

SUMMARY OF THE
U. S. NUCLEAR REGULATORY COMMISSION/U. S. DEPARTMENT OF ENERGY
TECHNICAL EXCHANGE ON
SAFETY CONSCIOUS WORK ENVIRONMENT
AND
PERFORMANCE INDICATORS
LAS VEGAS, NEVADA
MAY 19, 2005

The U. S. Nuclear Regulatory Commission (NRC) and the U. S. Department of Energy (DOE) conducted a technical exchange on May 19, 2005. The purpose of this exchange was to provide information on Performance Indicators (PIs) and the survey results and planned actions regarding the Safety Conscious Work Environment (SCWE) on the Yucca Mountain Project (YMP). The meeting was held at the DOE offices in Las Vegas, Nevada with video and audio connections to the NRC offices in Rockville, Maryland and the Center for Nuclear Waste Regulatory Analyses (CNWRA) in San Antonio, Texas. The NRC issued the notice for this public meeting on May 5, 2005. The meeting notice is available at the NRC Agency-wide Documents Access and Management System (ADAMS) at Accession No. ML051250603. The agenda for this meeting can be found in Enclosure 2.

Participants included representatives of the NRC, DOE, State of Nevada, Affected Units of Local Government, industry representatives, and members of the public. Enclosure 3 contains the list of attendees and Enclosure 4 contains the presentations.

The DOE started the meeting with a safety announcement and by welcoming the NRC management and staff, members of the public, and other stakeholders. The NRC provided a brief explanation that this was a Category 1 meeting, open to public comment and feedback during the meeting and encouraged use of the meeting feedback forms.

The NRC expressed interest in the use of PIs to provide an accurate and timely perspective of performance on the project; indicated a specific interest in pertinent indicators for the review phase of a License Application should one be submitted. The NRC emphasized the importance of a SCWE and that the holders of NRC licenses, and their contractors, are responsible for achieving and maintaining a SCWE. The NRC also stated that there are many practices that contribute to establishing and maintaining a SCWE and that these practices collectively define the organization and are the responsibility of management.

The NRC stated its interest in hearing the results of DOE's SCWE Survey recognizing that a survey is only one tool to assessing the SCWE. NRC also stated its interest in hearing the DOE management's overall assessment of the health of the SCWE on the Project considering recent issues associated with the delay in the DOE contractor's raising, to management attention, the US Geological Survey e-mails, how management interacts with workers when potential concerns are being raised, how management assures effective problem identification when schedules may be adversely affected, and what messages workers may be getting when problem resolution is ineffective or delayed.

Ken Powers, Associate Deputy Director of the Office of Repository Development, made opening remarks and stated that DOE management understands the importance of these subjects, and continues to upgrade PIs to prepare for the next phases of the project. DOE has undertaken an educational process utilizing leading industry tools to improve leadership and performance at all levels of the project. DOE stated that the 2004 SCWE survey again showed that the project compares favorably to the general industry and government research and technology norms. DOE's informal discussions with the nuclear industry executives also indicates to DOE that its SCWE is today within the norms for operating nuclear generating stations. DOE indicated that it is updating its plans to improve SCWE in a structured approach, and is already implementing much of what the NRC is recommending in the draft *Best Practice Guide for Establishing and Maintaining a SCWE*.

The DOE presented information on the newly revised PIs. The new PIs reflect a change in the Work Breakdown Structure (WBS) being used by DOE as the project moves into the Engineer, Procure, and Construct phase. This change resulted from an evaluation DOE conducted last year on the PI panel in relation to the next phase of the project. The new panel focuses on fewer, more critical aspects and indicators. The principal use is as a tool to provide management information regarding areas needing additional management attention and corrective actions. PIs are expected to continue to evolve as the project changes over time.

Following the presentation, the NRC and CNWRA raised points for discussion and DOE responded:

1. What is the best indicator for safety performance? At this time, the industrial safety indicators are the most valuable. As the project evolves, there will be an enhanced emphasis on nuclear safety.
2. The DOE indicated in response to a question that quality is included in each indicator. In addition, management can lower the score on an indicator, resulting in increased management attention; management focus is on quality and resolving conditions in a timely manner.
3. The NRC asked if the previous PIs and panel could be compared to the new PIs for the purpose of trending. DOE responded that this might be possible in some cases but not in others because the new WBS is now the basis for the PIs and panel. Since the new PIs are connected to current work scope, the new PIs will focus management attention where it is needed. However, data from previous PIs are available for use.
4. The NRC expressed concern that most of the indicators are lagging and that the use of more leading indicators could enhance effectiveness. DOE generally agreed that many of the indicators are lagging. However, it is DOE's belief that Human Performance, Corrective Action Program (CAP) trending, work management, SCWE and quality performance indicators are leading indicators and process indicators tend to be more predictive.

The DOE presented information on Human Performance (HU) as a detailed example for the PIs. The DOE's construct used for the HU metrics is the performance formula: Performance = Behaviors + Results. The metrics are intended to measure YMP's overall competency in reducing errors and managing defenses. Behavior measures can provide a leading indication of future error prevention, detection, and correction results. These measures provide insight into where additional management focus and attention may be needed to facilitate the organizational development of attributes found in successful licensees.

