



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

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

September 20, 2017

Mr. Bryan C. Hanson
Senior VP, Exelon Generation Company, LLC
President and CNO, Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

**SUBJECT: BYRON STATION, UNITS 1 AND 2—NRC TEMPORARY INSTRUCTION
2515/191, MITIGATION STRATEGIES, SPENT FUEL POOL INSTRUMENTATION
AND EMERGENCY PREPAREDNESS INSPECTION REPORT
05000454/2017008; 05000455/2017008**

Dear Mr. Hanson:

On September 1, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed a Temporary Instruction 2515/191, "Inspection of the Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans" inspection at your Byron Station, Units 1 and 2. On September 1, 2017, the NRC inspectors discussed the results of this inspection with Mr. P. Boyle and other members of your staff. The results of this inspection are documented in the enclosed report.

The inspection examined activities conducted under your license as they relate to the implementation of mitigation strategies and spent fuel pool instrumentation orders (EA-12-049 and EA-12-051) and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans, your compliance with the Commission's rules and regulations, and with the conditions of your operating license. Within these areas, the inspection involved examination of selected procedures and records, observation of activities, and interviews with station personnel.

The NRC inspectors did not identify any findings or violations during this inspection.

This letter, its enclosure, and your response (if any) will be made available for public inspections and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Ann Marie Stone, Team Leader
Technical Support Staff
Division of Reactor Projects

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

Enclosure:
IR 05000454/2017008; 05000455/2017008

cc: Distribution via LISTSERV®

Letter to Bryan C. Hanson from Ann Marie Stone dated September 20, 2017

SUBJECT: BYRON STATION, UNITS 1 AND 2—NRC TEMPORARY INSTRUCTION
2515/191, MITIGATION STRATEGIES, SPENT FUEL POOL INSTRUMENTATION
AND EMERGENCY PREPAREDNESS INSPECTION REPORT
05000454/2017008; 05000455/2017008

DISTRIBUTION:

Jeremy Bowen
RidsNrrDorLpl3
RidsNrrPMByron Resource
RidsNrrDirslrib Resource
Cynthia Pederson
James Trapp
Richard Skokowski
Allan Barker
Carole Ariano
Linda Linn
DRPIII
DRSIII
ROPreports.Resource@nrc.gov
JLD_Regional.Resource@nrc.gov

ADAMS Accession Number: ML17263B152

OFFICE	RIII	RIII			
NAME	SShelton:tt	AStone			
DATE	9/13/2017	9/20/2017			

OFFICIAL RECORD COPY

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report No: 05000454/2017008; 05000455/2017008

Licensee: Exelon Generation Company, LLC

Facility: Byron Station, Units 1 and 2

Location: Byron, IL

Dates: August 28 through September 1, 2017

Inspectors: S. Sheldon, Project Engineer
M. Bielby, Senior Operations Engineer
J. McGhee, Senior Resident Inspector
L. Rodriguez, Reactor Inspector

Approved by: A. Stone, Team Leader
Technical Support Staff
Division of Reactor Projects

Enclosure

SUMMARY

Inspection Report 05000454/2017008; 05000455/2017008; 08/28/2017 – 09/01/2017; Byron Station, Units 1 and 2; Temporary Instruction 2515/191 Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans.

This inspection was performed by three U.S. Nuclear Regulatory Commission (NRC) regional inspectors and one resident inspector. No findings of significance or violations of NRC requirements were identified during this inspection. The significance of inspection findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within the Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated November 1, 2016. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

NRC-Identified and Self-Revealing Findings

None.

REPORT DETAILS

4. OTHER ACTIVITIES

4OA5 Other Activities (TI 2515/191)

The objective of Temporary Instruction (TI) 2515/191, "Inspection of the Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans," is to verify the licensee has adequately implemented the mitigation strategies as described in the licensee's "Final Integrated Plan [for] Mitigation Strategies for a Beyond-Design-Basis External Event" (ADAMS Accession No. ML16197A390), and the NRC's safety evaluation (ADAMS Accession No. ML16334A504) and to verify the licensee installed reliable water-level measurement instrumentation in their spent fuel pool. The purpose of this TI was also to verify the licensee had implemented Emergency Preparedness (EP) enhancements as described in their site-specific submittals and NRC safety assessments, including multi-unit dose assessment capability and enhancements to ensure staffing is sufficient and communications can be maintained during such an event.

