Department of Energy

Washington, DC 20585

November 14, 2002

MEMORANDUM FOR DISTRIBUTION

FROM: Frank B. Russo, Acting Deputy Assistant Secretary
Office of Performance Assessment and Analysis

SUBJECT: Integrated Safety Management Performance Measures
for the period ending September 30, 2002

Attached please find the report on the Integrated Safety Management (ISM) Performance Measures for the period ending September 30, 2002. The five ISM Performance Measures presented in this report include: Total Recordable Case Rate, Occupational Safety and Health Cost Index, Reportable Occurrences of Releases to the Environment, Estimated Radiation Doses to the Public, and Worker Radiation Dose. These ISM Performance Measures will be coordinated with the current initiative to implement Department-wide performance measures resulting from the upcoming Executive Safety Summit.

For each measure, the report provides: 1) DOE-wide corporate performance trends, 2) relative contributions by each PSO, and 3) the current PSO performance in comparison to recent history. These Performance Measures and the presentation format were initially developed in December 1999 and have been used in previous reports. The last ISM Performance Measures report was issued in April 2001.

The ISM Performance Measures presented in this report are based on an analysis of the latest data available for the period ending September 30, 2002. The data used to generate these measures have different reporting periodicity; and for two Performance Measures the latest available data is for CY 2001. This report concludes that DOE-wide performance has not degraded or significantly improved during the current period based on the five measures. This report is available on the Internet at http://tis.eh.doe.gov/ism/performancemeasures.html.

Please contact me at 301-903-8008 or Bal Mahajan of my staff at 301-903-2919, if you have any questions.

Attachment

Final Distribution

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INTEGRATED SAFETY MANAGEMENT (ISM) PERFORMANCE MEASURES REPORT

Prepared by the Office of Environment, Safety and Health
Office of Performance Assessment and Analysis

With Support from
Other offices of the Office of Environment, Safety and Health

(For Period Ending: September 30, 2002)

ISM PERFORMANCE MEASURES REPORT

This ISM Performance Measures Report presents the result of the analysis of the latest data available for the period ending September 30, 2002. The objective of the analysis is to determine whether the ISM objective of "doing work safely" is being achieved. The following five performance measures have previously been used. The data used to generate these measures have different reporting periodicity, therefore, these measures cover different time intervals as indicated below.

1. Total Recordable Case Rate [quarterly; 1998Q2 to 2002Q2]
2. Occupational Safety and Health Cost Index [quarterly; 1998Q2 to 2002Q2]
3. Reportable Occurrences of Releases to the Environment [quarterly; 1998Q4 to 2002Q3]
4. Estimated Radiation Doses to the Public [annual; 1996 to 2001]
5. Worker Radiation Dose [annual; 1996 to 2001]

Three views are provided for each performance measure: 1) DOE-wide performance trend, 2) relative contribution by Program Secretarial Office (PSO), and 3) current performance by PSO compared to historical performance. DOE-wide performance is shown on a control chart, a statistical tool that allows users to view data and determine if there have been any significant changes affecting the results during the time interval reported.

For this reporting period performance measures 1, and 2, show that DOE, overall, has marginally shown improvement in safety.

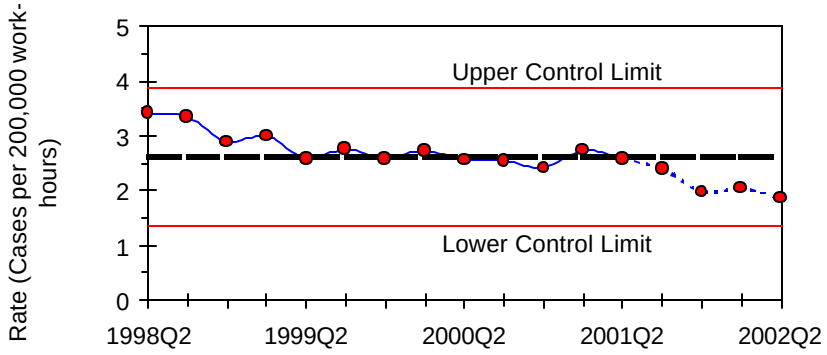
Performance measures 3 variance from quarter to quarter, however, the fluctuations in the number of release are within the control limits.

