RAPID
Technical Conference and Vendor Exhibit

Delivering The Nuclear Promise - SC-02 Material Cost Reduction

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May 2017

Agenda

- Delivering the Nuclear Promise (DNP)
- Procurement Scenarios – NextEra Energy
- Questions

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- **Procurement Scenarios– NextEra Energy**
- **Questions**

Introduction

- Material cost reduction may be realized through cost effective procurement scenarios such as the application of commercial grade dedication, seismic testing, reverse engineering, and electronic component repairs, ensuring efficient processes with metrics to measure quality production, and savings.
- In order for Nuclear Power to remain a viable option in the upcoming years, the cost of electricity from nuclear plants must be competitive with alternative sources.
- Reduction of capital, fuel and operations and maintenance costs while maintaining quality is of paramount importance to keep nuclear power competitive.

Reduce O&M spend for our materials

SC-02 Material Cost Reduction

- **Outcome will have a transition from a site-centric structure to a centralized model consisting of a group with the following areas:**
  - Procurement Engineering
  - Commercial Grade Dedication
  - Circuit Card Repair/Refurb
  - Reverse Engineering/Alternate Sourcing
  - Seismic Testing
- **Benefits include:**
  - Reduced parts cost and lead times
  - Buying in bulk for the industry to bring down cost of dedication
  - Bridging strategy support for engineering mods and capital projects
  - Readily available in-house expertise in multiple disciplines
  - Challenging Safety Class

Reduce O&M spend for our materials

NEXTera ENERGY

SC-02 Material Cost Reduction

- **Team members include representation from**
  - NextEra Energy
  - Dominion
  - Duke
  - EPRI
  - Talen Energy
  - PSEG
  - Exelon
  - Southern
  - Entergy

SC-02 Material Cost Reduction
Milestones and Statuses

- **First milestone action was to assess the current industry organization structures**
  - Survey went out to the industry in March of 2016; 17 of 22 utilities provided responses (COMPLETE)
- **White Paper/Efficiency Bulletin (EB)**
  - White paper defines the methods for material cost reduction, the screening/prioritization criteria, different options for performing those methods, and the capabilities for insourcing or out-sourcing (COMPLETE); EB summarizes initiative to the industry (COMPLETE)
- **Next steps for the Industry:**
  - Analyze current inventory segregation to identify potential cost reduction opportunities for each utility
  - Assess current in house capabilities/resources for each utility

Delivering The Nuclear Promise - SC02- Survey

Survey Results

Date:	April 25, 2016
Target:	Electric Utilities
Population:	22 utilities
Responses:	17 (77% of total population)

- **Responses from the following utilities:**
  - Exelon
  - Dominion
  - Duke
  - Southern
  - STP Nuclear
  - First Energy
  - PSEG
  - Luminant Power
  - WCNOC
  - Diablo Canyon (PG&E)
  - Talen Energy (Susquehanna)
  - Energy Northwest (Columbia)
  - Arizona Public Service (Palo Verde)
  - OPG
  - Xcel Energy
  - SCE&G
  - NextEra Energy

Delivering The Nuclear Promise

SC-02 Efficiency Bulletin

efficiency bulletin

Oct. 27, 2016

Color Code: Green

DELIVERING THE NUCLEAR PROMISE

nuclear matters:
my work • my plant • my industry

Efficiency Bulletin: 16-30

Material Cost Reduction While Maintaining Quality

Material cost reduction may be realized through cost-effective procurement scenarios such as application of commercial grade dedication, reverse engineering and electronic component repairs, ensuring efficient processes with metrics to measure quality production and savings.

Addressees: Chief nuclear officers, NEI APCs and INPO APCs

Issue: SC-02, Material Cost Reduction

Summary of Efficiency Opportunity

- Desired end-state—Nuclear plant sites' supply chain technical services group consisting of procurement engineering, commercial grade dedication, seismic testing, electronic component repairs and reverse engineering will be transitioned from a traditional site-centric structure to a central, corporate-led organization.