The inspection also verifies plans for complying with NRC Orders EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (ADAMS Accession No. ML12054A736) and EA-12-051, Order Modifying Licenses With Regard to Reliable Spent Fuel Pool Instrumentation (ADAMS Accession No. ML12054A679) are in place and are being implemented by the licensee. Additionally, the inspection verified implementation of staffing and communications information provided in response to the March 12, 2012, request for information letter and multiunit dose assessment information provided per COMSECY-13-0010, Schedule and Plans for Tier 2 Order on Emergency Preparedness for Japan Lessons Learned, dated March 27, 2013, (ADAMS Accession No. ML12339A262).

The inspectors discussed the plans and strategies with plant staff, reviewed documentation, and where appropriate, performed plant walk downs to verify the strategies could be implemented as stated in the licensee's submittals and the NRC staff prepared safety evaluation. For most strategies, this included verification that the strategy was feasible, procedures and/or guidance had been developed, training had been provided to plant staff, and required equipment had been identified and staged. Specific details of the team's inspection activities are described in the following sections. This inspection closes TI 2515/191 for the Byron Station, Units 1 and 2.

.1 Mitigation Strategies for Beyond-Design Basis External Events

a. Inspection Scope

The inspectors examined the licensee's established guidelines and implementing procedures for the beyond-design basis mitigation strategies. The inspectors assessed how the licensee coordinated and documented the interface/transition between existing off-normal and emergency operating procedures with the newly developed mitigation strategies. The inspectors selected a number of mitigation strategies and conducted plant walk downs with licensed operators and responsible plant staff to assess: the adequacy and completeness of the procedures; familiarity of operators with the

procedure objectives and specific guidance; staging and compatibility of equipment; and the practicality of the operator actions prescribed by the procedures, consistent with the postulated scenarios.

The inspectors verified a preventive maintenance program had been established for the Diverse and Flexible Coping Strategies (FLEX) portable equipment and periodic equipment inventories were in place and being conducted. Additionally, the inspectors examined the introductory and planned periodic/refresher training provided to the Operations staff most likely to be tasked with implementation of the FLEX mitigation strategies. The inspectors also reviewed the introductory and planned periodic training provided to the Emergency Response Organization personnel. Documents reviewed are listed in the attachment.

b. Assessment

Based on samples selected for review, the inspectors verified the licensee satisfactorily implemented appropriate elements of the FLEX strategy as described in the plant specific submittals and the associated safety evaluation and determined the licensee is in compliance with NRC Order EA-12-049. The inspectors verified the licensee satisfactorily:

- developed and issued FLEX Support Guidelines (FSG) to implement the FLEX strategies for postulated external events;
- integrated their FSGs into their existing plant procedures such that entry into and departure from the FSGs were clear when using existing plant procedures;
- protected FLEX equipment from site-specific hazards;
- developed and implemented adequate testing and maintenance of FLEX equipment to ensure their availability and capability;
- trained their staff to assure personnel proficiency in the mitigation of beyond-design basis events; and
- developed the means to ensure the necessary off-site FLEX equipment would be available from off-site locations.

The inspectors verified non-compliances with current licensing requirements, and other issues identified during the inspection were entered into the licensee's corrective action program (CAP) as appropriate.

c. Findings

No findings were identified.

.2 Spent Fuel Pool Instrumentation

a. Inspection Scope

The inspectors examined the licensee's newly installed spent fuel pool instrumentation. Specifically, the inspectors verified the sensors were installed as described in the plant specific submittals and the associated safety evaluation and that the cabling for the power supplies and the indications for each channel are physically and electrically separated. Additionally, environmental conditions and accessibility of the instruments were evaluated. Documents reviewed are listed in the attachment.

b. Assessment

Based on samples selected for review, the inspectors determined the licensee satisfactorily installed and established control of the spent fuel pool (SFP) instrumentation as described in the plant specific submittals and the associated safety evaluation and determined the licensee is in compliance with NRC Order EA-12-051. The inspectors verified the licensee satisfactorily:

- installed the SFP instrumentation sensors, cabling and power supplies to provide physical and electrical separation as described in the plant specific submittals and safety evaluation;
- installed the SFP instrumentation display in the location, environmental conditions and accessibility as described in the plant specific submittals;
- trained their staff to assure personnel proficiency with the maintenance, testing, and use of the SFP instrumentation; and
- developed and issued procedures for maintenance, testing and use of the reliable SFP instrumentation.

