

## MTS TASK FORCE PRESENTATION

# The Marine Transportation System and Environmental Concerns

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**T**he marine transportation system (MTS) presents a myriad of negative risks to the environment and a myriad of positive economic benefits for the American standard of living. The age-old question has been how to balance those risks and benefits. We have been making these decisions for many years; the wisdom of some of the decisions is now coming into question, but choices were made based on the information that was available at the time. Today's risk assessment and risk management models/procedures attempt to quantify available information providing a systematic framework for decision making, and their use in MTS planning should bring long-term health to the economy and to the environment.

The message in this presentation is captured in Exhibits 1 and 7; however, the reader is encouraged to examine Exhibits 2 to 6 and the text to understand the risk assessment/management framework as it is applied to the MTS.

The concepts in Exhibit 1 are not original or new, but they do represent the consensus of the National MTS Conference in Warrenton, Virginia, in 1998. The take-home message here is the first bullet—let us consider environmental concerns from the beginning in every one of our decisions. The challenge before us is how we can best integrate environmental concerns with MTS planning, which should help us achieve an efficient and effective MTS. The premise of this paper is that, if environmental concerns are not addressed up front, the vision for the MTS will not become a reality.

The second bullet in Exhibit 1 talks about stakeholders. It is essential for stakeholders to be brought into the plan-

ning and decision-making process early and to be kept informed as MTS plans are developed. Without the "help" of the stakeholders early and throughout the planning and decision-making process, a system that invites "late hits" evolves, which can stifle project time lines and create serious inefficiencies and very ineffective decision making. The final bullet in Exhibit 1 recognizes that environmental issues are seldom single faceted and broad-scale planning efforts should address the long-term aspects of the proposed action.

The risk assessment model presented in Exhibit 2 is the model that is used at the U.S. Environmental Protection Agency (EPA) in the various programs; it is the same model that Dr. Todd Bridges presented earlier. It is fairly simple, and I will not go into the technical details in this paper. The key is to recognize that this is a procedure to put the information into a decision-making framework that identifies the problem, assembles information on effects, assesses exposure, and then characterizes the risk. Risk characterization tells how good the information is and whether it can be used in the risk management decision.

As shown in Exhibit 3, EPA uses risk assessment in regulatory programs. These are frequently chemical-by-chemical assessments and are formal/traditional risk assessments. Many of these regulatory programs already deal with the MTS, such as in Superfund sites at ports, in air-quality standards and water-quality criteria, or in dredged material management. Risk assessment traditionally has been used in the MTS to prevent accidents and spills. The National MTS Conference recommended that the use of risk assessment be broadened in its appli-

**EXHIBIT 1 MTS National Conference:  
Recommendations on Environment**

- Environmental concerns must be consistently incorporated into MTS decision-making processes from the beginning.
- Decision-making processes must bring all interested parties to the table.
- Processes must focus on long-term planning on a broad scale.

**EXHIBIT 2 Components of Risk Assessment**

- Hazard identification/problem formulation
- Dose-response assessment for toxicity/effects
- Exposure assessment
- Risk characterization

cation to the MTS by addressing a multitude of potential environmental concerns, such as those presented in Exhibits 4 and 5 from port development projects and port operations, respectively.

Despite major progress in controlling pollution since the early 1970s, we have not achieved a healthy coastal environment, and there are a number of serious problems

**EXHIBIT 4 Typical Environmental  
Considerations for Port Development Projects**

- Underground/aboveground storage tanks
- Chemical storage
- Spills and leaks
- Water resources
- Wetlands
- Cultural resources
- Air emissions
- Wastewater discharges
- Storm water discharges
- Construction impacts
- Fisheries
- Traffic
- Noise
- Endangered species
- Public outreach/access
- Mitigation
- Hazardous wastes
- Sediment and erosion control
- Dredging and dredged material placement

before us. We have certainly made progress in controlling wastewater discharges from sewage treatment plants and industries, but the most difficult problems remain: toxic chemicals damage ecological resources and public advisories to not eat fish are very common. Other indicators of the challenge before us include unsafe shellfish and unsafe swimming beaches due to pathogens, algae blooms,

