the following exceptions:

- On January 27, 2007, the unit reduced power to 95 percent to swap feedwater pumps. The unit returned to full power on January 28, 2007.
- On February 11, 2007, the unit reduced power to 94 percent to swap feedwater pumps. The unit returned to full power on the same day.
- On March 15, 2007, the unit entered coastdown operation.
- On March 28, 2007, the unit reduced power from 87 to 80 percent to perform main steam safety valve testing. The unit returned to 87 percent power on March 30, 2007. The unit was scheduled to enter a refueling outage on April 1, 2007.

1. REACTOR SAFETY

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

1R04 Equipment Alignment (71111.04Q and S)

.1 Partial Walkdowns

a. Inspection Scope

The inspectors performed one partial walkdown sample of accessible portions of a train of risk-significant mitigating system equipment during times when the train was of increased importance due to the redundant trains or other related equipment being unavailable. The inspectors utilized the valve and electric breaker lineups and applicable system drawings to determine that the components were properly positioned and that support systems were lined up as needed. The inspectors also examined the material condition of the components and observed operating parameters of equipment to determine that there were no obvious deficiencies. The inspectors used the information in the appropriate sections of the Updated Final Safety Analysis Report (UFSAR) and Technical Specifications (TS) to determine the functional requirements of the systems.

The inspectors verified the alignment of the following:

- Unit 2 Train B Auxiliary Feedwater Pump while Train A was out of service.

The inspectors also reviewed selected issues documented in IRs, to determine if they had been properly addressed in the licensee's corrective action program. The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

.2 Complete Walkdown

a. Inspection Scope

During the inspection, the inspectors finished one complete system alignment inspection of the accessible portions of the Unit 2 Train A Essential Service Water System. This system was selected because it was considered both safety-related, and risk significant for the plant condition.

In addition to the walkdowns, the inspectors reviewed the following documentation to verify that the system was properly maintained in accordance with design basis documents:

- selected operating procedures regarding system configuration;
- the Updated Final Safety Analysis Report (UFSAR), system drawings, and other selected design bases documentation regarding the system; and
- issue reports (IRs) for the system initiated within the last year.

Documents reviewed as part of this inspection are listed in the Attachment. This walkdown represented one inspection sample.

b. Findings

Introduction: A finding of very low safety significance (Green) was identified by the inspectors for the licensee failure to maintain setpoint control of the constant level oilers. This condition increased the challenges to the proper functioning of the lubricating oil and thus to the bearings of the safety-related pumps. This finding was of very low safety significance because no bearings had been damaged due to the high oil levels despite operating in this condition for many years and the oil had only been moderately impacted.

Description: The inspectors observed that the constant level oilers on the four safety-related essential service water pumps (licensee system designator SX) were all above the maximum oil level line. The vendor recommended that to prevent bearing damage the maximum oil level should be at the center of the gauge glass and that it should be measured with the pump not operating. High oil levels can cause air to be pushed into the oil resulting in frothing, and thinning of the oil, which can cause inadequate heat removal and bearing damage. The licensee wrote IRs 555893 and 555201 to address the inspectors' observations.

After reviewing the issue, the licensee acknowledged the potential to damage the pump bearings due to either high oil levels or oil thinning. However the licensee did not identify any instances of bearing damage that could be attributed to improper oil levels. The oil levels in the SX motors were all immediately reduced to within the vendor recommended levels. The licensee's corrective actions included communications with the vendor to better understand the need to maintain the oil level at the center of the gauge glass, revising work instructions to ensure the oil level was restored to within the required range following maintenance and working with the equipment operators to ensure they understood the need to limit oil level.

Analysis: The inspectors determined that the failure to have setpoint control of the safety-related constant level oilers was a performance deficiency warranting a significance evaluation in accordance with Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Disposition Screening," issued November 2, 2006. This finding was more than minor because of the potential for degradation of oil/bearings to safety-related components that would increase their unavailability and unreliability and could have affected the core decay heat removal system.

In accordance with IMC 0609, "Significance Determination Process," issued November 22, 2005, Appendix A, Determining the Significance of Reactor Inspection Findings for At-Power Situations," issued March 23, 2007, Attachment 1, the inspectors determined that this finding screened as Green. Specifically, the finding did not result in a loss of operability, did not result in a loss of system safety function, did not result in an actual loss of safety function of a single train for greater than its TS Allowed Outage Time, did not represent an actual loss of safety function of one or more non-TS trains of equipment designated as risk-significant for greater than 24 hours and was not related to a seismic, flooding or severe weather initiating events. Therefore, the inspectors concluded that this finding was of very low safety significance (Green). (FIN 05000454/2007002-01; 05000455/2007002-01)

This finding has a cross-cutting aspect in the area of problem identification and resolution because the licensee failed to thoroughly evaluate a similar problem such that extent of condition was considered and the cause was resolved. That past problem was described in NRC Inspection Report 05000454/455/2006005.

Enforcement: The inspectors concluded that no violation of regulatory requirements had occurred as there was no procedure requirement in the maintenance work packages to check or adjust the constant level oiler setpoints; no significant oil degradation had occurred; and no bearings had been damaged due to the lack of setpoint control.

1R05 Fire Protection (71111.05)

.1 Quarterly Walkdowns

a. Inspection Scope

The inspectors conducted fire protection walkdowns that were focused on availability,

accessibility, and the condition of fire fighting equipment; the control of transient combustibles and ignition sources; and on the condition and operating status of installed fire barriers. The inspectors reviewed applicable portions of the Byron Station Fire Protection Report and selected fire areas for inspection based on their overall contribution to internal fire risk, as documented in the Individual Plant Examination of External Events Report.

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 that fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The Byron Station Pre-Fire Plans applicable for each area inspected were used by the inspectors to determine approximate locations of firefighting equipment.

The inspectors completed seven inspection samples by examining the plant areas listed below to observe conditions related to fire protection:

- Unit 2 Containment Pipe Penetration Area Elevation 364' (Zone 11.3-2);
- Unit 2 Division 22 Miscellaneous Electrical Equipment Room (Zone 5.4-2);
- Auxiliary Building elevation 346' general area (Zone 11.2-0);
- Auxiliary Building Elevation 401' General Area (Zone 11.5-0);
- Auxiliary Equipment Electric Room (Zone 5.5-1);
- Diesel Generator and Day Tank Room Unit 1 Train A (Zone 9.2-1); and
- Diesel Fuel Oil Storage Tank Room Unit 1 Train A (Zone 10.2-1).

The inspectors reviewed selected issues documented in IRs, to determine if they had been properly addressed in the licensee's corrective action program. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's corrective action program. The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

.2 Tri-ennial Fire Protection (71111.05T)

a. Adequacy of Safe Shutdown Procedures to Address Draining of the RWST

Introduction: The inspectors identified a Non-Cited Violation (NCV) of the Byron Station Operating License having very low safety significance (Green) for inadequate alternate safe shutdown procedures. Specifically, licensees' Procedure BOP FR-1, "Fire Response Guidelines," did not include adequate steps/instructions to prevent the draining of the refueling water storage tank (RWST) into the containment sump in the event of a fire in the auxiliary electrical equipment room (AEER) or the control room.

Description: Unresolved Item (URI 05000454/2004005-03; 05000455/2004005-03) was opened during the 2004 triennial fire protection inspection regarding the adequacy of alternate safe shutdown procedures in the event of a fire in the AEER or the control

room. Specifically, the inspectors questioned the adequacy of Procedure BOP FR-1 to ensure safe shutdown in the event of a fire in any of these areas that could result in the spurious opening of one of the low pressure safety injection containment sump supply isolation valves, 1SI8811A, and 1SI8811B. The licensee's safe shutdown (SSD) analysis documented that for a fire in either area, diagnostic indication, including RWST level and containment sump level circuits, may not be available. This issue was considered as an unresolved item pending NRC review of associated circuit issues. On December 20, 2005, the NRC issued Regulatory Issue Summary (RIS) 2005-30, "Clarification of Post-Fire Safe-Shutdown Circuit Regulatory Requirements," clarifying the NRC staff position, on protecting equipment affected by hot shorts, that "cables whose fire-induced failure could cause maloperation of redundant trains in a III.G.2 area due to hot shorts must be protected." Based on the inspector's review of the Byron Safety Evaluation Reports (SERs) and Fire Protection Report (FPR), and the information provided by RIS 2005-30, the inspectors determined that the spurious opening of one of these valves, 1SI8811A or 1SI8811B was credible and the licensee's procedures should have adequately addressed this concern.

Attachment 35 of Procedure BOP FR-1, Revision 6 (revision which was available during the 2004 inspection), addressed operator actions required for a fire in the AEER area. A table listing valves that may spuriously operate was provided in Step 13 of the Attachment. The instructions were to send an operator to open the breaker for SI8811A/B and verify the valve position locally. The information that the RWST inventory can drain to the sump was provided in the same instruction but no further procedural guidance was provided regarding the use of the sump and emergency core cooling system pumps to maintain hot standby and proceed to cold shutdown as stated in the SSD analysis. Similar instructions/discussion also applied to Attachment 38 for a fire in the control room.

