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Reactor Oversight Program (ROP) and Details of Inspector Activities

Jack Grobe
Associate Director for Engineering and Safety Systems
Office of Nuclear Reactor Regulation
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Reactor Oversight Process (ROP)

- NRC Goals
- Features of the ROP
- Use of Risk Information
- Regulatory Framework
- Use of Performance Indicators (PIs) and inspections in ROP
- Performance Indicators Used in ROP
- Inspections Performed in ROP
- Inspection Resources
- Resident Inspector Activities

Primary NRC Strategic Plan Goals

- Safety – Ensure protection of public health and safety and the environment by implementing a regulatory oversight framework for continued safe operation of commercial nuclear power plants
- Security – Ensure the secure use and management of radioactive materials
- Openness – Ensure openness in our regulatory process
- Effectiveness – Ensure that NRC actions are effective, efficient, realistic, and timely by focusing resources on most risk significant issues and reducing unnecessary regulatory burden

Strategic Plan

Features of the Reactor Oversight Process

- Focuses Inspections on Activities Where Potential Risks Are Greater.
- Applies Greater Regulatory Attention to Facilities with Performance Problems While Maintaining a Base Level of Regulatory Attention on Plants That Perform Well.
- Makes Greater Use of Objective Measures of Plant Performance.
- Gives the Industry and Public Timely and Understandable Assessments of Plant Performance.
- Avoids Unnecessary Regulatory Burden.
- Responds to Violations in a Predictable and Consistent Manner That Reflects the Safety Impact of the Violations.

Operating Reactor Oversight

Use of Risk Information

- ROP based on a dual system-performance indicators (PIs) using objective data, and focused inspection that complements the PIs
- Used to identify PIs, and to establish thresholds for regulatory action commensurate with safety significance
- Used to focus the inspection program on those issues important to safety
- A Significance Determination Process (SDP) was developed to assess the safety significance of inspection findings to determine the appropriate regulatory response
- Used for assessing significance of plant events and degraded conditions to help determine appropriate NRC response

