

Stanford Linear Accelerator Center: A Chemical Management Services Case Study

Summary

The Chemical Management Services (CMS) program at Stanford Linear Accelerator Center (SLAC) was launched in August of 2005. In the first six months of the program, there were 170 users in 35 work areas requesting more than 1,600 different chemicals from a central ordering system provided by the CMS provider. The CMS provider exceeded the goals for on-time delivery and the program has reduced scrap and spoilage in inventory. Savings have already been realized in material purchase costs, inventory carrying costs, MSDS management, EHS labor, and annual hazardous material inventory activity.

About SLAC

SLAC is a Department of Energy (DOE) facility, operated by Stanford University. SLAC performs basic science research for the government and is considered a federal facility, managed within the DOE. SLAC houses thousands of researchers from approximately 127 countries every year. As part of its operating environment, SLAC is required to follow all DOE protocols, executive orders, and general practices that go along with being a government facility.

Program Drivers

SLAC was considering investment in a new chemical inventory system to meet a mandate to track chemicals facility-wide when they learned about the CMS approach. Under a grant from the US EPA, SLAC worked with the non-profit, Chemical Strategies Partnership (CSP), to conduct a baseline of its chemical management system. CSP then worked with SLAC to develop the internal business case for pursuing a CMS program and assisted in drafting the Request for Proposals to select a CMS provider.

Program History and Timeline

Dec. 2002	SLAC makes decision to move ahead with full CMS program
2003	SLAC releases RFP; owner site visits; vendor selection
2004	Master Services Agreement and pilot project with CMS provider, HaasTCM
Nov. 2004 – Jul. 2005	Pilot project expands into extended roll-out
Feb. 2005 – Jul. 2005	Formal IT training of CMS provider’s system for over 90 SLAC users
Jun. 2005	SLAC stores inventory transferred to CMS provider hub in one weekend
Aug. 1, 2005	Formal “transfer date”; CMS provider assumes all responsibilities

Scope of Services

SLAC moved to a CMS program site-wide on August 1, 2005. This meant that every researcher, facilities operation, cooling tower, research chemical, fuel and cryogen was covered by the CMS program, and everybody onsite was required to use the CMS service. After two year of operation, two hundred people use the CMS program on a day-to-day basis.

CMS was a very different management approach for SLAC and for facilities of its kind – it was going to represent a huge business change. SLAC did not want to complicate matters by throwing in “bells and whistles.” Therefore, SLAC chose not to include waste management, wastewater treatment, or cabinet-level management as part of its initial scope.

SLAC decided to include in its contract the services it felt were the “core” proposition of a CMS program. Current services include:

- e-Commerce
- Online catalog
- JIT logistics
- Offsite, vendor managed inventory
- Point-of-use delivery
- MSDS management
- ESH reporting platform
- Incentives for cost and waste reduction

Through its e-commerce business system (tcmIS), Haas TCM currently provides electronic cataloguing, ordering, order tracking, data tracking, MSDS management, electronic invoicing, cost reporting and ESH reporting to SLAC. The CMS provider warehouses chemicals commonly used by SLAC and provides next business day just-in-time (JIT) delivery of warehoused chemicals. Haas provides all sourcing, purchasing, expediting, and Tier 2 vendor management support for all non-radioactive chemicals and gases used by SLAC.

The Contract

The SLAC contract had a two-year base period with two two-year options. Due to overall user satisfaction, SLAC exercised the first two year option period, which will take them through year four of the contract.

