



RIC 2010

NRC Reactor Oversight Process

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Evolution of the Reactor Oversight Process

- Initially, NRC and its predecessor, the Atomic Energy Commission, were focused on inspection and enforcement – an assessment process was not mandated by law.
- Key recommendation from the Kemeny Commission chartered by the President to review the 1979 Three Mile Island accident - “Each operating licensee should be subject periodically to intensive and open review of its performance according to the requirements of its license and applicable regulations.”
- This recommendation resulted in the development and implementation of the Systematic Assessment of Licensee Performance (SALP) process in 1980.



Evolution of the ROP (cont.)

- In response to lessons-learned regarding the NRC approach to assessing licensee safety performance stemming from the Davis-Besse loss-of-feedwater event in 1986, the Senior Management Meeting (SMM) review process, and associated “NRC Watch List” were developed.
- In June 1996, the Commission directed the staff to assess the SMM process and evaluate the development of indicators to provide a basis for licensee placement on/deletion from the Watch List.
- On June 24, 1997, the Commission approved the NRC staff’s plan to improve the SMM process based on the recommendations from an Arthur Anderson study of the effectiveness of the process conducted in the Fall of 1996.



Evolution of the ROP (cont.)

- In parallel with NRC efforts to improve the SMM process, the staff, with Commission approval, initiated an integrated review of the current agency assessment processes, including plant performance reviews, SALP, and the SMM.
- This initiative, called the Integrated Review of the Assessment Process (IRAP), was intended to address criticisms of the current process as expressed by multiple stakeholders, including Congress, the industry, and the public.



Concerns with the Previous ROP

- Aggregation of Severity Level IV violations.
- Use of “regulatory significance” concept – results in NRC not clearly focusing on the most important safety issues.
- Overly subjective process, with NRC action taken in a manner that was at times neither scrutable nor predictable.
- Inconsistencies between NRC regional offices in the significance assigned to similar inspection issues in determining licensee safety performance.



Evolution of the ROP (cont.)

- The IRAP team took a process re-engineering approach to identify those objectives, attributes, and activities that would be needed in a new process to effectively assess overall licensee safety performance.
- In March 1998, the NRC staff recommended to the Commission a new integrated assessment process. IRAP proposal fundamental concepts:
 - Inspection findings provide the basis for the assessment,
 - Findings would be categorized by performance template areas and would be scored based on safety significance,
 - Assessment would consist of totaling the scores in each template area and comparing these scores against threshold values, and
 - NRC actions would be taken based on a decision model.



Evolution of the ROP (cont.)

- Commission concerns with the IRAP proposal:
 - Use of enforcement as a “driving force” for the assessment process,
 - Quantitative scoring of plant issues matrix (PIM) entries, and
 - Use of color coding to define performance rating categories.
- Commission direction to recommend changes to the assessment process that considers:
 - Results of public comments on IRAP proposal,
 - How to address regional consistency and equitable treatment of plants receiving varying levels of inspection effort, and
 - Including conceptual changes to the inspection program needed to conform with the new assessment process.



Evolution of the ROP (cont.)

- In parallel with the NRC staff's development of the IRAP proposal, the industry, through the Nuclear Energy Institute (NEI), developed an independent proposal for improving the assessment process.
- NEI proposal was fundamentally and philosophically different from the IRAP:
 - Tiers of licensee performance based on maintaining radionuclide release barriers, minimizing events that could challenge the barriers, and ensuring systems can perform their intended functions; and
 - Measure tier performance through high-level, objective indicators with thresholds for each indicator that would define licensee response band, regulatory response band, and a band of unacceptable performance.
- On July 17, 1998, Commission holds meeting with public and industry stakeholders to hear views on the NRC's reactor oversight processes; on July 31, a discussion of the NRC's reactor oversight processes occurred during a Senate oversight hearing.



Evolution of the ROP (cont.)

- In response to the NEI proposal, Commission comments on the IRAP proposal, and comments during the July Commission meeting and Senate oversight hearing, the NRC staff decides to develop recommendations for revising all elements of the ROP, i.e., inspection, assessment, and enforcement.
- Series of public meetings to obtain internal and external stakeholder input on the development of a new or revised ROP were conducted.
- NRC staff formed three task groups to develop recommendations for a revised ROP; technical framework task group, inspection task group, and assessment task group.
- During development of the revised ROP, NRC staff continued to keep the Commission informed of progress and receive Commission direction.



Evolution of the ROP (cont.)

