



Oconee Nuclear Station

Major Projects Update Meeting, February 26, 2014
NRC Headquarters, Rockville, Maryland



- Preston Gillespie, Senior VP, Nuclear Operations
- Scott Batson, Site VP, Oconee Nuclear Station
- Dave Baxter, General Manager, PSW and External Flood Licensing
- Ed Burchfield, General Manager, Nuclear Engineering
- Jim Fuller, Senior Project Director, PSW Project
- Bob Guy, Director, Site Support
- Dean Hubbard, Licensing Manager, External Flood Project
- Chris Nolan, Director, Nuclear Fleet Regulatory Affairs
- Julie Olivier, Manager, Nuclear Fleet Licensing

- Opening Remarks
Scott Batson
- Protected Service Water (PSW)
Jim Fuller
- PSW Licensing Update
Dave Baxter
- National Fire Protection Association (NFPA) 805
Ed Burchfield
- Fukushima
Ed Burchfield
- External Flooding
Dean Hubbard
- Closing Comments
Preston Gillespie

Scott Batson

Site Vice President, Oconee Nuclear Station

Jim Fuller

Senior Project Director, PSW Project

Completed Milestones:

- Milestone 1 – Commercial Power Path to the Standby Shutdown Facility
- Milestone 2 – Power Path from Keowee Hydro

Remaining Milestones on track to meet required dates:

- Milestone 3 – Power Path From PSW to High Pressure Injection (HPI) System – October 1, 2014
- Milestone 4 – Align PSW Pump to Steam Generators – June 3, 2015
- Milestone 5 – PSW System Complete – February 4, 2016
- Milestone 6 – Satisfy the Requirements of NFPA 805 – November 15, 2016

Milestone 1 – Commercial Power Path to the Standby Shutdown Facility (SSF) – Complete

- Completed Items
 - Milestone One completed and turned over to Operations
 - A Selected Licensee Commitment was implemented to track unavailability of PSW power via Maintenance Rule
 - 13% Estimated Fire Core Damage Frequency (CDF) improvement
 - Milestone One completion notification letter submitted to NRC on August 28, 2013



PSW Building

For Information Only



PSW Building Switchgear

For Information Only



Breaker Switch on SSF Control Panel

Milestone 2 – Power Path From Keowee Hydro – Complete

- Completed Items
 - Milestone Two completed and turned over to Operations
 - A Selected Licensee Commitment was implemented to add Keowee power path to the tracking mechanism for unavailability of PSW power via Maintenance Rule
 - Additional 1% estimated Fire Core Damage Frequency improvement
 - Milestone Two completion notification letter submitted to NRC on December 12, 2013

**Breaker Control Switches
that route the output of
Keowee to the PSW Building**





Keowee Switchgear Cabinet

For Information Only

Junction Box in Keowee



Milestone 3 – Power Path From PSW to HPI System – October 1, 2014

- Completed Items
 - Unit 2 testing of all HPI components powered from PSW
 - Units 1 and 3 Overlap testing
 - Rotational checks A and B HPI pumps from PSW power for each unit
 - Phase rotation checks on 600VAC MCCs on PSW power for each unit
 - Milestone 3 field work complete

Milestone 3 – Power Path From PSW to HPI System – October 1, 2014

- Radiation Environment Qualification Status
 - Based on physical location, the Motor Operated Transfer Switches (MOTS) were self-identified as requiring a harsh environment qualification
 - Documented in the Oconee Corrective Action Program
 - Harsh Environment Qualification is underway per Institute of Electrical and Electronic Engineers (IEEE) 323-1974 Standards
 - Qualification plan is being executed by original provider of MOTS to perform the harsh environment qualification
 - All other Milestone 3 required PSW equipment environment qualifications are unaffected by the revised radiation levels

