January 7, 2002

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

SUBJECT: BYRON STATION, UNITS 1 AND 2
NRC INSPECTION REPORT 50-454/01-12(DRS); 50-455/01-12(DRS)

Dear Mr. Kingsley:

On December 14, 2001, the NRC completed an inspection at your Byron Station, Units 1 and 2. The enclosed report documents the inspection findings which were discussed on December 14, 2001, with Mr. R. Lopriore 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 triennial fire protection baseline inspection.

No findings of significance were identified.

In accordance with 10 CFR Part 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,

/RA/

Ronald N. Gardner, Chief
Electrical Engineering Branch
Division of Reactor Safety

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

Enclosure: Inspection Report 50-454/01-12(DRS);
50-455/01-12(DRS)

See Attached Distribution

cc w/encl: J. Skolds, Chief Operating Officer
C. Crane, Senior Vice President, Midwest ROG
J. Benjamin, Vice President Licensing
H. Stanley, Vice President, Midwest ROG Operations
K. Jury, Licensing Director, Midwest ROG
R. Helfrich, Senior Counsel, Nuclear
DCD - Licensing
R. Lopriore, Site Vice President
S. Kuczynski, Station Manager
W. Grundmann, Regulatory Assurance Manager
M. Aguilar, Assistant Attorney General
Illinois Department of Nuclear Safety
State Liaison Officer
State Liaison Officer, State of Wisconsin
Chairman, Illinois Commerce Commission

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See Attached Distribution
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State Liaison Officer, State of Wisconsin
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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos:	50-454, 50-455
License Nos:	NPF-37, NPF-66
Report No:	50-454/01-12(DRS), 50-455/01-12(DRS)
Licensee:	Exelon Generation Co., LLC
Facility:	Byron Station, Units 1 and 2
Location:	4450 N. German Church Road Byron, IL 61010
Dates:	November 26 through 30 and December 10 through 14, 2001
Inspectors:	Doris M. Chyu, Reactor Inspector Zelig Falevits, Senior Reactor Inspector Kenneth G. O'Brien, Senior Reactor Inspector (Lead)
Approved by:	Ronald N. Gardner, Chief Electrical Engineering Branch Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000454-01-12(DRS), IR 05000455-01-12(DRS), on 11/26-30 and 12/10-14/2001, Exelon Generation Co., LLC, Byron Station, Units 1 and 2. Triennial Fire Protection Baseline Inspection Report.

The report covers a ten day announced inspection. The inspection was conducted by three Region III based reactor inspectors. No findings of significance 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 violations.

A. Inspector Identified Findings

Cornerstones: Initiating Events and Mitigating Systems

No findings of significance were identified.

B. Licensee Identified Findings

No findings of significance were identified.

Report Details

Summary of Plant Status

Units 1 and 2 operated at full power throughout the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events and Mitigating Systems

1R05 Fire Protection (71111.05)

The purpose of this inspection was to review the Byron Station's Fire Protection Program (FPP) for selected risk-significant fire areas. Emphasis was placed on verifying that the post-fire safe shutdown capability and the fire protection features were maintained free of fire damage to ensure that at least one post-fire safe shutdown success path was available. The inspection was performed in accordance with the Nuclear Regulatory Commission's (NRC's) new regulatory oversight process using a risk-informed approach for selecting the fire areas and attributes to be inspected. The lead inspector and a Region III senior reactor analyst used the Byron Station's Individual Plant Examination of External Events (IPEEE) to choose several risk-significant areas for detailed inspection and review. The fire zones chosen for review during this inspection were:

- Fire Zone 3.2.A-1 Unit 1 Lower Cable Spreading Room
- Fire Zone 11.2.0 Auxiliary Building 346 Foot Level
- Fire Zone 11.4.0 Auxiliary Building 383 Foot Level
- Fire Zone 11.4.C-0 Remote Shutdown Panel Area

For each of these fire zones, the inspection was focused on the fire protection features, the systems and equipment necessary to achieve and maintain safe shutdown conditions, determination of license commitments, and changes to the FPP.

.1 Systems Required to Achieve and Maintain Post-Fire Safe Shutdown

The guidelines established by Branch Technical Position (BTP), Chemical Engineering Branch (CMEB) 9.5-1, Section C.5.b, "Safe Shutdown Capability," paragraph (1), required the licensee to provide fire protection features that were capable of limiting fire damage to structures, systems, and components (SSCs) important to safe shutdown. The SSCs that were necessary to achieve and maintain post-fire safe shutdown were required to be protected by fire protection features that were capable of limiting fire damage to the SSCs so that:

- One train of systems necessary to achieve and maintain hot shutdown conditions from either the control room or emergency control station(s) is free of fire damage; and

- Systems necessary to achieve and maintain cold shutdown from either the control room or emergency control station(s) can be repaired within 72 hours.

