



Oconee Nuclear Station Pre-Decisional Enforcement Conference

NFPA 805: Implementation of Protected Service Water (PSW) System



*NRC Headquarters
Rockville, MD
March 5, 2013*



Oconee Participants

- **Regis Repko** Senior Vice President Nuclear Operations
- **Preston Gillespie** Oconee Site Vice President
- **Tom Ray** Oconee Plant Manager
- **Ed Burchfield** Oconee Engineering Manager
- **Bob Guy** Oconee Organizational Effectiveness Manager
- **Chris Nolan** Regulatory Affairs Director
- **Jim Fuller** General Manager, PSW Project
- **Lara Nichols** Deputy General Counsel
- **Terry Patterson** Oconee Safety Assurance Manager
- **Bob Rishel** Fleet Probabilistic Risk Assessment Manager
- **David Goforth** NFPA 805 Transition Senior Project Manager

Agenda

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|---------------------------------|-------------------|
| ▪ Opening Remarks | Preston Gillespie |
| ▪ Compensatory Actions | Tom Ray |
| ▪ Causes and Corrective Actions | Bob Guy |
| ▪ Risk Perspective | Ed Burchfield |
| ▪ Event Significance | Chris Nolan |
| ▪ Closing Remarks | Regis Repko |

Opening Remarks

Preston Gillespie

Opening Remarks

- Oconee agrees with the apparent violation described in the NRC's letter dated January 31, 2013.
- As an NFPA 805 pilot plant, Oconee has worked closely with the NRC, the industry, and stakeholders to address the requirements associated with transitioning to NFPA 805.
- NFPA 805 transition is complex and resource intensive.
- NFPA 805 is the right thing to do. Our perspective on the benefits it provides has not changed.

Opening Remarks

- NFPA 805 transition provides risk benefits to the facility. Functions for achieving these risk benefits include:
 - Providing commercial power from PSW to the Standby Shutdown Facility (SSF)
 - Providing an additional power source to the SSF from the Keowee facility
 - Completing the balance of work activities to implement NFPA 805
- Completion of each function provides incremental risk improvement.

Opening Remarks

- Upcoming incremental risk benefits do not excuse the fact that we missed our committed implementation date.
- They do serve to highlight that the benefits of our NFPA 805 transition are being introduced into the operating facility.
- Duke Energy is committed to completing the work needed to fully realize the safety and risk benefits of the NFPA 805 program.

Compensatory Actions

Tom Ray

Compensatory Actions

Actions to Enhance Mitigation

Thermal hydraulic
scoping study
used to identify the
alternate steam
generator feed
approach for core
cooling



Compensatory Actions

Actions to Enhance Mitigation

Simulator used to validate operator actions for revised Emergency Operating Procedure (EOP)



Compensatory Actions

Actions to Enhance Mitigation

Focused EOP training for operators includes classroom instruction and simulator scenarios.



Compensatory Actions

Actions to Enhance Mitigation

Pre-staged
diesel driven
portable
pump for
backup feed
of steam
generators



Compensatory Actions

Actions to Enhance Mitigation

Pre-staged 2nd portable diesel driven pump as backup water source for the station's fire suppression system



Compensatory Actions

Actions to Enhance Mitigation

Robust fire brigade shift staffing supported by local fire fighting assets



Compensatory Actions

Actions to Reduce Fire Exposure

Fire Protection Engineer approval for hot work in high safety significant fire zones



Compensatory Actions

Actions to Reduce Fire Exposure

Rapid response to impaired fire mitigation/detection equipment



Compensatory Actions

Added Actions when SSF is Out of Service



Maximize readiness of the diesel driven portable pump to provide defense in depth capability to feed the steam generators



Compensatory Actions

Added Actions when SSF is Out of Service

Augmented
shift staffing
for rapid
response to
EOP driven
field actions





Compensatory Actions

Added Actions when SSF is Out of Service

Thermal scans
of risk
significant
sections of
4KV bus ducts



Compensatory Actions

Added Actions when SSF is Out of Service

Protecting
additional
equipment



Causes and Corrective Actions

Bob Guy



Causes and Corrective Actions Evaluation Team and Scope

- Scope included fleet and ONS oversight of PSW project implementation schedule adherence and timeliness
- The Root Cause Team (RCT)
 - Senior Vice President, Nuclear Operations - sponsor
 - Staffed with experienced personnel
 - Included independent members



Causes and Corrective Actions

Root Causes

- A flawed project plan led to risks that were not fully understood or appropriately addressed through proactive compensatory measures.
- Unexpected quality challenges with vendors resulted in rework, contributing to overall project completion schedule delays.