Milestone 3 – HPI Motor Operated Transfer Control Switch



For Information Only

Milestone 4 – Align PSW Pump to Steam Generators – June 3, 2015

- Completed Items
 - Installation of pre-outage piping and pipe supports
- In Progress Items
 - Engineering Change Packages revisions
 - Development of Implementation Procedures
 - Interference removal for installation of new ventilation duct work and piping
- Remaining Activities
 - Station Auxiliary Service Water system demolition
 - Installation of PSW system
 - Integrated PSW system testing

Milestone 4 – PSW Pump Room Mockup



For Information Only

Milestone 4 – 2000 HP Pump/Motor



Phase I Alternate Chilled Water (AWC)

- The Alternate Chilled Water system provides chilled water to selected Air Handling Units (AHUs) to maintain an acceptable environment for PSW equipment in the Control Area Complex and Auxiliary Building.
- The system will use portable chillers that will connect to permanently installed piping to allow flexibility for maintenance, testing, and future site needs.

Phase I AWC Mechanical/Civil

- Scope
 - Over 30 Engineering Change Packages to provide alternate chilled water to selected AHUs
 - Three Chillers (one is a spare)
 - Two Pumps (one is a spare)
 - Approximately 600 Hangers
 - Approximately 8000 feet of (4", 6", 8") Piping

Phase I AWC – Unit 1 East Penetration Room Piping



Phase I AWC Electrical

- Scope
 - Over 20 Electrical Engineering Change Packages to provide alternate power feeds to the Auxiliary Building AHUs and the Reactor Building Cooling Units
 - Approximately 40,000 feet of Cable
 - 4160V Switchgear
 - 1000 KVA Transformer, 500 KVA Transformer, (2) 75 KVA Transformers
 - (2) 600V MCCs, (2) 208V MCCs
 - Over 30 Transfer Switches

Phase I AWC Electrical – Transfer Switch



Milestone 5 – PSW System Complete – February 4, 2016

Scope

- Units 1, 2, and 3 Pressurizer Heater and Vital I&C Battery Charger Repowering from PSW
- Units 1, 2, and 3 Vital I&C Cable Reroutes
- Phase II of Auxiliary Building and Reactor Building Cooling Project
- Study and potential modifications based on the interaction of the new PSW system with existing plant equipment

Milestone 6 – Satisfy the Requirements of NFPA 805 – November 15, 2016

Transition License Conditions

- The Transition License Conditions will be discussed by Ed Burchfield in the NFPA 805 presentation

Dave Baxter

General Manager, PSW and External Flood Licensing

PSW TS and UFSAR Safety Evaluation

- Submit final PSW Technical Specifications (TS), TS Bases, and Updated Final Safety Analysis Report (UFSAR) – Complete
- Requests for Additional Information (RAIs) received November 22, 2013 and January 28, 2014; Responses submitted December 18, 2013 and February 14, 2014
- Remaining Outstanding Item
 - In-Structure Response Spectra (ISRS) for PSW Building Equipment
- Expect Final NRC PSW Safety Evaluation Report (SER) April 2014

Ed Burchfield

General Manager, Nuclear Engineering

Project Status

- NRC Safety Evaluation issued December 29, 2010
- Program implemented January 1, 2013
- All items on schedule
- Turbine Building / Auxiliary Building wall penetrations modifications completed
- Unit 3 fire detection modifications completed
- Units 1 and 2 Purge Inlet Room/West Penetration Room modifications completed

Remaining Items to Complete:

- PSW modifications
- Units 1 and 2 fire detection modifications
- Unit 3 Purge Inlet Room/West Penetration Room modification
- Once the PSW modifications are complete
 - Incorporate the PSW modifications into site documents
 - Confirm that the as-built risk decrease from installation of PSW bounds the transition risk
 - Complete the analysis of non-power operation fire impacts

Ongoing actions until modifications are complete:

- Appendix R required fire watches
- NFPA 805 fire watch program
- Additional compensatory actions remain in place until PSW is completed

