HazMat Transportation

Navigating Training Requirements

By Ron Gantt

IN BRIEF

- **This article provides an overview of which employees within an organization are required to complete HazMat transportation training.**
- **Developing a compliant training program encompasses many regulations, including some overlapping mandates from different agencies and organizations.**
- **Integrating HazMat transportation training into existing training programs can help make those programs more effective and efficient.**

A sense of duty compels safety professionals to identify and control hazards, as do many regulatory standards. Understanding what rules apply and in what situations can seem daunting. Prime examples are the rules and regulations regarding the transportation of HazMats and dangerous goods.

To the uninitiated, navigating through DOT's Hazardous Materials Regulations (HMR), with its various requirements, special provisions and exceptions, may leave one feeling overwhelmed. Add to these mandates international regulations and standards, such as those from International Civil Aviation Organization (ICAO), International Air Transport Association (IATA) and International Maritime Organization (IMO), and the task seems even more challenging. The training requirements alone—identifying who needs training, what must be covered and how to best manage the program—can leave one frustrated.

Further raising the stakes is the fact that a minimum citation for a training violation is almost double the minimum for other violations, and maximum fines can reach into the hundreds of thousands of dollars for civil penalties, with the potential for criminal penalties, including prison time, for extreme violations (DOT, 2012). Furthermore, according to 49 CFR Section 171.1(g), violations can be compounded with each new day being a new violation. This can make failures to identify employees who need training costly.

Despite this, training violations remain among the 10 most frequently cited violations (DOT, 2012). This is partly because many agencies and groups monitor HazMat transportation. A nonexhaustive list includes Pipeline and Hazardous Materials Safety Administration (PHMSA), Federal Aviation Administration, Federal Motor Carrier Safety Administration, Federal Railroad Administration, U.S. Coast Guard, state transportation agencies such as Highway Patrol, international agencies and some local agencies. Governmental agencies on the periphery of HazMat transportation can have overlapping jurisdiction as well; EPA and its numerous state variations are a primary example (see the sidebar on p. 70).

Effective training is a pillar of successful safety programs. A study on the effectiveness of the California Injury and Illness Prevention Program (IIPP) regulations reported that training was the IIPP element most associated with a decreased injury rate (Mendeloff, Gray, Haviland, et al., 2011). Since training is such an important element of regulatory compliance and program effectiveness, safety professionals should strive not simply to meet minimum standards, but to identify areas where compliance can be leveraged into safety programs to prevent injuries and illnesses.

This article provides an introductory survey of training requirements found in the DOT HMR, as well as some international standards for the transportation of HazMats and dangerous goods. Suggestions for how these training programs can be managed and integrated into an organization's broader training are provided as well.

Identify Who Needs Training

One common area of confusion regarding training those involved in HazMat transportation is identifying who must be trained. For some organizations, the answer is obvious (e.g., a trucking company that hauls HazMat tankers). However, not every organization is so obviously involved in HazMat transportation, and even in those organizations for which the need for training is obvious, it may not be clear who specifically needs the training. Does everyone

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need to be trained or only the select few who manage the transportation programs?

The answer comes in the definition of *HazMat transportation.* The term should be separated into its two elements: 1) HazMat and 2) transportation, because if an organization is involved with one but not the other, HMR does not apply. For example, employees of a transportation company or a company that does not ship materials considered HazMats under HMR or other relevant regulations would not need to be trained. If a company frequently handles and stores HazMats but performs no functions that fall under the broad definition of transportation, then training is not necessary (DOT, 2012).

Hazardous Materials

Therefore, the first question that must be answered is, what materials are hazardous? The definition is somewhat complicated. 49 CFR 171.8 contains most definitions of terms found in HMR, and HazMats are defined as follows:

> *Hazardous material* means a substance or material that the Secretary of Transportation has determined is capable of posing an unreasonable risk to health, safety and property when transported in commerce, and has designated as hazardous under section 5103 of federal hazardous materials transportation law (49 U.S.C. 5103).
>
> The term includes hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions in part 173 of subchapter C of this chapter. (DOT, 2012)

Generally, a HazMat is anything DOT says is a HazMat, especially those materials that meet the definition of one of DOT's hazard classes or divisions. Given the complexity involved in classifying a HazMat, a thorough discussion is beyond this article's scope. Therefore, a company should consult applicable regulations, MSDS and the results of any additional analyses to conclusively determine whether materials it ships or transports are hazardous. Employees who perform this process must be thoroughly trained in applicable requirements of HMR and other relevant standards.

