

Web-Based Technology

A competitive advantage for global MSDS management

By Scott Williams

MORE THAN 30 MILLION PEOPLE have the potential to be exposed to hazardous chemicals at one of more than 7 million establishments throughout the U.S. (OSHA, 2004; 2006). OSHA estimates that there are 945,000 hazardous chemicals listed for the U.S. (OSHA, 2006). In 1983, OSHA promulgated its Hazard Communication Standard (29 CFR 1910.1200), which required employers to provide training to employees who work with chemical substances. In addition, manufacturers must supply material safety data sheets (MSDS) and labels for chemical substances.

Due to economic globalization, business operating plans and workforces are being affected by international regulatory developments, causing growing concern for human health and environmental protection. This concern has resulted in global changes for HazCom, including changes in chemical classification, labeling and MSDS.

Three regulatory changes are currently affecting how business is conducted within the U.S.: 1) Chemical Facility Antiterrorism Standards (CFATS), a U.S. performance-based regulation; 2) Registration, Evaluation, Authorization and Restriction of Chemical Substances (REACH), European Union (EU) legislation; and 3) Globally Harmonized System of Classification and Labeling of Chemicals (GHS), promoted by the UN.

According to Mataloni (2007), multinational companies based in the U.S. increased foreign affiliates by 836 companies in 2005. In addition, all U.S. multinational companies and affiliates accounted for 54% of the total U.S. exports and 36% of total U.S.

imports. These statistics indicate the evolution toward a global economy for U.S. businesses. The U.S. Chamber of Commerce Statistics and Research Center (2006) reported that the top 10 U.S. trade partners as of May 2005 are Canada, Mexico, China, Japan, Germany, the U.K., South

Korea, Taiwan, France and Venezuela. Most of these countries are in the process of standardizing chemical substance information and requirements.

Therefore, U.S. businesses must be proactive to ensure that their exports comply and provide effective training to employees regarding safety information provided with imported substances. Understanding the implications of the regulations and available technological management methods can help businesses prepare for impending changes.

Technological advances can have a significant positive impact on how businesses prepare for and meet regulatory requirements. Specifically, web-based services for global MSDS management and integrated environmental reporting can be a more cost-effective way to meet the requirements. Therefore, in addition to understanding the implications of the various regulations, employers need to understand the different types of systems available and subscribe to the solution that best fits identified needs. Understanding the difference between the various options for management and reporting can affect the efficiency and compliance success for MSDS management and environmental reporting.

At Look at the Regulations

Chemical Facility Antiterrorism Standards

CFATS was implemented by the Department of Homeland Security (DHS, 2007b). It requires the reporting of certain chemicals to determine risk for terrorist activity. CFATS is designed to reduce the potential for terrorist activity related to the release of a hazardous chemical, and theft of chemicals for use in weapons or sabotage. An employer must know whether its facility has a chemical of interest (COI) that meets the standard threshold quantity (STQ) and submit a Top-Screen as appropriate.

The regulation includes a list of COIs, which is also referred to as Appendix A (DHS, 2007a). Each COI has a minimum concentration and respective STQ for each security concern: intentional release, theft or diversion for weapons, and sabotage or contamination (mixing a chemical with an existing

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Abstract: Exposure to hazardous chemicals is an ongoing concern. Technological advances can have a significant positive impact on how businesses prepare for and meet regulatory requirements. Specifically, web-based services for global MSDS management and integrated environmental reporting can be more cost-effective ways to meet the requirements. This article reviews the different types of systems available and discusses how to select the solution that best fits identified needs.

material to produce a hazard). Under CFATS, any facility with a COI at or above the STQ must file an online questionnaire referred to as a Top-Screen. DHS will then evaluate the Top-Screen submittal and determine whether the facility presents a high risk for terrorist activity. Based on this evaluation, a facility is placed into one of four tiers, rated from low risk (Level 4) to high risk (Level 1).