Causes and Corrective Actions

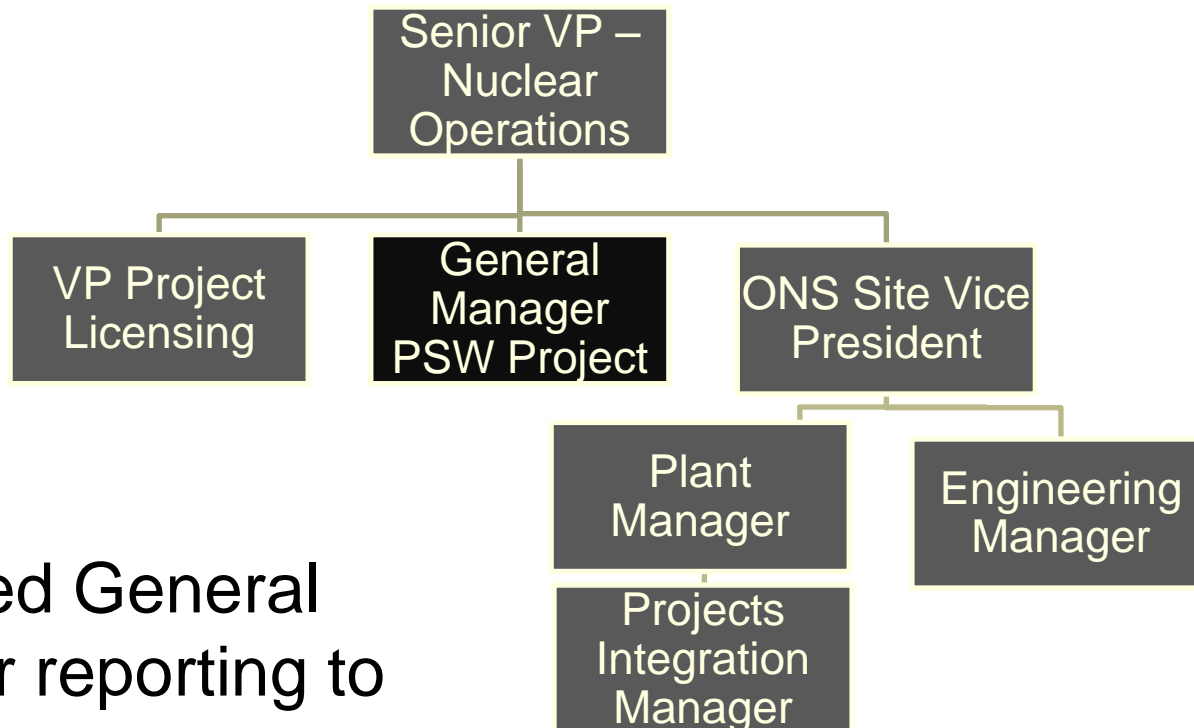
Extent of Condition

- Evaluated major projects fleet-wide that may have similar vulnerabilities, for example:
 - NFPA 805 implementation
 - Fukushima response activities
- Evaluation of project plans will be conducted.



