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Final Report

**UNITED STATES
SHIPBUILDING STANDARDS
MASTER PLAN**

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through:
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16. Abstract <p>This Shipbuilding Standards Master Plan was developed using extensive surveys, interviews, and an iterative editing process to include the views and opinions of key persons and organizations involved in developing, managing, and using standards in marine-related industries. Eight essential initiatives were identified that, when acted upon, should significantly enhance the competitiveness of U.S. shipbuilders through better use of standardization. They are:</p> <ol style="list-style-type: none"> 1. Establish a communications center for shipbuilding standards. 2. Become more involved in international standards. 3. Gain more domestic involvement in the shipbuilding standards community. 4. Refine the process for identifying and developing new shipbuilding standards. 5. Coordinate existing standards. 6. Convert the U.S. shipbuilding industry to the metric system. 7. Develop a marketing strategy for the plan. 8. Adopt or convert existing global standards for domestic use. 					
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ABSTRACT

This Shipbuilding Standards Master Plan was developed as a working document to be used mainly by shipbuilders and the SP-6 Panel of SNAME to become an effective and positive influence in the marine industry standards arena. It was developed using extensive surveys, interviews, and an iterative editing process to include the views and opinions of key persons and organizations involved in developing, managing, and using standards in marine-related industries. Eight essential initiatives were identified that, when acted upon, should significantly enhance the competitiveness of U.S. shipbuilders through better use of standardization. They are:

1. Establish a communications center for shipbuilding standards.
2. Become more involved in international standards.
3. Gain more domestic involvement in the shipbuilding standards community.
4. Refine the process for identifying and developing new shipbuilding standards.
5. Coordinate existing standards.
6. Convert the U.S. shipbuilding industry to the metric system.
7. Develop a marketing strategy for the plan.
8. Adopt or convert existing global standards for domestic use.

The Master Plan presents these initiatives along with their objectives, action plans for implementation and supporting documentation.

ACRONYMS

ABS	American Bureau of Shipping
AIA	Aerospace Industries Association
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ASTM F-25	ASTM Committee F-25 on Shipbuilding Standards
AWO	American Waterways Operators
CFR	Current Federal Regulations
DOD	Department of Defense
ECB	Executive Control Board of the NSRP
EPA	Environmental Protection Agency
FCC	Federal Communications Commission
IACS	International Association of Classification Societies
IHS	Information Handling Services
ISO	International Standards Organization
MARAD	Maritime Administration of the U.S. Department of Transportation
MILSPECS	Military Specifications
NAPVO	National Association of Passenger Vessel Owners
NGS	Non - Government Standards
NIST	National Institute of Standards and Technology
NMRI	National Maritime Research Institute
NSRP	National Shipbuilding Research Program
NSWC	CarderockDiv - Naval Surface Warfare Center, Carderock Division, formerly DTRC - David Taylor Research Center
OSHA	Occupational Safety & Health Administration
SAE	Society of Automotive Engineers
SCA	Shipbuilders Council of America
SP-6	The Marine Industry Standards Panel of the Ship Production Committee of the Society of Naval Architects and Marine Engineers
SSPC	Ship Structures Painting Council
TAG	Technical Advisory Group
USCG	U.S. Coast Guard

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I. EXECUTIVE SUMMARY

A. BACKGROUND

The Shipbuilding Standards Master Plan (the Plan) was developed under the direction of the NSRP¹ and Panel SP-6² of SNAME³, through a contract from MARAD⁴ administered by Peterson Builders, Incorporated. The Plan was developed using extensive interviews, surveys, and an iterative editing process to include the views and opinions of the key persons and organizations involved in the processes of developing, managing, and using standards in marine-related industries.

A U.S. shipbuilding standards program, like any other program, must be driven by the needs of its constituents. The direct constituents of this Plan are the shipyards. The indirect constituents are the ship owners and related marine industries. The reasons for developing the Plan were:

- the current system lacks focus and coordination,
- markets for U.S. shipbuilders are changing from government (primarily Navy) to commercial,
- future markets are becoming more international and the current system is not responding,
- reductions in ship production costs are needed,
- the standards system requires a faster development process,
- the standards system must employ best practices/materials,
- U.S. shipbuilders must adopt the metric system,
- the shipbuilding industry is losing its domestic supplier base, and
- standardization supports PWBS⁵ and other industrial technologies.

There are many tangible and intangible benefits of a solid standards program, all of which eventually reduce costs or time requirements of shipbuilding. The Plan's aim was to facilitate a program for emplacing a U.S. shipbuilding standards program that will address the prescribed needs.

Many of the people involved in the development of the Plan were also involved in the planning and execution of the Standards Planning Workshop (NSRP 0344). Therefore, many of the initiatives recommended in the Plan resemble goals developed during the workshop. Due to the additional participation, both in numbers and diversity, in the workshop as compared to the Plan, the Plan relies on and references the workshop results to obtain validity. However, the Plan is independent from the workshop in that it should be thought of as a living document and periodically revised and updated to reflect the current state of the industry.

The eight primary initiatives identified as necessary to develop and maintain a viable National Shipbuilding Standards Program are listed below.

1. Establish a communications center for shipbuilding standards.
2. Become more involved in international standards.
3. Gain more domestic involvement in the shipbuilding standards community.

¹National Shipbuilding Research Program

²Panel SP-6, Marine Industry Standards

³Society of Naval Architects and Marine Engineers

⁴The Maritime Administration of the U.S. Department of Transportation

⁵Product Work Breakdown Structure

4. Refine the process for identifying and developing new shipbuilding standards.
5. Coordinate existing standards.
6. Convert the U.S. shipbuilding industry to the metric system.
7. Develop a marketing strategy for the plan.
8. Adopt or convert existing global standards for domestic use.

The Plan presents the basic initiatives as a separate section in the summary below. The Detailed Plan Development section repeats the initiatives with a thorough supporting explanation of how they evolved.

B. SUMMARY OF NEEDED INITIATIVES

Following are the main initiatives needed to have an effective National Shipbuilding Standards Program. These initiatives are presented in more detail and are supported by research and data in the second part of this report. The only clear long term action item is identified in the first initiative. Timing for the other action items, although most of these initiatives require immediate attention, should be worked out as the SP-6 Panel takes items for action in consideration of their resources.

1. Establish a Communications Center for Shipbuilding Standards.

Objectives:

- a. Become knowledgeable of and coordinate activities among all organizations involved in shipbuilding and shipbuilding standards.
- b. Establish a central, unbiased, reference source of all U.S. and foreign shipbuilding standards.
- c. Disseminate standards information, including ISO⁶, to industry.
- d. Facilitate solutions to discrepancies among different sources of standards and among users and writers.

Specific Action Areas:

Short Term (1 - 2 years)

- a. Use the funded⁷ (or selected for funding) existing projects to develop the functions related to the Communications Center.
- b. Identify and evaluate possible performing organizations: NSRP Documentation Center, SP-6 Program Manager, Carderock Division NSWC⁸, SCA⁹, ASTM¹⁰ F-25, NIST¹¹, IHS¹², NMRI¹³ or some combination.
- c. Acquire seed money, in the neighborhood of \$50 - \$100,000, from the Navy's Industrial Competitiveness Programs.

Long Term (3-5 years)

- a. Establish broader based support, both in participation and financial forms, from the Navy, other owners (both government and private) member shipyards, and the rest of the marine industry.

⁶ International Standards Organization

⁷ Compendium of Shipbuilding Standards, Support to the U.S. TAG to ISO TC-8, Metrication, Standards Equivalency, Master Plan Update.

⁸ Carderock Division - Naval Surface Warfare Center, Carderock Division, formerly DTRC- David Taylor Research Center

⁹ Shipbuilders Council of America

¹⁰ American Society for Testing and Materials

¹¹ National Institute of Standards and Technology

¹² Information Handling Services

¹³ National Maritime Research Institute

- b. Establish continuing sources of funding, possibly combinations from the Industrial Competitiveness Program, USCG¹⁴, MARAD, DOD¹⁵, SCA and its constituent members, and Commerce (NIST).

2. Become More Involved in International Standards.

Objectives:

- a. Participate more fully in ISO.
- b. SP-6 should be a regular member of the ISO TAG¹⁶.
- c. Shipyards should be represented on the TAG.
- d. A liaison between IACS¹⁷ and SP-6 should be established.

Specific Action Areas:

- a. ECB¹⁸ - Continue to fund ISO support projects, preferably as a regular line item on the NSRP budget.
- b. SP-6 - Represent a strong presence of shipbuilders on the ISO TAG to TC-8.
- c. SP-6 - Investigate other avenues of representation in foreign and international standards organization.
- d. Create a database or library of international shipbuilding standards at a central repository for reference and access.

3. Gain More Domestic Involvement in the Shipbuilding Standards Community.

Objectives:

- a. Expand SP-6 membership.
- b. Expand the communications links among involved organizations.
- c. Get more shipbuilders involved with ASTM F-25.

Specific Action Areas:

- a. SP-6 - Recreate mailing list, identify people and organizations who are or should be important to SP-6, balance the membership with builders, suppliers, and related marine industry people.
- b. SP-6 - Conduct membership drive, solicit members from outside the normal areas such as AWO¹⁹ and NAPVO²⁰.
- c. SP-6 - Develop a recruiting package.
- d. ASTM - Bring membership ratio in line with the "Blue Book."

