

June 20, 2001

Mr. Oliver D. Kingsley, President
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: BRAIDWOOD STATION, UNITS 1 and 2 - NRC INSPECTION
REPORT 50-456/01-06(DRP); 50-457/01-06(DRP)

Dear Mr. Kingsley:

On May 21, 2001, the NRC completed an inspection at your Braidwood Station, Units 1 and 2. The enclosed report documents the inspection findings which were discussed with Mr. K. Schwartz and other members of your staff on May 14, 2001.

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 resident inspection activities.

One finding of very low safety significance (GREEN) was identified in the report.

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

Sincerely,

Original signed by
Ann Marie Stone

Ann Marie Stone, Chief
Branch 3
Division of Reactor Projects

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

Enclosure: Inspection Report 50-456/01-06(DRP);
50-457/01-06(DRP)

See Attached Distribution

cc w/encl: J. Skolds, Chief Operating Officer
W. Bohlke, Senior Vice President, Nuclear Services
C. Crane, Senior Vice President - Mid-West Regional
Operating Group
J. Cotton, Senior Vice President - Operations Support
J. Benjamin, Vice President - Licensing and Regulatory Affairs
H. Stanley, Operations Vice President
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J. von Suskil, Site Vice President
K. Schwartz, Plant Manager
A. Ferko, Regulatory Assurance Manager
M. Aguilar, Assistant Attorney General
Illinois Department of Nuclear Safety
State Liaison Officer
Chairman, Illinois Commerce Commission

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/s/Ann Marie Stone

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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report Nos: 50-456/01-06(DRP); 50-457/01-06(DRP)

Licensee: Exelon Generation Company, LLC

Facility: Braidwood Station, Units 1 and 2

Location: 35100 S. Route 53
Suite 84
Braceville, IL 60407-9617

Dates: April 2 through May 21, 2001

Inspectors: C. Phillips, Senior Resident Inspector
N. Shah, Resident Inspector
J. Belanger, Senior Physical Security Inspector
J. Roman, Illinois Department of Nuclear Safety

Approved by: Ann Marie Stone, Chief
Branch 3
Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000456-01-06(DRP), 05000457-01-06(DRP); on 04/01-05/21/01; Exelon Generation Company; Braidwood Nuclear Power Station; Units 1 & 2. Resident Operations Report.

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

A. Inspector Identified Findings

Cornerstone: Initiating Events and Mitigating Systems

GREEN. The Unit 2A motor driven feedwater pump tripped on March 30, 2001, due to low lubricating oil pressure. The feedwater pump's shaft driven lubricating oil pump was damaged by foreign material which had been left inside the pump's lubricating oil system during maintenance activities in August 1999.

This event was considered more than minor, because if left uncorrected, the same issue (foreign material in a lube oil system) under the same conditions, could have become a more significant safety concern. The finding was of very low safety significance because the motor driven startup feedwater pump was available (i.e., not affected by this event). This resulted in full mitigating credit in the Phase II analysis using the NRC SDP analysis. This was not a violation as the feedwater pump was nonsafety-related equipment.

B. Licensee Identified Violations

No findings of significance were identified.

Report Details

Summary of Plant Status

Both units operated at 100 percent power throughout the inspection period, with the following exceptions:

- On April 3, Unit 1 power decreased to about 93 percent after the #1 turbine governor valve unexpectedly failed closed. Specifically, the circuit card controlling the valve failed, resulting in the valve closure. After replacing the failed card, Unit 1 was restored to 100 percent power on April 6.
- On May 17, Unit 1 implemented a Technical Specification (TS) amendment allowing an increase in the reactor power limit to 3586 megawatts (thermal). This amendment was approved by the NRC on May 4, 2001. Specifically, the licensee raised reactor power to 3446 megawatts (thermal) or about 97.6 percent of the revised, power limit.
- On May 19, Unit 2 tripped on loss of reactor coolant pump flow due to human error at 4:06 a.m. The unit was made critical on May 20, at 12:49 p.m., and synchronized to the grid on May 20, at 10:26 p.m.. The unit was not returned to full power before the end of the inspection period.

1. REACTOR SAFETY

Cornerstone: Initiating Events, Barrier Integrity and Mitigating Systems

1R04 Equipment Alignment (71111-04)

a. Inspection Scope

The inspectors verified the system alignment of the following systems while the alternate trains were out-of-service for planned maintenance:

- Unit 1B diesel driven auxiliary feedwater pump; and
- Unit 1 system auxiliary transformers (SATs).