Oconee's fire safety has benefited from the implementation of NFPA 805 and will further improve upon PSW completion

Ed Burchfield

General Manager, Nuclear Engineering

FLEX Modifications

- SSF will be used for Phase 1 Coping
- Project Team established
- Implementation Schedule: U2 (Fall 2015), U3 (Spring 2016), U1 (Fall 2016)
 - Steam Generator Make-up Capability
 - Reactor Coolant Make-up Capability
 - CCW Embedded Water Transfer Capability
 - Primary Repower
 - Alternate Repower
 - Spent Fuel Pool Makeup
 - FLEX Equipment Storage Building

Spent Fuel Pool Level Instrumentation (SFPLI) Modifications

- Project Team established; design change underway
- Implementation Schedule: U1 & U2 (Fall 2015), U3 (Spring 2016)
- Primary and backup channel for each spent fuel pool
- Both channels will use wave guided radar technology

Flood Modifications (50.54(f) Request Letter)

- Fukushima Response includes external flood for Oconee
- Flood Modifications will be discussed later in the presentation

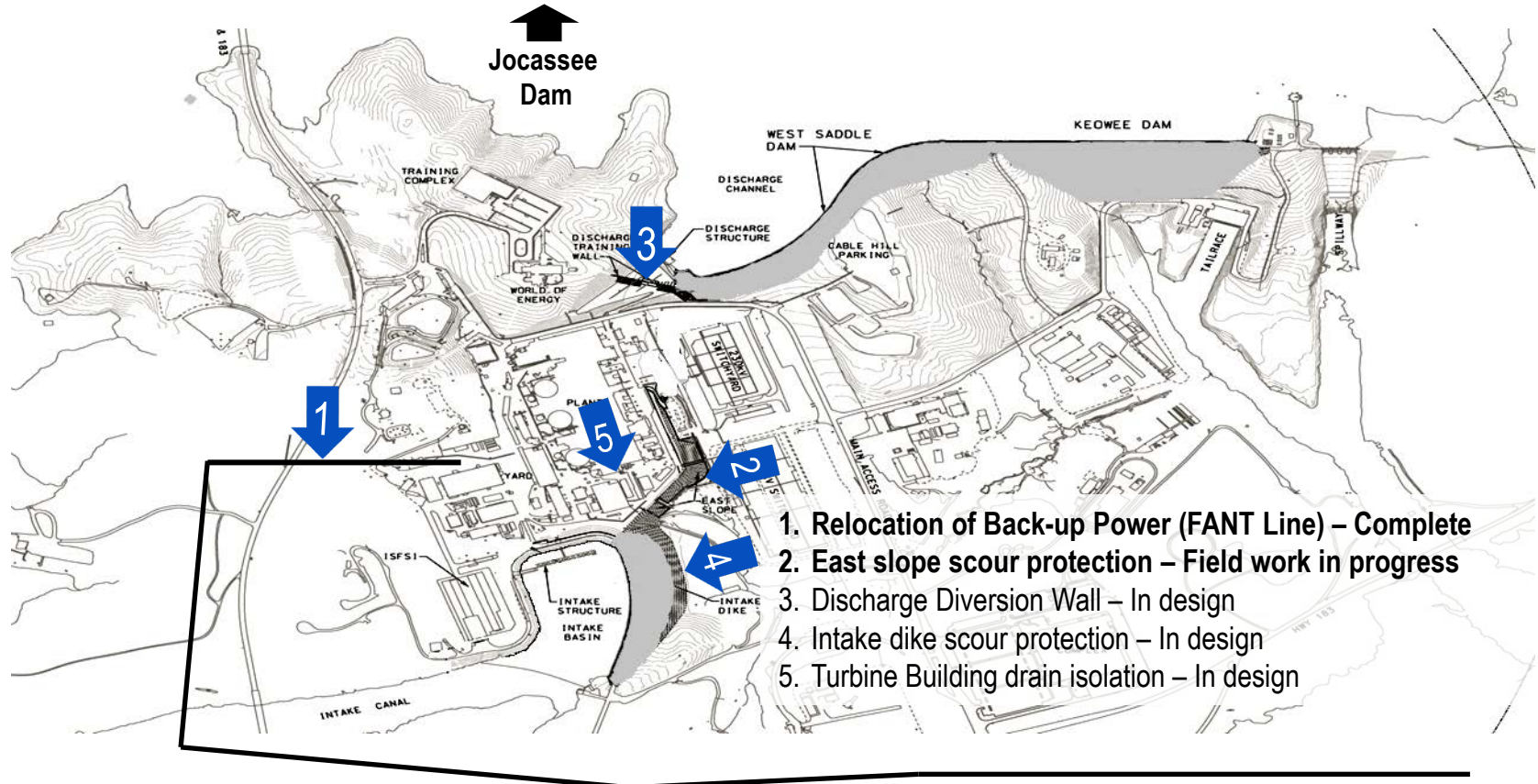
Beyond Design Basis Seismic Ground Motion Response Spectrum (GMRS)

