

Newport Chemical Agent Disposal Facility Project Management Team

Leveraging Fidelity of Performance-Based Metric Tools for Project Management

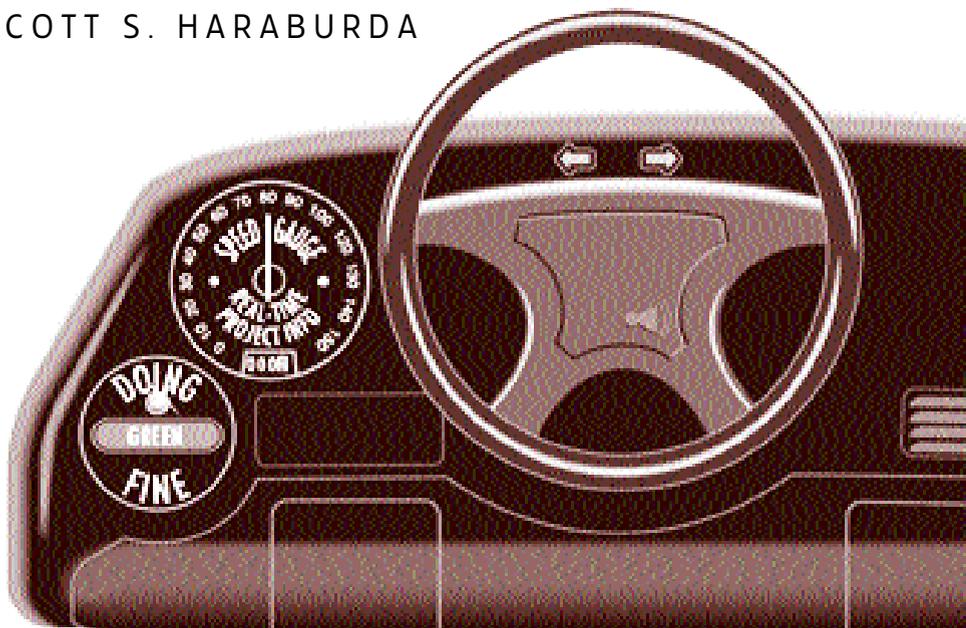
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The Chemical Stockpile Disposal Program (CSDP) is a U.S. Army program implemented to achieve destruction of the nation's stockpile of chemical warfare agents by April 29, 2007. In support of that program the Newport Chemical Agent Disposal Facility (NECDF) is being designed to neutralize the chemical nerve agent VX that is stockpiled in bulk quantities at the Newport Chemical Depot (NECD), Newport, Ind. This low-temperature and low-pressure neutralization process provides an alternative to the baseline incineration technology previously selected by the Army for chemical warfare agent disposal.

A Brief History

During the first couple of years, the project manager for the NECDF project had regularly received massive amounts of project-related data from the project management team. Additionally, the team would provide data and expect the project manager to: 1) interpret the information, 2) identify the major issues and concerns, and 3) provide direction to solve the issues. On a project of this magnitude, their expectations translated into a very time-consuming task for the project manager and a distinct distraction from managing the project's more critical areas.

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The dashboard, which is similar to the one used in an automobile, has the intent of showing managers the status of their projects in a quick glance. Just like the speedometer on a car's dashboard, which gives a valid metric on the "real-time" speed of the car, a project performance metric should provide useful and timely information to managers.

To improve communications between the project manager and members of the project management team, an improved method for applying performance metrics on the project was developed. This involved the following:

- Selecting key areas on the project to be assessed periodically using the improved method. As an example, the following nine project areas were selected: construction, contracting, cost, design, environmental, operations, safety, scheduling, and staffing.
- Appointing individuals, such as subject matter experts, to monitor and maintain the metrics for the key areas selected.
- Developing an effective performance metric for each key area.

- Creating a four-block page that summarizes the important information for each area.
- Establishing a single dashboard page that visually highlights the overall status of the project.

Performance-Based Metrics

The basic functions of project management involve planning, organizing, controlling, and directing human efforts. Managers should use performance-based metrics as a tool to assist the project manager in these basic functions.

Using just any metrics may



result in a situation creating the illusion that managers are being effective. In essence, using the correct metrics is very important. To ensure that the correct metrics are being used, managers need to understand the type of metric being used and the source of the data used in the metric.

First, the type of metric used is important so that managers can use it to influence the project, as required, to ensure that necessary tasks are accomplished. To facilitate their efforts, managers could look at a process in terms of its three elements: Input, Work, and Results. These elements can be portrayed as functions that depict the interface between the three groups of people within the project: suppliers, the customer, and the project manager/leader (Figure 1).

The type of metric selected should fall within the interfaces between the three groups of people, as they fit into the three elements of the project process.

Inputs

Resources. This refers to the amount and quality of the items used by the project, such as staffing, materials, equipment, tools, utilities, etc.

