Mastering Environmental Tasks Using Compliance Management Tools

Chemical Engineering, October 2002

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October 1, 2002
Throughout the chemical process industries (CPI), many companies have found that traditional methods of complying with environmental requirements—in particular calculating emissions and managing recordkeeping, and reporting—have become unacceptably time consuming. The compliance demonstration challenges are compounded when a company has multiple facilities for which to track and warehouse compliance information. These facilities may be located in different states and may operate varied types of equipment that have different regulatory requirements. In an effort to streamline the arduous compliance demonstration progress, many organizations are turning to compliance management tools. In order to implement such a solution, companies must assess the scope and focus of their environmental data management needs and employ a thorough planning process for developing the best site-specific tool.

**IDENTIFYING YOUR REQUIREMENTS**

During the course of routine chemical process operations, responsible officials must undertake the labor-intensive process of managing the constant flow of data associated with their organizations’ environmental monitoring, recordkeeping, and reporting obligations. Before developing a compliance management tool, companies must evaluate all of the data management tasks associated with these requirements.

**Calculating Emissions**

CPI facilities are required to perform routine emission calculations for a wide variety of reasons. For instance, most petrochemical manufacturing facilities, for example, must report emissions annually as a part of a state or local agency’s emission inventory program or through the U.S. Environmental Protection Agency’s (EPA’s) Toxic Release Inventory (TRI) Program. Facilities must also often calculate emissions on a more frequent basis (e.g. monthly) to demonstrate compliance with permitted emission limits. And, facilities must typically calculate and report short-term emissions from episodic conditions such as upsets, startups, shutdown, or malfunctions as well.

**Managing Recordkeeping**

Recordkeeping activities are required to comply with the diverse regulations that apply to a facility, and with the site-specific operating permit conditions that are issued to authorize construction and operation of the facility. For example, a facility that operates a flare as a control device will be required
to maintain records of any periods during which the flare pilot flame is no burning. Meanwhile, in the state of Texas, a common permit requirement for petrochemical facilities with fugitive emissions is to maintain on-site records of all instrument monitoring and maintenance activities associated with the piping and connection components.

Under Title V of the 1990 Clean Air Act Amendments, EPA mandated that each state develop an operating permit program for all “major” sources of emissions. These operating permits require facilities to annually certify compliance with all applicable requirements and report any compliance deviations every six months. A large chemical processing facility might have as many as 40,000 requirements applicable to its various processing units and emission sources. The most efficient way to demonstrate compliance with these requirements is through the use of a rigorous document management and recordkeeping system.

**Compliance Reporting**

Reporting activities play a very large role in day-to-day environmental operations at industrial facilities. Many of the programs mentioned above require some sort of submittal to an environmental agency (emission inventories, TRI reports, Title V deviation reports, and so on). Additionally, applicable regulations and permit conditions typically require a facility to report various activities on a routine basis. These activities include notifications whenever any performance testing or inspections of equipment are being performed.

**Compliance Management Tools**

A compliance management tool is simply any sort of system—typically implemented as a database application and user interface—that facilitates the data monitoring, tracking, reporting, and compliance activities described above. By specifically focusing on a relatively small set of functions, compliance management tools can often be developed on a small-scale cost and budget (compared, for instance, with more extensive underlying automation platforms used by CPI facilities, such as enterprise resource planning, or ERP, systems). Examples of typical functions that can be performed by compliance management tools include the following:

- Track regulatory deadlines of monitoring and reporting requirements
- Manage and document the status and completion of compliance-related tasks and records
- Calculate emissions from sources using operating data already electronically monitored or maintained by the facility
• Generate routine environmental reports for submittal to local, state, and federal agencies

As mentioned, many companies address large-scale data management concerns by implementing an ERP software package. A compliance management tool should not be considered a replacement to an ERP system; rather, it is an application that specifically focuses on performing designated environmental tasks. However, a well-designed compliance management tool can work in concert with an ERP by sharing or transferring data between the systems, thereby further increasing the value of the tool.

**Considering Automation**

While facilities can complete regulatory compliance demonstration tasks without the aid of a compliance management solution, utilizing this tool provides several benefits for CPI facilities. Compliance management tools enhance productivity by minimizing data and effort duplication and by optimizing environmental staff resources. In recent years, due to slack economic conditions, many environmental managers have been forced to limit or even reduce the number of personnel who are dedicated to performing these duties. By developing a compliance management tool to streamline these processes, existing personnel will be better equipped to effectively achieve all of their facility-wide environmental tasks.

