

# **Continuing to Foster A Strong Safety Culture at Fuel Facilities**

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Nuclear Energy Institute  
February 9, 2012

# **SC is Necessary**

- SC Concepts – Not New; Necessary Operational Element
- SC Responsibility – Everyone's; Management, Leadership and All Employees Have Critical Role
- SC Assessments – Respond to Internal & External Assessments; Continuous Learning by Facilities & NRC

# SC in Place Today

- SC – Policies, Procedures & Training Programs in Place for Some Time; INPO Traits Were in Use
- SC Elements to Include for Example:
  - SCWE – stop work orders; pre-job briefings
  - ECP – reporting hotlines; issue tracking
  - CAP – problem evaluation reports; trending
  - HP– metrics; monitoring

# SC Applied

- Mentor, Communicate, & Demonstrate Strong SC
- Observe Characteristics, Attitudes & Behaviors of Personnel
- Interview, Audit, & Assess SC
- Identify Early Indicators of Potential Problems, Trends & Corrective Actions;
- Monitor Corrective Action Effectiveness



# **Examples of Industry Actions**

**(before and after Final Policy)**

- **Dedicated SC Manager Position**
- **Revised SC Policy to Include NRC Traits**
- **Enhanced Concern Reporting & Tracking**
- **Targeted SCWE Training (e.g., Questioning Attitude, Safety Observations and Suggestions)**
- **Increased Checks and Balances**
- **Conducted SC Self Assessments with Continuous Improvement Actions (e.g., SCWE Surveys)**

# Continued NRC Role in SC

- *Current* NRC Oversight Process Demonstrated Appropriate to Assess SC
  - Deficient SC was Root or Contributing Cause of a Few Past Events
  - Continuous Learning & Applying Lessons-Learned by NRC & Industry
- *Improved* NRC Oversight Process Should Address SC

# Acronyms

- CAP -- Corrective Action Program
- ECP -- Employee Concerns Program
- HP -- Human Performance
- INPO -- Institute for Nuclear Power Operations
- SC -- Safety Culture
- SCWE -- Safety Conscious Work Environment



A progressive professional society whose members and activities constitute an invaluable resource to the regulation of radioactive materials and radiation safety across the nation.

# ***Safety Culture Activities***

***Lee Cox, OAS Director***

***February 9, 2012***

# ***History***

- ***Foundation of Health, Safety and Security***
- ***Suggested State Regulations for Control of Radiation (SSRCRs)***
- ***NUREG 1556 Guidance***
- ***Integrated Materials Performance Evaluation Program (IMPEP)***

# ***North Carolina High Level Activities***

- ***Governor Perdue Proclaims November,  
2011 Radiation Safety Month***



RADIATION SAFETY MONTH

2011

BY THE GOVERNOR OF THE STATE OF NORTH CAROLINA

A PROCLAMATION

WHEREAS, on November 8, 1895, Wilhelm Conrad Röntgen discovered X-rays by producing and detecting electromagnetic radiation in a wavelength range also known as Röntgen rays, an achievement that earned him the first Nobel Prize in physics in 1901; and

WHEREAS, while radiation continues to be a useful and necessary part of our modern world, radiation exposure can be harmful to people; and

WHEREAS, annual effective radiation dose from medical imaging has doubled in the past fifteen years; and

WHEREAS, radiation protection professionals work throughout North Carolina government, industry, medical, dental, educational, research, law enforcement and emergency management communities to bring the benefits of radiation to the people of our state while minimizing the hazards of radiation exposure; and

WHEREAS, children are more sensitive to radiation, the Image Gently Campaign provides optional scanning for children only when there is a clear medical benefit and to avoid unnecessary scans; and

WHEREAS, exposure to radiation can be reduced through alternative technology such as ultrasound and magnetic resonance imaging, doctors and radiologists can work as a team to select the best imaging exam options for their patients; and

WHEREAS, the State of North Carolina joins the Image Gently Campaign and other interested agencies and organizations to promote awareness of radiation safety and the opportunities to reduce radiation dose, and in encouraging citizens to test and mitigate their homes for radon levels, as well as to visit the North Carolina Radiation Protection website [www.ncradiation.org](http://www.ncradiation.org);

NOW, THEREFORE, I, BEVERLY EAVES PERDUE, Governor of the State of North Carolina, do hereby proclaim November 2011, as "RADIATION SAFETY MONTH" in North Carolina and commend its observance to all citizens.