During the 2004 inspection, the licensee indicated that in the event that the RWST drained to the containment sump, operators would use Procedure 1BEP ES-1.3, "Transfer to Cold Leg Recirculation, Unit 1," to maintain safe shutdown. The inspectors found that this procedure relied upon the use of indications and controls in the control room which may not be available in the event of a fire in the AEER or control room. For example, the procedure instructed operators to verify adequate containment sump level using level indicators 1LI-PC006 and 1LI-PC007. However, these instruments may not be available during this postulated fire. In addition, this procedure relied upon aligning the residual heat removal (RHR) pumps suction to the containment sump. The SSD analysis showed that both RHR pumps had control cables present in the AEER and control room fire areas. Credit was taken for repairing the control cables for one of the RHR pumps per existing repair procedure.

Based on the above discussion, the inspectors determined that the licensee did not have adequate procedures for alternate shutdown fire areas to ensure safe shutdown in the event of a fire in the AEER or the control room. Attachments 35 and 38 of Procedure BOP FR-1 did not provide adequate instructions to promptly prevent the draining of the RWST to the containment sump. Procedure 1BEP ES-1.3 relied upon the use of indication and controls that may not be available in the event of a fire.

Since the inspection in 2004, the licensee revised Procedure BOP FR-1 for both the

AEER and control room fire zones. The licensee added steps earlier in the procedure to promptly assure that an adequate RWST inventory was maintained. The steps included instructions for the operators to de-energize both valves SI8811A/B and to verify valves were in the closed position. The steps also provided instructions, that in the event any one of these valves was found not closed, for operators to close its associated SI8812A/B valve and one of the following valves RH8716A, RH8716B, or opposite train valve SI8812A/B to isolate all potential drainage.

Analysis: The inspectors determined that the failure to provide adequate steps/instructions in alternate shutdown Procedure BOP FR-1 (Revision 6) to ensure safe shutdown in the event of a fire in the AEER or control room was a performance deficiency, warranting a significance evaluation. Specifically, Attachments 35 and 38 of Procedure BOP FR-1 did not provide adequate instructions to promptly prevent the draining of the RWST to containment sump. The inspectors concluded that the finding was more than minor in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," issued on November 2, 2006. The finding involved the attribute of procedure quality for protection against external factors (i.e., fire) because the failure to provide adequate instructions in alternate shutdown procedure to promptly prevent the draining of the RWST to the containment sump could have adversely impacted the operator's ability to promptly take appropriate actions and could have complicated safe shutdown in the event of a fire. As such, this finding affected the mitigating systems cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage).

The inspectors reviewed IMC 0609, "Significance Determination Process," Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations," dated March 23, 2007, and determined that since the finding affected fire protection, a significance determination evaluation under IMC 0609, Appendix F, was required. The inspectors completed a significance determination of this issue using IMC 0609, Appendix F, "Fire Protection Significance Determination Process," dated February 28, 2005. This finding screened to a Phase 2 analysis in accordance with SDP Phase 1 using Attachment 2, "Degradation Rating Guidance Specific to Various Fire Protection Program Elements." The inspectors assigned a degradation rating of moderate because of procedural inconsistencies between BOP FR-1 and the Fire Safe Shutdown analysis.

The inspectors and the SRA performed a SDP evaluation to determine the risk-significance of this finding. The inspectors determined that the finding potentially affected the ability of the charging pumps to perform their safe shutdown function. The spurious opening of either valve SI 8811A or SI 8811B combined with the inadequate procedural guidance for operators to mitigate this spurious actuation would result in draining the RWST inventory to the containment sump. During a fire event, the operating charging pump suction would be aligned to the RWST and would therefore be vulnerable to failure from loss of suction if the RWST contents drain to the containment sump. The inspectors determined that the procedural guidance was inadequate for a fire in the AEER and in the main control room. As a result the SDP considered fire scenarios in these two plant areas.

For a fire in the AEER, the inspectors and the SRA completed a Phase 2 SDP evaluation using IMC 0609, Appendix F, "Fire Protection SDP." Based on information provided by the licensee, the inspectors determined that the spurious operation of SI8811A or SI8811B could occur if a fire affected either cabinet PA09J or PA10J in the AEER. The inspectors further determined that a fire in either of these panels was unlikely to spread within the AEER to affect a second division of safe shutdown equipment due to lack of intervening combustibles and the distance between the divisions within the room. Furthermore, a credible fire in either of these panels would not result in a loss of offsite power, or a small loss of coolant accident due to an inadvertent opening of the power operated relief valve (PORV). Therefore, the Phase 2 analysis considered a fire in either cabinet PA09J or PA10J that could induce a spurious opening of either SI8811A or B, which would result in the loss of one train of safe shutdown equipment. From Appendix F Step 2.4, the fire frequency for a single cabinet is $6.0\text{E-}5/\text{yr}$. Since the two cabinets contributed to this finding, the frequency of the fire is $1.2\text{E-}4/\text{yr}$. Also from Appendix F, Step 2.5, one division of equipment remained available for safe shutdown and was credited with a failure probability of $1.0\text{E-}2/\text{yr}$. Finally, from Step 2.8 of Appendix F, the probability of a spurious opening of the valve was estimated at 0.6. The final result of the change in risk for the AEER fire was estimated at $7.2\text{E-}7/\text{yr}$.

For a fire in the control room, the SRA completed a Phase 3 SDP evaluation using information from IMC 0609, Appendix F, and from the licensee's Individual Plant Examination for External Events (IPEEE) submittal. Based on information provided by the licensee and a walkdown of the control room, a fire in the main control room panel PM06J(A2) would be necessary to cause the spurious opening of SI 8811A or B. From the IPEEE, the SRA determined that a fire in this panel could affect auxiliary feedwater (AFW) pump 1B, both trains of safety injection (SI), both trains of RHR, manual reactor trip, manual safety injection switch, manual main steam isolation switch, manual Phase A isolation, and manual containment spray actuation switch. The SRA determined that offsite power, PORVs, and charging would not be affected by a fire contained in this cabinet. However, because of the inadequate procedure that could result in draining the RWST to the containment sump if the spurious valve opening occurred, the charging pumps could now also be affected due to loss of suction.

To estimate the fire frequency, the SRA used the main control board frequency from Appendix F ($4.8\text{E-}3$) and divided it by the number of control room cabinets listed in the licensee's IPEEE (31). The result was a fire frequency of $1.5\text{E-}4/\text{yr}$ for a single cabinet. No suppression of the fire prior to damage within the cabinet was evaluated. It was assumed that the fire would fail all of the functions listed above and would cause the spurious opening of the valve causing the draining of the RWST. To estimate a conditional core damage probability, the SRA used the Simplified Plant Analysis Risk Model, version 3.21 for Byron. The initiating event was assumed to be a transient with the loss of the power conversion system. The base case conditional core damage probability was estimated assuming AFW pump 1B, both SI trains, and both RHR trains were failed. The AFW pump was assumed to be recoverable since it is a diesel-driven pump that can be started and run locally. The current case to evaluate the delta risk due to the deficient procedure assumed that the charging pumps would fail with a failure probability of 0.6, to represent the probability of a spurious opening of the valve. No other spurious actuations were assumed to occur. The overall delta core damage

frequency estimate given these assumptions for the control room fire was 2.1E-7/yr. This analysis did not consider the control room evacuation scenario but assumed that the frequency of such a fire event would be less than the fire scenario considered here.

The total delta risk for both fire scenarios was 9.3E-7/yr which represented a finding of very low safety significance (Green). The result was bounding given that there was no credit for fire suppression prior to damage and no credit for operator manual actions to control equipment in the plant. The dominant sequence involved a fire in either the AEER or main control room that resulted in the spurious opening of SI 8811A or B, random failure of AFW, and failure of feed and bleed.

Enforcement: License condition 2.C.6 and 2E of the Byron Station Operating License for Unit 1 and 2 respectively required, in part, that the licensee implement and maintain in effect all provisions of the approved fire protection program as described in the licensee's Fire Protection Report, and as approved in the Safety Evaluation Report dated February 1987 through Supplement No. 8. Section 3.5.c "Alternative or Dedicated Shutdown Capability," Paragraph (3) [10 CFR Part 50, Appendix R, Section III.L.3] of the FPR in response to Appendix A of BTP [Branch Technical Position] APCS 9.5-1 stated, that "the shutdown capability for specific fire areas may be unique for each such area, or it may be one unique combination of systems for all such areas. In either case, the alternative shutdown capability shall be independent of the specific fire area(s). In addition, procedures shall be in effect to implement the alternative shutdown capability." This section of the FPR also indicated the licensee's response stated that the station complied with this NRC guideline.

Contrary to the above, in June 2004, the inspectors identified that Procedure BOP FR-1 "Fire Response Guidelines," Revision 6, was not adequate to implement the alternative shutdown capability. Specifically, Attachments 35 and 38 of Procedure BOP FR-1 for a fire in the auxiliary electrical equipment room and control room respectively, did not provide adequate instructions to prevent the draining of the RWST and did not direct the operators to use cold leg injection in the event that the RWST drained to the containment sump. Once identified, the licensee entered the issue into the corrective action program under AR 00234512 and revised Procedure BOP FR-1, by adding steps earlier in the procedure to promptly assure an adequate RWST inventory was maintained. Because this violation was of very low safety significance and it was entered into the licensee's corrective action program, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy. (NCV 05000454/2007002-02; 05000455/2007002-02)

1R06 Flood Protection Measures (71111.06)

1. Internal Flooding Review

a. Inspection Scope

The inspectors evaluated the internal flooding controls for the following areas:

- Unit 1 Auxiliary Feedwater Tunnel;
- Essential Service Water Pump Rooms Train A and Train B.