The inspectors verified non-compliances with current licensing requirements, and other issues identified during the inspection were entered into the licensee's CAP.

c. Findings

No findings were identified.

.3 Staffing and Communication Request for Information

a. Inspection Scope

Through discussions with plant staff, review of documentation and plant walk downs, the inspectors verified the licensee has implemented required changes to staffing, communications equipment and facilities to support a multi-unit extended loss of AC power (ELAP) scenario as described in the licensee's staffing assessment and the NRC safety assessment. The inspectors also verified the licensee has implemented multi-unit dose assessment (including releases from spent fuel pools) capability using the licensee's site-specific dose assessment software and approach as described in the licensee's multi-unit dose assessment submittal. Documents reviewed are listed in the attachment.

b. Assessment

The inspectors reviewed information provided in the licensee's multi-unit dose submittal and in response to the NRC's March 12, 2012, request for information letter and verified that the licensee satisfactorily implemented enhancements pertaining to Near-Term Task Force Recommendation 9.3 response to a large scale natural emergency event that results in an ELAP to all site units and impedes access to the site. The inspectors verified the following:

- the licensee satisfactorily implemented required staffing changes to support a multi-unit ELAP scenario;
- EP communications equipment and facilities are sufficient for dealing with a multi-unit ELAP scenario; and

- the licensee implemented multi-unit dose assessment capabilities (including releases from spent fuel pools) using the licensee's site-specific dose assessment software and approach.

The inspectors verified non-compliances with current licensing requirements, and other issues identified during the inspection were entered into the licensee's CAP.

c. Findings

No findings were identified.

4OA6 Management Meeting

.1 Exit Meeting Summary

On September 1, 2017, the inspectors presented the inspection results to Mr. P. Boyle and other members of the licensee's staff. The licensee acknowledged the issues presented. The inspectors confirmed none of the potential report input discussed was considered proprietary.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

B. Hanson, Senior Vice President
P. Boyle, Plant Manager
C. Catencamp, Security Manager
J. Lynde, Manager Operations Support
H. Welt, Operations Director
G. Gugle, Deputy Maintenance Director
C. Cote, Shift Operations Supervisor
M. Roberts, Radiation Protection Manager (acting)
C. Keller, Engineering Director
L. Zurawski, Principle Regulatory Engineer
R. Bolin, Operations SRO
S. Pierson, Operations EOP/SAMG/FSG Lead
J. Printz, Contractor-Procedure Writer
K. Zlevor, Senior Engineer-Design
J. Smith, Engineer-Programs
S. Thunberg, Operations CAP Coordinator
P. Henderson, Sr Operations Procedure Writer
D. Gutierrez, Sr Operations Procedure Writer
T. Edwards, Fire Marshal
K. Pope, Operations Admin
R. Lloyd, EP Manager
R. Kartheiser, EP
D. Wallheimer, Communications Manager
S. Harvey, Chemistry/Radwaste/Environmental Manager
R. Lawlor, Training Manager-Operations
Z. Cox, NRC Coordinator

U.S. Nuclear Regulatory Commission

A. Stone, Team Leader, Technical Support Staff, Division of Reactor Projects

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None.

Closed

None.

Discussed

None.

LIST OF DOCUMENTS REVIEWED

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

Condition Reports Initiated as a Result of the Inspection

- AR 04046568; High Pressure FLEX Pump Found Unplugged; 08/28/2017
- AR 04046950; Wrong Reference Found in 0BFSG-5; 08/29/2017
- AR 04047348; FLEX Locker Inventory; 08/30/2017
- AR 04047355; 383' AB FLEX Locker Inventory List; 08/30/2017
- AR 04047410; FLEX Used Equipment Labeling; 08/30/2017
- AR 04047459; Procedure Enhancements Identified for 0BFSG-5 and 0BFSG-11; 08/30/2017
- AR 04047753; Byron FLEX Satellite Comm EPA-FLEX-15-01/02 Enhancements; 08/31/2017
- AR 04047816; 0BFSG-50 Att. A Step 1.S.4 Needs Editorial Correction; 08/31/2017
- AR 04047860; MCR FLEX Portable Satellite Cable Routing Enhancement; 08/31/2017
- AR 04047928; Self-Assessment Recommended Actions at INPROG Went Overdue; 08/31/2017