Facilities in tiers 1, 2 and 3 must electronically file a security vulnerability assessment (SVA). The results of the SVA will then be used to further granulate each facility's level of threat; this will affect the type of site security plan (SSP) needed at the facility. Based on DHS's assessment, the facility will need to file its electronic SSP, which will detail how the facility will secure the risk.

CFATS is a risk-based performance standard, so the methods used to secure the risk will be site-specific and will vary based on facility location, threats and chemicals present. It is expected to have far-reaching effects on U.S. businesses. The law encompasses all types of industries—not just chemical facilities—that handle a COI in any way. Any institution that manufactures, uses, stores or distributes COIs is expected to file a Top-Screen. This includes agricultural businesses and secondary education

facilities. "Whether a facility produces a chemical that can be used in a terrorist attack, or uses it in its manufacturing process, or stores it, is of no consequence to the terrorist who might see to employ that chemical to harm others" (DHS, 2007a).

Some facilities may be exempt from CFATS if they fall under other regulatory acts that currently have security measures in place such as the Maritime Transportation Safety Act, Safe Drinking Water Act or Federal Water Pollution Control Act. However, if any portion of the plant does not fall under the regulation, then a Top-Screen must be filed for the area not regulated under the other acts.

Facilities under the Nuclear Regulatory Commission or owned by the Department of Defense or the Department of Energy are also exempt (DHS, 2007b). Finally, railroads and pipelines are also addressed by CFATS. Rail yards that store COIs in cars are not required to submit a Top-Screen because they are considered transport. Similarly, long haul pipelines are not required to file. However, if storage tanks or pipelines are on a facility's property, they must be reported on the Top-Screen (DHS, 2007b).

What are the reporting requirements for COIs? Any COI that meets STQ must be reported within 60 days of the COI coming on site (Moore, 2008). Tier 1

and 2 facilities will have to resubmit a Top-Screen every 2 years and Tier 3 and 4 facilities must resubmit the Top-Screen every 3 years (Moore). Therefore, keeping an accurate and updated chemical inventory is important as is ensuring that a facility has a verification process for new materials brought on site.

To assess a site's preparedness to file a Top-Screen with 100% due diligence, several questions can be asked. Does the site have a system that can efficiently cross reference its chemicals to Appendix A? How does the site manage chemicals brought on site to determine whether they are a COI? How quickly can site personnel identify changed STQs of current COIs to determine whether a Top-Screen must be filed? Can responsibility for tracking quantities be shared without losing control of the chemical inventory system?

Registration, Evaluation, Authorization & Restriction of Chemicals

REACH (EU regulation EC 1907/2006) went into effect June 1, 2007, in an effort to improve human health and environmental safety by identifying hazardous chemicals manufactured or imported in the EU (Europa, 2008). The EU is comprised of 27 countries: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, the Netherlands and the U.K. Iceland, Liechtenstein and Norway are also associated with the EU as partners in the European Economic Area (EEA).

REACH applies to all phases of a substance's life-cycle, including manufacturing, importing, marketing, general use and waste stream (Mayo, 2007). The standard is comprised of four steps: registration of chemicals, evaluation of the hazards, authorization for use or restriction. REACH requires the registration of chemical substances and the substitution of highly hazardous substances. In some cases, chemicals may be restricted in their use or banned altogether from being in the EU. Additionally, manufacturers and importers must register chemicals produced or imported over various quantities.

European Chemical Agency (ECHA) was founded to administer the regulation (Europa, 2008). This agency's mission is to ensure standardization of chemical information reporting and associated requirements throughout the EU. ECHA manages the database developed to maintain all registrations and chemical reporting data.

As part of the standardization of chemical data, REACH requires classification and labeling of materials and also requires that users are provided with safety data sheets (SDS). In 2007, the EU adopted a proposal to accept the classification, labeling and packaging of chemicals per GHS (European Commission, 2007). REACH requires substance reclassification to be completed by Dec. 1, 2010, and June 1, 2015, for mixtures (Europa, 2008).