This review represented one inspection sample. Documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

On March 14, 2007, the inspectors entered the Unit 1 Auxiliary Feedwater (AFW) Tunnel as part of this inspection. The licensee had opened two of the four bolted down flood seal hatches for the tunnel for routine work activities. The inspectors observed that flood seal 1DSFS007 had some of its gasket missing. The flood seal looked normal from above but when viewed from below approximately three feet of gasket material were hanging down into the tunnel. The licensee initiated an IR and repaired the gasket while the other flood seals were still open.

On March 19, the inspectors performed a routine verification that the Unit 1 AFW tunnel hatches had been properly re-installed. The inspectors determined that hatch 1DSFS008 had not been properly re-installed. The hatch was bent upwards along one corner resulting in a narrow opening of approximately seven square inches. The inspectors questioned licensee personnel regarding the as-found condition of the hatch. The licensee initiated IR 605830, which stated that the flood seals were still able to protect the AFW isolation valves and that the AFW isolation valves could still perform their containment isolation function.

The inspectors questioned the licensee's basis for operability. Licensee personnel were unable to provide an adequate bases for operability of the AFW isolation valves. Licensee personnel immediately restored the AFW tunnel hatch/flood seal to the as-designed configuration and began performing a more detailed operability assessment. By the end of the report period the detailed operability assessment was not complete. Pending receipt from the licensee and the inspectors' review of the detailed operability assessment the past operability of the safety related equipment in the AFW tunnel will remain an Unresolved Item (URI) 05000454/2007002-03.

1R07 Heat Sink Performance (71111.07B)

.1 Biennial Review of Heat Sink Performance

a. Inspection Scope

The inspectors reviewed the performance of the Unit 2 Train A SX pump lube oil cooler and the Unit 2 Train B Diesel-Driven AFW pump closed cycle cooler. These heat exchangers were chosen for review based on many factors, e.g., their high risk-assessment worth in the licensee's probabilistic safety analysis, their important safety-related mitigating system support functions, and relatively low margin. This review resulted in the completion of two inspection samples. While on-site, the inspectors verified that the licensee's inspection, engineering and maintenance activities were adequate to ensure proper heat transfer. This was done by reviewing the methods used to inspect and test the heat exchangers, verifying that the as-found inspection results were appropriately dispositioned, and interviewing personnel. The inspectors

also verified, by review of procedures, test results, and interviews that chemical treatments, ultrasonic tests, and methods used to control biotic fouling, corrosion and macro-fouling were sufficient to ensure required heat exchanger performance.

The inspectors verified that the condition and operation of these heat exchangers were consistent with design assumptions in heat transfer calculations by reviewing related calculations, inspect/clean work orders, procedures and completed surveillance tests.

Also while on-site, the inspectors verified three attributes of the ultimate heat sink (UHS) as required by IP 71111.07B, Section 2.02, items d.1, d.2, and d.7.

The inspectors verified proper maintenance of inaccessible below-water portions of the UHS system by reviewing the methodology and results of underwater diving inspection documentation which demonstrated UHS capability. The licensee's underwater inspection ensured UHS capacity by monitoring and removing sediment intrusion as necessary and ensuring structural integrity of underwater UHS structures, weirs, and excavations by any necessary inspection and repairs. The inspectors reviewed associated calculations to ensure UHS capacity would support safety function performance. The inspectors also confirmed that the calculation and inspection methodologies were consistent with accepted NRC and industry practices.

The inspectors reviewed corrective action documents, concerning heat exchanger or heat sink performance issues to verify that the licensee had an appropriate threshold for identifying issues. The inspectors also evaluated the effectiveness of the corrective actions for identified issues, including the engineering justifications for operability.

Documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Regualification (71111.11)

.1 Resident Inspector Quarterly Review

a. Inspection Scope

The inspectors completed one inspection sample by observing and evaluating an operating crew during a reactor trip and anticipated transient without scram with failure of Unit 1 Loop A Steam Generator Power Operated Relief Valve. The inspectors evaluated crew performance in the areas of:

- Clarity and formality of communications;
- Ability to take timely actions;
- Prioritization, interpretation, and verification of alarms;
- Procedure use;
- Control board manipulations;
- Supervisor's command and control;

- Management oversight; and
- Group dynamics.

The inspectors verified that the crew completed the critical tasks listed in the above simulator guide. The inspectors also compared simulator configurations with actual control board configurations. For any weaknesses identified, the inspectors observed the licensee evaluators to determine whether they also noted the issues and discussed them in the critique at the end of the session. The inspectors verified that minor issues were placed into the licensee's corrective action program.

The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors completed one inspection samples by evaluating the licensee's implementation of the maintenance rule, 10 CFR 50.65, as it pertained to identified performance problems associated with the following structures, systems, and/or components:

- Unit 1 and 2 Rod Control Circuit Cards Failure.

The inspectors evaluated the licensee's appropriate handling of structures, systems, and components (SSC) condition problems in terms of appropriate work practices and characterizing reliability issues. Equipment problems were screened for review using a problem oriented approach. Work practices related to the reliability of equipment maintenance were observed during the inspection period. Items chosen were risk significant, and extent of condition was reviewed as applicable. Work practices were reviewed for contribution to potential degraded conditions of the affected SSCs. Related work activities were observed and corrective actions were discussed with licensee personnel. The licensee's handling of the issues being reviewed was evaluated under the requirements of the maintenance rule.

The inspectors also reviewed selected issues documented in IRs, to determine if they had been properly addressed in the licensee's corrective action program. The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors reviewed the licensee's management of plant risk during emergent maintenance activities or during activities where more than one significant system or train was unavailable. The inspectors chose activities based on their potential to increase the probability of an initiating event or impact the operation of safety-significant equipment. The inspectors verified that the evaluation, planning, control, and performance of the work were done in a manner to reduce the risk and the work duration was minimized where practical. The inspectors also verified that contingency plans were in place where appropriate.

The inspectors reviewed configuration risk assessment records, UFSAR, TS, and Individual Plant Examination. The inspectors also observed operator turnovers, observed plan-of-the-day meetings, and reviewed other related documents to determine that the equipment configurations had been properly listed, that protected equipment had been identified and was being controlled where appropriate, and that significant aspects of plant risk were being communicated to the necessary personnel.

The inspectors completed seven inspection samples by reviewing the following activities:

- Unit 2 Train A Solid State Protection System Testing while Unit 2 Train A Residual Heat Removal Pump was out of service (OOS);
- Unit 2 Rod Control Emergent Failure while DC Bus 112 was Cross-tied to DC Bus 212;
- Unit 2 Train B Essential Service Water Pump Work Window while "D" Reactor Containment Fan Cooler was OOS;
- Emergent Work for Unit 2 Train A Emergency Diesel Generator Low Jacket Water Flow;
- Missed Surveillance for Containment Spray Pumps;
- Emergent Work for Unit 0 Train B Non-Essential Service Water Pump High Bearing Temperature; and
- Unit 2 Unexpected Letdown Isolation and Resultant Unrecognized Entry into a Yellow On-Line Risk Configuration.

The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors evaluated plant conditions, selected condition reports, engineering evaluations, and operability determinations for risk-significant components and systems in which operability issues were questioned. These conditions were evaluated to determine whether the operability of components was justified.

The inspectors completed seven samples by reviewing the following evaluations and issues:

- Unit 2 Train A Main Steam Isolation Valve Hydraulic Level Low;
- Plugged Fire Nozzles in Unit 2 Train B Diesel Generator Fuel Oil Storage Tank Room;
- Unit 2 Train A Containment Spray Pump Degradation;
- Unit 0 Train A Essential Service Water Makeup Pump Fuel Oil Contamination;
- Non Safety Related Filters Installed in Safety Related Ventilation Systems;
- Flood Seal and High Energy Line Break Barrier Hatches to the AFW Tunnel Not Properly Secured; and
- Different Material Used in Essential Service Water Fan Blade Clamps.

The inspectors compared the operability and design criteria in the appropriate section of the TS including the TS Basis, the Technical Requirements Manual (TRM) and UFSAR to the licensee's evaluations to determine that the components or systems were operable. The inspectors determined whether compensatory measures, if needed, were taken, and determined whether the evaluations were consistent with the requirements of licensee procedures. The inspectors also discussed the details of the evaluations with the shift managers and appropriate members of the licensee's engineering staff.

The inspectors also reviewed selected issues documented in IRs, to determine if they had been properly addressed in the licensee's corrective action program. The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the post maintenance testing activities associated with maintenance or modification of mitigating, barrier integrity, and support systems that were identified as risk significant in the licensee's risk analysis. The inspectors reviewed these activities to determine that the post maintenance testing was performed adequately, demonstrated that the maintenance was successful, and that operability was restored. During this inspection activity, the inspectors interviewed maintenance

and engineering department personnel and reviewed the completed post maintenance testing documentation. The inspectors used the appropriate sections of the TS, TRM, and UFSAR, and other related documents to evaluate this area.