Performance measures 4 and 5 show relatively stable performance over the past six years. `

For further information on the performance data please contact:
Bal Mahajan (301/903-2919)
DOE Office of Performance Assessment and Analysis (EH-3)
e-mail: bal.mahajan@eh.doe.gov

1. Total Recordable Case Rate

Figure 1A: DOE-Wide Performance Trend



Source: CAIRS

Data collection period: Quarterly

Definition: Work-related death, injury or illness, which resulted in loss of consciousness, restriction of work or motion, transfer to another job, or required medical treatment beyond first aid, per 200,000 hrs worked. The data includes both contractor and Federal employee cases. Data excludes personnel of the Office of Naval Reactors

Due to the lag-time in collecting final impact data for the Total Recordable Case Rate (TRC) data (i.e., final days away from work or days of restricted work activity), the last 4 data points are expected to rise. Historically, TRC data are reported as data is received but are continually updated[1]. For the purpose of data analysis, the following focuses on the most complete data - that through CY 2001Q2.

The data indicate a downward trend in the TRC Rate for time covered. The major contributor to the reduction in the TRC Rate has been the decrease in overall reportable cases over the last 4 years.

There were 3,158 total recordable cases for the 12-month period ending June 30, 2001; these represents about 4 % decrease compared to the 3,294 cases for the 12-month period ending June 30, 2000.

Figure 1B: Relative Contribution by PSO (Cases for CY2002 Q2)[2]

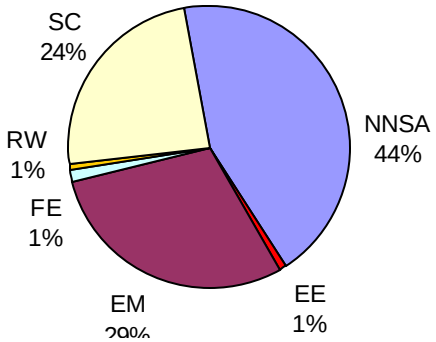


Figure 1C: Performance by PSO (Case Rate for CY2002 Q2)

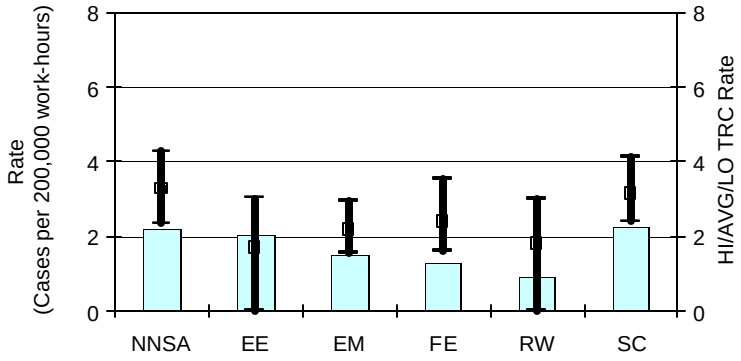


Figure 1C Legend:

Bars depict the relative total recordable case rate amongst the PSOs for the reported quarter (CY2002 Q1).

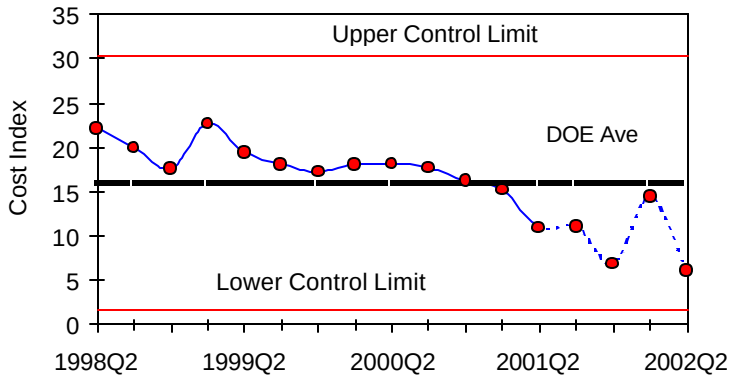
The High Low and Average values are based on the previous 4 years (i.e., CY1998Q2 through CY2002Q1) from the current quarter. The data from the current quarter is expected to rise by as much as 30-40% when finalized.

[1] The best method for representing this data is being evaluated.

[2] The number of cases by PSO was derived from data submitted by reporting organization.

2. Occupational Safety and Health Cost Index

Figure 2A: DOE-Wide Performance Trend



Source: CAIRS

Data collection period: Quarterly

Definition: The approximate amount of dollars lost (indirect and direct) per 100 hrs worked for all injuries/illnesses using the following formula. The coefficients used in the Cost Index formula are weighting factors derived from a study of the direct and indirect dollar costs of injuries. The index includes contractor and Federal employee injuries/illnesses. Data excludes The Office of Naval Reactors.

