# Making Maritime Transportation Safe and Effective

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The purpose of the Maritime Administration (MARAD) is to foster a safe and environmentally sound U.S. maritime transportation system that provides national security and economic growth. MARAD is the only agency that focuses primarily on the commercial marine transportation system and on having it ready for a variety of critical national purposes.

One of MARAD's goals is to ensure intermodal sealift capability to provide national security. We have been working in the shipbuilding area to provide a strong base for security. Tied into this is improving system performance through technology and innovation, thereby reducing the cost of the system. Finally, we want to increase U.S. participation in foreign trade. The more efficient our system is, the better we can compete. Within the United States there are many domestic cargo movements; waterborne transportation is by far the cheapest method.

Why is MARAD interested in risk assessment? It comes down to the desire for productive capability and competitiveness, which depend on effectiveness, efficiency, and error-free processes. That has been a theme in all the discussions today—doing things up front to avoid errors and make things safer.

Japanese shipbuilding, for instance, has a very low accident rate. It is not because the Japanese are focused on having very safe operations. It comes from trying to do things efficiently, starting up front, planning carefully, and doing things well. The Japanese data may be underreported, but, according to statistics, the danger of working in a shipyard in Japan is about the same as that of working in an office in the United States! There is a lot to be said for preplanning and for looking at things

carefully. The human-related aspects are the key, and I think the earlier presentations have echoed that today.

Theoretically, risk assessment provides a good basis for providing an objective comparison of alternatives. Everyone in the engineering field uses this type of approach for everything they do. In a broader view, however, the ideal is to have a risk assessment system that says precisely what the level of safety is; then society can decide where to go from there, up or down.

MARAD is very much involved with educating and training mariners. We work with the six state maritime academies to try to provide a basis for training; we also work with the U.S. Merchant Marine Academy, a MARAD activity at Kings Point, New York. MARAD is involved with many issues related to education. The real questions are, what do you need to teach, how do you test to make sure people know what they need to know, and what kind of things do you do to accomplish that.

One of the projects we have initiated is a cooperative program with the academies to look at the various changes that are happening in the industry. We have a joint project with the U.S. Coast Guard to look at the examination process for mariners. This is a longer-term research and development effort, but it is facilitated within the industry to engage collective thinking processes and determine what needs to be done. The first thing that needs to be done is to look at where the risks are: start by going to accident databases to see where the risks exist and then try to determine what type of knowledge, skills, and abilities are required. Of course, this is done during a dynamically changing situation.

Again, from the MARAD point of view, competitiveness is the driver. Internationally, a complete set of regulations and rules have been developed through the International Maritime Organization. The U.S. Coast Guard has fought for many years to bring the international standards up to or past those that are applied in the United States. The standards now are very high in most areas and we are at the stage of trying to rationalize our systems with what has happened internationally so that we are equally competitive.

I have outlined the basis of where MARAD comes from with regard to risk assessment. We want to have a level, competitive playing field but recognize that we need to look at everything if we are going to determine what that is and how to reach it.

The challenge, and this has been mentioned before, is lack of data, particularly lack of good human factors data. That is a continuing problem that we need to work on. We also need validated tools—tools that are going to stand up and processes that we can look to and point out to other people and say, here is what we really need and here is why. This is a far better process than waiting for a catastrophic accident to occur and then having to fix a problem when public pressure demands quick action, which often does not result in an ideal balanced, long-term solution. We need good tools that tell us what is the level of safety, allowing rational decisions on where to go from there.

Linda Connell's description of the Aviation Safety Reporting System leads to one of the cooperative projects we have with the U.S. Coast Guard. MARAD and the U.S. Coast Guard are working together to facilitate development of an international maritime information safety system with industry leadership. We stay away from the word "incident" in describing the system, as we want to ensure that any information that is of concern is reported. Things to be gathered are things that are not already required to be reported. Another key point of this initiative is that over time the cultural attitudes of individuals will change—their view of how they fit into the system including reporting their own errors and introspectively looking at how things can be changed and taking responsibility for the total system.

It is important to recognize that, for every accident, there are really about 100 incidents that could have been that serious accident. For each incident there are another 100 situations that could have become an incident. So, if you think about it, we actually have very little data for learning how to prevent accidents.

The fundamental basis for the system is the need to acquire precursor data. Along with meeting that need, particularly in the early term, is the opportunity to gather some lessons-learned knowledge that can be spread around that will make a real difference immediately. The bottom line is to identify problems and address them before an actual occurrence takes place.

I talked a little bit about the human factors taxonomy. We need to think more about standards. The aviation industry held a full symposium on human factors taxonomy recently. Also, under the Transportation Research Board this past January, we held a small intermodal workshop and spent a day focusing on the different taxonomies that are being used. We concluded that on a top level or two of categorization there is one particular approach that could be used by all modes. Standardization here would open up the opportunity to share data modally.

The key ingredient of a voluntary system is the deidentification and confidentiality process. When the data are acquired, they need to be carefully cleansed so that people and organizations remain anonymous but the data still must result in useful safety information. Those are the keys to a successful system.

The real key is to enable voluntary confidential reporting. We hope to convince the Department of Justice to permit protections that are really needed in our industry. Such protection was not as needed in the aviation industry to make things happen.

In a robust system that has adequate protections, people will report and come back as they learn its utility. We are at the point where the industry group has met a number of times. We have a draft blueprint to be published soon that is the basis for the entire system. We hope to put it within a nonregulatory party in the year 2000, but that depends on funding levels, industry leadership, and the Department of Justice really approving where we are headed.

One other thing I want to mention is that the Department of Transportation recently held its first ever Intermodal Safety Conference. One key recommendation that came from the event was to look at the safety data being collected. Are we collecting the right data? How can we get the data we need? Are we using the data in the right way? We concluded that we really need to have a good workshop that ties together intermodal interests and tries to compare and get the best practices in each; in particular we need to gather the information necessary for developing a good incident reporting system for the maritime industry.

We want to have practical, accurate, useful tools with which to assess safety levels. Our goal is an efficient and environmentally friendly waterway system in which we hope and are planning for trade to double or triple in the next 10 years. There are a lot of challenges and we need to do these things right away!