The inspectors performed a partial walkdown of the accessible portions of these systems and observed the system (electrical and mechanical) lineup and selected, system operating parameters (i.e., pump and bearing lube oil levels, room temperature, electrical breaker position, etc). For the Unit 1 SATs, the inspectors also performed a walkdown of the station switchyard to determine whether there were any concerns with the offsite power supply to the station. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), TSs, system drawings, and station procedures, as applicable.

The inspectors also performed a complete walkdown (i.e., Trains A and B) of the Unit 2 safety injection system. Specifically, the inspectors observed whether the system was in

the correct electrical and mechanical alignment for the current operating mode, determined whether temporary or permanent modifications (as applicable) were properly installed, and whether there were any outstanding work requests, operator workarounds or design changes that may impede system functionality.

The inspectors reviewed selected Condition Reports (CRs) to determine whether identified problems were being entered into the corrective action program with the appropriate characterization and significance.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111-05)

a. Inspection Scope

The inspectors evaluated the licensees fire protection controls for the following areas:

- Unit 1A motor driven auxiliary feedwater pump;
- Unit 2 miscellaneous electrical equipment room; and
- Unit 1B containment spray room.

The inspectors performed a walkdown of these areas to observe conditions related to the control of transient combustibles and ignition sources; the material condition, operational lineup, and operational effectiveness of fire protection systems, equipment and features; and the material condition and operational status of fire barriers. In each case, these walkdowns occurred after significant maintenance activities were completed. The inspectors verified that the area (including associated fire protection and mitigation equipment) was as described in the Braidwood Fire Protection Plan, dated December 1988.

The inspectors also reviewed selected CRs to determine whether identified problems were being entered into the corrective action program with the appropriate characterization and significance.

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation (71111-12)

b. Inspection Scope

The inspectors reviewed the licensee's implementation of the maintenance rule, 10 CFR 50.65, as it pertained to identified performance problems with the following systems (Units 1 and 2 unless indicated):

- Containment spray;
- Auxiliary power; and
- Unit 2 residual heat removal system.

The inspectors evaluated the licensee's monitoring and trending of performance data and the appropriateness of a(1) goals and corrective actions, and determined whether performance criteria were established commensurate with safety and whether equipment problems were appropriately evaluated in accordance with the maintenance rule. The inspectors interviewed the station's maintenance rule coordinator and reviewed selective CRs to determine whether identified problems were being entered into the corrective action program with the appropriate characterization and significance.

c. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments And Emergency Work Control (71111-13)

a. Inspection Scope

The inspectors reviewed the licensee's assessment and management of plant risk for planned maintenance and/or surveillance activities on the following systems or components:

- Routine maintenance associated with the Unit 1A motor driven auxiliary feedwater pump, occurring from April 2-4, 2001;
- Replacement of the ferro-resonance transformer for the safety-related inverter associated with the Unit 2, Division 21, electrical instrument Bus 213, occurring on April 9, 2001; and
- Deenergizing of the Unit 2 SATs for routine maintenance.

The inspectors attended shift briefings and daily status meetings to verify that the licensee took actions to maintain a heightened level of awareness of the plant risk status among plant personnel, and evaluated the availability of redundant train equipment. The inspectors also reviewed Nuclear Station Procedure WC-AA-103, "On-Line Maintenance," Revision 3, and evaluated licensee compliance with that procedure.

As part of the Unit 2 SAT review, the inspectors observed the installation of steel support structures in the station switchyard, in proximity to energized power lines that supplied the SATs. These towers were being installed prior to the Unit 2 SATs being deenergized, and were part of an ongoing project to meter the station's electricity usage. Specifically, the inspectors observed whether appropriate clearances were maintained between equipment and the energized power lines during installation of the towers.

In addition the inspectors reviewed selected issues that the licensee entered into its corrective action program to verify that identified problems were being entered into the program with the appropriate characterization and significance.

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Nonroutine Plant Evolutions And Events (71111-14)

.1 Failure of Service Water Return Valve During Surveillance

a. Inspection Scope

The inspectors reviewed the licensee personnel performance in responding to the failure of the service water return valve from the Unit 1B diesel driven auxiliary feedwater pump heat exchangers to open during a routine surveillance on April 20, 2001. This failure resulted in the Unit 1B auxiliary pump being declared inoperable. This inspection consisted of observations of licensee personnel response and review of operator logs, surveillance test results, and TSs.

b. Findings

No findings of significance were identified.

.2 High Level Radiation Alarm on Steam Jet Air Ejector

a. Inspection Scope

The inspectors reviewed the licensee personnel performance in responding to a suspected Unit 2 steam generator tube leakage based on high radiation levels indicated by the steam jet air ejector radiation monitor on May 10, 2001. This inspection consisted of observations of licensee personnel response including adherence to Braidwood Abnormal Operating Procedure (2BwOA) SEC-8, "Steam Generator Tube Leak–Unit 2," Revision 57; review of operator logs, and interviews with licensee staff.

b. Findings

No findings of significance were identified.