DOE sites use this index to measure improvement in worker safety and health. Due to the lag time in collecting final impact data (e.g., number of days away from work or the number of restricted workdays), the last 4 data points are expected to rise. The index is computed as follows:

Cost Index = 100 {(1,000,000) x D + (500,000) x T + (2,000) x LWC + (1000) x WDL + (400) x WDLR + (2000) x NFC}/HRS

D = *number of fatalities*

T = *number of permanent transfers or terminations due to occupational illness or injury.*

LWC = *number of lost workday cases*

WDL = *number of days away from work*

WDLR = *number of restricted workdays*

NFC = *number of non-fatal cases without days away from work or restricted workdays*

HRS = *number of total hours worked*

The data indicate a downward trend in the Cost Index for the time covered. The major contributors to the reduction in Cost Index are the decrease in WDL and WDLR.

Figure 2B: Relative Contribution by PSO (Total DOE Cost CY2002Q2)[3]

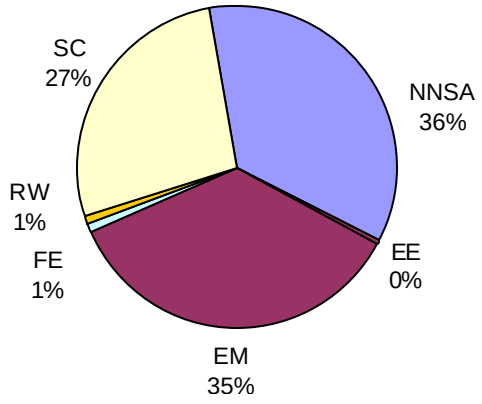
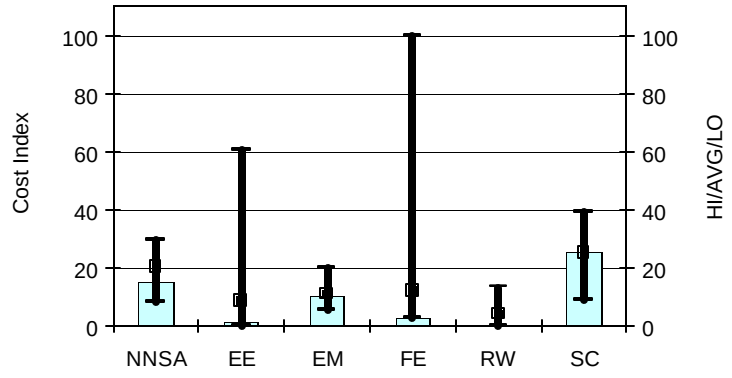


Figure 2C: Performance by PSO (Cost Index for CY2001Q2)



The high value of the cost index for FE is due to a motor vehicle related fatality in CY2000Q4, and for and EE is due to unusually high number of WDL in CY1999Q4.

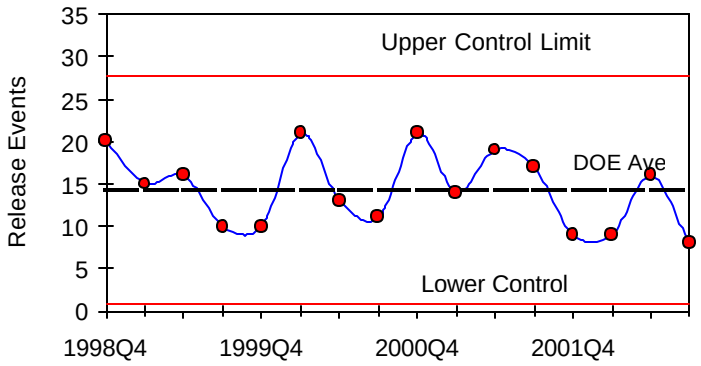
For the purpose of data analysis, the following discussion is based on data through CY2000Q2.

Legend: The High Low and Average values are based on the previous 4 years (i.e., CY1998Q2 through CY2002Q1) from the current quarter. The data for the current quarter is not complete and can change as much as 30-40% by the time the data is fully complete. This is due to the fact that some data, such as number of days away from work, cannot be known until well after the close of the quarter.

[3] The Cost Index by PSO was derived from data submitted by reporting organization.

3. Reportable Occurrences of Releases to the Environment

Figure 3A: DOE-Wide Performance Trend



Source: ORPS data, based on field office coding of environmental releases

Data Collection Period: Daily

Definition: Releases of radionuclides, hazardous substances, or regulated pollutants that are reportable to federal, state, or local agencies. Category 2a and 2b from ORPS data are used and sorted by PSO.

