APPLYING 10 CFR50.69 to NUCLEAR PROCUREMENT

Presented to RAPID
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TOPICS

- What is 10 CFR 50.69
- Benefits
- Challenges
- Southern Nuclear Approach
- Examples

What is 10 CFR50.69

- Way of categorizing nuclear safety systems.
- Starts with NRC approved License Amendment Request (LAR).
- Risk Informed Engineering categorizes selected systems.
- Safety or Non-safety design functions remain the same.
- Two new risk categories:
  - High Safety Significant (HSS)
  - Low Safety Significant (LSS)
- Focus resources on High safety significant systems.

BENEFITS of 10 CFR 50.69

Delivering the Nuclear Promise

- Focus resources on systems and components that have the most Nuclear Safety Significance.
- Allows relaxation of current “Special Treatment” requirements for Low Safety Significant items.
- Procurement from commercial suppliers.
- Reduced lead time.
- Impacts Maintenance and Programs.

Bottom Line – Reduce Cost

10 CFR 50.69 IMPACTS

Impacts of Applying Special Treatment:

- Maintenance Rule
- Environmental Qualification
- Seismic Qualification
- 10 CFR Part 21 Reporting Requirement
- Applicable portions of industry codes and standards (10 CFR 50.55 - ASME, IEEE, etc.)
- In-service Testing & Inspection
- Leak Rate Testing
- Quality Requirements of 10 CFR 50 Appendix B
- Reporting Requirements (10 CFR 50.72 & 73)
- Notification Requirements

4 RISC CATEGORIES

Structures Systems & Components Fall Into
One of Four Categories

RISC-1 – Safety related and high safety significant
RISC-2 – Non-safety related and high safety significant
RISC-3 – Safety related and low safety significant
RISC-4 – Non-safety related and low safety significant

CATEGORIZATION PROCESS

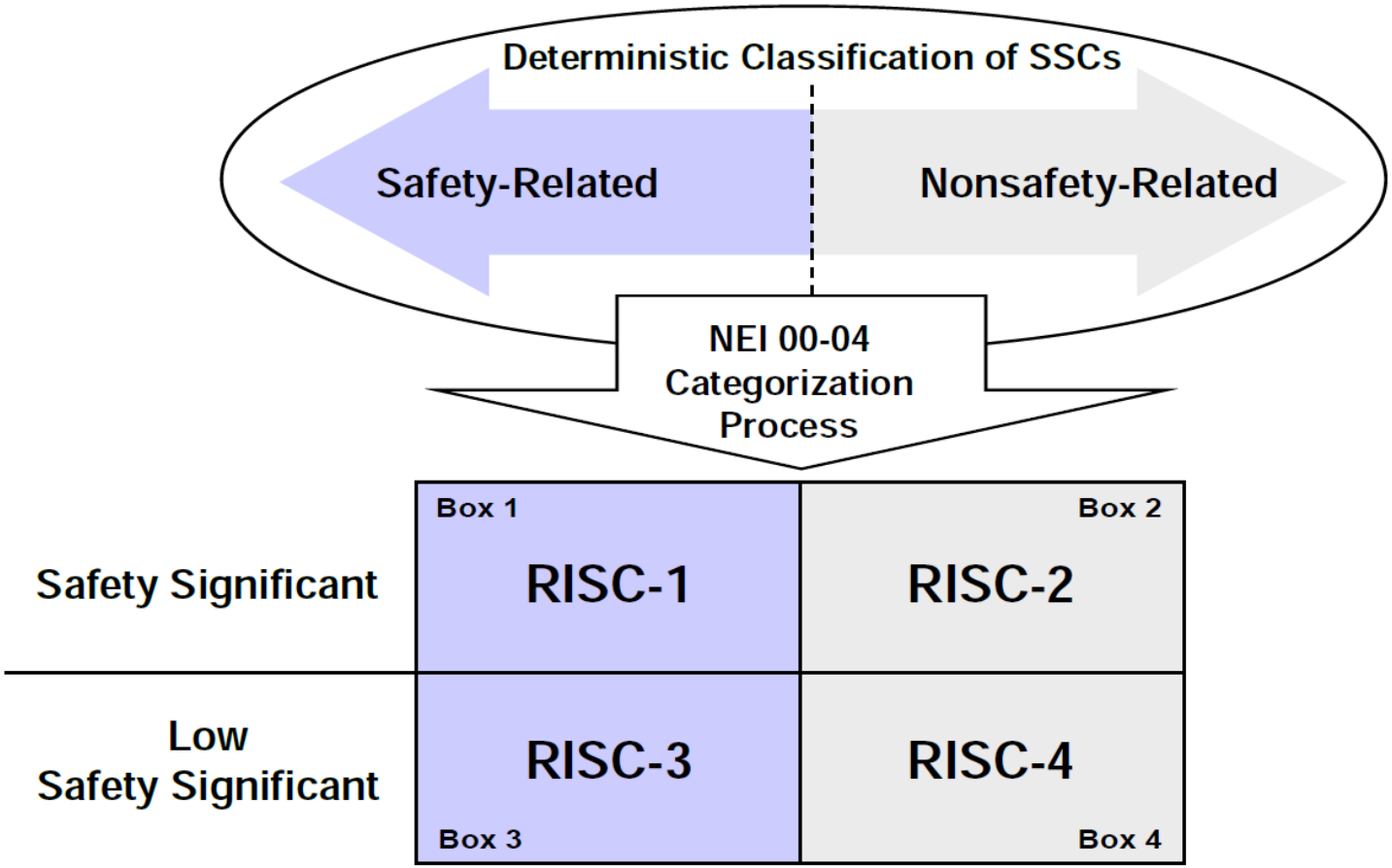
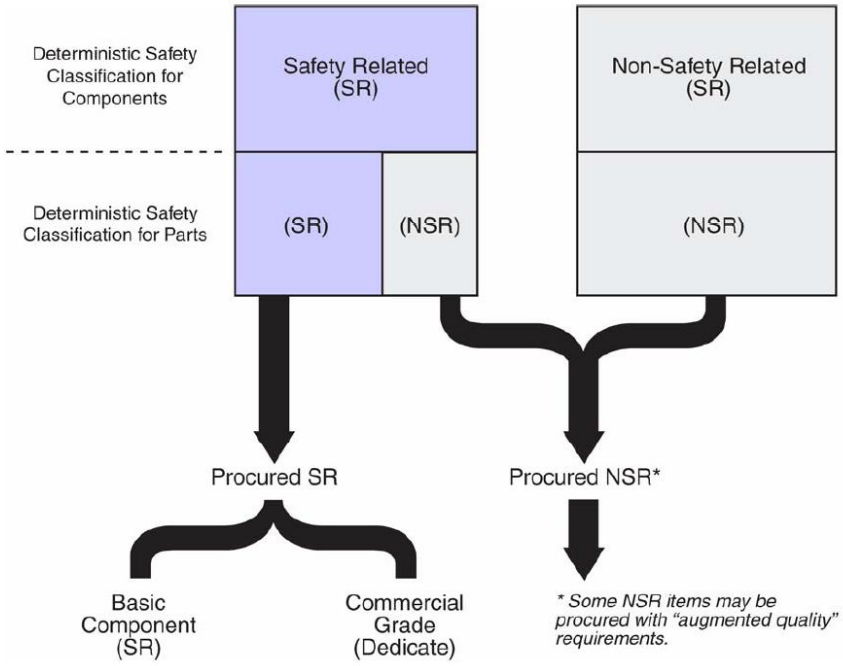


