



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION I
2100 RENAISSANCE BLVD., Suite 100
KING OF PRUSSIA, PA 19406-2713

November 30, 2017

Mr. Bryan C. Hanson
Senior Vice President, Exelon Generation Co., LLC
President and Chief Nuclear Officer, Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

**SUBJECT: OYSTER CREEK NUCLEAR GENERATING STATION – TEMPORARY
INSTRUCTION 2515/191 INSPECTION REPORT 05000219/2017009**

Dear Mr. Hanson:

On November 16, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Oyster Creek Nuclear Generating Station (OCNGS). The enclosed report documents the inspection results, which were discussed on November 16, with Mr. Michael Gillin and other members of your staff.

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 plant personnel. Based on the results of this inspection, no violations of NRC requirements were identified.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390 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's Public Document Room or from the Publicly Available Records component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC's Website at <http://www.nrc.gov/readingrm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Marc S. Ferdas, Chief
Technical Support and Assessment Branch
Division of Reactor Projects

Docket No. 50-219
License No. DPR-16

B. Hanson

2

Enclosure:
Inspection Report 05000219/2017009 w/Attachment:
Supplementary Information

cc w/encl: Distribution via ListServ

SUBJECT: OYSTER CREEK NUCLEAR GENERATING STATION – TEMPORARY
INSTRUCTION 2515/191 INSPECTION REPORT 05000219/2017009 DATED
NOVEMBER 30, 2017

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No. 50-219

License No. DPR-16

Report No. 05000219/2017009

Licensee: Exelon Nuclear

Facility: Oyster Creek Nuclear Generating Station (OCNGS)

Location: Forked River, NJ

Dates: November 13, 2017 through November 16, 2017

Inspectors: W. Cook, Senior Reactor Analyst, Division of Reactor Safety (DRS)
A. Patel, Senior Resident Inspector, Division of Reactor Projects (DRP)
T. Hedigan, Operations Engineer, DRS

Approved by: Marc S. Ferdas, Chief
Technical Support and Assessment Branch
Division of Reactor Projects

Enclosure

SUMMARY

Inspection Report 05000219/2017009; 11/13/2017 – 11/16/2017; Oyster Creek Nuclear Generating Station; 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.

The inspection covered a one week inspection by a senior reactor analyst, an operations engineer and a senior resident inspector. No findings were identified. The U.S. Nuclear Regulatory Commission's (NRC) program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

REPORT DETAILS

4. OTHER ACTIVITIES

4OA5 Other Activities

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

The objective of 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: (1) that licensees have adequately implemented the mitigation strategies as described in the licensee’s Final Integrated Plan (Agency-wide Documents Access and Management System (ADAMS) Accession No. ML16342C392) and the NRC’s plant safety evaluation (ADAMS Accession No. ML17086A492); (2) that licensees have installed reliable water-level measurement instrumentation in their spent fuel pools (SFPs); and (3) that licensees have implemented emergency preparedness enhancements as described in their site-specific submittals and NRC’s safety assessments, including dose assessment capability, enhancements to ensure that staffing is sufficient, and that communications can be maintained during beyond-design-basis external events.

The team verified that 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. ML12054A735) and EA-12-051, “Order Modifying Licenses With Regard to Reliable Spent Fuel Pool Instrumentation,” (ADAMS Accession No. ML12056A044) were in place and were being implemented by Exelon. The team also verified that Exelon had implemented staffing and communication plans provided in response to the March 12, 2012, request for information letter and multi-unit 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 team discussed the plans and strategies with Exelon’s personnel, reviewed documentation, completed a tabletop exercise involving a beyond-design-basis event leading to an extended loss of offsite power and, where appropriate, performed plant walk downs to verify that the strategies could be implemented as stated in Exelon’s submittals and the NRC’s 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. Documents reviewed for each section of this report are listed in the Attachment.

