

Trending Requirements and Results

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Introduction

- **Code of Federal Regulations**
- **Department Of Energy (DOE) Documents**

- **DuPont Review of Fluor Hanford**
- **DOE Office of Independent Oversight**

10 CFR 830.122 Quality Assurance

(c) Criterion 3--Management/Quality Improvement.

- (1) Establish and implement processes to detect and prevent quality problems.**
- (2) Identify, control, and correct items, services, and processes that do not meet established requirements.**
- (3) Identify the causes of problems and work to prevent recurrence as a part of correcting the problem.**
- (4) Review item characteristics, process implementation, and other quality-related information to identify items, services, and processes needing improvement.**

10 CFR 851 Worker Safety

Sec. 851.26 Recordkeeping and reporting.

- **Analyze related data for trends and lessons learned (reference DOE Order 225.1A, Accident Investigations, November 26, 1997).**

Department of Energy Documents

- The word “trend” or “trending” appears in 78 different documents at www.directives.doe.gov
- This topic focuses on requirements for DOE contractors
- This topic is not an all-inclusive list of DOE requirements
- You need to check your site contract for applicable requirements

G440.1-1A Worker Protection Program

4.3.4. Accident, Injury, and Illness Reporting and Data Analysis

DOE 440.1B requires the reporting and investigation of accidents, injuries, and illnesses and analysis of related data for trends and lessons learned This type of analysis or trending is used to identify the prevalent types of accidents, injuries, and illnesses and their sources and causes. Information derived from trend analysis can be used to focus worker protection efforts on the actual sources of injuries and illnesses and to help prioritize hazard abatement activities.

Necessary components of accident, injury, and illness data collection and analysis include:

- a **formalized approach to analyze identified trends**, to determine root causes, and to develop appropriate control measures.

DOE Manual 450.4-1B ISM Manual

Work processes and organizational safety management performance should be continuously measured and evaluated to ensure that line management is aware of the contractor's compliance with the documented SMS.

Accordingly, DOE and contractor organizations perform management and independent assessments using quantitative and/or qualitative information obtained from a variety of sources (e.g., in-process monitoring, performance indicators, occurrence reports, trending, **statistical analysis**, management assessments, independent assessments, and workers, customers, suppliers, regulators, and stakeholders).

DOE M 470.4-1 Safeguards and Security

Trending. **Trending evaluations** must be considered in the resolution of findings in the subtopical area of program management to determine if systemic and systematic causal factors exist within the S&S program. Results of this evaluation that indicate **negative trends must be analyzed** to ensure corrective action plans address root causes and the need to ensure continuous improvement of the S&S program.

DOE M 231.1-2 Occurrence Reporting & Processing

5.8 Performance Analysis and Identification of Recurring Occurrences. Each contractor at a site and managers at DOE owned and operated sites must perform ongoing, but as a minimum quarterly, analyses of events during a 12-month period to look for **trends**. This periodic performance analysis must evaluate occurrences of all significance categories plus contractor-/operator-determined non-reportable events in order to prevent serious events from occurring. Quarterly performance analysis results must be reported to contractor and DOE line management in order to achieve improvements.

DOE O 433.1B Maintenance Management

The nuclear maintenance management program should include:

Maintenance History. The process for developing and maintaining documented and retrievable maintenance history (i.e., cost data, system availability data, and failure data) to support work planning, **performance trending**, analysis of problems to determine root causes of unplanned occurrences related to maintenance, and continuous program improvement.

DOE O 226.1A DOE Oversight Policy

Assurance activities must encompass environment, safety, and health; safeguards and security; cyber security; emergency management; and business operations and must include—

- worker feedback mechanisms;
- issues management, including causal analysis, identification of corrective actions and recurrence controls, corrective action tracking and monitoring, closure of corrective actions and verification of effectiveness, and **trend analysis**;
- lessons-learned programs; and
- **performance indicators/measures.**

DOE O 210.2 Operating Experience Program

The contractor must –

- (4) Assess contractor operating **event trends** to identify recurring issues and evaluate the root causes of the recurring issues.
- (5) Investigate and identify contractor operating event causes.
- (6) Develop, implement, and track actions to correct problems identified in causal analysis of contractor operating experience and develop lessons learned on the successes.
- (7) Establish **metrics** to measure program performance and evaluate the effectiveness of actions implemented from lessons learned.