SLAC / Haas TCM Program Performance

SLAC worked with Haas TCM to develop a set of performance metrics to track program. Haas reports on the following metrics monthly:

- **Cost**
 - Commodity cost reduction
 - Management cost savings
- **Quality/Service**
 - On-time delivery min/max
 - On-time delivery OOR
 - Mission critical (He & LN2)

- Acceptance rate
- Shrinkage rate
- Scrap/obsolescence rate
- **Environmental Safety & Health**
 - Injuries/illness
 - Chemical spills/releases
 - Training
 - Participation in infrastructure improvement/ISMS
 - Hazardous waste reduction

SLAC Accomplishments

The benefits of SLAC's CMS program are significant. According to Butch Byers, Acting Safety Manager of the Chemical and General Safety Department, "We've realized cost savings and achieved safety and environmental gains. The system has greatly simplified the chemical delivery process, making it more efficient overall." Specific accomplishments include:

- First stand-alone academic or government facility to successfully implement the CMS model
- Reduced number of chemical suppliers from 250 to 1
- First truly paperless "e-business" system at SLAC
- PO cycle time for chemicals averages <1 day
- Elimination of annual hazardous materials inventory
- Development of CMS Mapping Tool (allowing lab employees to view all chemical storage areas on site)
- Overall streamlining of chemical supply chain
- Safe decommissioning of bulk tanks and cylinders (see details below)

ESH Benefits from CMS Program

The CMS program was initiated as an ESH effort at SLAC. In working with its CMS provider, SLAC has realized the following ESH benefits to date:

- **Eliminated ~15% of bulk storage tanks.** SLAC started the project with 50 bulk storage tanks (each 1,000 gallons or more).
- **Removed ~10% of old gas cylinders.** SLAC now has 2,500 gas cylinders that are government owned property.
- **Eliminated SLAC Stores.** SLAC originally operated its own stores operations, a warehouse that included about 100 items (managed gas cylinders in particular). One of the benefits of eliminating the entire operations was that by freeing up several thousand square feet in their warehouse, SLAC was able to turn the space into the calibration lab of the facility. While government facilities tend not to carry warehouse space on their books the way private sector companies do, there was a real benefit to freeing up the internal space by getting out of stores.
- **Reduced shop inventories.**
- **Hexavalent chromium elimination project.** Managing hexavalent chromium triggers numerous health and safety regulatory issues. Working with its supplier, SLAC recently managed to achieve some product substitution. They have eliminated all hexavalent chromium from its plating shop, at a cost of only ~\$5-10K. The project eliminated the

hexavalent chromium treatment unit, helped SLAC get out of California's permit by rule hazardous waste regulations, and eliminated the need to manage hexavalent chromium throughout the wastewater treatment process. In other words, this was a small project from a CMS perspective, but it had huge benefit in terms of reducing overall ESH burden at the site.

- **ESH reporting platform.**
- **Preparation for Global Harmonization System (GHS).**

Key Challenges

Described below are some of the challenges SLAC has faced with its CMS program. While some are unique only to SLAC, many likely apply to government entities in general.

- **Selling CMS to all stakeholders.** Selling CMS to all different stakeholders at SLAC was a challenge. Buy-in was needed from the Laboratory Director, Legal Department, Computing Management and Staff, ESH/Division Management, SSRL Facility Management, Purchasing, Stores, ESH/Waste Management, Budgets/Financial Controls, and SSRL Individual Researchers. Purchasing and Waste Management departments were initially hard to get on board, but in general, SLAC staff and management have been supportive of the contract all along. Now that the program is successful, they have certain stakeholders that are great supporters; particularly the Purchasing Department and the Contract Administrator who helps manage the program. Contract management has been extremely important; there is no substitute to having a great contract manager.
- **Training the Accounting Department.** Another challenge is that even though the Accounting Department set up the program, staff turnover has led to the need for re-training. Accounting does not just want to *use* the audit system; they want to be able to see it, touch it themselves, and be able to explain the system to auditors. SLAC's program leader now meets weekly with the accounting department.
- **Satisfaction of individual researchers.** After program implementation, researchers complained that turnaround time was not good enough. SLAC gathered all transactions and invited the CMS provider to explain turnaround time expectations. In talking about how the provider's supply chain worked and what the researchers' expectations were, they came to an agreement in which they would shrink turnaround time by 50%. Researchers said that if the supplier could do that, it would be good enough. This is an example of a challenge that led to continuous improvement.
- **Doing business the government way.** The CMS provider often says that "our hardest competition is against your previous way of doing business." In other words, government has its own way of doing business, its own history, and it includes a lot of paperwork, DOE oversight, and government orders one doesn't have to comply with in the private sector.
- **Infatuation with P-Cards.** While P-Cards make life easier for the purchasing department, they create major issues for ESH. The problem with P-Cards is that someone in the purchasing department signs a contract with the bank determining what information they will provide regarding individual purchases. However, the information provided does not

