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ONS-2014-130

## Special Report

October 2, 2014

U.S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, DC 20555

**Subject:** Oconee Nuclear Station  
Docket Nos. 50-269, -270, -287  
Special Report per Selected Licensee Commitment 16.9.9 Auxiliary Service Water (ASW) System and Main Steam Atmospheric Dump Valves and Oconee Transition from the Station ASW System to the Protected Service Water System – Revision 1

### Reference:

1. Letter from Scott Batson to the Nuclear Regulatory Commission, "Special Report per Selected Licensee Commitment 16.9.9 Auxiliary Service Water (ASW) System and Main Steam Atmospheric Dump Valves and Oconee Transition from the Station ASW System to the Protected Service Water System," dated August 15, 2014.
2. Letter from the Nuclear Regulatory Commission to Scott Batson, "Notice of Violation and Confirmatory Order Related to a Fire Protection Program License Condition (Oconee Nuclear Station, Units 1, 2, and 3)," dated July 1, 2013.

In accordance with Selected Licensee Commitment (SLC) 16.9.9, please find attached a revised copy of a report which details the outage required for replacement of the Oconee Nuclear Station (ONS) Station Auxiliary Service Water (ASW) System with the Protected Service Water (PSW) System. The report has been revised to allow flexibility for protected or required equipment to be removed from service in order to facilitate other implementation activities and to communicate an extension in the completion time of the transition from the Station ASW System to the PSW System.

SLC 16.9.9 requires that a report be submitted to the Nuclear Regulatory Commission (NRC) if the Station ASW System and the Standby Shutdown Facility (SSF) ASW System are inoperable for greater than 7 days or if the Station ASW System is inoperable and the SSF ASW System is OPERABLE for greater than 30 days. In this case, the Station ASW System is being completely removed and replaced with the PSW System. The extensive and complicated nature of this work activity will exceed the 30 day allowed outage time.

*JE22*  
*NRC*

A revised SLC 16.9.9 will be implemented to address PSW capabilities once the PSW pumps and header are installed and operational (Milestone 4, Ref. 2). The SLC will provide details associated with system capability requirements as well as surveillance requirements to test installed portions of the system. PSW Technical Specifications will be implemented after startup from each unit's refueling outage following completion of PSW Modifications (Milestone 5, Ref. 2) and after all of the PSW system equipment installed has been tested. The SLC will be revised at that time to remove any requirements associated with the PSW system that are addressed by the Technical Specifications.

No NRC commitments are contained in this report. The assessment and management of risk during the replacement of Station ASW with PSW ensures that this activity is considered to be of no significance with respect to the health and safety of the public.

If there are any questions, please contact Timothy D. Brown, PSW Licensing Manager, at (864) 873-3952.

Sincerely,



Scott L. Batson  
Site Vice President  
Oconee Nuclear Station

Attachment

U. S. Nuclear Regulatory Commission

October 2, 2014

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CC: Mr. Victor M. McCree, Administrator, Region II  
U.S. Nuclear Regulatory Commission  
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NRC Senior Resident Inspector  
Oconee Nuclear Station

Mr. James R. Hall, Project Manager  
(by electronic mail only)  
U. S. Nuclear Regulatory Commission  
Office of Nuclear Reactor Regulation  
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**ATTACHMENT**

**Oconee Transition from Station Auxiliary Service Water System to Protected Service Water System – Revision 1**

Special Report  
Oconee Transition from the Station Auxiliary Service Water System  
to the Protected Service Water System – Revision 1

Purpose

In accordance with Selected Licensee Commitment (SLC) 16.9.9, Auxiliary Service Water (ASW) System and Main Steam Atmospheric Dump Valves, this report outlines the plans and procedures that Oconee Nuclear Station (ONS) is using during the replacement of the Station Auxiliary Service Water (ASW) System with the Protected Service Water (PSW) System that started August 13, 2014.

System Description

Auxiliary Service Water System

Station Auxiliary Service Water (ASW) System provides defense-in-depth for decay heat removal (DHR) following a concurrent loss of the Main Feedwater (MFDW) System, Emergency Feedwater (EFW) System and DHR System for any or all three of the ONS units.

The Station ASW system is credited as a source of DHR for tornado mitigation and loss of all external water supply events. DHR is accomplished by supplying water to the steam generators through the EFW headers. The water supply for the ASW Systems is provided by the Oconee Unit 2 Condenser Circulating Water (CCW) System intake.

Protected Service Water System

The PSW System is designed as a standby system for use under emergency conditions. The PSW system provides additional "defense in-depth" protection by serving as a backup to existing safety systems and as such, the system is not required to comply with single failure criteria. The PSW system is provided as an alternate means to achieve and maintain safe shutdown conditions for one, two or three units following certain postulated scenarios. The PSW system reduces fire risk by providing a diverse power supply to power safe shutdown equipment in accordance with NFPA 805 safe shutdown analyses. The PSW system requires manual activation in the control room and can be activated if emergency systems are unavailable.