Following the presentation, the NRC and CNWRA raised points for discussion and DOE responded in the Human Performance area:

1. To what extent is HU proactive? DOE responded that, based on sample data in the CAP, there is a high volume of low-level condition reports (CRs) being line identified. This is considered an indication of proactive workforce behaviors: actively seeking errors and opportunities for improvement.
2. The point was raised of the potentially more significant human performance issue of making errors while correcting errors. In answer to this, it was stated that the CAP incorporates effectiveness reviews that should address this issue. In addition, metrics on apparent cause analysis indicates that apparent causes are being identified and properly corrected.
3. The question was raised, with regard to significant events, if there were any examples of multiple events leading to these breakdowns? DOE responded that there was not evidence of this in the data taken on human performance and that the entire effort of performance improvement is to stop those events.
4. In the tension between cost and schedule and safety and quality, NRC inquired about what evidence the Project could point to that demonstrates that it is dealing with that issue. DOE responded that safety and quality are first and that continuous monitoring and communication was used to assure that.
5. The NRC asked about different annunciator windows for CAP, quality performance, assessments, and human performance. DOE responded that the items are currently focus areas for continuous improvement and their existence on the panel reinforces management expectations. The emphasis for human performance is prevention, detection and correction of errors.
6. The NRC asked about the "green" color for the HU indicator, especially given that a large number of CRs are attributed to HU. DOE responded that the reason is that this is the first month of recorded data and the score is reflective of the weighting on prevention behaviors. Each color has an associated numeric score that falls within a pre-defined range. High yellow scores in the detection and correction measures, in addition to the weighting on prevention behaviors caused the primary metric to report Green. A corrective action had been previously identified to consider redefining the weighting for future reporting periods.

7. The CNWRA commented that behaviors are inherently difficult to affect. DOE responded that the theory is that culture influences certain types of behavior. HU will reinforce the values and beliefs we hold as a group thus bringing about culture and behavior change. In addition, while changing culture is a long-term proposition, changing behavior is part of management, and management attention is focused on HU.
8. The NRC commented on the recurring trend of human performance as the primary cause behind conditions identified in Project condition reports and asked what specific corrective actions were being taken to address this. In response, DOE stated that the U.S. DOE Office of Environmental Health sponsored a complex-wide train-the trainer workshop using course material from the Institute of Nuclear Power Operations' Human Performance Fundamentals and Principles class. Two Bechtel SAIC Company, LLC, (BSC) trainers attended the workshop and have completed training over 300 of YMP's managers, supervisors and leaders.

The results of the 2004 YMP Organizational Climate and SCWE Survey were presented by Mr. Gary Berger of International Survey Researchers, LLC, the firm contracted to conduct independent assessments of the YMP SCWE; results are discussed below. DOE affirmed its goal of continuous improvement, and its continued use of a variety of feedback mechanisms to identify successes and opportunities for improvement, including adjustments to planned actions.

The DOE described its approach for establishing and maintaining a SCWE, the use of survey results and other inputs to identify problem areas and opportunities, and the use of various inputs to focus improvement actions.

The DOE approach to establish and maintain a SCWE is structured around the "Four Pillars of a Safety Conscious Work Environment." The concept has been effectively used in the nuclear industry and is consistent with the NRC's draft *Best Practice Guide for Establishing and Maintaining a SCWE*.

1. Pillar 1 – Management support, where manager attitudes and behaviors promote employee confidence in raising concerns. In this regard, DOE has established a policy defining expectations, aligned procedures and processes with that policy and conducted communications and training. Contractors and subcontractors are required to comply with the NRC Policy Statement "Freedom of Employees in the Nuclear Industry to Raise Safety Concerns without Fear of Retaliation".
2. Pillar 2 – Effective normal processes for problem identification and resolution. During the last year, DOE placed considerable management attention on its CAP, and improved processes for resolution of Differing Professional Opinions.
3. Pillar 3 – Effective alternate means of raising and addressing concerns. Both the Office of Civilian Radioactive Waste Management and BSC now have Concerns Programs, and are staffed to meet performance goals.

4. Pillar 4 – Effective methods to detect and prevent retaliation. YMP managers and supervisors have received training on detection and prevention of retaliation, and both DOE and BSC have independent review processes to ensure employment actions are not taken in response for employee engagement in protected activities.

The DOE noted that the latest survey results indicate the project is at or above U.S. National and U.S. Government Research and Technology norms in all categories in which comparisons can be made. Benchmarking against the nuclear industry is underway. Preliminary analysis indicates that DOE's SCWE results are within the norms of operating nuclear generating stations. However, DOE stated that what is done with survey results is more important than the results in themselves, and that the purpose of the survey is to drive continuous improvement.