General Description of Byron's Safe Shutdown Paths and Capability

The licensee's safe shutdown methodology relied upon the identification of those components necessary and available to achieve and maintain hot shutdown conditions following a fire condition. Once identified for all plant areas, the licensee selected the components necessary to achieve and maintain the reactor in a hot shutdown condition which could be operated from the main control room or which could be operated locally and were not within the fire affected area. The methodology further identified those components necessary to achieve and maintain cold shutdown assuming limited repairs.

The licensee also identified an alternate or dedicated shutdown capability for fire conditions that affected the main control room and the Unit 1 and Unit 2 auxiliary electric equipment rooms. For each of these areas, the licensee relied upon the operators' use of the remote shutdown and fire hazards panels to ensure that the reactors could be brought to and maintained in a hot shutdown status.

To direct the plant staffs' response to fire conditions throughout the plant, the licensee relied upon the operators' use of a single fire response operating procedure in conjunction with other non-fire specific plant procedures. The fire response operating procedure provided the main control room staff with information as to the possible impacts of a fire condition in each of the identified plant areas and those actions necessary to minimize the impacts of potential spurious equipment operations. Expected local equipment operations were also identified in the fire response operating procedure.

a. Inspection Scope

The inspectors reviewed the plant systems required to achieve and maintain post-fire safe shutdown to determine if the licensee had properly identified the components and systems necessary to achieve and maintain safe shutdown conditions for each fire zone selected for review. Specifically, the review was performed to determine the adequacy of the systems selected for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring, and support system functions. This review included the fire protection safe shutdown analysis.

The inspectors also reviewed the operators' ability to perform the necessary manual actions for achieving safe shutdown including a review of procedures, accessibility of safe shutdown equipment, and the available time for performing the actions.

The inspectors reviewed the updated final safety analysis report and the licensee's engineering and/or licensing justifications (e.g., NRC guidance documents, license amendments, technical specifications, safety evaluation reports, exemptions, and deviations) to determine the licensing basis.

b. Findings

No findings of significance were identified.

.2 Fire Protection of Safe Shutdown Capability

The guidelines established by BTP CMEB 9.5-1, Section C.5.b, "Safe Shutdown Capability," paragraphs (2)(a) and (3), required separation of cables and equipment and associated circuits of redundant trains by a fire barrier having a three hour rating. If the guidelines cannot be met, then alternative or dedicated shutdown capability and its associated circuits, independent of cables, systems or components in the area, room, or zone under consideration should be provided.

a. Inspection Scope

For each of the selected fire areas, the inspectors reviewed the licensee's safe shutdown analysis to ensure that at least one post-fire safe shutdown success path was available in the event of a fire. This included a review of manual actions required to achieve and maintain hot shutdown conditions and make the necessary repairs to reach cold shutdown within 72 hours. The inspectors also reviewed procedures to verify that adequate direction was provided to operators to perform these manual actions. Factors, such as timing, access to the equipment, and the availability of procedures, were considered in the review.

The inspectors also evaluated the adequacy of fire suppression and detection systems, fire area barriers, penetration seals, and fire doors to ensure that at least one train of safe shutdown equipment was free of fire damage. To do this, the inspectors observed the material condition and configuration of the installed fire detection and suppression systems, fire barriers, and construction details and supporting fire tests for the installed fire barriers. In addition, the inspectors reviewed license documentation, such as deviations, detector placement drawings, fire hose station drawings, carbon dioxide pre-operational test reports, smoke removal plans, fire hazard analysis (FHA) reports, safe shutdown analysis, and National Fire Protection Association (NFPA) codes to verify that the fire barrier installations met license commitments.

b. Findings

No findings of significance were identified.

.3 Post-fire Safe Shutdown Circuit Analysis

The guidelines established by BTP CMEB 9.5-1, Section C.5.b, "Safe Shutdown Capability," paragraph (1), required that SSCs important to safe shutdown be provided with fire protection features capable of limiting fire damage to ensure that one train of systems necessary to achieve and maintain hot shutdown conditions remained free of fire damage. Options for providing this level of fire protection were delineated in BTP CMEB 9.5-1, Section C.5.b, "Safe Shutdown Capability," paragraph (2). Where the protection of systems whose function was required for hot shutdown did not satisfy BTP CMEB 9.5-1, Section C.5.b, paragraph (2), an alternative or dedicated shutdown

capability and its associated circuits, was required to be provided that was independent of the cables, systems, and components in the area. For such areas, BTP CMEB 9.5-1, Section C.5.c, "Alternative or Dedicated Shutdown Capability," paragraph (3), specifically required the alternative or dedicated shutdown capability to be physically and electrically independent of the specific fire areas and capable of accommodating post-fire conditions where offsite power was available and where offsite power was not available for 72 hours.

a. Inspection Scope

On a sample basis, the inspectors investigated the adequacy of separation provided for the power and control cabling of redundant trains of shutdown equipment. This investigation focused on the cabling of selected components in systems important for safe shutdown. The inspectors' review also included a sampling of components whose inadvertent operation due to fire may adversely affect post-fire safe shutdown capability. The purpose of this review was to determine if a single exposure fire, in one of the fire areas selected for this inspection, could prevent the proper operation of both safe shutdown trains.