¹⁴U.S. Coast Guard

¹⁵Department of Defense

¹⁶Technical Advisory Group

¹⁷International Association of Classification Societies

¹⁸Executive Control Board of the NSRP

¹⁹American Waterways Operators

²⁰National Association of Passenger Vessel Owners

- e. SP-6 - Establish liaison with other standards-writing organizations such as API²¹, SAE²², AIA²³, SSPC²⁴.

4. Refine the Process for Identifying and Developing New Shipbuilding Standards.

Objectives:

- a. Avoid duplication of established foreign or international standards.
- b. Expedite standards through the process.
- c. Consider the reduction of shipbuilding process time in processing standards.

Specific Action Areas:

- a. SP-6 and F-25 should have a filter to avoid development of new standards when applicable foreign or international standards already exist.
- b. SP-6 - Evaluate the possibility of other standards-writing organizations developing certain standards.
- c. SP-6 - Work with the other NSRP Panels to facilitate getting the applicable results of their work developed into shipbuilding standards.
- d. SP-6 and F-25 - Participate in and use the program set up at NAVSEA to track standards through the process and reduce process time.
- e. SP-6 and F-25 - place line items in their plans and by-laws to consider the reduction of shipbuilding process time in processing standards.

5. Coordinate Existing Standards.

Objectives:

- a. Maintain technical currency.
- b. Identify all standards relevant to shipbuilding.
- c. Add emphasis to the NDCP²⁵.

Specific Action Areas:

- a. Become more involved in other standards organizations.
- b. SP-6 - Identify (and sponsor for review) out-of-date standards.
- c. SP-6 - Require the Computerized Compendium of Standards subcontractor to include all standards relevant to shipbuilding.
- d. NAVSEA - Expand the NDCP to include other standards bodies and look at equivalency of existing NGS²⁶ or ISO standards.
- e. SP-6 - Establish liaison with other standards organizations.

²¹Aerospace Industries Association

²²Society of Automotive Engineers

²³Aerospace Industries Association

²⁴Ship Structures Painting Council

²⁵Navy Document Conversion Plan

²⁶Non - Government Standards

6. Support Conversion of the U.S. Shipbuilding Industry to the Metric System.

Objectives:

- a. Proceed with FY'92 metrication project.
- b. Write new standards, and updates of existing ones, using the metric system.

Specific Action Areas:

- a. Require SP-6 projects that deal with any units of measure to be written in metric first (U.S. second), similar to the SNAME publication requirement, and recommend to the SPC that it require the same.
- b. Implement the Presidential Executive Order that requires changeover to the metric system.
- c. Implement recommendations of the FY'92 Metrication project.

7. Develop a Marketing Strategy for the Plan.

Objectives:

- a. Give the Plan visibility.
- b. Develop high level support.
- c. Give the Standards Program an identity (Initiative #1).
- d. Adopt continuing initiatives into the SP-6 charter.

Action:

- a. U.M., SCA or SP-6 Program Manager - Mail the Plan directly to shipyard engineering V.P.s, ASTM F-25 Chairman, USCG Technical Division (G-MTH) head, and other identified "key players."
- b. SP-6 - Conduct an implementation workshop at a panel meeting.
- c. Have an SP-6 officer or representative present the Plan at SCA, ECB, and F-25 meetings.
- d. NSRP Management - Take steps to develop an identity for the NSRP, such as establishing a letterhead, a singular address and phone number for communications reference (Initiative #1), and a dedicated full time administrative contact person.

8. Adopt or Convert Existing Global Standards for Domestic Use.

Objectives:

- a. Provide easier domestic approval of equipment built to foreign standards.
- b. Increase domestic ability to build commercial vessels for a global market.
- c. Reduce the time and cost to build ships.

Action:

- a. Support the standards equivalency project.
- b. Identify foreign shipbuilders' commercial standards that may be available for purchase.
- c. Fully support the ISO TAG so that ISO standards are directly acceptable for U.S. commercial vessels.

II. MASTER PLAN DETAILS

A. INTRODUCTION

Conceptually, standardization reinforces the basic economic principle of eliminating excessive (non profitable) variety and provides performance guidelines for repetitive processes. However, in the transition from concept to implementation, standardization becomes a much more complex issue. Factors such as technical input, regulatory mandates, and market conditions require involvement by a wide range of organizations, both domestic and international. The effectiveness of an industry's implementation of the standardization concept is dependent upon its understanding of these factors and its ability to coordinate their influence into a comprehensive set of standards that address real needs. The real measure of effectiveness is not the volume of standards produced, but their ability to meet these needs.

U.S. shipbuilders are building and repairing ships by standards every day, and they are having a significant effect upon the cost and quality of ships and, ultimately, the competitiveness and profitability of shipbuilders. Recognizing this, the issue goes beyond the question of "Does (or should) the industry have standards?"; it does. The underlying and more appropriate question is, "How does the industry ensure that its standards meet the needs (cost-effectiveness and quality) of its constituents?"

The National Shipbuilding Research Program's Panel SP-6 on Marine Industry Standards initiated this project to pursue the above issue and develop objectives and a strategic plan for the industry to address it. This U.S. Shipbuilding Standards Master Plan is the culmination of that effort, pulling together the findings and recommendations resulting from a previous Long Range Plan¹, extensive interviews, surveys, and other research into the field of standardization, especially as it pertains to industry organizations. The research was focused on answering several key questions listed below.

1. In what areas of shipbuilding will the development, adoption, and/or the revamping of standards benefit the industry most?
2. What is the most effective process for the development and approval of industry standards?
3. How should the industry deal with the "globalization" of standards?
4. What organizational structure is required for the industry to administer and implement its system of standards?
5. What specific actions are needed, and by whom, to enact the above findings and recommendations?

This project looks beyond the individual standards themselves and delves into the organizational aspects of their development, administration, and implementation, with the intent that a well designed organizational structure will more effectively address the issues surrounding individual standards. A well designed foundation will, in the long run, have a much more beneficial impact on the industry's standards than a short term attempt to fix individual standards.

¹NSRP 0144, *Recommended U. S. Shipbuilding Standards Long Range Plan*, IHI Marine Technology Inc., February, 1982; Sponsored by U.S. Department of Commerce, Maritime Administration.

This Master Plan (hereafter referred to simply as the "Plan") is intended to provide long term strategic guidance to Panel SP-6 in the development programs of effort over the next five years. This Plan will provide the guidance necessary to focus the efforts of the U.S. shipbuilding infrastructure on the activities that are most important in developing shipbuilding standards in this country. The industry may then begin to develop and use shipbuilding standards within an organized and effective administrative framework, and may begin to reduce costs through standardization of design and engineering, product characteristics and performance, testing and inspection, and production processes.

As with any plan of this scope, portions of it are likely to be overcome by events prior to its full implementation. It is strongly suggested that the Plan be monitored and updated periodically to ensure that its basis and conclusions remain valid. The FY'93 NSRP project, "Shipbuilding Standards Master Plan Update," should serve to keep the Plan alive.

B. DEFINITION AND CATEGORIZATION OF STANDARDS

Standards, in the broadest sense of the term, can be defined as: Prescribed designs, processes, rules, and procedures to be used in repeatable operations to ensure a predetermined level of performance, quality, and safety. Standardization can be defined as: The process by which standards are developed, administered, and implemented.

While this report will deal primarily with issues of standardization, it is important that a clear and consistent definition of the various categories of standards, and a sense of how one category relates to the other, is presented. The following categorization is derived generally from the IHI report and defines the various categories and their relationship to each other.

International Standards

International Standards are usually the result of international trade and treaty agreements developed in both the government and private (trade agreements) sectors. Government trade and treaty agreements such as the General Agreement on Trades and Tariffs (GATT), the International Maritime Organization (IMO), the North Atlantic Treaty Organization (NATO), and the European Community (EC'92) effort may develop their own standards or draw upon those developed in the private sector for the language of the agreement. Regardless of the source, compliance is mandatory for all nation signatories.

The private sector develops international standards through organizations such as the International Standards Organization (ISO), Comité Européen de Normalisation/Comité Européen de Normalisation Electrotechnique (CEN/CENELEC), and the International Electrotechnical Commission (IEC). Participation in the development of and compliance with these standards is voluntary, although, as stated previously, their adoption by international agreement may mandate compliance.

National Standards

National Standards (U.S.) are generally defined to include standards and specifications developed at the national level either by an agency of the federal government (MIL-SPECS, CFR, EPA, FCC, OSHA, etc.)² or those voluntary industry standards that have been accepted by the

²Most common acronyms are listed in the front of this document.

American National Standards Institute (ANSI). While both are generally acknowledged to have nationwide applicability, they are distinguished from each other in that federal agencies develop their standards with limited input from the user community, while ANSI standards are developed with considerable input from industry and government, usually working together.

Industry Standards

Industry Standards are developed on a voluntary basis by nationally recognized industry organizations (ASTM, SAE, ASME, IEEE, etc.). Standards in this category include design and quality assurance criteria for various items of hardware, structures, and systems. They may or may not be adopted by ANSI as National Standards.