.3 Reactor Coolant Pump Trip and Subsequent Reactor Trip Due to Personnel Error

a. Inspection Scope

On May 19, 2001, while performing Step 19 of Braidwood Operating Procedure (BwOP) AP 26, "Restoring System Auxiliary Transformer 242-2 with Unit 2 UAT [unit auxiliary transformer] Energized," Revision 9, non-licensed operators incorrectly pulled fuses in line to the undervoltage relay for 6.9 kv Bus 258. This caused Bus 258 to become de-energized resulting in a trip of the 2C reactor coolant pump and subsequent reactor trip from 100 percent power. The inspectors observed the licensee personnel performance in response to the reactor trip; reviewed operator logs, emergency or abnormal operating procedures, and the sequence of events recorder printout; and interviewed licensee staff. The inspectors also consulted with NRC risk analysts who concluded that

this event had very low risk significance (change in conditional core damage probability of 3E-7.)

b. Findings

No findings of significance were identified.

.4 Problem Identification and Resolution of Selected Human Performance Issues

a. Inspection Scope

The inspectors reviewed the issues that the licensee entered into its corrective action program to verify that identified problems were being entered into the program with the appropriate characterization and significance. The inspectors also reviewed the licensee's corrective actions for human performance issues documented in selected CRs.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111-15)

a. Inspection Scope

The inspectors reviewed and evaluated the operability evaluations associated with the following CRs:

- CR A2001-00269, "Potential Inoperability of Non-Accessible Plenum Damper Surveillance"; and
- CR A2001-01192, "Ultrasonic Inspection Results On the Unit 1B Essential Service Water Pump Strainer Drain Line."

The inspectors reviewed the technical adequacy of the evaluation against the TS, UFSAR, and other design information; determined whether compensatory measures, if needed, were taken; and determined whether the evaluation was consistent with the requirements of RS-AA-105, "Operability Determination Process," Revision 0.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111-19)

a. Inspection Scope

The inspectors reviewed the post-maintenance testing associated with the following activities:

- Emergent maintenance following an unexpected trip of the Unit 2A motor driven feedwater pump occurring on March 30, 2001;
- Replacement of the ferro-resonance transformer for the safety-related inverter associated with the Unit 2, Division 21, electrical instrument Bus 213, occurring on April 9, 2000; and
- Routine maintenance on the containment sump suction valve (1CS009B) and cubicle cooler associated with the Unit 1B containment spray pump, occurring from April 18-20, 2001.

For each activity, the inspectors reviewed the applicable sections of the TS and UFSAR, and observed portions of the maintenance work. The inspectors also evaluated the adequacy of work controls (including foreign material exclusion controls), reviewed post-maintenance test data, and conducted walkdowns to verify system restoration after the testing was completed.

In addition the inspectors reviewed selected issues that the licensee entered into its corrective action program to verify that identified problems were being entered into the program with the appropriate characterization and significance.

b. Findings

A finding of very low safety significance (Green) was identified (self-disclosing) for an inadequate post maintenance test and a lack of foreign material control during previous maintenance on the Unit 2A motor driven feedwater pump. No violation occurred, as the Unit 2A motor driven feedwater pump was nonsafety-related equipment. The details are documented below.

The licensee determined that the unexpected trip of the Unit 2A motor driven feedwater pump on March 30, 2001, was caused by foreign material (an allen wrench) that had been left in the feedwater pump lubricating oil system, during prior maintenance. The wrench had damaged the internal components (which were made of plastic) of the shaft driven oil pump. This trip did not result in a significant plant transient, because the other two turbine driven feedwater pumps were still running and supplied sufficient feedwater flow. The licensee determined that the wrench was left in the pump during routine maintenance occurring in August 1999. This event was documented in CR A2001-00969.

This event was considered more than minor, because if left uncorrected, the same issue (foreign material in a lube oil system) under the same conditions, could have become a more significant safety concern. Specifically, the feedwater pump could have tripped at full power with a turbine driven feedwater pump out-of-service. Had this occurred, it could have resulted in an initiating event (reactor trip on low steam generator level) or have impacted the ability of the motor driven feedwater pump to perform its mitigating function as described in the licensee's Probabilistic Risk Analysis.

Since two cornerstones (i.e., initiating events and mitigating systems) were potentially impacted by the failure of the feedwater pump, the inspectors performed a Phase II analysis using the NRC Significance Determination Process (SDP) for Braidwood.

