NRC Leadership Expectations and Practices for Sustaining a High Performing Organization

NRC Commissioner William C. Ostendorff

FR/SSO/FS Workshop

U.S. Department of Energy

Las Vegas, Nevada

May 16, 2012

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United States Nuclear Regulatory Commission

Protecting People and the Environment

Agenda

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- NRC Mission
- Safety Culture
- NRC Oversight
- NRC Inspection Program
- Technical Qualification
- Continuous Learning

NRC Mission

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To license and regulate the nation's civilian use of byproduct, source, and special nuclear materials in order to ensure the adequate protection of public health and safety, promote the common defense and security, and to protect the environment.

Safety Culture

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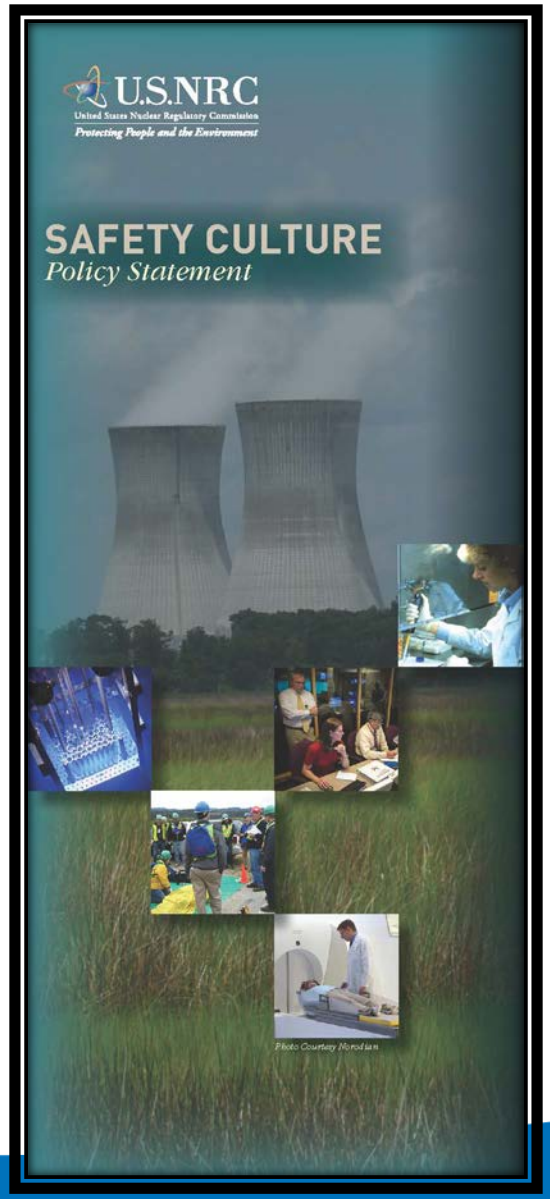

Safety Culture Policy Statement

Definition of Safety Culture

"Nuclear safety culture is the core values and behaviors resulting from a collective commitment by leaders and individuals to emphasize safety over competing goals to ensure protection of people and the environment."

Safety Culture

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Some Traits of a Positive Nuclear Safety Culture:

- Leadership Safety Values and Actions
- Problem Identification and Resolution
- Personal Accountability
- Continuous Learning
- Environment for Raising Concerns
- Questioning Attitude

