



SSPS Lessons Learned

Norbert Carte (NRC/NRR/DE/EICB)

July 1, 2015

Outline

- Context
- Challenges
- PWROG Involvement
- Direct Interactions with Engineers
- Frequent Technical Exchanges
- SharePoint
- Project Specific Characteristics
- Summary of Lessons Learned

Context

- SSPS is a Proven System (and Components)
- New-design Components Already Completed:
 - Design, Manufacturing, Test, & Installation
- Licensing Aspects addressed in Topical Report
 - It would be interesting to compare the level of effort between licensing and developmental activities.
- Evolving Regulatory Criteria
 - ISGs, RGs, SRP, STDs, ...

Challenges

- Short Span Time for Project
 - Engineering done and documented
 - Only Licensing
 - Several months to develop the topical report
 - Seven months to evaluate it
- Common Understanding of Regulatory Criteria
 - Terminology
 - e.g., Software
 - Model behind endorsed standards

PWROG Involvement

- Customer Representative/Advocate
- Development of Cards
 - Operating experience
 - Elimination of single point vulnerability's
 - Improved diagnostics
 - Testing of prototypes
 - Diversity
 - Independence
- Topical Report
 - Apply pressure to vendor

Direct Interaction with Engineers

- PWROG Engineers – Plant Experts
- Westinghouse Engineers – Equipment Experts
- Licensing Engineers – Processes Experts

Frequent Technical Exchanges

- Audits
- Open Item List
- Phone Calls
 - Discuss open item list

SharePoint

- Vendor Portal
 - Identify documentation needed on the docket
- NRC Staff Internal Tool
 - Concurrent editing of safety evaluation

Project Specific Characteristics

- Components vs. System
- Proven Design
 - Systems & cards proven in operating experience
 - Requirements specification
 - Test specifications
 - Implemented in new technology
 - Same requirements with augmentation
 - Pass all old tests with some additional testing
- Specific vs. Abstract
- Users and Designers
- Project Completed Prior to Application
- “...this SE cannot be used as an example or precedent for referencing in future topical reports associated with digital instrumentation and control (DI&C) upgrades that are submitted to the NRC for review and approval.”

-
- Regulations and Guidance are Poorly Understood
 - NRC should hold workshops to inform
 - Harmonizing of understandings takes lots of time
- Frequent Technical Exchanges are Helpful
- End user Involvement is Very Beneficial
 - Operation & maintenance

Acronyms

CPLD – Complex Programmable Logic Device

DI&C – Digital Instrumentation and Control

NRC – Nuclear Regulatory Commission

NRR – Nuclear Reactor Regulation

PLD – Programmable Logic Device

PWROG – Pressurized Water Reactor Owners Group

SDOE – Secure Development and Operational Environment

SSPS – Solid State Protection System

SRP – Standard Review Plan, NUREG-0800

TR – Topical Report