Results – DuPont Review at Fluor Hanford

In 2005, DuPont performed a Workplace Safety Assessment of Fluor Hanford:

“Performance measurements are evident throughout the Site, are posted in most office and operating areas, and are reviewed at various meetings”

“Extremely data rich organization with great statistical capability”

Results – OIO Review at Fluor Hanford (FH)

In August and September 2006, the DOE Office of Independent Oversight conducted an inspection of ES&H, with the following Positive Attribute:

FH has established and implemented a robust and effective performance monitoring program. Managers conduct routine, formal analysis of event/incident and non-event performance data and metrics that are identifying reportable recurring events, adverse safety trends, and emerging issues. . . Results of this iterative process of data collection and analysis are documented in quarterly performance analysis reports, and newly identified issues and actions are managed through the FH corrective action management system. This process is an effective means to identify and address declining performance and proactively address emerging potential safety issues.

FH has also developed robust processes for performance analysis and performance indicators that fulfill the requirements of DOE Manual 231.1 and contractual requirements.

Performance Analysis Experience

It should be noted that the first step of performance analysis is creation of the measures and charts. The following teams at FH reviewed the statistical results and initiate action:

Functional Area Forum – primary output was the ORPS quarterly report

Data Analysis Working Group – Corrective Action, QA, S&H and project personnel met for 8 to 10 hours quarterly

Presidents' Zero Accident Council – monthly meeting of bargaining unit, safety professionals, and senior managers

Weekly Senior Staff Meeting – included review of company level S&H leading and lagging indicators and the FluorBoard by the CEO and Vice Presidents.

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Dr. W. Edwards Deming's Red Bead Experiment

The "Red Bead Experiment" was an interactive teaching tool that Dr. Deming developed. It is used to teach quality control concepts. In the experiment, workers are given a task to produce a certain number of white beads. However, the supply of beads also contains some red beads. The workers are not allowed to sort the beads, and the quality of the final product is measured by the number of red beads. This illustrates the concept of process control and the importance of understanding the system.

Metrics

Charting Safety Performance

Combining statistical tools provides quality data

By Steven S. Pevette

Statistical process control (SPC) is a key tool for managing quality. It involves using statistical methods to monitor and control a process. SPC can help identify and reduce variability in a process, leading to improved quality and efficiency.

Key Elements of Statistical Process Control

1. Identifying the process to be controlled.
2. Determining the critical parameters to be controlled.
3. Planning the control plan to support long-term waste management.
4. Planning DOE across to work for the future.

EMERGING SECTORS

Cleaning Up With SPC

Statistical process control is playing a role in a huge environmental project at a nuclear weapon production site

By Steven S. Pevette

Statistical process control (SPC) is a key tool for managing quality. It involves using statistical methods to monitor and control a process. SPC can help identify and reduce variability in a process, leading to improved quality and efficiency.

The U.S. Department of Energy's (DOE) Hanford Nuclear Site played a pivotal role in the nation's defense beginning in the 1940s when it was created as part of the Manhattan Project.

After more than 50 years of nuclear weapons production, Hanford, covering 560 square miles in southeastern Washington state, is now focused on clean-up operations.

1. Identifying the process to be controlled.

2. Determining the critical parameters to be controlled.

3. Planning the control plan to support long-term waste management.

4. Planning DOE across to work for the future.

Hanford, my employer and a prime contractor for the DOE, has the ultimate responsibility for cleaning up a large portion of the site. Our ultimate has to be an safety quality of work and meeting deadlines. We choose to use SPC to manage our safety and quality information, and program has been achieved in both injury reduction and process improvement.

What SPC provides
SPC addresses several quality issues including adverse trends and corrective action management. It provides the most effective data analysis as required by several government regulations, policies and union agreements.

DOE's integrated system
DOE's integrated system, safety and health (OSH) management system (SMS) is based on the concept of integrating safety, environmental and good practices into all aspects of work.

Key principle of SMS
A key principle of SMS is that work should be conducted in a manner that protects the public.

Analysis results are replottable by date/time analysis.

False alarms and knee-pink reactions in the basin cause false alarm messages.

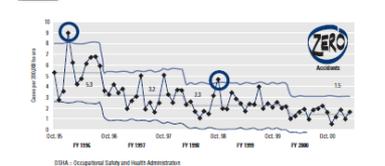
The rubber ducky both small long-term shifts and large short-term shifts on one chart.

When it detects a trend, a special cause is usually found.

It can be performed without expensive software.

It provides feedback on the impact of actions.

FIGURE 1 | Floor Hanford OSHA Recordable Injury/Illness Rate



OSHA - Occupational Safety and Health Administration

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General Practices for Analyzing and Understanding Performance

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in a quality environment in order to achieve continual improvement viewed in the context of the Guiding Principles and the ISMS. Presentation by: Steve Pevette

Player:
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Lead the Way!

Conclusion

If you implement a performance indicator and trend analysis system making use of the topics from the past two days, you will have no problem getting any auditor or inspector to say:

WOW!