The release (7) during the most recent quarter (2002Q3) are about 44 % percent of the releases (16) during the previous quarter (2002Q2); and the release (16) during 2002Q2 were about 80 % more than those during 2002Q1.However, statistical analysis of the data shows that the system performance is stable from 1998Q4 to the 2002 Q3. Fluctuations in the number of releases are within the control limits.

Figure 3B: Relative Contribution by PSO (for CY2002Q3) [4]

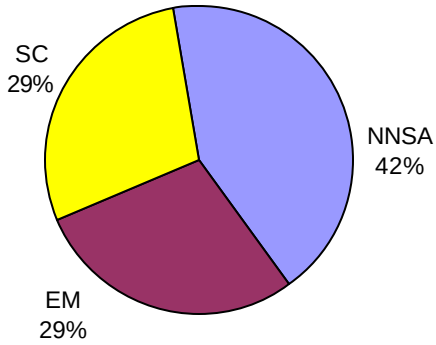
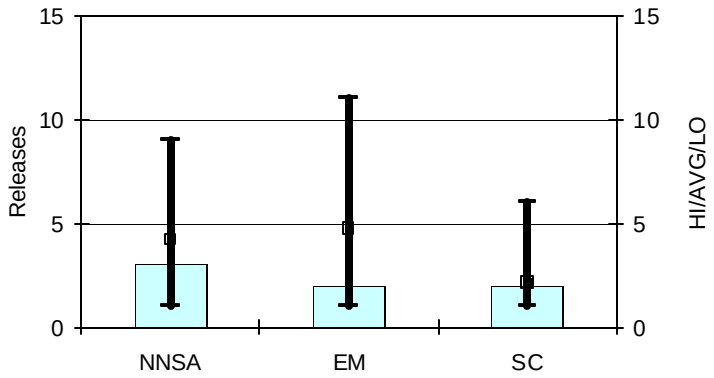


Figure 3C: Contribution by PSO (CY2001Q2)



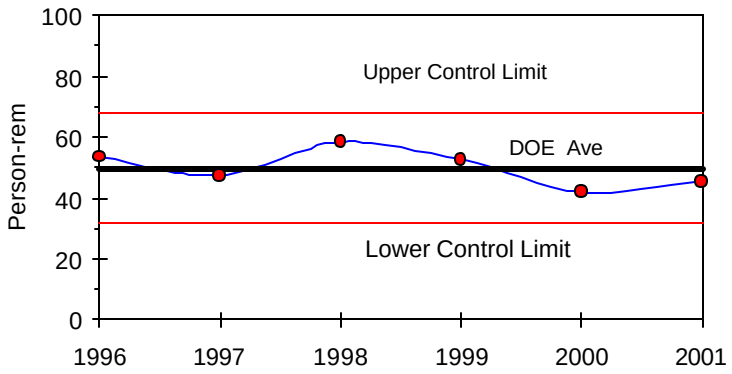
Legend: The High, Low, and Average values are based on 4 years (i.e., 1998 Q4 through 2002Q3) of data. The data reflects the number of occurrences and not the number of occurrence reports (a report can contain multiple occurrences). PSOs EE, FE, NE, and RW are not presented, as they reported no occurrences during 2002Q3.

During the most recent quarter (2002Q3) NNSA, EM, and SC, reported less release events than those during the prior reporting quarter (2002Q2); FE reported no release in this quarter but reported one release in the previous quarter; and EE, NE, and RW reported no release event in either quarter. Despite these variations in the PSO quarterly releases, the system performance is stable from 1998Q4 to present.

[4] Values may reflect the type of work, quantity of work, or variations in state and local reporting requirements.

4. Estimated Radiation Dose to the Public

Figure 4A: DOE-Wide Performance Trend



Source: Annual NESHAPS DOE Site Reports

DOE SME –Steve Woodbury (EH-41)
202-586-4371

Data Collection Period: Annual – (CY)

Definition: Collective radiation dose (person-rem) to the public within 50 miles of DOE facilities due to airborne radionuclide releases.

For 2001, the estimated radiation dose to the public was 45 person-rem. The estimated collective dose in 2001 was about 8% higher than in 2000, and it was about 12% lower than the average over the past five years.

About 54% of the estimated collective dose came from the four sites: Lawrence Livermore National Laboratory site-300 (20.7%), Savannah River site (12.3%), Princeton Plasma Physics Laboratory (11.7%), and Y-12 (9.9%).