The PSW system provides a diverse means to achieve and maintain safe shutdown by providing secondary side DHR, Reactor Coolant System (RCS) pump seal cooling, RCS primary inventory control, and RCS boration for reactivity management following plant scenarios that disable the 4160V essential electrical power distribution system. Following achieving safe shutdown, a plant cooldown is initiated within 72 hours of event initiation. PSW is not an Engineered Safety Features Actuation System (ESFAS) and is not credited to mitigate design basis events as analyzed in UFSAR Chapters 6 and 15.

Core DHR is provided by feeding the steam generators from the PSW pumps (booster and high head pumps) via PSW flow control valves. Core reactivity is controlled in a safe manner by injecting borated water from the borated water storage tank (BWST) into the RCS to maintain

adequate shutdown margin. RCS inventory control is provided by existing plant equipment that can be selectively powered from the PSW Electrical Distribution System.

For complete details associated with the PSW system, see the Safety Evaluation for Amendment Nos. 386, 388, and 387 dated August 13, 2014.

#### Selected Licensee Commitments

Condition A of Selected Licensee Commitment (SLC) 16.9.9 allows the Station ASW system to be out of service for 30 days if the SSF ASW system is operable.

Condition B of SLC 16.9.9 allows the ASW system and the SSF ASW system to be simultaneously inoperable for a period of 7 days.

Condition C of SLC 16.9.9 states if the required actions and associated completion times are not met within the specified time periods, then a report is to be written and submitted to the Nuclear Regulatory Commission (NRC) within 30 days outlining plans and procedures to be used to provide for the loss of the system.

Condition A and C of SLC 16.9.9 have been entered. The work associated with demolishing Station ASW and implementing PSW is expected to take greater than 30 days; therefore a special report is being provided to the NRC outlining plans and procedures to be used to provide for loss of the system.

#### ASW System Transition to PSW

The PSW pipe headers to each Unit's East Penetration Room have been installed. The Station ASW Switchgear and Pump demolition has been completed and PSW Pump installation is in progress. This includes the associated piping, valves, valve controllers, flow elements and electronics. During the PSW pump installation, the existing Station ASW piping to the Steam Generators will be cut from the Emergency Feedwater (EFW) headers that feed the Steam Generators and the new PSW piping lines headers will be connected to the EFW headers.

New high pressure valves were previously installed at the Station ASW connections to the EFW headers. These valves are normally closed and will be utilized as the isolations to the Steam Generators to allow the PSW tie-ins while the Units are online.

The Station ASW Switchgear has been removed from service including associated components such as transformers, motor control centers, breakers, Station ASW pump and motor, and piping.

PSW equipment such as the primary and booster pump/motor, piping, switches, valves, breakers, cables, etc. are in the process of being installed.

This work evolution was originally scheduled for an estimated duration of 70 days. Removing Station ASW and installing PSW is a large and extensive scope of work being done by modification. It is a complex evolution that contains many implementation activities requiring extensive resources and planning being implemented with all three Units online. Due to this and unanticipated critical skills workforce turnover, the project has incurred schedule challenges which has resulted in delays.

During project implementation, it was recognized that the PSW switchgear would require isolation to support PSW implementation activities. As a result, the protected equipment associated with PSW power feeds will be revised to allow for these implementation activities.

The following information will be added to allow for the implementation activities:

*“...except when PSW power is isolated to support PSW implementation. When PSW power is isolated, the SSF is to remain available with the exception of emergent corrective work. Note that if corrective work is required on the SSF or PSW power is required to perform its function, the work activities will be evaluated for the correct course of action and PSW power will be restored.”*

Contingencies to mitigate the risk for having the Station ASW system out of service greater than the AOT provided in SLC 16.9.9 Condition A have been incorporated into a complex activity plan. The Complex Activity Plan was originally reviewed and approved by the Plant Operations Review Committee on July 30, 2014 (Ref. 1). The Complex Activity Plan was revised to address the change described above and reviewed and approved by ONS Management on October 2, 2014. The work evolution is now scheduled to be completed by November 30, 2014.

SLC 16.9.9, Condition A was entered on August 13, 2014, when Station ASW was removed from service, but will not be explicitly applicable to Station ASW since it will cease to exist at the point that system is demolished. However, the Complex Activity Plan will provide control during the interim period while transitioning from Station ASW to PSW. When PSW is completed, a revised SLC 16.9.9 will be issued to address capabilities of the system until the PSW System is installed, fully tested and its Technical Specifications become applicable.

The following outlines the plans and procedures that will be in place to provide for the loss of the Station ASW system as specified in Condition C of SLC 16.9.9:

- The SSF will be available. With the exception of non-discretionary maintenance testing in accordance with TS or emergent corrective work to restore SSF availability, no elective work rendering the SSF unavailable will be performed on SSF systems during Station ASW demolition and PSW System installation. Required SSF monthly preventive maintenance will be performed with the Shift Manager concurrence.
- The following components shall be considered “Protected” equipment for the operating units:
  - PSW Building except when PSW power is isolated to support PSW implementation. When PSW power is isolated, the SSF is to remain available with the exception of emergent corrective work. Note that if corrective work is required on the SSF or PSW power is required to perform its function, the work activities will be evaluated for the correct course of action and PSW power will be restored.
  - SSF Building including the following:
    - SSF ASW Pump Breaker (OTS1-2), SSF ASW Pump Close Pushbutton/Trip, and the SSF ASW Pump.
    - Main Feeder Bus Normal Feeder (B2T-4) to SSF Switchgear (OTS1-1).
    - OTS1 Alternate Power Feed (OTS1-0) from PSW Switchgear (B7T) except when PSW power is isolated to support PSW implementation. When PSW power is isolated, the SSF is to remain available with the exception of emergent corrective work. Note that if corrective work is required on the SSF or PSW power is required to perform its function, the work activities will be evaluated for the correct course of action and PSW power will be restored.