  It is recognized that not all utilities are structured the same way with single-reactor and multireactor stations; some are strictly nuclear utilities, while others have a blended portfolio of generation. However, the optimum structure to maximize benefits for material cost reduction is through a centralized procurement engineering services organization with very clear interface boundaries with supply chain, engineering, maintenance and planning as defined and agreed upon by upper management. This allows for greater focus on core business efficiencies, governance and oversight, reduced overlap of personnel performing duplicate functions, shared test equipment in labs, standardized policies and procedures, utility-wide prioritization, and aggressive focus on fiscally responsible procurement decisions.

NEI
NUCLEAR ENERGY INSTITUTE

The Nuclear Energy Institute is the nuclear energy industry's policy organization.

This bulletin and additional information about nuclear energy are available at nei.org.

1201 F Street, NW
Washington, DC 20004
NEI.org

- Value proposition (vision of excellence)—For maximum material cost reductions, all options with the procurement engineering area of responsibility (including but not limited to procurement engineering, commercial grade dedication, seismic testing, electronic component repairs and reverse engineering) should be used with engineering technical rigor to assure that the procurement strategies result in the least cost to the utility. For long-term fiscal sustainability, it is recommended that the industry settle on consistent measurements for these initiatives and their relative cost savings calculations. For internal customer charges, each utility will need to address overhead dependence on their overall supply chain organizational structure and accepted accounting practices. Consideration of savings does recognize that successful implementation may involve upfront investment in terms of additional equipment, personnel, training and facilities and may require prompt initiation of internal processes such as procedures, process development and business cases to expedite implementation. As organizational experience increases and investments in capital equipment are amortized over time, the cost of expansion decreases. By using these strategies, you may save an average of 50 percent on materials. With mature organizations currently performing these cost-effective processes, the savings are expected to be $750,000 per generating unit.

- Why is it important?—The benefits include, but are not limited to: reduced parts cost and lead times, buying in bulk to bring down the cost of dedication, bridging strategy support for engineering modifications and capital projects, and readily available in-house expertise in multiple disciplines. Safety and reliability will be enhanced through cohesive, standard application of work flows and prioritization of production schedules. Economic performance will come in the form of cost reduction driven by the output of described services and long-term savings will be derived by application of those services on a fleetwide basis leading to optimization of head count and removal of low-value work.

- Industry benchmark value(s)—Per the SC-02 industry survey, it was determined that, on average, each utility is dedicating approximately 20 percent of safety-related inventory. This shows that the industry has the potential to grow in commercial grade dedication and seismic testing. Each utility is reverse engineering less than 5 percent of safety-related inventory (on average), which also shows that the industry has the potential to grow in reverse engineering. Eight utilities said that they had some form of a circuit card lab, but most of these labs have very limited capabilities. Therefore, there is room to grow in all areas of responsibility for the supply chain technical services group.

Relevant Standards

- EPRI TR 3002002982, "Guideline for the Acceptance of Commercial-Grade Items in Nuclear Safety-Related Applications."
- EPRI TR-107372, "Guidelines for Reverse Engineering at Nuclear Power Plants."

Relevant Regulatory Requirement

- U.S. Code of Federal Regulations, Title 10, Chapter 1, Appendix B to Part 50, "Quality Assurance Criteria for

Key to Color Codes:

Red: NSIAC initiative – full participation required for viability
Blue: Action expected at all sites, but is not needed for broad industry viability
Green: Utility discretion to implement, consistent with its business environment

Delivering The Nuclear Promise

SC-02 Efficiency Bulletin

Nuclear Power Plants and Fuel Reprocessing Facilities." And, Part 21, "Reporting of Defects and Noncompliance." Office of the Federal Register, National Archives and Records Administration, U.S. Government Printing Office, Washington, D.C.

Guidance

- NRC IN 2016-09 "Recent Issues Identified When Using Reverse Engineering Techniques in the Procurement of Safety-Related Components"
- NRC Inspection Procedure 43004 , "Inspection of Commercial Grade Dedication"
- NRC IN 2014-11 "Recent Issues Related to the Qualification and Commercial Grade Dedication of Safety-Related Components"
- NRC IN 2011-01, "Commercial Grade Dedication Issues Identified During NRC Inspection"
- NRC DG-1292, "Dedication of Commercial-Grade Items for Use in Nuclear Power Plants."