The inspectors completed four inspection samples by observing and evaluating the post maintenance testing subsequent to the following maintenance activities:

- Unit 2 Train B Safety Injection Pump Work Window;
- Unit 1 Train A Diesel Generator Lubricating Oil Pump Following Maintenance;
- Unit 2 Division 22 Direct Current Bus Work Window; and
- Unit 0 Train A Essential Service Water Basin Level Switch Replacement.

The inspectors also reviewed selected issues documented in IRs to determine if they had been properly addressed in the licensee's corrective action program. The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors witnessed selected surveillance tests and/or reviewed test data to determine that the equipment tested using the surveillance procedures met the TS, the TRM, the UFSAR and licensee procedural requirements. The inspectors also reviewed applicable design documents including plant drawings, to verify that the surveillance tests demonstrated that the equipment was capable of performing its intended safety functions. The activities were selected based on their importance in ensuring mitigating systems capability and barrier integrity.

These activities represented seven routine samples. The following surveillance tests were selected:

- Unit 2 Train A Safety Injection Pump Group A Inservice Test;
- Unit 2 Train A Emergency Diesel Generator Semi-annual Operability Surveillance;
- Unit 2 Engineered Safety Features Activation System Instrument Slave Relay Surveillance (Train B Automatic Containment Spray Relay K644);
- Unit 2 Train B Diesel Auxiliary Feedwater Pump "B" Battery Bank Capacity Test;
- Unit 1 Emergency Diesel Generator Essential Service Water Crosstie Line Semi-Annual Flush;
- Unit 2 Train A Solid State Protection System Bi-Monthly Surveillance; and
- Unit 1 Reactor Coolant System Leak Rate Surveillance.

Additionally the inspectors used the documents listed in the Attachment to this report to determine that the testing met the frequency requirements; that the tests were conducted in accordance with procedures, that the test acceptance criteria were met;

and that the results of the tests were properly reviewed and recorded. The inspectors verified that the individuals performing the tests were qualified to perform the test in accordance with the licensee's requirements, and that the test equipment used during the test were calibrated within the specified periodicity. In addition, the inspectors interviewed operations, maintenance, and engineering department personnel regarding the tests and test results.

The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors completed one inspection sample by evaluating the following temporary plant modification on risk significant equipment:

- Bypass of General Warning Relay K524 Contact 6-10 During Train A Solid State Protection System Surveillance

The inspectors reviewed this temporary plant modification to determine that the instructions were consistent with applicable design modification documents and that the modification did not adversely impact system operability or availability. The inspectors verified that the licensee controlled temporary modifications in accordance with Nuclear Station Procedure NSP CC-AA-112, "Temporary Configuration Changes," Revision 11.

The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control to Radiologically Significant Areas (71121.01)

.1 Inspection Planning

a. Inspection Scope

The inspectors reviewed all licensee Performance Indicators (PIs) for the Occupational Exposure Cornerstone for followup. This review represented one sample.

b. Findings

No findings of significance were identified.

.2 Plant Walkdowns and Radiation Work Permit (RWP) Reviews

a. Inspection Scope

The inspectors identified exposure significant work areas within radiation areas, high radiation areas (HRA) (<1 R/hr), and airborne radioactivity areas in the plant and reviewed associated licensee controls and surveys of these areas to determine if controls (e.g., surveys, postings, barricades) were acceptable.

The inspectors walked down these areas or their perimeters with a survey instrument to identify whether prescribed RWP(s), procedure(s), and engineering controls were in place, whether licensee surveys and postings were complete and accurate, and whether air samplers were properly located.

The inspectors reviewed RWPs used to access these and other HRA to identify what work control instructions or control barriers were specified using plant-specific TS HRA requirements as the standard for the necessary barriers. The inspectors reviewed electronic personal dosimeter (EPD) alarm set points (both integrated dose and dose rate) for conformity with survey indications and plant policy. The inspectors verified that workers knew what actions were required when their EPD noticeably malfunctions or alarms.

The inspectors reviewed RWPs for airborne radioactivity areas with the potential for individual worker internal exposures of >50 mrem committed effective dose equivalent (CEDE) (20 DAC-hrs). No areas of the plant were under airborne radioactivity work controls.

The inspectors reviewed the adequacy of the licensee's internal dose assessment for any actual internal exposure greater than 50 mrem CEDE. No personnel had documented committed effective dose equivalent greater than 50 millirem.

The inspectors examined the licensee's physical and programmatic controls for highly activated or contaminated materials (non-fuel) stored within spent fuel and other storage pools.

These reviews represented six samples.

b. Findings

No findings of significance were identified.

.3 Problem Identification and Resolution

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, Licensee Event Reports, and Special Reports related to the access control program since the last inspection. The inspectors assessed whether identified problems were entered into the corrective action program for resolution.

The inspectors reviewed corrective action reports related to access controls. Included in this review were HRA, radiological incidents (non-PIs, identified by the licensee) in HRAs <1R/hr that have occurred since the last inspection in this area. The inspectors interviewed staff and reviewed documents to assess if the follow-up activities were being conducted in an effective and timely manner commensurate with their importance to safety and risk:

- Initial problem identification, characterization, and tracking;
- Disposition of operability/reportability issues;
- Evaluation of safety significance/risk and priority for resolution;
- Identification of repetitive problems;
- Identification of contributing causes;
- Identification and implementation of effective corrective actions;
- Resolution of Non-Cited Violations (NCVs) tracked in the corrective action system; and
- Implementation/consideration of risk significant operational experience feedback.

The inspectors' review placed emphasis on ensuring problems were identified, characterized, prioritized, entered into a corrective action, and resolved.

The inspectors assessed if the licensee's self-assessment activities are also identifying and addressing repetitive deficiencies or significant individual deficiencies in problem identification and resolution.

These reviews represented three samples.

b. Findings

No findings of significance were identified.

.4 High Risk Significant, High Dose Rate HRA (>25 rem in one hour at 30 cm), and VHRA Controls

a. Inspection Scope

The inspectors discussed with first-line health physics supervisors, or equivalent positions, having back shift health physics oversight authority, the controls in place for special areas that have the potential to become VHRA during certain plant operations.

The inspectors reviewed how the required communications between the health physics group and other involved groups would occur beforehand in order to allow corresponding timely actions to properly post and control the radiation hazards.

The inspectors verified adequate posting and locking of all entrances to all accessible high dose rate HRAs (>25 rem in one hour at 30 cm) and VHRA.

These reviews represented two samples.

b. Findings

No findings of significance were identified.

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

.1 Verification of Dose Estimates and Exposure Tracking Systems

a. Inspection Scope

The inspectors reviewed the assumptions and basis for the current annual collective exposure estimate. The inspectors reviewed applicable procedures to determine the methodology for estimating work activity-specific exposures and the intended dose outcome. The inspectors evaluated both dose rate and man-hour estimates for reasonable accuracy.

The inspectors reviewed the licensee's method for adjusting exposure estimates or re-planning work, when unexpected changes in scope or emergent work are encountered.

These reviews represented two samples.

b. Findings

No findings of significance were identified.

.2 Problem Identification and Resolution

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, and Special Reports related to the ALARA program since the last inspection. The inspectors' review was conducted to determine if the licensee's overall audit program's scope and frequency (for all applicable areas under the Occupational Cornerstone) satisfied the requirements of 10 CFR 20.1101(c).

These reviews represented two samples.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems (71152)

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

a. Inspection Scope

As required by Inspection Procedure 71152, Identification and Resolution of Problems, and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed screening of all items entered into the licensee's corrective action program. This was accomplished by reviewing the description of each new Issue Report and attending selected daily management review committee meetings. Documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

.2 Selected Issue Follow-up Review - Recurring Issue Review

a. Introduction

During this quarter, the inspection identified three minor issues that were related to inadequate control of lubricating oil level setting, inadequate risk management action and inadequate seismic control of cryogenic liquid nitrogen containers. These issue had been identified within the past year and involved different areas of licensee operations.

b. Prioritization and Evaluation of Issue

(1) Inspection Scope

The inspectors reviewed the cause evaluation of the past events and compared the evaluation method used to the guidance provided in licensee's procedures. The inspectors also compared the present events with the past events and discussed the technical aspects of the issues with members of the licensee's staff.

(2) Issues

Inadequate Control of Lubricating Oil Level Setting: On February 22, 2007, during a routine system alignment walkdown, the inspectors identified that the Unit 2 Train A Essential Service Water pump motor oil level were all above the highest unlabeled mark on the sight glass. The inspectors informed plant operations and reviewed a

subsequent operability assessment. The assessment stated that this condition was acceptable because the mark was unlabeled and there had not been a bearing failure in 20 years of operation.

The inspectors reviewed the motor vendor manual and the nameplate data on the side of the motor and determined that the vendor recommendation was to set the level with the motor not running and to maintain the level below the highest mark on the sight glass. When asked by the inspectors, licensee personnel were not aware of the vendor recommendation. The licensee subsequently lowered the level of the oil in the constant level oilers to the recommended level. Note that the SX motor bearing oil system is an example of a constant level oiler. The enforcement aspect of this finding was provided in Section 1R04 of this report.