- Staff submits revised ROP to Commission on January 8, 1999.
- Regulatory oversight framework consists of three strategic performance areas which are subdivided into seven cornerstones of safety.
- The cornerstones of safety were chosen to:
 - limit the frequency of initiating events;
 - ensure the availability, reliability, and capability of mitigating systems;
 - ensure the integrity of the fuel cladding, reactor coolant system, and containment boundaries;
 - ensure the adequacy of the emergency preparedness function;
 - protect the public from exposure to radioactive material releases;
 - protect nuclear plant workers from exposure to radiation; and,
 - provide assurance that the physical protection system can protect against the design-basis threat of radiological sabotage.



Evolution of the ROP (cont.)

- Certain aspects of licensee performance were seen as “cross-cutting” and potentially impacting more than one cornerstone: human performance, safety conscious work environment, and problem identification and resolution (corrective action).
- Given the role of personnel in maintenance, testing, and operation, human performance plays a key role in normal and emergency operations.
- Safety conscious work environment (SCWE) is characterized by a willingness of licensee staff to raise safety issues to resolve risk-significant equipment and process deficiencies, adhere to written procedures, conduct effective training, make conservative decisions, and conduct probing self-assessments.
- Defining and implementing an effective problem identification and corrective action program is a key element underlying licensee performance in each cornerstone area.



Evolution of the ROP (cont.)

- Fundamental concepts:
 - Licensee performance that meets the objectives and key attributes of the seven cornerstones provides reasonable assurance that public health and safety is being maintained, and
 - Challenges/problems in one or more of the three cross-cutting areas are the precursors to conditions/events that will result in either exceeding the PI thresholds or risk-significant inspection findings.
- Six month pilot program of the revised ROP (May to November 1999) involving two sites per region.
- Based on successful pilot, revised ROP implemented nationwide starting April 2, 2000.



Defining Principles of the ROP

- Risk-informed baseline inspection program establishes the minimum regulatory interaction for all licensees.
- Thresholds can be set for licensee safety performance that provide for a graded approach to NRC engagement.
- Adequate assessment of licensee performance at the cornerstone level requires assessment of both performance indicators (PIs) and inspection findings
- Both PIs and inspection results will have risk-informed thresholds.



Defining Principles of the ROP (cont.)

- Crossing a PI threshold and an inspection threshold will have the same meaning with respect to safety significance and the need for regulatory engagement.
- Baseline inspection program covers those risk-significant attributes of licensee performance not adequately covered by the PIs.
- Baseline inspection program includes verification of PI accuracy and provides for event response.
- Enforcement actions (number of cited violations and the amount of a civil penalty) should not be an input to the assessment process. However, the issue that led to the enforcement action will continue to be considered in the assessment.



Reactor Oversight Process

- Placement in the Action Matrix determines degree of NRC engagement:
 - Licensee Response Column (all green PIs and inspection findings) – baseline inspection
 - Regulatory Response Column (one or two “white” inputs in different cornerstones) – 95001 supplemental inspection
 - Degraded Cornerstone Column (e.g., two “white” or one “yellow” input in the same cornerstone) – 95002 supplemental inspection
 - Multiple/Repetitive Degraded Cornerstone Column (multiple “yellows” or one “red” input) – 95003 supplemental inspection; and,
 - Unacceptable Performance Column;
 - IMC 0350 Process (i.e., outside the auspices of the Action Matrix) – Plants in a shutdown condition with performance problems.
- Since 2000, only seven plants have been in the Multiple Degraded Cornerstone column of the Action Matrix; none have returned.



How the ROP has Changed

- NRC recognized the critical importance to continuing success of the ROP is providing for a means to modify the ROP as new safety issues are identified and lessons are learned.
- ROP has provisions for critical self-assessment – process includes internal and external stakeholder input and evaluation against defined metrics.
- Major changes since 2000:
 - Security information made non-public post-9/11,
 - Frequently Asked Question (FAQ) process has led to assessment input revisions – 467 FAQs ruled on since the ROP began,
 - PIs have changed - Mitigating Systems Performance Indicator (MSPI),
 - Iteration of the substantive cross-cutting issue classification process, and
 - Provision for independent assessment of safety culture via the cross-cutting issue process in response to Davis-Besse lessons learned.



Positive Benefits of the ROP

- Improved scrutability and predictability,
- Increased focus on safety significance,
- Graded approach to NRC engagement as a function of licensee performance,
- Licensees are typically proactive regarding cross-cutting issue trends,
- Significant improvement in regional consistency with respect to inspection issue significance, and
- Licensees who have entered Action Matrix Column IV have improved their performance and sustained those improvements.



Challenges Going Forward

- Cross-cutting issues, approach to safety culture, and increasing number of green findings.
- PI effectiveness as leading indicators of licensee performance.
- Extensive effort expended by both NRC and licensees to finalize the significance of some inspection findings – diminishing returns?
- Optimal engineering inspection footprint.



Questions??

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