The team reviewed the licensee's fuse/breaker coordination analysis for the 4.16 kV and 480 Vac switchgears required for post-fire safe shutdown and the vital low-voltage AC and DC buses. The purpose of this review was to verify that selective coordination exists between branch circuit protective devices (fuses, breakers, relays, etc.) and the bus feeder breaker/fuse to ensure that in the event of a fire-induced short circuit, the fault is isolated before the feeder device trips. In addition, a review of the licensee's fuse replacement procedure was conducted to determine if adequate administrative controls exist to prevent the inadvertent substitution of incorrectly sized fuses in critical circuits.

b. Findings

No findings of significance were identified.

.4 Alternative Safe Shutdown Capability

The guidelines established by BTP CMEB 9.5-1, Section C.5.b, "Safe Shutdown Capability," paragraph (1), required the licensee to provide fire protection features that were capable of limiting fire damage so that one train of systems necessary to achieve and maintain hot shutdown conditions remained free of fire damage. Specific design features for ensuring this capability, were provided in BTP CMEB 9.5-1, Section C.5.b, paragraph (2). Where compliance with the separation criteria of BTP CMEB 9.5-1, Section C.5.b, paragraphs (1) and (2) could not be met, BTP CMEB 9.5-1, Section C.5.b, paragraph (3) and Section C.5.c, required an alternative or dedicated shutdown capability be provided that was independent of the specific fire area under consideration. Additionally, alternative or dedicated shutdown capability must be able to achieve and maintain hot standby conditions and achieve cold shutdown conditions within 72 hours and maintain cold shutdown conditions thereafter. During the post-fire safe shutdown, the reactor coolant process variables must remain within those predicted for a loss of normal ac power, and the fission product boundary integrity must not be

affected (i.e., no fuel clad damage, rupture of any primary coolant boundary, or rupture of the containment boundary).

a. Inspection Scope

The inspectors reviewed the licensee's systems required to achieve alternative safe shutdown to determine if the licensee had properly identified the components and systems necessary to achieve and maintain safe shutdown conditions. The inspectors also focused on the adequacy of the systems to perform reactor pressure control, reactivity control, reactor coolant makeup, decay heat removal, process monitoring, and support system functions.

b. Findings

No findings of significance were identified.

.5 Operational Implementation of Alternative Shutdown Capability

The guidelines established by BTP CMEB 9.5-1, Section C.5.c, "Alternative or Dedicated Shutdown Capability," paragraph (2)(d), required that the process monitoring function should be capable of providing direct readings of the process variables necessary to perform and control the functions necessary to achieve reactivity control, reactor coolant makeup, and decay heat removal.

a. Inspection Scope

The inspectors performed a walkdown of a sample of the actions defined in Procedure BOA PRI-5, "Control Room Inaccessibility," which was the procedure for performing a plant alternative shutdown from outside the control room. The inspectors verified that operators could reasonably be expected to perform the procedure actions within the identified applicable plant shutdown time requirements and that equipment labeling was consistent with the procedure.

The inspectors' reviews of the adequacy of communications and emergency lighting associated with these procedures are documented in Sections 1R05.6 and 1R05.7 of this report.

b. Findings

No findings of significance were identified.

.6 Communications

The guidelines established by BTP CMEB 9.5-1, Section C.5.g, "Lighting and Communication," paragraph (4), required that a portable communications system should be provided for use by the fire brigade and other operations personnel required to achieve safe plant shutdown. This system should not interfere with the communications capabilities of the plant security force. Fixed repeaters installed to permit use of portable radio communication units should be protected from exposure fire damage.

a. Inspection Scope

The inspectors reviewed the adequacy of the communication system to support plant personnel in the performance of alternative safe shutdown functions and fire brigade duties.

b. Findings

No findings of significance were identified.

.7 Emergency Lighting

The guidelines established by BTP CMEB 9.5-1, Section C.5.g, "Lighting and Communication," paragraph (1), required that fixed self-contained lighting consisting of fluorescent or sealed-beam units with individual eight hour minimum battery power supplies should be provided in areas that must be manned for safe shutdown and for access and egress routes to and from all fire areas.

a. Inspection Scope

The inspectors performed a walkdown of a sample of the actions defined in plant procedures use to control local equipment operations. As part of the walkdowns, the inspectors verified that sufficient emergency lighting existed for access and egress to areas and for performing necessary equipment operations. The inspectors verified that testing of emergency lighting for the remote shutdown panel area and the diesel generator rooms ensured a minimum of eight hours of emergency lighting.

b. Findings

No findings of significance were identified.

.8 Cold Shutdown Repairs

The guidelines established by BTP CMEB 9.5-1, Section C.5.c, "Alternative or Dedicated Shutdown Capability," paragraph (5), required that equipment and systems comprising the means to achieve and maintain cold shutdown conditions should not be damaged by fire; or the fire damage to such equipment and systems should be limited so that the systems can be made operable and cold shutdown achieved within 72 hours. Materials for such repairs shall be readily available onsite and procedures shall be in effect to implement such repairs.

a. Inspection Scope

The inspectors reviewed the licensee's procedures to determine if any repairs were required to achieve cold shutdown. The inspectors determined that the licensee did require repair of some equipment to reach cold shutdown based on the safe shutdown methods used.

b. Findings

No findings of significance were identified.

