

Safety Culture Performance Measurement: Dashboard Development and Use

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Programs & Projects

Can Safety Culture Be Measured?

“It is not possible to develop a comprehensive safety culture indicator.”

– *Jim Ellis, INPO President and CEO*

“No composite measure of safety culture exists. The multi-faceted nature of culture makes it unlikely that such a measure will ever be found.”

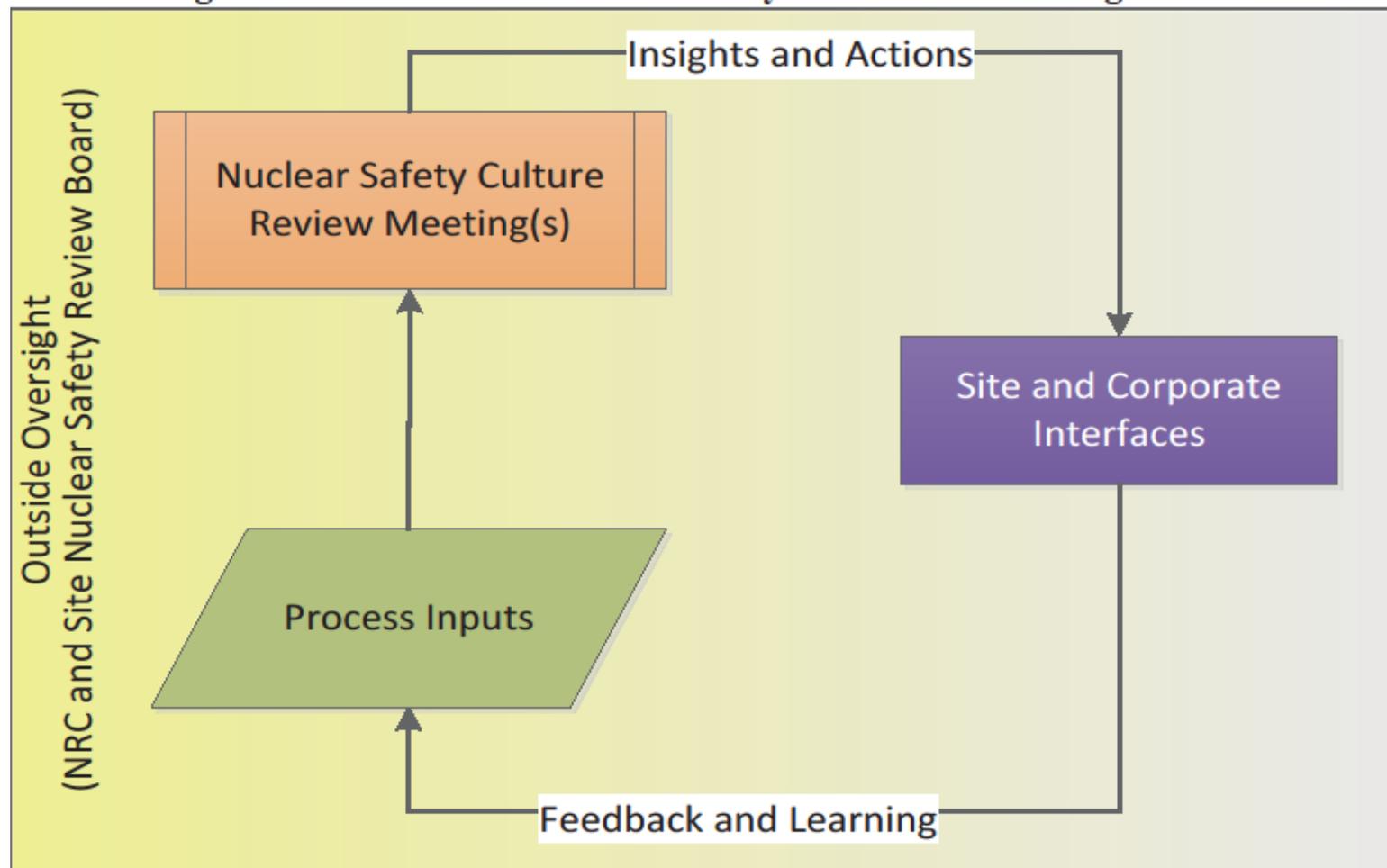
– *International Atomic Energy Agency*

What about the Nuclear Energy Institute (NEI) 09-07 methods of monitoring safety culture?