On November 17, 2006, the inspectors also identified a finding of very low safety significance (Green) related to the licensee's failure to maintain setpoint control of Trico constant level oilers. The oilers are used on the five safety related Component Cooling Water pumps. This condition increased the challenges to the proper functioning of the lubricating oil and thus to the bearings of the safety related pumps. Corrective actions at that time focused on the new corporate level procedure for setting constant level oilers, which primarily focused on Trico oilers that were used on the CCW pumps, and ensuring the Trico oilers were installed on the correct side of the bearing housing. The extent of condition review failed to consider other manufacturers of constant level oilers.

Inadequate risk management action: On March 8, 2007, during the performance of the Unit 2 Train B Essential Service Water oil cooler inspection, the inspectors identified that a protected equipment barrier for the Unit 2 Train A Essential Service Water pump was not installed in front of the room door in accordance with Operation Policy 400-47. The omission was determined to be a human error on creating the list of protected equipment. The inspector determined that this issue was a violation of 10CFR50.65(a)4 because one or more risk management actions were not effectively implemented. This issue was determined to be minor because all key safety functions were preserved and the increase in plant risk was less than or equal to the industry guidance threshold for taking risk management actions. Corrective action included a revision to the operating policy to add a peer check to prevent errors.

During the 4th quarter of 2006, the inspectors also identified that the Unit 2 Train A Residual Heat Removal pump cubical cooler breaker was not protected as required by procedure. At that time, licensee staff stated they were confused about what constituted the extent of the protected equipment boundary. This issue was determined to be minor as it was less than or equal to the industry guidance threshold for taking risk management actions. Corrective action included revising the operation policy to provide clarification and direction on protected equipment boundary. This revision has yet to be completed.

Inadequate Seismic Control of Cryogenic Liquid Nitrogen Containers: On March 14, 2007, the inspectors identified that cryogenic liquid storage (nitrogen) containers were not properly secured in the auxiliary building. The inspectors contacted a mechanical maintenance supervisor and were told that these containers did not need to be secured. However, when a senior reactor operator was contacted later, he stated

that containers needed to be secured. The inspector determined that the requirements for seismic control of the cryogenic liquid nitrogen containers were not well understood by plant personnel. The licensee later changed the work package to secure the containers at the job site.

In the first quarter of 2006, the inspectors also identified that several cryogenic liquid nitrogen containers were not secured in the auxiliary building. Corrective action at the time included a discussion at the weekly safety meeting for mechanical maintenance personnel to reinforce the expectation and procedure requirement. However, based on the recurrence of the problem, these corrective actions were not effective.

c. Effectiveness of Correction Actions

(1) Inspection Scope

The inspectors assessed the licensee's corrective actions associated with the three past events and the three current events to determine if the corrective actions were appropriately focused to address the problems identified.

(2) Issues

The inspectors reviewed the licensee's correction actions associated with the three past events and determined that the corrective actions were appropriate and addressed the causes identified. However, the extent of condition reviews were narrowly focused. In the case of the oilers, the licensee also initiated a comprehensive review of the Trico oilers used in the plant but the review did not extend to other types of constant oiler. In the case of the protected equipment barrier not being installed, the licensee did not establish a verification check that could identify errors in the list of protected equipment. In the case of the unsecured cryogenic containers, the licensee did not periodically communicate or provide adequate training to its staff to make clear the seismic control requirements.

In summary, these three issues were minor in nature and corrective actions to prevent reoccurrence were not required by NRC regulations. Nevertheless, the licensee was taking actions to correct the weaknesses in these areas.

c. Findings

No findings of significance were identified.

4OA5 Other Activities

.1 (Closed) Unresolved Item (URI) 05000454/2004005-03; 05000455/2004005-03: Adequacy of Safe Shutdown Procedure to Address Draining of the RWST

An URI was opened during the 2004 Triennial Fire Protection Inspection regarding the adequacy of alternate safe shutdown procedures in the event of a fire in the auxiliary electrical equipment room or the control room. Based on the information discussed in

Section 1R05.b.1 of this report, an NCV of the Byron Station Operating License 2.C.6 (Unit 1) and 2.E (Unit 2) was identified. Therefore, this URI is closed.

.2 (Closed) Unresolved Item 05000454/2006004-04; 05000455/20060004-04: Impact of Nonfunctional Dosimeters on Dose Tracking and Technical Specification Compliance

During a baseline radiation safety inspection, inspectors identified abnormal radiological restricted area exit electronic dosimetry transaction records related to a condition identified as "Electronic Dosimetry Digi Reset." The "Digi Reset" condition represented an event when the dosimeter appeared to be non-functioning for a period of time ranging up to 15 minutes. Consequently, it appeared that the electronic dosimeter would not continuously integrate the radiation dose rate in the area and would not alarm when a preset integrated dose was received. The inspectors reviewed the technical cause for this condition, actions taken by the manufacturer, and the radiological impact of the condition. The licensee's technical evaluation demonstrated that the reset event was a very short lived event (fractions of a second). However, the dose integration function was affected by data archival durations set in the software code. The licensee performed additional investigations to determine the specific instances when the "Digi-Reset" problem occurred, quantifying the duration that the dosimeter was not functioning and the amount of dose that was not integrated, and completed its evaluation for compliance with the requirements specified in TS 5.7 "Administrative Controls for High Radiation Areas." From the licensee's data, the inspectors observed that the very brief interruptions were well within the expected operation of the instrumentation and did not represent any violations of NRC requirements. Consequently, the inspectors concluded that the short duration of the power interruption and the minimal amount of dose that might not be integrated does not represent an occurrence in the Occupational Radiation Safety PI as defined in the Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline." Therefore, this URI is closed.

4OA6 Meetings

.1 On April 06, 2007, the resident inspectors presented the inspection results to Mr. D. Hoots and his staff, who acknowledged the findings. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

.2 Interim Exit Meetings

Interim exits were conducted for:

- Closure of URI 05000454/2004005-03; 05000455/2004005-03 as an NCV with Ms. M. Snow and other members of licensee management on January 19, 2007, via telephone.
- Heat Sink Biennial Inspection with Mr. D. Hoots and other members of licensee management on February 9, 2007.
- Occupational Radiation Safety Program for Access Control to Radiologically Significant Areas and As-Low-As-Reasonably-Achievable (ALARA) Planning and Controls programs with Ms. M. Snow on February 16, 2007.

4OA7 Licensee Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Manual, NUREG-1600, for being dispositioned as an NCV.

Cornerstone: Mitigating Systems

Technical Specification 5.4 required implementation of the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A. Regulatory Guide 1.33, Appendix A, Part 9, Subsection e, recommended procedures for the control of maintenance and factors to be taken into account in preparing work procedures. Contrary to this requirement, the licensee failed to implement the procedure for the on-line work control process. Specifically, corporate Procedure WC-AA-101, Revision 13, "On -Line Work Control Process," Step 4.1.1, states, in part, "Risk shall be reassessed if emergent condition results in a plant configuration that has **not** been previously assessed." [Original emphasis retained.]

Contrary to the above, on February 24, 2007, the licensee failed to reassess risk following the emergent condition requiring that both Unit 2 regenerative heat exchangers be removed from service due to letdown flow issues. This condition rendered pressurizer auxiliary spray as not available. With pressurizer auxiliary spray not available on-line risk changed from a Green to a Yellow Condition. The licensee recognized the missed risk assessment on February 26, 2007, and to the appropriate actions in accordance with their risk control process. This issue was considered to be of very low safety significance because the change in core damage frequency was less than 10^{-12} . This issue was entered into the licensee's corrective action system as IR 596192.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

D. Hoots, Site Vice President
M. Snow, Plant Manager
B. Barton, Radiation Engineering Superintendent
F. Beutler, Engineering, Fire Protection
D. Bohnert, UHS System Engineer
D. Combs, Security Manager
L. Doyle, Programs Coordinator
A. Giancatarino, Engineering Director
C. Gregory, RP Instrumentation Coordinator
W. Grundmann, Regulatory Assurance Coordinator
T. Hulbert, Regulatory Assurance
J. Langan, Regulatory Assurance
V. Naschansky, Supervisor, Design Engineering, Electrical
S. Swanson, Maintenance Director
D. Palmer, Radiation Protection Manager,
W. Kouba, Nuclear Oversight Manager
M. Prospero, Operations Manager
J. Roman, IEMA, Springfield
D. Sargent, Mechanical Design Engineer
D. Thompson, Technical Support Superintendent
N. Vakili, GL 89-13 Program Owner, Program Engineer

Illinois Emergency Management Agency

R. Zuffa, Section Supervisor, Resident Inspector

Nuclear Regulatory Commission

S. West, Deputy Director, Division of Reactor Projects
R. Skokowski, Chief, Branch 3, Division of Reactor Projects
D. Passehl, Senior Risk Analyst, Division of Reactor Safety
P. LaFlamme, Reactor Engineer, Inspector in Training Branch 3
L. Kozak, Senior Risk Analyst, Division of Reactor Safety

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000455/2007002-03	URI	Operability of the Flood Seals to the Unit 1 AFW Tunnel with One Corner Raised Up
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Opened and Closed

05000454/2007002-01 05000455/2007002-01	FIN	Inadequate Setpoint Control of the Oil Level to Safety Related Pumps
05000454/2007002-02 05000455/2007002-02	NCV	Adequacy of Safe Shutdown Procedures to Address Draining of the RWST

Closed

05000454/2004005-03 05000455/2004005-03	URI	Adequacy of Safe Shutdown Procedures to Address Draining of the RWST
05000454/2006004-04; 05000455/2006004-04	URI	Impact of Nonfunctional Dosimeters on Dose Tracking and TS Compliance

Discussed

None

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.