Shipbuilding Standards

A subset of Industry Standards, Shipbuilding Standards, are those standards that apply directly and, in some cases, exclusively to shipbuilding. SNAME, MARAD, and ASTM Committee F-25 are sources of standards developed and designated exclusively for shipbuilding; however, there are many other Industry Standards that, although not designated specifically as Shipbuilding Standards, are currently being used in the shipbuilding industry. For the purpose of this document, Shipbuilding Standards will generally be defined as those standards currently designated by source or title as such.

Company Standards

Company (or in-house) Standards are those that are developed to meet a company's particular needs. They are intended to fill the gaps in other standards categories and translate the intent of the various categories into actions best suited to the peculiarities and specialties of a specific company. Although Company Standards may follow the higher level standards very closely, they are distinguished by the fact that they are able to go into much greater detail, have more flexibility, and accommodate innovations much more readily than the others.

Standards Interfaces

The above categories were defined to describe the hierarchy of standards development, not to imply that they are entities on their own. They are very nebulous categorizations with no clear and concise definition possible within the scope of this report. The lines among the categories are immediately blurred when an "Industry Standard" is adopted as a "National Standard," or an "International Standard" is incorporated into a "Company Standard." What is clear is that the standards contained within each of the categories rely heavily upon a constant and coordinated flow of information among the organizations responsible for those standards in order to ensure that they are current and technically compliant with each other, and to avoid duplication of effort. Without this flow of information standards become chaotic and ineffective. Certainly, it can not be argued that the world's standards are in complete concert with each other, nor do they necessarily need to be. Technological advances, cultural differences, economics, and other considerations will always preclude 100 per cent standardization, whether at the international level or the company level. The goal is not 100 per cent standardization, but a level of communication and coordination such that optimum standardization is achieved.

C. OPTIMUM STANDARDIZATION

Optimum Standardization of Industry (shipbuilding) Standards can be characterized by the following key attributes.

Selection

Standards are targeted on those areas where a need exists and where they can be cost-effective. Isolated standards have no inherent value unless they are justified by an identified and, in certain cases, quantified need. Standards cost money to develop and administer and must be underwritten by an equal or greater benefit to be derived from their implementation. This is one of the most elusive aspects of standardization since benefits, particularly quality, are often hidden in nontangible returns. Nevertheless, all standards candidates must be subjected to a qualification process, whether it be a formal cost-benefit analysis or informal consensus, to determine need and ensure their future cost-effectiveness.

The costs of not going through this qualification process are that:

- resources are misspent on developing and maintaining ineffective standards,
- the credibility of the industry's standards as a whole is degraded by the inclusion of ineffective standards,
- improperly selected standards may actually result in higher costs to the producer and the consumer, and
- standards improperly imposed upon an emerging technology may stifle the innovation it requires to naturally mature.

A well designed selection and qualification process will recognize these potential pitfalls and provide mechanisms to avoid them.

Research

Standards comply with existing standards wherever necessary for regulatory compliance and wherever possible for economic and technical reasons. To borrow a term coined by the European Economic Community, standards must be "harmonized." A crucial part of the development process for any industry standard is the researching of existing standards that may affect it. In the hierarchy of standards, regulatory compliance is usually directed from higher levels down, while economic and technical considerations are directed from lower level up. In other words, the development of Industry Standards will be driven by International and National Standards for regulatory compliance, but will look to company standards (or other Industry Standards) for state-of-the-art and most economical practices. In turn, Industry Standards should strive to work "upstream" to influence the development of the higher level standards, especially those with the potential to invoke regulatory compliance.

It is also important to understand that it is not always necessary to create a new and proprietary standard if an existing standard can be adopted, possibly with minor modifications, to serve the intended purpose. There are over 80,000 published standards in the U.S.³, 60 per cent of which were developed by government agencies and 40 per cent by approximately 400 private sector industry groups. In addition, there are over 200,000 standards developed internationally and by

³R. B. Toth, ed. *Standards Activities of Organizations in the United States*. Washington, D.C., Government Printing Office, 1984. Sponsored by National Bureau of Standards. NBS-SP-681.

foreign nations. There is obviously a great deal of information to draw upon that should be exploited to its full potential. The numbers are somewhat daunting, but with modern computerized databases, the search process should not be overwhelming.

Development

Standards are open to input from all organizations that are affected by or have the potential to affect them. Unless the process is visible and open to all concerned, it cannot draw upon all of the data available and necessary for the proper development of standards. Input must be solicited from all sectors of the industry, including producers, customers, suppliers, and regulators. This is not to say that all input will necessarily be incorporated into the standards; the intent is only to ensure that all perspectives are considered. The process must further be capable of sorting through the often conflicting data and refining it into a single document that gains consensus approval. Failure to solicit this industry-wide input and gain consensus will result not only in the loss of valuable information needed for a standard's development, but will fail to gain "ownership" by the industry as a whole, resulting in low rates of implementation and compliance.

Most standards writing organizations will have a set of by-laws in place to guide the consensus approval process, but the industry should have its own standards by-laws to oversee the process, especially when working with more than one standards organization. This is one of the basic concepts that should drive the organization of the SP-6 Panel.

Administration

To be an effective instrument of industry, standards must be efficiently administered and maintained. Regardless of how well standards are selected, researched, and developed, successful implementation depends on visibility and accessibility. Contributing factors this visibility and accessibility are:

- a central source listing of all recognized industry standards,
- an efficient means of accessing, either in electronic or hard copy form, the full text of industry standards,
- a coding and classification system to expedite research of the standards listing,
- an on-line service to assist users in the selection and use of the standards and to receive feedback on the standards themselves, and
- a marketing campaign (direct mail publications, trade magazine articles, trade show exhibits, etc.) to alert all levels and sectors of the industry of its standards and to promote them as part of the way it does business.

These factors imply that an administrative office and staff need to be established. Most Industry Standards organizations have done so. Staffs range from a mailing address and phone number with a part time director to a permanent facility with a full time staff, such as at the Aerospace Industries Association. Standards are usually taken on by an industry association as one of its regular functions. Regardless of how standards organization's structure and staff, it is very important that it be developed sufficiently that it has a well formed identity and it retains the credibility to work with all aspects of the industry.

D. SURVEY ANALYSIS

A comprehensive survey related to shipbuilding standards was sent to a large cross section of the marine industry, from large shipyards to vendors to naval architects. It went to 88 shipyards and shipowners; 34 complete responses were received, 7 additional responses, although not complete, were also received and included in the results. In addition, post survey interviews were held with a number of builders and owners, most of which were not at the Kansas City workshop, so their input was a valuable addition. A brief description of the survey results is summarized in this section with various analysis of the results tallied in the appendix. The Plan uses the results of the survey in the "Full Analysis of the Initiatives" section to justify those initiatives.

Appendix A contains detailed results of the survey and is divided into five sections listed below.

1. Survey form.
2. Survey averages.
3. Numerical result tallies.
4. Histograms of survey results for Question #5.
5. Rank ordered results and summaries of comments.

The blank survey form is the first section of this appendix. The survey was first distributed on December 18, 1991 and most of the results were back before the Workshop in March of 1992. The survey was kept relatively simple to elicit responses. The purpose of the simplicity was to get enough responses so that the results would be statistically useful. A fair amount of effort was expended to contact respondents to get their surveys returned, thus the high response rate.

The following section of Appendix A shows the survey with the numerical averages for those questions on the survey looking for numerical responses. For questions 3, 8, 9, 10, 11 and 12, the results are presented as the number of respondents agreeing with that answer out of the total number that answered that question

The next section of the appendix shows the numerical results in spreadsheet form and presents the statistical analysis of the survey. The results are shown with data from all the respondents grouped together, then separated with the results from shipyards grouped together on page A-10 and all others⁴ grouped together on page A-11. The results show that not all respondents answered all questions. For example, of the 41 total responses, only 7 were knowledgeable of, or had experience with, the Germanischer Lloyd (GL) classification rules to give a response. Due to the type of answer required for Question #5, the results are more appropriately displayed by a histograms that are shown on page A-12.

A rank ordered analysis of the numerical responses is presented in the last part of the Appendix. That section also lists summaries of written responses where solicited and some analysis of the numerical results. They are presented in bullet form to give readers a direct picture of results obtained without hiding them in additional text. Readers are left to draw their own conclusions from the survey.

⁴"Others" includes, MARAD, Navsea, Academic Institutions, Standards Consultants and Naval Architects.

E. FULL ANALYSIS OF INITIATIVES

What follows is an itemized analysis of the initiatives identified in Volume I as necessary for establishing a strong marine industry standards organization. The primary identifiable references for developing these initiatives are listed below.

1. Recommended Standards Program Long Range Plan (1982 Plan).
2. Marine Industry Standards Planning Workshop (Workshop).
3. The Survey performed for this Plan (Survey).

The first two references are formally referenced and abstracted in Appendix B and will be referenced in this section by the shorter titles listed above in parenthesis. The Survey is fully analyzed in the preceding section of this report. Numerous direct discussions with key people in marine and other industry standards groups, attendance at all SP-6 meetings and full participation before, during, and after the Workshop also served to develop the initiatives, objectives, and action plans. These references will be called out only when directly quoted. Acronyms used in this Volume are defined at the end of Volume I.

