October 10, 2003

Mr. John L. Skolds, President
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: BRAIDWOOD STATION, UNITS 1 AND 2
NRC EVALUATION OF PLANT DESIGN - BASELINE
INSPECTION REPORT 05000456/2003007(DRS); 05000457/2003007(DRS)

Dear Mr. Skolds:

On September 12, 2003, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Braidwood Station, Units 1 and 2. The enclosed report documents the inspection findings, which were discussed on September 12, 2003, with Mr. M. Pacilio and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel. Specifically, this inspection focused on the evaluation of changes, tests, or experiments; permanent plant modifications; and design and performance capability of the residual heat removal and chemical and volume control systems to ensure that they were capable of performing their required safety-related functions.

Based on the results of this inspection, there was one NRC-identified finding of very low safety significance, which involved a violation of NRC requirements. However, because this violation was of very low safety significance and because the issue was entered into your corrective action program, the NRC is treating the issue as a Non-Cited Violation (NCV) in accordance with Section VI.A.1 of the NRC's 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, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region III, 801 Warrenville Road, Lisle, IL 60532-4351; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Braidwood Station.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

David E. Hills, Chief
Mechanical Engineering Branch
Division of Reactor Safety

Docket Nos. 50-456; 50-457
License Nos. NPF-72; NPF-77

Enclosure: Inspection Report 05000456/2003007(DRS); 05000457/2003007(DRS)
w/Attachment: Supplemental Information

cc w/encl: Site Vice President - Braidwood
Braidwood Station Plant Manager
Regulatory Assurance Manager - Braidwood
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, Mid-West Regional
Operating Group
Document Control Desk - Licensing
M. Aguilar, Assistant Attorney General
Illinois Department of Nuclear Safety
State Liaison Officer
Chairman, Illinois Commerce Commission

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Braidwood Station Plant Manager
Regulatory Assurance Manager - Braidwood
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, Mid-West Regional Operating Group
Document Control Desk - Licensing
M. Aguilar, Assistant Attorney General
Illinois Department of Nuclear Safety
State Liaison Officer
Chairman, Illinois Commerce Commission

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos:	50-456; 50-457
License Nos:	NPF-72; NPF-77
Report No:	05000456/2003007(DRS); 05000457/2003007(DRS)
Licensee:	Exelon Generation Company, LLC
Facility:	Braidwood Station
Location:	35100 S. Route 53, Suite 84 Braceville, IL 60407-9617
Dates:	August 25, 2003, through September 12, 2003
Inspectors:	A. Dunlop, Reactor Engineer R. Daley, Reactor Engineer J. Neurauter, Reactor Engineer R. Winter, Reactor Engineer H. Anderson, Mechanical Contractor W. Holland, Mechanical Contractor
Observer:	C. Roque-Cruz, NRC Intern
Approved by:	David E. Hills, Chief Mechanical Engineering Branch Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000456/2003007(DRS), 05000457/2003007(DRS); 08/25/2003 - 09/12/2003; Braidwood Station, Units 1 & 2; Plant Design - Pilot.

This report covers a three week announced baseline combined inspection of the evaluation of changes, tests, or experiments; permanent plant modifications; and design and performance capability of the residual heat removal and chemical and volume control systems. The inspection was conducted by regional engineering specialists with mechanical consultants' assistance. One Green finding associated with a Non-Cited Violation was 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. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. Inspector-Identified and Self-Revealed Findings

Cornerstone: Mitigating Systems

Green. A finding of very low safety significance was identified involving a Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion III, Design Control, for the failure to maintain an accurate design basis for instrumentation required to function at degraded voltage conditions.

This finding is greater than minor because the unverified assumption used in the degraded voltage calculation impacted the mitigating systems cornerstone objective of design control in that the instrumentation was not verified to operate under the design basis condition of degraded voltage. This finding is of very low safety significance because the licensee was able to subsequently verify, through calculation, that sufficient voltage was available under degraded voltage conditions to ensure the instrumentation would properly function. This issue was a design deficiency that was confirmed not to result in the loss of function in accordance with Generic Letter 91-18 (Revision 1). (Section 1R21.2)

B. Licensee-Identified Violations

No findings of significance were identified.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstone: Initiating Events, Mitigating Systems, and Barrier Integrity

1R02 Evaluations of Changes, Tests, or Experiments (71111.DS-Enclosure 3)

Review of Evaluations and Screenings for Changes, Tests, or Experiments

a. Inspection Scope

The inspectors reviewed six 10 CFR 50.59 evaluations and 24 screenings. These documents were reviewed to ensure consistency with the requirements of 10 CFR 50.59. The inspectors used Nuclear Energy Institute (NEI) 96-07, Guidelines of 50.59 Evaluations, Revision 1, to determine acceptability of the completed evaluations and screenings. The NEI document was endorsed by the NRC in Regulatory Guide 1.187, "Guidance for Implementation of 10 CFR 50.59, Changes, Tests, and Experiments," November 2000. The inspectors also consulted Inspection Manual, Part 9900, 10 CFR GUIDANCE: 50.59. Documents reviewed during the inspection are listed at the end of the report.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (71111.DS-Enclosure 2)

Review of Recent Permanent Plant Modifications

a. Inspection Scope

The inspectors reviewed 19 permanent plant modifications that were performed by the licensee's engineering staff during the last two years; including three commercial grade dedications and four item equivalency evaluations. Seven of the modifications affected the residual heat removal and chemical and volume control systems. The modifications were reviewed to verify that the completed design changes were in accordance with specified design requirements and the licensing bases and to confirm that the changes did not affect the modified system or other systems' safety function. Calculations which were performed or revised to support the modifications were also reviewed. As applicable to the status of the modification, post-modification testing was reviewed to verify that the system, and associated support systems, functioned properly and that the modification accomplished its intended function. The inspectors also verified that the completed modifications did not place the plant in an increased risk configuration. The inspectors evaluated the modifications against the licensee's design basis documents and the Updated Final Safety Analysis Report (UFSAR). The inspectors also used applicable industry standards, such as the American Society of Mechanical Engineers

(ASME) Code and the Institute of Electrical and Electronics Engineers (IEEE) Standards, to evaluate acceptability of the modifications.

b. Findings

No findings of significance were identified.

1R21 Safety System Design and Performance Capability (71111.DS-Enclosure 1)

Introduction: Inspection of safety system design and performance verifies the initial design and subsequent modifications and provides monitoring of the capability of the selected systems to perform design bases functions. As plants age, the design basis may be lost and important design features may be altered or disabled. The plant risk assessment model is based on the capability of the as-built safety system to perform the intended safety functions successfully. This inspectable area verifies aspects of the mitigating systems cornerstone for which there are no indicators to measure performance.

The objective of the safety system design and performance capability inspection is to assess the adequacy of calculations, analyses, other engineering documents, and operational and testing practices that were used to support the performance of the selected systems during normal, abnormal, and accident conditions. The inspection was performed by a team of inspectors that consisted of a team leader, three Region III inspectors, and two mechanical consultants.

The residual heat removal (RH) and chemical and volume control (CV) systems were selected for review during this inspection based upon:

- having a high probabilistic risk analysis ranking;
- being a high safety significant maintenance rule system; and
- having not received recent NRC review.

The criteria used to determine the system's performance included:

- applicable Technical Specifications and Bases;
- applicable UFSAR sections;
- the system's design documents; and
- the system's operating procedures.

The following system and component attributes were reviewed in detail:

System Requirements

Process Medium - water
Energy Source - electrical power, air
Control Systems - initiation, control, and shutdown actions
Operator Actions - initiation, monitoring, control, and shutdown actions

System Condition and Capability

Installed Configuration - elevation and flow path operation
Operation - system alignments and operator actions
Design - calculations and procedures
Testing - flow rate, pressure, temperature, voltage, and level

Components

The residual heat removal and chemical and volume control pumps were selected for detailed review during the inspection. These components were specifically reviewed for component degradation due to the impact that their failure would have on the plant.

.1 System Requirements

a. Inspection Scope

The inspectors reviewed the UFSAR, Technical Specifications, drawings and available design basis information to determine the performance requirements of the residual heat removal and chemical and volume control systems. The reviewed systems' attributes included process medium, energy sources, and control systems. The rationale for reviewing each of the attributes was:

Process Medium: This attribute needed to be reviewed to ensure that the residual heat removal and chemical and volume control pumps would supply the required flow under the design basis events.

Energy Sources: This attribute needed to be reviewed to ensure that the residual heat removal and chemical and volume control system pumps and valves would start or function when called upon and continue to operate as required during the design basis event.