Because the wrench had been in the feedwater pump lube oil system since 1999, the inspectors entered Table 1 of the SDP (i.e., the pump was considered unavailable for greater than 30 days). Per Table 2 of the SDP, the loss of the motor driven feedwater pump could impact the event sequences for a reactor trip, small and medium break loss of coolant accidents (LOCA), stuck open pressurizer power operated relief valve, steam generator tube rupture, loss of component cooling water, and loss of essential service water. In each of these scenarios full mitigating credit could be given if either the motor driven feedwater pump or the motor driven startup feedwater pump was available. Because the motor driven startup feedwater pump was available (i.e., not affected by this event), full mitigating credit was given in the analysis. Using the information from Tables 1 and 2, and the results of each specific accident sequence, the overall analysis results were entered into Table 4 of the SDP. Specifically, the following results were obtained. For a reactor trip, Table 4, Row A, Column 6, indicated a GREEN finding; for a small LOCA and stuck open pressurizer power operated relief valve Table 4, Row C, Column 6, indicated a GREEN finding; for a steam generator tube rupture and loss of essential service water, Table 4, Row C, Column 5, indicated a GREEN finding; for a medium LOCA Table 4, Row D, Column 6, indicated a GREEN finding; and for a loss of component cooling water, Table 4, Row E, Column 5, indicated a GREEN finding.

Based on the results of the SDP analysis, this event was a finding of GREEN significance. However, it was not a violation, as the Unit 2A motor driven feedwater pump was nonsafety-related equipment.

1R22 Surveillance Testing (71111-22)

a. Inspection Scope

The inspectors reviewed the following surveillance activities:

- Routine testing of the Unit 1A residual heat removal pump to verify operation consistent with the American Society of Mechanical Engineers operating criteria;
- Routine testing of the Unit 1A centrifugal charging pump to verify operation consistent with the American Society of Mechanical Engineers operating criteria; and
- Routine testing of the Unit 1A emergency diesel generator to analyze engine operating parameters.

For each activity, the inspectors witnessed portions of the testing, reviewed the test data and determined if the associated structures, systems, and components met the TS and UFSAR technical and design requirements. For selected activities, the inspectors also reviewed past test results to evaluate any adverse trends and to determine whether past testing was performed using consistent protocols.

In addition the inspectors reviewed selected issues that the licensee had entered into its corrective action program to verify that identified problems were being entered into the program with the appropriate characterization and significance.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111-23)

a. Inspection Scope

The inspectors evaluated the licensee's changing the normal steam supply to the Unit 1B turbine driven feedwater pump from low pressure to high pressure steam. The inspectors walked down accessible portions of the feedwater pump steam piping, reviewed the licensee's safety evaluation and post-installation testing documentation, and interviewed system engineering personnel. This temporary modification was chosen because the loss of a feedwater pump could lead to an initiating event.

b. Findings

No findings of significance were identified.

2. SAFEGUARDS

Cornerstone: Physical Protection

3PP3 Response to Contingency Events (71130-03)

a. Inspection Scope

The inspector reviewed the licensee's current protective strategy which included designated targets and target sets, their associated analysis, and security and operation response procedures. The inspectors also reviewed security event reports, and the licensee's problem identification and resolution program to determine that issues related to the licensee's contingent event program were identified at the appropriate threshold and were entered into the licensee's corrective action program. Items reviewed included self-assessments, audits, and a sample of training records, force-on-force drill evaluations, and the licensee's procedure for their corrective action process. In addition, the inspectors conducted interviews with security officers and security management to evaluate their knowledge and use of the licensee's corrective action system.

The inspector reviewed appropriate security records and procedures that were related to security drills, drill demonstrations, and drill critiques to verify the licensee's continuing capabilities to identify issues that represented uncorrected performance weaknesses or program vulnerabilities.

The inspector reviewed records and interviewed six selected members of the uniform contract security force to evaluate and verify security training that related to alarm station operations, tactical force-on-force training, and weapon proficiency training.

The inspector also reviewed performance indicator information related to alarm equipment performance to determine if isolated or system problems with the protected area intrusion alarm system and/or assessment system had become predictable and potentially exploitable by an adversary.

b. Findings

No findings of significance were identified.

3PP4 Security Plan Changes (71130-04)

a. Inspection Scope

The inspector reviewed Revisions 51, 52, and 53 to the Braidwood Nuclear Plant Security Plan to verify that the changes did not decrease the effectiveness of the submitted document. The referenced revisions were submitted in accordance with regulatory requirements or 10 CFR 50.54(p) by a licensee letter dated February 22, 2001.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

40A1 Performance Indicator Verification (71151)

Safety System Unavailability, Residual Heat Removal System

a. Inspection Scope

The inspectors reviewed the residual heat removal system performance indicator data reported by the licensee for April 2000 through March 2001 for Units 1 and 2. Specifically, this inspection determined whether the data was being collected as described in station procedure RS-AA-122-104, Revision 3, "Performance Indicator–Safety System Unavailability (high pressure safety injection/high pressure core injection, residual heat removal, auxiliary feedwater/reactor core isolation cooling, emergency diesel generator)." This inspection consisted of a review of control room logs for system inoperability times, a review of system CRs, and discussions with licensee personnel.

b. Findings

No findings of significance were identified.

