



## Feature Report

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# World-Class Compliance That Doesn't Cost a Fortune

## ***A well-designed and properly maintained inventory of hazardous materials onsite is of utmost importance***

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How are you managing the hazardous materials you use, store and produce in your facility? Unless you have a multimillion-dollar budget and work in an organization with a cultural commitment to safety and risk management, you are probably managing ever-more-complex rules and requirements with smaller budgets, fewer resources and less organizational commitment than the year before.

In today's perpetually resource-constrained operating environments, it is possible to manage the costs associated with hazardous materials management without compromising regulatory compliance, environmental performance, and worker health and safety. At the heart of any procedural framework for managing environmental compliance is an accurate inventory of the hazardous materials present at your facility.

Once an accurate inventory of dangerous and regulated raw materials, finished products and effluent streams has been established (and is then tracked in realtime), such data can be integrated with specific information related to how these regulated materials are being used, transported, stored and disposed. By developing and then building on an accurate hazmat inventory, you can use this knowledge to make better day-to-day decisions related to the management of hazardous materials, and in doing so, you can maximize worker safety, safeguard the community, reduce waste and costs, and ensure more timely and effective environmental compliance.

### **Rethinking the old approach**

Many chemical process facilities have long been using a computerized purchasing or procurement system, and these systems often include a module that allows the environmental health and safety (EH&S) staff to review and approve of incoming hazardous materials. Next, the chemical or product is typically tracked using some type of bar-coded or radio-frequency identification (RFID) tagged inventory-management system, so that data on location-specific usage of hazardous materials can be recorded. Material Safety Data Sheets (MSDS) are compiled and tracked, often via a computerized document and data-management system that is tied into the computerized procurement and tracking system.

At the end of all this, compliance reports that are required by local, state and federal environmental regulators are generated and submitted, usually electronically. In an ideal world, based on the information gathered, management plans are made or modified, staff are trained or retrained, and the company moves forward safely until the next monthly review period.

However, in reality, this scenario for compliance management is a more often than not a utopian view. It's what many high-profile companies continuously strive for and would like to see become the de facto process for managing compliance. In the world in which most EHS managers live, the tools and resources just described do not exist. Instead, most are forced to manage hazardous materials with limited budgets, staff, tools and systems. In the face of limited resources, you need to concentrate on creating a regulatory-compliance system that focuses on a key area —an accurate hazmat inventory.

### **A new game plan**

The whole picture begins with an accurate, up-to-date inventory of the pure chemicals, raw materials, intermediates and finished products, fuels, solvents and other cleaning supplies within your organization. This comprehensive inventory becomes the foundation for managing other critical data and turning that data into knowledge about the particular hazards that are present in your facilities. This knowledge, when applied on geographical, functional and hierarchal levels within your organization helps key personnel to make better business decisions.

For instance, access to accurate-company-wide and site-specific data on hazardous materials is invaluable when:

- Implementing specific safety and control processes across multiple locations within your organization
- Assigning responsibility to appropriate individuals who can identify the hazards associated with products used in the workplace
- Tightening purchasing policies and procedures so that the organization can control what chemicals are coming into each facility

All of these steps can help companies to reduce risk, cost and liability. A good hazmat inventory helps your bottom line, and the basics are easy to understand and implement.

### **Creating the inventory**

How often. The frequency with which you review your inventory of chemicals and other hazardous materials depends on the size of your business and number of locations/departments that handle hazardous materials, the sophistication of your purchasing and approval processes, and the expected turnover of chemicals and other hazardous materials. In an ideal world, a master inventory should be taken at least annually by the person responsible for the inventory in a specific location/department, and the inventory should be modified throughout the year with each new purchase or disposal.

EHS supervisors at each facility should have pre-purchase review and approval rights for any new product or chemical. EHS supervisors, in this scenario, review proposed new chemical purchases to "flag" purchases that may increase employee risk, operational costs, or negative public visibility. For example, purchase of relatively small quantities of mercury compounds for use in a manufacturing facility could trigger toxic release inventory (TRI) reporting – a time-consuming report that the U.S. Environmental Protection Agency (EPA; [www.epa.gov](http://www.epa.gov)) posts on its website for public review. Inventories from separate locations within an organization should be rolled into a corporate level inventory for analysis and to ensure consistency in process and purchasing. Similar processes utilizing different chemicals or grades of chemicals (i.e., muriatic acid vs. high-purity hydrochloric acid for example) could highlight a process-consistency problem or identify an opportunity to reduce reagent costs.

