

**2022 ROP Self Assessment:
Safety Culture Effectiveness Review
Presented at Bi-Monthly ROP
meeting**

Molly Keefe-Forsyth

Safety Culture Program Manager
Office of Nuclear Reactor Regulation

Background

In January of 2022, a multi-disciplinary team of staff from multiple agency offices was assigned to conduct an effectiveness review of the Safety Culture program as part of the ROP self-assessment program.

Team Members

- Molly Keefe-Forsyth, Safety Culture Program Manager NRR/DRO/IRAB (Team Lead)
- Rebecca Sigmon, Reactor Systems Engineer, NRR/DRO/IOEB
- April Nguyen, Senior Resident Inspector, Region III
- Elise Eve, Senior Reactor Inspector, Region I
- Dori Willis, OE/Allegations Team Lead
- Chris Hunt, Senior Resident Inspector, Region III
- Alex Garmoe, Senior Risk Analyst NRR/DRO/IRAB (Team consultant)

History of Safety Culture in the ROP

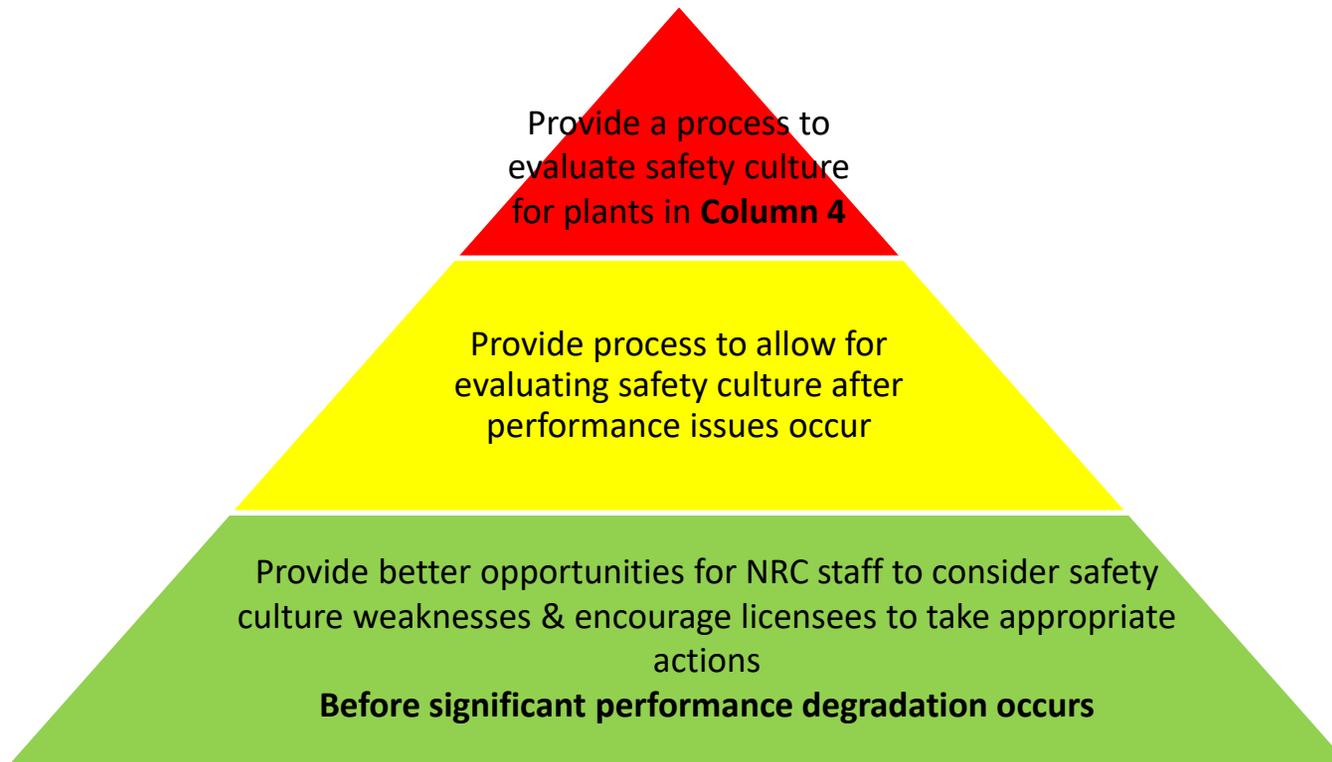
- Cross-cutting areas included in ROP from its inception in 2000
- Post-Davis Besse
 - SRM-SECY-04-0111 – Build on tools within the pre-existing ROP framework
 - No Rulemaking
 - No Baseline IP
 - RIS 2006-013
 - Outlines the ROP framework developed to address safety culture

