Best Practices for Managing Laboratory Chemical Inventory

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Leveraging Best Practices When Implementing a Chemical Inventory System Helps Ensure System Adoption and Successful Incorporation into Laboratory Processes

Companies that utilize chemicals in their labs and their manufacturing processes must manage those chemicals in a safe environment in accordance with government regulations. At a minimum, to ensure that this is accomplished, a system for managing information about the chemical safety and inventory data should be established and maintained. Best practices, on the other hand, take this minimum and optimize the management of the chemical inventory by leveraging the abilities of the people, processes, and technology involved to best effect. This article delves into the best practices involved in managing chemical inventory to ensure user adoption, process efficiencies, and accurate, real-time chemical data and reports.

One of the most underestimated processes in labs is also one of the most critical, and that's managing the laboratory's chemical inventory. Chemical inventory processes are intimately tied to ensuring not only that sufficient materials are on hand for research, but also to ensuring the accuracy of associated chemical safety and inventory data for regulatory requirements.

Numerous regulatory agencies require a range of chemical management reports to assess site safety and inventories of chemicals. Yet chemical inventory processes are often ignored because responsibility for managing the chemicals and related processes is often separate from responsibility for reporting chemical inventory. Often chemical inventory is performed manually by laboratory scientists on Excel spreadsheets that are then provided to the person responsible for Environmental, Health & Safety (EHS).

The best way to streamline chemical inventory management is to implement best practices, so that it becomes easy to ensure chemical data accuracy and regulatory compliance, and to streamline chemical inventory processes.

What Are Best Practices?

Best practices are “best in class” business policies, procedures, and processes that have continuously proven successful for many organizations. Best practices as applied to an organization’s chemical inventory system are significantly different today than they would have been even a decade ago. With

the increased use of commercial software and the outsourcing of Information Technology (IT) tasks, many organizations have implemented an off-the-shelf Chemical Inventory System (CIS) solution to ensure that the processes used to manage the chemical inventory are the most effective possible.

Best practices in chemical inventory management require taking advantage of the latest strategies -- such as Pareto analysis, Just in Time (JIT), and Material Requirements Planning (MRP) – and implementing them in the CIS. Doing so will enable an organization to perform effective chemical stock monitoring, forecasting, and setting and assessing chemical stock levels, while reducing stock levels, costs, liability, and environmental impact.

Thus, a best practices chemical inventory system that works with other IT solutions enables labs not only to track chemicals location and use, but also to address regulatory safety and reporting requirements.

What is a Chemical Inventory System?

The management and control of chemicals is the responsibility of everyone involved in the acquisition, use, and disposition of them. In addition, many organizations are responsible for complying with numerous federal, state, and local regulations covering chemical purchase, use, transportation, storage, emergency planning, and disposal. A comprehensive CIS solution satisfies these obligations by maintaining up-to-date inventories of the laboratory chemicals on site.

Such a system helps minimize the number and amount of chemicals stored, as well as minimize waste generation and control waste disposal costs. This, in turn, facilitates budget preparation and planning by maintaining information on usage patterns, age, shelf-life, and cost.

A Commercial Off-The-Shelf (COTS) chemical inventory system enables labs to keep track of where chemicals are and how much are available, as well as to generate reports listing chemicals by location, name, CAS number, formula, etc., and quickly access hazard information during an emergency.

A truly effective best practices CIS solution, however, goes beyond inventory management and government compliance. Such a best practices CIS will address each stage of the chemical management lifecycle, which begins with procurement and extends through use and disposal of chemicals.

Best practices CIS solutions provide a high-performance, relational database system for tracking chemicals and other laboratory supplies. Accurate, real-time inventory information enables all types of laboratories to operate more effectively and efficiently. A CIS that works with other IT solutions can be seamlessly integrated with other systems, such as purchasing, accounts payable, etc.

The Right Chemical in the Right Place

Effective inventory management of any kind involves getting the right inventory in the right place at the right time in the right quantity. Chemical inventory management focuses specifically on controlling the activities involved with chemicals used by the organization. To ensure chemical inventory accuracy, your organization must control not just the processes, but also the users. Implementing best practices software technology is one way to ensure CIS solution user adoption and process compatibility.

There are hundreds of often intricate inventory management processes that involve optimizing inventory levels, logistics and deployment, replenishment, disposition, and forecasting. Many

organizations are tracking their chemical inventory on paper, with a basic spreadsheet program, or with legacy in-house solutions. Unfortunately, these solutions typically can't provide accurate, up-to-the-minute information. The result is often unnecessary, duplicate ordering and high disposal costs due to inefficient use of purchased materials.

Real-time Inventory Information

The importance of real-time information cannot be underestimated. In this internet age, everyone expects accurate data to be at their fingertips instantly. This is not always the case with many chemical inventory systems. For instance, a common problem many labs stumble over is how to keep track of bulk chemicals, equipment, and solvents. Knowing who has taken an item, the status of the item upon return, and whether it needs to be reordered, are just a few of the issues that need to be addressed to ensure accuracy. Use of a spreadsheet may be easy to implement, but if the information is not kept up to date, it will not yield accurate chemical inventory information, resulting in user frustration and discontinued use of the spreadsheet. Also, users should not be expected to second-guess the system. For example, the system used should not only maintain accurate information on which chemicals are being used, but also provide ease of use and flexibility in locating chemicals when exact names or identification numbers are misspelled or mistyped.