1. Mitigation Strategies for Beyond-Design-Basis External Events

a. Inspection Scope

The team examined Exelon's established guidelines and implementing procedures for the beyond-design-basis mitigation strategies. The team assessed how Exelon coordinated and documented the interface/transition between existing off-normal and emergency operating procedures with the newly developed mitigation strategies. The team 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 team verified that a preventive maintenance program had been established for the Diverse and Flexible Coping Strategies (FLEX) portable equipment, and that periodic equipment inventories were in place and being conducted. Additionally, the team examined the introductory and planned periodic/refresher training provided to Oyster Creek's staff most likely to be tasked with implementation of the FLEX mitigation strategies. The team also reviewed the introductory and planned periodic training provided to the Emergency Response Organization (ERO) personnel.

b. Assessment

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

The team verified that Exelon satisfactorily:

- Developed and issued FLEX Support Guidelines (FSGs) to implement the FLEX strategies for postulated external events;
- Integrated their FSGs into their existing emergency operating procedures and off-normal 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 ensure personnel proficiency in the mitigation of beyond-design-basis events; and
- Developed procedures to ensure that the necessary off-site FLEX equipment would be available from off-site locations.

The team verified that observations made during the inspection were entered into Exelon's corrective action program, where appropriate.

c. Findings

No findings were identified.

2. Spent Fuel Pool Instrumentation

a. Inspection Scope

The team examined Exelon's newly installed SFP instrumentation. Specifically, the team 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 were physically and electrically separated. In addition, the team verified that Exelon had evaluated the environmental conditions and accessibility of the instrumentation.

The team verified that Exelon had approved procedures for maintenance, testing, calibration, and use of the primary and backup SFP instrumentation channels. The team also verified that the procedures followed the industry guidance contained in Nuclear Energy Institute 12-02, "Industry Guidance for Compliance with NRC Order EA-12-051, "To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," and that these procedures were part of an existing Exelon process to be maintained.

b. Assessment

Based on samples selected for review, the team determined that Exelon satisfactorily installed and established appropriate operating and maintenance controls for the SFP instrumentation as described in the plant specific submittals and the associated safety evaluation. The team determined that Exelon was in compliance with NRC Order EA-12-051.

The team verified that Exelon 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 accessible location, and environmental conditions as described in the plant specific submittals;
- Trained their staff to ensure 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 team verified that observations made during the inspection were entered into Exelon's corrective action program, where appropriate.

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 team verified that Exelon had implemented required changes to staffing, communications equipment, and facilities to support an extended loss of all AC power (ELAP) scenario as described in Exelon's staffing assessment and the NRC safety evaluation. The team also verified that Exelon had implemented dose assessment (including releases from SFPs) capability using site-specific dose assessment software, as described in Exelon's dose assessment submittal.

b. Assessment

The team reviewed information provided in Exelon's dose assessment submittal and in response to the NRC's March 12, 2012, request for information letter (ADAMS Accession No. ML12053A340), and verified that Exelon 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 and impedes access to the site.

The team verified the following:

- Exelon satisfactorily implemented required staffing changes to support an ELAP scenario;
- Emergency preparedness communications equipment and facilities were sufficient for dealing with an ELAP scenario; and
- Exelon implemented dose assessment capabilities (including releases from SFPs) using OCNCS's site-specific dose assessment software and approach.

The team verified that observations identified during the inspection were entered into Exelon's corrective action program, where appropriate.

c. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On November 16, 2017, the team presented the inspection results to Mr. Michael Gillin, Oyster Creek Plant Manager, and other members of Exelon's staff. The team verified that no proprietary information was retained by team members or documented in this report.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Exelon Personnel:

Mike Gillin, Plant Manager
Tim Keenan, Security Manager
Eric Swain, Operations Services Manager
John Weissinger, Operations Director
Andrew Krukowski, Operations Superintendent
Mike Lane, Ops Support (Primary FLEX contact)
Dave Olszewski, Engineering Branch Manager
Tom Powell, Regulatory Assurance
Gary Flesher, Regulatory Assurance Manager
Richard Brower, Senior Manager Engineering
Jason McDaniel, Manager Continuous Improvement
John Renda, WM Director
Tim Trettel, Engineering System Manager
Kevin Wolf, Radiation Protection Manager
Jim Stanley, Engineering Director
Steve Pierson, Corporate Engineering
Dave Cappoferi, Acting Maintenance Director
Wing Ho, Design Engineer
Peter Must, Senior Reactor Operator
Tom Ruggiero, Contractor Engineer
Jennifer Eng, Contractor Engineer