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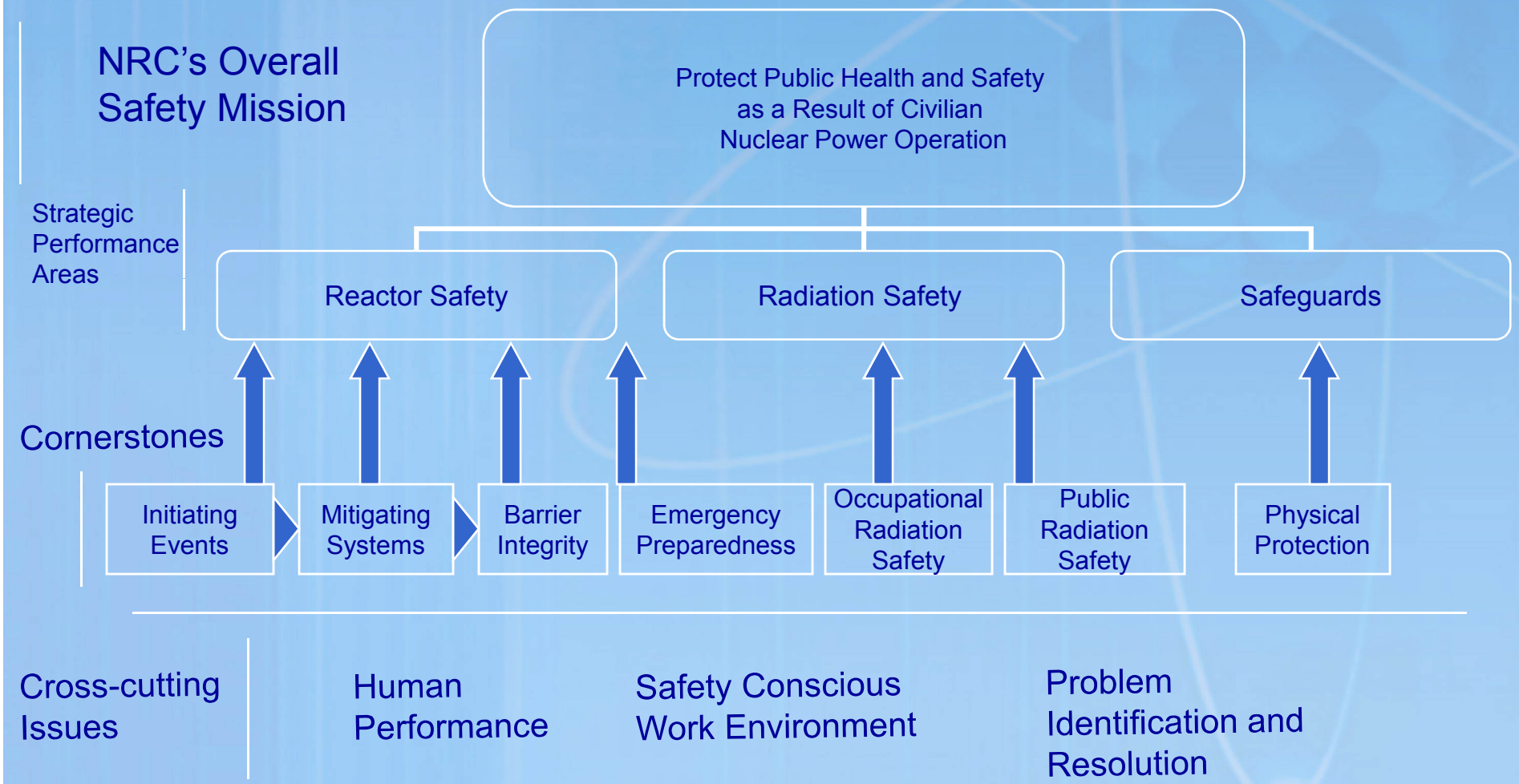
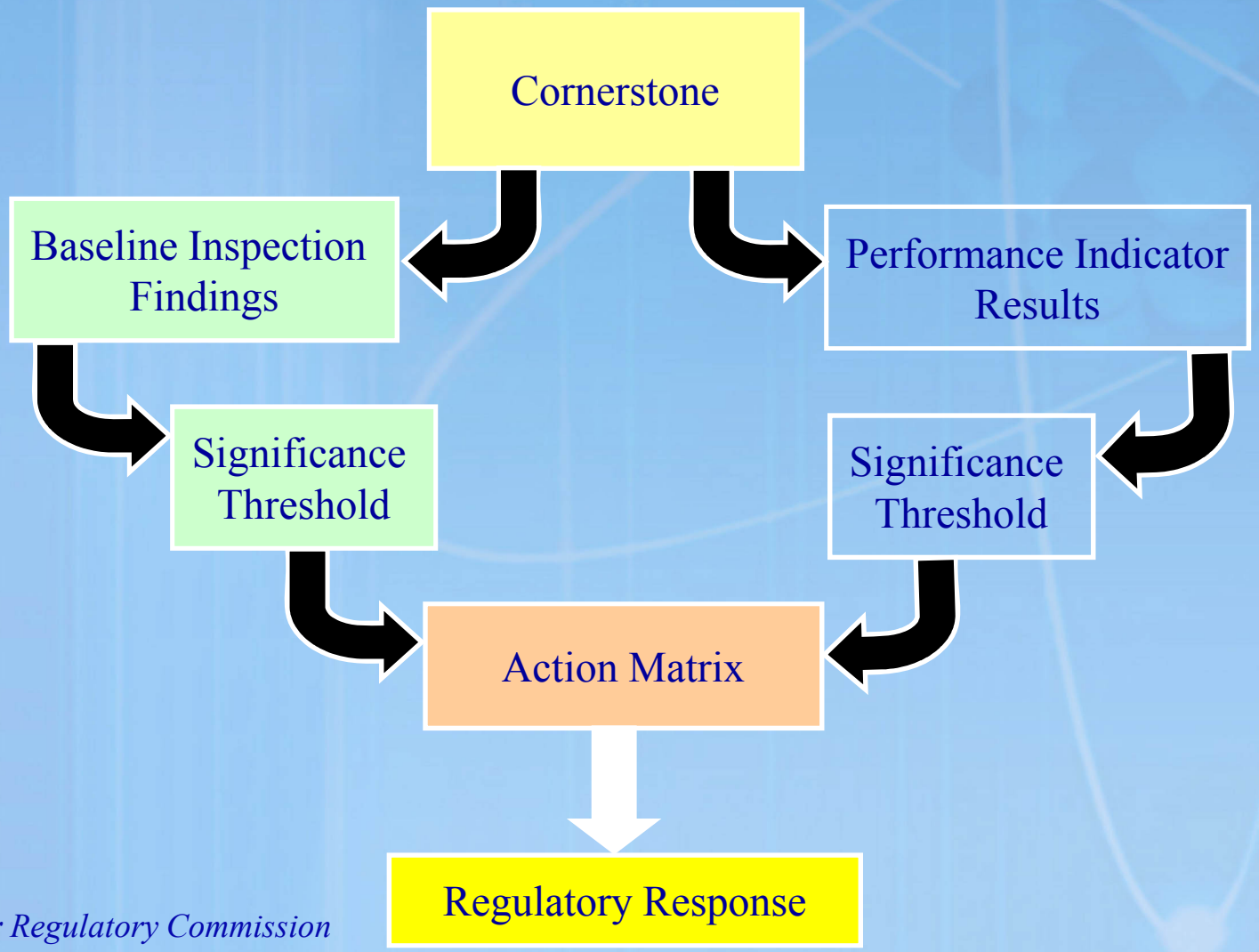
REGULATORY FRAMEWORK