  
BEVERLY EAVES PERDUE

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the Great Seal of the State of North Carolina at the Capitol in Raleigh this twenty-fifth day of October in the year of our Lord two thousand and eleven, and of the Independence of the United States of America the two hundred and thirty-sixth.

# ***North Carolina High Level Activities***

- ***North Carolina Radiation  
Protection Section Modifies  
Mission Statement***



# ***North Carolina High Level Activities***

- ***Reduce radiation exposure to the citizens and occupational workers of North Carolina; reduce radiation contamination to the environment and to protect all from radiation hazards by ensuring the existence of a preeminent radiation safety culture.***

# ***North Carolina High Level Activities***

- ***North Carolina makes NRC Safety Culture Pamphlet Their Own***
- ***Applies To All Radioactive Material Licensees, X-Ray Registrants and Tanning Facilities***
- ***NC Heavily Vested in This Effort***
- ***Traits Inherent to Existing Safety Programs***



The NC Department of Health and Human Services, Division of Health Service Regulation, Radiation Protection Section, in conjunction with the U.S. Nuclear Regulatory Commission, endorses and promotes a culture of safety.

## SAFETY CULTURE POLICY STATEMENT

The policy statement applies to all licenses issued under 15A NCAC 11.0300, all registrations issued under 15A NCAC 11.0200, all mammography facilities, and all applicants for a license or a registration subject to NCRPS authority. While the safety culture policy statement and traits are not incorporated into the regulations, many of the traits may be inherent to existing radiation safety programs.

In March 2011, the U.S. Nuclear Regulatory Commission (NRC) approved the Safety Culture Policy Statement. The Policy Statement was developed over a three-year period during which the agency engaged its licensees and the Agreement States and other interested parties. The North Carolina Radiation Protection Section (NCRPS) is heavily vested in this effort and encourages the development and implementation of Safety Culture policies and practices among its licensees and registrants.

NCRPS expects that individuals and organizations performing regulated activities establish and maintain a positive safety culture commensurate with the safety and security significance of their activities and the nature and complexity of their organizations and functions. This is codified in 15A NCAC 11.1603(a) and is a fundamental tenet under which licenses and registrations are granted. Because safety and security are the primary pillars of NCRPS' regulatory mission, consideration of both safety and security issues, commensurate with their significance, is an underlying principle of the Safety Culture Policy Statement.

## BACKGROUND

The 1986 nuclear accident at the Chernobyl nuclear power plant in the Ukraine revealed the importance of safety culture and the impact that weaknesses in safety culture can have on safety. Since then, the importance of a positive safety culture has been further demonstrated by a number of significant events in the United States and the international community. Assessments of these events revealed that safety culture weaknesses were an underlying cause or increased the severity of problems.

Safety Culture is not a new concept. Importance of safety culture was addressed in two previously issued NRC policy statements. The 1989 "Policy Statement on the Conduct of Nuclear Power Plant Operations" applies to all individuals engaged in activities that affect the safety of nuclear power plants. The 1996 "Freedom of Employees in the Nuclear Industry To Raise Safety Concerns Without Fear of Retaliation" policy statement applies to the regulated activities of all NRC licensees and their contractors. NCRPS codifies this concept in 15A NCAC 11.1007. This rule provides the expectation that licensees, registrants, and other employers subject to NC authority establish and maintain work environments in which employees feel free to raise safety concerns without fear of retaliation.

Following the September 11, 2001 terrorist attacks, the NRC issued orders enhancing security at nuclear facilities, followed shortly thereafter by the Increased Controls. During the early years of implementation several violations of the enhanced security requirements occurred because of failures to cultivate a positive safety culture in the licensee's security program.

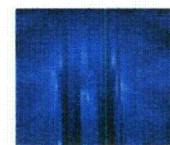
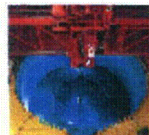
While discernable progress has been made to strengthen safety culture since the Chernobyl accident, NCRPS seeks to further emphasize the importance of safety culture by the issuance of this Policy Statement.

## IMPORTANCE FOR REGULATED ENTITIES

Industry experience has shown the value of establishing and maintaining a positive safety culture. NCRPS believes that through continued outreach this value will become apparent. It is important to remember that individuals and organizations performing regulated activities bear the primary responsibility for safety and security. NCRPS can monitor and trend the performance of licensees and registrants to determine compliance with regulatory requirements and commitments. Additionally, this information may serve as an indicator of possible problem areas in an organization's safety culture. However, NCRPS does not monitor or trend the traits in the policy statement. As stated previously, the policy statement is not a regulation, therefore, it is the responsibility of NCRPS' licensees and registrants to consider how to apply this policy statement to regulated activities as part of their radiation safety programs.