Registration

As noted, the first step of the REACH process is

registration. Following is an overview of this step (with more detailed information available at <http://guidance.echa.europa.eu>). All manufacturers and importers that preregistered their substances between June and December 2008 were allowed to continue to manufacture or import the substances and follow a staggered timeline for providing the documentation needed for the authorization step. The phase approach for documentation will occur over an 11-year period as follows:

- By Dec. 1, 2010, substances manufactured or imported:

- a) greater than or equal to 1,000 tons/year;
- b) carcinogenic, mutagenic or reproductive toxic substances greater than or equal 1 ton/year;
- c) substances classified as dangerous for the aquatic environment greater than or equal 100 tons/year.

- By June 1, 2013, substances manufactured or imported at 100 to 1,000 tons/year.

- By June 1, 2018, substances manufactured or imported at 1 to 100 tons/year.

Currently, REACH does not affect all chemicals. Some are exempt, and special rules apply for substances used in research and development, polymers, isolated intermediates and substances regulated by other agencies.

Evaluation

The second step is evaluation. ECHA will evaluate registration information to ensure the appropriate information is available and will approve testing procedures to "prevent unnecessary animal testing" or redundant testing (ECHA, 2008). Evaluation will result in one of the following findings:

- Action needs to be taken under the restriction or authorization procedures.
- Classification and labeling needs harmonizing under REACH.
- Information needs to be given to other authorities to take appropriate action under other legislation.

Authorization

The third step is authorization to allow the substance to continue to be imported or manufactured. This step identifies substances of high concern and prevents their use or sale unless authorized by ECHA.

Authorization is a four-step process (ECHA, 2008). The first step is to identify substances of very high concern (SVHC). These are:

- carcinogenic, mutagenic or reproductive toxins;
- persistent bioaccumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB) substances;
- substances that pose significant threat to the population or environment.

The second step is to prioritize what substances need authorization. If authorization is required, the next step is to determine whether certain uses are exempt from authorization because of existing controls that reduce the risk posed by the hazards. Finally, if a substance is an SVHC and no controls are

in place, a date will be set to indicate when the substance can no longer be used. This date is called the *sunset date* (ECHA, 2008).

The next step is to file a chemical safety report (CSR), then await authorization. A CSR outlines the risks of the substances, controls or substitutes for the substance. The CSR will document the following:

- human health hazards;
- physicochemical hazard assessment for labeling purposes;
- environmental hazard assessments:
 - a) PBT and vPvB—if PBT or vPvB results in a dangerous chemical, then an exposure assessment must be completed;
 - b) risk characterization for controlled use based on derived no effect levels (DNEL) and predicted no effect concentration (PNEC) with calculation exposure concentrations;
- chemical safety assessment to include manufacturer or importer use as well as use and waste stage of the downstream user;
- exemptions from the CSA exist for substances that are below thresholds, isolated intermediates that stay on site, used in research and development, and already regulated, such as pharmaceuticals.

Restriction

The final step in REACH is restriction. This step determines whether a substance will have use limitations or be completely banned from manufacture or import into the EU. Substances that are targeted for prioritization are published on the candidate list maintained by ECHA.

The expected impact on U.S. businesses involves classification and hazard data for exporters and training for importers. Potentially, a business could suffer financial loss because the EU market must limit or substitute a substance obtained from a U.S. manufacturer because it is deemed high risk per ECHA.

To assess a manufacturer's ability to comply with the REACH requirements, consider these questions. How can the manufacturer provide MSDS that meet EU composition requirements? How can the site provide classification for EU requirements? How should a given chemical be labeled per EU requirements? Are any of the manufacturer's substances on the REACH candidate list?

Globally Harmonized System of Classification & Labeling of Chemicals

GHS is a movement promoted by the UN to standardize chemical classification and labeling internationally through the use of pictograms, signal words and hazard warnings in order to improve comprehension and trade, and to reduce cost related to multiple testing and labels. Benefits will include reduced time and cost involved in meeting multiple regulations for labels; improving the comprehension and understanding of health and environmental hazards; facilitation of trade by removing barriers created by various safety and health requirements; and reduction of duplicate testing.

