

# SESSION 1-10

## MOVING FORWARD WITH RISK-INFORMED REGULATORY ACTIVITIES (RMTEF, NTTF – 1, 2.1, 2.3, RES LEVEL III)

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**RISK-INFORMED REGULATION SEMINAR**  
Mexico City, Mexico August 27-31, 2012

# LEARNING OBJECTIVES

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- To summarize
  - Where the NRC and industry is heading with respect to the use of risk analysis
  - What is on the horizon for additional uses

# Where We Are

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- Rules
- Guidance
- Technical basis

# Where We Are

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- Rules
  - Most rules continue to be deterministic
  - Some additional requirements have been implemented based on risk information
    - Station blackout, ATWS, Maintenance
      - infrastructure in place and working
  - Several alternative rules have been implemented
    - 50.48(c) (fire protection)
      - Pilots complete, LARs being received and reviewed
    - 50.69 (special treatment requirements)
      - Being piloted
    - 50.61a (pressurized thermal shock)
      - Untested

# Where We Are

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- Guidance
  - Many risk-informed applications are supported by regulatory guidance
    - Regulatory Guide 1.174 (general guidance)
      - infrastructure in place and working
    - Regulatory Guide 1.175 (inservice inspection)
      - infrastructure in place and working
    - implemented at nearly every US plant
  - Regulatory Guide 1.177 (technical specifications)
    - infrastructure in place and working
    - expansion opportunities being pursued
  - Regulatory Guide 1.205 (fire protection)
    - infrastructure in place and working

# Where We Are

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- Guidance
  - Consensus standards
    - Regulatory Guide 1.200 (PRA technical adequacy)
      - Revision 2 in effect since April 1, 2010
    - ASME/ANS RA-Sa-2009
  - Infrastructure in place and being used
  - Obviates need for NRC detailed review of licensee's **base** PRA (focuses staff review on application and peer review findings)

# Where We Are

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- Technical information and guidance

- Internal events PRA
  - Extensive
- Fire PRA
  - Methods and guidance available
  - Beginning to use
- External hazards PRA
  - Not extensive

- Technical expertise

- Internal events PRA
  - Extensive
- Fire PRA – NFPA 805
  - 50% of plants will have fire PRA as a result of NFPA 805 transition
  - Others developing fire PRA
- External hazards PRA
  - Fukushima NITTF 2.1
    - Seismic PRA
    - Flooding PRA

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# Moving Forward with Risk-Informed Initiatives



# Where We're Going

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- Commission Risk-Related Task Forces
  - A Proposed Risk Management Regulatory Framework (NUREG-2150, Commissioner Apostolakis Risk Management Task Force) and Near-Term Task Force (NTTF) Recommendation 1
  - Reassessment of External Hazards (NTTF Recommendations 2.1 and 2.3) and Station Blackout (SBO)
- New Full-Scope Level III PRA study

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# **Risk Management Task Force (RMTF)**