Use of Performance Indicators and Inspection Findings in ROP



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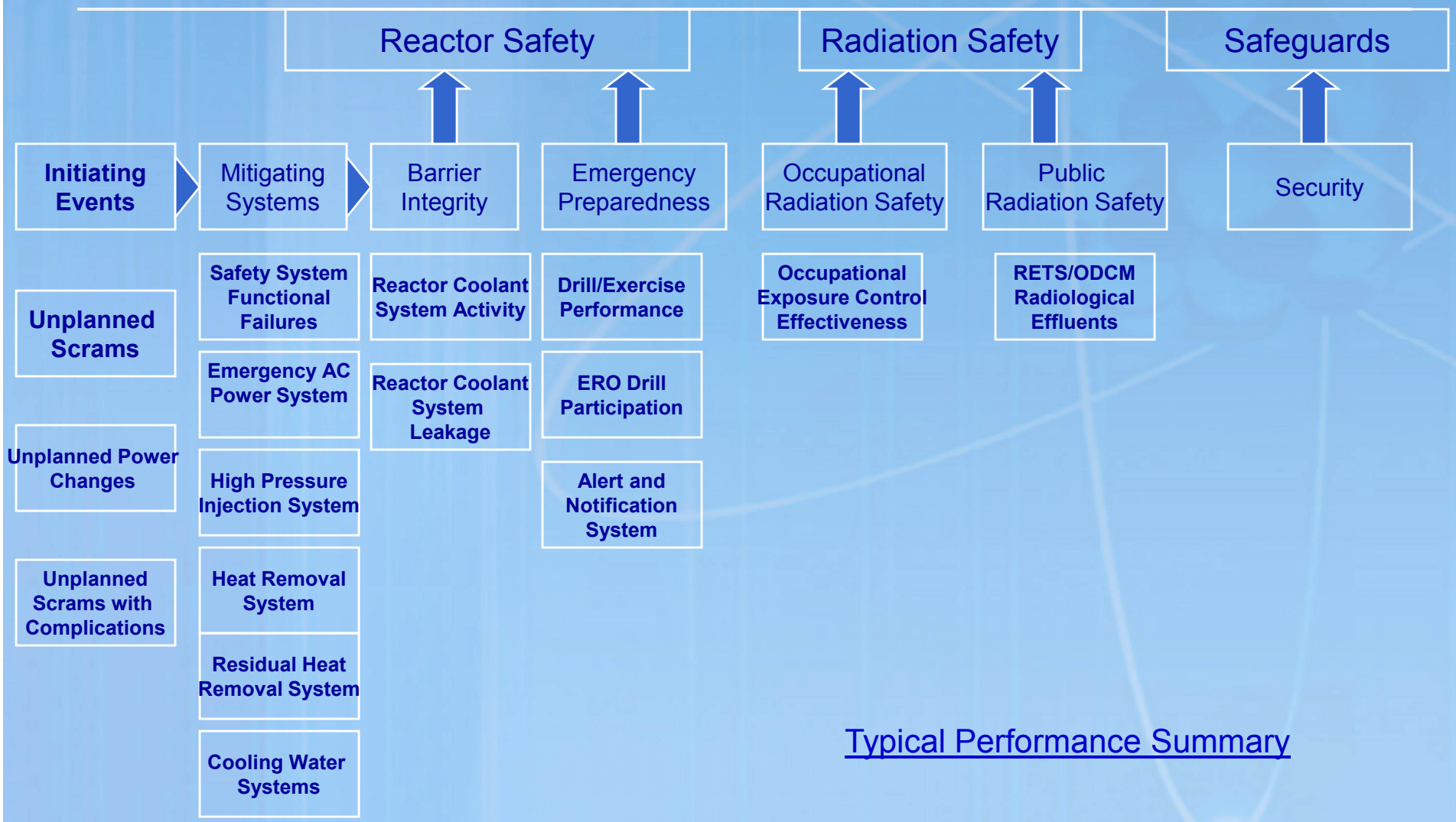
Performance Indicators in the Seven Cornerstones