4OA6 Meetings

Exit Meeting

The resident inspectors presented the inspection results to Mr. K. Schwarz and other members of licensee management on May 14, 2001. The licensee acknowledged the findings presented. No proprietary information was identified.

Interim Exit Meeting

The physical protection inspectors presented the inspection results to Mr. K. Schwartz and other members of licensee management at the conclusion of the inspection on April 20, 2001. The licensee acknowledged the findings presented. No proprietary information was identified.

KEY POINTS OF CONTACT

Licensee

J. Bailey, Regulatory Assurance - NRC Coordinator
G. Baker, Security Manager
C. Dunn, Engineering Director
A. Ferko, Regulatory Assurance Manager
R. Graham, Work Management Director
L. Guthrie, Maintenance Director
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T. Simpkin, Regulatory Assurance
D. Turner, Security Analyst
J. von Suskil, Site Vice President

NRC

M. Chawla, Project Manager, NRR
G. Grant, Director, Division of Reactor Projects
M. Jordan, Chief, Reactor Projects Branch 3

LIST OF ACRONYMS AND INITIALISMS USED

ADAMS	Agency wide Documents Access and Management System
BwIP	Braidwood Instrumentation Procedure
BwMP	Braidwood Maintenance Procedure
BwOA	Braidwood Abnormal Operating Procedure
BwOP	Braidwood Operating Procedure
BwOSR	Braidwood Operability Surveillance Requirement
CFR	Code of Federal Regulations
CR	Condition Report
LOCA	Loss of Coolant Accident
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulations
PARS	Publicly Available Records
SAT	System Auxiliary Transformers
SDP	Significance Determination Process
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
WR	Work Request

LIST OF DOCUMENTS REVIEWED

1R04 Equipment Alignment

BwOP AF-M1	Operating Mechanical Lineup–Unit 1	Revision 8
BwOP AF-E1	Electrical Lineup–Unit 1 Operating	Revision 6E1
Work Request (WR) 9900269939-01	Unit 2 Emergency Core Cooling System Venting and Valve Alignment	April 20, 2001
BwOP SI-M2	Operating Mechanical Lineup–Unit 2	Revision 12
M-136 (sheets 1-6)	Diagram of Safety Injection–Unit 2	March 12, 2001
BwOP SI-E2	Electrical Lineup–Unit 2 Operating	Revision 4
BwOP AP-21	Isolating SAT 242-1 With Unit 2 Unit Auxiliary Transformer (UAT) Energized	Revision 9
BwOP AP-E6	Electrical Lineup–Unit 2 (Operating Lineup for the 6900 V Busses	Revision 2
BwOP AP-E7	Electrical Lineup–Unit 2 (Operating Lineup for the Safety Related 4160V Busses, 480V Switchgear Busses, and 480V Motor Control Centers)	Revision 3E3
BwOP AP-E2	Electrical Lineup–Unit 1 (Operating Lineup for the Safety Related 4160V Busses, 480V Switchgear Busses, and 480V Motor Control Centers)	Revision 3E2
CR A2001-00130	SAT 242-1 Non-Segregated Bus Duct SAT Pre-outage Scaffold	May 2, 2001
CR A2000-00985	Status control event on 1AF004B (NRC Identified)	April 3, 2001

1R05 Fire Protection

A-1060	Station drawing of block wall elevations	January 16, 1987
M-521	Station drawing of pipe sleeve and opening closure details	June 16, 1986
A-229	Auxiliary Building Upper Basement Floor Plan (ele 383'-0" Area 2)	July 31, 1987

S-1743	Auxiliary Building Concrete Partition Wall Elevation	July 25, 1990
A-1076	Station drawing of block wall elevations	January 23, 1987
BR-E-25	Diagram of CT Gypsum for Fire/Air Seal Conduit	February 20, 1980
	Transco Fire Test Report TR-217	January 20, 1986
BR-E-24	Diagram of Spare Plugs for Radiation/Fire/Air/Water Sealing	February 22, 1985
	Transco Fire Test Report TR-151	
A-1005	Station drawing of block wall elevations	October 24, 1986
FP-11	Fire Barrier Location Plans	October 15, 1993
A-212	Auxiliary Building Basement Floor Plans	September 24, 1986
Fire Protection Report	Section 2.3.11.8 Containment Spray Pump 1B Room (Fire Zone 11.2C-1)	Amendment 13
CR A2001-00792	Induced Voltage Found on Terminal Points (PI&R)	March 13, 2001