Condition Reports Reviewed

- AR 02444297; Fukushima Project: Need to Check Phase Rotation; 01/29/2015
- AR 03964454; FLEX Mitigation Strategy TI2515/191 & FLEX Program CIA; 01/19/2017
- AR 04045847; 0BOSR FX-S1 Missing Inventory; 08/25/2017
- AR 04048176; 0BOL FX1 Unplanned LCO Entry Due to Loss of Power to Bldg.; 09/01/2017
- AR 2454866; 2SI078 FX Suction to SI Valve Doesn't Have Required Safety Cable; 02/18/2015
- AR 2454879; 2SI280 FX TO SI Injection Valve Doesn't Have Required Safety Cable; 02/18/2015
- AR 2513733; T-3 Project Management Challenge Meeting for FLEX; 06/12/2015
- AR 2565536; Valve Location Wrong in Passport; 10/05/2015
- AR 2574346; IR Not Written for OPS Schedule Exceptions; 10/21/2015
- AR 2583342; 0FX01KA Batteries Degraded But Functional; 11/06/2015
- AR 2583346; 0FX01KB Batteries Degraded But Functional; 11/06/2015
- AR 2583349; 0FX01KD Batteries Degraded But Functional; 11/06/2015
- AR 2583361; Extreme Over-Heat on 3 of 4 FLEX Diesel Generator Batteries; 11/06/2015
- AR 2583377; Overheated Heat Trace on FLEX Emergency Diesel Generator; 11/06/2015
- AR 2583847; FLEX Pump 0FX01PA Battery Voltage Low; 11/07/2015
- AR 2583849; FLEX Pump 0FX01PC Battery Voltage Low; 11/07/2015
- AR 2586476; All FLEX Diesel Generators Need Battery Replacement; 11/12/2015
- AR 2587151; Sign Request for Robust FLEX Building Doors; 11/13/2017
- AR 2587526; 0BOSR FX-S2 and S3 Require Minor Revision; 11/15/2015
- AR 2587976; FLEX Equipment Not Treated as Augmented Quality; 11/16/2015
- AR 2587992; Heat Trace on 0FX01KA Battery Compartment Found Wired Incorrectly; 11/16/2015
- AR 2587994; Heat Trace on 0FX01KB Battery Compartment Found Wired Incorrectly; 11/16/2015
- AR 2604773; High Head FX Pump Functional Test Duplication; 12/27/2015
- AR 2609418; Snow Removal By FLEX Building; 01/07/2016
- AR 2613029; Commercial FLEX Building Lighting and Heating Issues; 01/15/2016
- AR 2629572; FLEX F-750 Truck Will Not Start; 02/21/2016