- Oconee meets its seismic licensing basis
- Risk insights from the seismic PRA
- Standby Shutdown Facility (SSF) reviewed against beyond design basis GMRS
 - SSF can maintain safe shutdown
 - New strategies developed to rely on portable equipment for longer-term cooling
- Engineering analyses to validate strategy are in progress

Dean Hubbard

Licensing Manager, External Flood Project

Oconee Dam Failure Modifications – In Progress



For Information Only

Relocation of FANT Line Above Flood Plain

New tower
above postulated
flood plain



Old towers

For Information Only

Relocation of FANT Line Above Flood Plain

New towers
above postulated
flood plain



Old towers

For Information Only

Scour Protection – East Slope



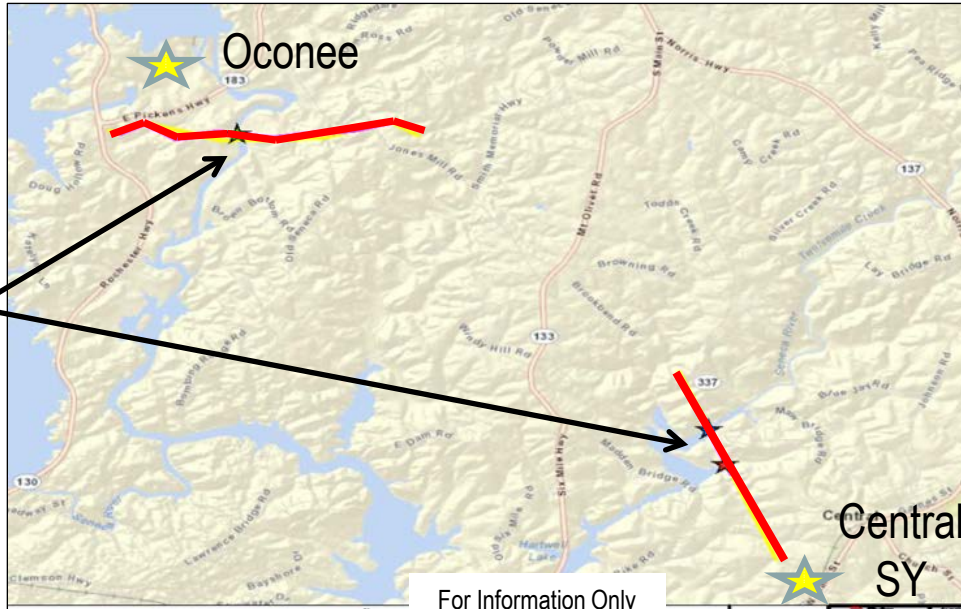
- **Hazard Reevaluation Report (HRR) – Completed March 12, 2013**
 - Flooding hazards: Upstream dam failure, Local Intense Precipitation flooding
 - Breach methodology question response
 - Independent review of Jocassee breach analysis – March 2014
- **Integrated Assessment (IA) started January 2013**
 - Conducted in parallel with Hazard Reevaluation Report (HRR completed)
 - IA is required to be completed by March 12, 2015 as a Category 1 priority site
 - Targeted to complete 2nd quarter 2014 using current HRR
- **Modification design & construction work in progress**