Controls: This attribute required review to ensure that the trips and interlocks of the residual heat removal and chemical and volume control system pumps and valves functioned as specified.

Operator Actions: This attribute needed to be reviewed to verify operating procedures (normal, abnormal, or emergency) were consistent with operator actions for accident/event conditions for the residual heat removal and chemical and volume control systems.

b. Findings

No findings of significance were identified.

.2 System Condition and Capability

a. Inspection Scope

The inspectors reviewed design basis documents and plant drawings, abnormal and emergency operating procedures, requirements, and commitments identified in the UFSAR and Technical Specifications. The inspectors compared the information in these documents to applicable electrical, instrumentation and control, and mechanical calculations, setpoint changes, and plant modifications. The inspectors also reviewed operational procedures to verify that instructions to operators were consistent with design assumptions. The inspectors also used applicable industry standards, such as the ASME Code and the IEEE Standards, to evaluate plant design.

The inspectors reviewed information to verify that the actual system condition and tested capability were consistent with the identified design bases. Specifically, the inspectors reviewed the installed configuration, the system operation, the detailed design, and the system testing, as described below.

Installed Configuration: The inspectors confirmed that the installed configuration of the residual heat removal and chemical and volume control systems met the design basis by performing detailed system walkdowns. The walkdowns focused on the installation and configuration of piping, components, and instruments; the placement of protective barriers and systems; the susceptibility to flooding, fire, or other environmental concerns; physical separation; provisions for seismic and other pressure transient concerns; and the conformance of the currently installed configuration of the systems with the design and licensing bases.

Operation: The inspectors reviewed plant drawings and system alignment procedures, and verified by control board and system walkdowns that the systems' alignments were consistent with design and licensing basis assumptions.

Design: The inspectors reviewed the mechanical, electrical, and instrumentation design of the residual heat removal and chemical and volume control systems to verify that the systems and subsystems would function as required under accident conditions. This included a review of the design bases, design changes, design assumptions, calculations, boundary conditions, and models as well as a review of selected modification packages. Instrumentation was reviewed to verify appropriateness of applications and setpoints based on the required equipment function. Additionally, the inspectors performed limited analyses in several areas to verify the appropriateness of the design values.

Testing: The inspectors reviewed records of selected periodic testing and calibration procedures and the associated results to verify that the design requirements of calculations, drawings, and procedures were incorporated in the system and were adequately demonstrated by test results. Test results were also reviewed to ensure automatic initiations occurred within required times and that testing was consistent with design basis information.

b. Findings

Introduction: The inspectors identified that the licensee's 120 Vac (volts alternating current) degraded voltage calculation relied upon an inaccurate assumption regarding minimum voltages for safety related heating, ventilation, and air-conditioning (HVAC) instrumentation. This failure to maintain the design basis of the plant was determined to be of very low safety significance and was dispositioned as a Green Non-Cited Violation (NCV).

Description: The inspectors identified that assumptions in regard to instruments used for safety related HVAC systems (the auxiliary building ventilation system and the control room HVAC System in the licensee's 120 Vac degraded voltage calculation), did not reflect the actual plant configuration. Specifically, the 120 Vac degraded voltage calculation, 19AQ-69, "Evaluation of the 120 Vac Distribution Circuits Voltage at the Degraded Voltage Setpoints," assumed the input voltage to specific HVAC process instrumentation (Moore Industries signal converters, Love Controllers, and Validyne P361 series pressure transmitters) to be at 95 Vac. While the vendor information associated with the instrumentation specified a higher voltage for proper operation (minimum voltage requirements was 103 Vac for Moore signal converters, 102 Vac for Love Controllers, and 105 Vac for the Validyne P361 series pressure transmitters), the licensee had stated in the assumption for the calculation that the instrumentation would be able to operate since tests on the instrumentation in service demonstrated that the control circuits would perform their design function at a reduced voltage of 95 Vac. The inspectors questioned this methodology, since it was unclear whether the licensee had a program in place for testing replacement instrumentation put in service at this reduced voltage. Without a test for each instrument placed in service, the vendor's specification for voltage would have to be used as it could not be guaranteed that the replacement instruments would operate at these assumed reduced voltages.

In response to this issue, the licensee discovered that the testing that was identified in the calculation assumption only applied to the Moore Industries signal converters and the Love Controllers; no testing was ever performed on the Validyne transmitters. Based upon this information, the licensee performed a bounding voltage drop calculation to prove operability. The new calculation took advantage of existing conservatisms and established margins to prove that the instruments, under worst case voltage conditions, could still perform their required function.

While the licensee was able to determine operability of the affected instruments through bounding voltage drop calculation, the licensee's existing design basis (the assumptions in the degraded voltage calculation) had not been adequately verified or maintained. The design basis assumption relied upon testing of the instruments at 95 Vac; however, some instruments were either not tested, while others were replaced without retesting the specific instrument at the assumed degraded voltage included in the calculation. As such, the licensee had failed to maintain accurate design basis assumptions that were essential for their design basis calculation.

Analysis: This issue was a design control deficiency resulting in a finding of very low safety significance (Green). The deficiency was due to the licensee's failure to maintain

an accurate design basis for instrumentation required to function at degraded voltage conditions.

This finding is greater than minor because the unverified assumption used in the degraded voltage calculation impacted the mitigating systems cornerstone objective of design control in that the instrumentation was not verified to operate under the design basis condition of degraded voltage.

This finding was evaluated with the Significance Determination Process (SDP) Phase I, and found to be of very low safety significance (Green). The licensee was able to subsequently verify, through calculation, that sufficient voltage was available under degraded voltage conditions to ensure the instrumentation would properly function. This issue was a design deficiency that was confirmed not to result in the loss of function in accordance with Generic Letter 91-18 (Revision 1).

Enforcement: 10 CFR Part 50, Appendix B, Criterion III, Design Control, states, in part, that measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions.

Contrary to the above, as of August 28, 2003, the licensee failed to assure that the design basis was correctly translated in the 120 Vac degraded voltage calculation for safety related HVAC instrumentation based on an unverified assumption concerning the operability of several instruments under degraded voltage conditions.

Because this violation was of very low safety significance and it was entered into the licensee's corrective action program (condition report 00173650), this violation is being treated as a NCV, consistent with Section VI.A of the NRC Enforcement Policy (NCV 05000456/2003007-01; 05000457/2003007-01).

.3 Components

a. Inspection Scope

The inspectors examined the residual heat removal and chemical and volume control pumps and selected valves to ensure that component level attributes were satisfied. The attributes selected for review were: component degradation, equipment and environmental qualification, equipment protection, and operating experience.

Component Degradation: The inspectors discussed with system engineers the processes used for monitoring the residual heat removal and chemical and volume control systems for potential degradation. Condition reports and maintenance work orders for the residual heat removal and chemical and volume control pumps were reviewed to confirm that proper focus was being placed on degraded equipment.

Equipment and Environmental Qualification: To confirm this attribute, the inspectors reviewed calculations and equipment qualification documents to ensure that components in the residual heat removal and chemical and volume control systems would perform their function under the temperatures that would be expected.

Equipment Protection: The inspectors reviewed calculations and other documents, performed walkdowns and interviewed personnel to ensure that components in the residual heat removal and chemical and volume control systems would perform their function following seismic, tornado, and high energy line break events.

Operating Experience: The inspectors reviewed condition reports, problem identification forms, and other documents to confirm that the licensee adequately evaluated industry information regarding residual heat removal and chemical and volume control system problems.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES (OA)

4OA2 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed a sample of residual heat removal and chemical and volume control systems problems that were identified by the licensee and entered into the corrective action program. The inspectors reviewed these issues to verify an appropriate threshold for identifying issues and to evaluate the effectiveness of corrective actions related to design issues. In addition, condition reports initiated on issues identified during the inspection were reviewed to verify adequate problem identification and incorporation of the problem into the corrective action system. The specific corrective action documents that were sampled and reviewed by the inspectors are listed in the attachment to this report.

b. Findings

No findings of significance were identified.