Figure 2-1
Risk Informed Safety Categorizations
Sources: 10 CFR 50.69 and NEI 00-04

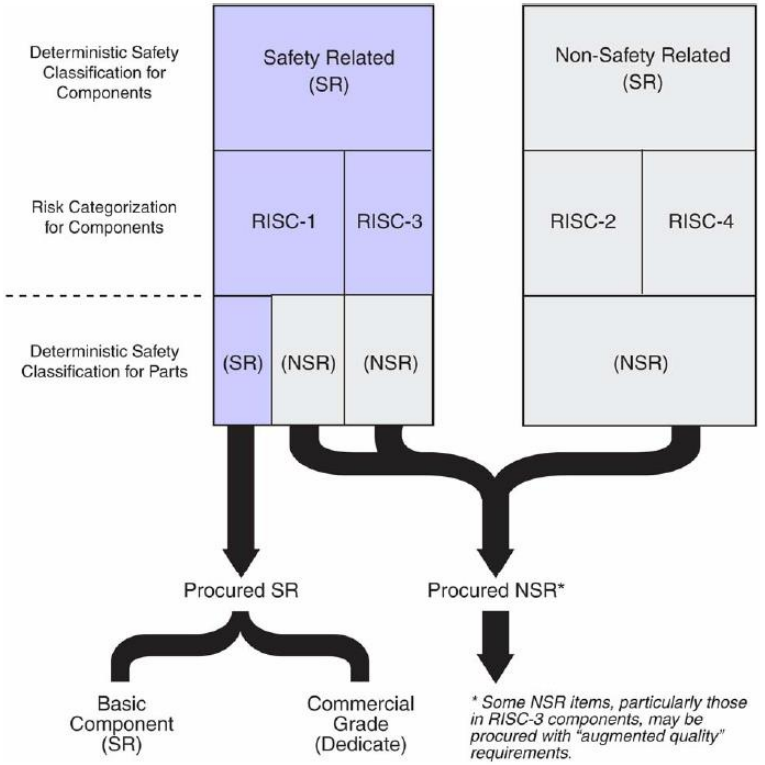
10 CFR 50.69 Categorization Guidance Document. EPRI, Palo Alto, CA: 2018. 3002012984.

TRADITIONAL vs 10 CFR 50.69 PROCUREMENT

TRADITIONAL PROCUREMENT

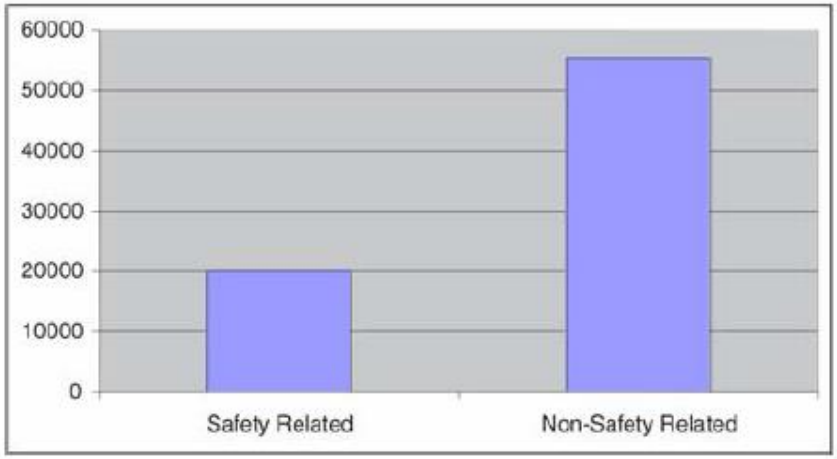


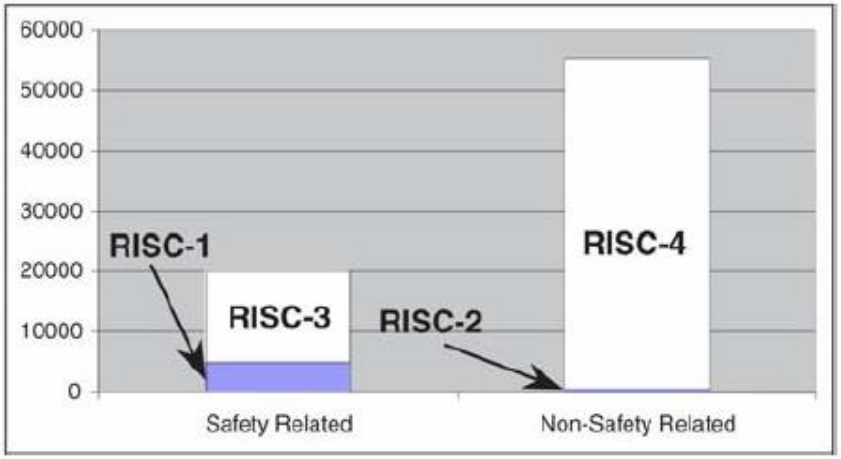
10 CFR 50.69 PROCUREMENT



From EPRI 1011234 Implementation Guidance Figure C-1

Low Safety Significant SSC's





Summary of results from South Texas Project categorization:

- 76% of Safety Related SSC's Low Safety Significant (RISC-3). Our experience so far at Vogtle is ~ 70%.
- 1% of Non-Safety Related SSC's Safety Significant (RISC-2)

From EPRI 1011234 Implementation Guidance Section 3.4.1

REASONABLE CONFIDENCE

- Key concept of 10CFR50.69 is **Reasonable Confidence:**

  Level of confidence based on engineering evaluation which should be supported by facts, actions, knowledge, experience, and/or observations.