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Questioning Attitude

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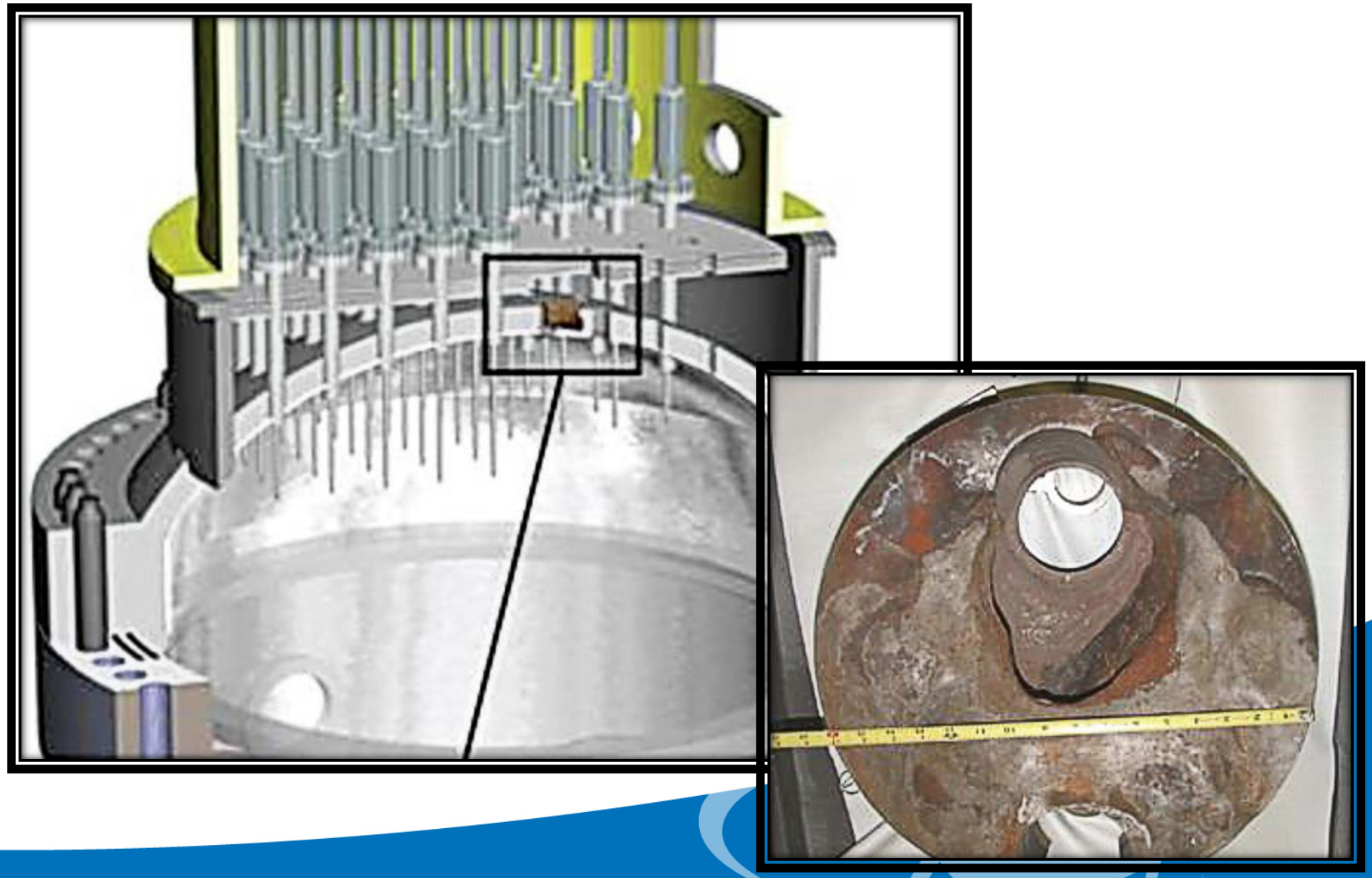

Safety Culture

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U.S.NRC Safety Culture Communicator
Case Study 4 — March 2012

April 2010 Upper Big Branch Mine Explosion—29 Lives Lost

PURPOSE

This case study provides a useful tool for the U.S. Nuclear Regulatory Commission (NRC) staff as it interacts with its stakeholders. It provides the regulated community with the findings of West Virginia Governor Manchin's appointed independent investigation panel and the results of an investigation conducted by the U.S. Department of Labor's Mine Safety and Health Administration (MSHA). Many of these findings contrast starkly with the positive safety culture traits that the NRC has incorporated into its safety culture policy statement.

Photo: Associated Press

WHAT HAPPENED?

On April 5, 2010, a series of explosions occurred inside the Upper Big Branch (UBB) mine in southern West Virginia. Twenty nine coal miners working for Performance Coal Company (a subsidiary of Massey Energy Company and hereinafter referred to as PCC/Massey) lost their lives in the "largest coal mine disaster in the United States in 40 years."[1] The company had a thoroughly documented, preexisting history of poor safety performance. "PCC/Massey failed to report accident data accurately. MSHA's post-accident audit revealed that, in 2009, UBB had twice as many accidents as the operator reported to MSHA."[2]

PROBABLE CAUSE

Existing government reports suggest that PCC/Massey "promoted and enforced a workplace culture that valued production over safety including practices calculated to allow it to conduct mining operations in violation of the law."[3] Consistently poor environmental conditions were permitted to exist inside the mine. "Upper Big Branch was cited every month during 2009—84 citations in all (57 from MSHA, seven from the state)—for failure to ventilate the mine according to the approved ventilation plan."[4] Poor ventilation was likely a contributor to the accumulation of methane gas. Government investigators believe malfunctioning water sprayers on the machine used to cut coal from the rock may have permitted the ignition source for igniting the methane gas. Additionally, an abundance of coal dust (from inconsistent rock dusting) served as a catalyst to a resulting series of massive explosions. An MSHA follow-up investigation "revealed multiple examples of systematic, intentional and aggressive efforts by PCC/Massey to avoid compliance with safety and health standards, and to thwart detection of that non-compliance by federal and state regulators."[5] "While violations of particular safety standards led to the conditions that caused the explosion, the unlawful policies and practices implemented by PCC/Massey were the root cause of this tragedy."[6]

1. MSHA, Coal Mine Safety and Health, "Report of Investigation—Fatal Underground Mine Explosion, April 5, 2010," December 6, 2011, p. 1.
2. Ibid., p. 4.
3. Ibid., p. 2.
4. J. Davitt McAteer and Associates, "Upper Big Branch—The April 5, 2010, Explosion: A Failure of Basic Coal Mine Safety Practices," Report to the Governor, the Governor's Independent Investigation Panel, May 2011, p. 60.
5. MSHA, Coal Mine Safety and Health, "Report of Investigation—Fatal Underground Mine Explosion, April 5, 2010," December 6, 2011, p. 2.
6. Ibid., p. 2.

