Chemical Strategies Partnership
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Research Project: Evaluation of CMS in Colleges and Universities

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Background

Secondary schools, colleges, universities, and laboratory research facilities use chemicals as part of their educational and research programs. Recent EPA regional enforcement initiatives focusing on colleges and universities and chemical incidents in secondary schools and research facilities show the need for improving their management of chemicals. In response, educational institutions are struggling to find effective approaches to better manage chemicals.

It is possible that the Chemical Management Services (CMS) model, which has been successfully utilized in the industry setting, may be used in educational and research institutions to improve chemical use efficiency, reduce waste generation, improve chemical management, and improve environmental health and safety.

Chemical Management Services

Under the CMS model, a chemical management service provider takes over some or all chemical management activities, from chemical purchasing to chemical waste disposal. Central to the model's success is to better align incentives so both the supplier and customer seek to use chemicals more efficiently. Rather than paying a supplier by the quantity of chemicals used, supplier's compensation is tied to the quality of chemical management services offered under the CMS model. The CMS model therefore transforms the traditional *product-based* supplier-customer relationship to a *services-based* one.

This model is successful in the automotive, microelectronics, and aerospace industries. Through better chemical use and waste tracking, CMS providers have achieved great success in optimizing chemical use, enhancing environmental health and safety, and minimizing waste.

Project Goal and Description

The goal of this project is to explore the viability of the CMS model in the college and university setting (based on criteria such as cost and effectiveness) recognizing the transferability potential to the broader educational and research arenas. To accomplish this, the non-profit, Chemical Strategies Partnership (CSP), is conducting two primary activities:

❖ **Case studies:** Chemical management practices at two educational institutions, University of New Hampshire and Dartmouth College, are documented in two case studies to illustrate the characteristics of chemical management and use in colleges and universities. The two case studies also discuss drivers and barriers for implementing a systematic chemical management system in universities.

❖ **Pilot program:** Dartmouth College was recruited to participate in the pilot CMS program. The pilot is designed to explore whether a CMS program could more cost effectively facilitate chemical management, including the reduction and elimination of mercury, at Dartmouth. CSP has provided support to assess Dartmouth's baseline chemical management costs and evaluate their chemical management needs. With additional funding from an EPA Innovations Grant, CSP is now assisting Dartmouth, who is seeking to go beyond compliance and develop a Request for Proposals (RFP) to initiate a CMS Program.

Key Findings

Review of current chemical management practices at colleges and universities (hereafter called universities) suggests the need for a comprehensive chemical management system. There are a number of challenges to developing such a comprehensive system:

- Highly decentralized chemical procurement and use pose challenges in devising an organization-wide chemical management program.

- Strong organizational inertia from chemical users to any reform or control on chemical management.
- Lack of information on chemical usage and related chemical management costs leads to underestimation of resources required for establishing a holistic chemical management program.
- Many universities are not familiar with available management approaches for establishing a holistic chemical management system. Current chemical-related management activities are largely compliance oriented focusing on end-of-pipe waste treatment (e.g. hazardous waste storage and disposal, and training on hazardous waste handling).

The chemical management system must be supported by a robust information system, for tracking and managing chemical purchases, inventory, and waste handling and disposal. Improved data management not only facilitates compliance activities around chemical use and disposal, but also supports targeted activities like environmental preferable purchasing, waste exchange, and other waste minimization/ pollution prevention programs.

The findings from the pilot with Dartmouth College and two other ongoing CMS pilots with University of California Merced and Stanford Linear Acceleration Center (SLAC) suggest that CMS could be a viable holistic solution for proper chemical management at universities. Dartmouth and SLAC are currently in the process of recruiting a CMS provider to assist them in developing a CMS Program. Their primary drivers for choosing a CMS approach include:

- Cash flow considerations: Upgrading an in-house chemical management system will require significant upfront costs to enhance internal capacity and develop a more sophisticated information system. Contracting with an external provider allows universities to pay an annual fee for a host of chemical management services instead of investing capital upfront.
- Cost effective approach for acquiring a best-in-class IT system: Experiences by other universities suggest that a comprehensive chemical information system - the backbone of a good chemical management system - requires continuous upgrades and, in some cases, a complete rebuild every 8-10 years. A CMS provider is able to conduct continuous upgrades of the IT system at lower cost due to the economies of scale with additional clients using a similar platform.
- Improve control over chemical acquisitions: A CMS provider can serve as the gatekeeper of a centralized chemical procurement and receiving system. Given that chemical procurement is highly decentralized at universities, the gatekeeper can help in consolidating chemical purchases to minimize redundant chemical acquisitions and tighten controls on hazardous materials review and approvals.
- Opportunities for waste and cost reduction and going beyond compliance: Better data on chemical purchase, inventory, and use not only facilitates compliance, but also can be used to design and implement environmentally preferable purchasing, chemical exchange and other waste minimization/pollution prevention initiatives.
- Reduce risk: An external CMS provider can help to reduce chemical inventory on-site, purchase less toxic chemicals, and address new heightened security requirements, thereby reducing the risk and liability to universities.

It will be important to demonstrate success of the CMS model in these larger institutions before testing the model in smaller educational and research settings.

Chemical Strategies Partnership

Founded in 1996, the non-profit CSP explores the viability of CMS as a business model for continuously reducing chemical use and waste in a variety of industry sectors. CSP works with both customers (e.g., manufacturing companies) as well as CMS providers (through the CMS Forum). CSP is staffed by California Environmental Associates, www.ceaconsulting.com, and Tellus Institute, www.tellus.org. Additional information about CSP can be found at www.chemicalstrategies.org and www.CMSForum.org.

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