.9 Fire Barriers and Fire Zone/Room Penetration Seals

The guidelines established by BTP CMEB 9.5-1, Section C.5.a, "Building Design," paragraph (3), required that penetration seal designs be qualified by tests that are comparable to tests used to rate fire barriers.

a. Inspection Scope

The inspectors reviewed the test reports for three hour rated barriers installed in the plant and performed visual inspections of selected barriers to ensure that the barrier installations were consistent with tested configuration.

b. Findings

No findings of significance were identified.

.10 Fire Protection Systems, Features, and Equipment

The guidelines established by BTP CMEB 9.5-1, required that fire protection systems, features and equipment were designed in accordance with the following:

Fire Protection Systems, Features and Equipment	BTP CMEB 9.5-1 Section	BTP CMEB 9.5-1 Title
Fire Brigade Capabilities	C.3	Fire Brigade
Passive Fire Protection Features	C.5.a	Building Design
Fire Detection System	C.6.a	Fire Detection
Fire Suppression System	C.6.b	Fire Protection Water Supply Systems
	C.6.c	Water Sprinkler and Hose Standpipe Systems
Manual Fire Fighting Equipment	C.6.f and C.3	Portable Extinguishers and Fire Brigade

a. Inspection Scope

The inspectors reviewed the material condition, operations lineup, operational effectiveness, and design of fire detection systems, fire suppression systems, manual fire fighting equipment, fire brigade capability, and passive fire protection features. The inspectors reviewed deviations, detector placement drawings, fire hose station drawings,

carbon dioxide pre-operational test reports, and FHA reports to ensure that selected fire detection systems, carbon dioxide systems, portable fire extinguishers, and hose stations were installed in accordance with their design, and that their design was adequate given the current equipment layout and plant configuration.

b. Findings

No findings of significance were identified.

.11 Compensatory Measures

a. Inspection Scope

The inspectors conducted a review to verify that adequate compensatory measures were put in place by the licensee for out-of-service, degraded or inoperable fire protection and post-fire safe shutdown equipment, systems, or features. The inspectors also verified that short term compensatory measures were adequate to compensate for a degraded function or feature until appropriate corrective actions were taken.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES (OA)

4OA2 Identification and Resolution of Problems

The guidelines established by BTP CMEB 9.5-1, Section C.4, “Quality Assurance [QA] Program,” paragraph h, required that measures should be established to ensure that conditions adverse to fire protection, such as failures, malfunctions, deficiencies, deviations, defective components, uncontrolled combustible material and nonconformance, are promptly identified, reported, and corrected.

a. Inspection Scope

The inspectors reviewed a selected sample of condition reports associated with Byron’s FPP to verify that the licensee had an appropriate threshold for identifying issues. The inspectors evaluated the effectiveness of the corrective actions for the identified issues.

b. Findings

No findings of significance were identified.

4OA6 Meetings

Exit Meeting

The inspectors presented the inspection results to Mr. R. Lopriore and other members of licensee management at the conclusion of the inspection on December 14, 2001. The licensee acknowledged the findings presented. No proprietary information was identified.

KEY POINTS OF CONTACT

Licensee

S. Chingo, Corporate Fire Protection Engineer
T. Fleck, Fire Protection System Engineer
D. Flowers, Operations Engineering Supervisor
S. Gackstetter, Operations Support Manager
S. Kuczynski, Station Manager
V. Naschansky, Electrical Engineering Supervisor
R. Randels, Design Engineering Manager
D. Roberts, Corporate Fire Protection Engineer
D. Robinson, Fire Protection Engineer
R. Scheidecker, Fire Marshall

NRC

R. Skokowski, Senior Resident Inspector
B. Kemker, Resident Inspector
P. Snyder, Resident Inspector

LIST OF ACRONYMS USED

ac	Alternating Current
ADAMS	Agencywide Documents Access and Management System
AEER	Auxiliary Electrical Equipment Room
BTP	Branch Technical Position
CFR	Code of Federal Regulations
CMEB	Chemical Engineering Branch
dc	Direct Current
DRS	Division of Reactor Safety
FHA	Fire Hazard Analysis
FP	Fire Protection
FPP	Fire Protection Program
IDNS	Illinois Department of Nuclear Safety
IMC	Inspection Manual Chapter
IPE	Individual Plant Evaluation
IPEEE	Individual Plant Examination of External Events
IR	Inspection Report
LLC	Limited Liability Company
NFPA	National Fire Protection Association
NRC	United States Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
OA	Other Activities
PARS	Publicly Available Records
PRA	Probabilistic Risk Analysis
SDP	Significance Determination Process
SSA	Safe Shutdown Analysis
SSC	Structure, System, or Component
UFSAR	Updated Final Safety Analysis Report
V	Volt