NRC Positive Safety Culture Traits	Evidence of Weak Safety Culture Traits
Leadership Safety Values and Actions in which leaders demonstrate a commitment to safety in their decisions and behaviors.	One specific work process that the PCC/Massey leadership had in place was to illegally provide advance notice to miners of MSHA inspections. This was a flagrant violation of Section 103(a) of the Federal Mine Safety and Health Act of 1977, as amended.[7]
Problem Identification and Resolution in which issues potentially affecting safety are promptly identified, fully evaluated, and promptly addressed and corrected commensurate with their significance.	"…when a worker told [the] foreman about the air reversal, [air moving the opposite direction of where it should have been in order to properly vent the mine] "He didn't say nothing, he just walked away."[8] The preshift, onshift examination system—devised to identify problems and address them before they became disasters—was a "failure."[9]
Personal Accountability in which all individuals take personal responsibility for safety.	In the weeks preceding the disaster, investigators found that one UBB foreman's hand held methane detector had not been turned on, even though he filled in examiner's books as if he had taken gas readings. "This data [integrity issue] raises doubt about the daily and weekly air readings and other data recorded by the crew foreman in the weeks leading up to the disaster."[10]
Work Processes in which the process of planning and controlling work activities is implemented to maintain safety.	"In instances in which a section boss did halt production because of a dangerous condition, such as wholly inadequate ventilation, he was instructed to write only 'downtime.' He was not to create a record acknowledging a potentially deadly situation."[11]

NRC Positive Safety Culture Traits	Evidence of Weak Safety Culture Traits
Continuous Learning in which opportunities to learn about ways to ensure safety are sought out and implemented.	"Testimony indicates that PCC/Massey inadequately trained their examiners, foreman and miners in health and safety…especially in hazard recognition, performing new job tasks and required annual refresher training. This left miners unequipped to identify and correct hazards."[12]
Environment for Raising Concerns in which a safety-conscious work environment is maintained where personnel feel free to raise safety concerns without fear of retaliation, intimidation, harassment, or discrimination.	"Witness testimony revealed that miners were intimidated by UBB management and were told that raising safety concerns would jeopardize their jobs. As a result, no whistleblower disclosures were made in the 4 years preceding the explosion, despite an extensive record of PCC/Massey safety and health violations at the UBB mine during this period."[13]
Effective Safety Communication in which communications maintain a focus on safety.	"Workers at UBB were treated in a 'need to know' manner. They were not apprised of conditions in parts of the mine where they did not work. Only a privileged few knew what was really going on throughout UBB."[14]
Respectful Work Environment in which trust and respect permeate the organization.	"Miners also mentioned disrespectful written messages they received" from [a senior manager]. Others, were intimidated by [a manager's] "nasty notes" and didn't say anything because they were "job-scared."[15]
Questioning Attitude in which individuals avoid complacency and continuously challenge existing conditions and activities in order to identify discrepancies that might result in error or inappropriate action.	"Testimony revealed that UBB's miners were intimidated to prevent them from exercising their whistleblower rights. Production delays to resolve safety-related issues often were met by UBB officials with threats of retaliation and disciplinary actions."[16]

7. Ibid., p. 9.
8. J. Davitt McAteer and Associates, "Upper Big Branch—The April 5, 2010, Explosion: A Failure of Basic Coal Mine Safety Practices," Report to the Governor, the Governor's Independent Investigation Panel, May 2011, p. 19.
9. Ibid., p. 97.
10. Ibid., p. 19.
11. Ibid., p. 99.
12. MSHA, Coal Mine Safety and Health, "Report of Investigation—Fatal Underground Mine Explosion, April 5, 2010," December 6, 2011, p. 5.
13. Ibid., p. 2.
14. J. Davitt McAteer and Associates, "Upper Big Branch—The April 5, 2010, Explosion: A Failure of Basic Coal Mine Safety Practices," Report to the Governor, the Governor's Independent Investigation Panel, May 2011, p. 99.
15. Ibid., p. 100
16. MSHA, Coal Mine Safety and Health, "Report of Investigation—Fatal Underground Mine Explosion, April 5, 2010," December 6, 2011, p. 5.

WHAT CAN ORGANIZATIONS LEARN FROM THIS ACCIDENT?

