U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

CONSIDERATIONS FOR PURSUING RISK-INFORMED REGULATIONS, PROGRAMS, AND ACTIVITIES

Donnie Harrison

U.S. Nuclear Regulatory Commission

Donnie.Harrison@nrc.gov

301.415.2470

RISK-INFORMED REGULATION SEMINAR

Mexico City, Mexico August 27-31, 2012

OUTLINE

- Transitioning
  - Attitudes
  - Processes
  - Organization
- Understand What Can and Cannot Be Done
- Resources

Transitioning Attitudes

- Change is always difficult
  - Initial responses to change are almost always resistive
    - Why change if it is not broken?
- Change can be achieved if vision is established
  - Value of the change must be explained, understood, and demonstrated
    - How does it make my job better, more informed, lead to better decisions?
    - What is risk-informed decision making and what is not?
- Change requires decisions and commitment to actions
  - Training, Resources, Application

Transitioning Processes

- Commission decided that risk-informed approaches should be voluntary alternatives to the traditional approaches, except under special circumstances
  - Many applications (and some Regulations) allow use of a risk-informed approach as an alternative to the established approach
- Building a risk-informed infrastructure takes effort and time:
  - In mid-1990s Regulatory Guides began to be developed to guide licensee's pursuing risk-informed licensing changes and Standard Review Plan Chapter 19 and application-specific sections developed to guide staff reviews of risk-informed license amendment requests
  - Expansion of risk-informed approaches brought into Reactor Oversight Program, Generic Issue Program, etc.
  - Still expanding

Transitioning Policies & Organization

- US NRC Commission led change by changing policies
  - Safety Goal Policy Statement
  - PRA Policy Statement
- In early 2000s, a few branch level entities were brought together and formed into a division (Division of Risk Assessment) within the Office of Nuclear Reactor Regulation at the US NRC in recognition of the expanding role of risk insights in all regulatory areas
  - Some of the branches brought into the new division were (and some still are) not probabilistic-oriented

Understand What Can/Cannot Be Done

- Need to develop understanding of how PRA and risk-informed approaches can be used and where they are not appropriate for use
  - Perspective should not be the elimination of the traditional engineering approach, but rather, a complementary addition that leads to better understanding and thus, better safety decisions
  - Recognize that there are unknowns and so the PRA is not perfect (or precise) and cannot answer all unknowns
    - If the phenomena is not understood, then the PRA will have similar issues as the traditional engineering approach

The goal is better safety decisions

Resources

- Challenges to secure PRA expertise from internal (NRC) or external resources
- Increasing demand for PRA expertise in NRC and by licensees:
  - Commission directed Level III PRA
  - 10 CFR 50.48(c) (NFPA 805) fire protection implementation
  - 10 CFR 50.69 (Special Treatment) pilot/implementation
  - Risk Managed Technical Specification pilot/implementation
  - Post-Fukushima activities (seismic PRA, flooding PRA, other natural hazards)
  - Risk Management Task Force report
- Recently began effort to establish a formal program to "Grow Your Own" PRA expertise

Program Characteristics

- Recruit internal candidates via a competitive process
- Require successful candidates to complete training program within about three years
- Promote successful candidates upon SUCCESSFUL completion of the program
- Utilize training offered at NRC:
  - Technical Training Center
  - Professional Development Center
  - Staff-developed, application-specific training
- Utilize training offered by external sources (e.g., Electric Power Research Institute)
- Emphasize On-the-Job training meeting mission critical needs (e.g., Level III PRA, NFPA 805 reviews)

Curriculum- Characteristics

- Core program common to all offices of NRC (NRR, RES, NRO, NMSS)
- Additional customized program to fit individual office's need and the background of the successful candidate
- Significant mentoring
- Well documented training records:
  - Formal qualification program
  - Electronic qualification cards
  - Periodic evaluations by technical mentors
  - Final evaluation by a Qualification Board

Curriculum - Sample

- Classroom training on basic PRA skills from PDC
- Independent Studies required for risk analysts.
- 7-week training course on reactor systems at TTC.
- Rotational assignments as a resident inspector (~ 3 months)
- Rotational assignment to Idaho National Laboratory to develop and refine PRA models (~ 3 months)

The Learning Project

- Unique hands-on project for multiple candidates
- Develop PRA analysis using actual licensee design documents and calculations
- Working with Human Resources to develop lesson plans

Status

- Completed the posting to internal NRC candidates
- Held information sessions to advertise within NRC
- Received applications from a large number of high-quality applicants
- Large number of high-quality applicants applied to join the program as a “lateral” simply to learn PRA
- Drafted an “Office Instruction” to establish the qualification program
- Selections of candidates completed and beginning implementation of the program in Fall

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

The End

Questions & Answers…..