GHS lists 16 classifications for physical hazards

and 10 classifications for health hazards. Each classification contains one or more hazard categories for both physical and health hazards. Health hazards include routes of exposure. Mixtures (which include alloys) or solutions, as defined by GHS, are composed of two or more substances that do not react and will be included in the testing process (SiteHawk, 2008).

GHS defines a hazard statement as "a statement assigned to a hazard class and category that describes the nature of the hazards of a hazardous product, including, where appropriate, the degree of hazard" (SiteHawk, 2008). Examples of hazard statements are "highly flammable liquid and vapor"; "toxic in contact with skin"; and "harmful to aquatic life." GHS has standardized these hazard statements and assigned each to relevant hazard categories.

Standardized precautionary statements will help to ensure that all product users will know and understand proper precautionary measures when working with the chemicals. These statements will be listed under four categories as appropriate: prevention, response, storage and disposal. Examples of each respectively are: "Keep only in original container"; "In case of fire: use . . . for extinction. Manufacturer/supplier or the competent authority to specify appropriate media if water increases risk"; or "Store in well-ventilated place. Keep cool." In the case of disposal, a more general statement is listed: "Dispose of contents/container to . . . in accordance with local/regional/national/international regulations (to be specified)" (UNECE, 2005).































The expected impact on U.S. business deals involves several issues: understanding the regulation, meeting the SDS and labeling requirements, and training employees on interpreting SDS and labels. To assess a facility's preparedness for this regulation, consider these questions. If I author product MSDS, how can I cost effectively rewrite all of them? Is there a system that will efficiently provide the required precautionary statements, pictograms and hazards classifications for the SDS? Can I get a system that will provide the new 16-section SDS form? Where can I obtain a labeling system that will print GHS-compliant labels? Can I obtain a labeling system that will pull data from the MSDS so it need not all be reentered? What resources are available to provide GHS training to employees? Is there a resource to help the site transition between its existing authoring, labeling and raw MSDS systems until such time that most chemicals/products have been classified following GHS requirements?

Technology Options & Their Benefits

Computer technology has been a key factor in reducing the time and effort required for routine business tasks. Spreadsheets make mundane calculations quick and easy. Word processing templates expedite document formatting. Presentation software allows for quick updates and elimination of overhead transparencies.

As with all aspects of technological development, advancement occurs in stages. Originally, most busi-

This timeline shows how the GHS has developed and will continue to be implemented around the world.

