

mance-oriented specifications should lead to fewer exemption applications. Although the task is formidable and will not be easily accomplished, the goal of simplified, less complex hazardous materials regulations deserves the support of all persons involved with the transportation of hazardous materials. The time is ripe for concerted action rather than more discussion and studies.

## A Question of Training

*Arthur C. Bensmiller*

During the National Strategies Conference Steering Committee meeting in Chicago, several questions arose concerning training. I believe it would be beneficial to state these questions, then respond to them from a trainer's point of view; they could be a valuable basis for further thought that may provide a meaningful list of issues from which a national plan for training could be developed.

### How can we reach the millions of response persons and the general public who need some kind of mass education?

The term "hazardous materials training" is very broad. It is so broad that it is unintentionally misunderstood and misapplied. For example, let's look at the word training. I will discuss what it is later, but for now let's look at what it is not. Training and education are different words and have different meanings. In my opinion, DOT is not functionally responsible to educate the general public. In fact, I also maintain that it is restricted from such activity under training provisions incorporated in the Civil Service Reform Act. To illustrate, colleges and similar institutions educate, but DOT's Transportation Safety Institute gives safety training.

DOT does have functional responsibility to provide safety training in the transportation of hazardous materials. Such training must complement and improve an understanding of how to apply the provisions of the regulations. Good training should increase the students knowledge and skills enabling them to perform specific safety-related job functions more effectively and efficiently. In this case, the students are those from the private and public sector who are responsible for the safe transportation of hazardous materials. That is the real training need. Training of the general public would not be a valid option, but merely a perceived (not real) training need.

### What is the training need?

This question also implies who is to be trained and from this we can determine what the need is. Perhaps one way to look at the question is to determine who has a job function that requires some knowledge and skill in the safe transportation of hazardous materials. Then we need to ask, Can they accomplish that job function without training? If they can, then a training need does not exist. If they cannot, then there is a need for training. In the complex area of hazardous materials transportation, the obvious answer is that we have a need for training, not only for entry level but for ongoing and/or specialized training. Perhaps the most critical need of all is for planners and those who have control over commitment of resources (funds and manpower) to understand job-oriented or job-related

training. Training in hazardous materials transportation does not mean a thing unless it is tied to a specific job function. For example, if one of a firefighter's job functions is to respond to a transportation accident involving leaking or burning hazardous materials, then it would not be appropriate to give that firefighter training in the complex detailed accident prevention regulations aimed at inspection and enforcement. Yet, in spite of this basic training concept, many states and federal counterparts simply lump all of their various people together, i.e., public service inspectors, environmental inspectors, firefighters, federal inspectors, etc., and proclaim the need for hazardous materials training. From a training point of view, a clear distinction must be made in job-oriented training needs. What is it that we want the person to be able to do? If we know that, then we can start on what the training need is. The most basic and pressing issue for state and federal planners is to recognize at least two categories of differing job functions and consequently two training needs. This is a fundamental issue and must be understood. Two different training needs are accident prevention regulatory compliance and emergency response training for after-the-fact accidents. Accident prevention regulatory compliance training would generally be needed by those who have to understand and use the regulations for shipping and transporting hazardous materials and for those who check for accident prevention regulatory compliance, i.e., personnel from industry shippers and carriers, government agencies such as special state inspection and compliance units, and federal inspectors such as those from FHWA's Bureau of Motor Carrier Safety Investigators.

Emergency response training would generally be needed by those who are responsible for the various operations in an emergency and would include but not be limited to highway department maintenance personnel, law enforcement officials, firefighters, emergency services (Civil Defense), and emergency medical personnel. The transportation public has a real (not perceived) need for job-oriented training in the transportation of hazardous materials.

### What are the different kinds of training and their effectiveness?

DOT uses several proven methods of training such as established recognized training centers, selected universities that have technical capabilities, computer-based instruction, computer-managed instruction, established learning centers in cooperation with industry associations, DOT training academies and/or institutes, talk-back television courses, and correspondence courses. These training methods are used separately or in combination, and with various established methods of presentation such as lecture, movies, television, slide/tape, programmed learning, and others. Whatever method is used, the goal to strive for must be performance-based (oriented) training. One way to approach it is to ask the question, What is the training objective or outcome? What is it that the learner (student) should be able to do after receiving the training? Training objectives (or outcomes) describe performance (or behavior) because an objective is specific and because performance (or behavior) is what we can be specific about.