The objectives and action items are presented in this section in essentially the same form as in Volume I. The action items should be considered as needing to be developed or established in a relatively short term (1-2 years) and, if appropriate, maintained thereafter.

1. Establish a Communications Center for Shipbuilding Standards.

It became obvious in the course of the investigation into standards that many of the parties involved in the production and use of standards were not effectively communicating with each other. The Navy's system for reviewing and updating Military Specifications (MILSPECS) was falling further behind while the DOD was cutting back spending and the NAVSEA staff was cut by 25%. The SP-6 Panel held the Kansas City Marine Industry Standards Planning Workshop in March of 1992 that struggled to attract a needed cross section of the industry. ASTM was thorough but slow in producing relevant standards. A central, unbiased, preferably funded clearinghouse and facilitator seemed to be a viable solution to many of the problems besetting this part of the marine industry.

Many of the inquiries made by the investigators for this project uncovered initiatives that could have been better coordinated by a central standards source. For example, the SCA had funded Phase 1 of the Standards equivalency effort but was unaware that ISO TC-8 was undertaking a "Standards Comparison" project. Actually, the U.S. TAG to TC-8 was also unaware of this effort because communications to the TAG via ANSI had broken down. The Coast Guard, necessarily in the loop to approve of identified equivalents, was unaware that SCA had located a possible source of funding for Phase 2 of the equivalency project. Avoidance of minor but irritating glitches like these would be routine with a central information center and a motivated facilitator for the standards cause.

A Communications Center for U.S. Shipbuilding Standards would satisfy the following major objectives:

- a. Be knowledgeable of and coordinate activities among all organizations involved in shipbuilding and shipbuilding standards, both domestic and foreign.
- b. Establish a central computerized reference source of all U.S. and foreign shipbuilding standards.
- c. Disseminate standards information, including ISO, to the marine industry.
- d. Facilitate solutions to discrepancies among different sources of standards and between users and writers.
- e. Facilitate timely review of new or reworked standards.

Such a center would necessarily be unbiased towards any of its users, whether it be a large or small shipyard, the government, or any of the standards bodies. It would also not be overly influenced by its source of funding. Precedent for such a center was set up by the Aerospace Industries Association (AIA). The AIA has a separate staff that works primarily on standards.

For the short term, developing the concepts seen necessary for the Center could be developed in the existing funded projects, those related to maintaining the Compendium of Shipbuilding Standards, the Support to the U.S. TAG to ISO TC-8, and the Master Plan Update .

An additional function needed early on would be to investigate sources for seed money. Possibilities include the NSRP, a direct grant from the Navy's Industrial Competitiveness Programs, the SCA, shipyards, or ideally, a combination of all these groups, as all stand to gain from a strong shipbuilding standards effort.

It will also be necessary to identify and evaluate organizations capable of performing such a function. Possibilities include the NSRP Documentation Center, the SP-6 Program Manager, Carderock Division NSWC (formerly DTRC) directly, SCA, ASTM F-25, NIST, Information Handling Services (IHS) or another of the established sources for electronic standards information, or a National Maritime Research Institute (NMRI), an organization identified as a needed entity for the whole of the maritime industries.

Question #5 of the Survey revealed mediocre marks on the following statements:

- 1) that standards as they are today create more bureaucracy than they're worth,
- 2) are well organized and coordinated, and
- 3) are easily accessible and understandable.

A Communications Center would alleviate the atmosphere that caused these marks.

The need for this initiative is also supported by Workshop Goals 1, 2, 4, 6, and 9, and could well support the requirements of Goal 3. The Center would not be responsible for executing all the tasks required to facilitate the action items identified in this Plan, the Workshop, or any other task identified as necessary for establishing a viable standards program. It could, however, support a variety of tasks and be a catalyst and central point of contact for many tasks.

The 1982 Plan described many of the responsibilities of the various organizations responsible for developing, using, and benefiting from standards, but it DOES NOT identify a responsible party for organizing or leading the effort. In May 1992, The ECB discussed and outlined the need for an Standards Advisory Panel from the ECB. Members are to be from MARAD, SCA, USCG, and a prominent shipyard. In September 1992, the ECB formed an Ad Hoc Group to "develop an action plan to produce a complete body of shipbuilding standards to support the NSRP goals and

objectives" (Appendix G). These plans will serve to give leadership and high level support to the marine industry standards effort and the Center could well serve to coordinate and support those efforts.

The process used by the AIA to begin developing its standards organization into a strong and productive group (see Appendix F) is a viable reference resource for the marine industry's standardization effort. Although funding levels available for shipbuilding ventures are not as abundant as those for aerospace, but the successful model is there to follow. The recommended alternative, then, would be to create a shipbuilding standards center under the banner of the SCA, the shipbuilding industry trade group. However, for this to occur, the SCA would have to expand beyond its label as the marine industry's lobbyist and become recognized as more of an industry technical representative that it actually has in its membership. The SCA's makeup already includes shipbuilders, allied industries members and naval architect members. This cross section of expertise is preferred by groups such as ASTM and SP-6 to have a balanced standards body.

Thus, the SCA is the most likely candidate to harbor a successful industry standards organization, although all the other groups identified above would be participants and contributors. Getting necessary levels of funding for such a group may be difficult - especially if it would appear that the government would be supporting a group whose main purpose is to lobby the government. However, the Navy has much to gain from a successful industry standardization organization and should support this or a parallel effort. If the "lobbyist" label of SCA cannot be overcome, an independent unit should be formed to be the Communications Center for U.S. Shipbuilding Standards, preferably at a location with an unbiased administrative system already in place.

Many of the action items identified in other initiatives in this report would best be performed or facilitated by the Communications Center. The Center should not be considered as replacing any of the existing groups presently involved with standards. It should be considered an administrative and reference resource.

Long term (3-5 years) goals for the Center would be to establish broader based support from the member shipyards and the marine industry, and to establish continuing sources of funding, possibly combinations of Navy's Industrial Competitiveness Programs, USCG, MARAD, DOD, SCA and its constituent members, and the Commerce Department through NIST.

2. Become More Involved in International Standards.

This initiative is already being pursued in a number of areas. The SP-6 Panel, NSRP, and MARAD have funded projects to support the U.S. TAG to ISO. The ABS representative to the TAG has recently become more involved. The SCA and SP-6 have recently been added to the TAG membership. The TAG Chairman has been able to add a number of U.S. people to TC-8 Subcommittees and Working Groups. However, this is a developing effort, and the degree of involvement needs to be developed as well.

The Survey gave relatively low marks to the statement that "U.S. Shipbuilding Standards support us (U.S. shipbuilders) in the international marketplace," meaning that most respondents disagreed with the statement

An extensive report (Appendix D) was prepared on this subject by Mr. Richard Thorpe, Vice President for Export Activities and Technical Research for the SCA. That report justifies the need to become more involved in international standards. This initiative is also identified in the goals

and objectives of the NSRP, presented in Appendix G, specifically Goal 4, Objective B. to "Actively support the capability to build to international standards and specifications."

The basic objectives of this initiative are to:

- a. Participate more fully in ISO,
- b. Establish SP-6 as a regular contributing member of the ISO TAG,
- c. Have shipyards represented on the TAG, and
- d. Establish a liaison between IACS and SP-6.

As discussed above, these objectives can be met through existing organizations if a representative level of participation is achieved.

The specific actions needed to achieve those objectives are for:

- a. The ECB to continue to fund ISO support projects, preferably as a regular line item on the NSRP budget,
- b. The SP-6 Panel to represent a strong presence of shipbuilders on the ISO TAG to TC-8,
- c. The SP-6 Panel to investigate other avenues of representation in foreign and international standards organizations, and
- d. The NSRP to create a database or library of international shipbuilding standards at a central repository for reference and access.

This last item could be performed by the Communications Center identified in Initiative 1, by the NSRP Documentation Center, or by the contractor that periodically maintains the Compendium of Standards. This item is directly supported by Goals 6 and 7 of the Workshop. The participation items are supported by Goal 9.

3. Gain More Domestic Involvement in the Shipbuilding Standards Community.

While Initiative 2 was concerned with the international scene, this initiative concerns the domestic scene. Many of the same people are involved in both areas, but it is necessary to differentiate the types of organizations and the players that need to be involved. The Survey indicated that most of the respondents participated in one or more of the standards-writing bodies. However, in their planning processes both SP-6 and ASTM F-25 indicated a need for recruiting more participants, SP-6 in the Workshop and F-25 in their strategic plan (Appendix E).

The objectives identified for this initiative are those of basic recruiting.

- a. Expand SP-6 membership.
- b. Expand the communications links among involved organizations.
- c. Get more shipbuilders involved with ASTM F-25.

The specific action areas listed below are those of basic recruiting, plus an attempt to have SP-6 establish a liaison with other standards-writing organizations.

- a. SP-6 - Recreate mailing list, identify people and organizations who are or should be important to SP-6, balance the membership with builders, suppliers, and related marine industry people.
- b. SP-6 - Conduct membership drive, solicit members from outside the normal areas, such as from AWO and NAPVO.
- c. SP-6 - Develop a recruiting package.

- d. ASTM - Bring membership ratio in line with the "Blue Book."
- e. SP-6 - Establish liaison with other standards writing organizations such as API, SAE, AIA, and SSPC.

