## Industry Proposal for Problem Statement #2 Activities

### Modeling Digital I&C with Current Techniques

The industry plans to demonstrate the viability of modeling digital I&C systems using current methods by relying largely on the methodology described July 2007 white paper on the subject. In order to ensure that these modeling methods would fulfill the review guidelines given in the draft ISG "Review of New Reactor Digital Instrumentation and Control Probabilistic Risk Assessments," and that they would fulfill the evaluation criteria given in the draft NUREG, "Approaches for Using Traditional Probabilistic Risk Assessment Methods for Digital Systems," the industry plans to prepare a matrix comparing the content of the white paper with the draft ISG review guidelines and the draft NUREG evaluation criteria and highlight any differences that exist in a gap analysis. The industry plans to complete this by 2/29/2008.

### Incorporation of Risk Insights in ISGs

The industry risk-informing TWG intends to review all ISGs to evaluate potential areas for generation of risk insights. Candidates for evaluation are listed in the table below.

| TWG | Problem Statement | PRA Applicable | Affects PRA Methods | Affects PRA Implementation |
|---|---|---|---|---|
| D3 | Adequate Diversity | | Yes | |
| D3 | BTP-19 Point 4 | Potentially | | Potentially |
| D3 | Effects of CCF | | Yes | |
| D3 | CCF Applicability | Potentially | Yes | |
| D3 | Echelons of Defense | Potentially | | |
| Human Factors | Minimum Inventory | | | Yes |
| Human Factors | Graded Approach | Yes | | |
| Human Factors | Credit for Operator Action | Yes | | Yes |

This activity will be ongoing as the draft ISGs for other TWGs are issued.

### Pilot Application for Use of Risk Information in Designing and Operating DI&C Systems

The industry plans to identify a plant to act as a pilot for a short-term, limited scope demonstration of the potential applications of risk insights for proposed upgrades at an existing plant. That is, the industry proposes using the pilot plant to demonstrate the viability of utilizing risk insights in 2-3 high-priority applications, and subsequently implementing the results at the pilot plant. The industry's highest priorities for developing methodology for generating and utilizing risk insights, and those which would be ideal candidates for pilot plant evaluations, are as follows:

- Optimize digital I&C system architecture in context with the overall plant design.
- Demonstrate incorporation of risk information in Diversity and Defense-in-Depth evaluations

- Suggest focus of NRC staff reviews of I&C submittals

The goal of the pilot plant is to provide a demonstration of the suitability of the use of risk information in the design of digital I&C systems at existing plants. Specifically, the industry intends to ensure that the pilot plant uses risk information both to determine which system design elements are not risk beneficial, and to determine which elements of design do not adequately address the risk. In order for this approach of incorporation of risk information in the design to be successful, the NRC I&C branch needs to commit to accepting risk-informed design approaches to be acceptable during their Diversity and Defense-in-Depth reviews. Specifically, the pilot plant needs to be able to install a system designed using risk-information as appropriate. The industry will draft and submit a more detailed pilot project plan, which will identify the plant to be used as the pilot, by 2/29/2008.

**Simplified Screening Techniques for Generating Risk Insights**

The industry intends to develop simplified methods to assist the designers of digital I&C systems in using data from PRAs at existing plants to optimize the design of their systems in the context of those plants. This methodology will assist system designers and plant personnel in understanding which features are important from a risk perspective, highlight credited system features, and help plant personnel evaluate which features are most important to maintain to assure lifetime reliability of the digital I&C system. The industry believes that this methodology will facilitate optimal communication between system designers and the plant PRA team without overburdening either group. The industry will develop this methodology in parallel with pilot plant activities, and will evaluate the robustness of the model by using data from the pilot plant to demonstrate that the methodology leads to risk insights that are substantially the same as those arrived at by completing a full evaluation.

**Demonstrate Consistency with Current Regulatory Policy**

The industry intends to demonstrate that the use of risk information in the design of digital I&C systems is consistent with current regulatory policy by comparing the analysis done in support of the pilot applications to applicable regulatory policy. This comparison will address RGs 1.174, 1.177, 1.200, and 1.206, as well as the PRA Policy Statement, the National Academy of Sciences report on digital I&C, and the SRM for SECY 93-87. The industry will document the results of this comparison in a white paper to be issued after completion of the pilot applications.