4OA6 Meetings

.1 Exit Meeting

The inspectors presented the inspection results to Mr. M. Pacilio, and other members of licensee management at the conclusion of the inspection on September 12, 2003. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. A number of documents reviewed were identified as proprietary information and returned to the licensee at the conclusion of the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee
R. Belair, Design Engineering
T. Cole, System Engineer
C. Dunn, Site Engineering Director
R. Gilbert, Nuclear Oversight Manager
T. Joyce, Plant Manager
F. Lentine, Design Engineering Manager
C. Mokijewski, Design Engineering
M. Pacilio, Site Vice President
J. Panfil, Design Engineering Supervisor
R. Rahrig, Operations Support Manager
D. Reidinger, Electrical/I&C Design Manager
K. Root, Regulatory Assurance Manager
B. Schipiour, Operations Service Manager
D. Skoza, Equipment Reliability Lead Engineer
E. Steffan, Regulatory Assurance
M. Smith, Plant Engineering Manager
C. Walrath, Operations Support Manager
R. Wolen, Rapid Response Team Supervisor
A. Wong, Corporate/Safety Analysis
J. Zecca, System Engineer

Nuclear Regulatory Commission
D. Hills, Chief, Mechanical Engineering Branch, RIII
S. Ray, Senior Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000456/2003007-01; 05000457/2003007-01	NCV	Instrumentation Assumption at Degraded Voltage Not Adequately Verified (Section 1R21.2)

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 of 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.

1R21 Safety System Design and Performance Capability

Calculations

3C8-0687-001; Verification of High Energy Line Break Design Approach for Jet Impingement Effects on Safe Shutdown Equipment, Instrumentation, and Cables (Outside Containment) Unit 2; Revision 5

3C8-0785-003; Verification of High Energy Line Break Design Approach for Jet Impingement Effects on Safe Shutdown Equipment, Instrumentation, and Cables (Outside Containment) Unit 1; Revision 4

3C8-0887-001, Confirmation of Safe Shutdown Capability after Auxiliary Building Flooding - Braidwood, Revision 3

7.16.11.2; Residual Heat Removal Pump, Aux. 346'-0", CQD-007651; Revision 1
8.1.16.3; Design for Differential Pressure (RWST); Revision 4

13.2.8BR; Calculations for Mechanical Component Support M-2CV08003X; Revision 2

19-T-6; Diesel Generator Loading During LOOP/LOCA - Braidwood Units 1&2; Revision 5

19AQ-69; Evaluation of the 120 VAC Distribution Circuits Voltage at the Degraded Voltage Setpoints; Revision 5

24.1.5; Embedded Plates - Design Control Summary for Plant Modifications & Station Support Work; Revision 0

AQ-68; Division Specific Degraded Voltage Analysis; Revision 5

BRW-97-0821-M; Safety Injection (SI) MOV Differential Pressure Calculation; Revision 0

BRW-97-0822-M; Chemical and Volume Control System (CVCS) MOV Differential Pressure Calculation; Revision 0

BRW-98-0789-M; Determination of Acceptance Criteria for RHR Heat Exchanger Flowrate Verification Surveillance; Revision 0

BRW-98-1032-1/BYR98-211; Residual Heat Removal (RHR) ECCS Pump Flow & Pressure Accuracy Evaluation; Revision 000A

BRW-99-0314-M/BYR99-104; Verification of Opening Capability for Braidwood and Byron 1(2)SI8804B Valves Susceptible to Pressure Locking; Revision 0

BRW-01-0111-E/BYR01-054; Seismic Evaluation of the Mounting and Foundation Loads for the Replacement Motors on the Boric Acid Transfer Pumps for the Braidwood and Byron Stations; Revision 0

BRW-99-0503/BYR99-141; Chemical Volume and Control Tank Level Error Analysis; Revision 0

BRW-01-0153-E/BRY01-068; Environmental Parameters of EQ Zones; Revision 1
BYR98-030/BRW-98-0100-M; Containment Sump Zone of Influence for Failed Coatings; Revision 3

BYR98-212/BRW-98-1081; Residual Heat Removal (RHR) Pump ASME Surveillance Instrument Accuracy; Revision 2

BYR97-287/BRW-97-0665-M; ECCS Pumps NPSH Verification Following a Failure of the RWST Vent Line; Revision 0

BYR98-212/BRW-98-1081; Residual Heat Removal (RHR) Pump ASME Surveillance Instrument Accuracy; Revision 2

CQD-005513, Nozzle Loads for Equipment, Revision 01

CQD-007496; Foundation Loads for Centrifugal Charging Pump Equipment No. 1,2CV01PA, B; Revision 0

CQD-007651; Foundation Loads for Residual Heat Removal Pumps (1,2RH01PA,B); Revision 0

CS-5; NPSHA for RHR and CS Pumps; Revision 3A

Design Analysis No. 055118; Revision to Stress Report for 2CV08/2CV47; Revision 1G

FSD/SS-M-167; RHR Miniflow Performance/4 Loop Plants; dated August 1981

HELB-26; Safe Shutdown Equipment Assessment Due to Postulated Through-Wall-Leakage Cracks Outside Containment; Revision 2

HELB-31; Containment Sump Blockage due to the Postulated Failure of Undocumented/Unqualified Coatings; Revision 1

NED-I-EIC-0082; Containment Floor Water Level Channel Error Analysis; Revision 3

N4SD-CVA-18; NPSHA for RHR and CS Pumps; dated March 1977

PSA-B-98-08; Byron/Braidwood ECCS Flow Calculations for Safety Analyses; Revision 3A

PSA-B-98-08; Byron/Braidwood ECCS Flow Calculations for Safety Analyses; Revision 3

PSA-B-98-08; Byron/Braidwood ECCS Flow Calculations for Safety Analyses; Revision 2

RSA-B-94-09; Byron/Braidwood ECCS Flow Calculations for LOCA Analyses; Revision 1

Rising Stem MOV Data Sheet; BRA-2CV112E; dated April 13, 1999

Rising Stem MOV Data Sheet; BRA-1CV8804A; dated September 17, 2001

Rising Stem MOV Data Sheet; BRA-2RH8716A; dated April 11, 2002

Rising Stem MOV Data Sheet; BRA-1SI8811B; dated September 17, 2001

SI-90-01; Minimum Water Volume Available for Containment Recirculation Sump Flooding; Revision 5

SITH-1; Refueling Water Storage Tank (RWST) Level Setpoints; Revision 6

SM-RC0403; RHR System Isolation - High Pressure Alarm (Loop 403); Revision B

T-3; Station Blackout - Diesel-Generator Loading; Revision 8

TE-EC-077; Increase in Flow Rate through the Byron and Braidwood Residual Heat Removal Heat Exchangers; Revision 1

V-EC-1678; Byron/Braidwood Heat Exchanger Bypass Valve Minimum Flow Rate; dated August 18, 1997

Commercial Grade Dedications

00011614; 4-way Pneumatic Solenoid Pilot Valve; dated August 29, 2001

00024579; Potentiometer, Wirewound, 250 Ohm +/-3%, 3 Watt 40C; dated June 2003

00024705; Potentiometer, Wirewound, 0-150 Ohm, 4 Watts Circuit ; dated June 2003

Condition Reports

A1997-03320; Sump Screen Blockage Calculation; dated August 8, 1997

A1997-04933; Gaps Between Plates Comprising Top Surface of Containment Recirculation Sump Frame; dated October 30, 1997

A1999-01654; Gaps Found in SI Recirculation Sump; dated May 16, 1999

NTS 456201971745; Narrow Range Iconic Net Charging Calc Non-Compliance with USFAR; dated April 4, 1997

00072410; Debris from 0FE-VT002 Lodged in Damper; dated August 16, 2001

00074791; Wiring Problems Found During Testing of 1CV03P; dated September 16, 2001

00081944; 2B RH pump tripped on Phase C Overcurrent; dated November 1, 2001

00082135; Inappropriate S/D Safety Classification on 2B RH Pump Failure; dated November 8, 2001

00082563; 2RH01PB - FME Issue Shavings in Pump Housing; dated November 12, 2001

00082594; Metal Shaving Found Inside of Pump Bowl; dated November 12, 2001

00082631; 2B RH Pump Missing Anti-Rotation Pin; dated November 13, 2001

00082711; Disposition of 1B RH Pump Running Clearances; dated November 2001

00082906; Math Error Results in Below Spec Clearance; dated November 14, 2001

00083865; Inadequate 50.59 for Placing RH in Service; dated November 26, 2001

00083949; Annunciator System Drawing Errors; dated November 26, 2001

00085601; 2CV640 Did Not Close While Establishing Letdown; dated December 7, 2001

00085710; 2CV460 Failed Stroke Test, Outside Alert; dated December 7, 2001

00089959; Confusion/Inefficiencies With 50.59 Form Usage; dated January 4, 2002

00090683; Operator work-around - 2B RH Pump seizure; dated January 15, 2002

00094181; Misinterpretation in BwOP RH-6 Heatup Limits; dated February 7, 2002

00093337; DCR Processed Without Updating Electrical L/U; dated January 31, 2002

00095748; Incorrect Setpoint Values Given by Engineering; dated February 19, 2002