Figure 4B: Relative Contribution by PSO (for CY2001)

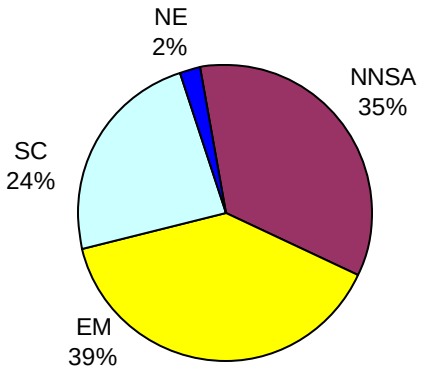
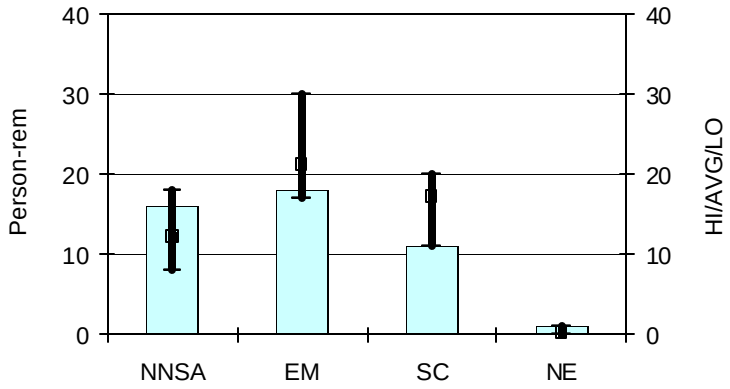


Figure 4C: Contribution by PSO (for 2001)

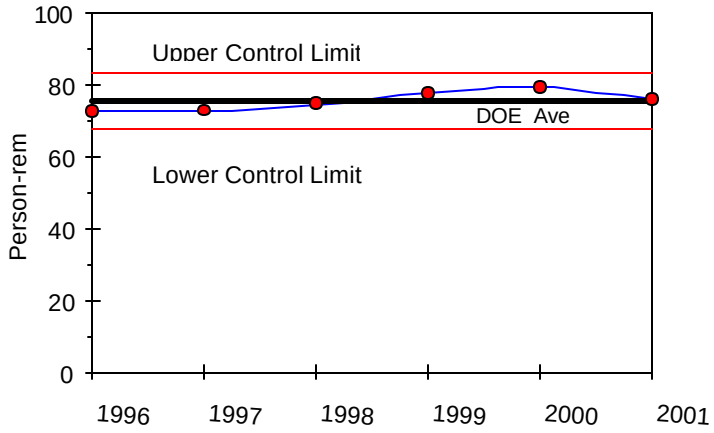


Some individual sites experienced increases or decreases since 2000. Increases resulted from specific activities, which resulted in greater emissions, or in one instance, from conservative modeling assumptions for a new experimental program. Decreases resulted from the conclusion of some specific activities conducted in prior years.

Legend: Blue column represents 2001 data. Hi/Avg/Lo bar represents 5 years of annual data (1996 – 2000).

5. Worker Radiation Dose

Figure 5A: DOE-Wide Performance Trend



Source: REMS Database

Data Collection Period: Annual

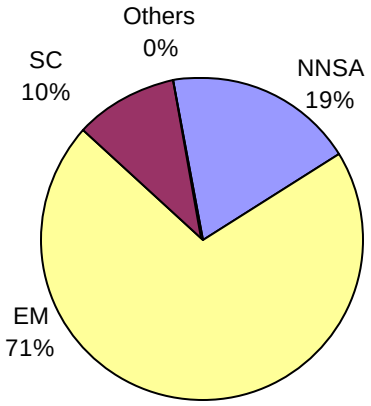
Definition: Average measurable dose to DOE workers, calculated by dividing the collective total effective dose equivalent (TEDE) by the number of individuals with measurable dose.

There has been no significant change in the average measurable dose per worker since 1996. However, CY 2001 average measured dose data represents a slight decrease (4.2%) from the prior reporting period, FY-2000; and the CY 2000 average measured dose data represents a slight (2.1%) increase from the prior reporting period, the FY 1999. However, these Fluctuations in the number of releases are within the control limits

In CY 2001, 17% of the monitored individuals received a measurable dose; in FY 2000 this number was 16%.