History of Changes in Safety Culture Oversight

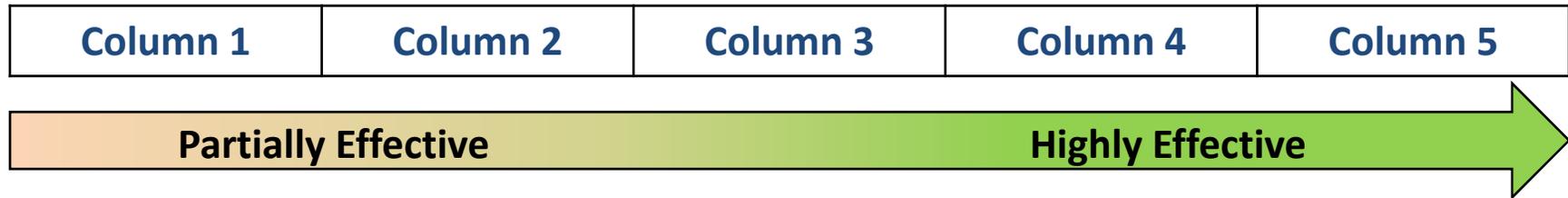
- Common Language Initiative – 2013:
 - Aligned ROP language with INPO language using 2011 Policy Statement
- ROP program changes that affect safety culture – 2015:
 - Raised threshold for a cross-cutting theme
 - Established 3-cycle (18 month) existence of theme to determine CCI
 - Changed Column 3 criteria
- Effectiveness Reviews
 - 2018 Effectiveness Review of common language
 - 2020 Effectiveness Review of 2015 CCI changes

Intent of ROP Safety Culture

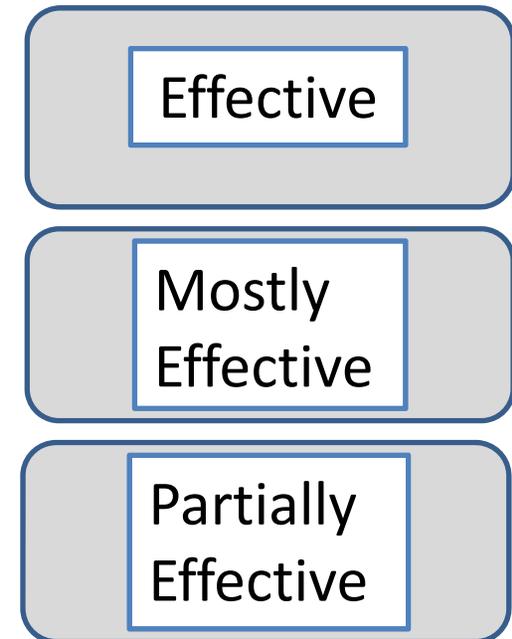
3-Tiered Approach based on SRM & RIS 2006-013



Effectiveness of Safety Culture Oversight



- **Column 4:** structured process to evaluate the licensee's safety culture assessment and to independently conduct a safety culture assessment
- **Columns 2 & 3:** process to determine the need to specifically evaluate a licensee's safety culture
- **Column 1:** consider safety culture weaknesses and encourage licensees to take appropriate actions before significant performance degradation occurs.



Column 4 Plants

Provide the NRC staff with a structured process to evaluate the licensee's safety culture assessment and to independently conduct a safety culture assessment for a licensee in the multiple/repetitive degraded cornerstone column of the action matrix.



- IP 95003 provides a framework for NRC staff to perform an independent assessment of licensee safety culture
- The ROP provides for assessment and feedback following IP 95003 inspections that has helped shape and improve the NRC's independent safety culture evaluation for subsequent plants in Column 4

Plants with Degraded Performance

Provide the NRC staff with a process to determine the need to specifically evaluate a licensee's safety culture after performance problems have resulted in the placement of licensee in the degraded cornerstone column of the action matrix



- IP 95002 provides a process for incorporating aspects of IP 95003 safety culture evaluation as needed
 - When used for Column 3 plants it has effectively identified underlying safety culture issues
- 2015 changes to ROP assessment process raised the threshold for reaching Column 3
 - IP 95001 does not provide an option for independent NRC safety culture assessment
 - Plants with safety culture issues that would have reached Column 3 instead bounced back and forth from Column 2 to Column 1 multiple times

Recommendation 1

- IMC 0305 and IP 95001 should be updated with language similar to that used for IP 95002 (below), allowing for an NRC evaluation of safety culture for Column 2 plants if the circumstances warrant

Independently determine whether the licensee root cause, extent-of-condition, and extent-of-cause evaluations appropriately considered if any safety culture component caused or significantly contributed to a significant performance issue.