This accident reinforces the need for, and importance of, promoting a positive safety culture by routinely evaluating an organization's safety culture activities and initiatives and by making enhancements and adjustments to ensure that an organization remains proactive and appropriately focused on this important area. This case study points to the following key lessons:

- Senior management dictates the tone for the balance between safety and corporate performance. These two items are not mutually exclusive and can and must successfully coexist. However, a strong safety culture demands a safety first approach to business.
- No single event led to this catastrophe. Instead, it resulted from a series of events that were precipitated by a work environment in which workers were not encouraged to raise safety concerns and managers may have been discouraged from halting production in order to address an unsafe condition.
- This disaster may have been avoided had there been a more robust, positive safety culture in which workers and managers were encouraged to raise concerns.

Sources of Information:

1. MSHA, Coal Mine Safety and Health, "Report of Investigation—Fatal Underground Mine Explosion, April 5, 2010," December 6, 2011.
2. J. Davitt McAteer and Associates, "Upper Big Branch—The April 5, 2010, Explosion: A Failure of Basic Coal Mine Safety Practices," Report to the Governor, the Governor's Independent Investigation Panel, May 2011 (http://online.wsj.com/public/resources/documents/wvamine0519.pdf).
3. Briefings by the U.S. Department of Labor and MSHA on the disaster at PCC/Massey's UBB mine in southern West Virginia at the request of President Barrack Obama, April 2010.

Rick Daniel, from the NRC Office of Enforcement, developed this safety culture case study. If you have any questions, please contact David Solorio, Branch Chief, by telephone at 301 415 0149 or by e mail at Dave.Solorio@nrc.gov.

Note that the NRC has not conducted a formal analysis of the events discussed herein for, or in conjunction with the US Dept. of Labor's, Mine Safety and Health Administration, the Governor's Independent Investigation Panel or any other government or private organization. The NRC compiled the information presented and discussed herein from government sources that were publicly available at the time of publishing, as identified.

http://pbadupws.nrc.gov/docs/ML1206/ML12069A003.pdf

How the NRC Regulates

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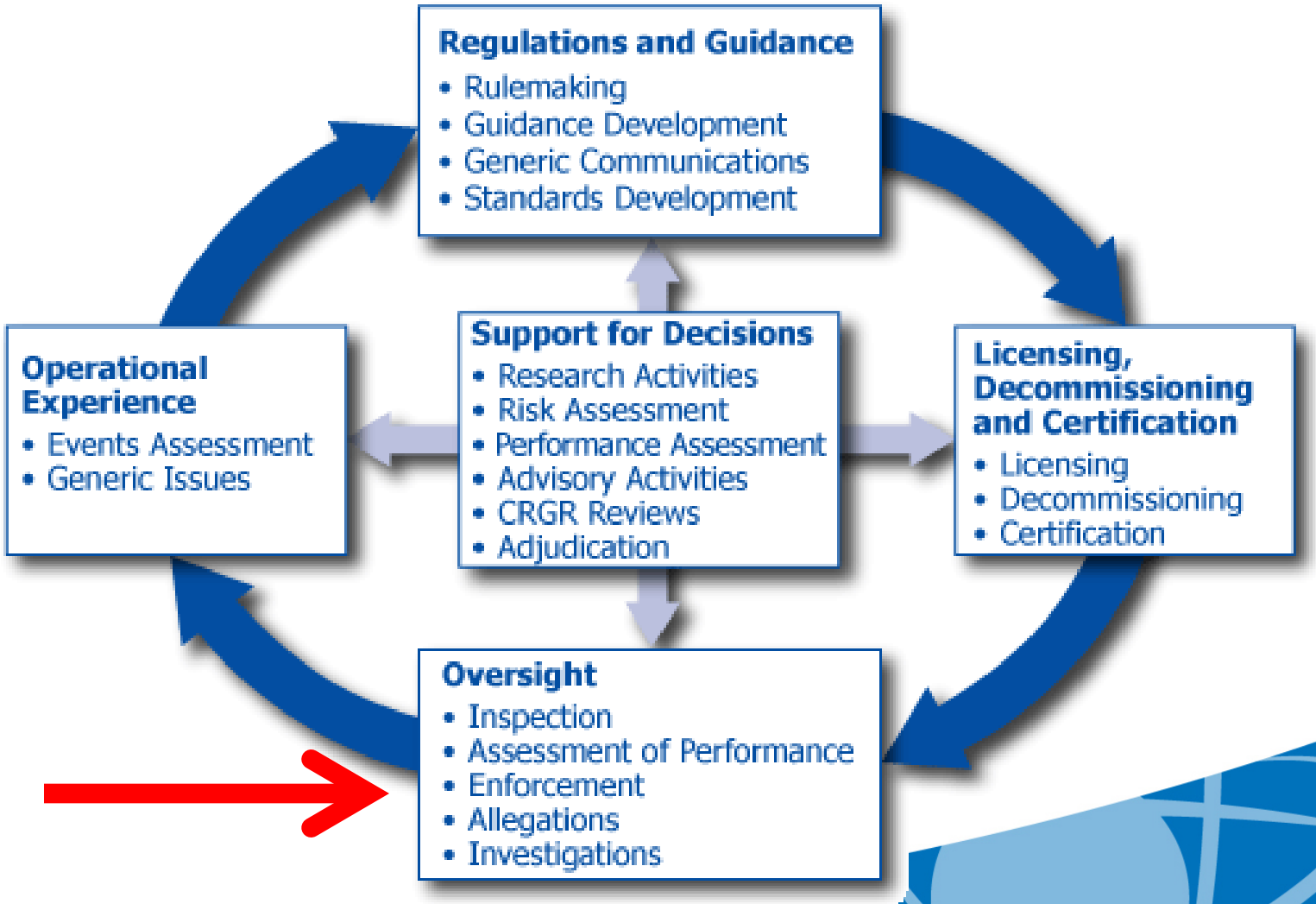