HazMat transportation training is an important element of the overall training for organizations involved in these functions.

Transportation

Once an organization determines that HazMats are, indeed, handled and stored, the next question is whether the functions that employees perform while handling and/or storing these materials would be considered *transportation* under HMR.

First, two clarifications related to this article are needed. *Transportation,* as regulated by HMR and other applicable standards, generally only applies to transportation in commerce. Thus, the transportation requirements generally apply only when HazMats are transported for business purposes. In accordance with 49 CFR 171.1(d)(6), private citizens who transport materials for personal, noncommercial purposes are not subject to HMR and need not be trained (DOT, 2012).

Furthermore, as used in this article, the word *transportation* can be substituted for *jurisdiction of the DOT HMR or applicable standard* because, technically, many of the functions performed by those who need HazMat transportation do not meet the technical definition of transportation as found in HMR. Therefore, the word *transportation* will be used as shorthand to note when an organization should comply with HMR or applicable standards for the balance of the article.

As noted, many organizations are clearly involved in HazMat transportation. If materials that have been determined to be hazardous in accordance with HMR are placed onto a truck, that truck's driver clearly is involved in transporting the HazMat.

If one views transportation as a timeline, those involved in the middle portions of the timeline are clearly involved in transportation and would, therefore, need training. The more difficult determinations involve the extreme ends of the transportation timeline. When does transportation begin and end?

49 CFR 171.1 contains definitions that provide some clarity. The first term, *pretransportation functions,* likely applies to many readers. Those who do not actually transport HazMats (e.g., drive the trucks, fly the planes), or whom HMR calls offerors or shippers usually fall within the pretransportation functions according to the regulations.

However, the regulations do not offer a specific definition for these functions. Instead, they contain a list of actions that would be defined as pretransportation functions. These include:

Agencies/Associations & Their Application to HazMat Transportation

U.S. Department of Transportation (DOT): U.S. agency with overall responsibility for developing and enforcing regulations for all forms of transportation under the jurisdiction of the U.S. federal government. Regulations are found in Title 49 of the Code of Federal Regulations (CFR).

Pipeline & Hazardous Materials Safety Administration (PHMSA): Agency within DOT that is chiefly responsible for developing and enforcing regulations specific to HazMat transportation within the U.S. Essentially, this is the keeper of the rules and regulations. PHMSA also has a small number of enforcement agents that perform inspections across the country. PHMSA regulations for HazMat transportation are specifically found in 49 CFR Chapter I, known as the HMR.

Federal Aviation Administration (FAA): Agency within DOT that assists in development of regulations for air transportation of HazMats within the U.S. Very aggressive in enforcement of the HMR as it relates to air transportation. Also has regulations specific to air carriers found in Title 14 CFR.

Federal Motor Carrier Safety Administration (FMCSA): Agency within DOT that provides for the development and enforcement of regulations specific to motor carriers. For HazMat transportation, FMSCA agents primarily enforce the HMR, but also have regulations found in 49 CFR Chapter III.

Federal Rail Administration (FRA): Agency within DOT that develops and enforces regulations specific to rail travel, primarily rail carriers. FRA enforcement agents also primarily enforce the HMR for HazMat transportation, but have additional requirements found in 49 CFR Chapter II.

U.S. Coast Guard (USCG): The only U.S. agency responsible for HazMat transportation that is not under DOT. After Sept. 11, 2001, USCG was moved to the Department of Homeland Security. However, USCG agents enforce the HMR, as well as maritime-specific requirements, such as 49 CFR Chapter IV.