LIST OF DOCUMENTS REVIEWED

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

CALCULATIONS

Number	Description	Rev/Date
19-AN-3	Protective Relay Settings for 4.16Kv ESF Switchgear	January 16, 1900
19-AN-4	Protective Relay Settings for 4160V Non-Safety Related Switchgear	January 15, 1900
19-AN-5	Diesel Generator Protective Relay Settings	January 2, 1900
19-AU-4	480V Unit Substation Breaker and Relay Settings - Unit 1	January 18, 1900
970227	125VDC Fuse Sizing and Coordination	June 10, 1997
970255	Circuit Breaker Trip Settings - 125VDC and 250VDC Distribution Centers	December 31, 1997
970959	Low Pressure Carbon Dioxide Flow Calculation - Lower Cable Spreading Room	September 14, 1979
980239	Coordination Calculation for 125 Vdc and 120 Vac Post Fire Safe Shutdown Circuits	October 1, 2001
990114	TRM Change Request 004-099: Fire Suppression Systems	July 23, 1999

CONDITION REPORTS AND ACTION REQUESTS GENERATED PRIOR TO INSPECTION

Number	Description	Rev/Date
B2000-02248	Nuclear Oversight Results in Trend Identified in Implementation of the Fire Protection Program	August 15, 2000
B2000-01114	Safe Shutdown and Appendix R Requirements	April 10, 2000
B2001-02468	Aging Fire Brigade	May 2, 2001

CONDITION REPORTS AND ACTION REQUESTS GENERATED PRIOR TO INSPECTION

Number	Description	Rev/Date
B2001-03517	Effectiveness Review Failed	August 16, 2001
B2000-03982	Areas for Improvement Noted in Fire Brigade	December 29, 2000
B2000-03754	Security Required Fire Brigade to Use Badges During Fire Drill	December 9, 2000
B2001-02358	Failed Fire Brigade Drill	May 20, 2001
B2001-03239	Failed Acceptance Criteria on 2 Halon 1301 Cylinders During Surveillance	July 23, 2001
B2001-03124	Halon and CO2 Out of Service Needed for Cable Spreading Room Fire Hose Surveillance	July 17, 2001
B2001-02990	Fire Seal 3695 Not Installed Per Proper Design Detail	July 6, 2001
B2001-00078	Cold Shut Down Cable Repair Inventory Below Requirement	December 13, 2000
B2000-01721	Inconsistency Between Byron Breaker Testing and Fire Protection Report	June 17, 2000
B2000-01424	Inconsistent Definition of Alternate Shutdown per Appendix R	May 17, 2000
B2001-03272	Inappropriate CO2/Halon Out of Services	July 25, 2001
AR 81451	Testing of Molded Case Circuit Breakers	November 5, 2001
B2000-01721	Inconsistency Between Byron Breaker Testing and Fire Protection Report	June 19, 2001
B2000-01850	Inverter 214 Fuse 4FU Upper Lug 125° Fahrenheit, 45° Fahrenheit Above Ambient Temperature	April 19, 2001
B2001-02462	Thermography Identifies Elevated U1 Stationary Gripper Coil Fuse Temperature	May 25, 2001
B2001-03281	Failure of OC SX Low Speed Breaker to Open from MCR	July 25, 2001
B2001-01899	Status of Fire Damper Testing Using 0BMSR 3.10.g.5	July 5, 2000
B2001-03451	OE 12571 - Breaker Fire Resulting in Reactor Trip and Natural Circulation Cooldown	August 9, 2001

Condition Reports Generated During Inspection

Number	Description	Rev/Date
00084774	FR-1 Does Not Include Manual Actions for Spurious Closure of all AF 013 Valves During a Fire	December 14, 2001
00083994	Typographical Errors on S/D 6E-1-4030AF12 and Slice Report	November 19, 2001
00084270	Station Procedures Do Not Direct The Use Of Portable Lighting	November 19, 2001
00084301	Typographical Errors Discovered on Drawing 6E-0-3673	November 29, 2001
00084312	Station Alarm Response Procedures Inconsistent with Safe Shutdown Analysis Assumptions	November 29, 2001
00084523	Post Safe Shutdown Exercise Lessons Learned	November 30, 2001
00084536	Safe Shutdown Analysis Evaluation for the Refueling Water Storage Tank Is Not a Formal Calculation	November 30, 2001
00084989	Change Procedure FR-1 to Require Removing Control Power for Valve AF 004	November 30, 2001
00086019	Revise Procedure FR-1 to Diagnose and Restore an Engineered Safety Bus	December 11, 2001
00086130	Revise Byron Alarm Response Procedures to Fix 0CC01P, 0 Component Cooling Water Pump	December 13, 2001
00086135	Emergency Light for 1AF03J Inappropriately Positioned	December 14, 2001
00086488	Inadequate Process to Ensure Proper Procedure Validation	December 13, 2001
00086563	Safe Shutdown Analysis Description of Manual Actions for Service Water Tower Makeup Valve Operations Incorrect	December 13, 2001
00086610	Inadequate Integration of Fire Response Procedure BOP FR-1 into Operations	December 13, 2001
00086620	Three Calculation Recommendations of Calculation 19-AU-4 were Informally Dispositioned Without Documentation	December 13, 2001
00086689	4 KV Breaker Tools Not Included in 0BOSR AR-Q2	December 13, 2001