These action items are supported by Goal 9 and other general statements from the Workshop, and are expected for any volunteer organization. The Communications Center could serve to facilitate or perform many of these action items and could take the administrative burden off the backs of the volunteer SP-6 Panel. The recruiting package could include a copy of the Computerized Compendium, a copy of the Workshop results, an SP-6 mailing list or similar items to help the prospective member become part of the organization.

ASTM needs to attract more shipbuilders into its shipbuilding standards writing organization to get the requisite balance of users, producers and general interest members for writing appropriate standards. Both ASTM and SP-6 need to get the participation of some of the smaller shipyards that are generally members of AWO. While they may not have the depth of personnel to be physically present at many ASTM and SP-6 meetings, through correspondence smaller yards can provide a valuable knowledge base.

4. Refine the Process for Identifying and Developing New Shipbuilding Standards.

The objectives for this initiative are easy to describe but will be difficult to achieve. The basic objectives are to:

- a. Avoid duplication of established foreign or international standards,
- b. Expedite standards through the process, and
- c. Consider the reduction of shipbuilding process time in processing standards.

These objectives are supported by Workshop goals 2, 4, and 9. They are referenced in many parts of the Workshop proceedings and in the 1982 Plan. The ASTM F-25 Strategic Plan also addresses refining their review process. The reduction of standards process time is also dependent on the success of the recruiting initiative in that the right people in the proper numbers are needed for competent and timely review of new standards.

The NSRP Long Range Plan (Appendix G.) states its top five year goal and its highest priority objective as reducing "design, acquisition, construction and repair process times." For this Plan to be complete, these same objectives must be reiterated and included in all forms of standards processing and in the SP-6 Panel decision processes.

The specific actions needed to achieve these objectives are for:

- a. SP-6 and F-25 to have a filter to avoid development of new standards when applicable foreign or international standards already exist,
- b. SP-6 to evaluate the possibility of other standards-writing organizations developing certain standards,
- c. SP-6 to work with the other NSRP Panels to facilitate getting the applicable results of their work developed into shipbuilding standards,
- d. SP-6 and F-25 to participate in and use the program set up at NAVSEA to track standards through the process and reduce process time, and
- e. SP-6 and F-25 to place line items in their plans and by-laws to consider the reduction of shipbuilding process time in processing standards.

The filter to avoid development of new standards when applicable foreign or international standards exist is a concept ASTM F-25 should consider. The ASTM F-25 Strategic Plan considers presenting approved ASTM standards to ISO for adoption but does not look at the reverse situation. The results of an FY'93 SP-6 project to perform an (equivalency) "Evaluation of U.S. and International Marine Engineering Standards" should provide some guidance in this area, including development of new standards, updating existing standards or adopting foreign standards.

The second action item dovetails with similar findings of the Workshop. It stands to reason that certain standards are best handled by organizations other than ASTM, such as ASME for Boiler and Pressure Vessel Code items. SP-6 should also take some responsibility for ensuring that applicable work of other SNAME SPC Panels is developed into shipbuilding standards.

The ASTM F-25 Strategic Plan describes a system used at NAVSEA to track standards through the approval process. And, as stated in the F-25 Plan, the system is only as good as the data supplied to it. Use of this system can at least verify where a standard is within the system and that knowledge may help those working on a particular standard to reduce the process time. The Navy has a vested interest in tracking standards because the more standards that are developed or converted with the approval of the Navy, the fewer specific military standards the Navy has to maintain on its own.

5. Coordinate Existing Standards.

Although executed by the same people in the same organizations, the objective of coordinating and maintaining existing standards must be listed separately. As technology progresses the standards that support its application must also progress. Itemized objectives for this initiative are to:

- a. Maintain technical currency,
- b. Identify all standards relevant to shipbuilding, and
- c. Add emphasis to the Navy Document Conversion Plan (NDCP).

Specific actions needed to achieve these objectives are for:

- a. Those involved in marine industry standards to become more involved in other standards organizations,
- b. SP-6 to identify (and sponsor for review) out of date standards,
- c. SP-6 to require the Computerized Compendium of Standards subcontractor to include all standards relevant to shipbuilding,
- d. NAVSEA to expand the NDCP to include other standards bodies and look at equivalency of existing non-government standards or ISO standards, and for
- e. SP-6 to establish liaison with other standards organizations.

The first action item is a general initiative for people involved in standards organizations to become at least knowledgeable of other organizations that manage standards for industrial processes that relate to shipbuilding. The last item is specific for SP-6 to establish a liaison with these organizations. This item is also identified in Goals 1 and 4 of the Workshop.

6. Support Conversion of the U.S. Shipbuilding Industry to the Metric System.

The objectives in this initiative are also included in the Workshop results and the ASTM F-25 Plan. They are to:

- a. Proceed with FY'92 metrication project,
- b. Have new standards, and updates of existing ones, be written with the metric system as the primary unit, and
- c. Use Syst me International (SI) units as the standard of weights and measures.

The specific action items are logical steps needed to achieve those objectives:

- a. Require SP-6 projects that deal with any units of measure to be written metric first (U.S. second), similar to SNAME publication requirements, and recommend to the SPC that the NSRP require the same,
- b. Implement the Presidential Executive Order that requires changeover to the metric system, and
- c. Implement recommendations of the FY'92 Metrication project.

It is assumed here that the FY'92 NSRP SP-6 Metrication project has been funded and will produce the results necessary to implement these action items and those identified in the Workshop. The ASTM F-25 Strategic Plan describes using Syst me International (SI) units in its vision statement, but does not address implementation in its action or business plans.

Whether the impetus for using the metric system comes as an immediate step from implementation of the Presidential Executive Order, as a directive from shipbuilding CEOs, or as a gradual transition spurred by less dominant sources such as SP-6 and ASTM F-25 initiatives, implementation of metric units into the U.S. shipbuilding industry must be started if the industry is to compete in a global market. The timing for these actions should be as soon as practicable.

7. Develop a Marketing Strategy for the Plan.

The marketing objective is also seen in Workshop Goal 3 and in the ASTM F-25 Plan. The basic agenda for marketing the Plan is to get key industry people to look at the initiatives, respond to them, and get involved with the continuing effort to get the U.S. shipbuilding standards program elevated to the level it should be. Meeting the objectives of establishing a communications center and recruiting the right individuals to be involved with the marine industry standards program will be a natural start to the marketing effort. Direct objectives are to:

- a. Give the Plan visibility,
- b. Develop high level support,
- c. Give the Standards Program an identity, and
- d. Adopt continuing initiatives into the SP-6 charter.

Specific action items to achieve these objectives are for:

- a. The SP-6 Program Manager to mail the Plan directly to shipyard engineering V.P.s, ASTM F-25 Chairman, USCG Technical Division (G-MTH) head, and other identified "key players",
- b. SP-6 to conduct an implementation workshop at a panel meeting,
- c. SP-6 to have an officer or representative present the Plan at SCA, ECB, and F-25 meetings, and

- d. NSRP management to take steps to develop an identity for the NSRP, such as establishing a letterhead, a singular address and phone number for communications (reference Initiative #1), and a dedicated full time administrative contact person.

The Workshop identified additional itemized action steps. The key test of the whole marine industry standards program will be for the regular participants directed by the leadership of SP-6 and the NSRP to take these initiatives and either implement them or modify and then implement them, but to TAKE ACTION. All the Workshops, Plans, and publications are of no value unless they are acted upon.

8. Adopt or Convert Existing Global Standards for Domestic Use.

This initiative is listed separately even though it seems to duplicate other initiatives, mainly initiative 4. That initiative recommends avoiding the duplication of existing standards in the consideration process for new standards. This initiative recommends actively going out to adopt existing global standards. There is also high level support in the ECB and Carderock Division of NSWC to simply purchase a fully developed set of standards from a foreign shipyard that has already successfully implemented standards.

The objectives of this impetus are to:

- a. Provide easier domestic approval of equipment built to foreign standards,
- b. Increase domestic ability to build commercial vessels for a global market, and in general to
- c. Reduce the time and cost to build ships.

Action items for this initiative are for:

- a. SP-6 to support the standards equivalency project,
- b. SP-6 and the ECB together to identify foreign shipbuilders' commercial standards that may be available for purchase, and for
- c. All involved in marine industry standards to fully support the ISO TAG so that ISO standards are directly acceptable for U.S. commercial vessels.

The standards equivalency project is supposed to be funded in the NSRP for FY'93 and a number of proposals have been submitted. It should set up a procedure with the Coast Guard for accepting or analyzing existing foreign standards to meet the intent of Coast Guard safety regulations. Thus, the way would be paved for some equipment, possibly not available in this country, and produced abroad to foreign standards, to be accepted for use in domestically approved commercial vessels.

The effort to identify, with the intent of purchasing, a fully developed set of standards from a foreign shipyard (that has already successfully implemented standards) is already underway but the details have yet to be fully developed. The effort to support the ISO TAG so that ISO standards are directly acceptable for U.S. commercial vessels should be on the agenda of all of those involved in marine industry standards development, and will be easier to effect with a successful recruiting effort from Initiatives 2 and 3.

