

THE COAST GUARD'S ANNEX V COMPLIANCE REPORT: A CASE STUDY

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ABSTRACT

This case study documents the U.S. Coast Guard process for accomplishing the congressional mandate for a compliance report concerning the implementation of Annex V (Regulations for the Prevention of Pollution by Garbage from Ships) of MARPOL 73/78. Annex V was implemented by Title II of Public Law 100-220, the Marine Plastic Pollution Research and Control Act of 1987.

The study follows the development of an empirical methodology for assessing compliance with new regulations that implement Annex V. The goal is a report that measures the amount of Annex V garbage being brought ashore both before and after Annex V became effective. As a secondary objective, the Coast Guard would like to assess the effects of Annex V regulations on the coastal and marine environments. The project involves an evaluation of current information and its statistical validity as a preimplementation baseline. The evaluation is then used to develop a baseline estimate for the amount of Annex V garbage being generated. Once that information has been collected, a methodology for measuring Annex V compliance and for assessing the effects of Annex V regulations on the coastal and marine environments will be developed.

The Coast Guard must follow specific congressional intent for the compilation of this report. Congress required in section 2201, Title II of PL 100-220, that within 1 year from the date of enactment of the act, and every 2 years thereafter for a period of 6 years, the Coast Guard, in consultation with the Secretary of Agriculture and the Secretary of Commerce, report to them on compliance with Annex V in U.S. waters, including the waters of the U.S. exclusive economic zone. The report is to include a description of the enforcement mechanisms in place and an assessment of the need for additional enforcement authority. It must also address the extent to which garbage reception facilities have been made available at the ports, and the mechanisms used by the Coast Guard to ensure that these facilities are made available as required by Annex V.

In preparing this report, the Coast Guard must assess the extent to which vessels dispose of floatable dunnage materials beyond 25 nmi from shore and the extent to which they wash ashore, and recommend whether Annex V should be amended to prohibit the disposal of these materials at sea. The report must also include a detailed assessment of the fines levied by foreign nations for violations of Annexes I, II, and V committed by foreign flag vessels in the U.S. exclusive economic zone. Finally, the report must summarize the education efforts undertaken to inform the public of the problem of pollution of the marine environment by improperly disposed garbage.

HISTORY OF ENACTMENT

MARPOL 73/78

The International Convention for the Prevention of Pollution from Ships, 1973, as amended by the Protocol of 1978 (MARPOL 73/78), established baseline levels of practice in attempting to mitigate or eliminate damage to the environment by pollution from vessels. The MARPOL 73/78 is built of five annexes. Each annex is concerned with preventing pollution of the world's oceans by a different product or group of products. Annex I is concerned with preventing oil pollution, Annex II with the noxious liquid substances or chemicals, Annex III with the release of packaged hazardous materials, Annex IV deals with the prevention of pollution by sewage, and Annex V with the prevention of pollution by garbage. Annexes I and II are mandatory for signatories, while Annex III, IV, and V are optional, only becoming effective 1 year from the date when at least 15 nations have ratified them. The 15 nations must represent a cumulative total of 50% of world shipping tonnage.

The Act to Prevent Pollution From Ships

Domestic legislation was needed to implement the convention and its annexes in the United States. The MARPOL 73/78 was incorporated into U.S. law when the Act to Prevent Pollution from Ships was passed by the Congress of the United States in 1980. (For a more complete description of this process, see Whitehead 1988.) The Act to Prevent Pollution from Ships was codified in Title 33, United States Code, Sections 1901-1910.

The Marine Plastic Pollution Research and Control Act of 1987

Scientific and environmental forums during the 1970's and 1980's highlighted the amount and impact of garbage from ships on the world's oceans. Although ocean disposal of any type of garbage presents the potential for environmental damage, plastics seemed to be the most immediate problem. The characteristics of plastics which make them useful: lightweight, strong, and persistent, make them deadly to the ocean's biota. Title II of Public Law 100-220, the Marine Plastic Pollution Research and Control Act (MPPRCA) of 1987, implemented Annex V of MARPOL 73/78. Annex V prohibits the discharge of any plastic materials from ships at sea, limits the locations

where other garbage may be discharged, and requires signatories to provide reception facilities for the discharge of ships' garbage. Title II includes additional requirements for Annex V's implementation in the United States. One of those requirements is a report on compliance with the new law's requirements.