Controls. This refers to the methods and means by which the project manager influences the way work is done. An example of this would include operating procedures, standards, and schedules.

Work

Process. This refers to the way work is done for the project. This includes the efficiency of the work and the compliance with the project's operating procedures/standards.

Output. This refers to the amount, quality, and timeliness of the products and services provided by the project. This is

typically supplied to the customer of the project.

Results

Feedback. This refers to the perception of the customers—how they view the project as determined by the demands they place upon the products (output). The use of surveys (proactive) could be used in addition to customer complaints (reactive).

Outcome. This refers to the customer's benefits from the products and services resulting from the project.

Understanding the Source

Finally, the project manager should understand the source of the data for the selected metric. To be effective, the metric should be:

Accurate. For the data to be accurate, they must be valid and reliable. Valid data refer to data that can be directly related to factors being measured. One aspect of valid data being collected is that of causality. The manager must take special care to ensure that the data being collected caused the effect to occur. Reliable data refer to data that would be consistent regardless of the data collection technique. An effort should be made to eliminate or minimize errors in data collection due to rater bias, data collection administration, and wording.

Relevant. For the data to be relevant, they must be credible and important. Credible data refer to data that will be believable by the people making the decisions, such as managers. Managers should ensure there is a plan or baseline from which to compare, which should include the goals. Important data refer to data that address the important items associated with the factors being measured. For example, managers should not use metrics on trivial items just because they are easy to measure, such as the number of hours that groups of people worked. In this case, a better measurement would be the output of the work performed by these groups.