- AR 2631025; FLEX Cable Storage Improvement; 02/24/2016
- AR 2633314; Follow-Up to FLEX F-750 Battery Charger – Actions Needed; 02/29/2016
- AR 2650281; FLEX Equipment Deficiencies; 04/04/2016
- AR 2651149; Review FLEX Equipment PM Strategy; 04/05/2016
- AR 2652202; SFP Level Backup Battery Not Fully Charged; 04/07/2016
- AR 2662890; FLEX 6-Month Report Discrepancy; 04/29/2016
- AR 2663795; FLEX Conduits/Field Wiring Not Long Enough; 05/01/2016
- AR 2664312; Breaker for Engine Block Heater is in the “ON” Position; 05/02/2016
- AR 2664720; FLEX Procedure Inconsistencies/Inaccuracies; 05/03/2016
- AR 2667543; Drawing in BOP AF-8 Does Not Illustrate New Flex Switch; 05/10/2016
- AR 2670038; Failed Acceptance Criteria 2BOSR FX-S1 for 2AF049B or C; 05/16/2016
- AR 2677117; Dry Boric Acid Deposits on Pipe Cap 2FX108-4; 06/02/2016
- AR 2682318; Miscellaneous FLEX Administrative Concerns; 06/16/2016
- AR 2685263; NRC ID: ER1 Cabinet in 1DC06E Cannot Be Opened; 06/24/2016
- AR 2685629; 0FX01KC Fuel Sample Results; 06/25/2016
- AR 2691913; B FLEX Diesel Generator Low Coolant Alarm; 07/12/2016
- AR 2694916; FLEX Cable Not Available for Use; 07/20/2016
- AR 2694920; FLEX Building Cart Caddy Unable to Effectively Move FLEX EDG; 07/20/2016
- AR 2694955; C FLEX EDG Engine Coolant Level Low in the Bulls Eye; 07/20/2016
- AR 2694957; D FLEX EDG Engine Coolant Level Low in the Bulls Eye; 07/20/2016
- AR 2694958; A FLEX EDG Engine Coolant Level Low in the Bulls Eye; 07/20/2016
- AR 2696488; OP-BY-1001 Procedure Enhancements; 07/25/2016
- AR 2700111; D FLEX EDG Failed to Display Current of Power; 08/03/2016
- AR 2700219; Anchor Points in FLEX Building are Safety Trip Hazard; 08/03/2016
- AR 2700673; FLEX Cart Caddy Not Operating Properly: Unable to Move EDG; 08/04/2016
- AR 2701440; FLEX FO Trailer Jack Stand Damaged; 08/05/2016
- AR 2701613; 0FX01PC Battery Voltage Reading Low; 08/05/2016
- AR 2702400; Procedure Revision for 0BOSR FP-14; 08/09/2016
- AR 2702847; Difficulty Returning Trailered Equipment to FLEX Building; 08/10/2016
- AR 2702853; C FLEX EDG Failed to Display Current or Power; 08/10/2016
- AR 2705347; FLEX Tractor Pintle Hooks Not Rated for FLEX Diesel Generator; 08/17/2016
- AR 2705921; FLEX Fuel Trailer Cable Damaged; 08/18/2016
- AR 2707845; Tires Degraded; 08/24/2016
- AR 2712710; Abandoned Material on Property North of the FLEX Building; 09/06/2016
- AR 2714097; 0PL06J Spent Fuel Pool Level Transmitter Warning Light Lit; 09/09/2016
- AR 2714326; OPS Focus – FX Full Flow Testing As PMT; 09/10/2016
- AR 2714561; #3 Exhaust Fan in FLEX Building Not Working Properly; 09/12/2016
- AR 2722822; 1BOSR FX-S1 Acceptance Criteria Exceeded for 1AF049A; 10/01/2016
- AR 2722823; 1BOSR FX-S1 Acceptance Criteria Exceeded for 1AF049D; 10/01/2016
- AR 2738757; Evidence of a Leak at Pipe Cap Upstream of 2FX170; 11/08/2016
- AR 2740403; 1/2 BOSR FX-S1 Needs Revision; 11/12/2016
- AR 3954206; 0FX01KB Oil Drain Line Leaking; 12/17/2016
- AR 3954209; FLEX F-750 Fuel Storage Tank Level in Lower Sight Glass; 12/17/2016
- AR 3961728; Commercial FLEX Building Power Issues; 01/11/2017
- AR 3962268; WO 4580467-01 0BOSR FX-M2; 01/12/2017
- AR 3963106; HL130M FLEX Pump Battery Trouble; 01/14/2017
- AR 3981046; February Housekeeping – FLEX Building; 03/03/2017
- AR 3983685; WO Needed to Replace FLEX Tractor Pintle Hooks; 03/10/2017
- AR 3986832; Does FLEX System Affect Our Ability to Mitigate an Accident?; 03/19/2017
- AR 3995623; Housekeeping – FLEX Building; 04/07/2017
- AR 3995695; Part Not Available for E-6 Work Due to Vendor Questions; 04/07/2017