2015	 May 31, 2015 (EU) – Expected deadline for mixture reclassification after entry into force
	 June 1, 2015 (EU) – The current Directives on classification, labeling and packaging, i.e. Council Directive 67/48/EEC and Directive 1999/45/EEC, will be repealed
2010	 Nov. 30, 2010 (EU) – Expected deadline for substance classification according to the Globally Harmonized System of Hazard Classification and Labeling (GHS), after the rule is entered into force in the EU
2009	 2009 (EU) – Expected entry into force of Directive COM (2006)852 on the inland transportation of dangerous goods. On the same date, the biennial updates of relevant international agreements will enter into force. The directive will make direct reference to the relevant legal instruments implementing the provisions of the UN Model Regulations on the transport of Dangerous Goods by road, rail, and inland waterways (i.e.: the European Agreement on the Transport of Dangerous Goods by road (ADR) and by inland waterways (AND) and the Regulation concerning the international carriage of dangerous goods by rail (RID)
2008	 2008 (EU) – Adoption and entry into force of the GHS-implementing Regulation (Regulation of the European Parliament and the Council on classification, labeling and packaging of substances and mixtures, and amending Directive 67/548/EEC and Regulation (EC) No 1907/2006)
	 2008 (Australia) – Target Date for declaration of a new GHS-based framework for the control of workplace hazardous chemicals
	 2008 (IFCS) – Intergovernmental Forum on Chemical Safety adopted an implementation goal of 2008. The US participates in this group and has agreed to work toward this goal
2007	 Jan 1, 2008 (US) – US DOT Updates 49 CFR to align with 14th edition UN Model Regulations and international modal regulations
	 2007 (US/DOT) – Transport regulations aligned to the GHS
	 Dec. 14, 2007 (UN) – 14th session of the Subcommittee of experts on the GHS held in Geneva
	 July 2007 (UN) – 2nd revision to the GHS is published (includes standardized precautionary measures and more)
	 July 10, 2007 (Ireland) – Invited public to submit comments on the EU draft proposal through the HSA's public consultation web page. Comments to assist in the development of the national position and inform the negotiating team at the EU discussions.
	 July 7, 2007 (UN) – 13th session of the subcommittee of Experts on the GHS was held in Geneva
	 June 27, 2007 (EU) – Adopted a proposed act that aligns the EU system of classification, labeling and packaging substances and mixtures to the UN GHS.
	 May 31, 2007 (Japan) – Deadline for most mixtures and substances to meet GHS
	 March 15, 2007 (Australia) – Closed public comment period
	2006
 Nov. 1, 2006 (US/OSHA) – ANPR Public comment period was closed	
 Oct. 21, 2006 (EU) – Closed the public comment period	
 Sep. 21, 2006 (US/OSHA) – Published an Advanced Notice of Proposed Rulemaking (ANPR) and opened it to public comments	
 Feb. 23, 2006 (Canada) – Published a sector analysis	
2005	 Sep. 1, 2005 (US/OSHA/EU) – Discussed GHS implementation at a joint conference on occupational safety and health, completed a pilot project related to GHS.
	 May 16, 2005 (US/OSHA) – Indicated the Hazard Communication Standard would adopt many of the GHS components.
2004	 Dec. 10, 2004 (UN) – 2nd session of the subcommittee of experts adopted amendments to the GHS which included various revised provisions concerning classification and labeling, new provisions for aspiration hazards, new guidance on the use of precautionary statements, pictograms, and the preparation of safety data sheets.
	 Aug. 1, 2004 (US/EPA) – Provided white paper related to application of GHS to pesticides in US. Some key components of the white paper were: how pesticides will be covered (some will be unclassified); adoption of GHS for all hazard classes currently labeled; generally limit changes to those required for GHS consistency; commitment to HAFTA technical working group on pesticides 5 year strategy; and info regarding other international and interagency coordinating efforts and outreach.
2003	 Aug. 1, 2003 (Canada) – Published a situational analysis, which compared the existing systems in Canada to the GHS and identified possible issues for discussion during the implementation of the GHS in Canada.
	 2003 (UN) – The 1st edition of the GHS was published and made available to implement.
2002	 Dec. 1, 2002 (UN) – The first Edition of the GHS was approved by the UN
	 Sep. 26, 2002 (UN) – A plan of Implementation (para22.(c)) was adopted in Johannesburg, the World Summit on Sustainable Development (WSSD) encouraged countries to implement the new GHS as soon as possible, with a view to having the system fully operational by 2008.
1999	 Oct. 26, 1999 (UN) – By resolution 1999/65 United Nations Economic and Social Council decided to enlarge the mandate of the Committee of Experts on Transport of Dangerous Goods to include the Globally Harmonized System of Classification and Labeling of Chemicals (CETDGGHS), and to create a new Subcommittee of Experts on the GHS.
1992	 1992 (UN) – An international mandate to develop a Globally Harmonized System for Hazard Classification and Labeling was adopted at the United Nations Conference on Environment and Development (UNCED).

nesses ran programs as client-server applications. The database and business logic was loaded onto the business' server while the interface and client logic for the application was deployed to users' desktop machines. The application and subsequent updates were purchased, and internal information technology personnel had to maintain and troubleshoot the software issues, deploy application updates to every user's desktop machine, ensure database integrity and perform data backups. All of this was done at the expense of the software customer.

