

## Best Practices: Expert Opinion

# An Interview with Industry Expert Jeff Tarter about Hazardous Materials Management

*Today's business operates in a complex and challenging environment that must be carefully managed and monitored to assure safety at all levels. This assurance starts with the building design and carries on through hazardous materials management, from receipt to storage to disposal. Because the regulatory requirements surrounding these issues are constantly changing, many firms hire outside help to ensure compliance. Integrated Engineering Services (IES) is one such specialist organization and principal Jeff Tarter is one of their key consultants in hazardous materials management.*

### **Q: What kind of guidance does an engineering firm like yours provide?**

**Jeff:** Engineering firms can provide not only guidance but expertise and support. Our firm specializes in facility development, process engineering and code compliance. We provide expertise for every stage of the engineering process, from initial planning and design through construction and installation.

More specifically, with regard to hazardous materials, we examine how an organization is collecting inventory data and ensure it is populating the database correctly and optimizing the data collection format. On the back end, we help to interpret the data and facilitate the reports. We work with architects and designers on ways to make the information more complete and if we discover any issues with the data, we can assist in resolving those issues.

If the organization is out of compliance, we suggest areas where it can implement controls. In this case, we might work with both the EH&S [Environmental, Health & Safety] people as well as the waste haulers to initiate more frequent waste pickups. We might install quantity limits for materials on site, or suggest alternative materials for controlled substances that have Department of Homeland Security [DHS] or FDA restrictions.

For example, the classification for a concentrated form of a material may be different for other formats. Sulfuric acid is used in many labs for pH control or waste treatment. It is a Class 2 Reactive and has stringent restrictions covering its use. However, if it is present in less than 50 percent concentration it becomes a Class 1 Reactive and will have fewer restrictions.

We might suggest that the labs have separate control areas for a substance. Or we could examine the engineering controls and suggest alternatives. For instance, a lab with ten HPLCs [High Performance Liquid Chromatographs] – each of which has a five gallon waste container – might be better designed with a closed waste collection system to get the material out of the lab. The goal is to control material quantities against the maximum allowable quantities for the lab.

Everything is compliance-driven. We devise ways to reduce material quantities in the lab and limit the handling of those materials, thereby reducing the total amount of material on site.

### **Q: What do organizations need to consider when addressing safety?**

**Jeff:** For starters, in an existing building, the laboratory environment itself must be examined to create as much built-in safety as possible in order to minimize damage and injury in the event of

human-error. Fire code regulations, for instance, were developed to ensure protection from fire hazards by requiring specific material storage, handling and disposal activities. There have been several changes to building and fire codes to improve safety, such as the modern requirement for fire-related control areas. In addition, modern construction materials are often designed to make buildings more burn-resistant.

**Q: Tell us more about fire and building code regulations...**

**Jeff:** There are national fire codes, international fire codes, state codes and more. Most states have building codes that also address fire safety issues. Right now, most current state building codes address use and occupancy issues, building heights and building egress issues that are tied closely to the state fire codes. For instance, use and occupancy issues now define occupancy based on use and not on occupant load. In addition, occupancies are subdivided into ten groups--one of which is hazardous occupancies.

Hazardous occupancies are in turn further defined by use--such as whether the building performs semiconductor fabrication (which falls into sub-group H5) or health hazards (which falls into subgroup H4), etc. California has also created a special occupancy Group L to address the hazards and safety concerns unique to R&D laboratories. Based on the category in which the site or building falls, there are maximum allowable quantities of hazardous materials, such as flammable liquids, for designated control areas at the site.

**Q: What's the best way to address fire code safety and reporting?**

**Jeff:** It needs to be a team effort. One department alone cannot solve the challenge of addressing hazardous materials management in a way that meets code requirements. For example, the lab may be involved in purchasing materials, but it is not the central authority. Typically only bits and pieces are known by each individual, and there is incomplete knowledge of the full inventory picture anywhere in the organization. Achieving a complete understanding of the inventory on site is a team effort involving laboratory management, facilities management, inventory management, and EH&S.

When determining inventory information for a new site, EH&S can't provide the reporting information regarding chemicals without working with the lab to define what chemicals are necessary for the work planned. Facility managers need this data to submit with the construction plans in the case of new buildings or with ongoing reporting requirements for existing sites. Accurate inventory must be performed and reports provided on the inventory data for every building.

Whenever an organization makes any plans for improvements, such as a lab remodel, the plans need to go to the local building and permit departments, to the county health department division of toxic substance control, and to the fire department.

The same data used for inventory summaries is used in the reports to these entities. However, most people don't gather enough data during inventory to generate complete reports. Reports need to include not only the quantity of material, but where it is located and how it is in use; i.e., in an open or a closed system. The way the material is regulated depends on how it is used, with different thresholds reporting units for the different types of systems. In addition, the building department often has higher thresholds than the county. This is where a real-time chemical inventory system makes a difference because you can back out summaries on a container level by individual materials or by hazard classification, and the data is very complete.

**Q: Has anything changed recently in regulatory reporting requirements?**

**Jeff:** The recently revised 2009 International Building and Fire Codes served as the model code for California. These were revised and published with state amendments as the 2010 California Codes and became effective January 1, 2011.

One of the recent revisions was the creation of new hazard classification categories for compressed liquefied corrosive, toxic and highly toxic gases. Previously, these liquefied gases were grouped with their gaseous counterparts. In addition, the units of measurement for reporting compressed liquefied gases--including flammable, oxidizing and non-flammable liquefied gases--was changed from cubic feet to pounds. This change was made according to an amendment sponsored by the Compressed Gas Association [CGA] since reporting of liquefied gases in cubic feet was problematic for manufacturers and consumers of industrial gases, and so as to be consistent with DOT reporting requirements.

Also, the Fire Code section 2701.5.2 Hazardous Materials Inventory Statement (HMIS) was amended to require the quantities being reported be broken out into storage, use-closed and use-open. Previously, this section only required the total maximum quantity be reported regardless of whether the materials were being stored or in use. This provides better information for Emergency Responders and clarifies the information that is to be submitted to determine compliance with the hazardous material requirements in IBC Section 414; e.g., hazardous occupancies. Corresponding changes were made to the IBC Section 414.1.3, which now requires that information similar to the requirements for an HMIS under section 2701.5.2 of the fire code be provided to the building official too. A chemical inventory system that can accommodate these provisions can greatly expedite the fire code reporting process.

Another change with the latest IBC revisions was the maximum allowable quantities--particularly for multi-story buildings where the quantities will be pro-rated depending on the floor you're on. You could have 380 ml of a substance on the first floor, but it must be halved on the second floor, halved again on the third floor and so on to remain compliant. The code becomes even more complicated in multi-tenant buildings. This increased code complexity will make manual inventory tracking and reporting extremely cumbersome.

The twist is that everything has a domino effect. Most code requirements are not retroactive. It is upon application for a permit that the building department will subject the building to new code. This is where companies like IES can help. Architects present building plans from a building perspective not from a code perspective, and many don't know how to extract code information from those building plans. IES ensures code compliant designs. We put inventory information in the package for planning purposes and ensure it is recorded correctly. Having this as part of the design package is extremely important. We work with the architect to create the code compliant drawings, to show that chemical use is in compliance with code, that existing plans are in compliance, and hazardous material drawings are included, etc. We know what building and county planners expect to see, so we can help walk the organization through this process.

*For more about hazardous materials management and regulatory compliance, please request a copy of Jeff's [Best Practices White Paper: How to Ensure Accurate Fire Code Reporting of your Chemical Inventory](#).*