- “The performance of individuals and organizations can be monitored and trended and may be used as an indicator of possible problem areas in an organization’s safety culture.”
- The commercial nuclear industry uses two mechanisms for understanding safety culture health
 - Periodic assessments – a snapshot of culture
 - Ongoing culture monitoring processes to detect changes

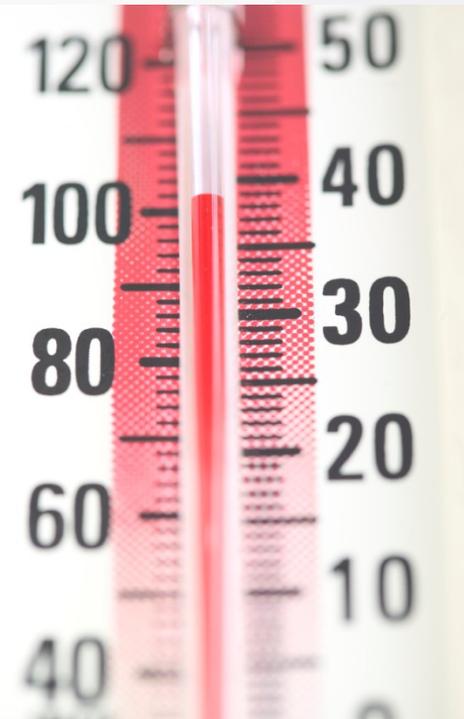
NEI 09-07, Overview of Nuclear Safety Culture Monitoring Process

Figure 1: Overview of Nuclear Safety Culture Monitoring Process



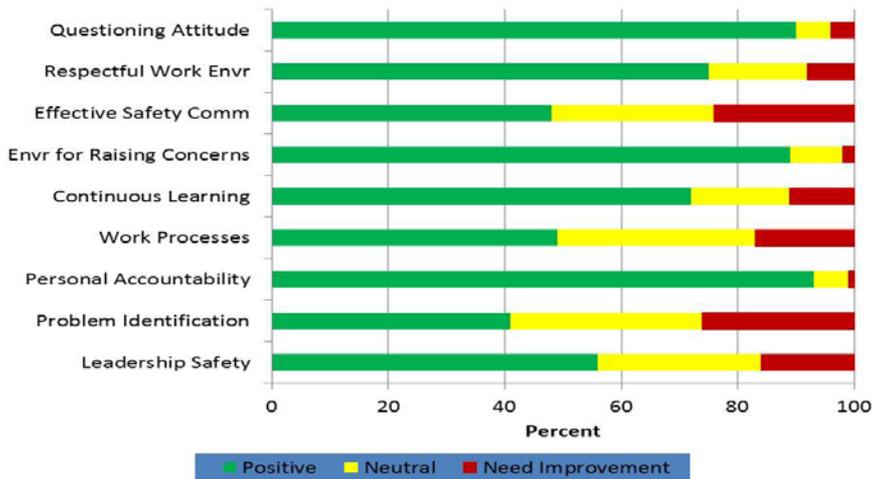
Process Inputs

- It is easy to overwhelm a monitoring process with too much data and inefficient analysis.
- Important that selected data streams help to recognize and respond to early indications of improving or declining safety culture.
 - The main goal is to gauge the effectiveness of improvement actions in safety culture improvement.
- Typical Process Inputs
 - Corrective action program data
 - Employee concerns
 - Causal analysis investigations
 - Assessments
 - Operating experience
 - Site performance trends



Y-12 Safety Conscious Work Environment (SCWE)

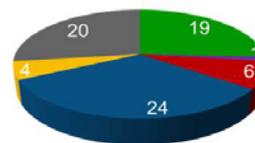
HSS Independent Assessment of UPF Project