Typical Performance Summary

Baseline Inspection Program

- Conducted in a risk-informed manner to achieve the following:
  - Maintain a low frequency of events that could lead to a nuclear reactor accident;
  - Zero significant radiation exposures resulting from civilian nuclear reactors;
  - No increase in the number of offsite releases of radioactive material from civilian nuclear reactors that exceed 10 CFR Part 20 limits; and
  - No substantiated breakdown of physical protection that significantly weakens protection
- See IMC 0308, Reactor Oversight Process Basis Document

Types of Inspection Activities Performed/Frequencies

- 71111.01 Adverse Weather Protection - annual
- 71111.04 Equipment Alignment – quarter/semi-annual
- 71111.05 Fire Protection – quarter/annual/triennial team inspections
- 71111.06 Flood Protection Measures - annual
- 71111.07 Heat Sink Performance – annually and triennial inspection
- 71111.08 Inservice Inspections – refueling outage
- 71111.11 Licensed Operator Requalification Program - biennial
- 71111.12 Maintenance Effectiveness - annual
- 71111.13 Maintenance Risk Assessment and Emergent Work Control - annual

Inspection Procedures

Inspection Documents

Types of Inspection Activities Performed/Frequencies

- 71111.15 Operability Evaluations - annual
- 71111.17 Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications - annual
- 71111.18 Plant Modifications - triennial
- 71111.19 Post-Maintenance Testing - annual
- 71111.20 ReFueling and Outage Activities – Refueling Outage
- 71111.21 Component Design Bases Inspection - triennial
- 71111.22 Surveillance Testing - annual
- 71111.21 Occupational Radiation Safety – annual/biennial
- 71111.22 Public Radiation Safety - biennial
- 71151 PI Verification - annual
- 71152 Identification and Resolution of Problems – annual/biennial
- 71153 Event Follow-up – as needed

Inspection Procedures

Inspection Documents

Inspections Performed by Resident Inspectors

- 71111.01 Adverse Weather Protection - annual
- 71111.04 Equipment Alignment – quarter/semi-annual
- 71111.05 Fire Protection – quarter/annual
- 71111.06 Flood Protection Measures - annual
- 71111.07 Heat Sink Performance – annual
- 71111.11 Licensed Operator Requalification Program - Quarter
- 71111.12 Maintenance Effectiveness - annual
- 71111.13 Maintenance Risk Assessment and Emergent Work Control – annual
- 71111.15 Operability Evaluations - annual
- 71111.17 Evaluations of Changes, Tests, or Experiments and Permanent Plant
- Modifications – annual
- 71111.19 Post-Maintenance Testing - annual
- 71111.20 Refueling and Outage Activities – Refueling Outage
- 71111.22 Surveillance Testing – annual
- 71152 Identification and Resolution of Problems – annual
- 71153 Event Follow-up – as needed

Inspection Procedures

Inspection Documents

Inspections Performed by Region-based inspectors

- 71111.05 Fire Protection – triennial
- 71111.07 Heat Sink Performance – Biennial
- 71111.08 Inservice Inspections – Refueling Outage
- 71111.11 Licensed Operator Requalification Program – Biennial
- 71111.18 Plant Modifications - triennial
- 71152 Identification and Resolution of Problems – Biennial
- 71153 Event Follow-up – as needed
- 71111.21 Occupational Radiation Safety – annual/biennial
- 71111.22 Public Radiation Safety – biennial
- 71114 Emergency Preparedness – annual/biennial/triennial
- 71130 Security – annual/biennial/triennial
- 71151 PI Verification - annual