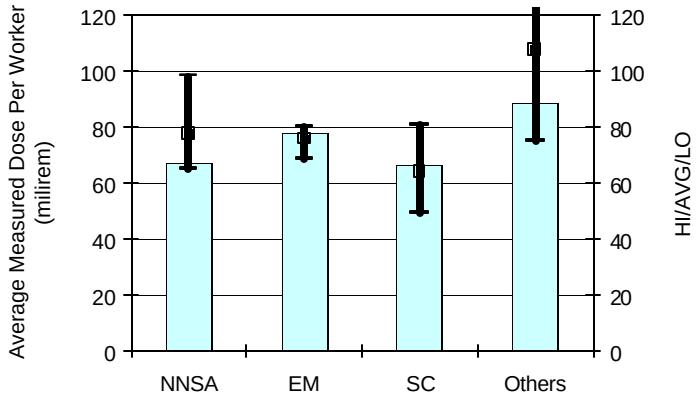
For CY 2001 the total collective worker dose was 1,231 rems, the total number of workers exposed was 16,552 and the number of workers monitored was 99,166.

Figure 5B: Relative Contribution by PSO (for CY2000)



Legend: Percentage is based on total dose for each PSO for 2002 divided by total dose for DOE not normalized for type of work or size of workforce

Figure 5C: Performance by PSO (for 2000)

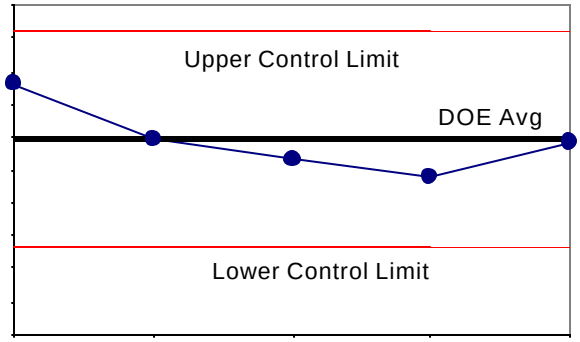


Five of 107 reporting contractors contributed about 57% of the total collective TEDE. These five contractors are Rocky Flats Prime Contractors, Westinghouse Savannah River, Flour Daniel Hanford, Los Alamos National Laboratory, and BWXT Y12

Eighty-four of the 107 of the reporting contractors contribute individually less than 1% of the total collective TEDE.

Legend: Blue column represents 2000 data. Hi/Avg/Lo bar represents 5 years of annual data (1996 – 2000).

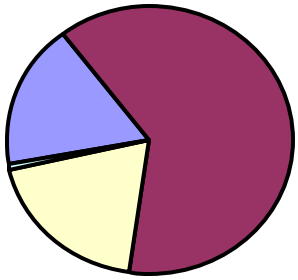
Glossary of Terms

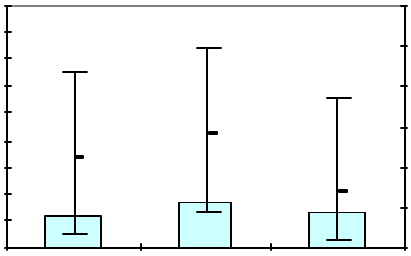


Control Chart - A Control Chart has statistically-generated upper and lower control limits. A process is in statistical control when the process measurements remain within the control limits. This means the variation is consistent and predictable over time. Control limits are computed from process information data[5].

Fluctuations in the data are caused by a large number of minute variations or differences: differences in materials, equipment, the surrounding atmospheric conditions, and the physical and mental reactions of people. Most of these differences are extremely small. They cause the pattern to fluctuate in what is known as a "natural" or "normal" manner. Experience shows that there are definite detectable differences between the "natural" and "unnatural" patterns. It is possible to discover and study these differences by means of simple calculations based on well-known statistical laws. This makes it possible to detect, identify and study the behavior of causes[6].

Pie chart - A type of presentation graphic in which percentage values are represented as proportionally sized slices of a pie[7]. Pie charts are used to depict relative contributions of PSOs to overall DOE totals.





Hi/Avg/Lo chart - A type of presentation graphic where Hi/Lo marks indicate how high and low each bar has been during a specific period. The Hi/Avg/Lo chart is used to depict recent performance by PSOs in comparison to historical performance. Comparisons across PSOs must be done with care as the nature of work can vary significantly.

[5] Mark J. Kiemele and Stephen R Schmidt. Basic Statistics: Tools for Continuous Improvement. Air Academy Press, 1990 p. 2-18.
[6] Handbook of Statistical Control, Western Electric Company, 1956, p. 6.
[7] http://e-comm.webopedia.com/TERM/p/pie_chart.html