NRC Oversight

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- **Inspection** – verifying that activities are conducted to ensure safe operation
- **Assessment of Performance** – reviewing inspection findings to assess the performance of nuclear facilities and determine appropriate agency action
- **Enforcement** – issuing sanctions to those who violate NRC regulations
- **Allegations** – responding to reports of wrongdoing
- **Investigations** – investigating wrongdoing

NRC Oversight

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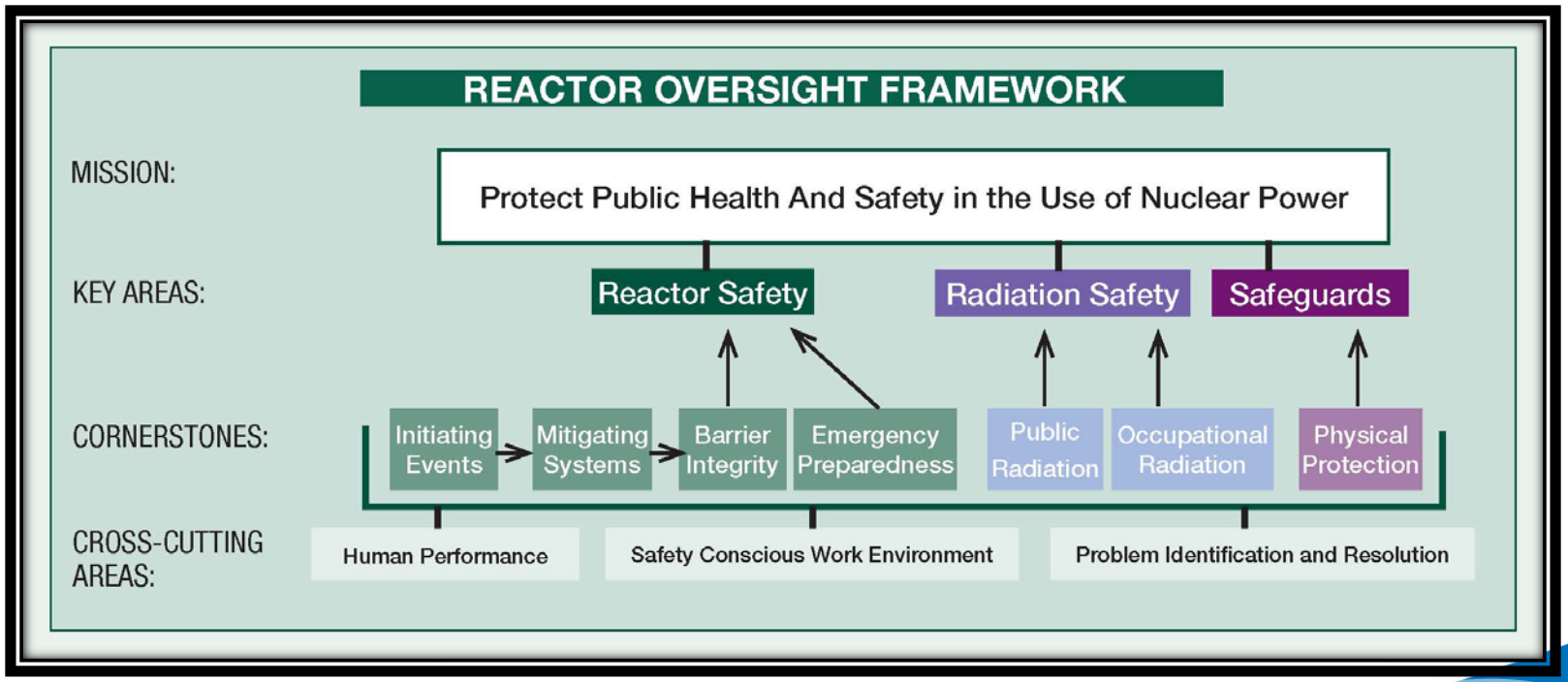
Example: Reactor Oversight Process (ROP)