DRAWINGS

Number	Description	Rev/Date
6E-0-3779B	Station Emergency Lighting Battery Operated Light Units	E
6E-1-403ICV24	Volume Control Tank Level and Diversion Control Cabinet 8	G
6E-1-4030CV11	Charging Pumps from RWST Suction Valves - 1CV122D and E	N
6E-1-4031CV13	Volume Control Tank Level Control Cabinet 5	G
6E-1-4030CV32	Volume Control Tank Level Control and Seal Water Injection Filter	H
6E-0-3000A	Instructions for Use of “SLICE” Cable Tabulations Sheets 1, 2, and 3	-----
6E-0-3000K	Installation Notes for Category I Conduit Boxes	T
6E-0-3312	Byron Units 1 and 2 - Electrical Installation Auxiliary Bldg Plan El.364’-0” Cols, L-Q, 15-21	DT
6E-0-3321	Electrical Installation - Auxiliary Bldg. Plan El. 383”-0”, Cols L-Q, 10-15	CV
6E-0-3322	Electrical Installation Auxiliary Bldg Plan Elev. 383”-0”, Cols L-Q, 15-21	DG
6E-0-3323	Electrical Installation - Aux Bldg. Plan El.383’-0”, Cols. L-Q, 21-26	ED
6E-0-3660	Cable Pans Routing AB EL. 383'-0"	AV
6E-0-3672	Cable Pans Routing Aux. Bldg. Plan El. 439’-0”, Cols L-Q, 10-13	AK
6E-0-3676	Cable Pans Routing Aux Bldg Plan El.439’ - 0” Cols, L-Q, 26-30	----
6E-0-3902	Fire Detection at El. 346'-0"	September 28, 1979
6E-0-3904	Fire Detection at EL. 383'-0"	September 28, 1979
6E-0-3910B	Fire Detection Zones 124, 142-156 and 224, 242-256	A
6E-0-3919A	Fire Detection Zones 107. 141-155 and 207, 241-261	B
6E-0-4027A	Cable Separation Criteria - Notes and Instructions	A

DRAWINGS

Number	Description	Rev/Date
6E-0-4027B	Cable Separation Criteria - Composite Table	B
6E-1-3352	Electrical Installation - Aux Bldg. Plan El.426'-0" Columns Q-W, 10, 7-15	CH
6E-1-3361	Electrical Installation AB EL. 439'-0"	CF
6E-1-4002E	Single Line Diagram - 120VAC ESF Instrument Inverter Bus 111-113 125VDC ESF Distribution Center 111	K
6E-1-4006A	Key Diagram - 4160V ESF SWGR Bus 141 (IAP053)	H
6E-1-4007A	Key Diagram - 480V ESF Substation Bus 131X (1AP10E)	M
6E-1-4008Z	Tabulation of Trip Settings 480V AB ESF MCC 132X3	T
6E-1-400BY	Key Diagram 480 V AB ESF MCC 132X3	AB
6E-1-4010B	Key Diagram - 125VDC ESF Distribution Center Bus 111 (IDC05E) Part 2	G
6E-1-4012A	Key Diagram 120 V AC Instrument Bus 111	T
6E-1-4016A	Relaying and Meeting Diagram Unit Auxiliary Transformer 141-1	G
6E-1-4016B	Relaying and Meeting Diagram Unit Auxiliary Transformer 141-2	G
6E-1-4016C	Relaying and Meeting Diagram Unit Auxiliary Transformer 142-1 and 142-2	K
6E-1-4030 DC22	Schematic Diagram Remote Shutdown Control Panels IPS04J AND IPL05J AND Auxiliary Safeguards Relay Cab's IPA27J and IPA28J 125VDC Cont Volt. Dist.	P
6E-1-4030AFI2	Schematic Diagram - Auxiliary Feedwater Pump 1B (Diesel Driven) Engine Startup Panel 1AFOIJ	AD
6E-1-4030DC08	Schematic Diagram 125VDC ESF Dist Center Bus 112 Pt. 1 - 1DCO6E	U
6E-1-4030MS39	Schematic Diagram - SG 1A Atmospheric Relief Valve IMS018A Modulation and Control	R