1R04 Equipment Alignment

Vendor Manual NSID-TB-85-14; "Westinghouse Electric Company - Life Line D Horizontal Induction Motor Frames 8000, 9600....."

Diagram of Essential Service Water M26, Sheet Number 2

Diagram of Essential Service Water M42, Sheet Number 1B

Drawing M2SX 23001R, Revision D; Support 2SX 23001

Drawing M2SX 23004R, Revision 6; Support 2SX 23004

Drawing M42, Sheet 1; Fabrication Drawing SX23, Essential Service Water

Drawing M2SX23002R, Revision F; Support 2SX 23002

Drawing M2SX22001R, Revision E; Support 2SX 22001

Drawing M2SX23005R, Revision B; Support 2SX23005

Diagram of Essential Service Water M126, Sheet Number 3, Revision AE

Diagram of Essential Service Water M126, Sheet Number 1, Revision AY

Auxiliary Building Essential Service Water Elevation Pump Room 330' 0", Drawing S670, Revision V

BOP AF-1; Diesel Driven Auxiliary Feedwater Pump Alignment to Standby Condition, Revision 23

BOP AF-E2B; Auxiliary Feedwater Train "B" Electrical Lineup, Revision 1

BOP AF-E2C; Auxiliary Feedwater Train "C" Electrical Lineup, Revision 1

BOP AF-M2B; Auxiliary Feedwater Train "B" Valve Lineup, Revision 4

BOP AF-M2C; Auxiliary Feedwater System Train "C" Valve Lineup, Revision 1

BOP SX-1; Essential Service Water Pump Startup, Revision 17

BOP SX-E2A; Train A Electrical Lineup, Revision 1

BOP SX-4; Essential Service Water Strainer Manual Operation, Revision 9

BOP SX-M2A; Train A Essential Service Water System Valve Lineup, Revision 6

MA-AA-734-400; Constant Level Oiler and Sight-Glass Maintenance, Revision 0

IR 597013; Auxiliary Building Floor Drain Plugged, February 28, 2007

IR 610130; Constant Level Oiler Configuration Issues (NER NC-07-004), March 01, 2007

Corrective Action Documents as a Result of NRC Inspection

IR 596658; Replace Missing Bolt in 1SX11012R Pipe Clamp, February 22, 2007
(NRC Identified)

IR 604013; Liquid N2 Bottles Not Tied Off, Confusion on Requirements, March 14, 2007
(NRC identified)

1R05 Fire Protection

Pre-Fire Plan; Auxiliary Building Elevation 401' - 0", Zone 11.5-0 North, January 27, 2003, Revision 4

1BCA-1.1; Loss of Emergency Coolant Recirculation - Unit 1; Revision 104

BOP FR-1T35; Fire Zones 5.5-1 and 5.5-2, Unit 1/Unit 2 Auxiliary Electrical Equipment Rooms; Revision 2

6E-0-3371B; Electrical Installation Equipment Location - Auxiliary Building Auxiliary Electrical Equipment Room Plan El. 451'-0", Col's L-Q, 10-13; Revision AA

6E-0-3372B; Electrical Installation Equipment Location - Main Control Room Plan El. 451'-0", Col's L-P, 13-23; Revision W

6E-0-3373B; Electrical Installation Equipment Location - Auxiliary Building Auxiliary Electrical Equipment Room Plan El. 451'-0", Col's L-Q, 23-26; Revision AB

Corrective Action Documents as a Result of NRC Inspection

IR 604355; Pipe Penetration in 0B WX Room Not Tight, March 15, 2007 (NRC Identified)

IR 604376; Loose Pipe Support on NT Line, March 15, 2007 (NRC Identified)

IR 604892; NRC Walkdown Questions, March 16, 2006 (NRC Identified)

IR 605634; Small Zero Shift of DP Indication, March 18, 2007 (NRC Identified)

IR 605639; Eleven Pieces of Oil Blanket in the 1A DOST RM, March 18, 2007, (NRC Identified)

IR 605644; Some FP Piping is Not Painted Red, March 18, 2007 (NRC Identified)

IR 609547; 0A SX Fuel Tank Fire Door Not Locked, March 27, 2007 (NRC Identified)

1R06 Flood Protection Measures

0BMSR DD-1; Water-Tight Barrier Inspection (CM-6.1.1), Revision 4

IR 142597; Unit 2 Valve Room/Auxiliary Feedwater Tunnel Flood/HELB Barriers Loose Bolting, February 03, 2003

IR 209635; Flood Seal Gaskets, March 19, 2004

IR 246856; Results of Combined Byron and Braidwood MS System Walkdown, August 20, 2004

IR 255090; Flood Seal Integrity, September 21, 2004

IR 291317; All PMTs Not Closed Prior to LCOAR Exit, September 21, 2004

IR 557186; 0BMSR DD-1 Add to Model Work Orders, November 13, 2006

IR 613522; Unit 1 and 2 AF Tunnel Dehumidifiers Need Attention, April 05, 2007

Drawing S-1062; Sections and Details Containment Building, Revision W

Issue 605830; Auxiliary Feed Tunnel Covers Need Attention, March 16, 2007

Corrective Action Documents as a Result of NRC Inspection

IR 557177; Revise 0BMSR DD-1 to Update Acceptance Criteria, November 13, 2006 (NRC Identified)

IR 603814; 3 Feet of Sealing Gasket Hanging Down into the Tunnel, March 14, 2007 (NRC Identified)

IR 606111; NRC Concern, 1DSFS008 AF Tunnel Flood Seal Opening Not Sealed, March 19, 2007

1R07 Heat Sink Performance

0BVSR SX-5; River Screenhouse and 0A SXCT Basin Inspections Performed June 13, 2006

0BVSR SX-5; River Screenhouse and 0B SXCT Basin Inspections Performed July 11, 2006

1BVSR XII-9; ECT of Secondary Side Components Performed January 22, 2007

1BVSR 5.5.8.SX.5-1a; Unit One Group A IST Requirements for the SX Pump 1SX01PA and Unit 1 SX Pump Discharge Check Valves Performed December 29, 2006; Revision 0

2BVSR 5.5.8.SX.5-1a; Unit Two Group A IST Requirements for the SX Pump 2SX01PA and Unit 2 SX Pump Discharge Check Valves Performed August 14, 2006; Revision 0

2BVSR 5.5.8.SX.5-2a; Unit Two Group A IST Requirements for the SX Pump 2SX01PA and Unit 2 SX Pump Discharge Check Valves Performed November 20, 2006; Revision 0
 2BVSR 5.5.8.SX.5-2a; Unit Two Group A IST Requirements for the SX Pump 2SX01PB and Unit 2 SX Pump Discharge Check Valves Performed January 2, 2007; Revision 0
 1BVSR 5.5.8.SX.5-2a; Unit One Group A IST Requirements for the SX Pump 1SX01PB and Unit 1 SX Pump Discharge Check Valves Performed October 12, 2006; Revision 0
 1BVSR 5.5.8.SX.5-2a; Unit One Group A IST Requirements for the SX Pump 1SX01PB and Unit 1 SX Pump Discharge Check Valves Performed January 11, 2007; Revision 0
 BAP-560-3; Byron Cooling Water Chemistry Monitoring Program Description CW, WS, SX; Revision 7
 BCP-560-3; Corrective Actions for Cooling Water Systems; Revision 7
 BRW-95-218; Evaluation of Essential Service Water Pump Operation with Degraded Lube Oil Coolers; Revision 0
 BVP 800-30; Service Water System (Essential Service Water) Fouling Monitoring Program; Revision 8
 BVP 800-30; Attachment D GL 89-13 HX Inspection Cover Sheet Inspection Results for 2A SX Pump Oil Cooler; August 22, 2006
 BVP 800-30; Attachment D GL 89-13 HX Inspection Cover Sheet Inspection Results for 2A Sx Pump Oil Cooler; November 30, 2006
 BVP 800-30; Attachment D GL 89-13 HX Inspection Cover Sheet Inspection Results for 2B AF Pump Diesel Closed Cycle Cooler; September 22, 2002
 BVP 800-30; Attachment D GL 89-13 HX Inspection Cover Sheet Inspection Results for 2B AF Pump Diesel Closed Cycle Cooler; October 24, 2005
 IR 387013; Discrepant 1A DG Jacket Water HX Current and Recommended GI 89-13 Inspection Frequencies; October 17, 2005
 IR 399041; 2A SX Pump Oil Cooler Fails As-Found GL 89-13 Tube Blockage Acceptance Criteria; November 15, 2005
 IR 462931; 2B EDG JW Coolers (2DG01KB X1 and X2) Exhibit Excessive Corrosion of the Divider Plates; January 22, 2006
 IR 469363; 1A SX Pump Lube Oil Cooler Failed Tube Blockage Acceptance Criteria; March 22, 2006
 IR 499491; 0A SXCT Basin Diver Inspection Results - VLV Room Roof/Gutter; June 13, 2006
 IR 501272; Various GL 89-13 HX Inspection Reports Contain Incomplete Information; June 19, 2006
 IR 501379; Various GI 89-13 HX Inspection Reports Contain Incomplete Information; June 19, 2006
 IR 506569, 2B SX Pump Oil Cooler Fails As-found GL 89-13 Tube Blockage Acceptance Criteria; July 5, 2006
 IR 581931; ECT Results on Upper 1a DG Jacket Water HX; January 22, 2007
 CY-AA-120-4110; Raw Water Chemistry Strategic Plan; Revision 0
 BYR 03-115; SX Pump Oil Cooler Allowable Tube Blockage; Revision 0
 BRW 95-218; Degraded SX Pump Oil Coolers; November 10, 2005
 ATI 18006-02; SX Supplied HXs Water Hammer Susceptibility Evaluation; December 3, 2003
 AR 18006-04; Evaluation Determined Only EDG JW HXs Potentially Water Hammer Susceptible; February 23, 2005
 AR 18006-04; Evaluation Determined EDG JW HXs Not Susceptible to Water Hammer; April 20, 2005
 EC 344005; SX Pump Lube Oil Cooler Allowable Tube Blockage; Revision 0