Y-12 Employee Concerns Data

Ethics Activity FY 2012

74 Concerns**



Ethics Activity Summary

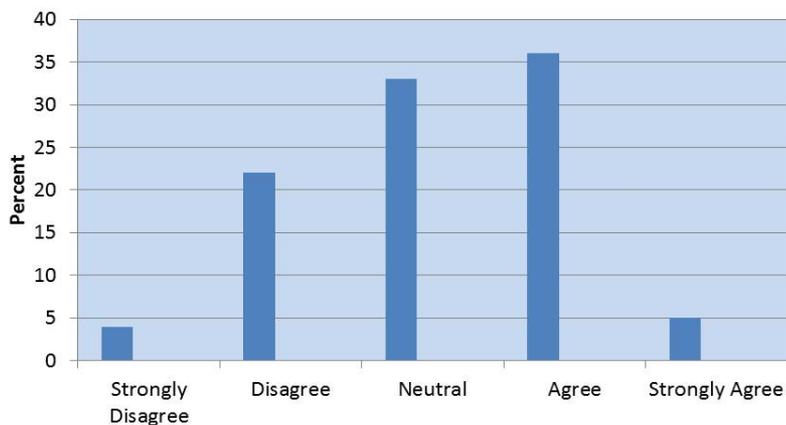
Concerns	74
Miscellaneous	25
Outside Activities	58
Total Activities	157

* Substantiated Concern (31)

** Includes eight NPO Requests

Y-12 Employee Concerns Data

Timely Resolution of Problems



Analysis

- November UPF safety culture survey results used as the basis for this update
- Problems are identified but not always resolved in a timely manner
- Less than 50% agreed that communications are not always frequent or timely

Actions to Improve

- Assure that issues impacting safety are evaluated, addressed, and corrected commensurate with significance
- Evaluate alternate communication methods for use when standing meetings cannot be held
- Communicate survey results to all UPF project personnel

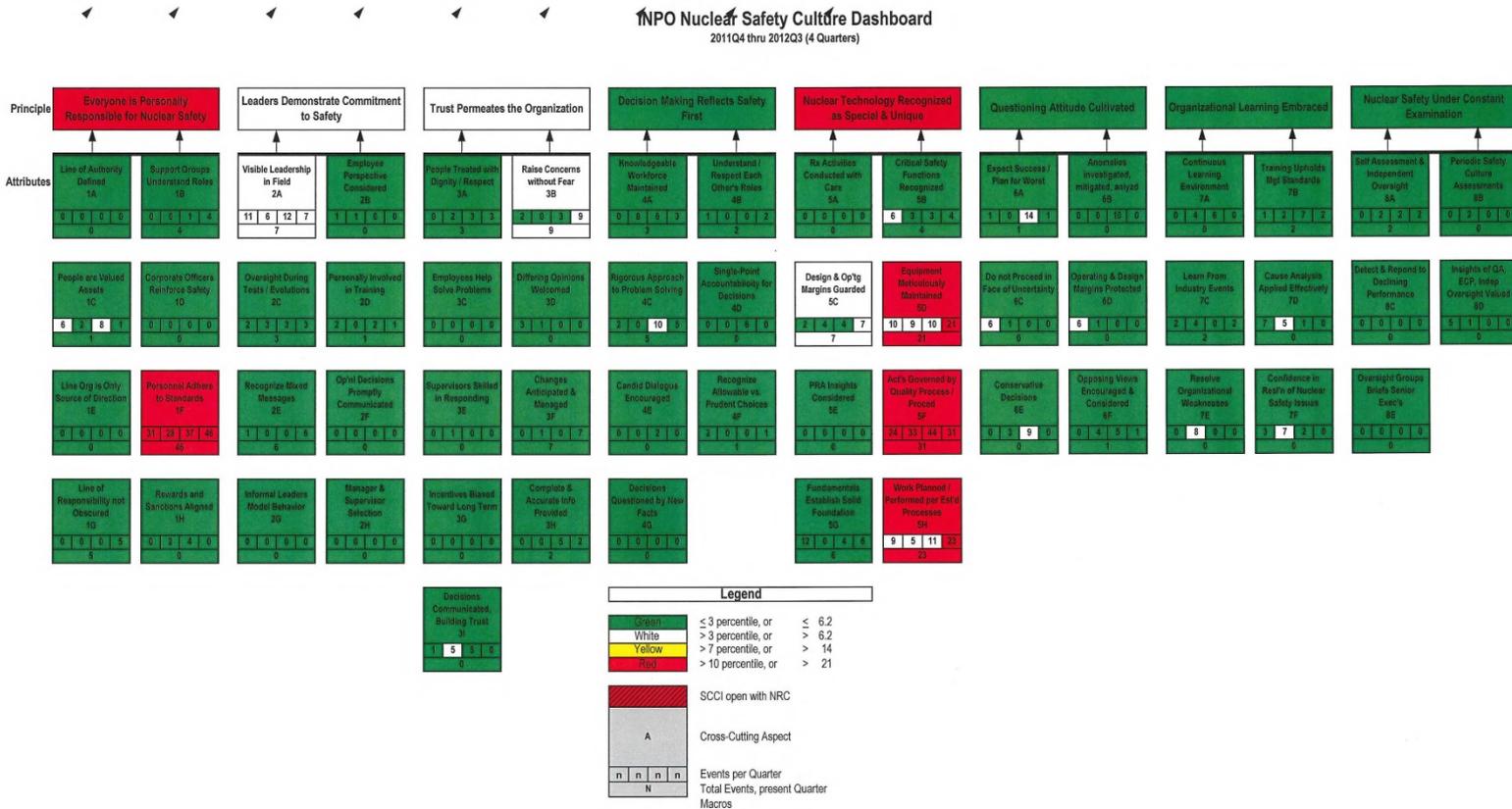
Typical Commercial Nuclear Process Input

