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UNITED STATES NUCLEAR REGULATORY COMMISSION

Protecting People and the Environment

Developing the Reactor Oversight Process (ROP) for New Reactors -

ROP Working Group Public Meeting
May 20, 2015

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Meeting Purpose

- To discuss and share the staff's plans to address the Commission SRM on risk-informing the ROP for new reactors
- To solicit and discuss feedback from the public, industry, and other stakeholders regarding the staff's approach and any other related considerations

Historical Context

- Risk numbers for new reactors are expected to be lower than current fleet by an order of magnitude or more (Staff 2009 White Paper)
- The Commission reaffirmed the existing safety goals for new reactors (SRM-SECY-10-0121)
  - Commission expects new reactor designs to have enhanced safety margins
  - New reactors with enhanced safety margins should have greater operational flexibility than current reactors
- Modifications within the ROP framework are warranted for new reactor designs (SECY-12-0081)
  - Tabletop exercises demonstrated that the safety significance of findings could be greater-than-green, but would likely involve common cause failures that affect multiple systems and/or long exposures of risk-significant components
  - MSPI is not adequate and would be largely ineffective

Recent Background

- In December 2013, SECY-13-0137 provided staff recommendations for risk-informing the ROP for new reactors
- Recommendation 1: Develop an integrated risk-informed approach for evaluating the safety significance of inspection findings for new reactors
  - The integrated risk-informed approach would use qualitative measures to supplement the risk evaluations in a structured manner to ensure an appropriate regulatory response to performance issues
- Recommendation 2: Develop appropriate PIs and thresholds for new reactor applications, specifically those PIs in the Initiating Events and Mitigating Systems cornerstones,
  - Or develop additional inspection guidance to address identified shortfalls to ensure that all cornerstone objectives are adequately met.

Commission SRM - June 2014

- Commission disapproved the staff's Recommendation 1, to develop an integrated risk-informed approach using qualitative measures to supplement the risk evaluations
- Commission approved the staff's Recommendation 2, to develop appropriate PIs and thresholds for new reactors
- Overall structure of existing ROP should be preserved
- Staff should notify Commission through the annual ROP self-assessment report if they identify any further needed changes based on operating experience with new plants

Specific SDP Direction

- Enhance the SDP by developing a structured qualitative assessment for events or conditions that are not evaluated in the supporting plant risk models
  - Areas of consideration may include issues associated with passive safety systems, digital instrumentation and controls, and human performance issues
- Continue to place emphasis on the use of the existing quantitative measures of the change in plant risk
- Address circumstances that are unique to new reactors, for example due to uncertain reliability of passive SSCs or others with limited operational experience
- Submit paper to Commission with its proposed approach at least one year before scheduled implementation

Specific PI Direction

- Develop appropriate PIs and thresholds for new reactors, specifically those PIs in the Initiating Events and Mitigating Systems cornerstones, - or -
- Develop additional inspection guidance as needed to address identified shortfalls to ensure that all cornerstone objectives are adequately met
- Develop, with appropriate stakeholder input, necessary updates to the PIs and submit them to Commission prior to power operation for the first new reactor units
- Further explore how the current Safety System Functional Failure (SSFF) PI would be applied to the passive safety-related components in new reactors

Staff Approach

- Develop the SDP and PIs concurrently and holistically, along with changes to the baseline inspection program
- Involve internal and external stakeholders, including NRR, NRO, Region II, Industry, ACRS, and public
- Likely run tabletops and/or pilot to validate proposals
- Development and implementation consistent with ROP goals and principles of good regulation
  - risk-informed, objective, predictable & repeatable
  - independence, openness, efficiency, clarity & reliability
- Provide crisp paper(s) with enough detail to provide the Commission the staff's plans and recommendations
  - May produce single comprehensive paper

Other Considerations

- Align with other transition readiness issues from September 2014 staff report (ML14031A386)
- Existing baseline inspection program needs to be evaluated to identify and fill gaps
- Several PIs won't be valid initially
- Lessons learned from Watts Bar 2 transition
- Operating experience from AP 1000s in China
- Applicability of ROP for new reactors
  - Relationship to current fleet
  - AP-1000 specific or for all "new" (passive?) reactors
- Continued improvements after implementation