00106807; 50.59 Could Not Have Been Performed for RH Procedure Change; dated May 5, 2002

00142397; 1B RH Pump Casing ID found to be Out of Round; dated January 31, 2003

00142851; Pump Assembly Difficulties with 1B RH Pump Work; dated February 4, 2003

00145494; WC Lessons Learned 1B RH Pump Project Critique; dated February 20, 2003

00145766; 1B RH Pump Skirt Diameter Not Recorded in WO; dated February 22, 2003

00146427; MMD Lessons Learned 1B RH Pump Project Critique; dated February 26, 2003

00146431; EMD Lessons Learned 1B RH Pump Project Critique; dated February 26, 2003

00151843; Tab Washer (Lock Washer) Found Missing on !RH01PA; dated April 1, 2003

00152072; 1A RH Pump Measurement Issues with Impeller and SBE; dated April 3, 2003

00152254; Cracks Identified on 1A RH Pump Diffuser; dated April 3, 2003

00152260; RHR Pump Disassembly Procedures Need Enhancement; dated April 3, 2003

00154763; CV Maximum Injection Line Flow Imbalance on 'B' Train; dated April 19, 2003

00158742; 1A DG Air Compressor Air Dryer Config Management; dated May 14, 2003

00163523; Potential Trend in Engineering Attention to Detail; dated June 17, 2003

00164672; Oil Leak 1A CV Pump; dated June 24, 2003

00165083; Oil leak on the !CV01PA thrust bearing housing; dated June 26, 2003

00170889; Discrepancies in ECCS Sump Screen Documentation; dated August 4, 2003

Condition Reports Written as a Result of the Inspection

00173617; Drawing Discrepancy on Single Line Diagram; dated August 26, 2003

00173620; Procedure Enhancement Opportunity; August 28, 2003

00173650; Testing Controllers at Degraded Voltage; dated August 26, 2003

00173059; Observations Made During NRC SSDI Walkdown; dated August 25, 2003

00173112; BwAR Procedure Inconsistencies Between Units; dated August 26, 2003

00173623; Enhancement to UFSAR on RCS Hydrostatic Testing; dated August 28, 2003

00174071; Reset 2A RCP Seal Leakoff Alarm Setpoints; dated September 3, 2003

00173214; Cable found cut and abandoned in place; dated August 26, 2003

00173604; Portions of Calculation SI-90-01 Not Superceded; dated August 28, 2003

00174386; ER Referenced in Calculation PSA-B-98-08 Not Located; September 4, 2003

00174555; Calculation Error Identified During SSD & PC Inspection; September 5, 2003

00174817; 2BwVSR5.5.8.RH.2 Enhancements/Clarifications; dated September 8, 2003

00174912; Use of Interim Abandoned Equipment Procedure; dated September 9, 2003

00175091; UFSAR Uses Incorrect Term for S/G Tube Rupture; dated September 10, 2003

00175093; SSDI Identified BwEP Procedure Enhancement; dated September 10, 2003

00175156; Section A1.82 of the UFSAR Needs Clarification; dated September 10, 2003

00175172; IST Procedure Statement of Applicability; dated September 10, 2003

00175227; NPSH Calculation Potential Enhancements; dated September 10, 2003

00175368; Procedural Enhancement Opportunity; dated September 11 , 2003

00175431; Root Cause Report 81944; dated September 11, 2003

00175432; Containment Sumps - Improvement Opportunities; dated September 11, 2003

00175433; Potential Enhancement to the Work Control Process; dated September 11, 2003

00175475; RH Full Flow Surveillance Check Valve Clarification; dated September 12, 2003

00175231; IST Bases Document Enhancement - CV System; dated September 10, 2003

00175232; Note in RH ASME Surveillance Needs Revision; dated September 10, 2003

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BRW-DIT-98-0293; Transmittal of Byron/Braidwood ECCS Flow Accuracy Evaluation Results; dated November 13, 1998

BRW-DIT-98-0350; RH Pump Minimum Flow Parameters/RH System Check Valve Stroke Testing; dated November 3, 1998

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NFM9800252; Information Required for CV and SI Check Valve Testing to Meet Safety Analysis, Sequences Nos. 0 and 1; dated January 11, 1999 and September 11, 2000

Drawings

M-2CV08003X; Component Support Design Drawing - Unit 2; Revision C

M-33, sheet 70; Instrumentation Installation Details Differential Level Transmitter & Sensor Bellows - Containment Level Units 1 & 2; Revision L

M-54, Sheet 4A; Diagram of Service Air (Diesel Gen. Starting Air) - Unit 1; Revision B

M-60, sheet 1B; Diagram of Reactor Coolant Loop - 1 Unit 1; Revision BE

M-60, sheet 3; Diagram of Reactor Coolant Loop - 3 Unit 1; Revision BE

M-61, sheet 1B; Diagram of Safety Injection Unit 1; Revision BD

M-61, sheet 3; Diagram of Safety Injection Unit 1; Revision AN

M-61, sheet 4; Diagram of Safety Injection Unit 1; Revision BA

M-61, sheet 5; Diagram of Safety Injection Unit 1; Revision AB

M-61, sheet 6; Diagram of Safety Injection Unit 1; Revision AW

M-62; Diagram of Residual Heat Removal Unit 1; Revision BN

M-64, sheet 1; Diagram of Chemical & Volume Control & Boron Thermal Regeneration Unit 1; Revision AK

M-64, sheet 2; Diagram of Chemical & Volume Control & Boron Thermal Regeneration Unit 1; Revision AN

M-64, sheet 3A; Diagram of Chemical & Volume Control & Boron Thermal Regeneration Unit 1; Revision BD

M-64, sheet 3B; Diagram of Chemical & Volume Control & Boron Thermal Regeneration Unit 1; Revision AW

M-64, sheet 4A; Diagram of Chemical & Volume Control & Boron Thermal Regeneration Unit 1; Revision H

M-64 , sheet 4B; Diagram of Chemical & Volume Control & Boron Thermal Regeneration Unit 1; Revision G

M-64, sheet 5; Diagram of Chemical & Volume Control & Boron Thermal Regeneration Unit 1; Revision BE

M-64, sheet 6; Diagram of Chemical & Volume Control & Boron Thermal Regeneration Unit 1; Revision AT

M-64, sheet 7; Diagram of Chemical & Volume Control & Boron Thermal Regeneration Unit 1; Revision AV

M-64, sheet 8; Diagram of Chemical & Volume Control Units 1 & 2; Revision AH

M-77, sheet 1; Auxiliary Building Equipment Vents (Filtered) Units 1 & 2; Revision AW

M-130, sheet 1A; Diagram of Diesel Oil and Fuel Supply Unit 2; Revision BK with markup per ECN 343337

M-130, sheet 1B; Diagram of Diesel Oil and Fuel Supply Unit 2; Revision BH with markup per ECN 343337

M-135, sheet 1B; Diagram of Reactor Coolant Loop - 1 Unit 2; Revision BE

M-135, sheet 3; Diagram of Reactor Coolant Loop - 3 Unit 2; Revision BC

M-135, sheet 6; Diagram of Reactor Coolant Unit 2; Revision AN

M-136, sheet 1; Diagram of Safety Injection Unit 2; Revision BH

M-136, sheet 2; Diagram of Safety Injection; Revision AD

M-136, sheet 3; Diagram of Safety Injection Unit 2; Revision AV

M-136, sheet 4; Diagram of Safety Injection Unit 2; Revision BA

M-137; Diagram of Residual Heat Removal Unit 2; Revision BE

M-138, sheet 1; Diagram of Chemical & Volume Control & Boron Thermal Regeneration Unit 2; Revision AY

M-138, sheet 2; Diagram of Chemical & Volume Control & Boron Thermal Regeneration Unit 2; Revision AU

M-138, sheet 3A; Diagram of Chemical & Volume Control & Boron Thermal Regeneration Unit 2; Revision BC

M-138, sheet 3B; Diagram of Chemical & Volume Control & Boron Thermal Regeneration Unit 2; Revision AY

M-138, sheet 4A; Diagram of Chemical & Volume Control & Boron Thermal Regeneration Unit 2; Revision BR

M-138, sheet 4B; Diagram of Chemical & Volume Control & Boron Thermal Regeneration Unit 2; Revision BJ

M-138, sheet 5A; Diagram of Chemical & Volume Control & Boron Thermal Regeneration Unit 2; Revision E

M-138, sheet 5B; Diagram of Chemical & Volume Control & Boron Thermal Regeneration Unit 2; Revision E

