Briefing on Digital Instrumentation and Controls

April 07, 2008

Agenda

Introduction	**J. Grobe**
Review of Issued	**R. Croteau**
Interim Staff Guidance	
Use of Interim Staff Guidance	**P. Hiland**
and Operating Experience	
Review of Ongoing Efforts	**M. Mayfield**
Path Forward	**J. Grobe**

Digital Instrumentation and Controls Steering Committee

- **Task Working Groups**
  - **Group 1: Cyber Security**
  - **Group 2: Diversity and Defense in Depth**
  - **Group 3: Risk-Informed Digital Instrumentation and Control**
  - **Group 4: Highly-Integrated Control Room – Communications**
  - **Group 5: Highly-Integrated Control Room – Human Factors**
  - **Group 6: Licensing Process**
  - **Group 7: Fuel Cycle Facilities**

Digital Instrumentation and Controls Steering Committee

- **Activities Since July 2007**
  - **Human Capital Investment**
    - **Hiring**
    - **Training**
    - **Graduate Fellowship Program**

Digital Instrumentation and Controls Steering Committee

- **Activities Since July 2007 (cont.)**
  - **Task Working Group Accomplishments**
    - **32 Public Meetings**
    - **4 Interim Staff Guidance Documents Issued**
    - **Fuel Cycle Task Working Group Established**
  - **Project Plan Revised**
  - **4 Industry White Papers Received**

Digital Instrumentation and Controls Steering Committee

- **Issued Interim Staff Guidance Documents**
  - **September 2007: Diversity & Defense In Depth**
  - **September 2007: Highly Integrated Control Room – Communications**
  - **September 2007: Highly Integrated Control Room – Human Factors**
  - **December 2007: Cyber Security**

Digital Instrumentation and Controls Steering Committee

- **Remaining Interim Staff Guidance Documents**
  - **2008: Probabilistic Risk Assessments**
    Licensing Process
    Manual Operator Actions
    Fuel Cycle Facilities
  - **2009: Licensing Process With Cyber Security**

Digital Instrumentation and Controls Steering Committee

- **Interfaces**
  - **ACRS**
  - **Other Agencies and Industries**
  - **International Organizations**

Issued Interim Staff Guidance: Diversity and Defense-in-Depth

- **Protection Against Common-Cause Failures**
- **Software Error may Affect all Divisions**

Issued Interim Staff Guidance: Diversity and Defense-in-Depth

- **Applicant Should Perform Analysis**
- **Backup Capability**
  - **Diverse Actuation System**
  - **Manual Actions**

Issued Interim Staff Guidance: Highly-Integrated Control Room Communications

- **Describes Acceptable Approach:**
  - **Interdivisional Communications**
  - **Multidivisional Control and Display Stations**
  - **Command Prioritization for Safety over Non-Safety Functions**

Issued Interim Staff Guidance: Highly-Integrated Control Room - Human Factors

- **Computer-Based Procedures**
  - **Backup Procedure**
  - **Operator Should Always be in Control**
- **Minimum Inventory**

Issued Interim Staff Guidance: Cyber Security

- **Regulatory Guide - Safety Systems**
- **NEI Guidance - All Plant Systems**
- **Table Correlating NEI Guidance with the RG**
- **Either Acceptable**

Use of Interim Staff Guidance ISG-04: Communications

- **Using for Prioritization and Control Module Topical Report Review**

- **Interim Staff Guidance is Providing a Clear Roadmap**

Use of Interim Staff Guidance Oconee Application

- **Digital Reactor Trip System and Engineered Safety Feature Actuation System Modification**

- **Review Design Features Using ISGs**

- **Pilot Draft ISG-06: Licensing Process**

- **Developing Inspection Procedure**

Operating Experience

- **National and International Data Bases**
- **CCFs are a Valid Concern**
- **Limited Level of Detail**
- **Continuing Review of Nuclear and Non-Nuclear Data**

Operating Experience DI&C Events

- **Domestic Power Reactor – Failed Feedwater Control System Complications During Recovery**

- **Domestic Fuel Cycle Facility – Digital Control System Re-Initialization of System Configuration**

- **Foreign Power Reactor – Digital Relays Delay in Disconnecting Main Generator**

Ongoing Efforts

- **Risk Informing Digital I&C**
  - **New Reactor Digital I&C PRA ISG is Near Completion**
  - **Plan for Risk Insights**
  - **Active Interactions with Industry**

Ongoing Efforts

- **Alternative Process to 30 Minute Criteria**
  - **Operator Action to Cope with Common Cause Failures**
  - **Human Factors TWG**
  - **Issue ISG in 2008**

Ongoing Efforts

- **Fuel Cycle Facilities**
  - **Project Plan has been Developed**
  - **Interacting with the Industry to Develop Guidance**

Path Forward

- **Issue Interim Staff Guidance Documents**

- **Revise Interim Staff Guidance as Needed**

- **Address Long Term Actions to Update Regulatory Infrastructure**

Acronyms

ACRS   Advisory Committee on Reactor Safeguards
CCF   Common Cause Failure
DI&C   Digital Instrumentation and Control
ISG   Interim Staff Guidance
NEI   Nuclear Energy Institute
PRA   Probabilistic Risk Assessment
QA   Quality Assurance
RG   Regulatory Guide
TWG   Task Working Group