Process Input Templates

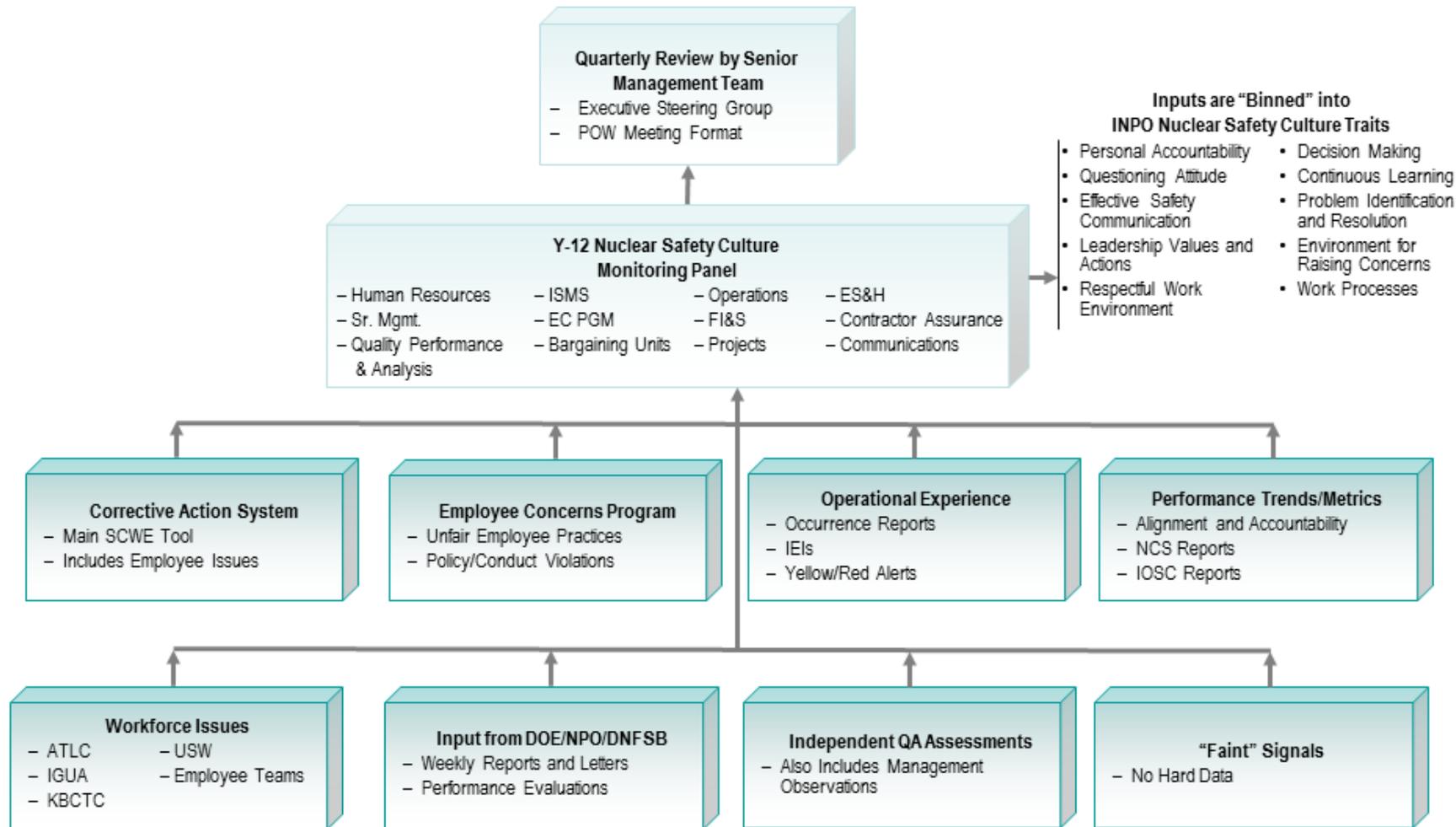
3. Operating Experience			
<u>WHO</u>	Performance Improvement Supervisor		
<u>WHAT</u>	<p>Mandatory to include in review:</p> <ul style="list-style-type: none"> Internal OE reports that were not the result of a cause evaluation. Station response to OE flagged as related to safety culture. Missed opportunities by station personnel to learn from OE. <p>At the discretion of the analyst:</p> <ul style="list-style-type: none"> None prescribed for this input. 	<p>Specifically excluded from review:</p> <ul style="list-style-type: none"> Internal OE reports that have a causal evaluation that is reviewed under the CAP Process. See input #8 	
<u>HOW</u>	<p><u>PRECURSOR</u></p> <ul style="list-style-type: none"> Internal OE reports that are a significance level of near miss and can be clearly linked to a nuclear safety culture principle 	<p><u>NEAR MISS</u></p> <ul style="list-style-type: none"> Internal OE reports that are a significance level of consequential and can be clearly linked to a nuclear safety culture principle 	<p><u>EVENT</u></p> <ul style="list-style-type: none"> None prescribed for this input