COMPLIANCE REPORT REQUIREMENTS

Provisions in the Law

Congress mandated in the law that "within 1 year after the effective date of this section, and biennially thereafter for a period of 6 years, the Secretary of the Department in which the U.S. Coast Guard is operating, in consultation with the Secretary of Agriculture and the Secretary of Commerce, shall report to the Congress regarding compliance with Annex V to the International Convention for the Prevention of Pollution from Ships, 1973, in United States waters" (P.L. 100-220).

The Congressional Record elaborated on this reporting requirement (U.S. Congress 1987). The report is required to include a description of the enforcement mechanisms in place and an assessment of the need for additional enforcement authority. It is to address the extent to which garbage reception facilities have been made available at the ports, and the mechanism used by the U.S. Coast Guard to ensure that these facilities are made available as required by Annex V. In preparing this report, the Coast Guard is to assess the extent to which vessels dispose of floatable dunnage materials beyond 25 nmi from shore and the extent to which they wash ashore, and to recommend whether Annex V should be amended to prohibit the disposal of these materials at sea. The report is to provide a detailed assessment of the fines levied by signatory nations for violations of Annexes I, II, and V by their vessels in the U.S. exclusive economic zone. Finally, the report is required to summarize the education efforts undertaken to inform the public of the problem of pollution of the marine environment by garbage that is improperly disposed of.

The Coast Guard is to solicit the advice of interested parties, including the shipping industry, ports, the commercial fishing industry, environmental groups, waste handling firms, and recreational boaters, in preparing this report. The input of industry and environmental groups is to be solicited through existing forums such as the Workshop on National Marine Pollution Problems and Needs conducted by the National Marine Pollution Planning Office of the U.S. National Oceanic and Atmospheric Administration (NOAA); the Marine Debris Roundtable, a national discussion group informally established by NOAA; the National Committee for the Prevention of Pollution, a subcommittee of the Shipping Coordinating Committee, which meets in advance of meetings of the Marine Environmental Protection Committee of the International Maritime Organization; and the National Boating Safety Advisory Council, an advisory committee to the Coast Guard that considers matters affecting recreational boating.

Completing the Feedback Loop

The Coast Guard wants to present a complete picture to Congress in the report. The current report requirements include information on violations, facilities available, and other enforcement information. However, it does not require relative measures against which enforcement data can be viewed. The Coast Guard compiled information on various vessel classes and their contribution to the garbage load in the oceans as a required portion of the regulatory process. It is logical that the report should examine compliance by the different vessel classes already identified. Compliance and regulatory effectiveness are related, and the information would be valuable to this and other Coast Guard regulatory efforts.

The regulation's effect on the environment is another item selected for examination by the report. The law's intended result is the elimination of ship-generated plastics from the waters of the United States, and a reduction in ship-generated garbage. Measurements of amounts of plastic and other garbage in the marine environment seem a necessary part of a compliance report. The effects of the law will be seen by evaluating compliance and environmental effects.

INITIAL PARAMETERS

Constraints

The plan for the required and desired portions of the report filters through a screen of constraints. The first of these is that no additional funds or other resources were allocated by Congress for implementation, enforcement, or for reporting compliance. The compliance report is to be developed using such resources as can be reprogrammed within the Coast Guard. What makes this constraint more difficult to work with is the routine shortage of Coast Guard operating funds. The lack of resources is amplified by any regulatory project's ability to compete within the Coast Guard's needs for operational missions. This is particularly true when those missions include drug interdiction efforts and Maritime Defense Zone planning. Another constraint is the internal human resources available to complete the task. Those responsible for developing the regulation and enforcement plans cannot devote the necessary time to the project without seriously impairing their ability to perform other necessary functions. A final constraint is the lack of information on the amounts, constituents, and sources of garbage in the waters of the world. Estimates and inferences are all that are currently available.