If the licensee did not consider whether a possible weakness in a particular safety culture component could have been a root cause or a significant contributing cause of the deficiency, and if the inspectors determined that a weakness in the same component could reasonably have been a root cause or a significant contributing cause of the deficiency, then an independent NRC evaluation should be performed.

Column 1 Plants

Provide better opportunities for the NRC staff to consider safety culture weaknesses and to encourage licensees to take appropriate actions before significant performance degradation occurs.

Partially
Effective

- “Consider safety culture weaknesses...”

Effective

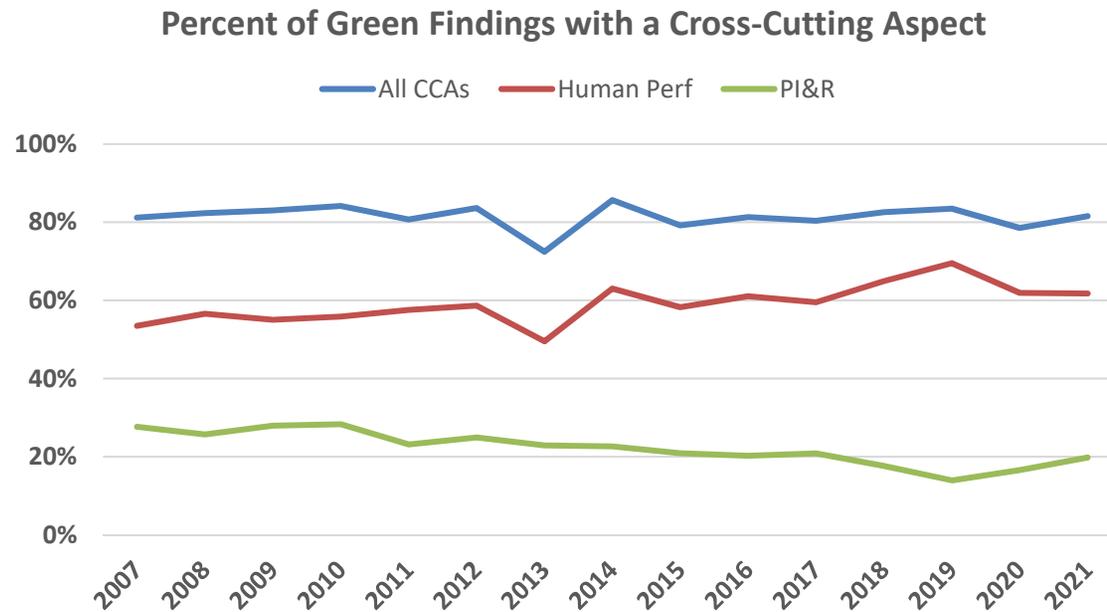
 - Cross-Cutting Aspects allow NRC staff to independently and objectively tag ROP findings with individual safety culture attributes.
 - Trends in these attributes demonstrate statistically significant predictive associations with future performance issues
- “Encourage appropriate actions...”

Partially Effective

 - The framework is less effective at encouraging action before this significant performance degradation occurs

Identification of Issues

- Since 2007, cross-cutting aspects have been consistently assigned to about 80% of ROP inspection findings each year
- Inspectors with additional training in safety culture find they can identify developing concerns before they reach the level of a finding, and engage licensees even earlier in the process

