



Implementation of a Risk-informed Surveillance Frequency Control Program For The NextEra Energy Nuclear Fleet

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Overview

- **Background of the NEE 5b Program**
- **NEE's Business Plan Strategic Initiative**
- **Follow-on Evaluations Completed**
- **Lessons Learned**
- **Future Plans (including 4b and 10CFR50.69)**
- **Conclusions**

Overview of NEE 5b Program

- **Duane Arnold and Seabrook had obtained their 5b SERs in the 2012 and 2014, respectively**
 - Site procedures were prepared, IDPs established, and several minor surveillance frequency changes were investigated
- **St. Lucie, Turkey Point, and Point Beach submitted their LARs later and received NRC approvals in mid-2015**

Business Plan Strategic Initiative

- **NEE Management was aware of the potential benefits of use of the 5b process and wanted to encourage broader usage.**
- **In early 2015, a strategic initiative was added to the fleet business plan to implement the extension of the outage EDG-ESFAS LOOP/LOCA testing prior to the upcoming refueling outages (staggered testing of trains).**

Business Plan Strategic Initiative (continued)

- **Outage schedule:**
 - Fall 2015: Seabrook, St. Lucie 2, Point Beach 2, Turkey Point 3
 - 2016: St. Lucie 1, Point Beach 1, Turkey Point 4, and Duane Arnold
- **These tests are very complex, satisfying multiple Technical Specification SRs, involving multiple plant systems, and often having interfaces with other surveillance test procedures (e.g., ESF response time testing).**
- **These tests are often critical path, require a number of system re-alignments, and make one train of ESF inoperable during the testing.**

Getting the Evaluations Done

- **The 2015 evaluations were done as five separate projects, running in parallel.**
- **For most plants, the first surveillance test change the IDP would consider would be the EDG-ESF test.**
 - Multiple SRs, multiple systems, testing major components
 - IDP members had to come up to speed quickly on the 5b process, but they did a good job of learning the process, asking probing questions, and taking ownership to implement the change

Getting the Evaluations Done (continued)

- **Some specific challenges:**
 - Fleet procedures had to be developed, building on the Duane Arnold and Seabrook site-specific procedures
 - The SERs for St. Lucie, Turkey Point, and Point Beach were expected in summer 2015 (while the evaluations were underway)
 - Dual unit impacts needed to be considered for Point Beach and Turkey Point (which share four EDGs and other equipment)

Getting the Evaluations Done (continued)

- **Joint NEE/consultant teams were established**
 - Evaluation teams performed the bulk of the work evaluating equipment performance, examining regulatory commitments, and evaluating risk impacts
 - Support provided on an as-needed basis by Licensing, Operations and System Engineering staff at each site
- **At a few sites, dedicated NEE site project managers were assigned; the corporate PRA group provided project management for the other sites**

Getting the Evaluations Done (continued)

- **For those plants that had not yet received their LAR approvals, unofficial IDP meetings were conducted once the evaluations were completed**
 - Follow-up “official” meetings were the conducted after receipt of the SER and the completion formal IDP training.
- **For post-implementation monitoring, a change was made to the fleet Equipment Apparent Cause Evaluation procedure to flag failures that could pertain to 5b extensions**

Getting the Evaluations Done (continued)

- **All sites were able to evaluate and approve extensions to the EDG testing in time for the fall 2015 outages**
 - Each resulted in outage time and labor savings that were immediately recognized as beneficial by plant staff
- **Work then began on the remaining units, and these too were able to have their extensions completed in time to support the 2016 outages**

Benefits of the Strategic Initiative

- **The implementation of the EDG test frequency changes demonstrated to each plant's staff the value that the 5b process could provide**
- **Subsequent to the completion of the EDG test evaluations, each of the plants embarked on additional 5b projects based on suggestions from plant staff**
 - Some done using only in-house staff; others using a NEE/consultant team

Additional Evaluations Performed

Plant	5b Extensions Performed
St. Lucie	<ul style="list-style-type: none"> • RPS Actuation Logic and Reactor Trip Breaker Testing • Gas Accumulation Management Program (GAMP) Monitoring • Full Length Control Element Assembly Testing
Seabrook	<ul style="list-style-type: none"> • ESFAS Slave Relay Testing • RPS Actuation Logic Testing • RPS/ESFAS Analog Channel Testing • RPS Reactor Trip Breaker Testing • SI Accumulator Boron Sampling
Duane Arnold	<ul style="list-style-type: none"> • River Water System Testing • Auto Scram Functional Test • Several others in review
Turkey Point	<ul style="list-style-type: none"> • Containment Integrity Checks • LLRT Purge Valve Test
Point Beach	<ul style="list-style-type: none"> • SI Accumulator Boron Testing • Reviewing other extensions

Lessons Learned

- **Senior management support is vital**
 - 5b needs to be a strategic initiative priority
- **A dedicated “core team” to perform most of the 5b evaluation steps is needed**
 - Difficult for staff to do while performing routine plant duties
- **Consider performing the same evaluations for all sites in a fleet**

Lessons Learned (continued)

- **Education of plant staff about 5b capabilities and benefits helps to identify candidates for extension**
- **The NEI 04-10 evaluation template (based on test changes that involved only a limited set of components) had to be modified to address tests that involve multiple SRs and large numbers of equipment**
 - Added tables and attachments to capture data more effectively

Future Plans

- **NEE is building a dedicated internal 5b evaluation team to move forward more quickly on additional test extension evaluations**
 - Team will be led by NEE corporate office
 - Will focus on evaluating similar sets of test changes for all plant sites
 - Candidates would be selected based on available site resources, benefits for supporting planned single-train outages, surveillance test changes already implemented in the industry, and other relevant industry initiatives
- **NEE hopes to utilize an NEI database of completed surveillance test extensions to support this effort and to share NEE evaluations with others**

Future Plans (continued)

- **St Lucie and Turkey Point have also applied for Risk Managed Tech Specs (4b)**
 - LAR approval is expected soon now that Vogtle approval has been granted
 - Currently working on fleet implementation procedures and staff training packages per the Change Management Plan
 - PRA models for both plants are also completing updates for internal events and fire PRAs
 - These models will be used in the PHOENIX Risk Monitor to support the RMTS process

Future Plans (continued)

- **Risk-Informed Engineering Programs (10 CFR 50.69)**
 - NEE just completed PRA Findings closure reviews for all of its plants in support of LAR preparation for 50.69 implementation
 - Recently completed a draft feasibility study at Duane Arnold to see if portions of the Control Room HVAC system could be categorized as low risk
 - Study determined that re-characterization of the chillers should be possible, which could result in significant cost savings for planned chiller replacement in the next few years

Conclusions

- **A Risk-Informed Surveillance Frequency Control Program can provide benefits in outage length reduction, on-line testing manpower, dose savings, etc.**
- **However, expenditure of resources is required to perform the initial STI change evaluations, as well as to perform ongoing monitoring by plant staff and the IDP.**
- **There must be a strong management commitment to perform the test extension evaluations**
- **Initial successes need to be publicized in the plant to spur interest in performing further test frequency extensions**
- **Having a dedicated team and project manager to perform the test extensions can help to improve efficiency and speed of implementing test extensions at the plant.**



Questions?