

Risk-Informed Decision-Making

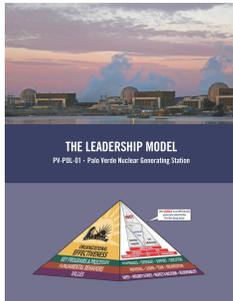
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Set and Maintain Standards



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Focus on Nuclear Safety Every Day

- Every group across the site starts shift discussing plant status and then safety, including the unit Probabilistic Risk Assessment (PRA) risk profiles for work week
- Plant status (including changes to risk) and safety is updated at the start of any meeting during the shift

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Example of Key Operator Action

Resetting AFA-P01

INSTRUCTIONS

CONTINGENCY ACTIONS

NOTE

KEY OPERATOR ACTION - Perfect performance of this Appendix will significantly reduce plant risk.

1. Close ALL of the following valves:

- SGA-UV-124, SG 1 Steam Supply to Aux Feed Pump A
- SGA-UV-128, SG 2 Steam Supply to Aux Feed Pump A
- AFA-HV-54, Essential Steam Driven APW Trip/Throttle Valve
- AFA-HV-32, Aux Feed Pump A Feed Valves to SG 1
- AFC-HV-33, Aux Feed Pump A Feed Valves to SG 2

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Employees Taking Initiative to Reduce Risk

- Engagement
- Modifications
- Procedure changes
- Process changes
- Scheduling changes

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Significant Operating Experience Report (SOER) 09-01 Summary

Per SOER 09-01, Shutdown Safety

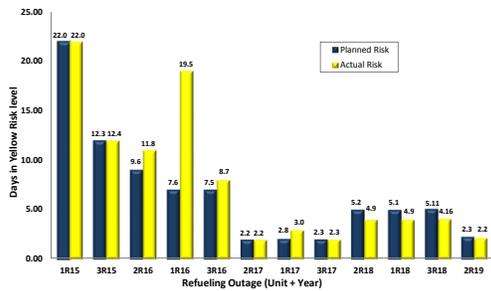
- Refueling Outages contribute one-third of the overall core damage frequency (CDF)

5% (Time) = 33% (Risk)

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Reducing Outage Days in Yellow Risk Level



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Station Risk Initiatives

- Station staff attend four-week plant systems course that includes PRA insights
- New engineers rotate through PRA group
- Green risk management action level for all online and outage planned work
 - Deploy FLEX equipment
 - Meet NRC Regulatory Issue Summary 2008-15 expectations for all temporary equipment
- Implement plant modifications to meet RG 1.174 limits
- Screen modifications/procedure changes for risk optimization

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Before Risk-Informed Decision-Making (RIDM)

- Only safety-related equipment credited
- Technical Specification (TS) Completion Times were developed based on:
 - Engineering judgment
 - Operating experience
- Operation within the TS considered safe and acceptable

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Risk-Informed Decision-Making

- Additional controls needed beyond TS
- Maintenance Rule 10CFR50.65 manages Structures, Systems and Components unavailability, reliability, configuration risk
- RG 1.174 - licensing basis for risk-informed applications
- RG 1.200 - consistency in PRA scope/methods
- Key regulatory applications using risk insights
 - Reactor Oversight Process
 - Risk-Informed TS (RITS) Initiatives 1 through 7
 - NFPA-805 Alternative to 10CFR50 Appendix R for Fire
 - INPO SOER 09-01 Shutdown Safety
 - 10CFR50.69 Risk-informed Categorization and Treatment

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Risk-Informed Initiatives Status

- RITS 5b – TS Surveillance Requirements
 - 23 surveillance changes processed
- RITS 4b – TS Completion Times
 - License amendment request submitted July 2015
- 10CFR50.69 Risk-informed Categorization and Treatment of SSCs
 - Planned submittal in 2017 after RITS 4b approval

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RITS 5b TS Surveillance Requirements

- Safety Benefit
 - Reduced time exposed to high risk conditions
 - Focus on testing of safety significant equipment
- Operational Benefit
 - Equip manipulation Reductions – less wear-and-tear
 - Dose exposures reductions
- Financial Benefit
 - Reductions in Operations/Maintenance manpower requirements – real dollars
 - Reductions in administrative burdens to support Surveillance Testing

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RITS 4b TS Completion Times

- Safety Benefit
 - Preventive work done online – rather than in an outage – when staff can maximize focus on that work
 - Minimize need for repeated TS entries
 - Encourages routine deployment of additional compensatory measures (e.g., FLEX equipment) to reduce risk
 - Reduce time pressure and stress
 - Avoid unnecessary shutdowns = Avoid nuclear safety challenges
- Operational Benefit
 - Increase flexibility in scheduling maintenance
 - Shorter, less-complex refueling outages
 - Reduce plant perturbations
 - Minimize need for enforcement discretion

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RITS 4b TS Completion Times (cont.)

- Financial Benefits
 - Avoid plant shutdowns
 - Avoid plant power reductions
 - Shorter refueling outages
 - Reduce outage staffing
 - More efficient maintenance planning and execution
 - Resources not wasted on contingent enforcement discretion requests

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10CFR50.69 Risk-informed Categorization and Treatment

- Safety Benefits:
 - Focus on safety significant SSCs – improve performance, increase regulatory margins
 - Enhance station's safety culture
 - Raise safety awareness of non-safety-related high risk SSCs
- Operational Benefits:
 - Reduce regulatory burden on low safety significant SSCs
 - Streamline processes, procurements
 - Less outage burden for regulatory testing/inspections
- Financial Benefits:
 - Reduce procurement costs
 - Fewer resources required for tests, inspections, oversight

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Challenges Moving Forward

- Issues with crediting FLEX equipment in quantitative risk assessments
- Issues with PRA Functionality determination in RITS 4b
- Conservative methods/assumptions in the RG 1.200 fire model not consistent with industry operating experience

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What it Takes to Get There...

- Leadership commitment
 - Executive leadership and sponsorship
 - Alignment among the Leadership Team
 - Organizational structure to support
- Risk-informed Culture
 - Operations must lead changes
- Resources
 - PRA model and quality meet RG 1.200
 - Plant modifications to meet RG 1.174 limits
 - License amendment preparation
 - Program, procedure changes, training

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SAFELY and efficiently **generate** electricity for the **long term**

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