International Air Transport Association (IATA): A nongovernment association of air carriers and stakeholders that develops regulations and standards for air transportation, including the transportation of dangerous goods (DG). Regulations for DG transportation are found in the IATA Dangerous Goods Regulations (DGR). IATA has no enforcement arm to enforce the DGR. However, IATA members can force their customers to follow IATA regulations in order to do business with them (e.g., FedEx for domestic DG shipments via air). Further, IATA regulations are designed to be at least compliant with ICAO (see below) regulations, giving them more legitimacy.

International Civil Aviation Organization (ICAO): ICAO is an organization under the UN, giving it less authority than a government agency, but more authority than an association such as IATA. ICAO has regulations related to DG transportation found in its Technical Instructions for the Safe Transport of Dangerous Goods. ICAO has no enforcement arm, but most UN member states have regulations that are very similar, giving organizations an incentive to comply with ICAO regulations for international air shipments.

International Maritime Organization (IMO): Like ICAO, IMO is under the UN. IMO regulates maritime transportation of dangerous goods using its International Maritime Dangerous Goods codes. IMO also does not have an enforcement capability, but its regulations are compliant with many UN member state regulations.

U.S. Environmental Protection Agency (EPA): EPA regulates the generation, handling and disposal of hazardous wastes. When hazardous wastes are prepared for transport and ultimately transported offsite, they are subject to both the HMR and EPA's hazardous waste regulations, found in Title 40 CFR Subchapter I.

- determining the hazard class of a HazMat;
- selecting HazMat packaging;
- filling a HazMat packaging, including a bulk packaging;
- securing a closure on a filled or partially filled HazMat package or container, or on a package or container with a residue of a HazMat;
- marking a package to indicate that it contains a HazMat;
- labeling a package to indicate that it contains a HazMat;
- preparing a shipping document;
- providing and maintaining emergency response information;
- reviewing a shipping document to verify compliance with HMR or international equivalents;
- for each person importing a HazMat into the U.S., providing the shipper with timely and complete information as to HMR requirements that will apply to the transportation of the material within the U.S.;
- certifying that a HazMat is in proper condition for transportation in conformance with HMR requirements;
- loading, blocking and bracing a HazMat package in a freight container or transport vehicle;
- segregating a HazMat package in a freight container or transport vehicle from incompatible cargo;
- selecting, providing or affixing placards for a freight container or transport vehicle to indicate that it contains a HazMat (DOT, 2012).

As stated in the regulation, this list is not inclusive. The basic rule is that if an employee directly affects the safety of HazMat transportation, then s/he should be trained.

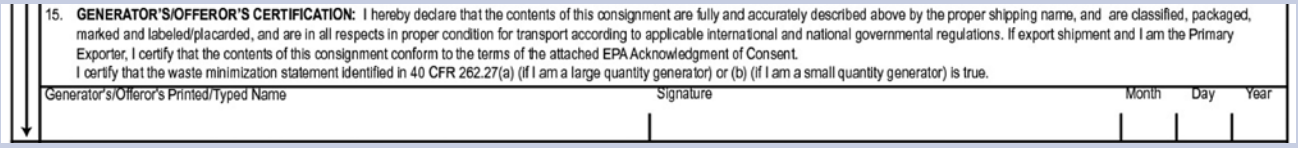
For example, consider the function of filling a HazMat packaging. Employees who place materials, such as hazardous wastes regulated by Resource Conservation and Recovery Act (RCRA), into packages that will be used to transport the materials off site are performing a pretransportation function and would need training. If employees sign a shipping document, such as a hazardous waste manifest, they are "certifying that a hazardous material is in proper condition for transportation"; they are performing a pretransportation function and would need training.