Today, computer applications can be purchased from a vendor and accessed from an Internet browser. Because the actual application resides on a server managed by the vendor, the need for internal IT resources is minimal. Two common types of systems that fall under this category are application service provider (ASP) and software-as-a-service (SaaS). Both can improve efficiency at reduced costs.

ASP and SaaS applications are delivered via the Internet. However, many systems currently sold under the ASP name are actually applications that were originally built for client-server distribution and later revamped to include an HTML front end that allows them to be distributed via the Internet. This means that many ASP systems still require some software to be installed on local machines and, therefore, require internal IT support for maintenance and updates. ASP does have the benefit of reduced direct costs involved in purchasing hardware, such as high-powered servers.

An SaaS application is the second generation of ASP and is built specifically for Internet distribution. All hardware and application-related software is, therefore, housed and maintained by the vendor. Updates are applied by the vendor without a need for any real interaction from the client and are usually included in licensing fees. Additionally, the need for special client-side software is likely eliminated, as most SaaS applications run with standard software, such as an Internet browser. Due to their nature, SaaS applications can be customized to meet the client's needs more readily than a true ASP application.

Use of web-based applications allows for outsourcing of specialized business functions to technological experts without draining an internal resource—giving staff SH&E professionals more time to focus on core competencies. Included in that philosophy is the expectation that the provider employs IT experts who focus on single-application development and associated upgrades and maintenance, resulting in a more sophisticated application than most in-house IT personnel could develop.

Because the purchase of web-based technology transfers much of the work to the vendor, it is important to diligently interview the vendor to ensure that it truly is an expert in the field and has a good grasp of the industry and the client's needs. Factors that should be considered when purchasing web-based systems include the following:

- data security;
- data accessibility by internal and external parties;

- data ownership;
- back-up processes in the case of server failure and catastrophic event;
- training and technical support;
- application accessibility and ease-of-use.

Because IT terminology is not fully standardized—for instance, ASP can mean application service provider or active server pages—the end-user must understand how the system works and ensure that the terminology used by the provider is clearly defined. A behind-the-scenes understanding of the application is needed as well to ensure that services are delivered as expected. Finally, a clear understanding of basic system functionality will ensure that funding allocated will directly result in having the technology vendor provide the capabilities required to meet business needs.

Web-Based Technology: The Flexible Solution

The compliance needs of an SH&E department are many and varied—from training, to inventory management and regulatory reporting. As web-based software becomes more prevalent, complete technological answers tailored to specific needs are available. The following discussion considers several areas—chemical inventory management, regulatory management, multilanguage/multicountry management and product MSDS management.

Chemical Inventory Management

Chemical inventory is an essential step in the overall goal of corporate compliance. It involves multiple areas, from physical inventory to MSDS management to internal approval of purchased chemicals.

Physical inventory might be the key to compliance as the employer must know what is on site and must accurately and compliantly track data. Recent advances in web-based technology can assist in this process. The actual physical inventory can be conducted using handheld computers that allow for bar-code scanning and the actual input of chemical and quantity information for those chemicals—even when the chemical label is missing or illegible. The right system will also allow the site to track quantity and location within the facility. Location information should be customizable to the facility's specific requirements.

The software on the handheld can be built to interface with the web-based system for consistency and integration. After the information is entered at the site of the actual chemical, it can be integrated (or synced) with the web-based system. The integration is automated, requiring fewer personnel to complete the task, which results in a more efficient inventory. Additionally, eliminating duplicate data entry and touch points helps reduce the possibility of human error. Wireless technology is also improving and will soon allow for instant access from handheld computers/scanners to web-based server applications from anywhere in the facility, making integration and inventories even more efficient.

After performing an accurate on-site inventory,

obtaining recent MSDS for each chemical and accurately tracking the associated data is the next step. MSDS management has benefited from technology for quite some time—from spreadsheets that record on-site inventory and help organize notebooks, to fax-back services and internal client-server applications. Each option offers some benefit, but most are lacking.