1R12 Maintenance Rule Implementation

2BwOSR 3.6.1.1-12	Unit 2 Local Leak Rate Test of Component Cooling System (test conducted October 20, 2000)	Revision 1
2BwOSR 3.6.1.1-12	Unit 2 Local Leak Rate Test of Component Cooling System (test conducted October 23, 2000)	Revision 1
2BwOSR 3.6.1.1-12	Unit 2 Local Leak Rate Test of Component Cooling System (test conducted October 29, 2000)	Revision 1
CR A2000-04000	2CC9486 Local Leak Rate Test Failure	October 23, 2000
CR A2000-02449	Incorrect Sump Screen Open Area Used in Net Positive Suction Head Calculation	June 5, 2000
CR A2000-04025	2CS008B Failed Local Leak Rate Test	October 24, 2000
CR A2000-03049	2A Containment Spray Fill Anomaly	July 27, 2000

CR A2000-00290	Limiting Condition for Operation Time Extended for Containment Spray Work Window	January 19, 2000
AD-AA-104-109	Expanded Pre-Job Briefing Worksheet for the Revenue Metering Project	May 01, 2001
Memo BR-023	Project Summary for Revenue Metering Project	Revision 2
Calculation BRW-97-0938-N	Plant Specific Assessment for Braidwood's Maintenance Rule Performance Criteria	October 16, 1997
NES-G-15.03	Maintenance Rule: Performance Criteria Determination Standard	Revision 0
NES-G-15.04	Maintenance Rule: System Monitoring Standard	Revision 1
NES-G-15.06	Maintenance Rule: Periodic Assessment Standard	Revision 0
	Maintenance Rule Expert Panel Meeting Minutes for Auxiliary Power System	November 27, 2000, and April 9 and 23, 2001
CR A2000-03668	4KV Breaker Motor Cutout Switch Failed Surveillance	September 16, 2000
CR A2000-03131	ACB 0451 (Transformer 045 Feed to Bus 045) Tripped for No Apparent Reason	August 3, 2000
CR A2000-03987	Failure of 2CV8112 Trip Status Light Board to Light Immediately When Closed (PI&R)	October 22, 2000
CR A2000-00466	Maintenance Rule Functional Failure Monthly Reviews for October - December 2000 (PI&R)	February 12, 2001
CR A2000-00701	Maintenance Rule Functional Failure Monthly Reviews for January 2001 (PI&R)	March 7, 2001
CR A2000-00203	480 Volt Motor Control Center Breaker-Starter Auxiliary Contact Improperly Installed	January 12, 1999
CR A2000-03477	Discolored Wiring Found During Motor Control Center Inspection	August 31, 2000
CR A2000-02068	Various Operator Logs & Limiting Condition For Operations Action Requirements Tracking Problems Affect Plant Indicators	April 4, 2000
	Unavailability and Reliability Criteria For The Residual Heat Removal System	April 25, 2001

	Maintenance Rule Performance Monitoring 2A and 2B Trains	April 1, 1999 to April 26, 2001
	Unit 2 Control Room Operator Logs	April 1, 1999 to April 26, 2001
CR A2000-00442	Unit 1B Heater Drain Pump Breaker Would Not Close During OAD Trip Checks	36930
CR A2000-03325	Degraded Wiring Found During Surveillance on Motor Control Center 231X1	August 22, 2000
CR A2000-01856	Safety Related 4kV Circuit Breaker-Latch Switch Out-Of-Tolerance	April 10, 2000
CR A2000-01588	1AP03EB Measurements Outside of Acceptance Criteria	March 29, 2000
CR A2000-03320	Motor Control Center 233U1, Cubicle D1 at Ambient Temperature	August 7, 2000
CR A2001-01387	Auxiliary Power (AP) System Maintenance Rule Performance Criteria not in Compliance with Probabilistic Risk Analysis (NRC Identified)	May 9, 2001

1R13 Maintenance Risk Assessments And Emergent Work Control

OOS 990030229	1A Auxiliary Feedwater Pump Coupling	April 2, 2001
	Control Room Logs	April 2-4, 2001
WR 990240796-01	Replace Ferro-Resonant Transformer, Instrument Inverter 213 (Contingency)	April 9, 2001
WR 990240796-02	Replace Ferro-Resonant Transformer, Instrument Inverter 213 (Contingency)	April 9, 2001
	Control Room Logs	April 9, 2001
OOS 990030462	Bus 213, Instrument Inverter 213	April 9, 2001
2BwOA Elec-2	Loss of Instrument Bus–Unit 2	Revision 7A
BwOP IP-2	Transferring and Instrument Bus from the Inverter to the Constant Voltage Transformer	Revision 6E2
BwOP IP-2T3	Instrument Bus 113/213 Dead Bus Transfer Actions	Revision 2
CR A2001-01059	Failure of Temporary Batter Charger During 213 Inverter Tuning (PI&R)	April 9, 2001