At the other end of the spectrum, if you do not have a hazmat inventory in place, you should start by conducting a full inventory at the beginning of your fiscal year. This single step will improve the quality of your EHS programs and drive down costs with higher compliance because it will give you a better picture of what products actually exist so that if an inspection occurred, there would be no surprises.

Also, at a minimum, you should carry out another inventory at the beginning of the next fiscal year to validate your assumptions on chemical usage and turnover. This refresher inventory should include one full inventory from a bellwether site within your organization and a "what's new" report from all other locations.

Dynamic chemical inventory change increases the likelihood for inventory maintenance errors. For instance, if there is more than a 20% change either in number of hazardous chemicals and products or in total pounds of hazmat substances from the previous year, you should consider conducting another full inventory at every site.

What to look for. Ideally, the staff conducting an inventory of hazardous materials should be trained EHS professionals who can easily identify the products and chemicals that should be represented there. If those types of people are scarce in your organization, non-EHS staff can be trained to read product labels as a method of hazardous materials identification. Manufacturer's labeling on industrial reagents and hazardous consumer products should contain identifiable hazard warnings; however, inner packaging of some materials (such as solder rolls or copier chemicals for example) may not carry adequate hazard warnings. Review Table 1 for examples of frequently overlooked hazardous materials.

What data to record. At a minimum, for each product or chemical, you should record the location of the material, the container size, and the quantity of the material on hand of the material, the name of the product or chemical, the name of the company that made the product or chemical, and any part number or description assigned by the manufacturer. This basic information will allow you to match the item to an MSDS, which can provide data needed for reporting and critical exposures.

Problems. The staff conducting the inventory may come across unlabeled containers or containers with illegible secondary labels. Record these items in a separate discrepancy document, with their specific location and description, then physically flag the items themselves, with stickers, labels or string that is easily visible. Review the discrepancy document at the completion of the inventory process to determine appropriate actions such as re-identifying products with appropriate labels and/or removing the products from the facility.

### **Completing the picture**

Once you have created the site-wide inventory, you can begin to add value to each record by associating other data, documents or records with each inventory item, and supporting this information with onsite EHS staff or outside resources to assist employees in use and interpretation. This is an important step in seeing the whole picture.

MSDS. Associate each item in your inventory with a manufacturer-specific MSDS and keep the inventory list and MSDS available for easy access by employees. The MSDS provides vital information for exposures and the specific characteristics of the chemicals in a product or mixture. In the U.S., many companies keep the inventory list and corresponding MSDS on file (hard copy or electronic) forever, to meet OSHA's exposure recordkeeping requirements. However, as your hazardous raw materials, intermediates, finished products, process aids, cleaning supplies and the like change, or your MSDS becomes outdated, you will also need a process for acquiring new or updated MSDS.

Classification. Assign each item in your inventory a National Fire Protection Agency (NFPA; [www.nfpa.org](http://www.nfpa.org)). Classification and Hazardous Materials Identification System (HMIS) Rating (or, if not in the U.S., the relevant, comparable system). NFPA offers a system for identifying the hazards of a chemical that was developed with the needs of fire protection agencies in mind. Your local fire department may require you to provide this information along with your chemical inventory. The HMIS Rating was developed by the National Paint and Coatings Association ([www.paint.org](http://www.paint.org); search for "HMIS") to help quickly identify the hazards associated with a given material.

Shipping. Inventory items should also receive a classification based on how the item is shipped, whether by ground, air or vessel. Each mode requires a different classification based on the size and quantity of the chemicals being transported.

Each hazardous material product that you put on a truck, boat, rail car or plane will need to have several pieces of data associated with it. When you offer hazardous materials (or "dangerous goods" as they are known internationally) for transport, you must appropriately classify, package, mark, label and provide appropriate documentation for these materials. Classification involves identifying the transportation hazards associated with the hazardous materials in your inventory in accordance with U.S. Department of Transportation (DOT; [www.dot.gov](http://www.dot.gov)) or international transportation code requirements.