Integrated Approach

- ROP Framework
  - Unchanged – Same seven cornerstones and goals
- PI Program
  - Changes needed per SRM and transition plan (RI-09A)
- Inspection Program
  - Changes needed per transition plan (RI-10)
- Significance Determination Process
  - Changes needed per SRM and transition plan (RI-11)
- Assessment Program
  - Unchanged – PIs and findings inform Action Matrix response
- Cornerstones Affected
  - IE, MS, and BI (Reactor Safety, most risk-informed)

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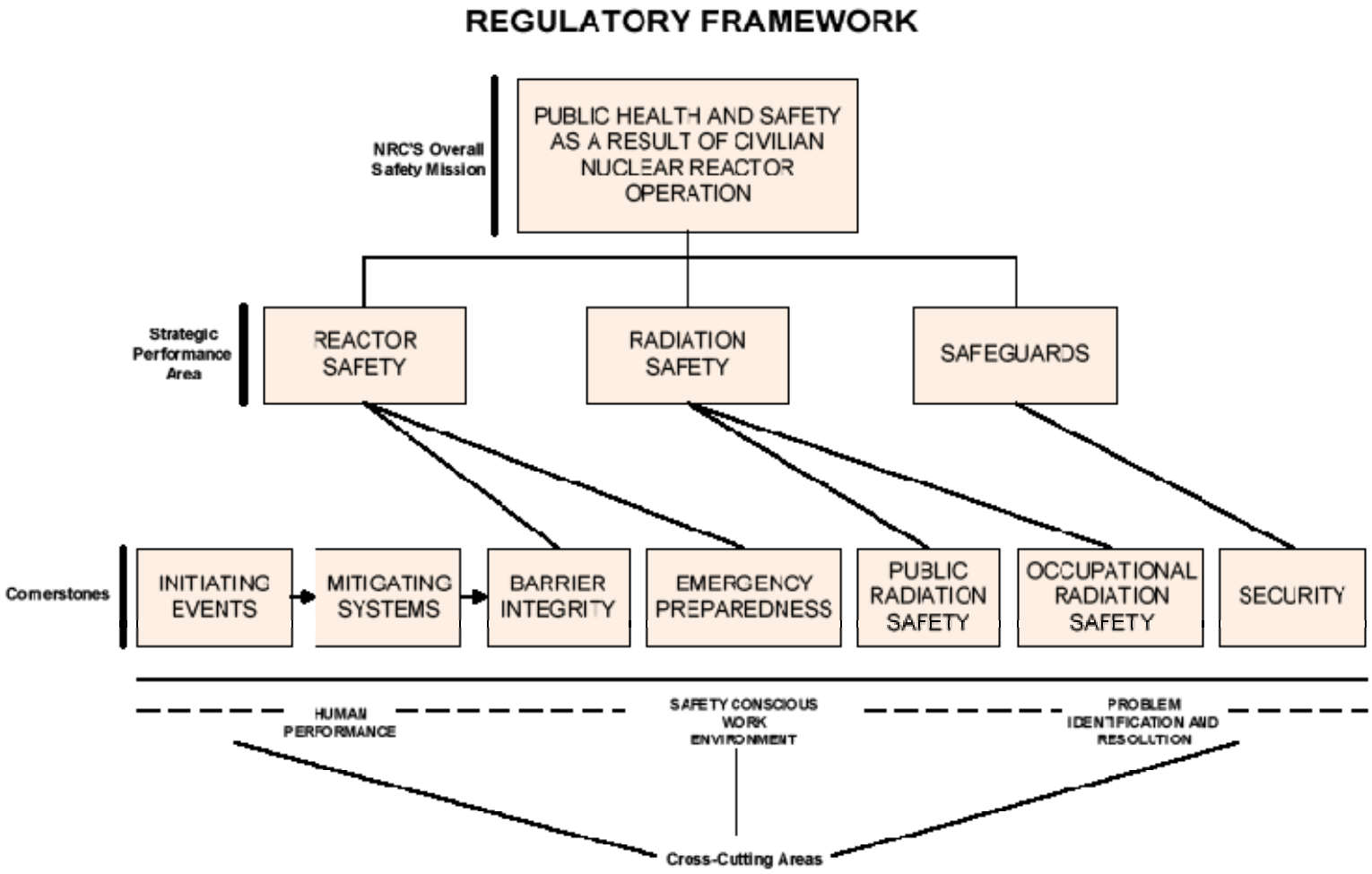
Exhibit 1: REGULATORY FRAMEWORK