CR A2001-00285	125 Volt DC Ground (PI&R)	January 29, 2001
CR A2001-00501	Probabilistic Risk Assessment Model Needs to be Updated to Reflect Installed Modification (PI&R)	September 1, 2000
CR A2001-00637	Risk Level Change Not Logged (PI&R)	March 1, 2001

1R14 Personnel Performance During Non-routine Plant Evolutions and Events

CR A2001-01168	1SX 178 Failed to Open on Unit 1 B Diesel Start	April 20, 2001
CR A2001-01488	Unit 2 Reactor Trip Due To Failure To Follow Procedure And Lack Of Supervision	May 19, 2001
BwOP AP-26	Restoring System Auxiliary Transformer (SAT) 242-2 With Unit 2 UAT [unit auxiliary transformer] Energized	Revision 9
BRW-SE-1997-990	Failing Open of the Service Water Isolation Valves 1(2)SX173 and 1(2)SX178, and Flow Control Valves 1(2)SX168 and Effect on the 1(2)B Diesel Driven Auxiliary Feedwater Pumps.	July 11, 1997
BRW-SE-1997-782	Isolation of Makeup Water to Auxiliary Feedwater Diesel's Jacket Water Expansion Tank	July 15, 1997
	Units 1 and 2 Control Room Logs	April 20, 2001
	Unit 2 Control Room Logs	May 19 - 20, 2001

1R15 Operability Evaluations

Operability Determination 01-003	Ultrasonic Inspection Results On 1B Essential Service Water Pump Strainer Drain Line	April 24, 2001
ASME Code Case N-513	Evaluation Criteria for Temporary Acceptance of Flaws In Class 3 Piping Section XI, Division 1	August 14, 1997
CR A2001-00200	Potential Inoperability Of Non-Accessible Plenum During Damper Surveillance	January 21, 2001

1R19 Post-Maintenance Testing

2BwOSR 3.8.7.1-1	Unit 2 Division 21 Engineered Safety Features Onsite Power Distribution Weekly Surveillance (Surveillance conducted April 9, 2001)	Revision 0
BwOP IP-1	Instrument Bus Inverter Startup	Revision 10
1BwOSR 5.5.8.CS-2B	Train B Containment Spray Power Operated Valve Indication 18 Month Surveillance (Surveillance conducted April 20, 2001)	Revision 1
1BwOSR 5.5.8.CS-1B	Train B Containment Spray System Valve Stroke Quarterly Surveillance (Surveillance conducted April 20, 2001)	Revision 1
ER-AA-301	Rising Stem Motor-Operated Valve VOTES Testing Procedure (Test conducted April 20, 2001)	Revision 1
WR 990243916-01	Remove/Rebuild Limitorque and Replace Spring Pack With New Style for 1CS009B	April 11, 2001
BwMP 3315-003	Limitorque Operator Maintenance (Stem nut and actuator removal/installation)	Revision 1E1
BwMP 3315-004	Limitorque Operator Maintenance (Type SB-0 actuator disassembly/assembly)	Revision 1E1
BwOP FW-23	Swapping Feedwater Pumps	Revision 5
CR A2001-00969	Prompt Investigation of the Failure of the Shaft Driven Oil Pump on the 2FW01PA Pump	March 30, 2001
CR A2001-00967	2A Feedwater Pump Main Oil Pump Failure	March 31, 2001
CR A2001-00962	2A Feedwater Pump Trip 1 Minute After Start	March 30, 2001
CR A2001-00893	Auto Start of 2A Feedwater Pump Auxiliary Oil Pump	March 25, 2001
WR 990270921-03	Replace Shaft Driven Oil Pump and Adjust System Relief Valve	April 6, 2001
CR A2001-00583	Motor Operated Valve Diagnostic Test Scheduled Without Required As-Found Local Leak Rate Test Scheduled (PI&R)	February 26, 2001