Needs

The report will need baseline information from which to estimate compliance. Knowledge of the amount of garbage, especially plastic garbage, presently in the ocean is necessary to gauge the effectiveness of the regulatory program. The effects of plastic and other garbage on the environment prior to the regulation will also have to be assessed. Measurements of current compliance and garbage generation by vessel types need to be made or estimated if trends are to be analyzed.

The Coast Guard is interested in assistance in developing the feedback-loop items necessary for placing in perspective the measures of compliance that Congress had identified. Questions concerning data collection needs and possible measures of effectiveness need to be answered. The report's time constraints make additional resource input necessary. In this instance the resource is expertise in evaluative design.

WORK PLAN

Need for Action

The Coast Guard is utilizing an incremental approach for the reporting process because of the short time allotted for the entire regulatory package, including the compliance report. The incremental approach allows general planning for completion of the regulatory project, while permitting changes in detail if new techniques or resources are identified. The method for compilation of the report has not been determined, but the end points for completion, as well as resource parameters for efforts to complete the report, are known. The Coast Guard began by identifying areas in which additional information and expertise were needed. It was decided that these areas should be addressed first. Members of the Transportation System Center (TSC), U.S. Department of Transportation, were retained for this effort.

Initial Studies

The first phase involved the search for existing information and studies. The Coast Guard was especially interested in data on the quality of the environment prior to enactment of the MPPRCA of 1987. However, it was also important to identify sources of empirical data for follow-on studies. Continuing information-gathering efforts or studies would be highly beneficial, as the data gathered would continue through the period in which the Coast Guard was interested.

The information search identified entities actively involved in surveying ocean surface debris and beach litter. Fifty organizations were identified and each was contacted by TSC representatives. Ongoing research efforts were separated and further disaggregated into one-time or continuing efforts. Twelve of the fifty organizations contacted actually had conducted ocean or beach surveys. Five of the twelve that had conducted surveys were doing so on a continuing basis. These five activities appeared to be good sources for data concerning the effects of the new regulations on the environment (U.S. Department of Transportation 1988b).

Information was also needed on the amounts of garbage being generated and prereregulation vessel garbage disposal practices. Eastern Research Group had developed much of this information for the Coast Guard during the regulatory development process as part of the regulatory evaluation (U.S. Department of Transportation 1988c). The estimated garbage generation rates for various vessel types are included in Table 1.

Table 1.--Estimated annual quantities of domestic garbage generated by vessels operating in U.S. waters.

Source	Tons	Percentage of total
Merchant marine	33,574	1.74
Commercial passenger vessels	283,881	14.71
Commercial fishing	256,494	13.29
Recreational boating	1,264,114	65.52
Offshore oil and gas industry	18,381	0.95
Miscellaneous vessels	1,801	0.09
U.S. Navy	63,356	3.28
U.S. Coast Guard	6,782	0.35
U.S. Army	539	0.03
National Oceanic and Atmospheric Administration	349	0.02
Total	1,929,271	100.00

It was apparent, even allowing for errors based on incomplete data, that recreational boating and commercial passenger and fishing vessels create most of the domestic waste (U.S. Department of Transportation 1988a). The garbage disposal practices for different classes of vessels were also estimated and are displayed in Table 2.

It was concluded that recreational boating, commercial fishing, and the U.S. Navy were the leaders in the amount of waste dumped overboard.

METHODOLOGY DEVELOPMENT

Requirements

The most difficult task in planning the report's completion is development of a methodology for measuring compliance with the law and the effects of the new regulations on the coastal and marine environment. Most other portions of the report are straightforward, requiring only data acquisition and formatting. Measuring compliance is another matter. The TSC began with given parameters for developing the methodology. The methodology is to rely on information already being collected by the Coast Guard or other governmental and nongovernmental agencies. The information for measuring compliance should be updated regularly, preferably on an annual basis. In the event that existing data sources and surveys are not adequate to this task, TSC is to recommend ways to acquire the appropriate data. Measurements of the effect of the law on the environment are to use only current data collection and survey efforts.