**EXHIBIT 3 Sample Regulatory Programs in  
EPA That Use Risk Assessment**

- All EPA regulatory programs use some form of risk assessment.
- Formal/traditional chemical-by-chemical risk assessments are the basis for decisions in numerous programs.
  - Superfund
  - Pesticide registration
  - Drinking water standards
  - Hazardous waste disposal siting
  - New chemical assessments
  - Air-quality standards
  - Water-quality criteria
  - Dredged material management

**EXHIBIT 5 Port Operations with Related  
Environmental Concerns**

- Automobile transport
- Building/grounds maintenance
- Cargo handling
- Chemical storage and handling
- Fueling
- Painting
- Paint stripping
- Public access and recreation
- Rail maintenance
- Ship liquid discharges
- Ship ballast water discharges:
  - invasive species
- Ship air emissions
- Ship breaking
- Vehicle and equipment maintenance
- Vessel repair and maintenance

and hypoxic conditions (i.e., lack of oxygen) in our coastal waters from excessive nutrients from storm water runoff, loss of habitat/wetlands, and the decline of our fisheries. The MTS is a contributor to these coastal conditions. The question is how much the MTS contributes to these effects, how much each one of the concerns in Exhibits 4 and 5 contributes, and what can reasonably be achieved in terms of application of controls. This is where risk assessment can help.

One very well-known example of port development or port operations that can pose risks to the environment is the deepening or maintenance of channel depth by dredging and placement of dredged material, as noted in Exhibit 6. Dr. Bridges pointed out in his paper that the environmental evaluation of dredging and placement operations by the Corps of Engineers and EPA has been consistent with risk assessment but efforts are ongoing to provide a more formal risk assessment approach; in this regard, it is important to understand that risk assessment is a model (some prefer to call it a framework) and that "one size does not fit all." The intensity and effort put into the risk assessment for each project or component of a project should reflect the extent of the problem, the potential risks to the environment, and the amount of data and information that are needed to reach a decision. A formal risk assessment for a Superfund site can be very complex, expensive, and time-consuming, whereas some other risk assessments, such as the risks of the actual dredging operation, can reach conclusions with much less effort.

#### **EXHIBIT 6 Potential Impacts from Dredging and Placement of Dredged Material**

- Wildlife and fishery impacts during dredging
- Physical impacts of placement of dredged material
  - Contamination of dredged material and potential adverse impacts to ecological resources and human health
  - Beneficial use of dredged material

#### **EXHIBIT 7 Major Factors That Affect Decision Making: Risk Management**

- Scientific factors
- Economic factors
- Laws, regulations, and legal decisions
- Social factors
- Technological factors
- Political factors
- Public values

Risk assessment provides a model or framework to organize data and information and to characterize the data/information to determine whether it is an adequate basis from which to make a decision. The actual decision-making process is termed risk management and it embodies all aspects of factors that influence the decision, such as the factors indicated in Exhibit 7.

Traditional approaches in the MTS have been to balance economic needs with environmental concerns. There have been major environmental issues over the years. Some of the problems that have been experienced were a result of not considering potential environmental impacts until late in the project evaluation process and a lack of stakeholder involvement. In addition, there has not been sufficient use of risk assessment models to assist in the analysis and evaluation of environmental concerns. The learning curve has reached a point where decision makers now understand that environmental concerns must be consistently incorporated into MTS planning from the beginning and that use of risk assessment and risk management can provide an efficient approach to reach the most efficient and effective decisions.

Thus, I believe the environment will not stand in the way of achieving the vision for the MTS if we use the tools before us, if we recognize that all interested stakeholders need to be brought in early, and if we all understand that a healthy MTS cannot be achieved without a healthy environment and that the concept of balance should be replaced by the concept of harmonization.