1R22 Surveillance Testing

M-62	Drawing of residual heat removal system	July 28, 1997
1BwVSR 5.5.8.RH.1	ASME Surveillance Requirements for Residual Heat Removal Pump 1RH01PA (Surveillance dated October 17, 2000)	Revision 1
1BwVSR 5.5.8.RH.1	ASME Surveillance Requirements for Residual Heat Removal Pump 1RH01PA (Surveillance dated January 18, 2001)	Revision 2
1BwVSR 5.5.8.RH.2	ASME Surveillance Requirements for Residual Heat Removal Pump 1RH01PB (Surveillances dated December 7, 2000 and February 28, 2001)	Revision 2
2BwVSR 5.5.8.RH.1	ASME Surveillance Requirements for Residual Heat Removal Pump 2RH01PA (Surveillances dated December 18, 2000 and March 14, 2001)	Revision 2
2BwVSR 5.5.8.RH.2	ASME Surveillance Requirements for Residual Heat Removal Pump 2RH01PB (Surveillance dated November 27, 2000)	Revision 1
2BwVSR 5.5.8.RH.2	ASME Surveillance Requirements for Residual Heat Removal Pump 2RH01PB (Surveillance dated February 21, 2001)	Revision 2
BwOP DG-1	Diesel Generator Alignment To Standby Condition	Revision 13
BwOP DG-11	Diesel Generator Startup	Revision 22
BwVS 900-8	Diesel Generator Engine Analysis	Revision 6
OMa-1988, Part 6	Inservice Testing of Pumps in Light-Water Reactor Power Plants	N/A
WR 990146758-01	1A Diesel Generator Pre-outage Engine Analysis	May 2, 2001
CR A2001-00508	2SX147A Surveillance Concern	February 17, 2001
BwVP 200-1T2	Technical Review of Pump Performance Parameters (1A centrifugal charging (CV) pump)	Revision 3
WR 990259408-01	ASME Surveillance Requirements for the Unit 1A CV Pump	May 8, 2001

WR 990259409-01	TS Differential Pressure Check for the Unit 1A CV Pump	May 8, 2001
WR 990246680	ASME Surveillance Requirements for the Unit 1A CV Pump	February 14, 2001
WR 990259411-01	ASME Surveillance Requirements for the Unit 2A CV Pump	May 8, 2001
WR 990235204-01	ASME Surveillance Requirements for the Unit 2A CV Pump	February 13, 2001
WR 990231230-01	ASME Surveillance Requirements for the Unit 1B CV Pump	February 1, 2001
WR 990256047-01	ASME Surveillance Requirements for the Unit 1B CV Pump	April 26, 2001
WR 990210476-01	ASME Surveillance Requirements for the Unit 2B CV Pump	December 5, 2000
WR 990246687-01	ASME Surveillance Requirements for the Unit 2B CV Pump	February 27, 2001
WR 990251373-01	ASME Surveillance Requirements for Residual Heat Removal Pump 1RH01PA	April 10, 2001

1R23 Temporary Modifications

TMOD 01-1-001	Temporary Modification To Change Normal Steam Supply To The 1B Turbine Driven Feedwater Pump From Low Pressure To High Pressure Steam	March 2, 2001
WR 990263795-01	U-1 Feedwater Pump 1B Controller	April 24, 2001
CR A2001-00475	Unexpected Loss of Subcooling Indication in the Unit 2 Main Control Room (PI&R)	February 12, 2001

3PP3 Response to Contingency Events

BR-010	Subject: Security Violations	December 19, 2000
Condition Reports	Security Related Only	November 1, 2000 - April 17, 2001
	Memo to All Site Personnel-Subject: Personnel Security Performance Expectations	December 18, 2000

NGG Security Training Program Course: Security Drills and Exercises Program/Force on Force Exercises	June 30, 1999
Operations Department and Security Department Interface	March 28, 2001
Safeguards Event Log SY-AA-101-101	November 1, 2000 - April 17, 2001
Security Force Training Manual Volume 3	
Stress Fire Observations, Revision 00	June 1999

40A1 Performance Indicator Verification

RS-AA-122-104	Performance Indicator–Safety System Unavailability (High Pressure Safety Injection, Residual Heat Removal, Auxiliary Feedwater, and Emergency Diesel Generator Systems)	Revisions 1-3
	Control Room log entries (selected)	April 2000- April 2001
BwIP 2500-042	Calibration of Residual Heat Exchanger Outlet Flow Manual Control Loop	Revision 0E2
CR A2000-01614	Failed Inservice Test Setpoint Test of Relief Valve 1SI8856A	March 27, 2000
CR A2000-01840	Nuclear Energy Institute Safety System Unavailability Indicator for the Residual Heat Removal System (PI&R)	April 8, 2000
CR A2000-02068	Various Operation Logs and Limiting Condition for Operation Tracking Problems Affect Plant Indicators	April 4, 2000
CR A2000-02231	A1RO8 Startup Causes Maintenance Rule Function RH3 to Exceed Unavailability Criteria	April 3, 2000