

**SUMMARY HIGHLIGHTS OF THE  
U.S. DEPARTMENT OF ENERGY/U.S. NUCLEAR REGULATORY COMMISSION  
TECHNICAL EXCHANGE ON PERFORMANCE INDICATORS  
MAY 3, 2004  
LAS VEGAS, NEVADA**

**INTRODUCTION**

On Monday, May 3, 2004, the U.S. Department of Energy (DOE) and U.S. Nuclear Regulatory Commission (NRC) staff conducted a Technical Exchange in Las Vegas, Nevada, to discuss the DOE Performance Indicator Program. The meeting was held at the Bechtel SAIC offices in Las Vegas with videoconferencing to the NRC in Rockville, Maryland and the Center for Nuclear Waste Regulatory Analyses in San Antonio, Texas. Audio connections were also made available. The detailed agenda for this meeting can be found in Attachment 1.

Participants included representatives of the NRC, DOE, State of Nevada, Affected Units of Local Government, and the general public. Attachment 2 contains the list of attendees who were present at the meeting locations.

**OPENING REMARKS**

The meeting began with opening remarks by DOE. DOE stated that the purpose of the technical exchange was to discuss the performance indicator system at the Yucca Mountain Project (YMP). DOE added that the discussion would include an overview of the performance indicator system, the technical basis for implementation, the architecture, and give specific examples of performance indicators currently being measured. DOE stated that the meeting was a follow up to questions raised by NRC management and staff at the February 2004 Quarterly Quality Assurance (QA) and Management Meetings with respect to the DOE's approach to performance indicators and how they measure progress in specific areas.

**PRESENTATIONS AND DISCUSSION**

DOE and BSC presented the Performance Indicator Program. The presentations included discussions on:

- Performance Indicator Overview;
- Technical Basis and Key Supporting Concepts;
- Performance Indicator Architecture; and
- Examples of Specific Performance Indicators.

The presentations are included as Attachment 3.

**Performance Indicator Overview**

Before presenting the overview of the Performance Indicator System, DOE introduced the DOE/Bechtel SAIC Company LLC (BSC), managers responsible for management of this system and discussed the new organizations developed to support implementation of the system.

The DOE overview of the Performance Indicator System provided background information which described the comprehensive performance monitoring concept, the measures of performance that are key to success, and implementation of the Performance Indicator System at the YMP. The Performance Indicator System is an integrated project management tool that is divided into three major areas: work execution, management, and focus areas. The Performance Indicator System is designed to support all phases of the project, such as licensing, engineering, procurement, construction and operation.

Since its implementation in September 2003, the Performance Indicator System has undergone several changes to enhance the quality assurance metrics, to include human performance improvement metrics, and to build in integration within the primary metrics. The current and future initiatives to determine the effectiveness of the performance indicators include Performance Improvement International (PII) evaluations, self-assessments, QA audits/evaluations, and efforts to minimize subjective indicators. DOE stated that the current performance indicators are well developed, however, they could still be balanced better by implementing better quality and effectiveness measurements in the Performance Indicator System. DOE added that senior management interest in the system has been strong since inception.

NRC staff asked DOE to explain the Performance Indicator System work execution. DOE replied that the work execution area refers to the scope of work in the work breakdown structure for major deliverables. In the future after License Application submittal, the performance indicators will be revised in the work execution area to reflect assets (e.g. buildings) that will be designed, constructed and placed in operation.

#### Technical Basis and Key Supporting Concepts

PII described the technical basis and key supporting concepts of the Performance Indicator System. The description included the relationship of the Performance Indicator System to similar programs utilized by nuclear utilities. A detailed discussion was provided regarding the design and development of the system. In addition, success factors for an effective Performance Indicator System were discussed.

Definitions and examples of leading, real-time, and lagging indicators were presented including how these type indicators were integrated into the YMP Performance Indicator System design.

Next, PII described the process for designing a performance indicator system. Such a system required 'Planning Steps,' 'Assessment Steps,' and 'Closeout Steps.' Examples were provided for each of these steps. Finally, utilizing all of the above concepts, PII described how the YMP Performance Indicator System was developed and the specifics of the system. The discussion of the YMP Performance Indicator System development and specifics included:

- Key criteria for developing effective indicators;
- Evaluating linkage and integration of each performance indicator;
- Linkage and integration of indicators into the management monitoring system;
- Understanding linkage of panel inputs to the system;
- Conceptual design;
- Balance and completeness;
- Indicator data collection flowchart;
- Communication and presentation of results; and
- Example indicator outputs and trends.