M-138, sheet 5C; Diagram of Chemical & Volume Control & Boron Thermal Regeneration Unit 2; Revision C

M-138, sheet 6; Diagram of Chemical & Volume Control & Boron Thermal Regeneration Unit 2; Revision AV

M-138, sheet 7; Diagram of Chemical & Volume Control & Boron Thermal Regeneration Unit 2; Revision AV

M-138, sheet 8; Diagram of Chemical & Volume Control; Revision AB

M-571, sheet 5; Auxiliary Building El. 426’ 0" & 477’ 0" Filtered Vent. System Units 1 & 2; Revision M

M-2095; HVAC/C&I Diagram Auxiliary Building; Revision E

M-2096; HVAC/C&I Diagram Control Room System - VC; Revision N

N-2LT-0112, Sheet 1 of 4; Level Transmitter, Aux Building, FL. El. 426’-0"; Revision 1

N-2LT-0112, Sheet 2 of 4; Level Transmitter, Aux Building, FL. El. 426’-0"; Revision 1

N-2LT-0112, Sheet 3 of 4; Level Transmitter, Aux Building, FL. El. 426’-0"; Revision 1

N-2LT-0112, Sheet 4 of 4; Level Transmitter, Aux Building, FL. El. 426’-0"; Revision 1

N-2LT-0185, Sheet 1 of 3; Level Transmitter, Aux Building, FL. El. 426’-0"; Revision 1

N-2LT-0185, Sheet 2 of 3; Level Transmitter, Aux Building, FL. El. 426’-0"; Revision 1

N-2LT-0185, Sheet 3 of 3; Level Transmitter, Aux Building, FL. El. 426’-0"; Revision 1

N-837; Ingersoll-Rand Company Characteristic Curve - Pump No. 127432; dated September 23, 1976

N-838; Ingersoll-Rand Company Characteristic Curve - Pump No. 127433; dated September 22, 1976

N-1037-2; Vickery-Simms Incorporated Drawing Mk-52 Orifice Plates; Revision D

S-712; Auxiliary Building Tunnel Framing Plan, EL. 388’-6" & 379’-6", Area 7, Unit 2; Revision N

S-1402; Refueling Water Storage Tank Foundation Plan; Revision J

S-1403; Refueling Water Storage Tank Roof Plan; Revision H

S-1404; Refueling Water Storage Tank Section & Details; Revision U

1457F57; Sheet 1 of 2; Tank-400CU FT, Volume Control; Revision 2

2A-CV-18; Chemical Feed and Volume Control, Auxiliary Building, Floor El. 364’-0"; Revision J

2A-SI-22; Safety Injection System; Revision D

2SI-34; Inservice Inspection Isometric of the Safety Injection Lines 2SI01B-24" and 2SI02A-8"; Revision B

20E-1-4030RH02; Schematic Diagram Residual Heat Removal Pump 1B 1RH01PB; Revision M

20E-1-4030CV02; Schematic Diagram Centrifugal Charging Pump 1B 1CV01PB; Revision U

20E-1-4030AP30; 4160 ESF Switchgear Bus 141 Undervoltage Relays - PR29-427-B141 & PR9C-427-B141, PR29A-427-ST11 & PR29C-427-ST11; Revision T

20E-0-4031VA05; Loop Schematic Diagram Aux Bldg HVAC System; Revision 1

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00012363; 10 Inch Wafer Sphere Butterfly Valve by Enertech; dated November 8, 2001

00016683; CV Pump Mechanical Seals; dated April 24, 2002

00021721; Transmitter, Pressure 0-3 to 0-300 psig Range; dated February 2003

00025053; Capacitor, Inverter, 0.5 MFD, ±10% tolerance, 1000vdc Peak; dated July 2003

Lesson Plans

I1-CV-XL-01; Chemical and Volume Control System; Revision 5

I1-RH-XL-01; Residual Heat Removal System; Revision 3

Miscellaneous

BB PRA-017.29A; Braidwood PRA - CV and RH Importance Measures; Revision 0

BwVP 2000-IT2; Technical Review of Pump Performance Parameters - 2BRH01PB Pump; Revision 2

BwVP 200-1T2; Technical Review of Pump Performance Parameters; Charging Pump 1CV01PA; June 13, 1997

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CAE-01-097/CCE-01-098 (Westinghouse Letter); Subject: Valve Stem Evaluation for the Installation of Strain Gauges; September 12, 2001

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IST-BWD-BDOC-V-24; Braidwood Inservice Testing Bases Document (RH System); December 21, 1999

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Letter from Exelon Generation Company, to NRC; Subject: Completion of Modifications to Support the Implementation of Amendment Nos.108 and 114; dated April 4, 2001

Letter from NRC to Mr. Oliver D. Kingsley; Subject: Issuance of Amendments; dated December 22, 1998

Memo No. BR-044; Critical Drawing Control; Revision 0

Operability Determination for CR 082711; dated February 8, 2002

Revised Focused Area Self-Assessment Plan Safety System Design and Performance Capability and Permanent Plant Modifications; dated June 30, 2003

Root Cause Investigation Report; 2B RH Pump Failure, Contact Between the Pump Impeller and Stuffing Box Extension Upper Wear Ring; dated November 15, 2001

Safety Evaluations of the Byron Station Responses to the Station Blackout (SBO) Rule; dated August 6, 1990

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Technical Requirements Manual Control Program, Appendix S; Revision 13

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MOV Design Basis Documents

MOV-DB-BRW-CV; Chemical and Volume Control System; Revision 2

MOV-DB-BRW-RH; Residual Heat Removal; Revision 3

MOV-DB-BRW-SI; Safety Injection; Revision 3

Modifications

EC 042470; Modify 1CV8804A to Prevent Pressure Locking; Revision 0

EC 042497; Install Vent Valve on Suction of CV Charging Pump 2CV01PB; Revision 002

EC 042882; 2PT-0124 Replace Barton Xmitter with Rosemount; dated December 19, 2001

EC 334714; Evaluate Valve Stem Thread Removal for QSS Installation on MOVs 1(2) CC9412A/B; Revision 000

EC 335668; Change Breaker Setting for 2SX016B; Revision 0

EC 336585; CV-Pump Mechanical Seal Changed from the Current Seal Per John Crane Dwg H-SP-2955 to HSP-1006396-1 Issue C and HSP-1001627-1 Issue C; Revision 000

EC 336804; Replace 2RC8042A Kerotest Valve with Anchor Darling; Revision 0

EC 340702; Revise Classification of Various Components on the Starting Air Skids for the 1B, 2A and 2B EDG; Revision 002

EC 340931; Evaluate Replacement Impeller for the 1B RH Pump; dated February 2, 2003

EC 337450; Switch (1RH610) to Maintained Open Contact; dated December 20, 2002

EC 338270; TD Timer Relay for Letdown Booster Pump Control Circuit; dated April 1, 2003

EC 339262; Remove RCS Loop Stop Isolation Valve Limit Switch Trip Circuit; Revision 0

SCR 97-048; 2A RCP Seal Leakoff High Alarm Setpoint from 5 to 5.5 GPM and 2A RCP #2 Seal Leakage Setpoint from 1 to 0.5 GPM; dated July 1, 1997

SCR 00-048; Increase 2B RCP Number 1 Seal Leakoff High Temperature Alarm from 195°F to 200°F to Maintain MCR Darkboard Condition; dated May 30, 2000

TMOD EC 333958; Revise Setpoints for the Reactor Head Vent Temperature Switches 2TSH-RC017 and 2TSH-RC018; Revision 0

Monthly Ship System Reports

Residual Heat Removal System, June 2003

Chemical and Volume Control, June 2003

Operator Work-Arounds

Number 165; Unit 2 Reactor Coolant Makeup System Doesn't Work in Automatic; Closure Date May 30,1999

Number 207; Unit 1 RH Pump 610/611 Miniflow Valve De-energized to Place RH in S/D Cooling; Closure Date December 15, 2002

Number 208; Unit 2 RH Pump 610/611 Miniflow Valve De-energized to Place RH in S/D Cooling; Closure Date April 17, 2002

Pre-operational and Initial Startup Test Results

BwPT-SI-12; Braidwood Unit One Safety Injection Test; Revision 0, Retest No. 90 - performed May 4, 1986