A best practices CIS solution addresses these and other problem areas, allowing the organization to make the best use of all chemicals in all facilities. Features like barcode labeling and tracking, remote inventory control, and automatic e-mail notifications, are all part of a best practices solution that enables the organization to maintain accurate chemical inventory information in real-time.

Facility-Wide Safety Data Access

Current, up-to-date safety information concerning the inventory – particularly hazardous materials – must be maintained by the CIS to ensure immediate facility-wide access to MSDS or in-house handling instructions in the event of an accident.

Laboratories that handle regulated chemicals and toxic substances are required to submit regulatory reports about those materials. Typically, this is done through management of in-house Regulatory Lists that match regulated materials against specific regulatory requirements. Determining which materials on site are regulated and tracking those materials is not a straightforward task, as the regulations were not written with consistency in mind. For example, OSHA's Right-to-Know regulation requires that a current MSDS (SDS) must be attached to each material. Department of Homeland Security's Chemical Facility Anti-Terrorism Standards (CFATS) regulation requires Security Vulnerability Assessments and Site Security Plans as well as reporting of specific materials whenever threshold levels are exceeded. The most robust CIS solutions address not only these regulations, but also EPA's Tier II and GHS regulations as well as local, state and federal Fire Code requirements.

An integrated best practices solution can automatically flag chemicals that are subject to regulatory control by CAS number and associates those chemicals with the regulatory controls that affect them. This capability enables petrochemical companies to meet regulatory control and reporting requirements quickly with minimal effort regardless of where the facility is located, whether for a single site or for multiple sites at a multi-national corporation.

Ease-of-Use Drives System Adoption

Finally, the downfall of many custom-designed CIS solutions is that they are too difficult to use. The result is that only a few people in the company have the knowledge and patience to use the system. As a result, accuracy and timeliness of the chemical inventory data suffers. Valuable time may be lost when research must be stopped because the necessary chemicals are not on hand. A best practices chemical inventory system solution is easy to learn and use, ensuring adoption and use.

Quantifying the Financial Benefits of Chemical Inventory Management

A recent series of surveys by ChemSW concerning chemical management values that result from implementing the CISPro® chemical inventory management system have delivered an astounding range of detail concerning cumulative financial benefits from even small productivity enhancements in the lab.

The surveys were designed to identify financial benefits, trends and developments discovered by ChemSW's CISPro chemical inventory system users.

Lab Labor is Number One Cost

It's well known that labor costs are the largest expense line item for operating a lab. Whenever labor can be streamlined, there is the potential to generate financial benefits. In a perfect world, chemists would spend 100% of their time performing research or bench work, but this just isn't the case. However, if other tasks can be minimized, then time can be saved and labor costs can be reduced.

CISPro Streamlines Lab Operations, Delivers Financial Benefits

The results revealed by the surveys regarding lab operation activity costs uncover areas where a best practices chemical inventory management system can streamline processes for greater efficiency and hence, greater financial benefits.

Study Results Detailed in White Paper

The survey data was used to develop a cost/benefit study of the CISPro solution. CISPro users were surveyed to capture the costs and benefits directly associated with the use of CISPro for managing their chemical inventory. Fourteen key parameters that affect laboratory costs and process efficiency were measured. The subsequent cost/benefit study is based on standard return-on-investment (ROI) methodology that calculates the financial benefits accrued by cost savings and increased productivity.

CISPro users responded favorably across the board for realizing substantial increases in efficiencies for each of six areas studied; laboratory operations, inventory management, inventory reporting, MSDS Management, procurement, and waste management. The survey findings enabled a calculation of the financial benefits gained through efficient inventory management that were produced by a reduction in inventory size and more efficient chemical inventory use, management, and reporting. Based upon the results, organizations on average are able to enjoy an annual financial benefit of $12,900 per laboratory staff user, plus $12.50 saving per container for inventory support. For an organization of 50 laboratory staff users with 10,000 chemical containers, the financial benefit is estimated at $770,500 per year.

The survey results are presented along with the cost/benefit study that resulted in a white paper titled Quantifying the Financial Benefits of Chemical Inventory Management Using CISPro available upon request from ChemSW.

Summary

Best practices in chemical inventory management enable chemical inventory accuracy driven by error-resistant processes, well-trained users, and intelligent use of technology. Understanding how to achieve best practices involves understanding the conditions under which errors occur and why systems fail. In addition, significant financial benefits can be realized when a best practices system is successfully implemented.

About The Author

Jon Webb is a Senior Technical Specialist and Inventory Consultant for ChemSW. Webb leverages his application expertise at ChemSW to assist organizations around the world in optimizing and streamlining their chemical inventory management activities. Webb has a degree in Biology from Eastern Washington University in Spokane, Washington. He can be reached at jwebb@chemsw.com.

About ChemSW

Founded in 1991, ChemSW is a leading provider of chemical and biochemical inventory management systems, MSDS systems, and other chemistry laboratory software and services. ChemSW's wide range of products enables companies to streamline laboratory processes and reduce chemical purchasing and disposal costs. The CISPro Chemical Inventory System® provides a high-performance, relational database system for tracking chemicals and other laboratory supplies. ChemSW supports over 15,000 customers in more than 40 countries throughout the world. Our software is installed in thousands of laboratories, from the smallest of chemical stockrooms to the largest enterprise environments.

To find out more about CISPro, contact **VWR**CATALYST at 1.888.793.2300 or VWRCATALYST@vwr.com