The other term in 49 CFR 171.1 that helps define the transportation timeline is *unloading incidental to movement of a HazMat,* which is defined as follows:

Unloading incidental to movement

Figure 1

Shipper's Certification Statement



15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name | Signature | Month | Day | Year

of a hazardous material. Removing a package or containerized hazardous material from a transport vehicle, aircraft, or vessel; or for a bulk packaging, emptying a hazardous material from the bulk packaging after the hazardous material has been delivered to the consignee when performed by carrier personnel or in the presence of carrier personnel or, in the case of a private motor carrier, while the driver of the motor vehicle from which the hazardous material is being unloaded immediately after movement is completed is present during the unloading operation. (DOT, 2012)

Note that the word *consignee* means basically the final destination where the material is being shipped. The HMR definition for unloading incidental to movement of a HazMat indicates that if unloading is conducted while the carrier or transporter is present, then unloading is considered to be part of transportation and is regulated.

The implication is that if the carrier leaves before the materials are unloaded from the vehicle or bulk package (e.g., railcar), then unloading actions are not considered to be transportation and, therefore, are not regulated. For example, if employees remove freight from a trailer with forklifts while the carrier is present, then those employees need training. If the carrier leaves the area, in the specific case of motor transportation, then those employees will not need training (DOT, 2012).

So, how can all of this be summed up? Painting in broad strokes, one can say that if a company has HazMats as defined by HMR or other applicable standards; has employees prepare materials for transport in a way that affects the safety of the shipment; has employees physically transport the materials; or has employees unload such materials when the carrier is present, then those functions are regulated and employees who perform these functions must be trained. While this is an oversimplification, as certain exceptions and limitations apply to groups (e.g., government agencies) and types of HazMats, it is a good overall rule.

HazMat Employee & HazMat Employer

Another way to consider this issue is to understand the definition of *HazMat employee* and a *HazMat employer.* One must understand these terms because the HMR training regulations (49 CFR 172 Subpart H, section 172.702) state that it is the HazMat employer's job to ensure that HazMat employees are trained (DOT, 2012).

According to 49 CFR 171.8, a HazMat employee is a person who meets one of the following definitions:

- employed on a full-time, part-time or temporary basis by a HazMat employer and, in the course of such employment, directly affects HazMat transportation safety;
- self-employed (including an owner-operator of a motor vehicle, vessel or aircraft) transporting HazMats in commerce and, in the course of such self-employment, directly affects HazMat transportation safety;
- a railroad signalperson;
- a railroad maintenance-of-way employee (DOT, 2012).

Again, HMR relies on the general approach that if an employee directly affects the safety of HazMat transportation then that person is a HazMat employee and should be trained.

The definition for HazMat employee lists examples of functions such an employee may perform:

- loads, unloads or handles HazMats;
- designs, manufactures, fabricates, inspects, marks, maintains, reconditions, repairs or tests a package, container or packaging component that is represented, marked, certified or sold as qualified for use in transporting HazMats in commerce;
- prepares HazMats for transportation;
- is responsible for safety of transporting HazMats;
- operates a vehicle used to transport HazMats (DOT, 2012).

Another aspect that needs clarification is the definition of a *HazMat employer.* A HazMat employer is any person who employs HazMat employees, is self-employed or is a government agency that:

- transports HazMats in commerce;
- causes HazMats to be transported in commerce;
- designs, manufactures, fabricates, inspects, marks, maintains, reconditions, repairs or tests a package, container or packaging component that is represented, marked, certified or sold by that person as qualified for use in transporting HazMats in commerce (DOT, 2012).

Thus, a company is a HazMat employer if it has HazMats that it either transports or causes to transport, or if it is involved in package manufacturing. A HazMat employer must ensure that its HazMat employees are trained.

No doubt, this can be confusing. So, let's consider some real-world examples based on the author's experience.

Example #1

An employee signs a hazardous waste manifest after a company's hazardous waste hauling/disposal company prepares the RCRA hazardous wastes for disposal by ensuring that the material is packaged appropriately, classified, marked, labeled and placarded for transportation.

The hazardous waste hauling company completes the manifest except for one section, the em-

An employee who signs a hazardous waste manifest must be considered a HazMat employee and must be trained appropriately.

Figure 2: The regulatory designation of consumer commodity is no longer allowed for air shipments and is being phased out for ground transportation.

ployee signature box. Does an employee need to be trained simply to sign a piece of paper?