The effectiveness of performance-based training can be evaluated. In other words, the increase in knowledge and skill in the learner can be measured. The \$64-question for the decade is, Can training program effectiveness be measured? Another way of saying this is can we reduce death, injury, and

property damage in the transportation process by training? The answer is yes. Time and space do not permit me to elaborate on this, but suffice it to say that a recent controlled emergency response training program conducted by the Office of Civil Defense in Oklahoma reduced the yearly average of response personnel injury/death in hazardous material transportation-related accidents by 90 percent. Evaluation of the effectiveness of accident prevention training is more difficult. I am not aware of any final program evaluation in this area; however, I am familiar with one under way. My opinion is that it will be increasingly difficult to have safety programs (including regulatory requirements, training programs, etc.) approved during this decade unless we can evaluate total program effectiveness in terms of reduced death, injury, and property damage. Any safety program, including training, that cannot be evaluated in terms of reduced injury, death, and property damage should not receive any support.

#### Who would enforce whose regulations?

Enforcement of federal regulations is established by law. That is, an enabling congressional act or statute authorizes an administrator to regulate certain things. The regulations written under the authority of that congressional act have the weight and the power of the acts' penalty provisions behind them. Many states have adopted the federal hazardous materials regulations in whole or in part (adopted by exception). When adopted by a state, the federal regulation may be coded differently but would be enforceable by state agents. This is generally done on surface transportation by a public service commission or department of public safety personnel. When adopted by states, the regulations are enforceable on both intrastate and interstate surface carriers. The question is not one of who would enforce but rather who has the authority by law to enforce regulations.

#### Who designs curriculum and certifies graduates?

Curriculum is generally more successful if developed jointly by training specialists and experienced field personnel. However, it should be noted that training plans must be developed first. The training plan establishes the need for training (what is the problem). It then identifies what the attendees' job functions are. Then the training or course outcome (objectives) is very specifically listed--i.e., what is it that the student should be able to do after the instruction is given. The training plan is the contract and perhaps its most important function is that of agreement between the government agency that has the program authority and responsibility (including resource control) and those who provide the training. As for certification, I believe that inspectors at all levels of government who inspect and enforce the complex requirements of hazardous materials regulations related to accident prevention must be certified as to performance. This certification should consist of passing an approved training program and demonstrating skills on the job for a specific period of time. Again, the certification program must be administered by the government agency that has program authority and responsibility.

#### What are the cost considerations of training?

Poor training is no bargain at any price. As a general rule, you get what you pay for. Have your people received performance-based training in the

transportation of hazardous materials? A decade plan suggests sound planning and continued areas of emphasis. A comprehensive plan with training as an area of emphasis suggests continuity. On-again off-again training programs are costly and expert hazardous material managers are impossible to recover from previously discontinued training programs. Organizations desiring to send personnel to distant training locations face constraints in the form of limited travel budgets and increasing travel costs. A need does exist to use training resources more effectively and efficiently to accommodate organizations whose personnel need training. One model to look at is the one developed by EPA. EPA uses a distributive training system under the direction of a central training facility with excellent results. DOT could conduct training under the supervision of its training arm for state and local governments and industry personnel. Certain training would be accomplished under contract with established training centers and universities to develop the capability of training at the centers and universities and at other locations as required. In cooperation with the transportation industry, this highly versatile capability associated with computer-based instruction and computer-managed instruction could be used. This would provide access to many contract learning centers throughout the United States and would adapt quickly to a fast need for teaching regulatory requirements in areas such as accident prevention and also in teaching transportation emergency response procedures. Also, terminals can be used at any location that has a telephone line to provide a wide distribution of training capability.

## Segment I--Training Concepts Assessed

### *John Granito*

Training usually is seen as planned learning activities designed to bring about changes in the behavior of the learner. In other words, we train people to do what we think they should in given situations. Typically we want personnel to perform defined tasks under specified conditions and in certain circumstances, so training directors work out carefully detailed projections of future situations and the sets of respondent behavior that experts believe is most desirable. Training programs should be based to a large extent on experts' predictions of future situations and problems so that students will be trained to bring incidents to a satisfactory resolution.

The ability of the expert to predict future problems depends on such skills as the ability to understand history, to analyze technical data, and to generate insights. An example is the well-known prediction of experts that exploding horizontal tanks usually burst at the rounded ends, and so attacking nozzle teams should approach from the direction of the sides. In that common lesson, training experts have predicted what is likely to happen--based on history and technical knowledge--and they attempt to modify the random behavior of emergency forces so that, through training, nozzle attack from the sides become habitual.

Almost all problems of training stem from that seemingly simple definition. Those who invest in training want to be sure that future situations will be met by "approved" behavior on the part of the trainees. Experience with hazardous materials