help an ESH person because it does not meet the data needs required for ESH and business practices.

Getting rid of P-Cards was a tough challenge when the CMS program first started. When CSP did the original benchmark study, they identified ten channels by which people were getting chemicals, with one of the most popular being P-card purchases. With the launch of the CMS contract, SLAC said that those 10 channels were closed, with increased consequences for using them, and everyone was required to go through a single channel.

- **Bias against lengthy service contracts.** SLAC looked to private sector companies to benchmark the length of their CMS contracts; they found that most were in the five to ten year range. At first, SLAC was not willing to write a contract for more than one year (not wanting to stray from the government ways of previously doing business). It took six months of arguing to reach a compromise solution: a series of three two-year periods. The model has been successful thus far.
- **No measurement of delivery, service, and ESH metrics.** Before SLAC started, they did not measure delivery time, service metrics or EHS performance. SLAC's CMS provider is now responsible for tracking such metrics.
- **ERP integration.** There was a huge amount of fear on ERP integration. SLAC runs PeopleSoft, and there was fear that integrating the CMS provider's software with PeopleSoft would be the worst part of the project. SLAC was told by the CMS provider that they had successfully integrated with PeopleSoft once. The software integration turned out to be one of the most successful parts of the project. SLAC's CMS provider had people working on the integration piece, as did SLAC. SLAC's side took about 200 hours of programming time, and integration was complete within the three months planned.
- **DOE data security issues.** Within certain parts of DOE, labs have to house all of their data onsite (e.g. NNSA labs such as Sandia, Los Alamos). As an Office of Science lab, SLAC's data does not have to live onsite. There are some real challenges in the federal government sector of where data needs to live.
- **DOE audit frequency.** SLAC faced 56 audits last year that were related to ESH (more than one audit per person who does ESH-related work). The CMS system greatly eases the burdens of such audits.
- **Supply interruptions.** The chemical industry has a worldwide shortage of helium to its customers. Liquid helium is one of SLAC's two mission critical supplies (liquid nitrogen is the other). Their CMS provider did a good job of securing SLAC's place at the head of line with the Bureau of Land Management (BLM) for such supplies. They showed the vendors that sell liquid helium that SLAC really was at the head of the line; SLAC could not operate without liquid helium – it is mission critical – and their CMS provider is not allowed to miss a single supply.

Future Directions

SLAC is looking to integrate the New Waste Tracking System (NWT'S) with its CMS program. SLAC originally left waste management out of it, but now is interested in closing the loop on the entire lifecycle of materials. SLAC benchmarked other DOE facilities and found that most are in the same place as itself -- initially starting with two systems that are now beginning to migrate towards each other. SLAC believes there is significant opportunity in having information about materials inform the waste business.

Metals supply chain services is another potential area of opportunity. SLAC buys as much raw metal stock (aluminum, stainless steel, copper) as chemicals because it makes its own parts for the accelerator. Many of the metal compounds require intensive management similar to chemicals.

Serialized individual container management is another opportunity SLAC is considering; SLAC's CMS provider already barcodes containers for their own internal data systems.

Many believe that this is the end of the beginning. SLAC has several other ideas for utilizing the CMS contract model (e.g. hazardous and/or e-waste management, radiological materials management, cooling towers and analytical testing), and they are currently doing feasibility studies assessing which is most important to the lab and why.

Contacts

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