Procedures

1BwCA-0.0; Loss of all AC Power; Revision 100

1BwEP-0; Reactor Trip or Safety Injection, Unit 1; Revision 101

1BwEP-1; Loss of Reactor or Secondary Coolant, Unit 1; Revision 104

1BwEP-2; Faulted Steam Generator Isolation, Unit 1; Revision 1A

1BwEP-3; Steam Generator Tube Rupture, Unit 1; Revision 100

1BwEP ES-1.2; Post LOCA Cooldown and Depressurization, Unit 1; Revision 102

1BwEP ES-1.3; Transfer to Cold Leg Recirculation, Unit 1; Revision 101

1BwOA PRI-1; Excessive Primary Plant Leakage, Unit 1; Revision 100

1BwOA PRI-6; Component Cooling Malfunction, Unit 1; Revision 101

1BwOA PRI-10; Loss of RH Cooling, Unit 1; Revision 100

1BwOA PRI-15; Loss of Normal Charging, Unit 1; Revision 0

1BwOA RCP-1; Reactor Coolant Pump Seal Failure, Unit 1; Revision 100

1BwOA RCP-2; Loss of Seal Cooling; Revision 55

1BwOSR 3.3.3.1; Unit One Accident Monitoring Instrumentation Monthly Channel Checks; Revision 5

1BwOSR 3.3.4.1; Unit One Remote Shutdown Instrumentation Monthly Channel Checks; Revision 0

1BwOSR 3.6.3.5.CV-3; Chemical and Volume Control Seal Injection Containment Isolation Valve Stroke Quarterly Surveillance; Revision 1E1

1BwOS TRM 2.5.c.4; RH Pump ECCS Flowrate Verification; Revision 0

2BwCA-3.1; SGTR with Loss of Reactor Coolant - Sub-cooled Recovery Desired Unit 2; Revision 101

2BwOSR 3.3.3.1; Unit Two Accident Monitoring Instrumentation Monthly Channel Checks; Revision 5

2BwVSR 5.5.8.RH.2; ASME Surveillance Requirements for Residual Heat Removal Pump 2RH01PB; Revision 4

BwAR 1-2-A6; RH HX CC Wtr Flow High Low; Revision 54

BwAR 1-5-E7; Cnmt Recirc Sump Valve Canister Level High; Revision 6E2

BwAR 1-6-A1; RH Pump Trip; Revision 5E5

BwAR 1-6-A2; RH Pump Auto Start; Revision 52

BwAR 1-6-A3; RH Suct Press High; Revision 4

BwAR 1-6-B1; RH Pump 1A Dsch Press High; Revision 5E2

BwAR 1-6-B2; RH Pump 1B Dsch Press High; Revision 5E2

BwAR 1-6-C1; RH Pump 1A Dsch Flow Low; Revision 52

BwAR 1-6-C2; RH Pump 1B Dsch Flow Low; Revision 52

BwAR 1-6-D1; RH Pump 1A CC Flow Low; Revision 7

BwAR 1-6-D2; RH Pump 1B CC Flow Low; Revision 7

BwAR 1-7-A2; RCP Seal Wtr Inj Fltr Delta P High; Revision 7

BwAR 1-7-B2; RCP Seal Wtr Inj Flow Low; Revision 6

BwAR 1-7-B3; RCP Seal Leakoff Flow High; Revision 51E2

BwAR 1-7-D2; RCP Seal Wtr Bypass Flow Low; Revision 51E2

BwAR 1-7-D3; RCP Seal Outlet Temp High; Revision 6E1

BwAR 1-7-E1; Seal Wtr HX Outlet Temp High; Revision 5E1

BwAR 1-7-E2; Excess Ltdwn HX Temp High; Revision 51E1

BwAR 1-8-A5; Ltdwn HX Outlet Flow High; Revision 6

BwAR 1-8-A6; Ltdwn Orif Isol Vlv Local Cont; Revision 51E1

BwAR 1-8-B5; Ltdn HX Outlet Press High; Revision 5E1

BwAR 1-8-C5; Ltdwn HX Outlt Temp High; Revision 6

BwAR 1-9-A1; Regen HX Ltdwn Temp High; Revision 7

BwAR 1-9-A2; VCT Level High-High Low; Revision 10

BwAR 1-9-A3; Chg Pump Trip; Revision 6

BwAR 1-9-B1; LP Ltdwn Rlf Temp High; Revision 51E2

BwAR 1-9-B2; VCT Press High Low; Revision 53

BwAR 1-9-B3; Chg Pump Auto Start; Revision 51E1

BwAR 1-9-C2; VCT Temp High; Revision 6

BwAR 1-9-C3; PD Chg Pump CC Wtr Flow Low; Revision 51

BwAR 1-9-D2; Ltdwn Flow Diverted to HUT; Revision 53

BwAR 1-9-D3; Chg Line Flow High Low; Revision 7

BwAR 1-9-E1; Chg Pump Isolation Valve Closed; Revision 0E1

BwAR 1-9-E2; Ltdwn Temp High; Revision 52

BwAR 1-9-E3; Chg Pump/Vlv Local Cont; Revision 51E1

BwAR 2-1PR13J; RH CS Pump 1A CUB; Revision 2

BwAR 2-1PR14J; RH CS Pump 1B CUB; Revision 2

BwAR 2-1PR15J; RH HX 1A CUB; Revision 2

BwAR 2-1PR16J; RH HX 1B CUB; Revision 2

BwAR 2-1PR17J; Cent Chg Pump 1A CUB; Revision 2

BwAR 2-1PR18J; Cent Chg Pmp 1B CUB; Revision 2

BwAR 2-2-A6; RH HX CC Wtr Flow High Low; Revision 52

BwAR 2-5-E7; Cont Recirc Sump Valve Canister Level High; Revision 7E3

BwAR 2-6-A1; RH Pump Trip; Revision 5E3

BwAR 2-6-A2; RH Pump Auto Start; Revision 5E1

BwAR 2-6-A3; RH Suct Press High; Revision 4

BwAR 2-7-B3; RCP Seal Leakoff Flow High; Revision 7

BwAR 2-7-D2; RCP Seal Wtr Bypass Flow Low; Revision 51E1

BwAR 2-7-D3; RCP Seal Outlet Temp High; Revision 8

BwAR 2-8-A6; Ltdwn Orif Isol Vlv Local Cont; Revision 51

BwAR 2-9-D2; Ltdwn Flow Diverted to HUT; Revision 52

BwAR 0PL01J-9-A3; RHR Pump 1A Leak Det Sump Level High; Revision 5

BwAR 0PL01J-9-A4; Rhr Pump 1B Leak Det Sump Level High; Revision 5

BwAR 0PL01J-9-A5; RHR HT Exch 1A Leak Det Sump Level High; Revision 5

BwAR 0PL01J-9-A6; RHR HT Exch 1B Leak Det Sump Level High; Revision 6

BwISR 3,3,2,10-M223; Operational Test and Channel Verification Calibration for Loop L-0932; Revision 2

BwOP CV-5; Operation of the Reactor Makeup System in the Dilute/Alternate Dilute/Batch Dilution Mode; Revision 17

BwOP CV-6; Operation of the Reactor Makeup System in the Borate/Batch Boration Mode; Revision 14

BwOP CV-7; Make-up to the RCS Using the Reactor Makeup System in the Auto or Manual Mode or Using the RWST, or for RCS Feed and Bleed for Chemistry Control; Revision 18

BwOP CV-17; Establishing and Securing Normal and RH Letdown Flow; Revision 18

BwOP CV-22; Operation of Letdown and Regen Heat Exchangers; Revision 10

BwOP CV-E1; Electrical Lineup - Unit 1 Operating; Revision 7

BwOP CV-E2; Electrical Lineup - Unit 2 Operating; Revision 6

BwOP CV-M1, Operating Mechanical Lineup Unit 1; Revision 16

BwOP CV-M2, Operating Mechanical Lineup Unit 2; Revision 17

BwOP RH-6; Placing the RH System in Shutdown Cooling; Revision 28

BwOP RH-11; Securing the RH System from Shutdown Cooling; Revision 19

BwOP RH-E1; Electrical Lineup - Unit 1 RH System Operating Electrical Lineup; Revision 5

BwOP RH-M1; Operating Mechanical Lineup Unit 1; Revision 5

BwVS 4.5.2.f.1.a; Surveillance Requirement for _A Centrifugal Charging Pump Discharge Pressure; Revision 3A

BwVSR 5.5.8.CV.4; Safety Injection System Charging Check Valve Stroke Test; Revision 3

BwVSR 5.5.8.RH.2-2; Residual Heat Removal System Check Valve Stroke Test; Revision 8

CC-AA-102; Design Input and Configuration Change Impact Screening; Revision 5

CC-AA-103; Configuration Change Control; Revision 4

CC-AA-109; Interim Abandoned Equipment Identification, Evaluation and Control; Revision 2
LS-AA-104; Exelon 50.59 Review Process; Revision 3