Recommended Industry Actions

- Implement actions in the SC-02 white paper titled "Material Cost Reduction," dated July 19, 2016.
- Material cost reduction should consider items that can leverage economies of scale in the industry:
  - Standardization of procurement engineering practices and documentation to create consistent documentation packages and support the sharing of procurement engineering personnel and inventory between utilities.
  - Creation of "Centers of Excellence" within utilities, utility groups (e.g. Utilities Services Alliance), and/or among suppliers to support procurement engineering, commercial grade dedication, seismic testing, electronic component repairs and reverse engineering activities. These Centers of Excellence would be the focal points for the completion of these activities for utilities, minimizing required individual utility investments in each area. They would allow utilities to focus on their core business of operating their plants.

Change Management Considerations

Industry Activities

- Industry webinar to provide background for initiative, discussion, and an open forum to clarify expectations and ask questions. Webinar information can be found at the following site: https://web.inpo.org/Pages/Nuclear-Promise-Issues.aspx.
- Discuss at regional supply chain meetings and routine industry conference calls.
- The Electric Power Research Institute is evaluating an update to TR-107372 to address current NRC concerns with reverse engineering.

Company Actions

- Obtain an understanding of organizational models, financial models (number of times or length of time that savings can be claimed for each line item, method used to include cost of labor and facilities in the calculation, etc.), economies of scale (number of units supported, ability to aggregate) and maturity of commercial grade dedication/reverse engineering/electronic component repairs programs to gain an understanding of actions needed to obtain savings.
- Implement team to lead the efforts for this initiative.

Guiderails

- Ensure that a process exists for the utility to be able to calculate and report out cost savings.

Report Your Site's Results

Please report your company's implementation of this improvement opportunity, including the date of completion. Send this information along with your company point of contact to EfficiencyBulletin@NEI.org.

Industry Contacts

- Industry champion for this issue: Matthew Gooder, 630-657-3651, Matthew.Gooder@exeloncorp.com
- EPRI Contact: Marc Tannenbaum,704-595-2609, mtannenbaum@epri.com
- INPO Contact: Undrenia Burnside, 770-644-8883, burnsideu@inpo.org
- NEI Contact: Nima Ashkeboussi, 202-739-8022, nxa@nei.org

- On the web: www.nei.org/bulletin1630

Industry Approval:

Adam C. Heflin, CNO Lead

Anthony R. Pietrangelo, Nuclear Energy Institute

Delivering The Nuclear Promise

SC-02 Data Sheet

Detailed Data Sheet
Delivering the Nuclear Promise Improvement Opportunity (IO)
Title: Material Cost Reduction
IO#: SC-02 Date: 12/29/15 (Rev 06/08/16)

Level 1 Milestone Schedule *(High level schedule that identifies the key milestones and their expected target dates)*

Milestone	Start Date	Completion Date	Responsible Group/ Resource
1. Assess current org structures	1/2016	COMPLETE	Supply Chain/Engineering (as applicable)
2. White paper delineating organizational structure for Technical Services resulting in Material Cost Reduction including defining the methods for material cost reduction, defining the screening/prioritization criteria, the different options for performing those methods and capabilities for in sourcing or out-sourcing.	3/2016	COMPLETE	SC-02 team **WhitePaper to SC-02 Team**
3. Benchmark to gain best practices and opportunities.	3/2016	COMPLETE	Supply Chain/Engineering (as applicable) (5 Utilities outstanding on their response).
4. Analyze current inventory segregation to identify potential opportunities-work with NEE to ensure benefit of opportunities is accomplished A) Evaluate current SR inventory/purchasing opportunities to determine potential candidates to transition to CGD 1. Review seismic sensitive items to determine potential candidates to transition to CGD with seismic testing or seismic testing at 3rd party B) Review inventory/purchasing opportunities for transition to reverse engineering for cost savings and/or obsolescence opportunities C) Review electronic boards/modules purchases and inventory for potential to explore alternative processes to procure and/or repair	5/2016	COMPLETE	Supply Chain/Engineering (as applicable) **Financial spreadsheet**
5. Efficiency Bulletin delineating organizational structure resulting in	5/2016	COMPLETE	SC-02 team