- AR 3999631; 0C FLEX Diesel Generator Fuel Oil Test Failure; 04/18/2017
- AR 3999631; 0C FLEX Diesel Generator Fuel Oil Test Failure; 05/21/2017
- AR 4006312; Degraded Operating Instruction Attached to B.5.b Pump; 05/03/2017
- AR 4006754; Housekeeping – FLEX Building; 05/04/2017
- AR 4011590; FLEX Assessment Discrepancies; 05/16/2017
- AR 4012470; No OPS Support Scheduled for FLEX DG Operation; 05/18/2017
- AR 4016255; FLEX Staging Area Should Be Clearly Marked; 07/03/17
- AR 4022596; Shelving in FLEX Building Needs to be Secured; 07/24/2017
- AR 4022646; FLEX Storage Labeling; 07/31/2017
- AR 4037084; Returning Equipment to Storage at the FLEX Building; 07/30/2017
- AR 4040518; FLEX Tractor Oil Leak; 08/09/2017

Calculations

- EC 391872; Load Shed Calculation; Rev 0
- EC/ECR No. 396209/396243; Design Analysis No. BYR-14-130/BRW-14-0211-M; Evaluation of Tank and Hose Freezing During an ELAP; Rev 0
- EC 399165; FLEX Haul Path Liquefaction Evaluation; Rev 0

Drawings

- M-50 Sht. 1D; Diagram of Diesel Fuel Oil; Rev AP
- M-130 Sht. 1B; Diagram of Diesel Oil and Fuel Oil Supply; Rev BE
- S-189; Roadway Plan & Profile of Plant Access Road; Rev C

Miscellaneous Documents

- CC-AA-118; Diverse and Flexible Coping Strategies (FLEX) and Spent Fuel Pool Instrumentation Program Document; Rev 2
- CC-BY-118; Site Implementation of Diverse and Flexible Coping Strategies (FLEX) and Spent Fuel Pool Instrumentation Program; Rev 5
- CC-BY-118-1003; Byron FLEX (BDBEE) Validation Process; Rev 0
- CC-BY-118-1004; Byron Station Units 1 & 2 Final Integrated Plan Document Mitigation Strategies for a Beyond-Design-Basis External Event (NRC Order EA-12-049) 08/2017; Rev 1
- Letter to NRC RS-13-105, RA-13-042, TMI-13-066, Exelon Generation Company, LLC Response to NRC Request for Information Regarding the Capability to Perform Offsite Dose Assessment During an Event Involving Multiple Release Sources; 06/27/2013
- OP-AA-102-106; Operator Response Time Validation Sheets FLEX; Rev 3
- PI-AA-126-1001-F-01; (Byron Self-Assessment, AR 3964454, Report Date 06/15/2017) TI 191 Mitigating Strategies Response to Order (2515/191) Pre-Inspection; Rev 2
- RS-14-53; Flood Hazard Reevaluation Report for Byron Nuclear Generating Station; Rev 0
- Services and Materials Agreement, Long Term Fuel Supply Contract Between Bells Fuel, Inc. and Exelon Generation Dated 12/01/2009
- VETIP F-2590; Fukushima (FLEX) Mods

Modifications

- EC392445; Spent Fuel Pool Instrumentation - Fukushima; Rev 0
- EC399646; EP Satellite Communications for Beyond Design Basis Event and Upgrade NARS Phone to VOIP; Rev 0