Others

Veena Gubbi, NJ Bureau of Nuclear Engineering

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened and Closed

None

Discussed

None

LIST OF DOCUMENTS REVIEWED

NEI 12-02, Industry Guidance for Compliance with NRC Order EA-12-051, "To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," Revision 1
 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, Revision 1
 NEI 12-06, Diverse and Flexible Coping Strategies (FLEX) Implementation Guide, Revision 4
 EP-AA-112-100-F-01, Shift Emergency Director Checklist, Revision Y
 OU-AA-103, Shutdown Safety Management Program, Revision 17
 RM Documentation No. OC-MISC-010, MAPP Analysis to Support FLEX Initial Strategy, Revision 1, dated 6/9/2015
 Design Analysis #C-1302-735-E320-047, Oyster Creek Station Battery B&C Capacity for SBO, ECR #06-01143, dated 3/9/2007
 OP-OC-118-1001, Oyster Creek FLEX Validation Plan, Revision 1
 Safer Response Plan for Oyster Creek, Chapter 7, Equipment Listing, NSRC-005 Revision 001
 ABN-36, Loss of Offsite Power and Station Blackout (Plant Control), Revision 32
 AD-OC-103, EOP/SAM Program Control, Revision 11
 AD-AA-101, Procedure Control
 EP-AA-110-200, Dose Assessment, Revision 8
 FSG-01, Operations of the FLEX Portable Pump, Revision 0
 FSG-02, FLEX Generator Operation, Revision 0
 FSG-03, FLEX Hose Deployment, Revision 1
 FSG-04, DC Load Shed, Revision 1
 FSG-05, FLEX Equipment Deployment and Debris Removal, Revision 0
 FSG-06, FLEX 480V Cable Deployment and Connection, Revision 1
 FSG-07, Lin-Up of USS 1A2/1B2 for Re-Powering from FLEX Generator, Revision 3
 FSG-08, Makeup to the Isolation Condenser, Revision 0
 FSG-09, Makeup to the Fuel Pool, Revision 2
 FSG-10, makeup to the RPV, Revision 1
 FSG-12, Restoration of Plant Loads with FLEX Generator, Revision 0
 FSG-13, Alternate Spent Fuel Pool Level Monitoring, Revision 1
 FSG-21, FLEX Communications, Revision 0

Procedures

ABN-36, Loss of Offsite Power & Station Blackout, Revision 32
 FSG-00, Extended Loss of AC Power FLEX Strategy Implementation Flowchart, Revision 2
 FSG-07, Line-Up of USS 1A2/1B2 for Re-Powering From Flex Generator, Revision 3
 FSG-08, Makeup to Isolation Condensers, Revision 0
 FSG-09, Makeup to the Fuel Pool, Revision 2
 FSG-10, Makeup to the RPV, Revision 1
 FSG-12, Restoration of Plant Loads with Flex Generator, Revision 0

Calculation

C-1101-734-E420-009, TMI-1 Extending Battery Life to 6 Hours under ELAP, Revision 0
 C-1101-919-E420-009, FLEX Electrical Performance Analysis (ETAP), Revision 0

Condition Reports

4072525
 4072528

Modifications

OC 14-00389, Spent Fuel Pool Level Instrumentation, Revision 3

Miscellaneous

Technical Evaluation 621997, Flex Generator Output Breaker Settings, Revision 0

Work Orders

4387036	4387038	4693335	4387030	4623434	4623435
4386343	4386349	4657095	4655468	4390707	4390704
4387030	4353499	4386295			

Training Records

N-AN-EP-FLEX-TECH (Training), FLEX-Related ERO Technical Training (Fleet Code)

N-AN-EP-NANTEL-5305 (NANTEL), Generic Advanced FLEX Course – Initial

N-AN-EP-NANTEL-5301 (NANTEL), Generic Basic FLEX Course - Initial

Issue Reports

04074593	04075037
04074567	02726349
00625325	04074411
04073351	04074611
04075110	04075192

LIST OF ACRONYMS

ADAMS	Agencywide Document Access and Management System
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
ELAP	Extended loss of all AC power
EP	Emergency Preparedness
ERO	Emergency Response Organization
FLEX	Diverse and Flexible Coping Strategies
FSG	FLEX Support Guidelines
OCNGS	Oyster Creek Nuclear Generating Station
NRC	Nuclear Regulatory Commission, U.S.
SFP	Spent fuel pool
TI	Temporary instruction