- Reasonable **Confidence** is a lower hurdle than Reasonable **Assurance** associated with conventional Safety Related systems and components.

ASSURANCE vs CONFIDENCE

REASONABLE ASSURANCE
Traditional

REASONABLE CONFIDENCE (10 CFR 50.69)

If we define Reasonable Confidence as basically the same or slightly lower than Reasonable Assurance – No real benefit of 10 CFR 50.69.

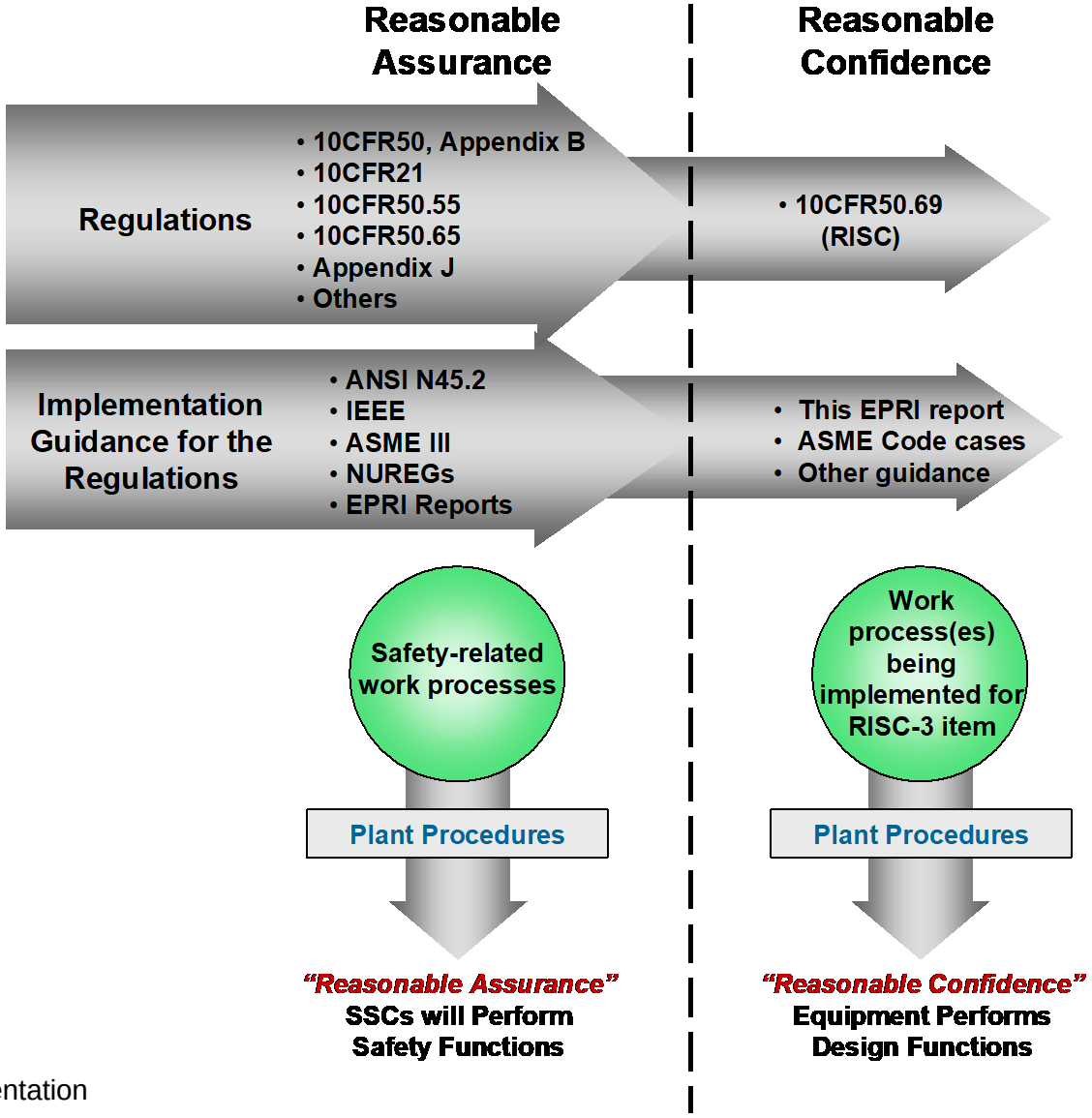
CONFIDENCE vs ASSURANCE

REASONABLE ASSURANCE
Traditional

REASONABLE CONFIDENCE
(10 CFR 50.69)

If we define Reasonable Confidence as less than Reasonable Assurance – 10 CFR 50.69 Alternative Treatment is beneficial.

REASONABLE ASSURANCE vs REASONABLE CONFIDENCE



EPRI 1011234 Implementation Guidance Figure 4-3

RISK BASIS DETERMINATION

The key document is the Risk Based Determination (RBD) which categorizes the components in the specified system into one of 4 categories:

- RISC-1 – Safety related and high safety significant (HSS)
- RISC-2 – Non-Safety related and high safety significant
- **RISC-3 – Safety related and low safety significant (LSS)**
- RISC-4 – Non-Safety related and low safety significant

RBD contains a table that lists every component in the system and tabulates the results of the categorization.

