

such shortcuts and demand that specific rules be reprinted in state registers. This reprinting, particularly if it involves revision of existing provisions, is a time factor currently not considered in the federal regulatory scheme. It should be.

The Adopted Solution Should Be Made the Target of Publicity and Training

Although agency-operated training programs are not necessary, government encouragement of effective training or new regulations is essential. This should be done through grants to professional educators, not by federal employees. Grants may be given to universities and others professionally competent to instruct, preferably on a wide regional basis with some consistency between programs.

Enforcement of the Adopted Solution Is Essential to Assure Awareness and Compliance

Enforcement is an essential element in an effective regulatory process, and total, uncommunicating segregation of regulatory and enforcement functions is an error. Close coordination and cooperation between those who select regulatory actions and those who enforce them are vital. If the regulation is properly aimed to solve a safety problem, then enforcement of that regulation is an essential element of its implementation. There is little doubt that requirements highlighted through enforcement are stressed in company compliance efforts, and this energy must be harnessed to achieve the safety intended. Enforcement should be coordinated with regulation and, after a full period to allow for implementation and after enhancement of awareness through education, vigorous enforcement, and publication of enforcement efforts, should be undertaken.

Enforcement programs that are not given subject priorities correlating closely with actual accident experience or regulatory efforts in problem-solving are merely revenue-producing measures that make no improvement in safety. This has been true of much hazardous materials enforcement to date.

On the topic of enforcement generally, it is clear that the current transportation agency program is not working. Centralization of the function, or at least unification of procedures, appears warranted, so that the penalty suffered by a respondent does not vary due to the affiliation of the inspector who makes the charge.

In enforcement, as in other aspects of regulation, some quantitative guideline is essential to preclude arbitrariness and inconsistency. Today penalties vary by mode of transit, by modal affiliation of the inspector, by procedural avenues selected, by the personnel assigned to the case, and by their mood at the moment. The current system is purely subjective with any relation to seriousness of the offense often just coincidence. A specific weight must be assigned to statutory factors such as the nature of the offense and the culpability of the respondent, whether the offense occurs in highway, rail, or the other modes of commerce, and regardless of the attorney assigned to the case or his or her attitudes.

An enforcement program that thrives on cases that are easy to prove, regardless of their correlation with safety, is a disservice to the public. As a revenue-producing measure, it is ridiculously inefficient, and it certainly cannot be justified as a safety program. Selection of minor requirements and assessment of small dollar amounts on the hope the respondent will not undertake the expense of resistance also disserves to the public, for the same reason.

A vigorous enforcement effort that seeks significant penalties to deter future noncompliance with significant requirements by the respondent and others necessarily results in requirements that are more soundly based and more easily understood. The current program, avoiding the hard cases because the regulations are unclear, is not serving one of its vital functions--achievement of greater public safety through improvement of the regulations.

Effectiveness of the Selected Solution Must Be Periodically Assessed

Auditing of the program can be done through independent investigation, analysis of incoming incident reports, agency investigations, and other public processes. It is vital to determine whether the solution that was selected is being successful and, if so, whether some less severe mechanism might also succeed. If not, the process must begin again, with new experience blended with previous considerations to select new solutions. Periodic review of all regulatory efforts should be undertaken to minimize the economic burden on the public and to assure that the best solutions are implemented.

PART 3: COMPLEXITY OF HAZARDOUS MATERIALS TRANSPORTATION REGULATIONS (D.A. Boyd)

For a number of years, perhaps more than 10, numerous suggestions and recommendations have been made by various groups and persons that the hazardous materials transportation regulations should be simplified or made less complex. For example, the 1969 report of panel 3 at the 1969 Airlie conference recommended that "as an initial step, immediate efforts be made to simplify the existing regulations." In the same report, the following statement was made: "The secondary mission consists of simplification and condensation of present regulations to a more realistic and workable document."

In the intervening years it appears that little progress has been made toward achieving the goal of simple concise regulations for the transportation of hazardous materials. The Transportation Research Circular 219 listed the 10 most critical issues in hazardous materials transportation. The circular noted that DOT's hazardous materials regulations are "too complex."

TRB Circular 219 offers two solutions to the problem. The first solution would require publication of digests of the regulations (although it is not clear who would compile them or where they would be published), which would summarize the most pertinent parts and state them in language designed to be as readable as possible. At first blush, this solution appears quite reasonable and simple. On more complete analysis, however, it appears likely that this solution would create problems as confusing as the existing complicated regulations. Any attempt to summarize the present lengthy regulations (some 1200 pages) would require substantial manpower and a great deal of insight and effort. The end result would no doubt be a dual or parallel set of regulations that would duplicate the existing rules. Furthermore, in any controversy or question or even an interpretation it would be necessary to refer to the actual regulations; thus, it is quite possible that summarization of existing regulations would actually compound the problem.

