NRC Response to Plant Performance

The NRC determines its regulatory response in accordance with an Action Matrix (see Figure 3). This matrix objectively ranks plant performance based on the significance of the inspection findings and PIs. The Action Matrix provides consistent, predictable, and understandable agency responses to licensee performance. As illustrated in Figure 3, NRC increases oversight as licensee performance declines.

Communications

The NRC assesses plant performance continuously and issues letters summarizing plant performance every 6 months. The NRC posts these assessment letters on each plant's performance summary public Web site, and conducts public meetings with licensees to discuss plant performance. Other information available through the plant's Web site includes the following:

- quarterly performance indicator data
- significant inspection findings
- inspection reports

Individual plant performance information and additional information about the ROP can be accessed through the following Web site:

http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/index.html

Increasing Regulatory Oversight

ROP Action Matrix Assessment of Plant Performance	NRC Response
Column 5. Unacceptable Performance	**Response at Agency Level**
Column 4. Repetitive degraded cornerstone, multiple degraded cornerstones, or multiple **YELLOW** inputs, or one **RED** input	**Response at Agency Level** • Meeting with NRC Executive Director for Operations and senior plant management • Plant operator improvement plan with NRC oversight • NRC team inspection focused on performance issues at the site • Demand for Information, Confirmatory Action Letter, or Order
Column 3. One degraded cornerstone (two **WHITE** inputs or one **YELLOW** input or three **WHITE** inputs in any strategic area)	**Response at Regional Level** • Meeting with NRC and senior regional management and plant management • Plant operator self-assessment with NRC oversight • Additional NRC inspections focused on cause of degraded performance
Column 2. No more than two **WHITE** inputs in different cornerstones	**Response at Regional Level** • Meeting with NRC and plant management • Plant operator corrective actions to address WHITE inputs • NRC inspection to follow up on WHITE inputs and corrective action
Column 1. All performance indicators and cornerstone inspection findings **GREEN**	**Normal Regional Oversight** • Routine inspector and staff interaction • Baseline inspection program • Annual assessment public meeting

Increasing Safety Significance

Figure 3. NRC response plan to ROP assessment of plant performance

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Reactor Oversight PROCESS

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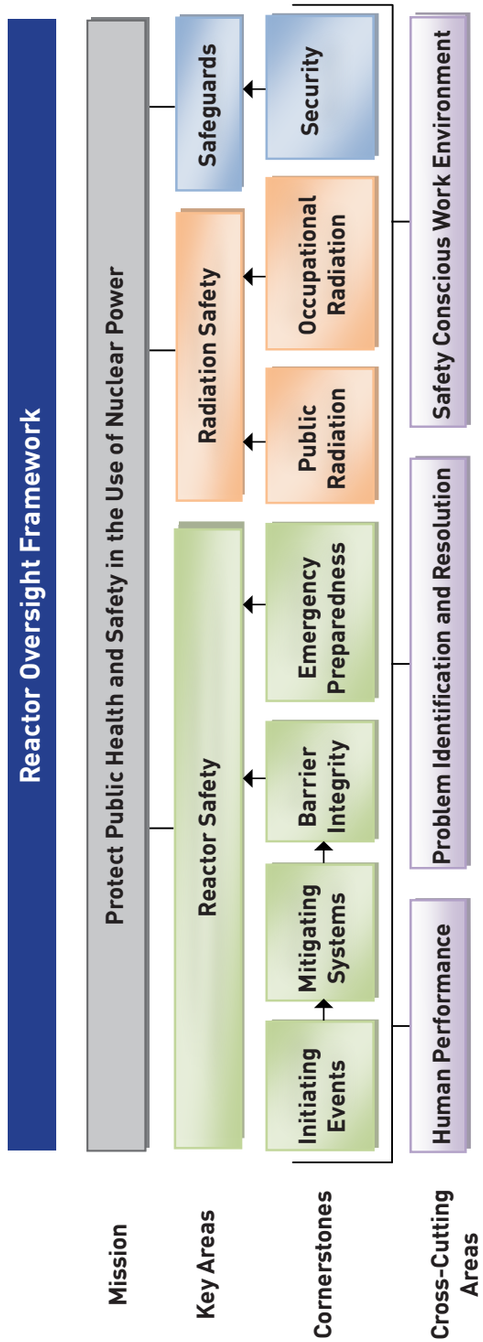

Figure 1. Reactor oversight framework

What is the Reactor Oversight Process?

The U.S. Nuclear Regulatory Commission's (NRC's) Reactor Oversight Process (ROP) is the agency's program to inspect, measure, and assess the safety and security performance of commercial nuclear power plants. It also responds to any decline in performance. The ROP contributes to the NRC's mission of ensuring public health and safety during the operation of commercial nuclear power plants by monitoring plant performance in three key areas:

- **Reactor Safety:** avoiding accidents and reducing the consequences of accidents if they occur
- **Radiation Safety:** protecting both plant workers and the public from unnecessary radiation exposure during routine operations
- **Safeguards:** protecting the plant against sabotage or other security threats

Cornerstones of Safe Operation

The seven "cornerstones" of the ROP support the three key areas by monitoring and measuring plant performance (see Figure 1). The cornerstones cover the following:

- **Initiating Events:** this focuses on limiting the occurrence of the events that could disrupt plant operations and challenge safety functions
- **Mitigating Systems:** this monitors the function of the plant's safety systems designed to reduce the effects of initiating events
- **Barrier Integrity:** this monitors the design barriers (fuel cladding, reactor coolant system, and containment) that protect the public from radionuclide releases caused by accidents or events
- **Emergency Preparedness:** this measures the effectiveness of the plant's staff to carry out emergency plans to respond effectively to a possible accident
- **Occupational Radiation Safety:** this monitors the effectiveness of the plant's program to protect worker's health and safety from exposure to radiation from radioactive material
- **Public Radiation Safety:** this monitors the effectiveness of the plant's program to protect public health and safety from exposure to radioactive materials released into the public domain
- **Security:** this monitors the plant's physical protection systems and ability to defend the plant against attack

Cross-Cutting Areas

In addition to the cornerstones, the ROP features three "cross-cutting" areas that can affect each of the cornerstones. These are as follows:

- human performance
- problem identification and resolution
- safety-conscious work environment

These cross-cutting areas are considered during all NRC inspections and are covered during periodic plant assessments.

Plant Assessment

The NRC's plant evaluations are based on two distinct inputs:

- findings from the NRC's inspection program
- performance indicators (PIs) reported by the licensee

The NRC gives both PIs and inspection findings a color designation based on their safety significance (see Figure 2).

Green: very low safety significance (for findings), expected performance (for PIs)

White: low-to-moderate safety significance

Yellow: substantial safety significance

Red: high safety significance

Figure 2. Safety significance color designation

Inspection Program

The NRC's inspection program starts with the "baseline" inspections done at every U.S. nuclear plant. Baselines inspections represent the minimum level of inspection required to ensure plant safety and security. Baseline inspections focus on activities and systems that are significant to plant safety and security (e.g., those activities and systems that could trigger an accident or could either reduce or increase a potential accident's consequences). Inspections beyond the baseline program are performed in response to specific events at a plant or changes in a plant's performance.

The NRC's Significance Determination Process determines the importance of inspection findings and associated violations.

Performance Indicators

Each performance indicator objectively measures performance according to established safety margins. The plants compile the indicators and report them to the NRC quarterly.