RBD RESULTS

COMPONENT RISK ASSESSMENT
ESSENTIAL CHILLED WATER SYSTEM

TAB N

All Components

Component ID	Service Description	IE PRA	FIRE PRA	SEIS	EXT. HZRDS	SHUT DWN	FUNC RISK	ACTIVE RISK	PASSIVE RISK	DID	FINAL RISK	RISC
2TY12124A	CB CLG COIL U/11531A7001			HSS	LSS	LSS	LSS	HSS	LSS		HSS	RISC-1
2TY12125A	CB CLG COIL U/11531N7002			HSS	LSS	LSS	LSS	HSS	LSS		HSS	RISC-1
2ZSH22560A	ESF CHILLER TRAIN A VANES			HSS	LSS	LSS	LSS	HSS	LSS		HSS	RISC-1
2ZSH22560B	ESF CHILLER TRAIN B VANES			HSS	LSS	LSS	LSS	HSS	LSS		HSS	RISC-1
2ZSH22563A	ESF CHILLER TRAIN A HOT G			HSS	LSS	LSS	LSS	HSS	LSS		HSS	RISC-1
2ZSH22563B	ESF CHILLER TRAIN B HOT G			HSS	LSS	LSS	LSS	HSS	LSS		HSS	RISC-1
2ZSL22559A	ESF CHILLER TRAIN A VANES			HSS	LSS	LSS	LSS	HSS	LSS		HSS	RISC-1
2ZSL22559B	ESF CHILLER TRAIN B VANES			HSS	LSS	LSS	LSS	HSS	LSS		HSS	RISC-1
2ZSL22561A	ESF CHILLER TRAIN A VANES			HSS	LSS	LSS	LSS	HSS	LSS		HSS	RISC-1
2ZSL22561B	ESF CHILLER TRAIN B VANES			HSS	LSS	LSS	LSS	HSS	LSS		HSS	RISC-1
2ZSL22562A	ESF CHILLER TRAIN A HOT G			HSS	LSS	LSS	LSS	HSS	LSS		HSS	RISC-1
2ZSL22562B	ESF CHILLER TRAIN B HOT G			HSS	LSS	LSS	LSS	HSS	LSS		HSS	RISC-1
11592F4003	4 INCH BASKET STRAINER			LSS	LSS	LSS	LSS	LSS	LSS		LSS	RISC-3
11592F4007	4 INCH BASKET STRAINER			LSS	LSS	LSS	LSS	LSS	LSS		LSS	RISC-3
11592F4014	4 INCH BASKET STRAINER			LSS	LSS	LSS	LSS	LSS	LSS		LSS	RISC-3
11592F4019	4 INCH BASKET STRAINER			LSS	LSS	LSS	LSS	LSS	LSS		LSS	RISC-3
11592F4028	6 INCH BASKET STRAINER			LSS	LSS	LSS	LSS	LSS	LSS		LSS	RISC-3
11592F4029	6 INCH BASKET STRAINER			LSS	LSS	LSS	LSS	LSS	LSS		LSS	RISC-3
11592P5EWB	VIBRATION AMPLIFIER HOUSI			LSS	LSS	LSS	LSS	LSS	LSS		LSS	RISC-3
11592U4001	ESF CHLD WTR CHW PUMP A SUCT FILTER DRAIN			LSS	LSS	LSS	LSS	LSS	LSS		LSS	RISC-3
11592U4002	ESF CHLD WTR CHW PUMP B SUCT FILTER DRAIN			LSS	LSS	LSS	LSS	LSS	LSS		LSS	RISC-3
11592U4004	1A ESF EXPANSION TANK DRAIN VALVE			LSS	LSS	LSS	LSS	LSS	LSS		LSS	RISC-3
11592U4005	ESF CHLD WTR TRAIN A CHW EXPANSION TK OUTLET ISO(1OP3-389)			LSS	LSS	LSS	LSS	LSS	LSS		LSS	RISC-3
11592U4006	ESF CHLD WTR TRAIN B CHW EXPANSION TK OUTLET ISO (1OP3-425)			LSS	LSS	LSS	LSS	LSS	LSS		LSS	RISC-3

RBD CRITICAL ATTRIBUTES

COMPONENT CRITICAL ATTRIBUTES
COMPONENT COOLING WATER SYSTEM

TAB M

Representative Components only shown (e.g.; Unit 1, Train A, Pump 1 associated components and, if applicable Non-Train components); applicable to equivalent Pump/Train/Unit components.

Type	Component ID	Service Description	OVERALL RISK	CRIT ATTR 01	CRIT ATTR 02	CRIT ATTR 03
				TRANSFER CONTROL OF ASSOCIATED COMPONENT FROM CONTROL ROOM TO LOCAL SWITCH IN THE EVENT THAT CONTROL ROOM HAS TO BE EVACUATED.	CONTINUITY TO ALLOW SIGNAL TO PASS THROUGH TO ASSOCIATED COMPONENT.	
IN	1LSLL1852	COMPO CW SURGE TK T4001	HSS	PREVENT INADVERTENT ACTUATION.	MAINTAIN SEISMIC INTEGRITY (SEISMIC SSEL).	
IN	1PI1874	COMPO CW PUMP TRAIN A DISCH	HSS	PROVIDE ACCURATE INDICATION OF PRESSURE.		
IN	1PT1874	COMPO CW PUMP TRAIN A DISCH	HSS	PROVIDE ACCURATE SIGNAL.		
MV	11203U4030	CCW,PMP 1 DISCH,CHECK VALVE,*,*,*,A	HSS	ALLOW FLOW IN NORMAL DIRECTION.	PREVENT BACKFLOW.	
IN	1FE1876	COMPO CW PUMP TRAIN A DISCH	LSS	SUPPORT ACCURATE INDICATION OF FLOW.		
IN	1HS1852B	COMP CW PUMP P4001 LOCAL	LSS	ALLOW LOCAL OPERATION OF ASSOCIATED COMPONENT IN THE EVENT THAT CONTROL ROOM HAS TO BE EVACUATED.		
IN	1HV11800	PUMP 001 SUCTION VALVE (1OP2-143)	LSS	STAY OPEN TO PERMIT FLOW.		
IN	1HV11803	CCW PUMP 001 DISCHARGE VALVE (1OP2-146)	LSS	STAY OPEN TO PERMIT FLOW.		
IN	1HV11806	CCW HX 001 OUTLET VALVE	LSS	STAY OPEN TO PERMIT FLOW.		
IN	1HV11807	CCW HX 001 INLET VALVE (1OP2-150)	LSS	STAY OPEN TO PERMIT FLOW.		
IN	1HV11816	SFP HX 001 INLET VALVE (1OP2-159)	LSS	STAY OPEN TO PERMIT FLOW.		
IN	1HV11818	RHR HX 001 INLET VALVE	LSS	STAY OPEN TO PERMIT FLOW.		
IN	1HV11819	RHR HX 001 OUTLET VALVE (1OP2-162)	LSS	STAY OPEN TO PERMIT FLOW.		