The discussion then focused on describing implementation of the Performance Indicator System. Implementation of the system involved a phased approach. This included discussion of effective triggering of response actions for performance indicators. Also, the steps required to ensure continuous improvement and assessment of the system were described. PII stressed the need for training for proper use and implementation of the system. Five subject matter experts are currently trained on use of the system. Finally, assessment of the system was described which assures meaningful input data for the system. A Performance Indicator Quality Checklist for the system was also described.

NRC staff questioned the design of an integrated performance management system (i.e., are there elements in the cause analysis that are used as feedback, is the Safety Conscious Work Environment considered). DOE and BSC management stated that quality measures for

performance indicators result from cause analyses, the Corrective Action Program generally provides feedback, as used in the commercial nuclear industry, and the Safety Conscious Work Environment and Employee Concerns programs are included on the annunciator panel. NRC staff also questioned inputs since the start of the Performance Indicator System and requested examples of Performance Indicator System changes by management decisions. PII responded to the question of Performance Indicator System inputs, stating that Subject Matter Experts, who were trained by PII, provided feedback by asking specific questions about the system. PII added that a self-assessment is currently in progress to measure the effectiveness of the Performance Indicator System. DOE management provided an example of a Performance Indicator System change by management decision, e.g., monitoring of Key Technical Issues. DOE added that since the KTI responses were not on schedule, DOE and BSC management assembled a team of individuals specifically to respond to KTIs. DOE and BSC management also indicated that additional examples of Performance Indicator System changes by management decision would be provided during the presentation of Examples of Specific Performance Indicators.

### Performance Indicator Architecture

BSC described the architecture of the Performance Indicator System. Four areas of presentation involved the architectural structure, website information, internal controls and maintenance/improvement of the Performance Indicator System. Architectural structure encompasses the system prototype, integrity and fairness of representation, and the 'dashboard' with diagnostic, detailed analysis capabilities. The BSC intranet website contains the Project 'Annunciator Panel,' a system training module, system governing documents, and other supporting information/resources utilized by the system. The Performance Indicator System has internal controls that institute a centralized change control, formal approval process, predefined rules for 'executive overrides,' and limited access to operating components. DOE and BSC collaboratively maintain and improve the Performance Indicator System by using feedback from the Leadership Council, Management Operating Review, Trending Reports, the Corrective Action Program (CAP), Self-Assessments, and Lessons Learned.

The Performance Indicator Annunciator Panel has a tiered structure that provides a hierarchy of key performance indicators. Primary, secondary, and tertiary roll-up metrics provide the input into the base metrics, which provide actual results. The results are communicated using a standardized 4-point colored scale that includes historical performance, performance trends, and rolling averages that are represented graphically. The analysis of the data and required actions to be taken are stated on the base metrics.

The metric definition sheets (MDS) of the Performance Indicator System are the result of a collaborative development between DOE and BSC responsible managers that provide the definition, performance thresholds and goals, calculations, data source, roll-up families, and the weightings of the metric attributes. The base metrics provide a measurement of key performance attributes such as timeliness, quality, or effectiveness; drive specific performance; and the ability to diagnose overall performance results, leading and lagging implications, and the supervisor's analysis and required actions. The tertiary roll-up metrics consolidate the critical areas to allow analyses on common attributes by mid-level managers and normalize the results on a standardized 4-point colored scale. The secondary roll-up metrics provide the overall measurement of the results, and consolidate analysis and required actions by responsible area managers. The primary roll-up metrics similarly provide the overall measurement of the results, but at a higher level.

NRC staff questioned the development of the metrics, specifically asking how the weight of each performance indicator is determined, who makes that determination, and what criteria are in place for developing metrics. DOE responded by stating that the weight of each roll-up metric is determined by its relationship to the base metric with respect to the impact to the critical mission and that each metric owner decides the actual weighting, which is approved by senior

management. DOE added that the criteria for developing metrics is specific to the metric owner but must contain adequate justification for management approval.