Another benefit of implementing such tools is the ability to take advantage of other electronic systems. Often, the process data necessary for calculating emissions are already being tracked and stored in other software systems. A well-designed compliance management tool can in many cases interface directly with these systems to extract the necessary information. Examples of process data being tracked by other systems include fuel use of a boiler and product throughput for a storage tank. When data are not already stored in other systems, a compliance management tool can minimize manual data entry by using a single data entry point for multiple results. For example, a facility may be required to record daily throughput to a storage tank for both emissions calculations and as a provision of a permit condition. In this case, the environmental staff could enter the daily throughput information once and access it for both reports.

Perhaps the most important reason for utilizing a compliance management tool is to potentially reduce the risk of incurring a compliance enforcement action. As facilities must maintain more and more records necessary to document compliance, they become increasingly vulnerable to noncompliance determination during a site inspection. The financial ramifications associated with this determination can be severe. For example, a chemical company in Texas was recently fined $750,000 for
failing to maintain records, comply with emission limits, and provide required notifications to the governing regulatory agency, among other violations. While a compliance management tool cannot guarantee that an organization will avoid these sorts of violations, a well-designed tool can assist in performing calculations, tracking compliance activity deadlines, and generating reports and other notifications.

**The Key to Getting Started**

When electing to develop and implement a compliance management tool, organizations should undertake a thorough initial planning process. This effort will shape the final developed product and will ultimately determine the overall success or failure of the tool.

1. **Set specific requirements for the tool’s capabilities.** In developing a compliance management tool, companies may be tempted to start building the solution without properly defining the site-specific challenges. If an organization does not clearly outline the regulatory requirements for which it is developing the tool, then it will have a difficult time revising the tool as new ideas are considered, which can lead to delayed project schedules and increased project costs. On the other hand, it is important to set realistic goals for the tool without being too ambitious. Trying to build the ultimate compliance tool—one that is capable of performing every environmental task required at a facility—without considering project costs or available technology will likely result in an unsuccessful product.

2. **Plan for future considerations.** To be successful, a compliance management tool must anticipate the user’s future needs. A well-designed tool will have the proper infrastructure to readily allow for new functionality (new calculations, additional reports, etc.) without requiring redevelopment of existing functions or design. During the planning stages, it is also important to consider what will happen when external changes occur. These changes could include changes to the facility, such as new or modified emission sources, or changes related to regulations, such as amendments and new requirements.

3. **Consider external factors within the organization.** During the planning stages of compliance management tool development, companies should consider other key resources within their organization. For instance, if the tool will be interfacing with other data gathering systems, organizations should involve operational and technical resources to ensure that the project will not interfere with normal activities, and to identify the best way to connect the relevant
systems. Or, if the compliance tool needs to be developed for a multi-user environmental, it is important that the IT personnel are involved, as they will most likely be the ones responsible for maintaining the system.

4. **Plan big but start small.** A typical criticism of developing a management system is that the process takes too long and costs too much before an organization begins to realize the benefits of the tool. To counteract this concern, it is important to divide the development cycle into discrete increments and periodically roll out portions of the tool for testing and use. A phased system rollout allows staff to begin using the system much sooner and to appreciate the benefits of the fully completed tool sooner. A good example of a phased rollout is to develop a compliance tracking system that initially only allows users to manually log completion of compliance activities and generate reports from a system. As this system is tested and used, functionality can be developed to allow communication with electronic data gathering systems at the facility in order to automatically determine when emission limits or regulatory standards are met.

5. **Establish robust documentation procedures.** Compliance management tools are rarely static solutions. Over time, new functional requirements or changes to the facility will arise, creating a need for revisions to the tool. Without the proper documentation, even the original developer of the tool will find it difficult to make the necessary changes without expending a significant amount of resources. Although the effort required to fully document all aspects of the compliance management tool design will increase the up-front development cost and schedule, it will ultimately increase the overall longevity and success of the solution.

An electronic compliance management tool can be a valuable resource for achieving environmental tasks. The ability to streamline and automate everyday calculations, recordkeeping, and reporting requirements can effectively enhance productivity within a CPI facility, while minimizing the potential for compliance issues. Through sound planning and design, organizations can achieve these goals on a small-scale schedule and budget.