



Introduction

- Robinson Participated in a Tabletop Exercise (March 2014)
- Robinson Served as an Industry "Pilot Plant" (Summer 2014)
 - Pre GDC plants pose unique opportunities for risk improvements.
 - Overall Duke found the process beneficial to assure that the mods/changes requested moved the plant toward lower CDF or LERF.
 - Better prioritization and scheduling leads to improved plant safety.
 - Process relies on a diverse team with broad experience base to support technical decision making.
 - The structure of this review can be used when new proposed regulations are out for comment.
 - Best value is achieved when this evaluation is conducted early in the scoping phase of a proposed project and when specific PRA inputs are available and applied. Excellent use of risk insights.
 - Process is disciplined and repeatable.
 - Significant fleet support.

Integrated Decision Making Panel

- Site Director – 40 years of Duke experience including Engineering, Operations and Senior Station Management at 3 Duke sites as well as Corporate.
- Operations – 30 years nuclear experience. Held RO and SRO licenses at Catawba. On-Line Corporate Functional Area Manager (CFAM) in Nuclear Corporate. Assistant Ops Manager Robinson.
- Major Projects – 30 years of Nuclear at Duke. Held various leadership roles at the site in Engineering and Maintenance.
- Probabilistic Risk Analysis – 35 years of nuclear experience and is the Manager of PRA Applications for the Brunswick, Harris and Robinson Nuclear Plants.
- Licensing – 33 years of Nuclear experience including Program Engineering and is the Manager of Nuclear Regulatory Affairs at the Robinson Nuclear Plant.
- Ops Training – 30 years of Nuclear experience. SRO at Robinson and was licensed for 18 years. Supervisor of Operator Initial Training.
- Engineering – 38 years of nuclear experience. He has extensive experience in engineering management at St Lucie Power and Millstone. Engineering Recovery Manager for RNP.

Issue Prioritization

- 11 Regulatory Based Projects
 - NFPA 805 modifications (3)
 - Fukushima modifications (2)
 - Cyber-security modifications
 - TSTF 523 implementation - ECCS void inspections
 - Insulation replacement for GSI-191- containment sump impacts
 - Recognizing open phase conditions
 - MRP-227A core barrel hold down spring inspections/replacement
 - Upgrading lake level indication to continue to meet license conditions - equipment obsolescence

Issue Prioritization

- 11 Reliability Based Projects
 - Loss of RCP seal cooling
 - Hotwell Level- change valve from fail open to fail closed on loss of instrument air
 - Local operator action to reset breaker to instrument air compressor
 - Operator burden- inhibiting fire suppression
 - Replace existing vacuum switches
 - Replace cable vault CO2 system – reliability and cost of maintenance upgrade
 - Install communication repeater in containment – Fire Brigade
 - Diaphragm valve replacement – address body to bonnet leaks
 - Loose parts monitoring system upgrade
 - Install new isolation valve in RWST supply to charging pumps – facilitate outage maintenance
 - Replace B-battery with larger battery

Aggregation Process and Results

- Robinson Performed Comparisons Within the Priority Groups
 - All priority items ranked within the group
 - Comparisons between groups performed
 - Overall panel consensus gained and an aggregate ranking established
- Recommendations
 - TSTF-523 commitment re-evaluated – stay with quarterly versus monthly inspections
 - Single phase event – Nuclear Safety review – fleet reconsiders commitment for auto action
 - Cancellation of battery upgrade – acted upon to change to replacement with like for like
 - Cancellation of two additional projects – returned to Plant Health Committee due to low value
 - Moved modification to support operator actions on instrument air compressors up in priority due to risk impact
 - Moved modification to support fire detection staying in service up in priority during diesel runs
 - Fukushima and NFPA 805 mods were judged as impactful in improving risk

Lessons Learned

- Process is Repeatable
 - Comparisons to pilot results on similar issues demonstrated this
- Structure removes emotion
 - Battery replacement showed little risk reduction
 - Operator actions remedy showed risk reduction
 - Proposed solutions may change based on the review
- Reliability Issues Can Have Impact on Risk
 - Using the process, documented the impact on risk
 - Communicated the risk associated with reliability issues
- Collaborative Review Brought Insights to Scoring
 - Experienced plant personnel assured Robinson unique design was considered
 - The inter-disciplinary review identified factors that had not been fully considered previously

Value Proposition

- The Process Resulted in Improved Safety, Work Efficiency for Higher Safety Significant Activities, and Dose
 - Regulatory
 - Commitment change on ECCS Voids
 - Reduction in future dose received
 - Actions implemented with initial generic letter response were effective
 - Changed solution on open phase based on screening
 - Reliability Mods
 - Three projects recommended for cancellation
 - Non-project alternatives were equally effective
 - Moved priority of instrument air modifications up based on risk reduction
- Structure to Compare Risk Significance with Reg Driven Projects to Station Driven Projects

Value Added

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