Yes. The document is more than simply a piece of paper; it is a hazardous waste manifest. As shown in Figure 1 (p. 71), the wording in block 15 is taken directly from DOT regulations; it is known as the shipper's certification statement. This means that even though the hazardous waste hauling company prepared the hazardous wastes, the employee and his/her employer are responsible if the hazardous waste hauler makes a mistake. Therefore, the employee who signs such a manifest must be considered a HazMat employee and must be trained appropriately.

Example #2

A distributor ships brand-name household cleaning products that are intended for consumer use. Therefore, they are not considered HazMats. So employees do not need training to ship them out, right?

Wrong. A review of the SDS for the products reveals that most met the definition of a HazMat, primarily because of hazards such as corrosivity. Typically, these types of consumer products are allowed to be shipped using various exceptions.

However, readers whose companies handle such products should be aware that these exceptions are in the process of being changed. For example, at the time of this writing, the regulatory designation for a consumer commodity (Figure 2) is no longer allowed for air shipments and is being phased out for ground transportation. Regardless, even if these shipments are considered consumer commodities, the exceptions do not exempt the employer from the requirement to ensure that employees are properly trained.

Example #3

An environmental consulting company provides a vehicle emergency kit to its consultants who travel regularly. The kit contains items such as fire extinguishers and road flares, both of which are regulated HazMats. Do the consultants have to complete DOT HazMat training because the company provided them these kits?

No. These materials would fall under the materials of trade (MOT) exception found in 49 CFR 173.6. In terms of training requirements, the MOT exception only requires that employers inform employees about the presence of the materials and the basic requirements for transporting an MOT. This example reflects the fact that little is clear-cut when it comes to HazMat regulations.

Designing a HazMat Transportation Training Program

Once a company confirms that it is a HazMat employer and that it must train employees accordingly, the next step is to determine how they should be trained. The best starting point is 49 CFR 172 Subpart H, which defines HMR training requirements and includes some important provisions about developing and delivering training.

The basic requirement is to ensure that HazMat employees are adequately trained (DOT, 2012). While this may seem obvious, an employer must understand the implications of this requirement. Many organizations send employees to training courses taught by third-party instructors or consultants. If those trainers provide poor and/or inaccurate training, the HazMat employer is the one that failed to make sure its HazMat employees were properly trained; as a result, the employer can be cited, not the third-party trainer.

Therefore, a HazMat employer must ensure that training delivered meets the requirements of HMR and other applicable standards. This is not to say that third-party trainers cannot be used, only that they cannot be used to avoid responsibility.

Training must be provided to all new employees and those who change job functions to become HazMat employees within 90 days of employment. If the employee must perform functions regulated by HMR before s/he is trained, this is allowed as long as the individual is supervised by an employee who is knowledgeable and able to ensure that the nontrained employee's work is performed in accordance with HMR requirements. Once trained, employees must receive refresher training every 3 years. This training must cover the same elements covered in the initial training course.

Another general requirement is that trainees must be tested (DOT, 2012). Section 172.702(d) is not specific about test methodology, except to say that the test must be "appropriate" on the "training subjects covered." This means the test can be written or verbal, and trainees need not necessarily pass the test, as long as they can demonstrate that the training was effective.

Finally, as with all training, records must be kept to document training delivery. HMR does not specify the format for the records, but training records must contain specific information to be compliant:

- employee's name;
- date of course completion;
- description, copy or location of the training materials used;
- name and address of trainer;
- certification that the employee is trained and tested according to applicable requirements.

These records must be kept for 3 years, until a more current training record from refresher replaces them. If an employee leaves the company, the records must be kept for 90 days after s/he leaves (DOT, 2012).

Training Topics

The topics required by HMR (49 CFR 172.704) and other applicable standards can be grouped into four basic categories:

1) general awareness/familiarization;
2) function-specific;
3) safety;
4) security (DOT, 2012).

General awareness/familiarization training must help employees become familiar with basic HMR requirements and enable them to recognize and identify HazMats (DOT, 2012). Thus, an overview

of HMR along with a basic discussion of what DOT considers to be a HazMat, including a discussion of the hazard classes and the ways to identify these materials, would meet this mandate.

