Digital PRA Task Work Group Industry Perspective Problem Statements

NRC / Industry Meeting

Digital I&C

February 23, 2007

Digital PRA Issues

- With the creation of joint industry/NRC efforts for resolving digital I&C licensing issues
  - Technical issues at which the development of risk-informed methods were originally directed have been assigned to other Task Work Groups
  - The resolution of these technical issues by the other Task Work Groups will define the path forward for both new plants and operating plants considering digital upgrades
  - The focus of near term industry and NRC research efforts needs to support the short term issues associated with these other Task Work Groups

Digital PRA Issues

- Short Term
  - Reliability of ESFAS during Large LOCA
  - Value of Diversity between ‘echelons of defense’
  - Technical Adequacy of PRAs for new Plants
- Long Term
  - Modeling/quantification of digital I&C in PRAs is evolving

Short Term

- Defense-in-depth and diversity Task Work Group
  - Precedence for justifying not addressing the need for a diverse actuation system during Large LOCA has been based on
    - Low potential for failure of the digital system coincident with a Large LOCA
    - Leakage detection systems that are diverse from the digital system
  - Knowledge of the reliability of a digital ESFAS under Large LOCA conditions would be useful

Short Term

- Defense-in-depth and diversity Task Work Group
  - Understanding where defense-in-depth and diversity are of value and how reliable digital systems need to be would help identify the risks and benefits of such diversity

Short Term

- The technical adequacy of new plant PRAs are being demonstrated using current standards and regulatory guidance
  - Given the imminent completion of the new plant PRAs and their schedule for submittal, it is expected that meeting current standards and regulatory requirements (e.g., ASME Std RA-S-2002 and R.G. 1.200) will be sufficient.
  - Sensitivity evaluations can be used to show low safety significance and impact of specific modeling methods (particularly given that the new plants will have fully designed and implemented digital systems in accordance with conservative regulatory requirements).

Long Term Issues

- Methods for modeling and quantifying the reliability of digital systems are evolving
  - The industry, via the task force, expects to continue supporting the research projects via technical reviews.
  - A graded approach to defining the level of detail that is useful in modeling I&C in PRA is needed that is consistent with current industry standards and regulatory guidance
    - NEI 00-02
    - ASME Std RA-S-2002
    - Reg Guide 1.174
    - Reg Guide 1.200