Note: Components listed are only those components whose overall risk is HSS or that support an HSS function.

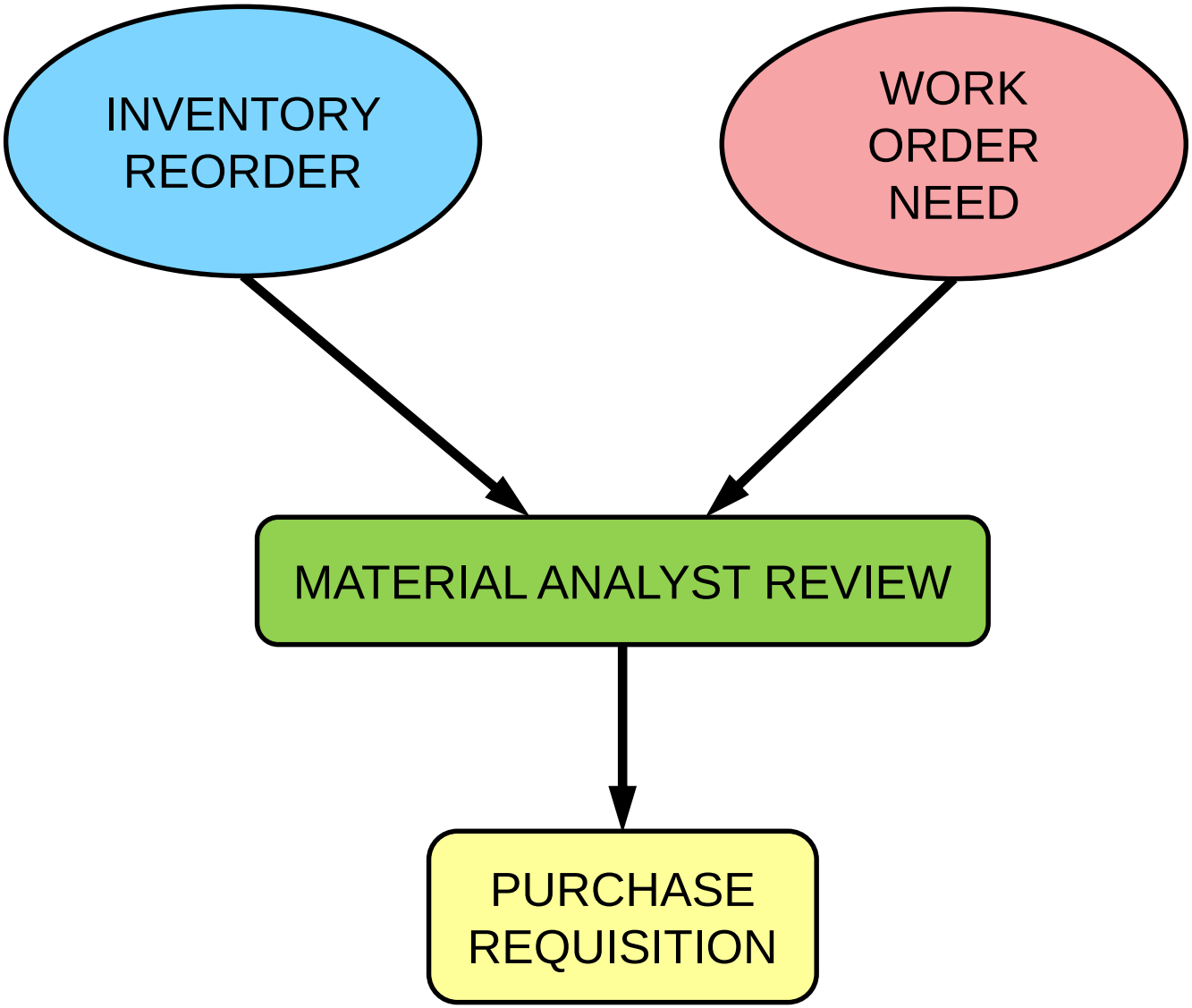
CHALLENGES

- Defining REASONABLE CONFIDENCE
- Time and resources:
  - Identify Parts
  - Find Replacements & Suppliers
  - Engineering Evaluation
- Realistic expectations of cost savings
- Traditional thinking - Perception of additional risk in traditionally risk-averse culture:
  - Regulatory
  - Quality and impact on Equipment Reliability

