

# The 2002 Davis Besse Event and Safety Culture Policy at the U.S. Nuclear Regulatory Commission

**Brazil – U.S. Workshop on Strengthening the Culture of Nuclear Safety and Security  
August 25-27, 2014**

Stephanie Morrow, Ph.D.  
Safety Culture Program Manager  
Office of Enforcement  
Nuclear Regulatory Commission



# Outline

- Overview of NRC
- Davis Besse Event and Safety Culture Lessons
- Safety Culture in the Reactor Oversight Process
- Safety Culture Policy Statement
- Summary

# Nuclear Regulatory Commission



- Established as independent agency in 1974
- Mission to ensure safe use of radioactive materials for civilian purposes, including nuclear power
  - Protect public health and safety
  - Promote the common defense and security
  - Protect the environment
- Accomplished through licensing, inspection and enforcement



# 2002 Davis Besse Event



- Davis Besse Nuclear Power Station
- Oak Harbor, Ohio
- Babcock and Wilcox pressurized water reactor
- History of boric acid leakage

# Reactor Vessel Head Degradation

- March 6, 2002
- Cavity discovered in the reactor pressure vessel head adjacent to a control rod drive mechanism (CRDM) nozzle penetration
- Corrosion caused by boric acid leakage from CRDM nozzle cracks
- Cavity extended through the base metal of the vessel head to the 3/8-inch stainless steel cladding on the inside of the head
- Stainless steel cladding was not designed to maintain reactor coolant pressure boundary



# Safety Culture Lessons from Davis Besse Event

- **Leadership Safety Values and Actions:** Prioritizing production over safety
- **Questioning Attitude:** Shift in focus to justifying minimum standards
- **Decisionmaking:** Lack of conservative decisionmaking or systematic safety analysis of decisions
- **Problem Identification and Resolution:** Corrective actions addressed symptoms rather than causes
- **Continuous Learning:** Failure to integrate and apply operating experience to plant conditions

# Safety Culture in the Reactor Oversight Process (ROP)

- 2006 revision to the ROP to more fully address safety culture
  - More opportunities for NRC staff to consider safety culture weaknesses before significant performance degradation occurs
  - Process to determine the need to evaluate a licensee's safety culture in the degraded cornerstone column of the ROP Action Matrix
  - Process to evaluate a licensee's safety culture assessment and independently conduct an assessment in the multiple/repetitive cornerstone column of the ROP Action Matrix
- Safety culture common language initiative
  - Joint effort with U.S. nuclear industry from 2011 to 2013
  - Developed common terms for describing safety culture
  - Terms have been incorporated under the ROP cross-cutting areas

# 2011 Safety Culture Policy Statement

Sets forth the Commission's **expectation** that individuals and organizations performing regulated activities establish and maintain a positive safety culture commensurate with the safety and security significance of their actions and the nature and complexity of their organizations and functions

# Safety Culture Definition

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 Traits\*

<p><b>Leadership Safety Values and Actions</b></p>	<p><b>Problem Identification and Resolution</b></p>	<p><b>Personal Accountability</b></p>
<p>Leaders demonstrate a commitment to safety in their decisions and behaviors</p>	<p>Issues potentially impacting safety are promptly identified, fully evaluated, and promptly addressed and corrected commensurate with their significance</p>	<p>All individuals take personal responsibility for safety</p>
<p><b>Work Processes</b></p>	<p><b>Continuous Learning</b></p>	<p><b>Environment for Raising Concerns</b></p>
<p>The process of planning and controlling work activities is implemented so that safety is maintained</p>	<p>Opportunities to learn about ways to ensure safety are sought out and implemented</p>	<p>A safety conscious work environment is maintained where personnel feel free to raise safety concerns without fear of retaliation, intimidation, harassment or discrimination</p>
<p><b>Effective Safety Communications</b></p>	<p><b>Respectful Work Environment</b></p>	<p><b>Questioning Attitude</b></p>
<p>Communications maintain a focus on safety</p>	<p>Trust and respect permeate the organization</p>	<p>Individuals avoid complacency and continually challenge existing conditions and activities in order to identify discrepancies that might result in error or inappropriate action</p>

\*Decisionmaking is also included as a trait in the safety culture common language for nuclear power reactors.

# Safety and Security

- Safety and security activities are closely intertwined
- Licensees should emphasize the need for integration and balance to achieve both safety and security in their activities
- Safety and security are important in an overall culture of safety

# Outreach and Education Efforts

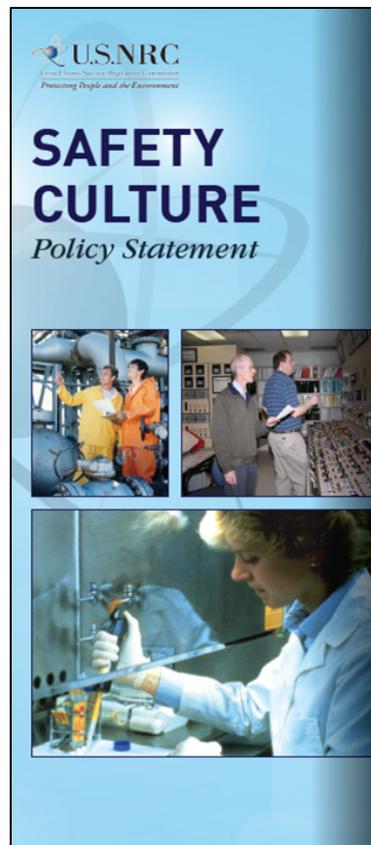


United States Nuclear Regulatory Commission

Protecting People and the Environment

- Interactions with Licensees and External Stakeholders
- International Involvement
- Conferences and Training
- Educational Tools
  - Brochures
  - Case Studies
  - Trait Talk
  - Posters and support materials
- Safety Culture Website

<http://www.nrc.gov/about-nrc/safety-culture.html>



# Summary

- Lessons learned from Davis Besse event highlight the importance of safety culture
- NRC considers safety culture in its Reactor Oversight Process
- NRC communicates safety culture expectations through the Safety Culture Policy Statement
- The Safety Culture Policy Statement acknowledges the importance of safety and security within an overarching culture of safety
- Outreach and education fosters understanding of safety culture and helps disseminate good practices