- Hard copy management of MSDS in binders makes maintaining the data on paper MSDS difficult and generally requires an additional technological solution. Hours can be spent creating advanced databases containing detailed property information in a spreadsheet in an effort to track data for later reporting.

- A fax-back service introduces issues related to telephone line access and limited availability, which can result in failure to meet OSHA compliance.

- An internal computer application calls for the most resources, requiring IT and SH&E resources to create, maintain and update the system. Because the regulatory community is currently in a state of flux, it can be difficult to keep an internal application compliant with regulations.

- Vendor-supplied client-server applications introduce maintenance issues and often require extensive software and hardware purchases, adding to cost.

Web-based technology has become the most cost-effective and efficient means of managing these challenges. Finding a vendor that supplies the needed level of MSDS management—whether it involves basic HazCom compliance or more detailed global regulatory compliance—is essential.

As noted, most true SaaS applications can be tailored to specific needs, which results in significant cost savings. Associated hardware/software and related personnel overhead are avoided, and the extended ability to purchase only the level of service needed helps a company avoid overpurchasing unnecessary modules and services. Because SaaS systems are adaptable, they can usually be integrated with other processes, such as the physical inventory module mentioned earlier.

Software that allows for multiple user levels also facilitates compliance. Based on need, information can be presented in a clear, concise manner—from workplace labels to MSDS summary information—to help employees quickly access and understand hazardous chemical data. When information is presented consistently at the appropriate level, compliance training becomes more efficient and effective. This will become more important as training to incorporate GHS begins.

One benefit of web-based software is the global accessibility it affords, particularly when dealing with banned chemicals and the approval of chemicals before purchase. Corporate SH&E personnel can approve chemicals from anywhere in the world before purchase. Additionally, web-based systems can easily link worldwide facilities, providing a birds-eye view of corporate vendors and allowing for vendor consolidation. The result is lower costs and improved compliance.



If a technological solution is in place for MSDS management and chemical inventory control, using the associated data for regulatory compliance is a logical next step.

Regulatory Management

Regulatory management is a complex, detailed portion of the SH&E role. Regulatory compliance in North America alone includes many levels of reporting and material tracking, from Title V/air permitting to SARA reporting for Tier II and Form R-TRI, to industrial hygiene sampling and assessment to inventory review, and more. Depending on the corporation's size, the list of regulatory compliance needs can be extensive. Finding a system that is scalable and adaptable to specific needs based on new and changing regulatory requirements is imperative.

If a technological solution is in place for MSDS management and chemical inventory control, using the associated data for regulatory compliance is a logical next step. Based on regulatory needs, an SaaS vendor for MSDS management can typically provide deeper levels of service. An integrated system should allow for one-point entry and requires a robust database that allows for cross-referencing of data against regulatory lists (such as DHS and REACH), data searching and report integration.

When a chemical is entered into the database and the MSDS data indexed, the use of that data should be leveraged by all areas of SH&E compliance. Physical properties should be searchable, advanced regulatory reporting mechanisms should use data to determine which chemicals are reportable and they should insert reportable information (such as location data) already tracked by the system. Regulatory lists should also be cross-referenced to help determine what hazardous materials are on-site and where they are located at any moment.

When the MSDS is lacking information, systems with advanced algorithms can use available data to assist in the actual classification of a product, resulting in more comprehensive hazard assessment. If the inventory system tracks quantities and is integrated with the regulatory compliance system,

importing that quantity data into a regulatory report will reduce time spent and the potential for human error, and eliminate redundancies.

As with MSDS management, multiple technological solutions are available for regulatory management. Solutions range from internal, in-house client-server applications to SaaS applications. One benefit of using a web-based system for regulatory compliance is the assurance of updates. As noted, the regulatory climate is dynamic. Partnering with a vendor that has regulatory expertise and can ensure that the software features the latest regulatory requirements, list updates and reports is key to meeting compliance goals. Those involved must also understand the costs associated with such updates to ensure that overhead remains in a manageable range.