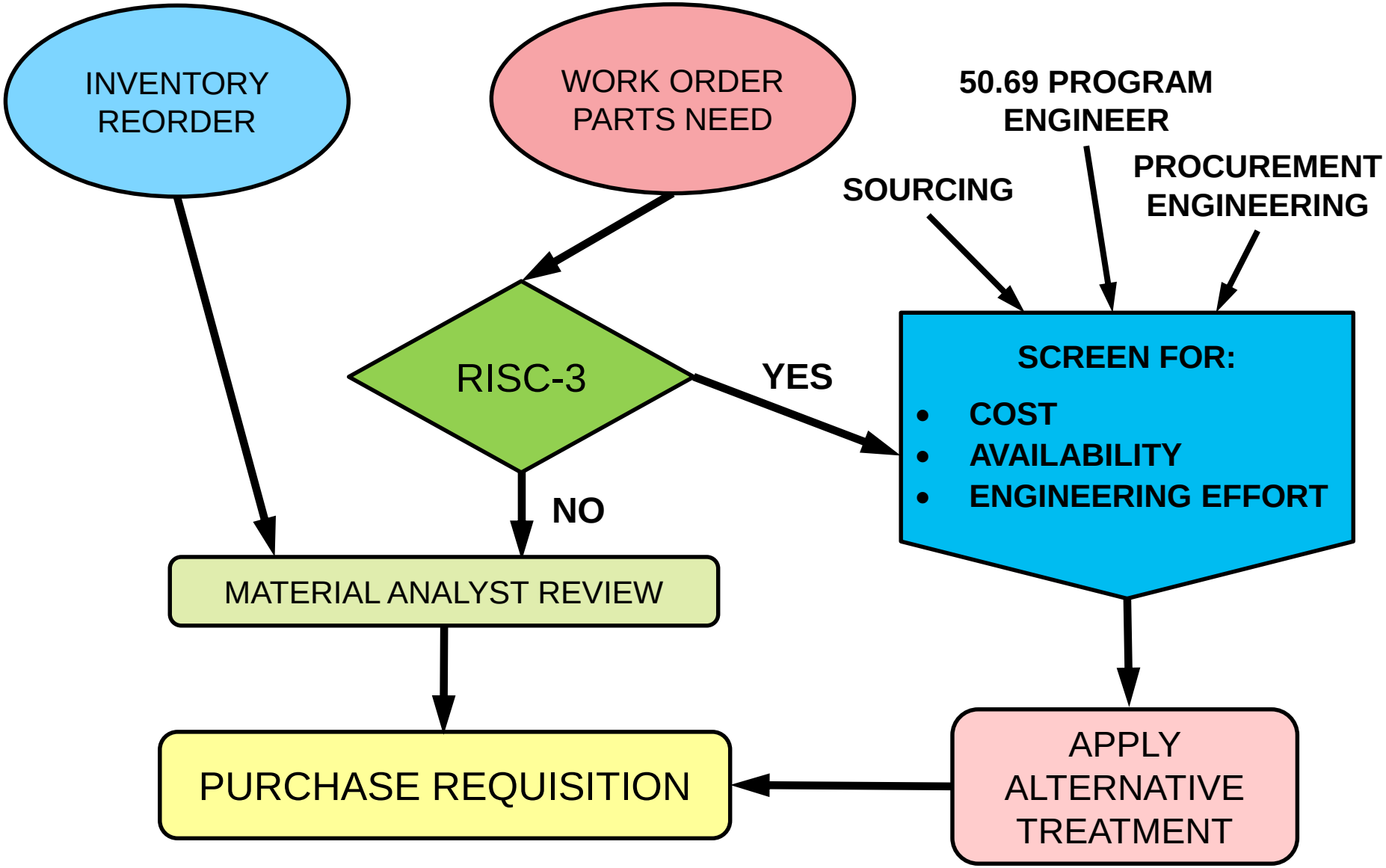
CH..CH..CH..CHALLENGES

- Testing may require 3rd Party services raising cost and eliminating benefit.
- Station Wide Culture – Identifying RISC-3 Applications:
  - Maintenance Planning
  - Supply Chain
- Inventory Control
  - Inventory Growth when item used in both RISC-1 & RISC-3 locations
  - Use existing SR inventory
- What to do if/when recategorized back to RISC-1

EXISTING PROCUREMENT



10 CFR 50.69 PROCUREMENT



SNC's APPROACH

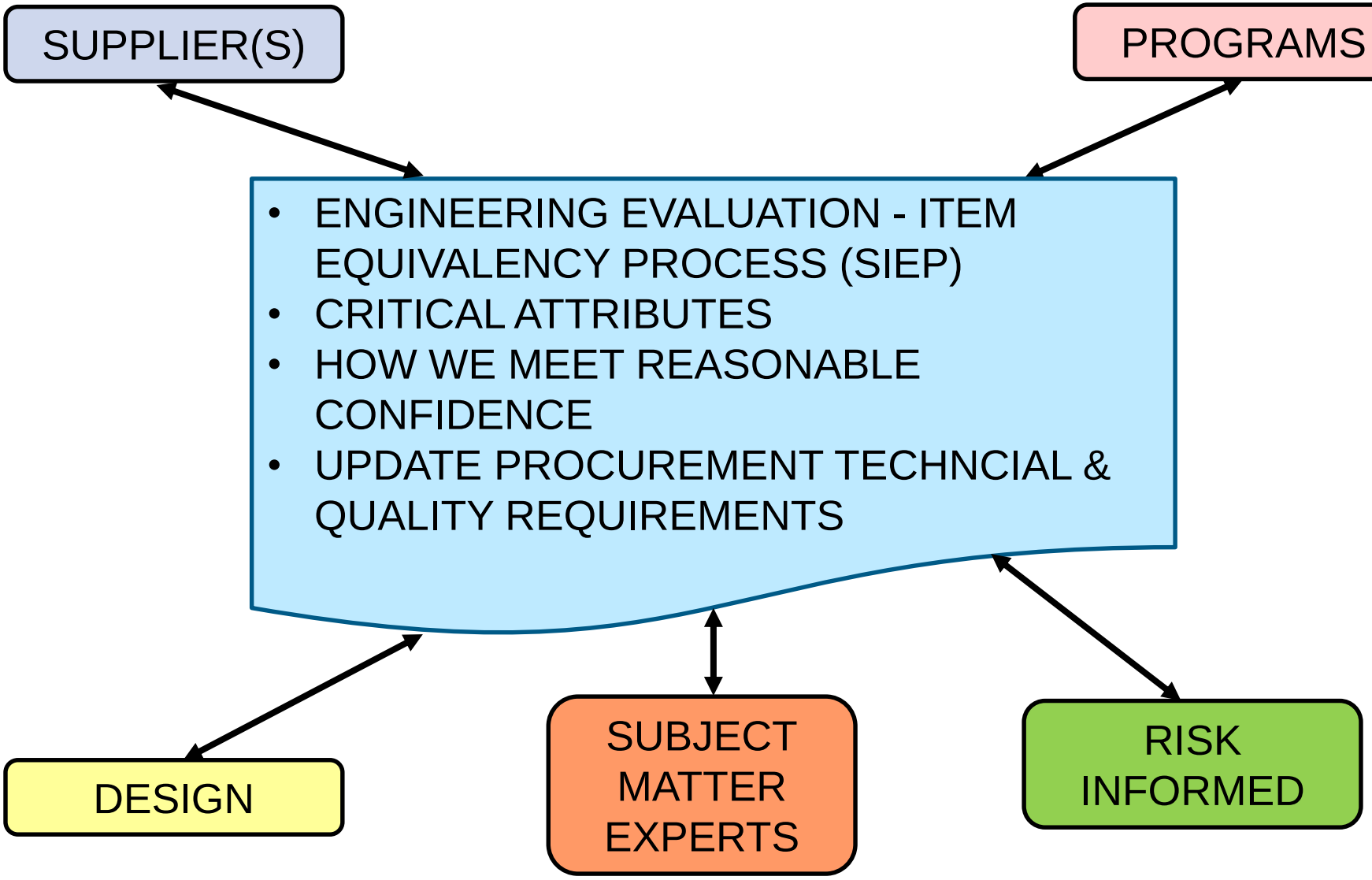
- Review planned work orders with parts needs for RISC-3 locations.