F. CONCLUSIONS

Many of the conclusions that can be drawn from this particular study must be considered in the context of the U.S. shipbuilding industry as a whole. The industry is gradually losing its best customer, the U.S. Navy, and is trying to re-focus its efforts on obtaining a share of the international shipbuilding market.

The U.S. shipbuilders are trying to create a level playing field so that they can compete on an equal basis with their international competitors. This objective is being worked on in the halls of the U.S. Congress and with international trade representatives. The effective use of properly applied shipbuilding standards through a well organized U.S. shipbuilding standards program could help U.S. builders competitiveness once the playing field is, in fact, leveled.

This U.S. Shipbuilding Standards Master Plan was developed to help organize the standards program. In conjunction with the Kansas City "Marine Industry Standards Planning Workshop" results (NSRP 0344), this Plan sets a framework by which the goal of creating a well organized shipbuilding standards program can be achieved. This achievement cannot be attained without the following:

- A. The commitment and concentrated effort of the SP-6 Panel to implement the Plan (and the Workshop goals),
- B. The commitment of a larger number of shipyards to participate in this endeavor,
- C. The cooperation of the SP-6 Panel and the ASTM F-25 Committee, and
- D. A commitment on the part of shipyard management to compete through cooperation in working towards a well organized shipbuilding standards program.

The Plan is meant to be a working document and should not be considered set in stone. Responses to requests for review of the draft Plan, even though it was widely distributed, were minimal. Hopefully this is not an indication of the level of participation that the SP-6 Panel will have in attacking the initiatives recommended by the Plan. However, widespread publication of the Plan should serve as the first full round of review for the Plan. After that, proper execution of the FY'93 NSRP project, "Shipbuilding Standards Master Plan Update", will keep the Plan alive.

Creation of a strong, well organized, and cooperative shipbuilding standards program will probably not solve all the problems facing U.S. shipbuilders, but it can surely help get U.S. shipbuilders closer to the level of competitiveness required for success in the international market.

APPENDICES

**SURVEY
U.S. SHIPBUILDING STANDARDS
MASTER PLAN**

In order to ensure consistent interpretations, please refer to the following definition that will be refined through the Master Plan project and workshop. Suggested modifications are welcome.

STANDARDS: Prescribed designs, processes, rules and procedures to be used in repeatable operations to ensure a predetermined level of performance, quality and safety. For the purpose of this survey these may include those designs, processes, rules and procedures developed both specifically for shipbuilding as well as those developed for industrial processes in general and adapted to shipbuilding.

1. There are many sources of standards which influence our industry. Of those listed below, please annotate them as to their applicability to shipbuilding, technical content and clarity, using the following scale:

- 3 - Excellent
- 2 - Satisfactory
- 1 - Unsatisfactory
- NA - Not familiar with or do not use

	<u>APPLICABILITY</u>	<u>TECHNICAL</u>	<u>CLARITY</u>
ABS*	—	—	—
ANSI	—	—	—
ASTM	—	—	—
EPA	—	—	—
IEEE	—	—	—
MARAD	—	—	—
MILSPECS	—	—	—
NAVSEA	—	—	—
USCG CFR's	—	—	—
USCG NVIC's	—	—	—
USPHS	—	—	—
INTERNATIONAL-FOREIGN STDS			
BMT	—	—	—
DIN	—	—	—
DNV	—	—	—
GL	—	—	—
IEC	—	—	—
IMO	—	—	—
ISO	—	—	—
JIS	—	—	—

2. Are there any of the above listed standards that you generally prefer to work with?

— YES (Please list them) _____
 — NO

*abbreviations are defined on last page

3. On your next ship new construction, repair, or overhaul contract, would you like to see the specifications written using:
- More standards?
 - Less standards?
4. Assuming ship's specifications were written using more standards, in what area would you prefer to see them? Please number in order of preference, with #1 being the highest priority.
- Quality assurance
 - Design of shipboard structure and systems
 - Procured components and materials
 - Construction processes
 - Other, please specify _____
-
5. Standards generally evoke a wide range of opinions amongst users, some of which are listed below. Please review them and annotate them using the following scale:
- 4 - Strongly agree
 - 3 - Agree
 - 2 - Disagree
 - 1 - Strongly disagree

U.S. SHIPBUILDING STANDARDS AS THEY ARE TODAY:

- a stifle creativity and innovation
- b reduce repetitious processes and make us more efficient
- c are something we have no control over
- d reflect state-of-the-art practices
- e don't apply to the type of work we do
- f protect us as shipbuilders
- g are developed with the shipbuilder and profitability in mind
- h recognize sufficiently the differences and similarities between commercial and Navy ships
- i support us in the international marketplace
- j create more bureaucracy than they're worth
- k are well organized and coordinated
- l are easily accessible and understandable
- m are sufficient in number and scope to meet our needs

6. Out of the above list, select the opinion you feel most strongly positive about and comment briefly upon it. _____
- _____
- _____
- _____
7. Out of the above list, select the opinion you feel most strongly negative about and comment briefly about it, including suggestions for corrective action. _____
- _____
- _____
- _____

8. The NSRP has sponsored the development of Shipbuilding Standards through the American Society for Testing and Materials (ASTM) Committee F-25, which has published a volume of some 80 specifications and practices. Does your shipyard use these standards as a regular practice?

- YES
- ONLY WHEN INVOKED ON A SHIP'S SPECIFICATIONS
- NO

9. Has the selection of subject matter of the ASTM Shipbuilding Standards been appropriate to your needs?

- YES
- NO
- SOMEWHAT

If you answered NO or SOMEWHAT, what subjects would you like to see more emphasis on? _____

10. Did you find the technical content of the individual ASTM Shipbuilding Standards to be appropriate (economically producible, sufficiently detailed, using the latest materials and technology)?

- YES
- NO
- SOMEWHAT

If you answered NO or SOMEWHAT, what specifically about the content would you like to see changed? _____

11. How does your shipyard utilize standards? Please check all that apply.

- Use them only as they apply to current contracts
- Work with standards writing (ASTM, ASME, SAE, etc.) and regulatory (ABS, USCG, etc.) bodies in the development of industry standards
- Maintain a library of industry standards in-house with assigned personnel to administer them
- Have an assigned function within the shipyard for the development of company standards (which may be based upon industry standards)
- Others _____

12. Please indicate below the level of utility your company gains from the types of standards listed:

<u>SOME</u>	<u>MUCH</u>	<u>NONE</u>	
—	—	—	1. Engineering standards describing how design and engineering data is developed and displayed.
—	—	—	2. Material standards defining purchased items that are preferred.
—	—	—	3. Production standards describing methods for performing repetitive tasks.
—	—	—	4. Design standards which are drawings for items or assemblies which appear several times in a ship's design.

13. I recommend that a future program of U.S. Shipbuilding Standards might include the following concepts:

Please rate the concepts below using the following scale:

- H - High priority
- M - Medium priority
- L - Low priority

- An index and central repository of all approved U.S. Shipbuilding Standards
 - Development and consolidation of existing standards that have both commercial and military applications
 - Development of equivalencies, international and foreign to U.S. standards
 - Adoption of International and foreign standards to replace and/or supplement domestic standards
 - Establishment of a standards clearinghouse to coordinate and administer shipbuilding standards
 - Other (respondent's choice) _____
-

14. A Marine Industry Standards Planning Workshop is being developed for March 9, 10 & 11, 1992 by the National Shipbuilding Research Program's Panel SP-6. A summary of the results of this survey will be presented to industry leaders from shipyards, suppliers, shipowners, and regulatory agencies in the formulation of objectives for a cohesive shipbuilding standards. Please indicate below if you would be available for participation in the workshop.

- Available, please contact me with details
- Not available for the workshop, but please keep me informed of the developments
- Not available

SUBMITTED: _____

COMPANY: _____

NAME: _____

TITLE: _____

All responses will be held in the strictest confidence by the University of Michigan. Thank you for your time and thought in completing this survey.