- **Modifications – Dam Flooding**
 - **Interim actions in place and inspected by NRC**
 - **Relocation of FANT transmission line above the flood plain – Complete**
 - **East slope scour protection – Field work in progress**
 - Intake dike scour protection (FERC approval required) – Design in progress
 - Discharge diversion wall – Design in progress
 - Isolation gate/slide valve for 6' Turbine Building drain – Design in progress
 - Completion date for dam failure modifications – June 2016

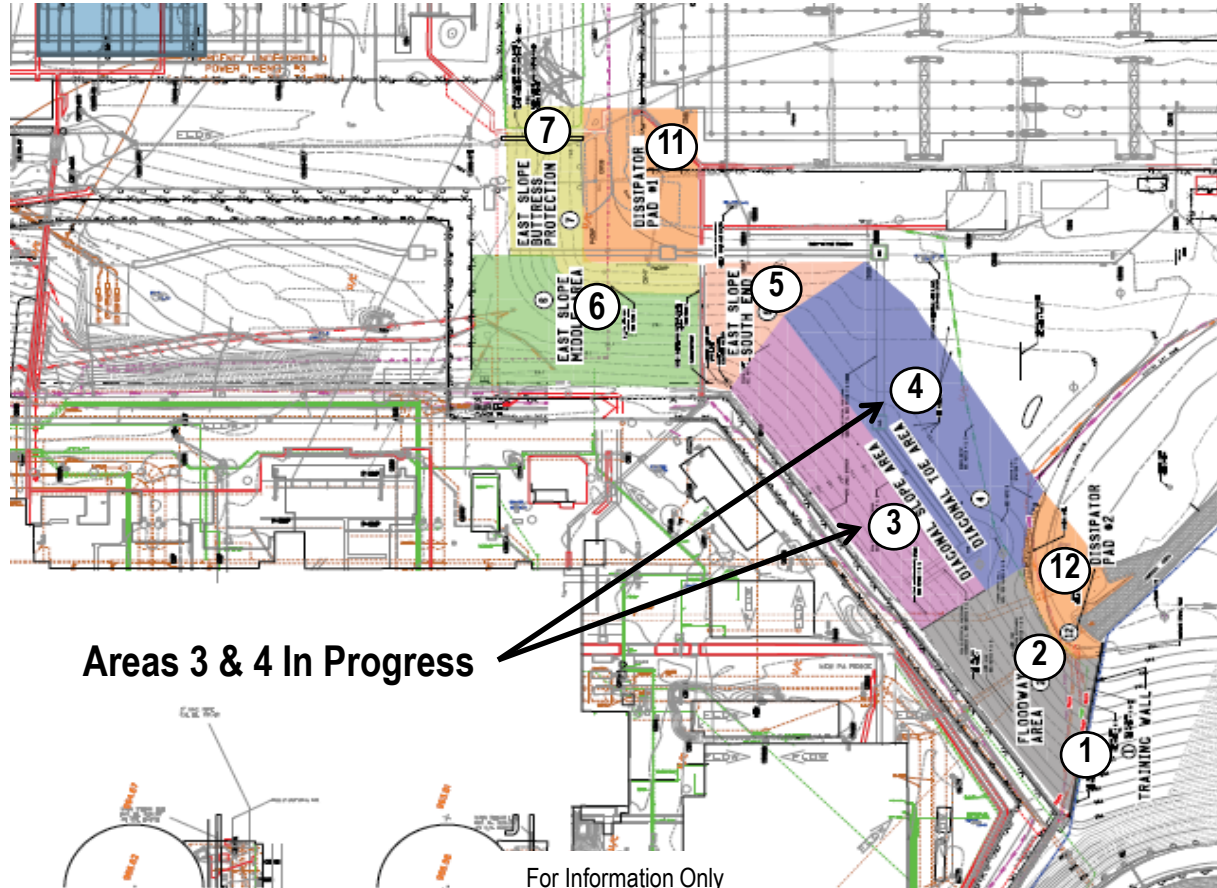
FANT Transmission Line Relocation - Complete