Operating Experience: Data on previous deficiencies (such as operations, design, and equipment) are used to improve procedures and processes and to avoid future problems. Any nuclear safety culture related OE is identified and progress in addressing station concerns is reviewed by the NSCMP.

Typical Commercial Nuclear "Dashboard"



Monitoring Panel Process Inputs



WP. Work Processes

The process of planning and controlling work activities is implemented so that safety is maintained. Work management is a deliberate process in which work is identified, selected, planned, scheduled, executed, closed, and critiqued. The entire organization is involved in and fully supports the process.

WP.1. Work Management: The organization implements a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. The work process includes the identification and management of risk commensurate to the work.

Behavior Examples

- Work is effectively planned and executed by incorporating hazard controls, job-site conditions, and the need for coordination with different groups or job activities.
- Insights from probabilistic risk assessments are considered in daily work activities and change processes.
- The work process monitor/tracks temporary modifications.

Measures/Indicators

- Senior Supervisory Watch (SSW) data (Production)
- Maintenance Management Watch (MMW) data (FI&S)
- MMW planning observations
- Production metrics, CSOOT reports for temp mods
- Work package quality performance measures
- Preventive maintenance performance
- FI&S schedule adherence
- Initial Event Investigation (IEI) reports
- Work planning and control metrics
- FI&S approved-for-use hazard control documents

Process Input Ratings

PERFORMING (GREEN)

- Programs and processes are formalized and documented where applicable, and
- Programs and processes are used to manage and/or execute the activities, and
- Where appropriate, metrics have been developed and demonstrate continuing performance meeting expectations

UNDERPERFORMING (YELLOW)

- Programs and processes are formalized and documented where applicable, but not being effectively used, or
- Informal programs are in place and are being effectively used where a formal program or process is deemed necessary, or
- Where available, metrics consistently demonstrate only partial meeting expectations

NOT PERFORMING (RED)

- No formal or informal program or process is in place, and
- Success in area is solely based upon individual effort, and
- Where available, metrics consistently demonstrate not meeting expectations