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Inspection Findings

+

Performance Indicators

Plant Assessment

NRC Oversight

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Action Matrix Concept

Licensee Response	Regulatory Response	Degraded Cornerstone	Multiple/Rep. Degraded Cornerstone	Unacceptable Performance

- Increasing Safety Significance
- Increasing NRC Inspection Efforts
- Increasing NRC/Licensee Management Involvement
- Increasing Regulatory Actions

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Agency Action Review Meeting (AARM)

- Annual Meeting Held with NRC Executive Management to
  - Discuss Plants in Columns 4 and 5 of the Action Matrix
- Confirmatory Review of the ROP Action Matrix Results
- Major Discussion Items Include:
  - Reactor Plant Performance and Review of NRC Actions
  - Reactor Oversight Process Self-Assessment
  - Analysis of Reactor Industry Trends
  - Fuel Cycle and other Material Facilities Trends and Performance
- Following the AARM, Senior Executives Brief the Commission
- Licensees may appear before the Commission

NRC Inspection Program

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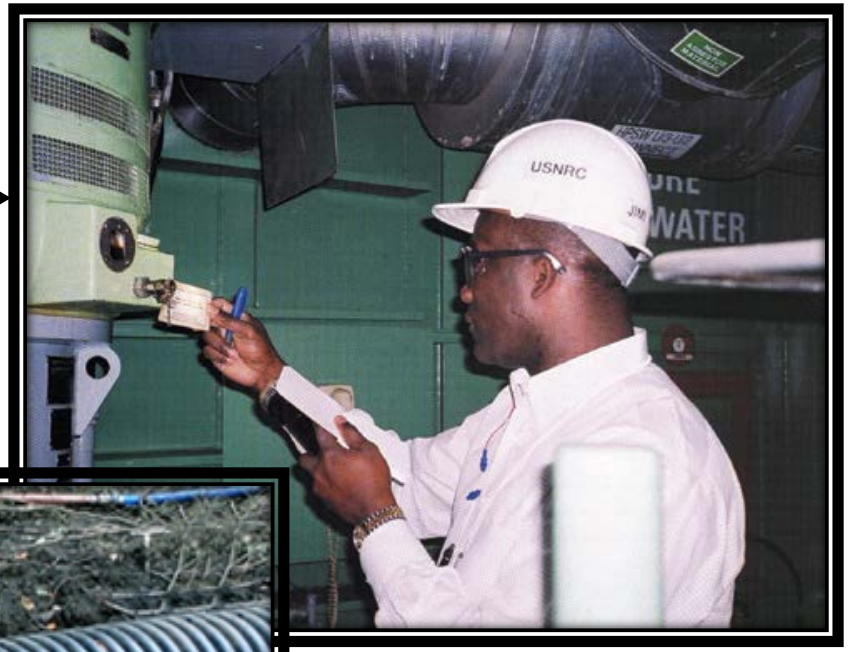
- **Resident Inspectors**
- **Regional Inspectors**



NRC Inspection Program

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Baseline Inspection Program

Examples of Areas Inspected

Equipment Alignment	~ 80 hrs/yr
Operator Response	~ 125 hrs/yr
Emergency Preparedness	~ 80 hrs/yr
Worker Radiation Protection	~ 95 hrs/yr
Corrective Action Case Reviews	~ 60 hrs/yr
Corrective Action Program	~ 250 hrs/2 yrs
Radiation Release Controls	~ 110 hrs/2 yrs
Triennial Fire Protection	~ 250 hrs/3 yrs