- Screen Parts based on:
  - Current inventory
  - Cost and potential savings
  - Parts availability
  - Engineering effort

- Viable candidates →Apply alternative treatment to procurement per procedure SCM-014 and industry guidance.

- Engineering evaluation typically Item Equivalency (SIEP)
  - Documents how Reasonable Confidence will be achieved.
  - May require input from programs, systems, or design
  - Critical Characteristics identified
  - Identify acceptance criteria – tests, documentation, etc.

APPLYING ALTERNATIVE TREATMENT



APPLYING 10 CFR 50.69

PROCEDURE SCM-014 10 CFR 50.69 Alternative Treatment Procurement

PROCUREMENT OF A REPLACEMENT ITEM IN A RISC-3 LOCATION (ORIGINALLY FURNISHED AS A BASIC COMPONENT)

Pre-10 CFR 50.69 Procurement Activity	Alternate Treatment After 10 CFR 50.69 Categorization
Procurement Class for the Item Master was Safety Related.	Procurement Class for the Item Master is Non-Safety Related.
Item originally procured as a basic component.	**Can procure item as a Non-Safety item subject to 10 CFR 50.69 acceptance.**
Specification of technical requirements.	**Specify technical requirements with 10 CFR 50.69 alternate treatment (e.g., non ASME-Code). Fracture toughness is excluded from Alternative Treatment. Original design fracture toughness requirements MUST be maintained when applying Alternative Treatment.**
Specification of quality requirements.	**Specification of 10 CFR 50, Appendix B and 10 CFR 21 is NOT needed.** **Specification of commercial quality controls should be considered, as well as specific requirements from 10 CFR 50, Appendix B that remain relevant to the item's quality.**
Specification of supplier documentation.	**Request certificate of conformance verifying implementation of supplier quality controls based on Alternate Treatment.**
Acceptance basis was Performance Based Supplier Audit which verified adequate controls of the item or adequate implementation of the supplier's CG dedication process.	**Acceptance basis is implementing one or more of the following acceptance tools:** **A. Tests/inspections** **B. Supplier documentation** **C. Product history**
Certification verifying implementation of the Appendix B compliant QA program reviewed during the standard receipt inspection. **Standard receipt inspection verified other inspection attributes.**	**Verification of Appendix B QA program NOT required.** **Receipt inspection verifies inspection attributes (part number, markings, color, quantity).** **Continue to implement quality controls appropriate for preventing, detecting, and controlling counterfeit and fraudulent items.**
Achieved adequate confidence that the item would perform its safety-related function based on it being controlled under the supplier's 10 CFR 50, Appendix B compliant QA program.	**Achieve Reasonable Confidence that the item will perform its low-risk safety-related function based on the 10 CFR 50.69 acceptance process, which may include supplier quality controls, standard receipt inspection, product inspection, and supplier certification.**

NEI TECHNICAL REPORT 17-05

RISK INFORMED ENGINEERING PROGRAMS (10 CFR 50.69); RISC-3 ALTERNATIVE TREATMENTS

Guidance for utilities developed by Task Force for implementing 10 CFR 50.69:

- Alternative Treatments are adequate
- Consistent across industry
- Use industry templates
- Integrate into existing processes
- Share resources
- Lessons learned

NUCLEAR ENERGY INSTITUTE

INDUSTRY COLLABORATION

- Joint BWR/PWR Owners Group – detailed implementation based on NEI 17-05
- Collaborative approach among utilities to “Solve 50.69”
- Supply Chain & Procurement Engineering core team
- Current Efforts:
  - Alignment Document (June 2019)
  - Vendor alignment and education
  - Clarify roles and expectations for core procurement entities (PE, design, sourcing, vendor, QA, etc.)
  - Develop examples for common components

GOALS of BWROG/PWROG

- Safety in numbers – Alignment.
- Develop consistent approach to procurement of RISC-3 components.
- Avoid creating new processes and procedures.
- Share Alternative Treatment plans.
- Come up with actionable solutions.
- Identify common components.
- Promote consistent procurement specs across industry.

MEETING REASONABLE CONFIDENCE

- Follow practices defined in OG Alignment Document
- Industry standards and specifications
- Test and acceptance criteria where cost effective
- Supplier commercial QA programs
- Supplier and product history
- Supplier certifications
- Documentation
- Receipt inspection

THOUGHTS & OBSERVATIONS

- Most initial opportunities will be with mechanical parts and components – valves, fittings, pumps, motors, etc.
- Electrical may be a challenge because of complexity, seismic, EQ, and connection to HSS systems.
- May not be feasible for all parts, complex components, refurb, etc.
- Take advantage of existing industry standards and specs to satisfy Reasonable Confidence.
- Need to identify and engage new commercial and industrial suppliers who have traditionally avoided nuclear.
- NSSS supplier involvement and participation.

WHAT WILL SUCCESS LOOK LIKE?

- Reduced lead time
- Reduced cost
- No significant inventory growth
- Not a significant burden on Supply Chain
- Use of existing industry specs and standards
- Collective buy-in across organization and programs
- Additional flexibility in the way we specify and procure parts

FOCUS RESOURCES ON HSS AS INTENDED

10 CFR 50.69's FUTURE

- New Tool – We need to understand how and when to use.
- Contribute to industry alignment and best practices.
- Identify and apply Alternative Treatment as feasible for planned maintenance.
- Incorporate 10CFR50.69 into processes and procedures.
- Prove viability.
- Incorporate across fleet – Hatch and Farley sites.

SUPPLIER IMPACTS

- Some suppliers incorporating 10 CFR 50.69 in business strategy.
- Does 50.69 threaten business model of Appendix B suppliers?
- If industry procures fewer SR or Code components, what is impact to SR purchases?
- Concern about inconsistent approaches to 56.69 procurement by utilities.
- Owners Group tasked with supplier alignment, engagement, and education.