- Diesel Generator Breaker (OTS1-4) Control Pushbutton Switch and Diesel Generator Breaker (OTS1-4).
  - Air Starter Relay Inlets for Diesel Generator A, Engines A (DA-24) and B (DA-30) and Diesel Generator B, Engines C (DA-36) & D (DA-42).
  - Unit 1, 2, 3 Motor Driven Emergency Feedwater Pumps when PSW power is not available to the SSF.
  - Unit 1, 2, 3 Turbine Driven Emergency Feedwater Pump when PSW power is not available to the SSF.
- Once the Station ASW System is taken out of service, work activities will be performed continuously until the PSW pumps and valves are installed and capable of providing water to the steam generators.
  - The Fant 100 kV line or the Keowee Hydro Unit aligned to PSW for SSF will be available except when PSW power is isolated to support PSW implementation. When PSW power is isolated, the SSF is to remain available with the exception of emergent corrective work. Note that if corrective work is required on the SSF or PSW power is required to perform its function, the work activities will be evaluated for the correct course of action and PSW power will be restored.
  - Any emergent equipment issue that places the site in an unplanned elevated PRA condition due to interaction with ASW unavailability will be evaluated by the Shift Manager, the Project Command Center (PCC), and Activity Manager to determine the most prudent course of action to exit the elevated risk condition. The Activity Manager will consult with the PCC, Management Oversight, and Shift Manager to determine whether to terminate activities in progress or proceed to completion based on which is the most expeditious. Elevated risks will be carefully controlled to have a clear path for successful return to normal. If the elevated risk condition cannot be prevented, PCC and work control will prepare a response (plan) to return conditions to acceptable levels. These actions could include completing all work in progress and exiting the unavailability. The Shift Manager may initiate a Unit Threat team per NSD 505, “Response to Reactor Trips, Significant Transients, or Unit Threat Situations.” Adverse weather will be treated similarly.
  - In the event of notification of tornado watch or warning for Oconee or Pickens Counties, at Shift Manager discretion, Operations will be prepared to station personnel at SSF as required by AP/0/A/1700/006 (Natural Disaster).
  - PSW power to High Pressure Injection Pumps (HPIs) will be available except when PSW power is isolated to support PSW implementation. When PSW power is isolated, the SSF is to remain available with the exception of emergent corrective work. Note that if corrective work is required on the SSF or PSW power is required to perform its function, the work activities will be evaluated for the correct course of action and PSW power will be restored.
  - Staged diesel driven pump and alternate B.5.b hose connections will be available to support scenarios that credit ASW connection point for providing a source of water to the steam generators.
  - Sensitive Equipment monitoring will be utilized during work activities to prevent interaction with sensitive equipment. Normal work practices will be used to avoid foreign material intrusion.
  - No planned work on Low Pressure Service Water or High Pressure Service Water that affects HPI Motor Coolers in order to maintain cooling water for HPI Motor Cooling Jackets.
  - To avoid extending the duration of the work, PSW scheduled tasks will be assigned higher priority than other normally scheduled online work. Any PSW emergent tasks will be given high priority. Risk assessments will be performed daily. A PCC coordinator will be



assigned to track work progress and ensure appropriate priorities are established for the work tasks.

- An assessment will be conducted each shift to evaluate work progress and risk to the extent that they affect the projected unavailability. The PCC manager will be notified of any potential negative impacts.
- BWST Tornado Protection Enhancements – Passive Civil Features remain intact when HPI Pump Spent Fuel Pool Priming Pumps are not available.

Conclusion:

The appropriate action statements have been entered for the Station ASW System being declared inoperable. SLC 16.9.9, Condition A, Required Action and Completion Time to return the Station ASW system to service within 30 days will be exceeded due to the complexity and increased scope of the planned maintenance evolution and modifications which transition Station ASW to PSW. Since the work evolution is scheduled to be complete by November 30, 2014, it required entry into SLC 16.9.9, Condition C, Required Action, and Completion Time to generate the report to the NRC outlining the plans and procedures to be used to provide for loss of the Station ASW System within 30 days. Appropriate risk management actions are being implemented within Oconee's Maintenance Rule a(4) program to provide for the loss of the system and assure the availability of redundant accident mitigation systems throughout the entire duration of the system outage. It is important to note that the benefits of performing the work include improved reliability of the affected systems and equipment. Also, overall plant risk will be reduced for the remaining life of the plant after final installation of the new PSW system.