Classification may follow DOT's 49 CFR (Code of Federal Regulations) for domestic shipment in the U.S., or it may follow international shipping codes such as the International Civil Aviation Organization (ICAO) regulations for air transportation, or the International Maritime Dangerous Goods (IMDG) regulations for vessel transport. These international regulations may also, in most circumstances, be utilized domestically (within the U.S.) for air and vessel transport.

Beyond classification, instructions will also be needed on how to properly package different types of hazardous materials, what marking and labels must go on the package, which placards go on the vehicle, how to complete the required shipping documentation and emergency information including who to call in the event of a transport emergency.

### **Supporting data**

With so many companies managing their hazmat inventories so poorly, any company that does it right has an opportunity to gain a significant strategic advantage. When analyzed, the size and diversity of hazardous products within an organization is almost always a surprise. EHS staff and managers have not seen the whole picture and the result is misguided programs, misleading reporting, insufficient training and poor decisionmaking.

The prevalence of inventory misunderstanding was revealed in 2003, when our firm analyzed the hazmat inventories of more than 300 companies. In total, more than 1 million products and 10,000 separate site inventories were reviewed. The average facility had an inventory of 3,500 hazardous items, including pure chemicals, mixtures and finished goods. Some of the key findings related to these points:

Phantom products. On the average, 33% of the products that were listed on the inventory did not exist in the actual workplace. The products or chemicals had been used or disposed, and the inventory had not been updated. Common culprits include chemicals that have a short lifespan, are onsite for only a few days as a trial, or are provided in small quantities and are used quickly. While this is certainly better than not having all the hazardous products listed and tracked on the inventory, it also means that the average company is incurring one-third more cost than necessary to maintain and manage their hazardous materials inventory.

The 50-50 Rule. In the average hazmat inventory, 50% of the items listed have no associated supporting data, such as MSDS, quantities, storage locations and container information. Of the items that have supporting information, 50% of the information is out of date. In essence, the average company is making decisions related to the use, storage, disposal and reporting of chemical and other hazardous materials with only 25% of the information the company needs.

Nothing in common. Our firm also compared inventories from different locations, sites or departments within the same organization. Only 12% of the items listed on the inventories were the same from site to site, inventory to inventory. This reinforces the notion that hazmat use is site-specific, so the use of a "master" inventory will lead to inaccurate reporting and decision making.

Change is the only constant. Of the inventories reviewed, 90% of them changed at least monthly. Products were used or disposed. New materials were ordered. Products shifted from one site to another. All these factors affect site-specific usage numbers and related reporting.

'Most Wanted' list. Sixty percent of the inventories contained at least one of the following carcinogens: aflatoxins, arsenic compounds (inorganic), asbestos, benzene, beryllium and beryllium compounds, coal tar and coal tar pitches, coke oven emissions, ethylene oxide, vinyl chloride, wood dust, lead and mercury.

Across industry. The four sample inventories shown in Table 2 represent four distinct industries of various sizes (identified as "A- D"). All have significant numbers of products containing carcinogens.

### **What's at stake**

The completeness and accuracy of your hazmat inventory can have a cascading effect within your organization, affecting specific EHS responsibilities, employee well-being, management decision making and corporate responsibility. If even 10% of your inventory is inaccurate, problems may arise in the following areas:

MSDS compliance. If your inventory is not accurate, MSDS may not be available when needed, or they may contain outdated information. Or, by acting on outdated information, you may spend time and resources acquiring and maintaining MSDS for products that are not even used or stored at your site anymore. Alternatively, if you use archived MSDS files to satisfy your 30-year exposure record requirement mandated by the Occupational Safety and Health Administration (OSHA); the potential for inclusion of chemicals and products reviewed but never actually used at your facility could unnecessarily increase your potential future liability.

Chemical exposures. Onsite data may not be available for the chemicals to which an employee may actually be exposed in the course of their workday. If data is provided, the information may erroneously refer to a previous or generic version of the product, thereby increasing the likelihood of improper handling or treatment.