DRAWINGS

Number	Description	Rev/Date
6E-1-4031CV33	Loop Schematic Diagram PZR Level Control and Charging Flow (IFI-0121B) IPA06J	K
6E-1-4054K	Int/Ext Wiring Diagram MCB Eng. Safety Features Section A1, Pt.10	AA
6E-1-4089H	Int./Ext. Wiring Diagram Remote Shutdown Control Panel 1PLO5J Part 9	T
6E-1-4089K	Int/Ext WIRING Diag. Remote Shutdown Control Panel 1PL05J PT.1	U
6E-1-4183	Int/Ext Wiring Diagram - Fire Hazards Panel 1PL1OJ	G
6E-1-4184	Int/Ext Wiring Diagram - Fire Hazards Panel 1PL1OJ	F
6E-1-4251A	Int/Ext Wiring Diag. 125VDC ESF Dist Center Bus 112 PT-1 1DCO6E Sect. A and B (Front)	Y
6E-1-4687B	U1 Ext Wiring Diagram 480V Aux Bldg. ESF MCC 132x4, Section B, 1AP28E	T
6E-2-4031FW77	Loop Schematic Diagram - Steam Generator 2A and 2B Wide Range Level (2LT-0501 and 0502)	E
6E-2-4031NR003	Loop Schematic Diagram - Post Accident Neutron Monitor Channel A	E
6E-2-4031NR004	Loop Schematic Diagram - Post Accident Neutron Monitor Channel D	E
M-64	Diagram of Chemical and Volume Control and Boron Thermal Regeneration	AW
M122	Diagram of Auxiliary Feedwater	AV
PN-1	Remote Shutdown Panel	January 1, 1900
6E-0-4030CC01	Component Cooling Pump 0	T
6E-0-4030CC05	Component Cooling Pump 0	M
6E-1-4001A	Station One Line Diagram	K
S-1309	AB Main Floor EL. 451'-0"	

FIRE PROTECTION AND SAFE SHUTDOWN ANALYSIS REPORT CHANGES:

Number	Description	Rev/Date
6E-01-0219	Revision of Fire Protection Report Appendix A5.8 Deviation	1
6E-01-0220	SSA Category 1 and 2 Format and Clarification Changes	0
6E-01-0221	New and Deleted Equipment, Category 2 and 3 Clarification and Minor Changes	0
6E-01-0222	SSA Category 3 Minor Changes	0
6E-01-0223	Revision to Fire Hazard Analysis Assumptions and Methodology	0
6E-01-0224	SSA Criteria and Assumptions, Category 5 Changes	0
6E-01-0225	Miscellaneous Category 5 Changes	0
6E-01-0226	Reliance on Fire Hazard Panel for Hot Standby and Restoration of IP Bus for Cold Shutdown	0
6E-01-0227	Cycling On/Off, AF and CV Pumps	0
6E-01-0229	Spurious Closure of Valves CV 112/C, 2 CV Pumps Available	0
6E-01-0230	Spurious Closure of Valves CV112/C; 1 CV Pump Available	0
6E-01-0231	Spurious Valve Operation	0
6E-01-0232	Spurious HVAC Damper Operation	0
6E-01-0233	Open 4 KV Breakers, Pull Control Fuses	0
6E-01-0234	Plant Staffing, Component Access and Emergency Lighting to Perform Credited Manual Actions	0
6E-01-228	Spurious SI8811A/B Operation	0
6G-99-0031	TRM Change	1

PROCEDURES

Number	Description	Rev/Date
OP-AA-102-104	Standing Order 01-134: BOP FR-1, Fire Response Guidelines, Temporary Ventilation Equipment	November 5, 2001

PROCEDURES

Number	Description	Rev/Date
OP-AA-102-104	Standing Order 01-135: Fire Protection Safe Shutdown Analysis Report Revision	November 5, 2001
0BMSR 3.10.g.7	TRM Fire Damper 18-Month Visual Inspection	3
SM-WM-102	Inbound and Outbound Logistics Procedure	0
1BHS 7.10.3.2.b.1-4	Lower Cable Spreading Room 1S-43 Low Pressure Co2 System Actuation 18 Month Surveillance	6
CC-AA-211	Fire Protection Program	0
OP-AA-201-005	Fire Brigade Qualification	1
BCA 0.0	Loss of All AC Power	100
BEP-0	Reactor Trip or Safety Injection	101
BOA ELEC-5	Local Emergency Control of Safe Shutdown Equipment Unit 1	53B
0BOA PRI-5	Control Room Inaccessibility Unit 0	100
FR-1	Fire Response Guidelines	0
1Pm09J-C7	Byron Control Room Alarm Response Procedure for a Fire on the 383' Auxiliary Building Level	6
BHP 4200-33	Installation of Appendix R Emergency Cable	8
MM-AA-723-350	Emergency Lighting Battery Pack Quarterly Inspection	0
CC-AA-102	Design Impact Screening	2
CC-AA-103	Design Change Package	1
CC-AA-206	Fuse Control Program	2
CC-AA-209	Fire Protection Program Design Change Impact Evaluation	0
CC-AA-309	Control of Design Analyses	1
NES-G-14	Calculations	0
RS-AA-107	UFSAR and Fire Protection Report Update Procedure	0