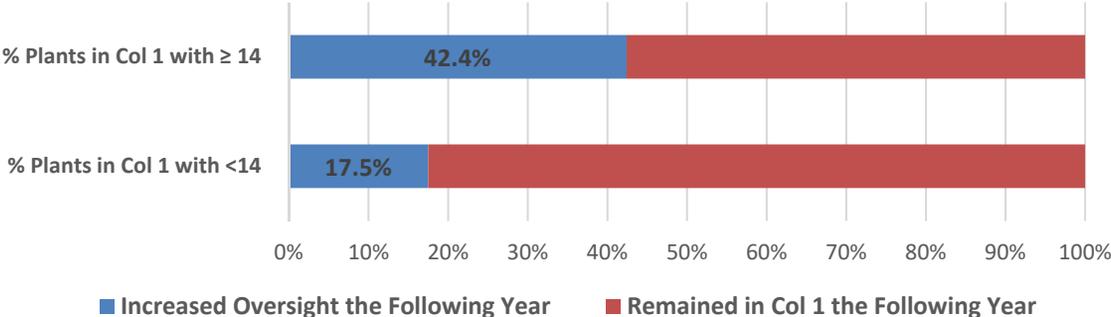


Recommendation 2

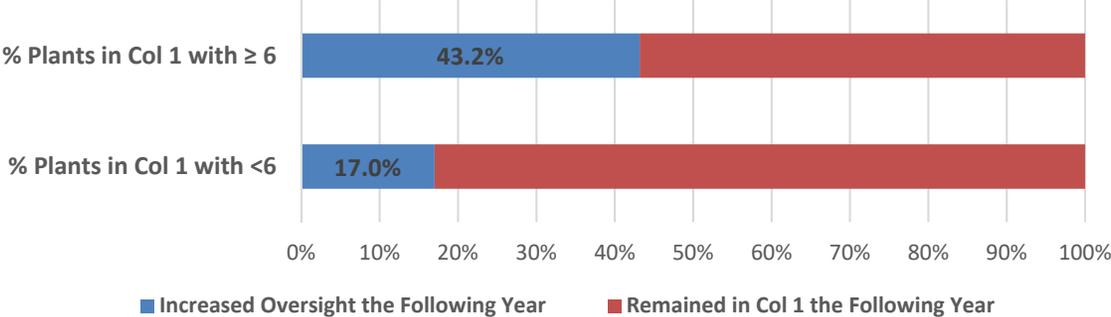
- Improve training available to inspectors to better meet Commission objectives stated in SRM 04-0111
 - Ongoing based on previously identified training needs

Predictive Associations – Action Matrix

Human Performance Cross-Cutting Aspects



PI&R Cross-Cutting Aspects

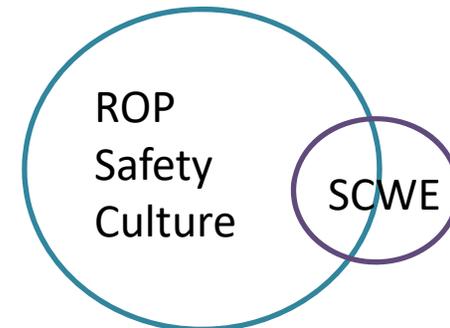


Retrospective – 95003 Case Studies

- Underlying themes
 - Safety culture issues were always apparent in hindsight
 - In some cases multiple SCCIs were open, but the ROP did not encourage meaningful action
 - Often the underlying issues are outside the safety culture attributes allowed to be tagged in baseline ROP (“Other”)
 - Safety culture issues not resulting in enough findings to trigger CCI thresholds
- Noted in multiple 95003 lessons learned reports and CCI reviews in both 2015 and 2020.

IP 93100 Experience to Inform a Path Forward

- IP 93100 “Safety Conscious Work Environment Issue of Concern Followup”
- SCWE included in ROP cross-cutting framework, but aspects of SCWE are also dealt with outside the ROP with inspection using IP 93100 including:
 - Allegations and Investigations
 - Traditional Enforcement
 - Chilling Effects Letter
- Inspections under 93100 for SCWE follow-up have identified broader safety culture concerns



Recommendation 3

Update IP 93100 to review all of safety culture using one of three potential options

3-1. Modify CCI Determination and Follow-Up

- Adjust inputs used for determining if a CCI exists
- Use IP 93100 for follow-up once concerns are identified

3-2. Adjust Existing Inspection Framework

- Maintain IP 93100 as an Appendix C procedure available for use at RA discretion when NRC has concerns about licensee safety culture and its potential impact on performance
- Supplement PI&R inspections with qualified safety culture assessors as needed
- Update IP 93812 and IP 93800 (SIT & AIT) to provide for safety culture assessor as part of team if known safety culture issues are thought to be a factor

3-3. Baseline Safety Culture IP

- Add IP 93100 as a baseline inspection to look specifically at safety culture on a bi/tri-ennial basis.
 - Though initial Commission direction specifically said no additional IP, this review has found that one intended goal of the program, to identify safety culture issues and encourage action before more significant issues develop, is challenged under the current program.
 - Resources currently devoted to SCWE in PI&R would be transferred to this inspection

All Recommendations

1. Update 95001 to allow for safety culture review when indicated
2. Update inspector training based on User Need input from RES
3. Improve ability to encourage action in Column 1 using revised IP 93100
 1. Modify CCI determination criteria and follow-up actions
 - or
 2. Flex existing inspection framework
 - or
 3. Baseline IP