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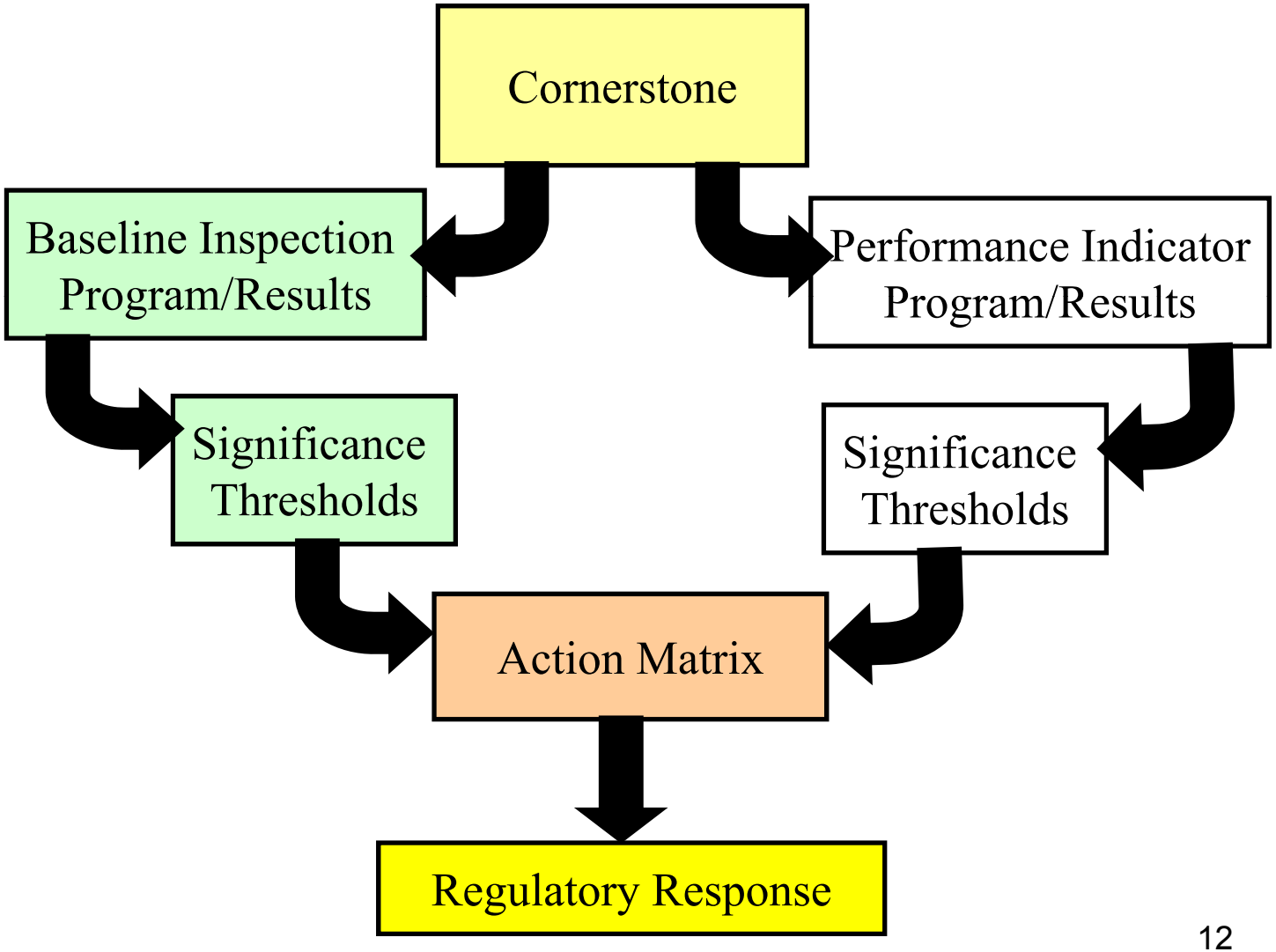
Reactor Oversight Process



Next Steps

- Series of public meetings and tabletop exercises through 2nd quarter 2017, as necessary
  - Consider next meeting and potential frequency
- Produce draft SECY(s), discuss in public meeting, and brief ACRS in 3rd quarter 2017
- Revise SECY as needed in 4th quarter 2017
- SECY to Commission in 1st quarter 2018
- Finalize guidance documents by 4th quarter 2018
- NOTE: Current dates based on anticipated operation of first units in December 2019 (this date is unofficial and could change)