## MOVING FORWARD

As refinement of the safety culture policy statement enters the next phase, cooperation and interaction between all stakeholders will become crucial to the success of the development of positive safety cultures. During this phase, NCRPS will continue to engage stakeholders in dialogue regarding the importance of a positive safety culture in their specific activities. NCRPS will also seek feedback on the ability of stakeholders to use the policy statement in those activities, as well as to determine areas in the policy statement where changes may be appropriate.





#### DEFINITION OF SAFETY CULTURE

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.

#### TRAITS OF A POSITIVE SAFETY CULTURE

Experience has shown that certain personal and organizational traits are present in a positive safety culture. The following are traits of a positive safety culture:

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

There may be additional traits not included here that are also important in a positive safety culture. These traits were not developed for inspection purposes.

#### MISSION

*The Mission of the North Carolina Radiation Protection Section is to:*

*Reduce radiation exposure to the citizens and occupational workers of North Carolina; reduce radiation contamination to the environment and to protect all from radiation hazards by ensuring the existence of a preeminent radiation safety culture.*

*Ensure all licensees and registrants have equal opportunity to comply with applicable regulations through education and guidance.*

*Attain self-sufficiency through collection of licensing, registration and inspection fees, grants, and the development and implementation of training programs all driven by responsible fiscal accountability.*

*Provide employment that is rewarding through compensation, education and opportunity.*



This brochure is based on U. S. Nuclear Regulatory Commission publication NUREG/BR-0500, June 2011

TO GET MORE INFORMATION FROM THE NRC:  
[www.nrc.gov](http://www.nrc.gov)  
[www.nrc.gov/about-nrc/regulatory/enforcement/safety-culture.html](http://www.nrc.gov/about-nrc/regulatory/enforcement/safety-culture.html)

## SAFETY CULTURE

### Policy Statement



NC Radiation Protection Section  
3825 Barrett Drive  
Raleigh, North Carolina 27609

# ***Agreement States' Activities***

- ***Educating Licensee Leadership***
  - ***Entrance and Exit Meetings***
  - ***Identifying Existing State Regulations Specific to Traits***
- ***Distribution of Pamphlet: List Serves***
- ***Website Posting of Pamphlet***
- ***Working Group Contributions***

# ***Looking Forward***

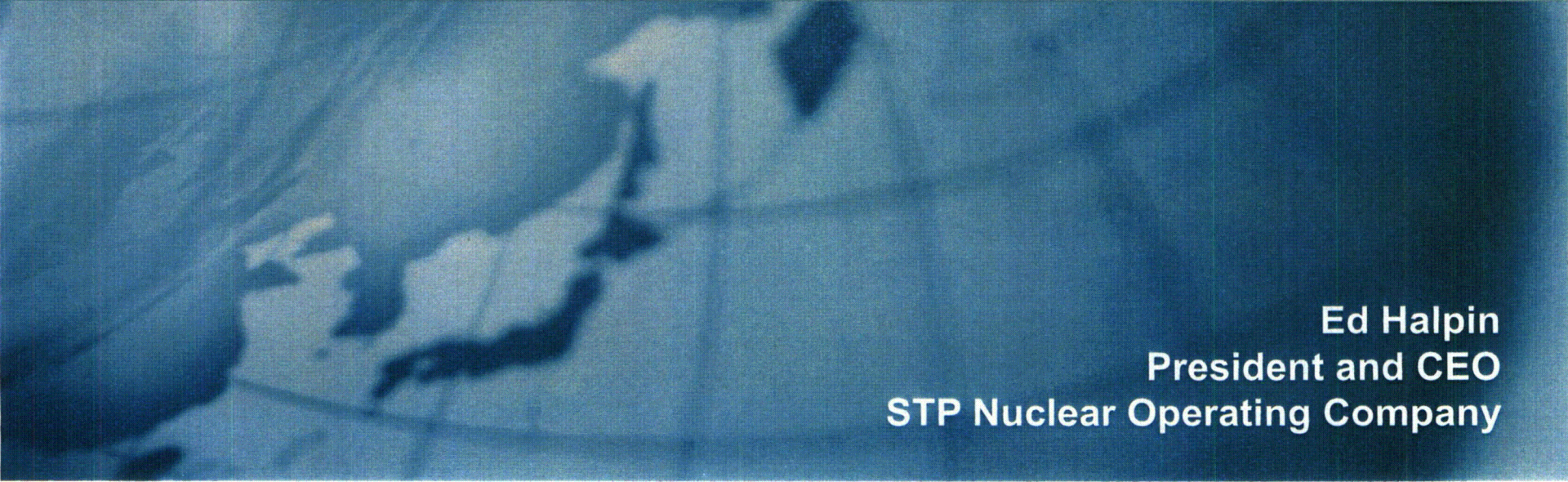
- ***Measuring Success***
  - ***Long Term Effort-Familiar Concept***
  - ***Evaluating Nuclear Material Events Database***
  - ***IMPEP***
- ***Continue Efforts***
- ***Improvement Opportunities***



