Problem Statement 2

January 14, 2008

NUCLEAR ENERGY INSTITUTE

Digital I&C Risk Insights from Current PRAs

- Modeling digital I&C with current techniques
- Example applications for which existing PRAs could be used in designing and operating digital I&C systems
- Consistency with current regulatory policy
- Simplified/screening techniques for generating risk-insights

Digital I&C Risk Insights from Current PRAs

- **Modeling digital I&C with current techniques**
  - Rely heavily on white paper for problem statement 1
    - Assure digital CCF is modeled between
      - Redundant mitigating systems
      - Control systems and mitigating systems
    - Perform sensitivity studies to show whether results are sensitive to digital I&C modeling
    - Capture the risk insights
  - Provide a comparison of the white paper from problem statement 1 with the criteria of the draft NUREG on traditional methods

Digital I&C Risk Insights from Current PRAs

- Provide a listing of example applications for which existing PRAs could be used in designing and operating digital I&C systems.
  - Risk evaluations of the ISGs
    - Credit for operator action
    - Others (see next slide)
  - Risk evaluations of digital I&C designs
    - Optimizing the digital I&C system architecture in context with the overall plant design
    - Performance of D3 evaluations
    - Staff review of digital I&C submittals

Generation of Risk Insights from PRA to Address Digital I&C Issues

Risk-Informed Application Candidates
Task Work Group Problem Statements

Problem Statement	*PRA Applicable*	*Affects PRA Methods*	*Affects PRA Implementation*
D3 TWG			
Adequate diversity		X	
BTP-19 Point 4	X[1]		X
Effects of CCF		X	
CCF applicability	X[1]	X	
Echelons of defense	X[1]		
HFE TWG			
Minimum Inventory			X
Graded Approach	X		
Credit for Op Act	X		X

[1]Depends on final outcome of the ISG

Digital I&C Risk Insights from Current PRAs

- Provide a discussion on how generation of risk-insights from existing PRAs is consistent with current regulatory policy, e.g.
  - Regulatory Guide 1.174 and 1.177
  - Regulatory Guide 1.200 and 1.206
  - PRA Policy Statement
  - National Academy of Sciences Report on digital I&C
  - Various sections of the SRP
  - SRM for SECY 93-087

Digital I&C Risk Insights from Current PRAs

- **Provide a white paper on simplified techniques for deriving risk-insights from PRA.**
  - **Screening approach to identify what accident sequences and functions are most affected by digital CCF**
  - **Identification of key plant design features keep the risk from digital failures low**
  - **Identification of what digital system diversity attributes and defensive measures are most important in the maintenance of acceptable risk profile from digital I&C.**