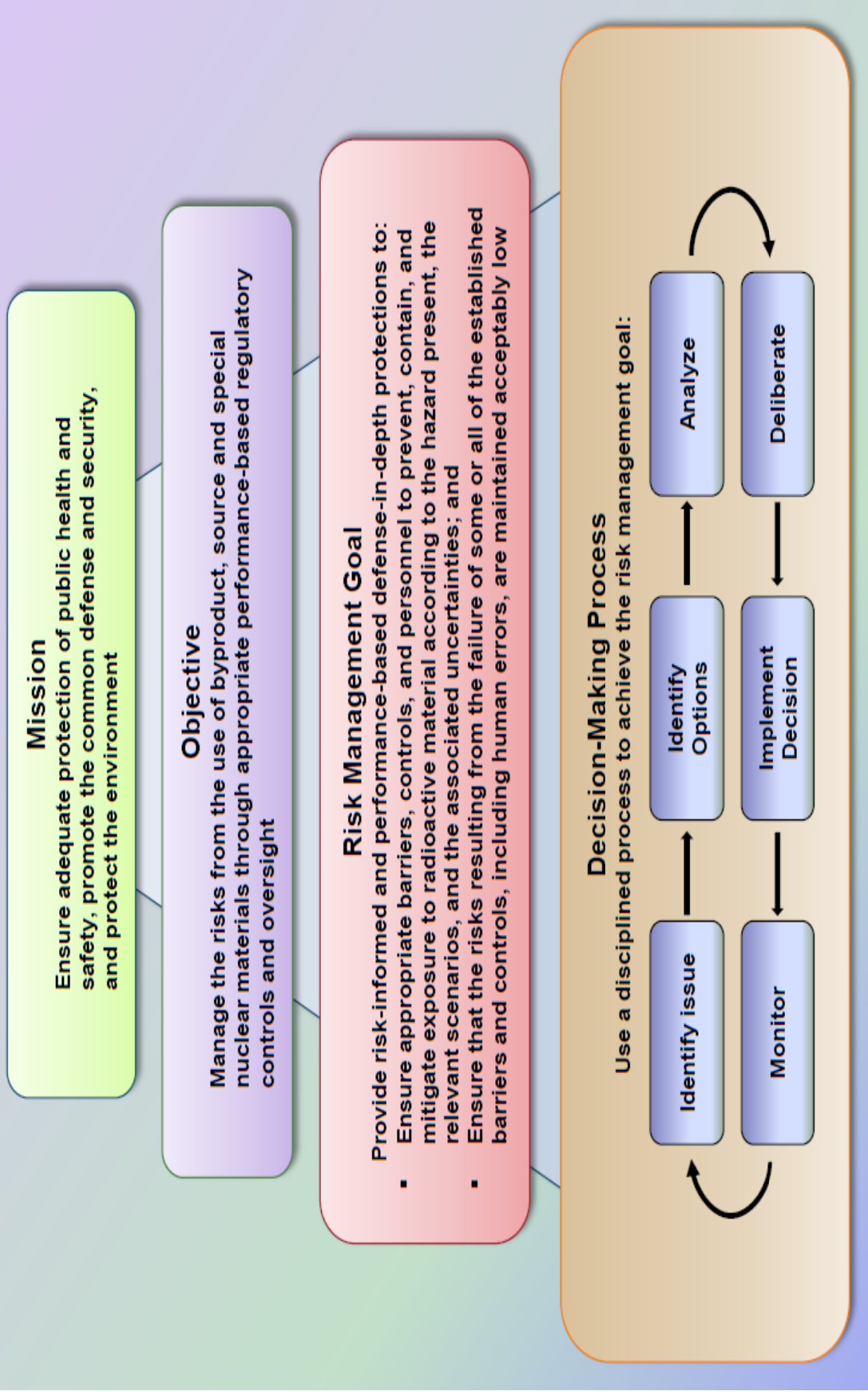
# RMTF Approach

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- Provide a vision for a regulatory system 10-15 years in the future
- The approach should build on the experience of the last 20 years and should be evolutionary rather than revolutionary
- The need for a new regulatory approach was also recognized by the Fukushima Near Term Task Force Recommendation 1:

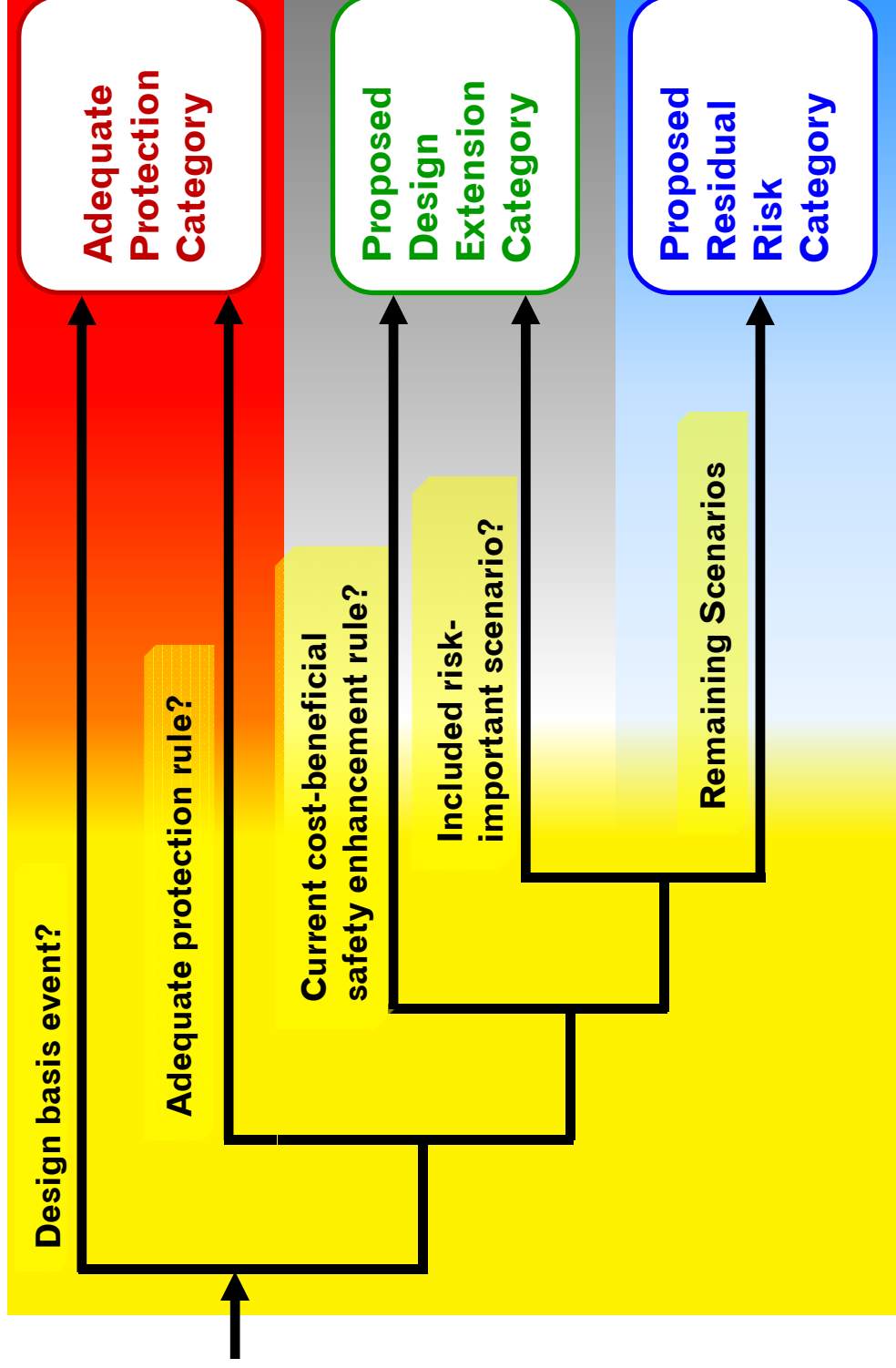
*“Establish a logical, systematic, and coherent regulatory framework for adequate protection that appropriately balances defense-in-depth and risk considerations.”*