While the initial effort would be substantially greater, it would appear that a broad program for revision and simplification of the existing regulations would be of more benefit to the many people

involved in the transportation of hazardous materials and ultimately would benefit the public in general. Simple, clearcut but no less demanding regulations would enable people to be occupied with safety performance rather than preoccupied and confused with complex and sometimes conflicting requirements. In fact, it is quite possible that easily understood regulations would result in better compliance. That was the conclusion of the National Transportation Safety Board (NTSB) Study of Noncompliance with the Hazardous Materials Safety Regulations (August 3, 1979). In fact, one of the principal recommendations of the NTSB calls for expediting an ongoing DOT program of evaluating every hazardous materials regulation with the objective of revising each regulation in such a manner that the persons who need to use them on a daily basis can readily understand them.

Specification versus Performance Standards (Exemptions)

Most of the requirements for hazardous material containers are set forth in the regulations with specific detail concerning the materials and manufacturing process. For example, the detailed specification standards for hazardous materials containers in the existing regulations (Part 178, 49 CFR 178.0-178.350) are quite voluminous, filling approximately 400 pages of the Code of Federal Regulations. The specifications cover such containers as carboys, cylinders, drums, boxes, bags, and portable tanks.

In 1968, the Hazardous Materials Regulations Board published a notice of its intent to substantially revise the regulations, and one of the major parts of the proposal was to "state the container requirements in performance standards rather than manufacturing specifications." (A performance standard prescribes what a container must be capable of doing after it is built, but not how to build it. No matter how it is built, any container that can meet the performance requirements would comply with the regulations.)

The 1969 Airlie conference concluded that "establishment of a performance standard approach is feasible." The conference proceedings also noted that "the primary mission is revision of regulations to reflect, insofar as practicable, a performance standards system orientation."

TRB Circular 219, when proposing solutions to simplify the regulations, suggested that the regulations be made less complex by converting the present hazardous materials packaging regulations from detailed specifications to performance criteria. The circular suggested that creativity is stifled by the present regulations, which dictate design and similar matters in great detail. An advantage to performance standards (as contrasted to specification standards) is that such a philosophy would in certain areas bring the U.S. Hazardous Materials Regulations closer to the United Nations packaging philosophy.

In this connection it should be noted that the U.N. Committee of Experts has recognized the probable impossibility of accomplishing harmonization (among the various nations) of design standards for hazardous materials containers and has recommended performance standards as an alternative.

Exemptions

Since the existing regulations are specification-oriented with little leeway for deviation, it is necessary to have a procedure whereby some innovation can be authorized. This is accomplished by the

exemption procedures in Subpart B of Part 107 of Title 49 of the Code of Federal Regulations, which makes it possible to obtain administrative relief for departure from the regulations if the departure will provide equivalent levels of safety, or levels of safety consistent with the public interest and the policy of the Hazardous Materials Transportation Act (49 CFR 107.101). It appears reasonable to expect that if the regulations were more performance-oriented than they are, it would not be necessary for the MTB to issue as many exemptions as are currently in existence. As of October 1980, some 924 exemptions were outstanding for departure from the regulations. At the present time there are approximately 1200 exemption applications filed with MTB annually (this includes new exemptions, "party-to" exemptions, and renewals). It seems obvious that the processing of such a large number of exemptions that are made necessary under existing regulations might be substantially reduced if the present regulations were more performance-oriented.

A substantial amount of MTB professional staff time is spent processing exemptions. Even if staff time cannot be reduced substantially, a change of focus from design to performance standards should reduce the need for exemptions from the existing regulations.

Enforcement Versus Compliance

A review of the regulations indicates that some regulations are written from a legalistic point of view. It has been readily admitted that such regulations are written with the intent of making enforcement of violations of such regulations as successful as possible. Such a philosophy may stem from a view that at least some persons involved with the regulations will make little, if any, attempt to comply with the regulations, so they must be written to be "violation proof." This idea seems to prevail even if such an objective results in complex, hard-to-understand regulations.

The question that might be raised is whether it is appropriate to assume that shippers and carriers do desire to comply with the safety regulations (as contrasted with noncompliance) and, therefore, the regulations should be written in a clear, concise, and uncomplicated manner that would be beneficial to those persons to whom the regulations apply. Such a change in philosophy might be characterized as enforcement versus compliance.

If it is true that the existing regulations are so complex that many people subject to them cannot interpret or understand them--and as a result there is noncompliance with the regulations--one avenue to achieve better compliance would be to simplify the regulations. In view of allegations that there is substantial noncompliance now, it would seem to follow that simplified, more easily understood regulations would lead to substantially better compliance.

Conclusion

In conclusion, it is submitted that simplification and clarification of the existing regulations are the cornerstones to eliminating or at least moderating some of the criticism of the hazardous materials regulations. If the regulations were easier to interpret and understand, the training required for persons handling hazardous materials could also be simplified and accomplished in a shorter time. Simpler regulations should also enhance compliance, because the persons handling hazardous materials could better understand the regulations. Finally, less complex regulations coupled with more perfor-

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