LS-AA-105; Operability Determinations; Revision 1

LS-AA-125; Corrective Action Program (CAP) Procedure; Revision 5

SM-AA-300; Procurement Engineering Support Activities; Revision 0

SPP-03-001; Movement of Heavy Loads in the Fuel Building; Revision 0

Surveillances (Date Shown Is Date Surveillance Was Completed)

1BwOSR 5.5.8.CV-1; CVCS Charging/Letdown Containment Isolation Valve Stroke Test; dated April 28, 2003

1BwOSR 5.5.8.CV-5A; Emergency Boration Flowpath Isolation 1CV112D Valve Stroke Quarterly Surveillance; dated April 23, 2003

1BwOSR 5.5.8.CV-5B; VCT Outlet Isolation Valve Stroke Quarterly Surveillance; dated April 23, 2003 and April 23, 2003

1BwOSR 5.5.8.CV-7A; Train A Chemical and Volume Control System Miniflow Valve Stroke Quarterly Surveillance; dated July 19, 2003

1BwOSR 5.5.8.CV-7B; Train B Chemical and Volume Control System Miniflow Valve Stroke Quarterly Surveillance; dated June 23, 2003

1BwOSR 5.5.8.CV-11; RCP Seal Injection Isolation Valve Stroke Quarterly Surveillance; dated April 24, 2003

1BwOSR 5.5.8.CV-15; Emergency Boration Flowpath Isolation 1CV112E Valve Stroke Quarterly Surveillance; dated April 23, 2003

1BwOSR 5.5.8.RH-1A; Residual Heat Removal Valves 1RH8701A/B Valve Stroke Quarterly Surveillance; dated April 21, 2003

1BwOSR 5.5.8.RH-1B; Residual Heat Removal Valves 1RH8702A/B Valve Stroke Quarterly Surveillance; dated April 21, 2003

1BwOSR 5.5.8.RH-3A; Residual Heat Removal Train A Valve Stroke Quarterly Surveillance; dated June 9, 2003

1BwOSR 5.5.8.RH-3B; Residual Heat Removal Train B Valve Stroke Quarterly Surveillance; dated July 28, 2003

1BwOSR 5.5.8.SI-3A; Train A Unit One Safety Injection System SVAG Valve Stroke Quarterly Surveillance; dated April 24, 2003

1BwOSR 5.5.8.SI-3B; Train B Unit One Safety Injection System SVAG Valve Stroke Quarterly Surveillance; dated April 27, 2003

1BwVSR 5.5.8.CV.1; ASME Surveillance Requirements for 1A Centrifugal Charging Pump and Check Valve 1CV8480A Stroke Test; dated July 8, 2003

1BwVSR 5.5.8.CV.2; ASME Surveillance Requirements for Centrifugal Charging Pump and Check Valve 1CV8480B Stroke Test; dated June 27, 2003

1BwVSR 5.5.8.RH.1; ASME Surveillance Requirements for Residual Heat Removal Pump 1RH01PA; dated June 12, 2003

1BwVSR 5.5.8.RH.2; ASME Surveillance Requirements for Residual Heat Removal Pump 1RH01PB; dated July 30, 2003

2BwVSR 5.5.8.CV.1; ASME Surveillance Requirements for 2A Centrifugal Charging Pump and Check Valve 2CV8480A Stroke Test; dated July 10, 2003

2BwVSR 5.5.8.CV.2; ASME Surveillance Requirements for 2B Centrifugal Charging Pump and Check Valve 2CV8480B Stroke Test; dated July 31, 2003

2BwVSR 5.5.8.RH.1; ASME Surveillance Requirements for Residual Heat Removal Pump 2RH01PA; dated August 14, 2003

BwHS 4002-061S4; Post Static Test Evaluation Data Sheet - 2CV112E; dated May 3, 1999

BwVP 200-1T2; Technical Review of Pump Performance Parameters; dated July 9, 1998

BwVSR 5.5.8.CV.4; Safety Injection System Charging Check Valve Stroke Test; dated April 29, 2002 and April 21, 2003

BwVSR 5.5.8.RH.2-2; Residual Heat Removal System Check Valve Stroke Test; dated April 18, 2003

ER-AA-301; Post Static Test Analysis - 1CV8804A; dated September 27, 2001

ER-AA-301; Post Static Test Analysis - 1SI8811B; dated September 29, 2001

ER-MW-301-1001; Post Static Test Analysis - 2RH8716A; dated April 21, 2002

SPP-01-016; Residual Heat Removal Pump 2RH01PB Post Maintenance Test; dated November 15, 2001

Technical Specifications; Amendment 127

3.3.2; Engineered Safety Feature Actuation System (ESFAS) Instrumentation

3.3.4; Remote Shutdown System

3.4.6; RCS Loops - MODE 4

3.4.7; RCS Loops - MODE 5, Loops Filled

3.4.8; RCS Loops - MODE 5, Loops Not Filled

3.4.12; Low Temperature Overpressure Protection (LTOP) System

3.5.2; ECCS - Operating

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3.5.4; Refueling Water Storage Tank (RWST)

3.5.5; Seal Injection Flow

3.6.3; Containment Isolation Valves

3.9.3; Nuclear Instrumentation

3.9.5; Residual Heat Removal (RHR) and Coolant Circulation High Water Level

3.9.6; Residual Heat Removal (RHR) and Coolant Circulation Low Water Level

5.5.8; Inservice Testing Program

Technical Specifications Bases; Revision 41

B 3.3.2; Engineered Safety Feature Actuation System (ESFAS) Instrumentation

B 3.3.4; Remote Shutdown System

B 3.4.6; RCS Loops - MODE 4

B 3.4.7; RCS Loops - MODE 5, Loops Filled

B 3.4.8; RCS Loops - MODE 5, Loops Not Filled

B 3.4.12; Low Temperature Overpressure Protection (LTOP) System

B 3.5.2; ECCS - Operating

B 3.5.3; ECCS - Shutdown

B 3.5.4; Refueling Water Storage Tank (RWST)

B 3.5.5; Seal Injection Flow

B 3.6.3; Containment Isolation Valves

B 3.9.3; Nuclear Instrumentation

B 3.9.5; Residual Heat Removal (RHR) and Coolant Circulation High Water Level

B 3.9.6; Residual Heat Removal (RHR) and Coolant Circulation Low Water Level

Technical Requirements Manual; Revision 28

1.6; Technical Requirements Manual Revision

2.0.b; ESFAS Instrumentation Trip Setpoints

2.1.a; Miscellaneous Test Requirements

3.1.a; Boration Flowpath - Shutdown

3.1.b; Boration Flowpaths - Operating

3.1.c; Charging Pump - Shutdown

3.1.d; Charging Pumps - Operating

3.1.e; Borated Water Source - Shutdown

3.1.f; Borated Water Sources - Operating

3.4.e; Reactor Vessel Head Vents

3.7.d; Area Temperature Monitoring

3.8.b; Motor Operated Valves Thermal Overload Protection Devices

3.8.a; Containment Penetration Conductor Overcurrent Protective Devices

Updated Safety Analysis Report; Revision 9

Section 3.1; Conformance with NRC General Design Criteria

Section 5.4.7; Residual Heat Removal System

Section 6.3; Emergency Core Cooling System

Section 9.3.4; Chemical and Volume Control System

Table 7.5-1; Main Control Board Indicators and/or Recorders Available to the Operator

Section 15.4.6; Chemical and Volume Control System Malfunction that Results in a Decrease in Boron Concentration in the Reactor Coolant

Section 15.5; Increase in Reactor Coolant Inventory

Section 15.6.2; Failure of Small Lines Carrying Primary Coolant Outside Containment

Section 15.6.3; Steam Generator Tube Rupture

Section 15.6.5; Loss-of-Coolant Accidents Resulting from a Spectrum of Postulated Piping Breaks Within the Reactor Coolant Pressure Boundary

Section 15.7; Radioactive Release from a Subsystem or Component

Work Orders

98099996-01; PM Replacement of Pump Seals 1CV01PB; dated December 10, 1999

99153574-01; Inboard Seal Leaking Approx. 4 dpm 2CV01PA; dated July 10, 2003

99183803-01; Inboard Seal Leaks Approx. 0.23 GPM 2CV01PA; dated July 25, 2002

99198948-01; 2L-0931 18 Month CAL of RWST Level Loop; dated January 31, 2002

99199304-01; 2L-0933 18 Month CAL of RWST Level Loop; dated February 4, 2002

99199305-01; 2L-0930 18 Month CAL of RWST Level Loop; dated February 1, 2002

99200329-01; 2L-0932 18 Month CAL of RWST Level Loop; dated February 6, 2002

99226670 01; Unit 2 Stroke and Closure Test of 2SI8958B; dated April 27, 2002

99229803-01; Inboard Bearing Oil Leak, 1CV01PA; dated November 9, 2000

00110124-01; LI-0932 Is 3% Lower Than Other Level Channels; dated August 27, 2003