# A Proposed Risk Management Regulatory Framework



# A Proposed Risk Management Regulatory Framework

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# Reassessment of External Hazards and SBO

# Requests for Information

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- The NRC requested information on:
  - the adequacy of facility design bases with respect to seismic and flooding hazards
  - whether facility configurations, as confirmed by seismic and flooding walkdowns, are in compliance with current facility design bases
  - current communications system power supplies and their availability during a prolonged SBO event
  - the required staffing necessary to respond to a multiunit, prolonged SBO event

# Schedule Overview – 50.54(f) Letter Seismic/Flooding Reevaluations

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Milestone	Operating Reactors and Construction Permit Holders
Guidance Issued	November 30, 2012
Initial Response	January 30, 2013
Licensee Seismic Hazard Evaluations Due	September 9, 2013 (CEUS) / March 9, 2015 (WUS)
Licensee Flooding Hazard Evaluations Due	March 9, 2013 – March 9, 2015 (based on prioritization)
Future Steps	Pending NRC evaluation and prioritization, with completion of evaluations for all facilities between October 2016 and April 2019



# Schedule Overview – 50.54(f) Letter Seismic/Flooding Walkdowns

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Milestone	Operating Reactors
Guidance Issued or Endorsed	May 31, 2012
Licensees Provide Results of Walkdowns	November 27, 2012

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# Full-Scope Level 3 PRA

# Site Level 3 PRA – Background

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- Commission paper (SECY-11-0089), dated 7/7/11, provided three options for undertaking Level 3 PRA activities<sup>1</sup>
  1. Maintain status quo
  2. Focused research to address gaps before proceeding
  3. Conduct a full-scope, comprehensive site Level-3 PRA
- In a staff requirements memorandum (SRM) dated 9/21/2011 the Commission approved a modified version of Option 3
  - Schedule extended from 3 to 4 years

<sup>1</sup> *Level 3 PRA includes the onset of core damage, the release of radioactive material to the environment, and offsite radiological consequences.*

# Site Level 3 PRA – Objectives

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- Develop a Level 3 PRA that (1) reflects technical advances since the last NRC-sponsored Level 3 PRAs were completed over 20 years ago, and (2) addresses scope considerations that were not previously considered
- Extract new insights to enhance regulatory decisionmaking and to help focus limited agency resources on issues most directly related to the agency's mission to protect public health and safety
- Enhance PRA capability, expertise, and documentation
- Demonstrate technical feasibility and evaluate the realistic cost of developing new Level 3 PRAs

# Site Level 3 PRA – Approach

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- Scope includes site radiological sources (all reactor cores, spent fuel pools, and dry storage casks on site), all internal and external initiating event hazards, and all modes of operation
  - Excludes radiological sources involving fresh nuclear fuel and radiological waste, and initiating events involving malevolent acts
- In general, the Level 3 PRA study will be based on current “state of practice”
- Additional advancements in PRA technology will be required in some areas (e.g., multi-unit risk and non-reactor-core radiological sources), but the desire for realism will be balanced against resource and schedule limitations
- The study will be for a single site; therefore, it will not necessarily provide insights applicable to all sites and all technical issues.

# Where We're Going in Other Areas

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- **Rules**
  - Pilot implementation of 50.69
  - Pilot implementation of risk managed technical specifications (Initiative 4B)
- **Guidance**
  - Focus on applications
  - Continue standards development
- **Technical Basis**
  - Continue “basic” research
  - Develop new guidance documents
  - Build staff and industry expertise
- **Risk Metrics (ROP & applications) for new reactors**
- **Better tools for SDP**

# SUMMARY

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- Progress has been made
- Risk analysis methods offer many additional opportunities to improve decision making
- To accomplish these, a long-term commitment is needed:
  - To build and maintain the models
  - To train staff to use them
  - To use them

# The End

## Questions & Answers.....

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