Whereas general awareness/familiarization training offers a brief overview, function-specific training covers specific HMR elements and any special permits issued under the regulations relative to employees' job functions.

For example, if employees load trailers, the training must cover segregation requirements, package blocking and bracing, and requirements relative to securing the trailer before loading. If an employee signs hazardous waste manifests, certifying that the materials are in proper condition for transport, training must cover classifying, packaging, marking, labeling and placarding, as well as documentation requirements (DOT, 2012).

Training must provide employees with preventive measures, specific procedures to follow to protect themselves from hazards associated with HazMats and emergency response information. For example, it is not enough to tell employees to wear gloves when working with corrosive chemicals. Training must specify which gloves must be worn, and proper procedures for wearing them and decontamination (DOT, 2012).

Security training is a relatively new mandate (since 2003). At a minimum, all HazMat employees must receive security awareness training that covers the security threats and risks employees face, methods that employees can use to prevent security threats and procedures for responding to security threats.

Additionally, HazMat employers that must develop a written security plan under 172 Subpart I must also provide employees with in-depth security training. This training must cover the organization's security plan, the facility's security objectives, organizational security structure, specific security procedures, specific security duties and responsibilities for each employee, and specific actions to take in the event of a security breach (DOT, 2012).

In addition to the noted topics, other training requirements may apply depending on job functions, mode(s) of transportation and location to which materials are transported. For example, 49 CFR 175.20 notes additional training requirements for air carriers (in 14 CFR 121 and 135). For motor vehicle drivers who transport HazMats, additional training requirements are found in 49 CFR 177.800 and 177.816 (DOT, 2012).

Generally, modal-specific training requirements cover specific procedures for driving or piloting the vehicle being used. Additionally, the motor vehicle training requirements note that drivers must be trained on preinspection procedures and the proper, safe use of the motor vehicle, topics typically covered in a defensive driving safety class.

It should be noted that certain groups or types and quantities of HazMats do not require employees to be trained. For example, combustible liquids, such as diesel fuel, when transported by ground in packages with a quantity of less than 119 gallons are not subject to HMR. Another example is the small-quantity exceptions found in 49 CFR 173.4. If a material is transported under these exceptions, the training requirements do not apply (DOT, 2012). Therefore, it is beneficial to clearly determine which regulations apply because exceptions may provide relief from some or all of HMR or other applicable requirements.

Once a company confirms that it is a HazMat employer and that it must train employees accordingly, the next step is to determine how they should be trained.

International Requirements

As the economy globalizes, many HazMat employers are shipping or transporting materials to, through and/or from other countries. DOT has recognized this and has strived to make HMR more consistent with international standards.

However, some differences exist, so completing training that meets HMR requirements does not guarantee compliance with international standards. Furthermore, 49 CFR 171.22(b) states that when a HazMat is offered for transportation or transported in accordance with international regulations, it must meet international requirements as well as HMR. In effect, this means that DOT can cite an organization for failing to meet an international standard (DOT, 2012).

Do employees need to take two courses that will largely repeat the same information with minor variations? No. HMR and applicable international standards make allowance for these situations. For example, 49 CFR 172.704(a)(2)(ii) notes that international training may take the place of function-specific training as long as the international training covers all relevant areas of the employees' job functions and meets HMR requirements. Note that HMR requirements not covered in international training must be covered in additional training (DOT, 2012).

Although many potential international standards may apply to HazMat shipments, depending on where the material is transported to, through and/or from, two specific international standards are referenced in HMR training requirements. These requirements are ICAO Technical Instructions for the Safe Transport of Dangerous Goods and IMO's International Maritime Dangerous Goods (IMDG) codes. Both ICAO and IMO are UN organizations, meaning that most UN member countries will have mandates that are relatively close to these requirements (although some differences may exist).