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Material Cost Reduction including defining the methods for material cost reduction, defining the screening/prioritization criteria, the different options for performing those methods and capabilities for in sourcing or out-sourcing.			
6. Assess current in house capabilities/resources (cost benefit analysis and infrastructure requirements need to be considered) A) Evaluate expansion of in house testing capabilities B) Look for opportunity to partner with other suppliers/utilities	8/2016	11/2016	Supply Chain/Engineering (as applicable) Targeting $750,000 per unit
7. Implement outcome of Milestone # 4	11/2016	3/2017	Supply Chain/Engineering (as applicable)
8. Establish protocol and timeline with SC-02 Team to conduct an effectiveness review.	12/2016	3/2017	Supply Chain/Engineering (as applicable)
9. Monitor progress of conversion of materials based on overall savings.	ongoing	n/a	Supply Chain/Engineering (as applicable)
10.			
11.			

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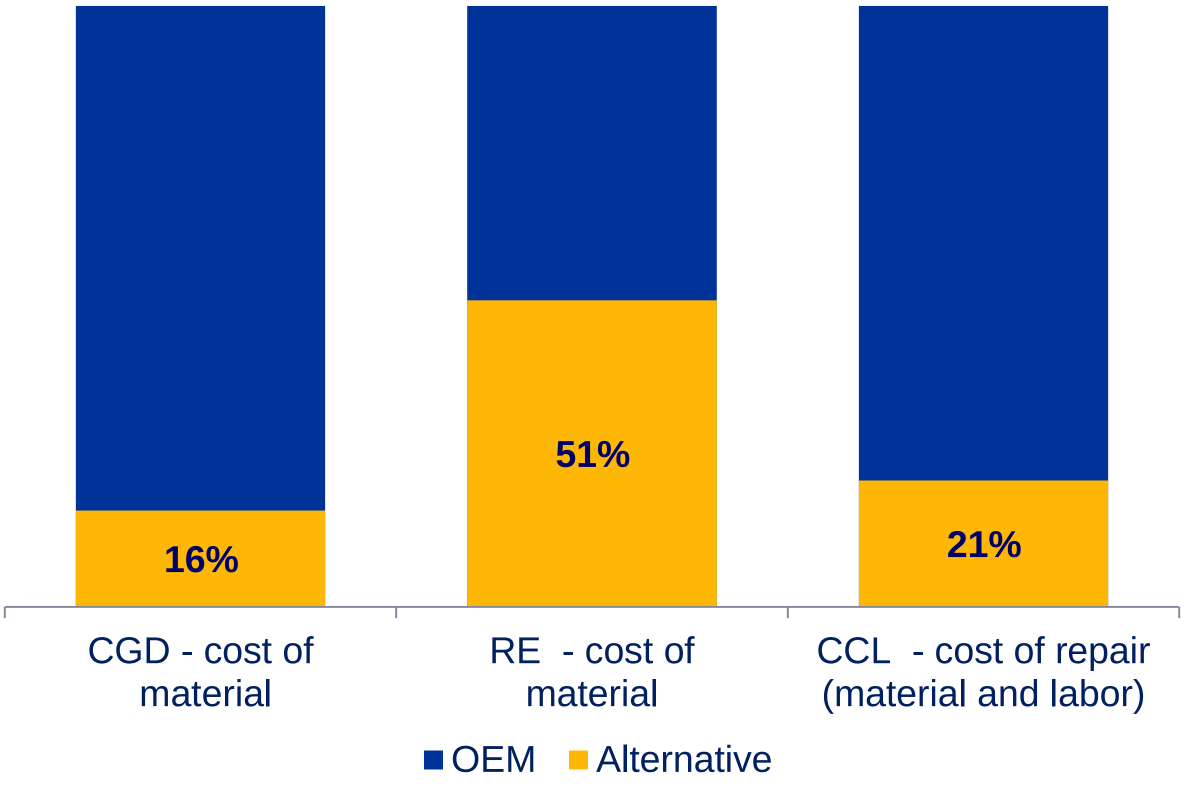
Procurement Scenarios

OEM Cost vs. Alternative



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