While there were gains in employee perceptions regarding the CAP, some loss was evident in the highest overall category – SCWE Culture – related to four questions about employee perceptions about retaliation. DOE clarified employee perceptions (especially in light of the uncertainties associated with the budget cycle and other events that existed in the workforce during the survey which was done in fall 2004) using focus group meetings. The results of the focus groups were evaluated to identify key themes.

The DOE recently observed an internal safety culture assessment at a nuclear utility using the "Convergent Validation" approach. Using this concept, DOE identified seven priority focus areas:

1. Improve SCWE behaviors through Human Performance Training, Observation and Coaching.
2. Improve the ease-of-use of and employee confidence in the CAP.
3. Improve employee willingness to use the Concerns Programs, with confidence that concerns will be thoroughly investigated.
4. Improve confidence in commitment to quality.
5. Develop and implement organization-specific action plans as warranted.
6. Improve the survey instrument.
7. Complete alignment with the NRC's draft Best Practice Guide for Establishing and Maintaining a SCWE.

Following the presentation, the NRC and CNWRA raised questions for discussion. These questions included:

1. What is DOE's overall assessment of the Project's SCWE?
2. From a management perspective, what are key organization factors or influences DOE needs to think about? Are cost and schedule important organizational factors?

3. A SCWE begins with problem identification. What is the real threshold for reporting and evaluating issues? What messages are the employees getting regarding the reporting of issues?
4. How will the insights from the survey, particularly regarding perceptions about the thoroughness of investigation of concerns, how well corrective actions are communicated, and the decrease in the perception of the detection and prevention of retaliation, be implemented in the action plans?
5. Are adequate resources were being made available to maintain the resource intensive areas of Employee Concerns Program (ECP) and SCWE?

The DOE responded:

1. The DOE responded that there is a low threshold for issue identification and entry into the CAP system. Senior management has reinforced their encouragement to employees to raise issues and get them into the system. From a management perspective, quality and safety must come first.
2. In implementing insights from the survey, DOE is addressing issues regarding retaliation and the need to consistently reinforce appropriate management behaviors. It is believed that unintended messages, not actions, are causing the concern.
3. The DOE indicated that it is continuing to seek ways to make the CAP system easier to use, and acknowledge the importance of having the initiator informed of corrective action status. DOE is considering changing the process for initiation of CRs to promote supervisor engagement, support, and follow-up. To minimize unintended "chilling" by asking employees to involve their supervisors, DOE indicated that it was important that employees understood the reasons for the request, including reducing the time required to clarify the issues, promoting the expectation that supervisors champion the issue, taking advantage of the supervisor's broader understanding of potentially related organizational issues, and ensuring the right problem is fixed the first time. Additionally, employees will be told they are only encouraged, not required, to involve their supervisors.
4. The DOE is working to improve employees' willingness to use the ECP. This is an area where improved communications can help overcome uncertainty as to how the program works and what happens with concerns once raised.

Mr. Rod McCullum (Nuclear Energy Institute) thanked DOE and the NRC for having the meeting. NEI recognizes that, based on industry experience, success is contingent on a strong safety culture and SCWE. DOE's emphasis on using PIs and SCWE as tools is correct and is more important than the numbers and colors.

Mr. Grant Hudlow (Allied Science, Incorporated) expressed concern about the need to measure retaliation in government organizations (as opposed to technical or for-profit organizations). The focus should be on getting the job done.

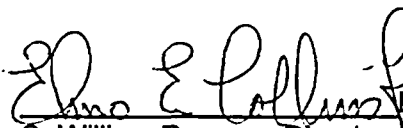
Ms. Sally Devlin indicated that she had attended the meeting because she wanted to understand different categories and management levels of people who were surveyed, and expressed concern about worker safety and accommodation of a diverse work force. She also expressed concerns that employee concerns would be properly investigated as well as with the cost of the program and the numbers of concerns that were raised.

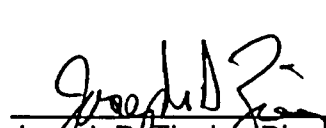
Ken Powers responded to these comments and reiterated the position that SCWE and PIs are very significant areas on the project. Training for hazards is conducted before any work is done at YMP. DOE strongly supports maintaining employee safety. In addition, DOE has strong diversity programs that involve campaigning and recruiting on a national basis.

The DOE agreed to provide additional information to the NRC Onsite Representative on the basis for the current score (Green) for the Preclosure metric on the Annunciator Panel.

The NRC noted in closing remarks that participation by members of the public was appreciated. During the pre-licensing phase, the NRC is actively seeking to stay informed and acknowledged DOE's efforts to communicate their activities in these two areas. PIs and SCWE contribute directly to the quality and safety of the final product and are tools that provide information, but the Project's management also needs to demonstrate its commitment to those concepts. The questions asked by the NRC were to help its understanding but were also based on its experience with these issues and therefore to suggest to DOE areas it should think about. The important thing is what is done with the information; the bottom line is performance and actions. The NRC plans to continue monitoring in these areas.

The DOE indicated that it welcomed the NRC's questions and that they help DOE focus on important issues in the Project's continuous improvement efforts in the PIs and SCWE areas.

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