Procedures

- 0BFSG-11; Alternate SFP Makeup and Cooling Unit 0; Rev 2
- 0BFSG-11; Alternate SFP Makeup and Cooling Unit 0; Rev 3
- 0BFSG-14; Shutdown RCS Makeup Unit 1; Rev 1
- 0BFSG-5; Initial Assessment and FLEX Equipment Staging Unit 0; Rev 6
- 0BFSG-50; FLEX Support Equipment Operation Unit 0; Rev 6
- 0BFSG-51; Alternate MCR Ventilation Unit 0; Rev 3
- 0BFSG-6; Alternate CST Makeup Unit 0; Rev 2
- 0BOA ELEC-1; Degraded Switchyard Voltage Unit 0; Rev 15
- 0BOA ENV-1; Adverse Weather Conditions Unit 0; Rev 123
- 0BOA ENV-2; Rock River Abnormal Water Level Unit 0; Rev 103
- 0BOA ENV-4; Earthquake Unit 0; Rev 114
- 0BOA PRI-7; Loss of Ultimate Heat Sink Unit 0; Rev 002
- 0BOL FX1; LCOAR, FLEX Support Equipment; Rev 5
- 0BOL FX2; LCOAR Spent Fuel Pool SFP Level Instrumentation; Rev 1
- 0BOSR FX-14M; FLEX Equipment Monthly Surveillance; Rev 1
- 0BOSR FX-14Q; FLEX Equipment Quarterly Surveillance; Rev 1
- 0BOSR FX-A1; FLEX Pump Annual Flow Surveillance; Rev 6
- 0BOSR FX-M1; Spent Fuel Pool Level Instrumentation Monthly Channel Checks; Rev 1
- 0BOSR FX-S1; Unit 0 FLEX Equipment Inventory Surveillance; Rev 3
- 1BCA-0.0; Loss of All AC Power Unit 1; Rev 300
- 1BFSG-1; Long Term RCS Inventory Control Unit 1; Rev 0
- 1BFSG-12; Alternate Containment Cooling Unit 1; Rev 0
- 1BFSG-13; Transition From FLEX Equipment Unit 1; Rev 1
- 1BFSG-14; Shutdown RCS Makeup Unit 1; Rev 1
- 1BFSG-2; Alternate AFW/EFW Suction Source Unit 1; Rev 0
- 1BFSG-3; Alternate Low Pressure Feedwater Unit 1; Rev 1
- 1BFSG-4; ELAP DC Bus Load Shed/Management Unit 1; Rev 1
- 1BFSG-5; Initial Assessment and FLEX Equipment Staging Unit 1; Rev 2
- 1BFSG-8; Alternate RCS Boration Unit 1; Rev 0
- 1BOA ELEC-4; Loss of Offsite Power Unit 1; Rev 113
- 1BOA ELEC-8; Loss of All AC Power While On Shutdown Cooling Unit 1; Rev 1
- 2BCA-0.0; Loss of All AC Power Unit 2; Rev 210
- 2BEP0; Reactor Trip Or Safety Injection Unit 2; Rev 208
- 2BFSG-2; Alternate AFW/EFW Suction Source Unit 2; Rev 1
- 2BFSG-3; Alternate Low Pressure Feedwater Unit 2; Rev 3
- 2BFSG-8; Alternate RCS Boration Unit 2; Rev 4
- BIP 2500-181; Calibration of Guided Wave Radar Spent Fuel Level Instruments; Rev 2
- CC-AA-118; Diverse and Flexible Coping Strategies (FLEX) and Spent Fuel Pool Instrumentation Program Document; Rev 2
- CC-BY-118; Site Implementation of Diverse and Flexible Coping Strategies (FLEX) and Spent Fuel Pool Instrumentation Program; Rev 5
- CC-BY-118-1002; SAFER Response Plan for Byron Station; Rev 4
- CC-BY-118-1003; Bryon FLEX (BDBEE) Validation Process; Rev 0
- EP-AA-110-200; Level 2 – Dose Assessment; Rev 8
- EP-AA-110-201; Level 2 – On Shift Dose Assessment; Rev 3
- EP-AA-112-100-F-01; Shift Emergency Director Checklist; Rev Y
- EP-AA-112-400-F-01; Nuclear Duty Officer Checklist; Rev G
- EP-AA-120-F-04; Corporate EP Recurring Tasks; Rev Q
- EP-AA-124-F-03; Site & Site Specific EOF Communications 9.3 & EMNET Satellite Communications Systems Semi-Annual Testing & Inventory; Rev B

- EPA-FLEX-15-01; Portable Back-Up Main Control, Room (MCR) Satellite Communication System Operating User Aid; Rev 0
- EPA-FLEX-15-02; Portable TSC/OSC Satellite Communication System Operating User Aid; Rev 1
- EPA-FLEX-15-03; Communications Handheld Radio/Battery Deployment User Aid; Rev 0
- EP-MW-100-F-01; Nuclear Accident Reporting System (NARS) Form; Rev H
- OP-BY-FX-1002; Ford F-750 FLEX Truck and Mounted Accessories Operating Guidelines; Rev 0
- OU-AA-102; Forced Outage Management; Rev 7
- OU-AA-102-1001; Exelon Forced Outage Response; Rev 6
- OU-AA-103; Shutdown Safety Management Program; Rev 17
- OU-AA-103-1001; Shutdown Safety Plan Independent Review; Rev 1
- SY-BY-101-115-1003; Controlling Gates and Power Operated Active Vehicle Barriers; Rev 2
- TQ-AA-150-F23; Shift Manager Initial Training Checklist; Rev 16
- TQA-AA-113; ERO Training and Qualification; Rev 30