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Baseline Inspection Example

Brunswick 2011

- Potential for EDG flooding
- Moved plant from Column 1 to Column 2

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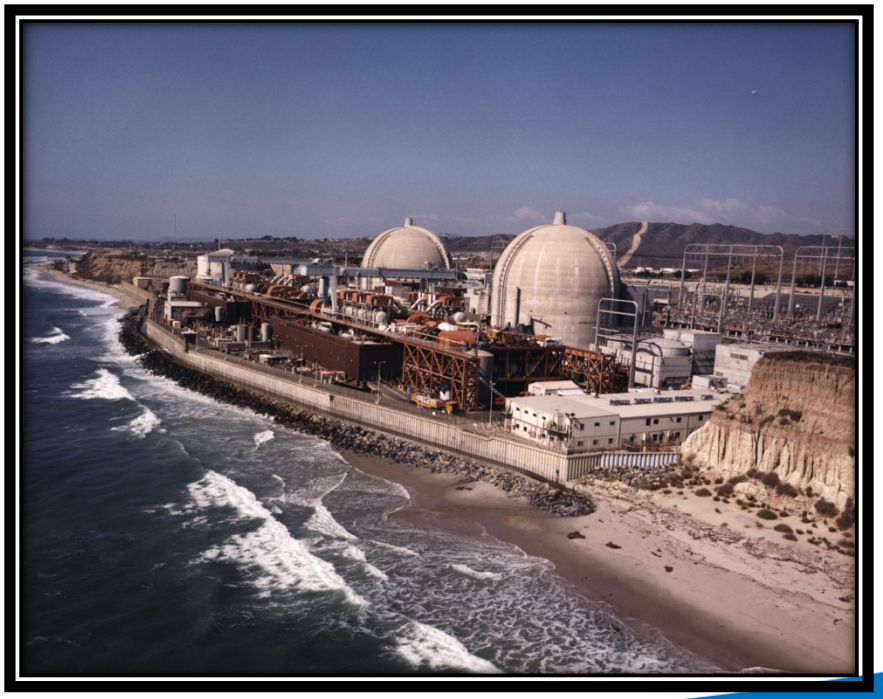
NRC to Send Augmented Inspection Team to San Onofre Nuclear Generating Station (Mar. 15, 2012)



Example: Steam Generator Internals

Technical Qualification

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NRC INSPECTION MANUAL IPAB

MANUAL CHAPTER 1245

QUALIFICATION PROGRAM FOR OPERATING REACTOR PROGRAMS

1245-01 PURPOSE

01.01 To define training and qualification requirements for inspectors and operator licensing examiners performing activities in the Nuclear Reactor Regulation (NRR) and Nuclear Security and Incident Response (NSIR) programs.

01.02 To establish the requirements for completing refresher and continuing training as a means for updating and maintaining qualification.

01.03 To establish the requirement and define the process for evaluating the effectiveness of the inspector training and qualification process.

1245-02 OBJECTIVES

02.01 To ensure that inspectors and operator licensing examiners have the necessary knowledge and skill to successfully implement the NRR and NSIR programs.

02.02 To ensure that the inspector training and qualification program remains effective in preparing inspectors to implement the inspection program.

1245-03 DEFINITIONS

03.01 Attitude. A manner of performing tasks that demonstrates an understanding of and an appreciation for the NRC's organizational values of integrity, excellence, service, respect, cooperation, commitment, and openness.

03.02 Basic Inspector Certification. A certification made by the trainee's supervisor which signifies that the individual has successfully completed all basic level inspector training and qualification activities. Achieving Basic Inspector Certification allows an individual to perform limited scope inspection activities. Inspection activities will be specifically assigned and are to be performed with an appropriate degree of detailed supervision.

03.03 Basic-Level Training and Qualification. The activities designed to provide newly hired staff with an awareness of basic information related to the agency, the role of the inspector, and the technology being regulated and to provide a context for the development of proficiency as an inspector. Successful completion of basic-level training leads to Basic Inspector Certification.

03.04 Competency. The group of related knowledge, skills, and attitudes describing the characteristics needed to perform successfully as an inspector.

Issue Date: 12/29/11 1 1245

Technical Qualification

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EXAMPLE: Technical Qualification Card

- Topic: (OJT-OPS-2) Conduct of Operations
- Purpose: The overall conduct of operations is an essential element in the safe operations
- Areas(partial list):
  - Control room observations
  - Licensee procedures for operator “at the controls” expectations
  - ANSI standard-3.2-1994
  - NRC Inspection Procedure 71715
  - Relevant sections of NRC license and Technical Specifications
- Estimated Time: 40 hours

Continuous Learning

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Four Categories of Interest:

- Human resources processes, policies and procedures
- Knowledge sharing practices
- Knowledge recovery practices
- Information technology applications

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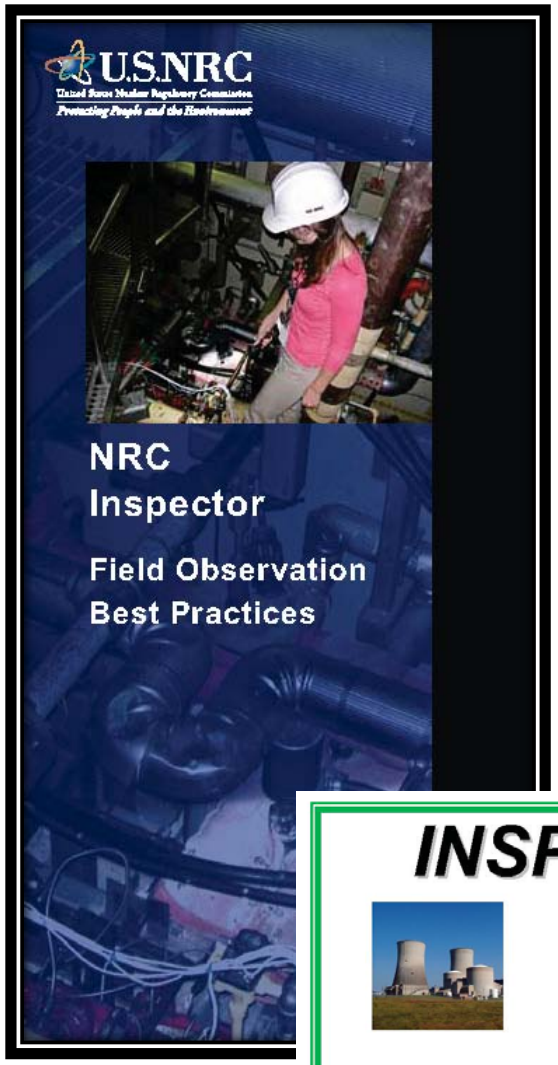