International Air Transportation

ICAO regulates air transportation. However, many organizations that offer HazMats for transport internationally by air do not know about ICAO. This is primarily because the organization that is often referenced for international air shipments is IATA, which is not a UN organization nor is it affiliated with any government. Rather, IATA (2013) is a trade association of air carriers that make standards for air transportation. Most major air carriers are members of IATA, which is why most prefer that HazMat air shipments (even noninternational) comply with IATA's Dangerous Goods Regulations (DGR); some air carriers, such as FedEx (2012), require it as a matter of policy.

IATA bases its regulations on ICAO's technical instructions and, where differences exist, IATA is more stringent. Thus, if an organization ships materials in compliance with IATA's DGR, it is essentially in compliance with ICAO's standards. IATA's DGR training requirements are similar to HMR requirements, including the need for general awareness/familiarization training, function-specific training, safety training and security training. One significant difference is that recurrent training must take place every 24 months for international air HazMat transportation (IATA, 2013).

International Vessel (Ocean) Transportation

The only international organization of substance that regulates vessel (ocean) shipments is the IMO through its IMDG code. IMDG training requirements, like international air shipment requirements, are similar to HMR requirements. Again, one difference is recurrent training requirements. In this case, however, IMDG does not specify training frequency, instead leaving it to the authority having jurisdiction to decide on the frequency (IMO, 2010). In the case of HazMat employers that transport to, through or from the U.S., DOT is the authority having jurisdiction. Thus, by default, the recurrent requirements for IMDG training is every 3 years.

Other International Requirements

Those involved in international shipping should keep in mind that every country, even UN member countries, can create their own version of the U.S. DOT and, therefore, may have their own regulations. For example, Canada has Transportation of Dangerous Goods regulations. Often, these regulations are similar to HMR and international standards, but because significant differences may exist, HazMat employers are encouraged to research the requirements of each country they will transport materials to, through and/or from.

Incorporating HazMat Transportation Training Into Existing Programs

Looking closely at the four training areas that must be covered to meet HMR, IATA and IMO requirements—general awareness/familiarization, function-specific, safety and security—one can easily see overlaps with other requirements that are likely met by an active training program at a facility that handles HazMats and/or wastes. For example, to meet the safety training requirement, a HazMat employer must provide specific procedures that employees can use to protect themselves from the dangers of HazMats (DOT, 2012). These requirements sound similar to OSHA's (2011) HazCom training requirements [29 CFR 1910.1200(h)(3)(iii)].

As with international training, HMR and international standards recognize that duplicate training is inefficient and ineffective, so allowances are made for relevant training. Thus, if other employee training, such as that required by OSHA or EPA, meets any required elements in HazMat transportation training, the training need not be duplicated (DOT, 2012).

So, if employees who sign hazardous waste manifests receive thorough RCRA training that covers some elements of packaging, marking, labeling and describing hazardous wastes on a manifest, some function-specific element mandates likely have been met. In the same way, training that employees receive at a chemical plant that falls under U.S. Department of Homeland Security security requirements may not need to duplicate employee security training.

This allowance creates opportunities for a savvy training coordinator. By looking for opportunities to combine training courses, the coordinator can reduce training costs and produce potentially more effective training. Combining training courses so that information is covered topically can increase the program's relevancy to employees. For example, rather than taking a 1-day RCRA course then taking a 1-day DOT HMR course, employees can take a hazardous waste handling and transportation course that meets all applicable requirements and covers the process of handling and disposing of hazardous wastes from beginning to end in a more logical flow that workers can understand; this also increases the likelihood of information retention.

Viewing training this way also forces a training coordinator to think about what is required to make training effective and efficient, thereby eliminating unnecessary elements. If an employer enrolls employees in a 2-day DOT course when a 6-hour course is all that is necessary, the employee may realize that the information is not relevant and tune out, potentially missing important safety information. In such cases, the fault lies not with the employee for failing to pay attention, but with the employer for failing to ensure that the training was appropriate for the employee.

A training coordinator must think about training as part of an overall safety program, rather than as another hurdle to jump before achieving compliance. 49 CFR 172.700 defines training as a "systematic program." This means that it should not be an afterthought, but rather a planned process (DOT, 2012).