Causes and Corrective Actions

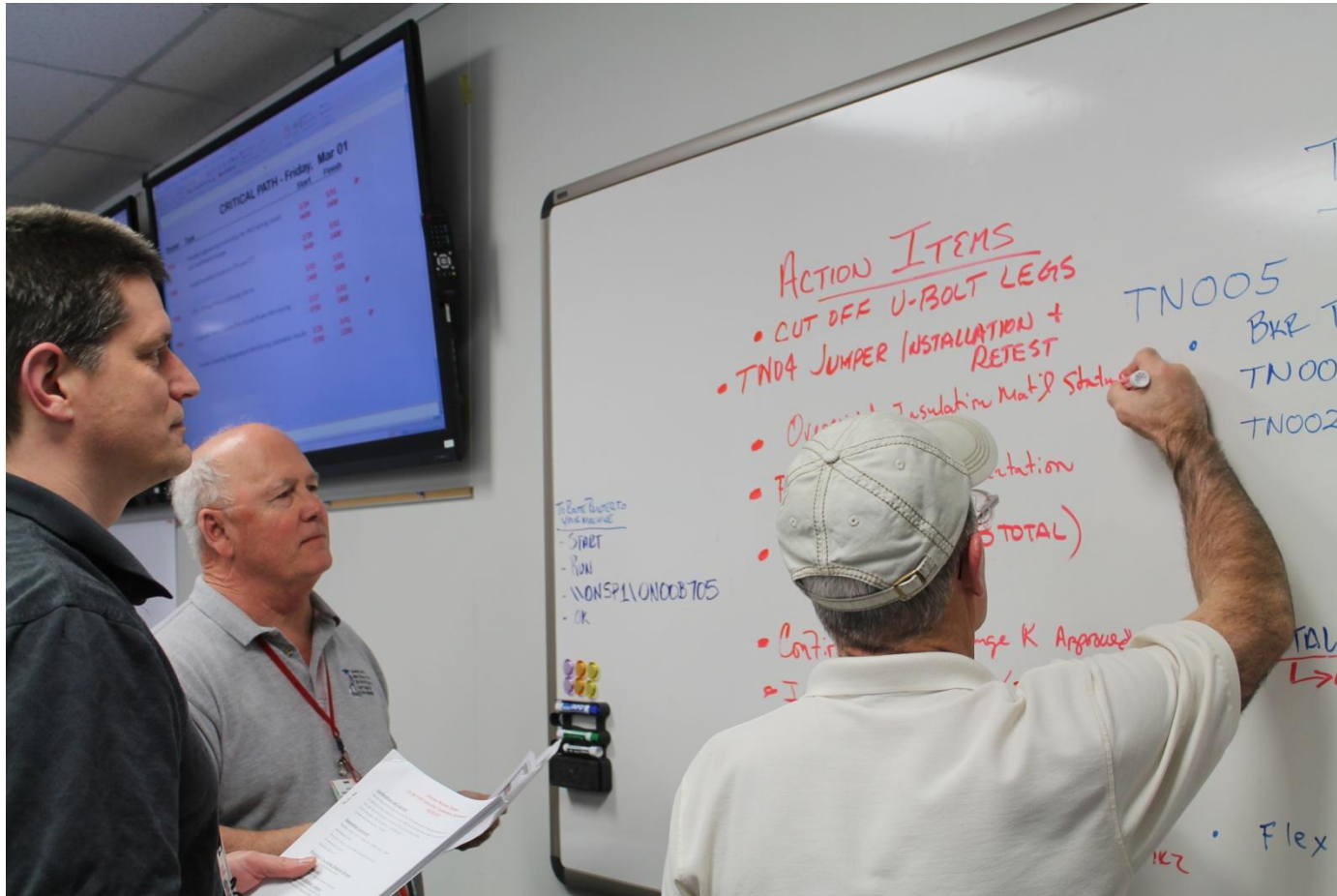
Completed Actions



Dedicated General Manager reporting to Senior VP for Nuclear Operations

Causes and Corrective Actions

Completed Actions



Established Project Command Center to direct PSW activities



Causes and Corrective Actions Completed Actions



Increased the oversight of project schedule implementation

Causes and Corrective Actions **Completed Actions**



Improved
vendor
oversight and
coordination



Causes and Corrective Actions

Planned Corrective Actions

- Finalize and document plant level PSW design basis
- Finalize schedule for the completion of the design effort
- Revise PSW Project final implementation schedule following independent 3rd party review
- Establish detailed Risk Mitigation Plan
- Identify and evaluate the PSW services providers and contractors for restriction or removal from the approved supplier list



Causes and Corrective Actions

Planned Corrective Actions

- Revise policy for NRC commitments for future major projects
- Strengthen standards for project management
- Improve standards for vendor oversight
- Implement industry best practices for procurement specifications
- Strengthen governance and oversight