February 9, 2012



# Nuclear Safety Culture Process Pilot

A blurred, blue-tinted background image showing a person in a white lab coat, likely a scientist or technician, working in a laboratory or industrial setting.

Ed Halpin  
President and CEO  
STP Nuclear Operating Company



## Students of Culture

- 1993 – both units shutdown followed by a Confirmatory Action Letter (CAL)
- Declining culture began manifesting itself in equipment and maintenance issues
- Culture change resulted in significant improvements in overall safety performance, equipment reliability and outage performance
- Stressful challenges such as BMI and Generator Outage handled well



## Pilot Project Milestones

2009	Project team formed Process developed First quarterly assessment completed
2010	First biennial assessment completed Program procedure approved STP Nuclear Safety Culture policy approved
2011	Regional workshops completed Second biennial assessment completed



## Process Lessons

- Assign the right resources
- Learn to identify and act on faint signals
- A communication plan is critical
- Monitor the effectiveness of actions
- Learn from cultural positives



## Cultural Benefits

- Provides continuous assessments of culture
- Provides a basis for communicating relevant cultural issues to leaders and staff
- Promotes management accountability for nuclear safety culture
- Increases familiarity with the Nuclear Safety Culture Principles and Attributes



## Industry Status

- Implementation of NEI 09-07 process
- Common Language



## Conclusions

### **The Nuclear Safety Culture process:**

- Provides a method to proactively identify safety culture issues
- Promotes management accountability for nuclear safety culture
- Is well-defined and repeatable
- Is transparent

***Views on Industry  
Activities Related to the  
NRC Safety Culture Policy  
Statement***

***Billie Pirner Garde, Esq.  
Clifford & Garde, LLP  
February 9, 2012***



# ***Safety Culture Policy Statement June, 2011***

***“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.”***

***Final NRC Safety Culture Policy  
Statement, Fed. Reg. June 14, 2011***

# ***Exhaustive Regulatory Journey***

- 1986 – Chernobyl and Challenger tragedies point to Safety Culture collapse as a contributing cause of significant safety failures***
- 1996 – Millstone site safety culture issues challenge regulatory confidence***
- 1996 – NRC issues Safety Conscious Work Environment (SCWE) Policy Statement***
- 2002 – Davis-Besse Near Miss re-emphasized safety culture as a significant contributor to safety risks***
- 2006 – NRC ROP modified to address Safety Culture implications***
- 2008 – Commission directs Staff to develop Safety Culture policy***



# ***Safety Culture Policy Statement – At Last The Work Begins!***

- ***2011 NRC Safety Culture Policy Statement issued, recognizing safety as the overriding priority***
- ***Policy Statement will become a benchmark for other low risk/high consequence industries***
- ***The recognition of the importance of Safety Culture has already changed the face of the industry in many ways – with more to come***

# ***NRC Staff Has Made Great Progress***

- ***Outreach meetings, communications, continuing dialogue and workshops with all stakeholders has continued***
- ***Development of definitions for a common language ongoing but not yet completed***
- ***Highly motivated, well qualified and committed staff doing an excellent job as advocates for Safety Culture activities***

# ***More Work Needed, Staff***

- ***NRC Staff needs Commission encouragement, direction, and freedom to further develop Safety Culture methodology and implementation plans***
  - ***Goals should become measurable metrics***
  - ***Timeline for implementation***
- ***Staff, including OI and OIG activities, need to keep safety as the overriding priority***

## ***More Work Needed, Staff, cont'd***

- ***More staff training needed in recognizing and identifying Safety Culture precursors***
  - ***Resident inspectors are first line of defense, but are often the most overworked and least trained in recognizing Safety Culture issues***
- ***Safety Culture staff needs additional resources and support to complete the Commissions' expectations in a timely manner***