Training Documents

- 2013-1-F750; F750 FLEX Truck; Rev 0
- BY-EO-CY14; Cycle Topics 14-5; Rev 1
- Drill; Byron Dose Assessment Summation Report (Detailed); 08/24/2017
- Drill; Byron Dose Assessment Summation Report (Rapid); 08/24/2017
- Exelon Industrial/Nuclear Safety and Security; Rev 00
- FLEX Related ERO Technical Training Handout
- FLEX Related ERO Technical Training; 08/30/2017
- Nantel Generic Advanced FLEX Training; Rev 1
- Nantel Generic Basic FLEX Training; Rev 0
- N-BY-TQ-LORT-FLEX; FLEX; Rev 0
- P1-SBY-1566; Cycle Topics 15-6; Rev 0
- P1-SPBY-1401; Cycle Lesson Plan 14-1; Rev 1
- Spent Fuel Pool Level Indicating System; July 2014

Work Orders

- WO 01686372 20; Site Acceptance Test of 0FX01KA per EC #393367; 10/09/2014
- WO 01686372 21; Site Acceptance Test of 0FX01KB per EC #393367; 10/08/2014
- WO 01686372 22; Site Acceptance Test of 0FX01KC per EC #393367; 10/08/2014
- WO 01686372 23; Site Acceptance Test of 0FX01KD per EC #393367; 10/08/2014
- WO 01784411 01; Calibrate Spent Fuel Pool Level Indication 0FC-002; 06/01/2016
- WO 01784412 01; Calibrate Spent Fuel Pool Level Indication 0FC-001; 07/06/2016
- WO 01868715 01; OPS - Perform 0BOSR FX-A1 (Annual Flow Testing) for HL130M (Low Head); 9/4/2016
- WO 01883692 01; FLEX DG 'A' Component Operational Inspection; 12/14/2016
- WO 01883694 01; FLEX DG 'B' Component Operational Inspection; 12/14/2016
- WO 01884015 01; FLEX DG 'D' Component Operational Inspection; 12/14/2016
- WO 01884821 01; Component Operational Inspection of A Medium Head FLEX Pump; 09/01/2016
- WO 01884823 01; Component Operational Inspection of C Medium Head FLEX Pump; 09/02/2016
- WO 01890845 01; Component Operational Inspection of A High Head FLEX Pump; 09/02/2016
- WO 01890847 01; Component Operational Inspection of C High Head FLEX Pump; 09/02/2016

- WO 01939494 01; OPS – Run Low Head FLEX Pump (No Flow); 01/12/2017
- WO 01959874 01; B Medium Head FLEX Pump Functional Test and Inspection; 04/13/2017
- WO 01959875 01; C Medium Head FLEX Pump Functional Test and Inspection; 04/13/2017
- WO 01959876 01; A Medium Head FLEX Pump Functional Test and Inspection; 04/13/2017
- WO 01959879 01; FLEX 'A' DG Functional Test and Inspection; 04/13/2017
- WO 01959880 01; FLEX 'B' DG Functional Test and Inspection; 04/13/2017
- WO 04590668 01; FLEX Communications Systems-Semi-Annual Testing & Inventory; 05/11/2017
- WO 04653117 01; OBOSR FX-M1, SFP LVL Instrument Monthly Channel Check; 07/16/2017
- WO 04654504 01; FLEX Equipment Monthly (1M) Surveillance; 07/14/2017
- WO 04664982 01; FLEX Equipment Monthly (1M) Surveillance; 08/11/2017
- WO 0486438; Fukushima Project: Need to Check Phase Rotation; 02/02/2015

LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
AR	Action Request
CAP	Corrective Action Program
CFR	<i>Code of Federal Regulations</i>
ELAP	Extended Loss of AC Power
EP	Emergency Preparedness
FLEX	Diverse and Flexible Coping Strategies
FSG	FLEX Support Guidelines
IMC	Inspection Manual Chapter
IR	Inspection Report
NRC	U.S. Nuclear Regulatory Commission
SFP	Spent Fuel Pool
TI	Temporary Instruction
WO	Work Order