The regulations provide considerable leeway in how the training requirements can be met. Although most HazMat employers have employees complete structured classroom training, such training is not specified in the regulations. Systematic, hands-on training supervised by a knowledgeable HazMat employee can help meet the training requirements and may be more effective for certain job functions or facilities. The key takeaway is that a training coordinator should view the HMR training requirements as a tool to help ensure that employees are adequately trained in the proper procedures.

Case Study

A local refinery was in the midst of a serious labor dispute and a strike seemed imminent. To prepare, the refinery flew in personnel from other parts of the organization to help fill gaps. However, these employees were going to assume numerous roles, from loading and unloading railcars

Figure 3

Client-Specific Training Matrix

Training topic	Employees needing training	Frequency	Estimated hours	Comments
DOT general awareness	All HazMat employees	Every 3 years	2	
Hazmat safety	All HazMat employees	Annually	2	Annually required by the site; employees already received this training
Security awareness	All HazMat employees	Every 3 years	0.5	Employees already received this training
In-depth security training	All HazMat employees	Every 3 years	1.5	Employees already received this training
IATA general awareness	Warehouse employees	Every 2 years	1	
RCRA hazardous waste handling/generation	Hazardous waste handlers	Annually	2	Client is large quantity generator
Loading/unloading	Loaders and unloaders	Every 3 years	1	Cover both rail cars and tank trucks
Packaging	Warehouse employees, hazardous waste handlers	Every 2 years for IATA; annually for wastes	1	
Marking/labeling	Warehouse employees, hazardous waste handlers	Every 2 years for IATA; annually for wastes	0.5	
Placarding	Hazardous waste handlers, loaders and unloaders	Every 3 years	0.5	
Shipping documents	Warehouse employees	Every 2 years	1	Cover the shipper's declaration
Manifesting	Hazardous waste handlers	Annually	1	

A training matrix creates a structure to identify what topics must be covered, which employees need specific topics, the required frequency, estimated hours to complete the training and other pertinent information required to make training successful.

and tank trucks, to preparing hazardous wastes for shipment, to preparing shipments to meet IATA requirements. The company wanted training to be completed as efficiently and quickly as possible so that these employees would be up to speed should a strike occur and so that they did not have to attend training that did not apply to them.

The author performed a needs assessment by developing a training matrix for the organization based on required training topics (Figure 3). The matrix created a structure to identify what topics must be covered, which employees needed specific topics, the required frequency, estimated hours to complete the training and other pertinent information required to make the training successful.

Through this process, the author determined that many employees had already received refinery-specific safety and security training. Therefore, those elements did not have to be covered in the training being developed; the author worked with refinery management to ensure that the safety and security training were documented to meet DOT training recordkeeping requirements.

In addition, all employees had been trained in their respective topics in the past, making this refresher training. Finally, all topics would be designed specifically to the types of chemicals and materials with which employees would work. For example, for employees who load and unload propane only, the training would not cover loading acids.

Based on the matrix, the author created a training outline and specific training objectives for each topic that was approved by the refinery. Training was delivered, training goals were met and the site was happy. In the end, the labor dispute was settled and the strike avoided. However, by understanding what was required in HMR and other regulations and by combining that information with knowledge of the company's existing training programs, needs and goals, the author was able to develop a custom training program that achieved all goals efficiently and cost effectively.

Conclusion

HazMat transportation training is an important element of the overall training for organizations involved in these functions. Such training prevents costly fines, and it can be leveraged to improve safety and health programs overall.

A training coordinator must conduct a thorough training analysis to review job functions performed and types of materials handled and shipped to determine what requirements apply. This analysis should consider training requirements from multiple agencies and organizations to identify overlaps where training can be combined to increase efficiency and effectiveness.

Then, a systematic training delivery program should be developed that utilizes the best training methods, not necessarily the most convenient, when possible. Understanding HMR, ICAO, IATA, IMO and other applicable requirements can help a training coordinator transform the regulations from hurdles to opportunities that help an organization meet its safety performance goals. **PS**

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