PRINCIPLE/ATTRIBUTES	RATING
<p>Work Processes</p> <ul style="list-style-type: none"> • Work Management • Design Margins • Documentation • Procedure Adherence 	<p> <input type="checkbox"/> Performing <input checked="" type="checkbox"/> Under-Performing <input type="checkbox"/> Not Performing <input type="checkbox"/> Not Evaluated </p>
<p>Justification for Rating:</p> <p>Work Management = Yellow</p> <ol style="list-style-type: none"> 1. IEI event 2014-276, Task not identified on RWP request in Building 9204-2E. Work added to Work Package was not included in a revised RWP request. Follow up survey confirmed no contamination related issues. 2. IEI event 2014-257, Calibration Standard Tamper Seal in Building 9204-2. Field calibration standard used 13 times with broken seal. Standard taken to Building 9737 and rejected by procedure by Metrology personnel. <p>Design Margins = White</p> <ol style="list-style-type: none"> 3. No observable data, not evaluated. <p>Documentation = Green</p> <ol style="list-style-type: none"> 4. IEI event 2014-146, Height of storage location did not match tolerance on drawing with field condition more conservative. Material Management personnel self-identified and corrected. 5. No reported issues or concerns with procedure verification and use. <p>Procedure Adherence = Yellow</p> <ol style="list-style-type: none"> 6. LO/TO issue in Building 9995 – Electrician completed a fan motor replacement without work start approval or reading the approved work instruction and bypassed a defined hold point in the LO/TO. Upon completion of the job the worker failed to inform the shift manager that the replacement motor had been replaced. 7. IEI event 2014-142, Inadvertent Entry Into respirator area – Two employees signed in on the wrong RWP and entered a respirator required area without the proper PPE. Appropriate action taken once the condition was realized. 8. IEI event 2014-237 – Personnel entered the 15 ft. controlled boundary of an array with an observed nuclear criticality safety violation, in violation of procedure Y56-001. <p>Based upon the number and significance of Procedure Adherence related issues, the overall Work Processes attribute is rated as Yellow (under-performing). Corrective actions taken by line management have resulted in a decrease in recent frequency but this condition needs additional time to evaluate results.</p>	

WORK PROCESSES (WP)

The process of planning, organizing, directing, and controlling work activities is implemented so that safety is integrated into all phases. Work management is a deliberate process in which work is identified, selected, planned, scheduled, executed, closed, and critiqued. Business decisions are made based on hard data and metrics and not past practices or intuition. The entire organization is involved in and fully supports the process.

Attributes:

WP.1 WORK MANAGEMENT: The organization implements a process of planning, organizing, directing, controlling, and executing work activities such that personnel and nuclear safety are fully integrated into all phases. The work process includes the identification and management of risk commensurate to the work.

BEHAVIOR EXAMPLES:

Work is effectively planned and executed by incorporating Core Functions of Integrated Safety Management (ISM). Planning includes a defined scope of work with execution steps, hazard identification, development of controls and consideration of job-site conditions. The need for coordination with different groups, especially workers, or job activities is vital to this process. Insights from probabilistic risk assessments and lessons learned both at Y-12 and the construction and nuclear industries are considered for work application. The work process monitors/tracks temporary modifications.