Inspector Examples

INSPECTION TIPS

- Stop Look Listen Learn. Stop and stand in an area for 5 to 15 minutes. It is amazing what will stand out, or who will walk by with an interesting story.
- Get out in the field, especially during testing and outages. When you know what normal looks like, abnormal will jump out at you.
- Keep a list of follow up items when screening corrective action reports. Use this list during subsequent plant visits.
- When emergent issues arise, walk down the issue in the field, if possible. Follow up periodically until the issue is resolved to ensure conditions do not degrade further.
- Watch for and take advantage of opportunities to tour normally inaccessible areas. Nothing substitutes for "being there." You have to climb, look at things, and get dirty.
- Follow the string, extension cord, temporary label, or anything out of the ordinary. There's usually a story.
- You must remain aware of operating experience (OE). Frequently review value added findings. Communicate your questions and issues.
- Pay attention to what's different day to day. Compare unit to unit.
- Focus on changes, decisions, and adjustments made in-process or with short lead times.

Improvements

nts and suggestions
the requirements of
apter 0801, "Reactor
eedback Program."

INSPECTOR NEWSLETTER

April 2012

Our goal is to provide useful information to inspectors

The material presented in this newsletter is for informational purposes only and does not necessarily reflect official agency guidance or policy. Approved ROP guidance is promulgated in NRC's inspection manuals.

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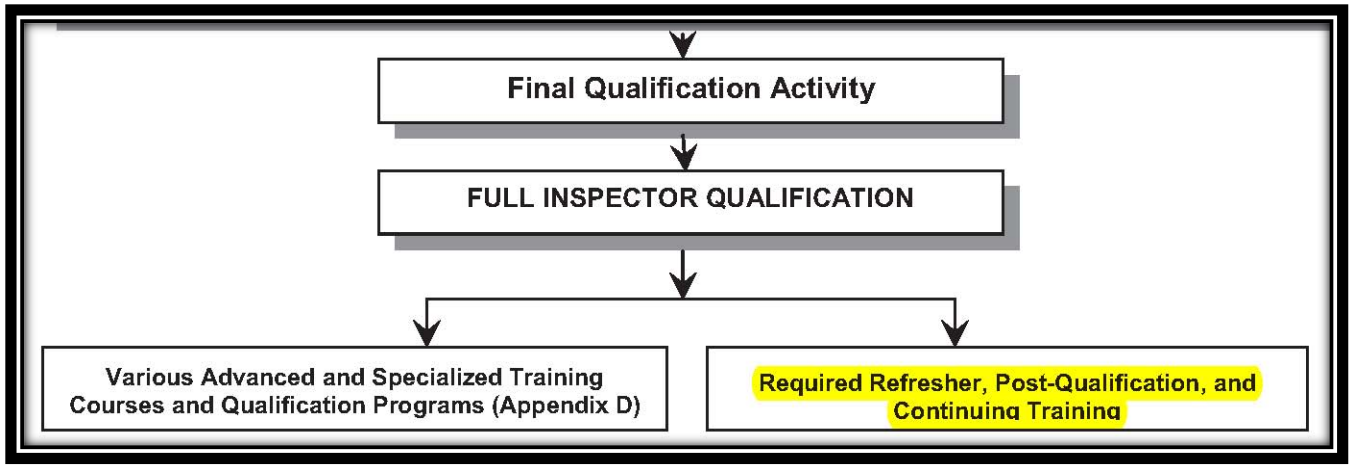

Inspector Training and Qualification Program Sequence

- **Basic Inspector Certification:** Need Basic-Level Courses
- **Full Inspector Qualification:** Need Personal & Interpersonal Skills, General Proficiency, and Technical Proficiency + Final Qualification Activity
- **AFTER Full Inspector Qualification:** More *Required* Training
  - Refresher + Post-Qualification + Continuing

Continuous Learning

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CONCLUSION

"You cannot relive the past, but we use it as a springboard to help us inform and prepare for the future."

Thank You

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Questions?

Comments?

Discussion?