Transportation. The prevalence of outdated information may lead to products being improperly classified for shipment. This directly impacts the safety of the product in transit and the safety of the transporting vehicle (air, ground, vessel), its driver, crew and passengers. And, if an in-transit incident occurs, emergency crews will be ill prepared to respond if working with incomplete or misleading information.

Disposal of hazardous waste. The budget you have designated for disposal costs may be inadequate if there are potentially hazardous materials being used and disposed/recycled of which you are unaware. Site-specific contingency planning for emergency response may also be incomplete if based on an inadequate inventory.

Regulatory reporting. Inadequate hazmat inventory information may lead to failure to disclose sensitive chemicals (such as those that appear on the SARA 302 Extremely Hazardous Substances List). Alternatively, items listed on the inventory but not actually used or stored onsite could trigger reporting thresholds and lead to unnecessary and inaccurate hazardous materials disclosures and associated fees.

Training and preparedness. An incomplete inventory can hamper employee awareness of the chemicals in the workplace. This significantly increases the risk of exposure or injury, and the related costs of treatment. Meanwhile, a lack of appropriately detailed inventory data, such as required MSDS and storage quantities, can also mean that all hazards onsite have not been properly evaluated.

### **One size does not fit all**

Similarly, if you assume that the inventories at all sites or departments within your organization are the same, the following issues may arise:

MSDS compliance. Site-specific MSDS may not be immediately available where they are needed, as they may be stored in another building or office, or be completely unavailable. In a true emergency, such as ingestion, inhalation or exposure incident, treatment information contained on the MSDS must be immediately accessible by responding personnel. You will be out of compliance with the hazard communication standards, which require access to MSDS for employees with no barriers, and thus you may incur one of the most commonly cited OSHA violations.

Chemical exposures. If you are unaware of the specific hazards at a given site or within a department, you may not be prepared to respond properly to employee exposures or injuries. In addition, you may not have proper personal protective equipment, eyewash stations or containment tools in place for the specific chemicals or other hazardous materials used or stored at a given location. Be careful not to assume, from its name or its function, that a given site or department is risk-free.

Transporting hazardous materials. Shipping personnel may be inadequately trained on the types of chemicals and products they are shipping. This can delay shipments or cause them to go out improperly labeled, packed and placarded. If shipping by ground, the drivers may not be qualified to transport the hazardous materials you are shipping. Potential fines for noncompliance, from the U.S. DOT and U.S. Federal Aviation Administration (FAA; [www.faa.gov](http://www.faa.gov)) for instance, are large and may be assessed against individual executives with responsibility for hazmat-related transportation.

Disposal of hazardous wastes. Without an accurate inventory, established processes for handling specific waste streams may not be adequate. This could lead not only to improper handling, but waste remaining onsite for longer than necessary. Uncertainty about what exactly is in your waste stream may result in using waste contractors who do not have proper training, certification, tools and insurance to handle your needs. This applies to your staff as well, who may not have adequate training and tools to manage the types of hazardous wastes your processes are generating.

Regulatory reporting. Using a "master" report that uses one location as being representative of all locations may cause some chemicals or other hazardous substances to be reported unnecessarily. This could also trigger additional local or state reporting and engender associated costs. The reverse is also true — a "master" report could leave some chemicals unreported, increasing your risk and opening the way to fines for not reporting the true nature of the potential hazards at your site.

Training and preparedness. Without an understanding of the exact nature of the hazards at a specific location, proper training will not be possible. Locations where you have underestimated the hazards will not have enough training. This is amplified in situations where substances that require unique handling procedures, such as lead and mercury, are found onsite. Over-training can also occur, which unnecessarily increases your training costs.

### **Winning the game**

By focusing your efforts on gathering and analyzing the right information, you can significantly streamline the costs you incur to protect your employees and manage your regulatory compliance requirements, as well as the costs associated with acquiring, tracking, storing, shipping and disposing of hazardous materials that your facility handles, stores, uses and produces. EHS departments are winning every day because they are looking at the right data and making good decisions. You can be one of them.

Edited by Suzanne Shelley

Note: Anticipating health and safety issues and taking action to prevent them is a long-term and profitable investment for companies. For more information on industrial hygiene and methods for promoting health and safety in the workplace, please visit the American Industrial Hygiene Association website at [www.aiha.org](http://www.aiha.org).