EC 339308; SX Pump Oil Cooler Allowable As-found Tube Blockage Acceptance Criteria; Revision 0
 EC 358510; SX Pump Oil Cooler Tube Blockage; Past Operability; Revision 0
 EC Number 360948; Revision 0; 1SX01aa Replacement Scheduled for February 19, 2007
 EC Number 360950; Revision 0; 1SX01AB Replacement Scheduled for January 7, 2008
 ER-AA-340; GL 89-13 Program Implementing Procedure; Revision 3
 ER-AA-340-1001; GL 89-13 Program Implementation Instructional Guide; Revision 5
 ER-AA-340-1002; Service Water Heat Exchanger and Component Inspection Guide; Revision 3
 566757-05; Check-in Self-Assessment Report Pre-NRC Inspection on UHS Performance; January 18, 2007
 Heat Exchanger Specification Sheet Ametek Job No. N80-40361; SX Pump Lube Oil Cooler; February 25, 1980
 Heat Exchanger Data Sheets; 2B AF Pump Diesel Closed Cycle Cooler; Revision 1
 WO 832044; Diver inspections of River Screenhouse and 0A SXCT Basin; June 13, 2006
 WO 831833; Diver Inspections of River Screenhouse and 0B SXCT Basin; July 11, 2006
 WO 925468; 2A SX Pump Oil Cooler Inspection per GL 89-13; August 22, 2006
 WO 949670; 2A SX Pump Oil Cooler Inspection per GL 89-13; November 30, 2006
 WO 99275594; 1SX01K - HX Inspection Per Generic Letter 89-13; Sept 22, 2002
 WO 588794; 1SX01K - HX Inspection Per Generic Letter 89-13; Oct 24, 2005
 WO 977278; 1SX01PA Group A IST Required for SX Pump; December 29, 2006
 WO 937125; 2SX01PA Group A IST Required for SX Pump; August 14, 2006
 WO 947255; 2SX01PA Group A IST required for SX pump; November 20, 2006
 WO 938517; 1SX01PB Group A IST Required for SX Pump; October 12, 2006
 WO 966114; 1SX01PB Group A IST Required for SX Pump; January 11, 2007
 WO 964039; 2SX01PB Group A IST Required for SX Pump; January 7, 2006

Corrective Action Documents as a Result of NRC Inspection

IR 00589119; Identified Inconsistencies Between Site and Corporate Eddy Current Procedures; February 8, 2007 (NRC Identified)
 IR 00588416; NRC Questioned 70 Percent Through-wall Tube Plugging Criteria; February 7, 2007 (NRC Identified)
 IR 00588428; UFSAR Section 9.2.5 References Were Not Updated; February 7, 2007 (NRC Identified)

1R12 Maintenance Effectiveness

IR 586746; Rod Control Urgent Failure Alarm During Unit 1 Ramp to 98%, February 02, 2007
 IR 587090; Unit 1 Control Rod Urgent Failure Alarm During Post Maintenance Test, February 03, 2007
 IR 587186; Non-Urgent LED Lit on the Lift Phase Control Cards, February 03, 2007
 1BOA Rod-2; Failure of Rods to Move, Unit 1, Revision 100
 Issue 589605; Rod Drive Urgent Failure Update, February 09, 2007
 Rule Monthly Evaluation, RD: Control Rod Drive, February 2007
 ER-AA-310-1004; Maintenance Rule - Performance Monitoring, Revision 5
 Apparent Cause Report; Unit 1 Rod Drive (RD) System Power Cabinet Phase Urgent Failures
 SER 2007-07; Plant Issue Resolution Documentation, March 01, 2007

1R13 Maintenance Risk Assessments and Emergent Work Control

Unit 1 Risk Configurations; Week of January 29, 2007, Revision 2
 Unit 1 Risk Configurations; Week of February 19, 2007, Revision 2

Unit 2 Risk Configurations; Week of March 05, 2007, Revision 1
Protected Equipment Log, January 19, 2007
Protected Equipment Log, February 02, 2007
Byron Operating Department Policy No. 400-47; On Line Risk/Shutdown Risk/Protected Equipment, Revision 10
Policy No: 400-47; Byron Operating Department Policy Statement, Online Risk/Shutdown Risk/Protected Equipment, Revision 10
Protected Equipment Log, March 08, 2007, Revision 12
IR 598127; ASME Code Review Identifies CS ASME Procedure Issue, March 01, 2007
ER-AA-600-1045; Risk Assessments of Missed or Deficient Surveillances, Revision 0
BB PRA-017.59B; Missed Surveillance Risk Assessment for CS ASME Surveillance Methodology Condition, Revision 0
IR 594653 4D; 2A DG SX Flow Indication Low, February 22, 2007
IR 605914; Unexpected S/D of 0B WS Pump Required, March 19, 2007
IR 606094; 0WS506B Opened to Support Backflushing Efforts on 0B WS PP, March 19, 2007
IR 608935; FME Found in Strainer for Bearing Upper cooler on 0B WS Pump, March 26, 2007
Temperature Trends; 0B Non-Essential Service Water Pump, March 19, 2007
Risk Configurations, Week of March 19, 2007, Revision 2
Issue 605914; Unexpected S/D of 0B WS Pump Required, March 19, 2007
Scoping/Risk Significance Detailed Report; CS Containment Spray, Revision Date: January 01, 2004

Corrective Action Documents as a Result of NRC Inspection

IR 601223; Omission in Placement of Protected Equipment for 2B SX Pump, March 08, 2007 (NRC Identified)

1R15 Operability Evaluations

IR 490729; Fuel Oil Sample, 0BOSR 7.9.9-1, SX, Appeared Cloudy, May 16, 2006
IR 577203; 2A MSIV Reservoir Level is Empty, January 10, 2007
IR 588779; NSR Ventilation Filters Installed in Safety Related Systems, February 07, 2007
IR 591317; 2CS01PA Differential Pressure Only 1 PSI Over Acceptance, February 24, 2007
IR 591975; NOS Finding: NSR Parts in SR VA/VC Applications, February 06, 2007
IR 593286; OA SX Makeup Fuel Oil Sample Results Out of Spec., February 19, 2007
IR 606909; MCR Ventilation AST Calculation Prefilter Efficiency, March 21, 2007
IR 607572; SX Fan Blade Hub Assembly Supplied with Aluminum Blade Clamp, March 22, 2007
IR 611144; Scaffold Pole in Contact with Seismic Valve 2FW044D, March 30, 2007
Laboratory Report: Diesel Fuel 0DO08TA, May 16, 2006
Laboratory Report: Diesel Fuel 0DO08TB, May 16, 2005
WO 989520 01; Unit 2 MSIV Checks Weekly Surveillance, January 10, 2007
WO 991950 01; Unit 2 MSIV Checks Weekly Surveillance, January 17, 2007
WO 993643 01; Unit 2 MSIV Checks Weekly Surveillance, January 24, 2007
Issue 577298; 2D MSIV Reservoir Level Low Out of Sight Glass, January 10, 2007
NDIT No. BYR 97-162; Provide Certified Performance Curves for Containment Spray Pumps 1CS01PA and 1CS01PB, March 27, 1997
NDIT No. BYR 98-291; Transmittal of Containment Spray Pump Degradation Limits for Use in ASME Surveillance Testing, November 17, 1998
Calculation No. BYR97-191/BRW-97-0337-M; Containment Spray Hydraulic Model, Revision 1