Multilanguage, Multicountry Management

As corporations expand globally, the selected system must be scalable and flexible enough to allow for the addition of facilities and their associated languages and regulations. Interfaces as well as data will need to be presented in the local language of the personnel. It may be difficult to find one vendor that can support every possible language necessary. Therefore, a better option may be to find software that allows for fast translation of interfaces and related fields into the necessary languages. Understanding the costs associated with such upgrades and the internal resources needed to apply such changes will be important. An SaaS vendor should be able to supply such translation services efficiently and should manage all associated hardware and software updates with limited strain on a company's internal resources.

Multiple versions of MSDS must be tracked to ensure that employees have access to necessary data in a language they understand. In the case of a multinational company, it will likely be difficult to find suppliers able to provide an MSDS in every language used by corporate personnel. The detail of data tracked by the software as well as interface translations offered will help ensure that all personnel can access MSDS-related data in their local language. SaaS applications that support local languages will allow for user-based language preferences without forcing a high level of redundancy. If a database is delivered via the Internet, software can be built so that every user views the same data in the language they prefer, based on specified preferences.

Finally, tracking appropriate data based on regulatory needs of a specific country within which business is conducted is also necessary. The vendor should understand the implications of conducting business in, for example, an EU state (e.g., the software should track information necessary for REACH and GHS compliance, such as hazard statements, precautionary statements and associated pictograms).

SaaS flexibility provides for user-based preferences, so the information can be tailored to a specific user's location. A web-based system can be designed so that each person in a corporation can view the same chemical, but only view the data nec-

essary for his/her specific scenario. For example, a person in Ohio may not need to view the same pictogram as a person in Ireland. The employee in Ohio can view ANSI symbols, while the individual in Ireland can view EU pictograms, and both can view GHS pictograms.

Product MSDS Management

Authoring compliant product MSDS is also an extensive task, especially when products are exported internationally. With the adoption of GHS, the assessment of data and related classification will be greatly modified. As a result, most product MSDS will need to be updated, as will most authoring systems.

With GHS in particular, the first step is to examine the implementation timelines in the countries in which an organization conducts business. The next consideration is the fact that SDS will need to be updated to match the 16-section format required by GHS and must include the standardized hazard classification, precautionary statements and pictograms. In addition, workplace labels will need to be GHS compliant.

The benefits of a web-based application are similar to those in the other areas of regulatory compliance. A system that is maintained and updated by a vendor with personnel who specialize in technology saves internal resources. Updates to regulations can also be managed and applied by the vendor (which again highlights the need for the vendor to understand the complex requirements involved in authoring MSDS). Because of the nature of web-based technology, implementation is much easier and more streamlined with no software installation needed. Additionally, many systems come with prepopulated phrase libraries and integrated resources to help the user begin document creation much faster.

A web-based system also provides instant, linkable access to external resources (e.g., NIOSH, OSHA). It should also supply extensive international regulatory support, tracking and classifications. SaaS applications typically allow for extensive regulatory lists and cross-references to be included on a per-document basis, based on export requirements for that product. Another export consideration is the ability to produce a document in multiple languages.

Web-based accessibility allows many users to work on the same document, based on specified document preferences. This allows each business unit to enter its own information, so each unit can specialize while creating a team authoring approach. To do this, the system must feature advanced document control, organization and version management.

Integrated web-based systems can also easily distribute authored data sheets once complete, making distribution a one-click action. Secure web hosting can make product MSDS available to customers directly from a corporate web page. A deeper level of service would allow for customer profiles and preferences linked with their specific purchasing histories. A web-based system can also automatically provide customers with MSDS as they are revised, helping meet compliance goals for both the supplier and user.

Conclusion

With the increasing complexity of global economics, international regulations and multiagency reporting requirements, a company should seek a system that provides SH&E staff with 100% due diligence for meeting the requirements—while also removing the increased requirements from their already full plates. In the long run, a company will save time and money and allow its staff professionals more time to focus on core competencies, such as incident reduction, assessments, and proactive environmental and safety measures. ■

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