**SURVEY
U.S. SHIPBUILDING STANDARDS
MASTER PLAN
ALL RESPONSES INCLUDED**

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- 1 - Unsatisfactory
- NA - Not familiar with or do not use

	<u>APPLICABILITY</u>	<u>TECHNICAL</u>	<u>CLARITY</u>
ABS*	<u>2.70</u>	<u>2.37</u>	<u>2.27</u>
ANSI	<u>2.27</u>	<u>2.26</u>	<u>2.19</u>
ASTM	<u>2.34</u>	<u>2.28</u>	<u>2.31</u>
EPA	<u>1.89</u>	<u>1.95</u>	<u>1.84</u>
IEEE	<u>2.35</u>	<u>2.42</u>	<u>2.31</u>
MARAD	<u>2.04</u>	<u>1.92</u>	<u>1.88</u>
MILSPECS	<u>2.34</u>	<u>2.13</u>	<u>1.79</u>
NAVSEA	<u>2.47</u>	<u>2.10</u>	<u>1.96</u>
USCG CFR's	<u>2.70</u>	<u>2.41</u>	<u>1.85</u>
USCG NVIC's	<u>2.82</u>	<u>2.35</u>	<u>2.24</u>
USPHS	<u>2.12</u>	<u>2.06</u>	<u>2.06</u>
INTERNATIONAL- FOREIGN STDS			
BMT	<u>2.75</u>	<u>2.43</u>	<u>2.29</u>
DIN	<u>2.29</u>	<u>2.38</u>	<u>2.23</u>
DNV	<u>2.47</u>	<u>2.31</u>	<u>2.06</u>
GL	<u>2.57</u>	<u>2.00</u>	<u>2.14</u>
IEC	<u>2.10</u>	<u>2.40</u>	<u>2.20</u>
IMO	<u>2.63</u>	<u>2.06</u>	<u>2.00</u>
ISO	<u>2.00</u>	<u>2.04</u>	<u>1.96</u>
JIS	<u>2.63</u>	<u>2.40</u>	<u>2.15</u>

2. Are there any of the above listed standards that you generally prefer to work with?

25/37 A. YES (Please list them) ABS(13), ASTM(13), MILSP(9), CFR(8)
12/37 B. NO

*abbreviations are defined on last page

3. On your next ship new construction, repair, or overhaul contract, would you like to see the specifications written using:
- 31/38 A. More standards?
7/38 B. Less standards?
4. Assuming ship's specifications were written using more standards, in what area would you prefer to see them? Please number in order of preference, with #1 being the highest priority.
- 2.78 A. Quality assurance
1.94 B. Design of shipboard structure and systems
1.82 C. Procured components and materials
3.35 D. Construction processes
____ Other, please specify _____
5. Standards generally evoke a wide range of opinions amongst users, some of which are listed below. Please review them and annotate them using the following scale:
- 4 - Strongly agree
3 - Agree
2 - Disagree
1 - Strongly disagree

U.S. SHIPBUILDING STANDARDS AS THEY ARE TODAY:

- 2.15 A. stifle creativity and innovation
2.83 B. reduce repetitious processes and make us more efficient
1.79 C. are something we have no control over
2.05 D. reflect state-of-the-art practices
1.74 E. don't apply to the type of work we do
2.23 F. protect us as shipbuilders
2.00 G. are developed with the shipbuilder and profitability in mind
1.98 H. recognize sufficiently the differences and similarities between commercial and Navy ships
1.83 I. support us in the international marketplace
2.10 J. create more bureaucracy than they're worth
1.95 K. are well organized and coordinated
2.10 L. are easily accessible and understandable
2.00 M. are sufficient in number and scope to meet our needs
6. Out of the above list, select the opinion you feel most strongly positive about and comment briefly upon it. _____

7. Out of the above list, select the opinion you feel most strongly negative about and comment briefly about it, including suggestions for corrective action. _____

8. The NSRP has sponsored the development of Shipbuilding Standards through the American Society for Testing and Materials (ASTM) Committee F-25, which has published a volume of some 80 specifications and practices. Does your shipyard use these standards as a regular practice?

- 11/34 A. YES
14/34 B. ONLY WHEN INVOKED ON A SHIP'S SPECIFICATIONS
11/34 C. NO

9. Has the selection of subject matter of the ASTM Shipbuilding Standards been appropriate to your needs?

- 11/35 A. YES
11/35 B. NO
13/35 C. SOMEWHAT

If you answered NO or SOMEWHAT, what subjects would you like to see more emphasis on? _____

10. Did you find the technical content of the individual ASTM Shipbuilding Standards to be appropriate (economically producible, sufficiently detailed, using the latest materials and technology)?

- 16/34 A. YES
10/34 B. NO
8/34 C. SOMEWHAT

If you answered NO or SOMEWHAT, what specifically about the content would you like to see changed? _____

11. How does your shipyard utilize standards? Please check all that apply.

- 18/30 A. Use them only as they apply to current contracts
24/30 B. Work with standards writing (ASTM, ASME, SAE, etc.) and regulatory (ABS, USCG, etc.) bodies in the development of industry standards
14/30 C. Maintain a library of industry standards in-house with assigned personnel to administer them
11/30 D. Have an assigned function within the shipyard for the development of company standards (which may be based upon industry standards)

___ Others _____

12. Please indicate below the level of utility your company gains from the types of standards listed:

<u>SOME(3)</u>	<u>MUCH(2)</u>	<u>NONE(1)</u>	
<u>18/37</u>	<u>14/37</u>	<u>5/37</u>	A. Engineering standards describing how design and engineering data is developed and displayed. (Average=2.35)
<u>12/37</u>	<u>22/37</u>	<u>3/37</u>	B. Material standards defining purchased items that are preferred. (Average=2.24)
<u>20/37</u>	<u>10/37</u>	<u>7/37</u>	C. Production standards describing methods for performing repetitive tasks. (Average=2.35)
<u>14/36</u>	<u>18/36</u>	<u>4/36</u>	D. Design standards which are drawings for items or assemblies which appear several times in a ship's design. (Average=2.28)

13. I recommend that a future program of U.S. Shipbuilding Standards might include the following concepts:

Please rate the concepts below using the following scale:

- 3 - High priority
- 2 - Medium priority
- 1 - Low priority

- 2.55 A. An index and central repository of all approved U.S. Shipbuilding Standards
- 2.43 B. Development and consolidation of existing standards that have both commercial and military applications
- 2.54 C. Development of equivalencies, international and foreign to U.S. standards
- 2.27 D. Adoption of International and foreign standards to replace and/or supplement domestic standards
- 2.30 E. Establishment of a standards clearinghouse to coordinate and administer shipbuilding standards
- ___ Other (respondent's choice) _____

14. A Marine Industry Standards Planning Workshop is being developed for March 9, 10 & 11, 1992 by the National Shipbuilding Research Program's Panel SP-6. A summary of the results of this survey will be presented to industry leaders from shipyards, suppliers, shipowners, and regulatory agencies in the formulation of objectives for a cohesive shipbuilding standards. Please indicate below if you would be available for participation in the workshop.

- ___ Available, please contact me with details
- ___ Not available for the workshop, but please keep me informed of the developments
- ___ Not available

SUBMITTED: _____

COMPANY: _____

NAME: _____

TITLE: _____

All responses will be held in the strictest confidence by the University of Michigan. Thank you for your time and thought in completing this survey.

SURVEY RESULTS

	ABS			ANSI			ASTM			EPA			IEEE			MARAD		
	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR
SUM	81	71	68	68	70	68	82	82	83	36	37	35	61	63	60	51	46	47
AVG	2.7	2.37	2.27	2.27	2.26	2.19	2.34	2.28	2.31	1.89	1.95	1.84	2.35	2.42	2.31	2.04	1.92	1.88
STD	0.47	0.56	0.52	0.52	0.51	0.54	0.54	0.66	0.62	0.57	0.52	0.6	0.49	0.5	0.55	0.68	0.65	0.67
#RES	30	30	30	30	31	31	35	36	36	19	19	19	26	26	26	25	24	25

	MILSP			NAVSEA			CFR			NVIC			USPHS			AVERAGE SCORES		
	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR
SUM	75	74.5	62.5	79	73.5	66.5	73	65	50	48	40	38	36	37	37			
AVG	2.34	2.13	1.79	2.47	2.1	1.96	2.7	2.41	1.85	2.82	2.35	2.24	2.12	2.06	2.06	2.37	2.20	2.06
STD	0.65	0.56	0.53	0.51	0.54	0.53	0.54	0.57	0.72	0.39	0.49	0.66	0.49	0.54	0.42	0.53	0.55	0.58
#RES	32	35	35	32	35	34	27	27	27	17	17	17	17	18	18			

INTERNATIONAL												
	BMT			DIN			DNV			GL		
	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR
SUM	22	17	16	32	31	29	37	37	33	18	14	15
AVG	2.75	2.43	2.29	2.29	2.38	2.23	2.47	2.31	2.06	2.57	2	2.14
STD	0.46	0.53	0.49	0.61	0.51	0.44	0.64	0.48	0.44	0.53	0.58	0.38
#RES	8	7	7	14	13	13	15	16	16	7	7	7

	IEC			IMO			ISO			JIS			AVERAGE SCORES		
	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR
SUM	21	24	22	50	37	34	50	51	49	42	36	28			
AVG	2.1	2.4	2.2	2.63	2.06	2	2	2.04	1.96	2.63	2.4	2.15	2.43	2.25	2.13
STD	0.57	0.52	0.42	0.5	0.54	0.61	0.65	0.61	0.61	0.5	0.63	0.55	0.56	0.55	0.49
#RES	10	10	10	19	18	17	25	25	25	16	15	13			

	#3		#4				#5									
	More	Less	A.	B.	C.	D.	A.	B.	C.	D.	E.	F.	G.	H.	I.	J.
SUM	31	7	89	62	60	104	86	113	70	76	68	89	80	79	73	82
AVG	1	1	2.78	1.94	1.82	3.35	2.15	2.83	1.79	2.05	1.74	2.23	2	1.98	1.83	2.1
STD	0	0	0.97	0.95	0.88	0.91	0.77	0.87	0.95	0.74	0.64	0.77	0.78	0.77	0.78	0.82
#RES	31	7	32	32	33	31	40	40	39	37	39	40	40	40	40	39