- Provides back-up emergency power upon the assumed loss of Keowee
- 22 towers relocated above the flood plain between Oconee and Central switchyard
- Modifications complete with the new line is in service

New transmission line segments rerouted above the postulated flood plain



Scour Protection – East Slope



Areas 3 & 4 In Progress

For Information Only

Scour Protection Schedule – East Slope Areas

- **Areas 3, 4**

- Construction Completion

Schedule

March 31, 2014

- **Areas 5, 6, 7, 11**

- Engineering Completion
- Construction Completion

October, 2014

June, 2015

- **Areas 1, 2, 12**

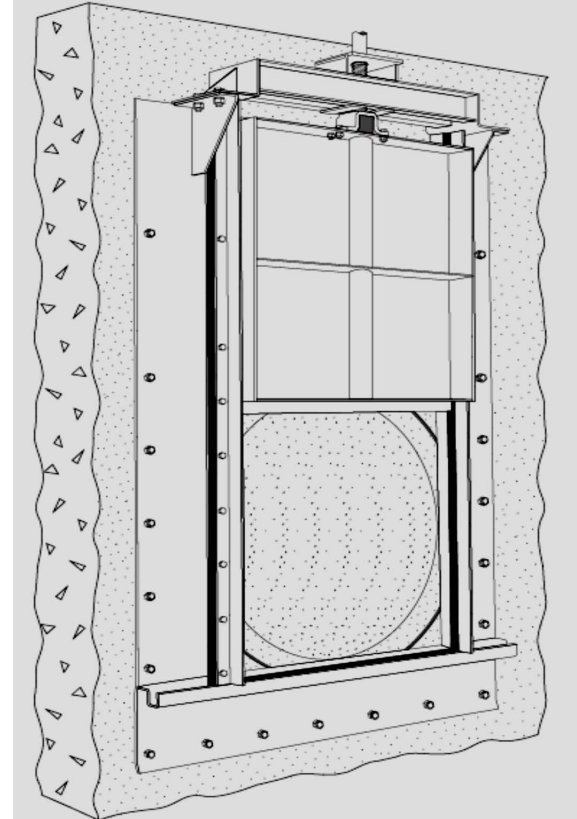
- Engineering Completion
- Construction Completion

December, 2014

June, 2015

Vertical Sliding Gate

- No impact on drain line integrity
- No impact on drain line flow capability
- Seismic qualification to ensure gate is secure in a seismic event
- Trash cage barrier reconfiguration will be required to allow clearance and operator access
- Detail design in progress



■ **Local Intense Precipitation (LIP)**

- Interim actions in place and inspected by NRC
- Engineering work performed to evaluate mitigation/protection alternatives
- Proposed LIP modifications to meet the Integrated Assessment requirements will focus on protecting the reactor cores, spent fuel and containments
- Proposed LIP modifications are targeted for 2017

Preston Gillespie

Senior Vice President, Nuclear Operations

- AHU – Air Handling Unit
- AWC – Alternate Chilled Water
- HPI – High Pressure Injection
- I&C – Instrumentation and Control
- KVA – Kilovolt-ampere
- MCC – Motor Control Center
- NFPA – National Fire Protection Association
- PSW – Protected Service Water
- SSF – Standby Shutdown Facility
- VAC – Volts Alternating Current