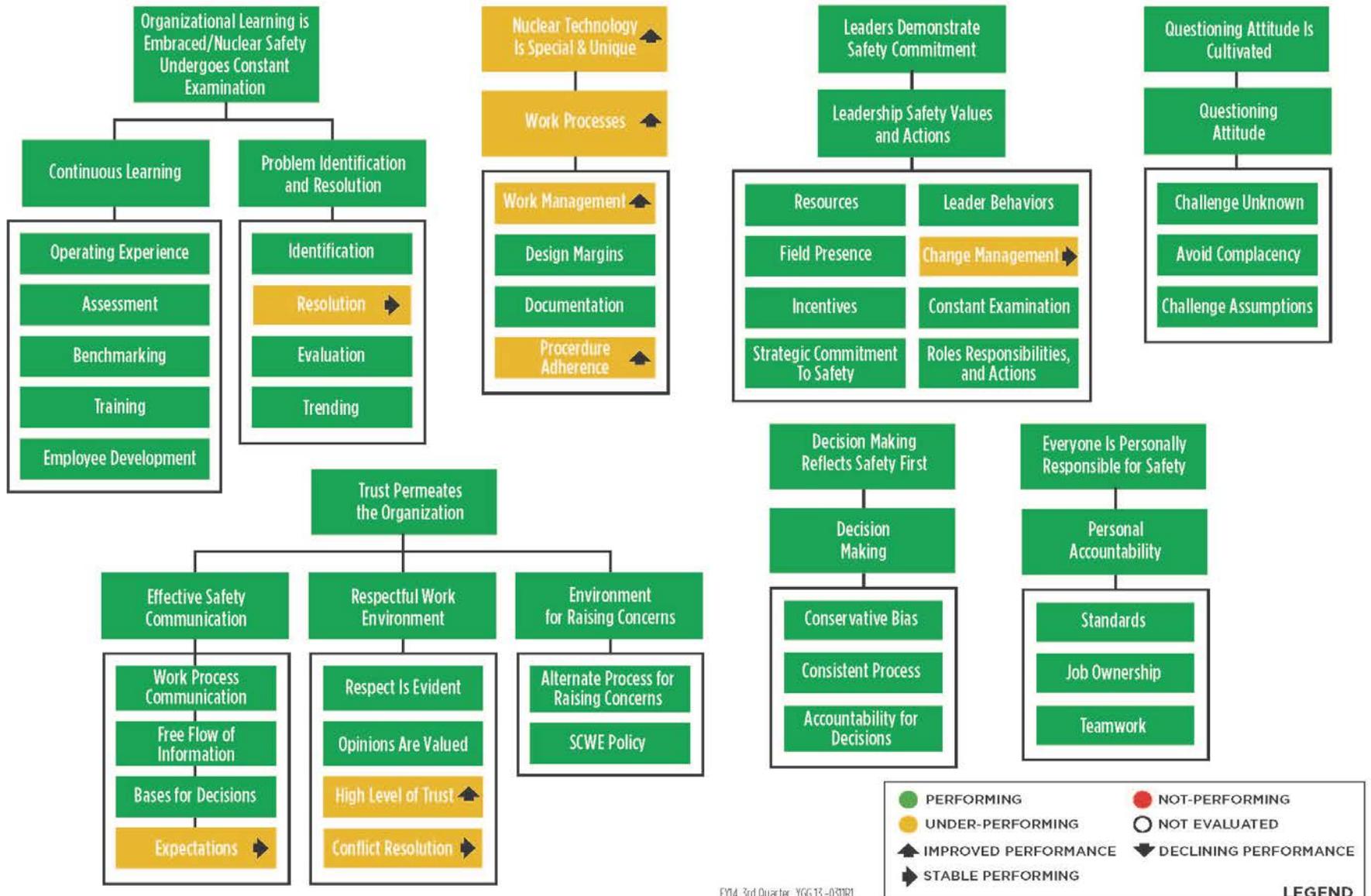
MEASURES/INDICATORS

- SSW data (Production)
- MMW data (FI&S)
- Production metrics, CSOOT reports for temp mods
- TD activity
- IEI reports
- Number of First Aid cases, Recordable and Lost Workday cases
- Inspection rejections
- Craft/non-manual ratio
- Productivity surveys

Work Management = Performing

- The Work Planning status indicates an upward trend from each work center. The Available to Work category has increased 992 jobs and the Planning in Progress has decreased 712 jobs from the previous month in August. The last 3 months (June – August) have seen an increase of 1,179 Available to Work jobs.
- The FI&S overall schedule adherence was excellent in August at 90 percent.
- Seven FI&S Work Centers were above 90% on Preventive Maintenance activities for August.
- OBSERVATION: Activity Observed – OSB to Approve Maintenance Work Package in 9204-2. The OSB reviewed and commented on a revision to a work package to determine the location of a clog in the system. A quorum of members was in attendance as well as the NPO Facility Rep, the Operations Manager, Senior System Engineer, and FI&S management. The requested change was reviewed and approved.
- OBSERVATION: Work activity observed – Fire Department Skills Practice. Following safety brief, skills to be worked on were reviewed with a hands-on technique. Each employee practiced the skills multiple times. Good personal accountability and effective communication were observed.

Y12 safety culture dashboard



LEGEND

- PERFORMING
- UNDER-PERFORMING
- NOT EVALUATED
- ▲ IMPROVED PERFORMANCE
- ▼ DECLINING PERFORMANCE
- ▶ STABLE PERFORMING

Path Forward

- Current method of measuring safety culture:
 - Evaluations, Monitoring Panels, and Dashboard
- To address emergent issues that may occur outside of survey frequencies and quarterly Dashboard development, additional action may be necessary:
 - Addition of an “Emergent Issue” element to the Monitoring Panel charter
 - Facilitate rapid review of issues that may occur between reporting periods
 - Consistent with process defined in NEI Standard 090-07



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