# ***Industry Initiatives***

- ***NEI and INPO have made a solid commitment to Safety Culture initiatives***
- ***The pilot programs have been good, but inadequate transparency for public reliance on industry commitments***
- ***Common language workshops have continued the stakeholder involvement, progress is being made, although slow***

# **Concerns About Barriers Towards Successful Implementation**

- ***Applicability to Agreement States Needs to Be Clearly Established – all licensees must be accountable to follow policy***
- ***Industry (NEI and INPO) need to adopt the Policy Statement Definition and Traits, refresh its program materials, and implement them with rigor***
- ***Agency needs to demonstrate a bias towards integrating Safety Culture Policy into all Agency materials and programs***

# **ACKNOWLEDGEMENT**

***Eric Fries (1953-2012)***



Eric Fries was a valued member of the NRC Safety Culture Team.

His contributions to the industry were thoughtful, intelligent, and experienced. He was a proud engineer, a key participant in the Millstone Safety Culture recovery, completed post-graduate work in the field, and a personal friend and colleague.

We recognize the loss to his family and the NRC team, and the important contributions he made to the development of Safety Culture throughout this and other industries.



# **STATUS OF OUTREACH AND EDUCATIONAL EFFORTS WITH EXTERNAL STAKEHOLDERS RELATED TO THE SAFETY CULTURE POLICY STATEMENT**

**February 9, 2012**



# **Agenda**

- **Opening: Bill Borchardt, EDO**
- **Roles and Responsibilities:**  
**Andy Campbell, Deputy Director, OE**
- **Safety Culture Policy Statement  
Implementation Plan:**  
**Diane Sieracki, Sr. Safety Culture  
Program Manager, OE**

# **Background**

- **Safety Culture Policy Statement**
- **Outreach and Education**
- **Implementation Plan**

# **Completed Activities Outreach and Education**

- **Educational Tools**
  - **Case Studies & User Guide**
  - **Brochure & Posters**

# **Completed Activities Outreach and Education, cont.**

- **Licensees and Other External Stakeholders**
- **NRC Staff Inspector Educational Outreach**
- **Workshop Stakeholder Panelists**

# **Completed Activities Outreach and Education, cont.**

- **FSME, NRR newsletters**
- **Regulatory Information  
Summary**
- **Safety Culture website**

# **Completed Activities Outreach and Education, cont.**

- **National & International Efforts**
  - **Domestic and Foreign Regulators**
  - **International Atomic Energy Agency**

# **Completed Activities**

## **Other Safety Culture Activities**

- **Reactor Oversight Process**
- **Construction Reactor Oversight Process**

# **Planned Activities: Outreach and Education**

- **Educational Tools**
  - **Case Studies**
- **Presentations/Communications:**
  - **Licensees and External Stakeholders**
  - **Domestic and International Stakeholders**



# **Planned Activities: Guidance Document Revisions**

- **Inspection Manual Chapters revisions**
- **NUREGs and Licensing Guidance Documents**

# **Planned Activities**

## **Other Safety Culture Activities**

- **Construction Reactor Oversight Process**
- **Fuel Cycle Oversight Process**
- **Spent Fuel Storage and Transportation**

# **SUMMARY**

- **Continue outreach and education to effectively employ the Policy Statement**
- **Assess effectiveness and propose any new activities**

# List of Acronyms

<b>cROP</b>	<b>Construction Reactor Oversight Program</b>
<b>EDO</b>	<b>Executive Director for Operations</b>
<b>FCOP</b>	<b>Fuel Cycle Oversight Program</b>
<b>FSME</b>	<b>Office of Federal and State Materials and Environmental Programs</b>
<b>IAEA</b>	<b>International Atomic Energy Agency</b>
<b>NMSS</b>	<b>Office of Nuclear Material Safety and Safeguards</b>
<b>NRC</b>	<b>Nuclear Regulatory Commission</b>
<b>NRO</b>	<b>Office of New Reactors</b>
<b>NRR</b>	<b>Office of Nuclear Reactor Regulation</b>
<b>NSIR</b>	<b>Office of Nuclear Security and Incident Response</b>
<b>NUREG</b>	<b>A type of document issued by the NRC</b>
<b>RES</b>	<b>Office of Nuclear Regulatory Research</b>
<b>ROP</b>	<b>Reactor Oversight Process</b>