REFERENCES

Number	Description	Rev/Date
DIT-BB-EXT-0444	Byron Station Cold Shutdown Repair Cables Routing Report	December 18, 1992
	Byron Fire Protection Report Volumes 1, 2, and 3	January 19, 1900
	Individual Plant Examination of External Events for Severe Accident Vulnerabilities Submittal Report	December 1996
	Braidwood NRC Inspection Report 50-456/00-06(DRS); 50-457/00-06(DRS)	January 19, 2001
19AN-3	Switchgear Relay Settings Byron Station Unit 1 (1APO5E)	
IAF004B	Safe Shutdown Cable Report For EPN 1AF004B	November 19, 2001
NFPA 72E-1982	Automatic Fire Detectors	June 5, 1905
NFPA 12-1980	Carbon Dioxide Extinguishing Systems	June 3, 1905
Pre-Fire Plans	2D-17, 2D-40	3
Pre-Fire Plans	1D-11, 1D-12, 1D-13, 1D-49, 1D-50	4
SI - 501	Master Diagram - Safety Injection Pump 1A	May 19, 1973
SLICE Version 7.4	Cable Tabulations (For Various Cables)	
TR-221	Test Report for a 1-hour Fire Test of Darmatt KM-1 System	September 16, 1994
TR-223	Test Report for Protecting Boxed and Premolded 3/4" and 4" Diameter Rigid Steel Conduits	September 26, 1994
WO 00343834	Lost Indication and Had to Manually Trip Breaker for OC SX Fan	July 19, 2001

MISCELLANEOUS DOCUMENTS

Letter from M&M Protection Consultants to Commonwealth Edison	Fire Detection Reports	February 15, 1985
Letter from Chemetron Fire Systems to Commonwealth Edison	Low Pressure Co2 System Test	August 6, 1987

Letter from Commonwealth Edison to Harold Denton, NRC	Byron Generating Station Units 1 and 2 Fire Protection Report Changes, Amendment 3	June 28, 1984
Letter from Commonwealth Edison to Harold Denton, NRC	Byron Generating Station Units 1 and 2 Fire Protection Report Changes (Preliminary Amendment 5 Changes)	October 20, 1984
Letter from Commonwealth Edison to Harold Denton, NRC	Byron Generating Station Units1 and 2 Fire Protection Report Changes, Amendment 7	May 2, 1986
Chemetron Low Pressure CO2 System Test	1-Z1Lower Cable Spreading Area	July 27, 1987
WMS009	Store Room Appendix R Emergency Materials for Cold S/D Repairs Look Ahead Report	February 20, 2001
	Triennial Fire Protection Self-Assessment	August 2001
	Self-Assessment of the Re-constituted Safe Shutdown Assessment	September 2001
	Self-Assessment of Plant Systems	September 2001
	Self-Assessment of Administrative Portion of the Fire Protection Program	August 2001
	Self-Assessment of Fire Protection Program and Safe Shutdown Capability	September 2001

SAFETY EVALUATIONS

Number	Description	Rev/Date
BRW-96-083-04	Minimum Required Instrumentation for Successful Post-Fire Safe Shutdown	November 28, 2000
BRW-96-111-1	Safe Shutdown Cable and Routing Criteria	March 4, 1997
BYR-2000-079	Safe Shutdown Cable Selection - Single Spurious ESF Signals	October 27, 2000
BYR-97-036-01	Attachment and Cable Report for 1AF004A	November 27, 2001
BYR-97-036-01	Attachment and Cable Report for 1AF01PB	November 27,2001
BYR-97-036-01	Attachment and Cable Report for 1AF013A-G	
BYR-97-036-01	Attachment and Cable Report for 1AF004B	November 27, 2001

SAFETY EVALUATIONS

Number	Description	Rev/Date
BYR-97-040-03	Attachment and Cable Report for 1CV01PA	November 27, 2001
BYR-97-040-03	Attachment and Cable Report for 1CV01PB	November 27, 2001
BYR-97-040-03	Attachment and Cable Report for 1CV112E	November 27, 2001
BYR-97-040-03	Attachment and Cable Report for 1CV112D	November 27, 2001
BYR-97-044	Attachment and EPN No. 1LI-0501	
BYR-97-047	Attachment and Cable Report for 1MS018A	

MODIFICATIONS

Number	Description	Rev/Date
0000078909	FP Line u/s of 1FP5160 Valve is Unsupported for 15 Feet	February 3, 2000
0000079065	Repair Cable 2FP311 - Severely Deformed	February 28, 2001
0600079267	Evaluate Changes to Provide Additional Appendix R Emergency Lights	June 26, 2001

TRAINING DOCUMENTS

Number	Description	Rev/Date
Course Attendance Sheets	NLO Continuing Training Cycle 01-6, Weeks 1, 3, and 4 Course N-0E0XR	November 16, 30 and December 7, 2001

UPDATED FINAL SAFETY ANALYSIS REPORT CHANGES

Number	Description	Rev/Date
FDRP 20-011	Replacement of Sections 2.4 and A5.8 of the Fire Protection Report	November 5, 2001
PR 01-050	Re-Constituted Byron Station Fire Protection Report Safe Shutdown Analysis	November 5, 2001

WORK/ACTION REQUESTS

Number	Description	Rev/Date
00355649	Eight Hour Battery Operated Emergency Lights	November 20, 2001
950073645	Replace Thermo-Lag Fire Barrier with Dramatt	February 22, 1997