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10 CFR50.69 Implementation at Plant Vogtle

SYSTEMS CATEGORIZED

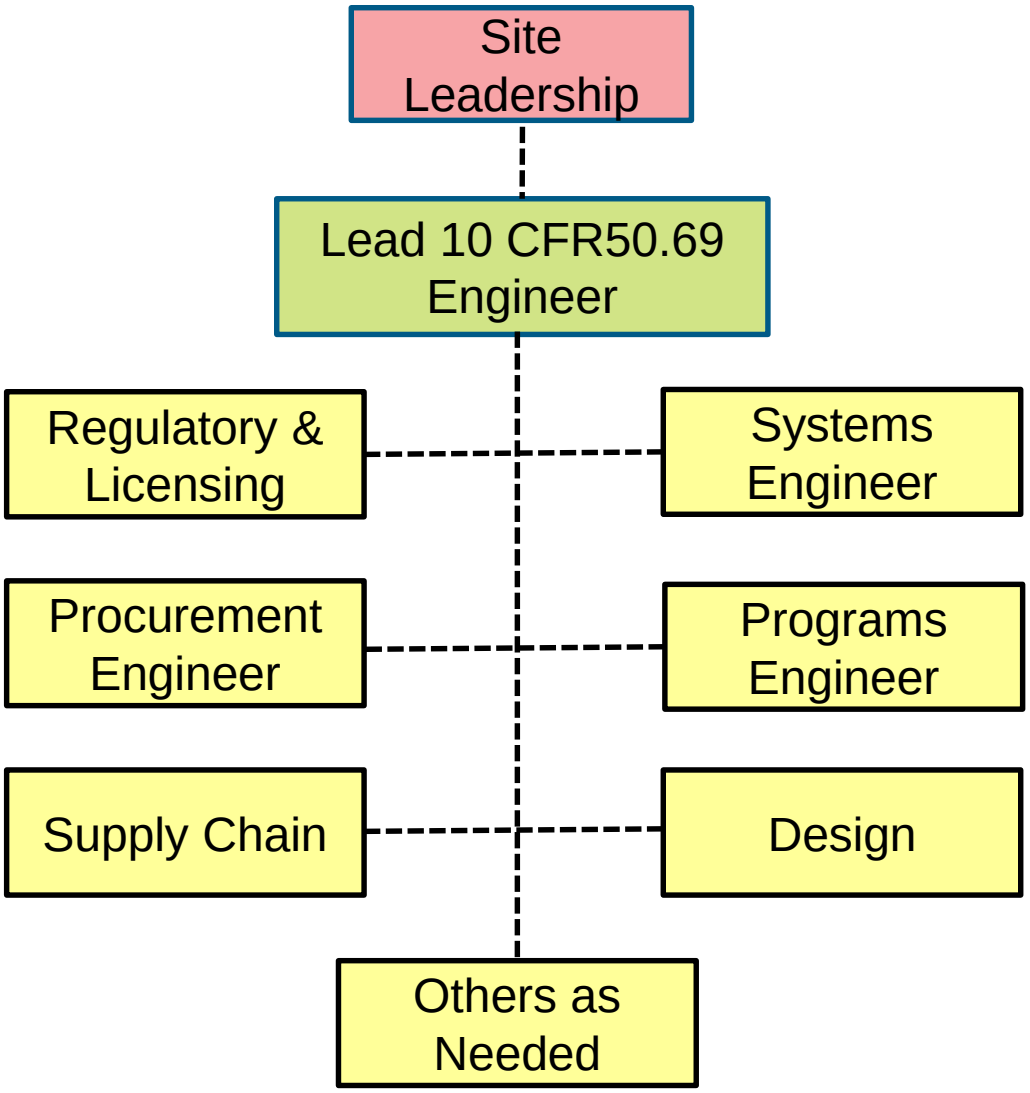
The following systems have been categorized at Vogtle 1 & 2:

- 5/14/2015 Containment Spray (CS) System
- 6/10/2015 Radiation Monitoring (RM) System
- 5/1/2017 Component Cooling Water (CCW) System
- 6/1/2017 Essential Chilled Water (ECW) System
- 9/3/2017 Chemical Volume Control System (CVCS)
- 3/6/2018 Plant Safety Monitoring System (PSMS)
- 3/29/18 Nuclear Instrumentation System (NIS)

Vogtle 10 CFR 50.69 Team

- Vogtle is implementing 10CFR 50.69 by establishing a matrixed project team:
  - Risk Informed
  - Systems
  - Operations
  - Programs
  - Design
  - Configuration Management
  - Procurement & Supply Chain
- Begin April 2019
- Cautious approach to implementation to maintain high quality.
- Early Win - Chilled water pump to learn and develop process and update procedures as needed.

Functional 10 CFR 50.69 Matrixed Team



ALTERNATIVE TREATMENT EVALUATION

- Use the SIEP process

- Typical references in applying Alternative Treatment to Procurement
  - Original procurement specifications
  - Design documents
  - Industry standards and specifications

- The RBD is an important document for the Evaluation

- RBD contains a table of Component Critical Attributes
  - Attributes that support an HSS Function
  - e.g., MOV: Open on Demand

- Critical Attributes are listed for:
  - High Safety Significant Components
  - Low Safety Significant Components that support an HSS Function

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Examples
Applying 10 CFR 50.69 to Procurement at Vogtle

Real 10 CFR 50.69 Procurement Examples

Goulds 3196 MTi Essential Chilled Water Pump

Safety Related
- Cost ~ $200,000
- Lead Time ~ 38 weeks

Non-Safety Related
- Cost $39,420 - $42,020
- Lead Time ~ 12 – 19 weeks
- ~ 20 Engineering Manhours

10 CFR 50.69 Procurement Examples

1 Inch CVCS Vent Diaphragm Valve

- Safety Related (Enertech/ITT)
- Cost ~ $23,000
- Lead Time ~

- Non-Safety Related (Hills-McCanna)
- Cost $1,918
- Lead Time ~
- ~ 10 Engineering Manhours

10 CFR 50.69 Procurement Examples

- CVCS 1 inch globe drain valve
- Original: Flowserve $20,414
- Replacement: $1,556 (currently in inventory)
- Original: ASME Section III Class 2
- Replacement: ANSI B16.34

LESSONS LEARNED

- Engineering effort and hidden costs to implement.
- Commercial parts availability.
- Impact on SR Supply Chain – in particular ability to procure unique SR parts.
- Resources to implement - Level of effort difficult.
- Site ownership and resources.
- Cultural change.
- Realistic expectations of savings.
- Existing SR inventory – use or surplus?
- Hidden costs of implementation.
- To limit burden on Supply Chain, need to find good parts candidates as efficiently as possible.

QUESTIONS?

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