Analysis No. BYR04-047 & BRW-04-0041-M; Re-analysis of Fuel Handling Accident (FHA) Using Alternate Source Terms, Revision 1
Analysis No. BYR04-051 & BRW-04-0038-M; Re-analysis of Loss of Coolant Accident (LOCA) Using Alternate Source Terms, Revision 1
Engineering Change 360921; OP Evaluation 06-004, Evaluation of SX Fan Blade Degradation, Revision 003
Engineering Change 364519; OP Evaluation 07-001, Non-Safety Related Ventilation Filters Installed in Safety Related Systems, Revision 0
Issue 588779; NSR Ventilation Filters Installed in Safety Related Systems, February 07, 2007
Issue 591975; NOS Finding: NSR Parts in SR VA/VC Applications, February 15, 2007
Apparent Cause Report 588779; Parts Classification Impact Due to Mods/Analysis, March 15, 2007
OP Evaluation 07-002; Aluminum vs Cast Iron SX Fan Blade Clamps, Revision 0
Structural Test Report for Hudson Model APT-30K Fan Blade Clamps, Report No. TR-136-8521-2, Revision 0
ES-24.73, Hudson Products Corporation Fan Engineering Standards; General Specifications for Tuf-Lite III Fan Assemblies, Revision 1
ASTM Standard B 85-03; Standard Specification for Aluminum-Alloy Die Castings
ASTM Standards A 536-84; Standard Specification for Ductile Iron Castings

Corrective Action Documents as a Result of NRC Inspection

Issue 593838; River Screen House, House Keeping Issues Identified by NRC Resident, February 20, 2007 (NRC Identified)
IR 612956; NRC Concern with SX Fan Flade Clamp OP Evaluation, April 04, 2007 (NRC Identified)

1R19 Post Maintenance Testing

WO 880444 01; Replace Existing OLS-SX096 with New Card, February 20, 2007
WO 880444 02; OPS PMT - SX MU Pump Start on Actual Low Basin Level, February 20, 2007
WO 835697 01; EM Contingency - Troubleshoot DC Charger, February 02, 2007
WO 838422 01; EM Battery Charger 212 - 18M Inspection, February 01, 2007
WO 838681 01; 212 Train B 125V Battery Charger Operability Test, February 02, 2007
WO 994135 01; 0A SX MU Pump Monthly Operability Surveillance, February 13, 2007
IR 586759; BUS 212 Charger Load Test, February 02, 2007
Issue 583267; 1A DG Pre-Lube Oil Pressure Low, January 25, 2007
IR 583267; 1A DG Pre-Lube Oil Pressure Low, January 25, 2007

Corrective Action Documents as a Result of NRC Inspection

IR 583196; Packing Leakage From 2FW541D, January 25, 2007 (NRC Identified)
IR 583455; Quality Level 2 Part Installed on 2B Safety Injection Pump Motor, Needs Evaluation, January 24, 2007 (NRC Identified)
IR 594430; Door Found Unlocked, February 21, 2007 (NRC Identified)
IR 594432; Door Found Unlocked, February 21, 2007 (NRC Identified)
IR 602577; 0BOSR 7.9.6-1 Step F.1.C Data Not Recorded, March 12, 2007 (NRC Identified)

1R22 Surveillance Testing

IR 594653; 2A DG SX Flow Indication Low, February 22, 2007
WO 1003471 01; 2A DG SX Flow Indication Low, February 22, 2007

WO 356964 01; 2B AF Pump Battery Bank B-B Capacity Test, March 14, 2007
WO 952531 01; 1BOSR SX-SA1, Unit 1 DG SX X-Tie Semi-Annual Surveillance (F.1, 1A DG), March 13, 2007
WO 971763 01; SEP 2BVSr 5.5.8.SI.5-1A, 2A SI IST Group A Pump Test, January 23, 2007
WO 980730 01; 2A DG Operability Monthly and Semi-Annual Surveillance, February 21, 2007
Byron Inservice Testing Bases Document; IST-BYR-BDOC-V-25, Safety Injection Pump, July 01, 2006
2BOSR 3.1.5-1; Unit 2 Train A Solid State Protection System Bi-Monthly Surveillance (Staggered), Revision 25
2BOSR 4.13.1-1; Unit 2 Reactor Coolant System Water Inventory Balance 72 Hour Surveillance Computer Calculation, Revision 15 (Interim 07-2-008)
Diagram of Essential Service Water; Sheet Number 3, 42, Revision AZ
Certificate of Calibration; Multimeter, April 24, 2006
Certificate of Calibration; True RMS Clamp Meter, February 07, 2007

1R23 Temporary Plant Modifications

IR 592584; Unit 2 Train B SSPS Troubleshooting Results, February 16, 2007
IR 597354; On-Line Risk Aspects - 2B SSPS General Warning Relay Condition, February 28, 2007
IR 602816; Had to Abort 2A SSPS Surveillance Due to Breaker Problems, March 12, 2007
IR 602826; Unexpected MCB Alarms While Exiting 2BOSR 3.1.5-1, March 12, 2007
Interim Revision of 2BOSR 3.1.5-1, Revision 25 to Install a Temporary Jumper in 2PA10J and 10 CFR 50.59 Evaluation 6G-07-0002
SER 2007-08; EF/2PA10J K524 General Warning Circuit, March 02, 2007

2OS1 Access Control to Radiologically Significant Areas; and

2OS2 ALARA Planning And Controls

RP-AA-460; Controls for High and Very High Radiation Areas; Revision 11
RP-AA-460-1001; Additional High Radiation Exposure Control; Revision 1
RP-BY-500-1003; Radiological Controls for Handling Items and Hanging Activated Parts in the Spent Fuel Pool; Revision 1
RP-AA-401; Operational ALARA Planning and Controls; Revision 7
RP-AA-400; ALARA Program; Revision 4
RP-AA-403; Administration of the Radiation Work Permit Program; Revision 1
RP-AP-460; Access to Reactor Incore Sump Area; Revision 2
NF-AA-390; Spent Fuel Pool Material Control; Revision 2
Byron Rack Z Inventory; May 26, 2006
Check-In Self-Assessment; Access Control to Radiologically Significant Areas; AT No. 558048-04; January 18, 2007
Check-In Self-Assessment; B1R14 Outage ALARA Planning and Controls; AT No. 431087-05; August 29, 2006
AR 00579595 and Associated Supporting Information; Individual Received ED Rate Alarm in 1A CS PP Rm
Byron Station SAC Meeting Minutes; Pressurizer Weld Overlay Project; August 9, 2006
Byron Station SAC Meeting Minutes; Pressurizer Weld Overlay Project; September 17, 2006
Byron Station SAC Meeting Minutes; Pressurizer Weld Overlay Project; September 20, 2006
ALARA Plan and associated Work In Progress (WIP) Reviews; RWP 1007074; B1R14 Pressurizer Weld Overlay Welding, Grinding, Equipment Setup and Maintenance
ALARA Post-Job Review; RWP 10007074; B1R14 Pressurizer Weld Overlay Welding,

Grinding, Equipment Setup and Maintenance; February 12, 2007
Root Cause Investigation Report; Weld Indications Identified by NDE in Three Unit 1
Pressurizer Nozzles Associated with Structural Weld Overlay Work; AT 537084-03; Report
Date October 27, 2006
Root Cause Evaluation Report; B1R10 LSIV Project Over Dose, Schedule, and Budget Due to
Inadequate Planning and Execution; AT No. 36205 (B2000-02812), Report Date
November 8, 2000

4OA2 Identification and Resolution of Problems

Unit 2 Standing Order Log Number 07-008; RCS Unidentified Leakage and Pressurizer Nozzles

Corrective Action Documents as a Result of NRC Inspection

IR 459529; Mechanical Maintenance Department Did Not Secure LN2 Dewars Per
Requirement, February 27, 2006

IR 559537; Weakness in Byron's Protected Equipment Program, November 17, 2006
(NRC Identified)

IR 561183; Method of Checking Oil Level in Trico Oilers, November 22, 2006 (NRC Identified)

4OA3 Event Follow-up

Corrective Action Documents as a Result of NRC Inspection

IR 602202; Unit 2 RCS Leakrate 2BOSR 4.13.1-1, March 08, 2007 (NRC Identified)

LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
AEER	Auxiliary Electrical Equipment Room
AFW	Auxiliary Feedwater
ALARA	As Low As Reasonably Dose Achievable
AR	Action Request
BTP	Branch Technical Position
CCW	Component Cooling Water
CFR	Code of Federal Regulations
CCDP	Conditional Core Damage Probability
CEDE	Committed Effective Dose Equivalent
DRP	Division of Reactor Projects; Region RIII
EDG	Emergency Diesel Generator
EPD	Electronic Personal Dosimeter
FPR	Fire Protection Report
HDR-HRA	High Dose Rate (>25 R/hour at 30 cm) High Radiation Area
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IPEEE	Individual Plant Examination for External Events
IR	Issue Report
NCV	Non-Cited Violation
NRC	United States Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
OOS	Out of Service
PARS	Public Availability Records
PORV	Power Operated Relief Valve
RHR	Residual Heat Removal
RIS	Regulatory Issue Summary
RWP	Radiological Work Permit
RWST	Refueling Water Storage Tank
SDP	Significance Determination Process
SI	Safety Injection
SRA	Senior Reactor Analyst
SSC	System, Structure, or Component
SSD	Safe Shutdown
SX	Essential Service Water
TRM	Technical Requirement Manual
TR	Technical Requirement
TS	Technical Specification
UHS	Ultimate Heat Sink
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VHRA	Very High Radiation Area
WO	Work Order
WR	Work Request