Table 2.--Estimated amount of vessel-generated domestic garbage disposed of at sea by vessels operating in U.S. waters.

Source	Tons	Percentage of total
Merchant marine	30,493	3.76
Commercial passenger vessels	27,846	3.43
Commercial fishing	256,494	31.63
Recreational boating	421,371	51.96
Offshore oil and gas industry	6,574	0.81
Miscellaneous vessels	1,796	0.22
U.S. Navy	63,356	7.81
U.S. Coast Guard	2,059	0.25
U.S. Army	539	0.07
National Oceanic and Atmospheric Administration	349	0.04
Total	810,877	100.00

Measuring Compliance

Measuring compliance appears to be a fairly simple task. First, find out how many entities are in the regulated population. Then ascertain what portion of the regulated population is obeying the statute. The task is complicated in this instance by the lack of available or collectable data.

The Coast Guard is the primary Federal agency source for information on vessels in the waters of the United States. However, data collection efforts are related directly to legal requirements for maintaining that information. The Coast Guard has a spectrum of information on many types of vessels. Most of the information collected by the Coast Guard is on vessels that are inspected regularly for structural, electrical, safety, and operational requirements. However, Eastern Research Group's estimate is that this population generates less than 20% of the total garbage load entering the waters of the United States. The Coast Guard collects some information on recreational boating, estimated to be the largest garbage contributor. This information is collected through random boardings by Coast Guard regular and reserve personnel and by the Coast Guard Auxiliary. However, less information is collected on recreational vessels than on commercial vessels, and collections are not made on a regular basis. The Coast Guard has virtually no contact with commercial fishing vessels, which are estimated to generate approximately 14% of the total garbage load. Finally, the estimate for the U.S. Navy's contribution to the problem made it the fourth largest contributor. The Coast Guard had no data on or regular contact with the U.S. Navy vessels.

Measurement of the amounts of garbage deposited at ports in the United States before and after implementation of the regulations is likewise hindered by the lack of data. It is apparent that current data collection efforts have to be expanded and other sources of data identified if compliance is to be adequately measured.

Recommended Approach

The study by TSC identified methods by which current data collection shortfalls for measuring compliance with the regulations could be corrected (Department of Transportation 1989). The easiest to address are the data collection efforts associated with commercial vessels currently required to be inspected on a regular basis. Additional data collection would involve requirements associated with the implementation of Annex V. The Coast Guard could also include items associated with Annex V in its examinations of port and terminal facilities.

More information on recreational boating compliance could be obtained by modifying the data collection requirements of the random boarding program to include Annex V requirements. The Coast Guard Auxiliary could also gather information on the level of compliance observed during the courtesy marine examinations that they conduct.

The compliance levels of commercial fishing vessels could be determined by establishing a cooperative effort with the National Marine Fisheries Service (NMFS) for inspecting garbage and fishing net pieces brought in to shore when fishing vessels are off-loading their catches. This would not require an expansion of manpower efforts on NMFS' part.

The compliance level could also be better estimated by conducting in-depth studies of selected ports and vessels on a voluntary basis to observe choices of compliance methods, problems encountered, improvements, and port/vessel interactions.

CURRENT STATUS

The Coast Guard is now processing the recommendations for action. The report is to be developed by a contractor selected through the competitive bidding process. Those entities that are currently conducting studies and surveys are being contacted to ascertain how their information may best be utilized. The Coast Guard is acting internally to effect the changes necessary to collect the additional information needed to measure compliance within the various vessel categories. The NMFS is being approached to ascertain their ability to collect data on fishing vessels returning to off-load their catch. The effort to compile the report has been an interesting exercise in measuring compliance with an environmental regulation that affects a wide range of people. Its success in aiding regulatory efforts will be important, as will the lessons learned in attempting to measure those efforts.

The opinions or assertions contained herein are those of the author and are not to be construed as official or reflecting the opinions of the

Commandant of the Coast Guard, the Chief Counsel of the Coast Guard, or the Coast Guard at large.

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