Practical. For the data to be practical, they must be timely, simple, economic,

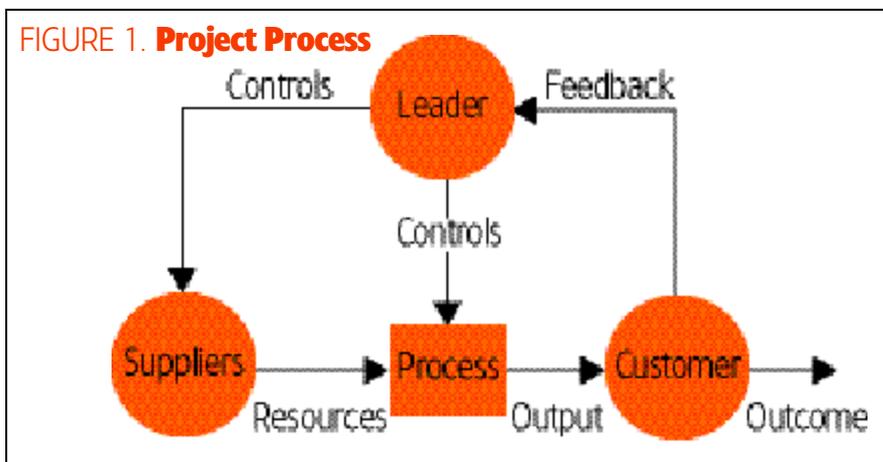


FIGURE 2. 4-Block Metric Page

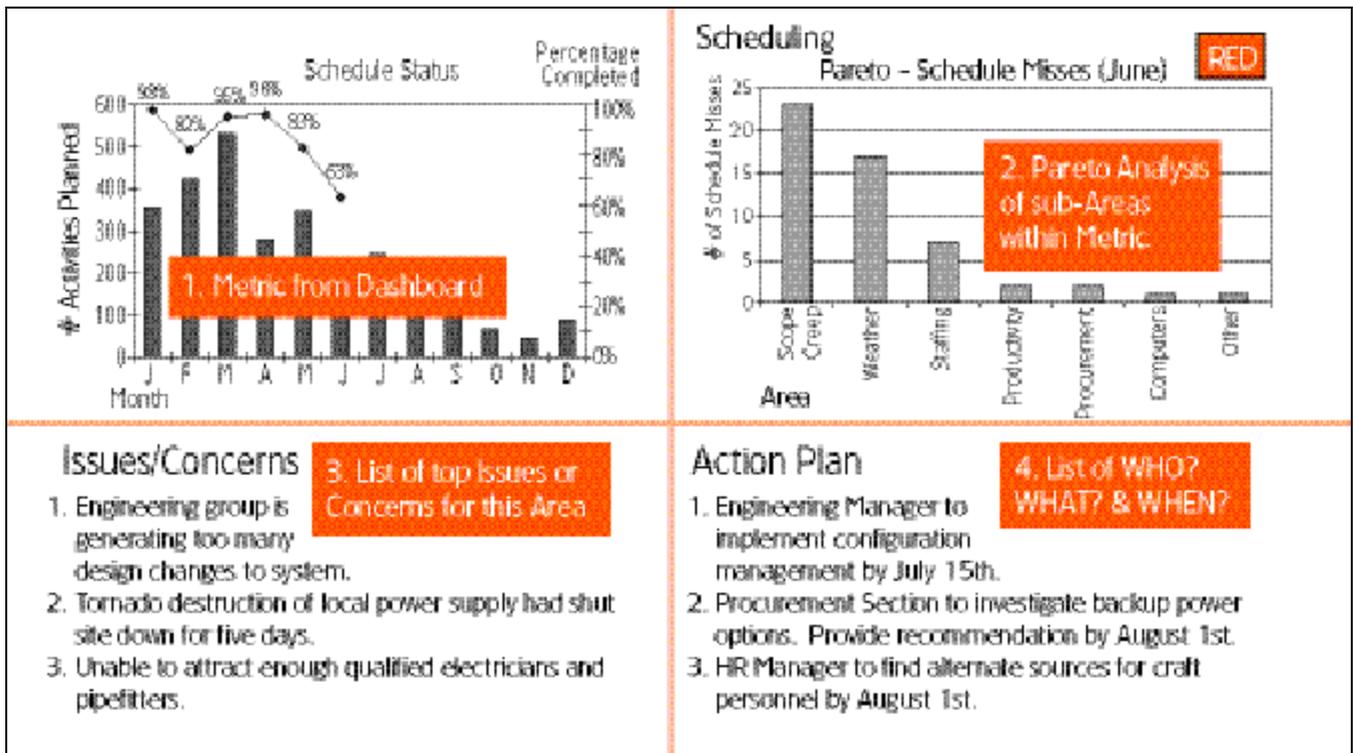


FIGURE 3. Single-Page Dashboard



and unchangeable. Timely data refer to data that can be measured in enough time to be effectively used. Simple data refer to data that are easy to understand. Economic data refer to data that can be obtained within the budget constraints for data collection. Unchangeable data refer to data that cannot be easily distorted to provide different information.

Four-Block

Selecting the metrics is important; but, using the metrics is more important. For the NECDF project, a simple four-block page was developed to help the project manager use the metric in managing the project. Figure 2, which is an example of a four-block page for the scheduling area, communicates important project information. This page can be used for each of the critical areas on the project, such as the nine areas previously mentioned.

The first block is a graphical or other depiction of the primary metric from this area. This is the metric that provides the manager a proactive indication of the status of the project for this area. The primary metric for this example is the schedule status using a dual graphic indicating both the number of activities planned for the month and the actual number (in percentage) of those activities accomplished by month.

The second block is another metric that provides more in-depth information about the primary metric in a system-

atic attempt to prioritize the areas of concern. In this example, the Pareto Chart is used as a method to identify the cause of the schedule misses for the current month, grouped into common areas. This is a useful tool to help prioritize the areas for the manager.

The third block is a textual list of the top issues or concerns for the area, such as scheduling in this example. This list can flow directly from the second block, which is the case in this example, or it can come from the individual maintaining the metric by using other sources of information.

The fourth block is the most important block, as this block identifies the action plan for improving the performance of the project. It should clearly identify the individual responsible for the action and the suspense date for that action.

Dashboard

The dashboard, which is similar to the one used in an automobile, has the intent of showing managers the status of their projects in a quick glance. Just like the speedometer on a car's dashboard, which gives a valid metric on the "real-time" speed of the car, a project performance metric should provide useful and timely information to managers.

Figure 3 is an example of this single-page dashboard. For the nine areas previously mentioned, a dashboard is constructed using the metric from the first

block shown in Figure 2. Additionally, a visual status is used to provide a quick visual representation of the performance of each area on the project, which was represented by a RAG (Red, Amber, Green) status for each of the nine areas in this example. This status highlights areas in which managers need to pay special attention. For example, a green status indicates that that area is doing fine; whereas, a red status indicates that that area is failing to meet the project objectives.

Swamped With Data No More

Project managers are responsible for the outcome of their projects. They normally base their decisions upon data and information obtained, or lack thereof. The effective use of performance metrics and the prioritization of that data help managers in managing their projects. Failure to use effective metrics will foster a situation in which managers are swamped with data, most of which has no effect on the success or failure of the project.

For the NECDF project, this methodology has significantly helped the project management team focus its attention and especially its scarce resources upon the critical issues.

Editor's Note: Haraburda welcomes questions or comments on this article. Contact him at scott.haraburda@necdf.necd.army.mil.

DAU AND DMO SIGN STATEMENT OF PRINCIPLES

The Defense Acquisition University (DAU) and Defence Materiel Organisation, Embassy of Australia, Washington D.C., signed a Statement of Principles (SOP) on Oct. 30, 2002, to provide a framework for continuous cooperation in the field of acquisition training. Signing the SOP from left: Frank Anderson Jr., DAU President; and Michael Roche, Under Secretary of Defence Materiel, Australian Department of Defence, Embassy of Australia. Standing from left: Richard Kwatnoski, Office of the Secretary of Defense for Acquisition Technology and Logistics, International Chair; and David Fitch, Dean, Defense Systems Management College.

Photo courtesy Embassy of Australia