NRC staff asked DOE what criteria they use to balance their scores and if it was possible for a manager to hide the indicators that were negative and only emphasized positive indicators. DOE responded that senior management continually challenges and assesses the performance indicators, and that a self-assessment is currently underway to determine the overall success of the Performance Indicator System.

NRC staff also questioned what are 'Focus Areas' and what do the dashed lines on the indicator output charts signify. BSC management defined 'Focus Areas' as indicators that do not currently count in the overall primary indicator, but are provided for management attention. The dashed lines on the indicator output charts signify a change in the underlying metric for the performance indicator.

#### Examples of Specific Performance Indicators: Licensing, Corrective Action Management Program, Human Performance, and Quality Assurance

BSC presented example performance indicators for Licensing, Human Performance, Quality Assurance and the Corrective Action Management System.

NRC staff had numerous questions involving the specifics of performance indicators that are generalized as follows:

- Why specific performance indicators were colored as shown on their annunciator panels;
- What criteria were used to determine specific performance indicators;
- Should the performance criteria be better balanced;
- Is the weighting of performance indicators proper; and
- Do performance indicators properly encompass all related work functions.

DOE/BSC management responded to the NRC staff's question on annunciator panel performance indicator colors providing justification details as to why each questioned performance indicator was colored as indicated. DOE/BSC management provided the NRC with the specific criteria used to determine the questioned performance indicator annunciator panel colors. DOE/BSC management provided justification for the balance and weighting used for questioned performance indicator criteria. In addition, DOE/BSC management provided justification that performance indicators encompass work functions determined by their importance to the associated department/program and the Project.

#### PUBLIC COMMENTS

Steve Frishman, representing the State of Nevada, expressed a concern that the results being rolled up into the level one performance indicators are being diluted. He then asked DOE what were the management's expectations about the condition of the Performance Indicator System prior to the submittal of the License Application; e.g., do all of the performance indicators have to be blue or green or is it acceptable to have some red areas?

DOE responded by stating that the Performance Indicator System is a management tool that is used to look at the broad aspect of the project and to adjust resources to lower performing areas. DOE added that they would submit a high quality License Application. The Performance Indicator System will be continuously improving by setting higher goals when an activity is measured blue or green continuously.

Steve Frishman asked if the Performance Indicator System directly applied to management's decisions on the License Application schedule. DOE replied that the Annunciator Panel is discussed at the monthly operating review. However, DOE acknowledged that not all the performance indicators reflected on the Annunciator Panel affect the schedule.

Steve Frishman stated that model validation only accounts for about six percent but presents a big problem to the YMP and asked why does it only account for the six percent. For model validation, the DOE replied by emphasizing the level of importance placed on model validation, as it is a secondary metric under the Safety Analysis primary metric in addition to being captured in the QA program metric.

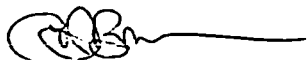
#### CLOSING REMARKS

DOE identified the following two action items:

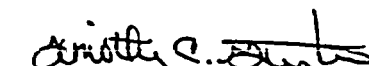
- Performance Indicator 2.4.1.3 "QA Acceptance of CA Verification" - DOE is to provide NRC the percentages of "QA Acceptance of CA Verification" from BSC and DOE respectively.
- Performance Indicator 2.4.4 "Timely & Effective Corrective Action Reports" – DOE is to revise the title of performance indicator 2.4.4 to delete the word "effective," which is covered under 2.4.1, "CA Program Effectiveness."

NRC staff summarized the purpose and scope of the meeting. NRC staff stated that the purpose of the meeting was for DOE to provide the NRC with a better understanding of how DOE developed the Performance Indicator System. NRC staff added that they understand that the Performance Indicator System is a management tool for DOE. However, NRC staff stated that their specific interests are the license application development, safety, quality and results, in lieu of schedule and budget issues.

DOE stated that since the YMP is a one of a kind project the Performance Indicator System would continue to mature over time. DOE added that they were proud of the work to date that established our present Performance Indicator System. Lastly, DOE welcomed feedback from the NRC and the public, indicating that the feedback would assist DOE in making the Performance Indicator System more effective.

  
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Date: 5/20/04

  
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April V. Gil, Director  
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Office of Repository Development  
U.S. Department of Energy

Date: 5/18/04