Risk Perspective

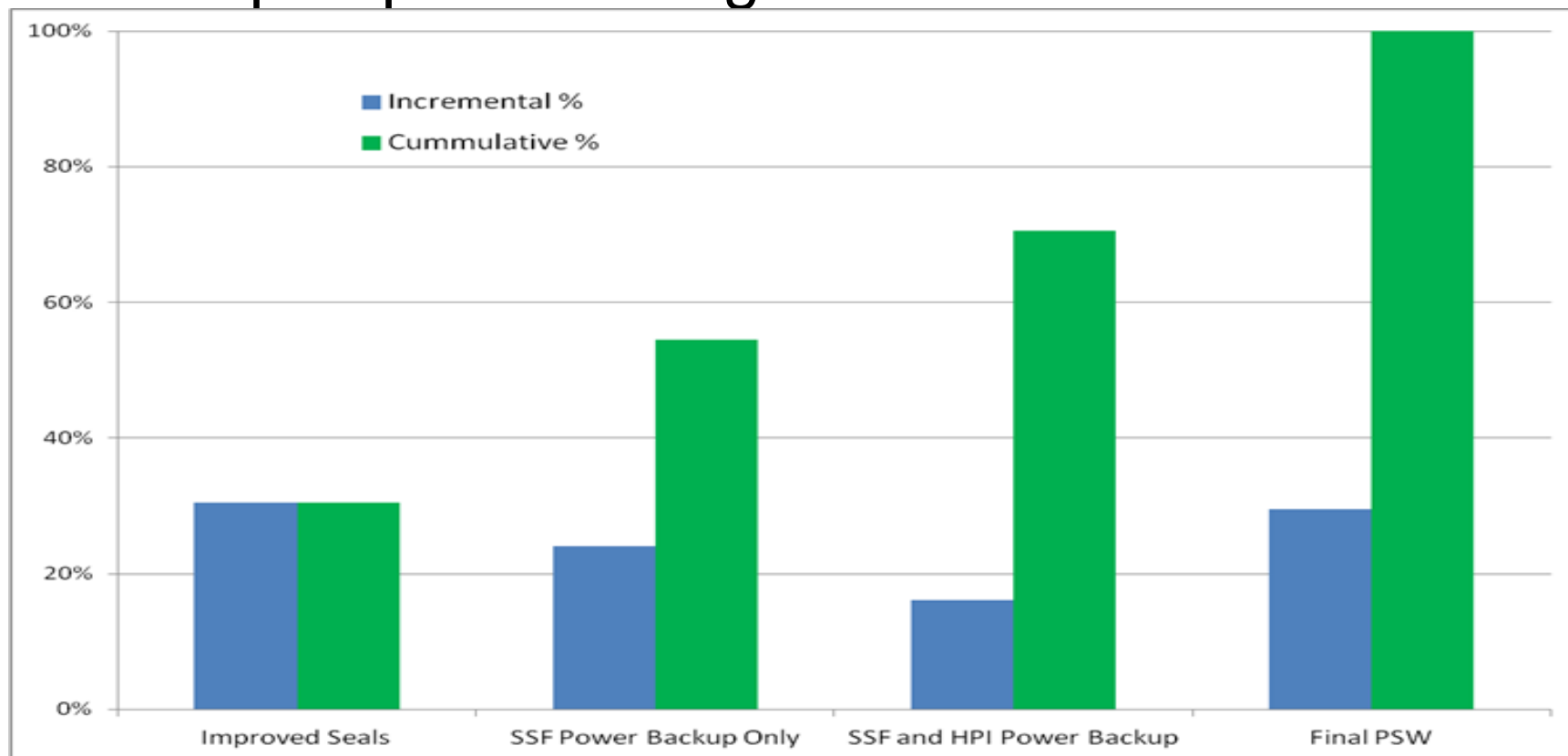
Ed Burchfield

Risk Perspective

- The PSW Project has three key functions that provide backup capability for existing systems:
 - SSF backup power source
 - Backup power to selected HPI components
 - High head steam generator feed pump that replaces the existing low head pump

Risk Perspective

Estimated risk benefit including credit for reactor coolant pump low leakage seals



Risk Perspective

- Estimated reduction in fire core damage frequency of $0.9\text{E-}5$ associated with providing commercial power from PSW to the SSF will be realized by October 1, 2013.
- Estimated reduction in fire core damage frequency of $1.1\text{E-}5$ achieved through use of low leakage reactor coolant pump seals.
 - As of the fall 2012, all three units have low leakage reactor coolant pump seals installed.
- Approximately 50% of the fire risk benefit will be realized by October 1, 2013.

Risk Perspective

- Schedule for remaining portions of NFPA 805 conversion activities will be available within 90 days of issuance of safety evaluation report.
- Date for NFPA 805 implementation is November 15, 2016.

Risk Perspective

- Oconee has demonstrated a sustained commitment to improve plant safety:
 - Reactor vessel head replacements
 - Low Pressure Injection System cross-connect
 - Keowee Digital Governor and Exciter
 - Keowee underground cable replacement
 - Low leakage RCP seals
 - Natural Phenomena Barrier System
 - Upgrade of Lee Combustion Turbines
 - Digital Reactor Protective and Engineered Safeguards System
 - Conversion to Digital Control Systems (Control Rod Drive, Turbine Control, Feedwater Pump Control, Integrated Control System, Automatic Voltage Regulator)

Event Significance

Chris Nolan

Event Significance

- Oconee agrees with the facts identified in the apparent violation.
- PSW provides an important risk enhancement.
- The potential consequences of the apparent violation have been mitigated:
 - Oconee is safe as a result of compensatory measures maintained through the transition to NFPA 805.
 - Safety is further enhanced through the additional compensatory measures.
 - Failure to complete PSW modification does not result in an increase in plant risk from the current plant risk profile.

Event Significance

- The significance of the apparent violation should be considered at Severity Level III:
 - NRC decision to approve the transition to NFPA 805 was based on PSW implementation.
- Other considerations:
 - Violation was not repetitive
 - Violation was licensee identified
 - Timely implementation of compensatory measures
 - Comprehensive actions to prevent recurrence
 - Degree to which the violation was preventable

Event Significance

- Civil Penalty Considerations:
 - There were no actual consequences.
 - This condition was licensee identified.
 - Actions were timely and comprehensive.
 - License amendment request was submitted.
 - Additional compensatory measures were implemented.
 - Comprehensive actions were taken or planned.
 - Extent-of-condition to be evaluated with fleet perspective.
 - Oconee continues to demonstrate its commitment to improving plant safety through NFPA 805 implementation and other projects.

Closing Remarks

Regis Repko