Inspection Procedures

Inspection Documents

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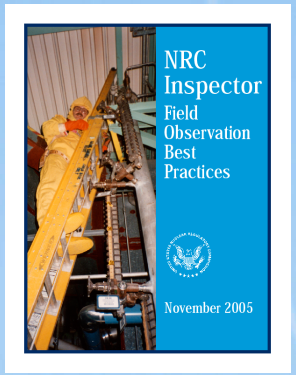
NRC Inspection Resources

- 50% of NRC inspection resources used to complete baseline inspections performed by resident inspectors
- Engineering specialists from the regions perform the remaining 50% of baseline inspections
- Total FY 2007 inspection resources expended - all inspection related activities (includes supplemental inspections, special inspections AITs, TIs, SDP analysis, travel) – 6,540 hours per site or equivalent of about 6 inspectors per site

Daily Activities of Resident Inspectors (RIs) at NPP sites

- Daily Activities of Resident Inspectors (RIs) at NPP sites
- Methods and Skills to obtain appropriate Information/ Knowledge about plant status
- Attitude or Mind-set of Inspectors at NPP Sites not to disturb Licensees' activities
- Reflection of RIs' knowledge about Plant Status to Baseline Inspection Plans and Procedures



Daily Activities of Resident Inspectors (RIs) at NPP sites

- **Obtain knowledge of plant activities and status through:**
  - **Control room walk-down**
  - **Attend daily licensee meetings**
  - **Plant tours**
  - **Details described in IMC-2515 Appendix D: Plant Status procedure**

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Daily Activities of Resident Inspectors (RIs) at NPP sites

- **Inform regional management of plant status and of risk-significant plant activities**
- **Based on plant status, conduct baseline inspections as appropriate**

Methods and Skills to Obtain Appropriate Information/Knowledge About Plant Status

- **Control room walk-down**
  - **Walk down the control room panels.**
  - **Review:**
    - **Control room logs**
    - **Equipment out-of-service or clearance logs**
    - **TS logs**
    - **Chemistry logs**
    - **Standing orders and night orders**

Control Room Walk-Down

- Walk down the control room panels.
- Review:
  - Control room logs
  - Equipment out-of-service or clearance logs
  - TS logs
  - Chemistry logs
  - Standing orders and night orders
- Determine RCS pressure boundary leakage

Attend Daily Licensee Meetings

- **Attend:**
  - **licensee's plan of the day meeting**
  - **shift turnover meeting**
  - **emergent work meeting**
  - **equipment prioritization meeting**
  - **corrective action document review meeting**

Plant Tours

- Purpose: to provide an independent perspective of ongoing plant activities that may affect plant performance in the cornerstones.
- Tour accessible areas of the plant containing safety significant structures, systems, and components (SSCs) within the scope of the maintenance rule, areas that contain significant radiological hazards, and areas with important physical security equipment.

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Attitude or Mind-set of Inspectors at NPP Sites not to Disturb Licensees' Activities

- **Inspectors are expected to observe, but not interfere or comment on licensee's activities while the activity is in progress**

- **Inspectors may intervene in the licensee's activities to point out danger condition to either plant personnel or to plant equipment**

Reflection of RIs' knowledge About Plant Status to Baseline Inspection Plans and Procedures

- **RI's knowledge of plant activities and status is used to determine how to select and implement the appropriate baseline inspection procedures.**

References

Reactor Oversight Process

- IMC – 0308 “ROP Basis Document”
- IMC – 0308 Attachment 1 “Technical Basis for Performance Indicators”
- IMC – 0308 Attachment 2 “Technical Basis for Inspection Program”
- IMC – 0308 Attachment 3 “Significance Determination Process Basis Document”
- IMC – 2515 “Light-Water Reactor Inspection Program -- Operations Phase”
- IMC – 0609 “Significance Determination Process”
- IMC – 0612 “Power Reactor Inspection Reports”
- IMC – 2515 Appendix A “Risk Informed Baseline Inspection Program
- IMC – 2515 Appendix D “Plant Status”

Inspection Manual Chapters