00330788-01; Oil Leak From Coupling Side Oil Seal 2CV01PB; dated June 13, 2002

00331740-01; 2B CV Pump 10-20 dpm Oil Leak Inboard Bearing; dated June 21, 2001

00340462; MM Perform Thread Cut of MOV Valve Stem; Revision 01

00362933-01; 1CV01PA Leak on Cooling Line to Inboard Seal; dated December 3, 2002

00362936-01; 2B CV Pump Seals Spraying Oil; dated July 31, 2002

00373394-01; Stroke and Closure Test of 1SI8958B and 1RH8730B; dated April 19, 2003

00374949-01; Excessive Boric Acid on Pump Seal 2RH01PB; dated August 27, 2002

00378510-01; Disassemble/Reassemble Pump 2RH01PB; dated November 15, 2001

00389396-01; Pump Disassembly; 1RH01PA; dated April 4, 2003

00389395-01; Next Pump Disassembly, Confirm Diffuser Anti-rotation 1RH01PB; dated February 2, 2003

00439027-01; Inboard Pump Seal Leaking 28 dpm 2CV01PB; dated June 16, 2003

00517133-01; Pump Gasket Leak Causing Stud Corrosion 2RH01PA; dated April 24, 2003

00517148-01; Visible Boron on Pump Seal Package 2RH01PB; dated March 28, 2003

00551994-01; 2PI-DG097A Leaking Oil; dated September 9, 2002

00553237-01; Visible Boron on Pump Seal Package 1RH01PB; dated March 20, 2003

00553238-01; Visible Boron on Pump Seal Package 1RH01PA; dated March 28, 2003

00577691-01; Boric Acid on 1B RH Pump Stud 1RH01PB; dated August 4, 2003

00583217-01; 2L-0932, Functional of RWST Level Loop, Ch. 3; dated September 3, 2003

00590277-01; 1A CV PP, Oil Leak at Inboard/Outboard Bearings; dated June 24, 2003

00603984-01; 1B CV Pump Inboard Bearing Oil Deflector Backed Out; dated August 7, 2003

00611760-01; 2L-SI0933 Unscheduled Maintenance Elect. CAL; dated September 5, 2003

Work Requests

950105204 01; Safety-Related 480V MCC Bucket Surveillance; dated October 30, 1995

980095203 01; 1RH8701A Breaker Test at 1A925E MCC 131X2; dated May 20, 1999

00027864; 2CV460 Valve Did Not Close; dated December 7, 2001

10 CFR 50.59 Safety Evaluations

BRW-SE-1997-301; Revise Setpoints of the 2A RCP #1 and #2 Seal Leakoff Flow Alarms; dated July 1, 1997

BRW-SE-1997-676; Review PDPs Currently Out of Service and Not Readily Available to Provide Charging Flow to the Reactor Coolant System; dated June 4, 1997

BRW-SE-1999-1073; Eliminate the Plant Shutdown Requirements Associated with the Inoperability of the Reactor Vessel Head Vents; dated September 1, 1999

BRW-SE-1999-1399; Design Change D20-1(2)-99-348 - Modify Valves 1(2)CV8804A to Prevent Pressure Locking; dated December 9, 1999

BRW-SE-2000-1081; Revision UFSAR Chapter 15, Section 15.5.1, Inadvertent Operation of Emergency Core Cooling System During Power Operations; dated October 20, 2000

BRW-SE-2002-010; Placing the RH System in Shutdown Cooling; January 16, 2002

BRW-E-2002-234; Revise Control Switch Operation for the Miniflow Isolation Valves, to Allow Maintained Contact for Open Position; dated September 9, 2002

BRW-E-2002-301; Replace SG Blowdown Hotwell Condenser Pump Variable Speed Motor Controllers with Digital Devices; dated November 6, 2002

BRW-E-2002-305; Temporary Configuration Change Package (TCCP) on UAT 241-2 Sudden Pressure Relay (SPR) Trip Circuitry; dated November 17, 2002

BRW-E-2003-93/6G-03-0001; Revision to Emergency Procedures to Implement Changes to SVAG Valve Reenergizing; Revision 1

BRW-E-2003-94/6G-03-0002; Revision to Emergency Procedures for Manual Shutdown of VV, VL, and VW Systems Following Safety Injection Actuation; Revision 0

10 CFR 50.59 Screenings

BRW-FCS-2000-0505, Revise the High Temperature Alarm Setpoint for the RCP 2B Number 1 Seal Leakoff and the High Temperature Alarm Setpoint for the RCP 2B lower Bearing, dated May 15, 2000

BWR-S-2001-397; Addition of High Point Vent Valve 2CV213 to the Suction Piping of Centrifugal Charging Pump 2CV01PB; Revision 0

BRW-S-2001-462; Install Taps on the FP and SX Piping to Provide Alternate Cooling to the 2B CV Pump; Revision 0

BRW-S-2001-518; Design Change Test D20-1-99-383-01; Revision 0

BRW-S-2001-520; Alteration for Interlock for Opening 8701A/B Valves; Revision 0

BRW-S-2001-519; Update Boration System Capabilities in UFSAR 9.3.4.1.3.1; Revision 0

BRW-S-2001-611; Residual Heat Removal Pump 2RH01PB Post Maintenance Test; Revision 0

BRW-S-2001-614; Placing the RH System in Shutdown Cooling; Revision 0

BRW-S-2001-635; Replace Existing Veritrak Flow transmitters 1(2)FT-0651, 0651, 0651, 0651 with Rosemount Transmitters; dated February 18, 2002

BWR-S-2002-20; Evaluate Valve Stem Thread Removal for QSS Installation on MOVs 1(2) CC9412A and B; Revision 0

BRW-S-2002-055; Securing the RH System from Shutdown Cooling; Revision 0

BRW-S-2002-056; Placing the RH System in Shutdown Cooling; Revision 0

BRW-S-2002-075; Instantaneous Setting of Circuit Breaker for 2SX016B; Revision 0

BWR-S-2002-081; Install 6" Drain & 1" Vent on U2 SX Cross-tie Line; Revision 0

BRW-S-2002-125; Modification to the SPDS Net Charging Flow Iconic Display Input and Software Algorithm; Revision 0

BRW-S-2002-133; Normal Venting of the VCT; Revision 0

BRW-S-2002-135; DRP-9-085; Clarification of Electrical Separation Requirements in UFSAR Section 8.3.1.4.2.2; dated April 10, 2002

BRW-S-2002-139; Letdown Booster Pump 2CV03P Modification Test; Revision 0

BRW-S-2002-157; LCOAR Control Room Ventilation (VC) Filtration System Tech Spec LCO 3.7.10; Revision 0

BRW-S-2002-158; Replace 2RC8042A Kerotest Valve with Anchor Darling; Revision 0

BWR-S-2002-182; Increase Size of CC Throttling Orifices from the RCP Motors Lower Radial Bearing Coolers; Revision 0

BWR-S-2002-199; Install Test Equipment on the 1AF01PB and 2AF01PB Pump in Order to Monitor Pump Starts; Revision 0

BRW-S-2002-224; Install Taps on the FP and SX Piping to Provide Alternate Cooling to the 1B CV Pump; Revision 0

BWR-S-2003-31; Emergency Diesel Generator Downgrade; Revision 0

BWR-S-2003-96; SPP-03-001, Movement of Heavy Loads in the Fuel Handling Building; Revision 0

BRW-S-2003-182; Change Existing Magnetic Trip Setting for Breaker 131X1-P3 for Motor Operated Valve 1SI8806; dated June 21, 2003

LIST OF ACRONYMS USED

ADAMS	Agency-wide Document Access and Management System
ASME	American Society of Mechanical Engineers
CFR	Code of Federal Regulations
CV	Chemical and Volume Control
DRS	Division of Reactor Safety
HVAC	Heating, Ventilation, and Air-conditioning
IEEE	Institute of Electrical and Electronics Engineers
IMC	Inspection Manual Chapter
IR	Inspection Report
LLC	Limited Liability Company
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
OA	Other Activities
PARS	Publicly Available Records System
RH	Residual Heat Removal
SDP	Significance Determination Process
UFSAR	Updated Final Safety Analysis Report
Vac	Volts Alternating Current