	#5 cont'd			#8			#9			#10			#11			
	K.	L.	M.	A.	B.	C.	A.	B.	C.	A.	B.	C.	A.	B.	C.	D.
SUM	78	84	80	11	14	11	11	11	13	16	10	8	18	24	14	11
AVG	1.95	2.1	2	1	1	1	1	1	1	1	1	1	1	1	1	1
STD	0.64	0.71	0.75	0	0	0	0	0	0	0	0	0	0	0	0	0
#RES	40	40	40	11	14	11	11	11	13	16	10	8	18	24	14	11

	#12				#13				
	A.	B.	C.	D.	A.	B.	C.	D.	E.
SUM	87	83	87	82	102	97	104	93	92
AVG	2.35	2.24	2.35	2.28	2.55	2.43	2.54	2.27	2.3
STD	0.72	0.6	0.79	0.66	0.64	0.81	0.64	0.78	0.79
#RES	37	37	37	36	40	40	41	41	40

SURVEY RESULTS - SHIPYARDS ONLY

	ABS			ANSI			ASTM			EPA			IEEE			MARAD		
	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR
SUM	40	33	33	35	39	38	37	35	36	16	16	14	29	28	28	22	22	21
AVG	2.67	2.2	2.2	2.19	2.29	2.24	2.31	2.06	2.12	1.71	1.78	1.56	2.23	2.15	2.15	2	2	1.75
STD	0.49	0.56	0.56	0.54	0.59	0.56	0.48	0.56	0.6	0.44	0.44	0.53	0.44	0.38	0.38	0.77	0.63	0.62
#RES	15	15	15	16	17	17	16	17	17	9.33	9	9	13	13	13	11	11	12

	MILSP			NAVSEA			CFR			NVIC			USPHS			AVERAGE SCORES		
	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR
SUM	33	35.5	31.5	36	35.5	30.5	36	30	21	30	25	23	20	21	21			
AVG	2.2	1.97	1.75	2.4	1.97	1.79	2.77	2.31	1.62	2.73	2.27	2.09	2	1.91	1.91	2.29	2.08	1.93
STD	0.41	0.36	0.43	0.51	0.36	0.4	0.44	0.48	0.51	0.47	0.47	0.7	0.47	0.54	0.3	0.50	0.49	0.51
#RES	15	18	18	15	18	17	13	13	13	11	11	11	10	11	11			

INTERNATIONAL												
	BMT			DIN			DNV			GL		
	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR
SUM	5	5	4	8	10	9	17	17	16	10	8	9
AVG	2.5	2.5	2	2	2.5	2.25	2.43	2.13	2	2.5	2	2.25
STD	0.71	0.71	0	0	0.58	0.5	0.53	0.35	0.53	0.58	0.82	0.5
#RES	2	2	2	4	4	4	7	8	8	4	4	4

	IEC			IMO			ISO			JIS			AVERAGE SCORES		
	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR
SUM	6	7	7	17	13	11	17	20	18	17	15	10			
AVG	2	2.33	2.33	2.43	2.17	1.83	1.7	2	1.8	2.43	2.14	2	2.25	2.22	2.06
STD	1	0.58	0.58	0.53	0.41	0.41	0.5	0.5	0.44	0.53	0.69	0.71	0.55	0.58	0.46
#RES	3	3	3	7	6	6	10	10	10	7	7	5			

	#3		#4				#5									
	More	Less	A.	B.	C.	D.	A.	B.	C.	D.	E.	F.	G.	H.	I.	J.
SUM	15	4	41	24	27	48	43	54	44	35	37	43	34	34	33	42
AVG	1	1	2.93	1.71	1.93	3.43	2.26	2.84	2.44	1.84	1.95	2.26	1.79	1.79	1.74	2.21
STD	0	0	1	0.91	0.92	0.76	0.87	0.9	0.98	0.6	0.62	0.65	0.71	0.71	0.81	0.92
#RES	15	4	14	14	14	14	19	19	18	19	19	19	19	19	19	19

	#5 cont'd			#8			#9			#10			#11			
	K.	L.	M.	A.	B.	C.	A.	B.	C.	A.	B.	C.	A.	B.	C.	D.
SUM	34	35	38	2	10	8	4	8	5	7	6	4	14	12	8	8
AVG	1.79	1.84	2	1	1	1	1	1	1	1	1	1	1	1	1	1
STD	0.63	0.69	0.67	0	0	0	0	0	0	0	0	0	0	0	0	0
#RES	19	19	19	2	10	8	4	8	5	7	6	4	14	12	8	8

	#12				#13				
	A.	B.	C.	D.	A.	B.	C.	D.	E.
SUM	43	42	42	41	52	45	45	41	44
AVG	2.15	2.21	2.1	2.16	2.6	2.25	2.25	2.05	2.2
STD	0.75	0.71	0.55	0.6	0.6	0.91	0.72	0.76	0.77
#RES	20	19	20	19	20	20	20	20	20

SURVEY RESULTS FOR NON-SHIPYARDS

	ABS			ANSI			ASTM			EPA			IEEE			MARAD		
	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR
SUM	41	38	35	33	31	30	45	47	47	20	21	21	32	35	32	29	24	26
AVG	2.73	2.53	2.33	2.36	2.21	2.14	2.37	2.47	2.47	2	2.1	2.1	2.46	2.69	2.46	2.07	1.85	2
STD	0.46	0.52	0.49	0.5	0.43	0.53	0.6	0.7	0.61	0.67	0.57	0.57	0.52	0.48	0.66	0.62	0.69	0.71
#RES	15	15	15	14	14	14	19	19	19	10	10	10	13	13	13	14	13	13

	MILSP			NAVSEA			CFR			NVIC			USPHS			AVERAGE SCORES		
	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR
SUM	42	39	31	43	38	36	37	35	29	18	15	15	16	16	16			
AVG	2.47	2.29	1.82	2.53	2.24	2.12	2.64	2.5	2.07	3	2.5	2.5	2.29	2.29	2.29	2.45	2.33	2.21
STD	0.8	0.69	0.64	0.51	0.66	0.6	0.63	0.65	0.83	0	0.55	0.55	0.49	0.49	0.49	0.53	0.58	0.61
#RES	17	17	17	17	17	17	14	14	14	6	6	6	7	7	7			

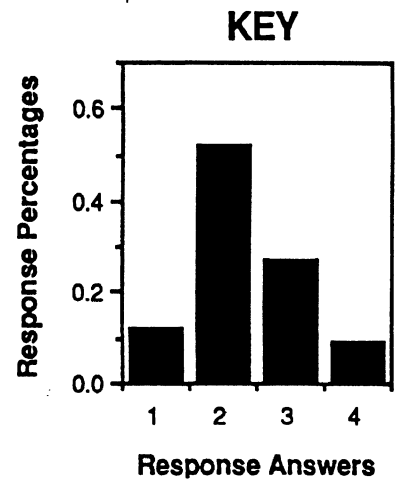
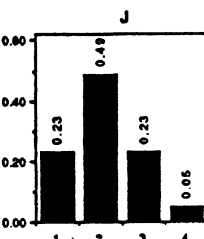
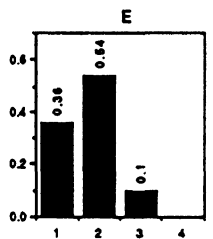
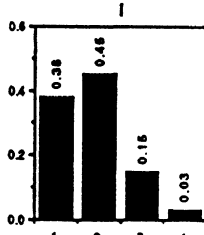
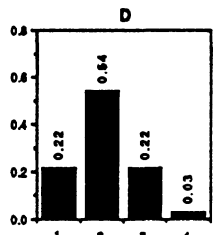
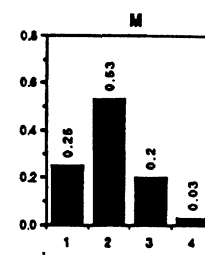
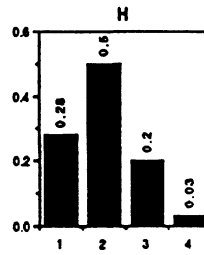
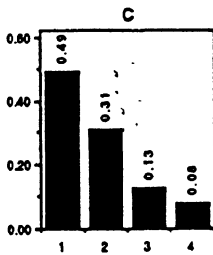
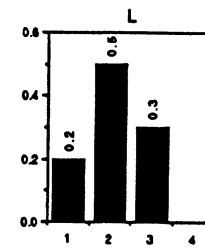
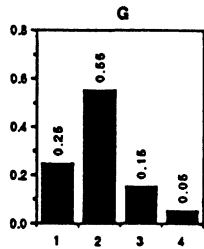
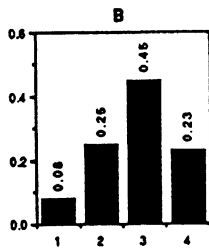
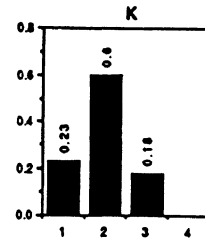
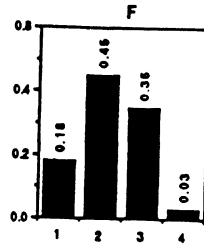
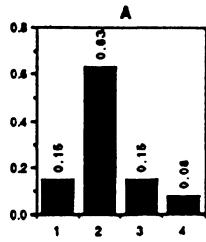
INTERNATIONAL																		
	BMT			DIN			DNV			GL								
	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR
SUM	17	12	12	24	21	20	20	20	17	8	6	6						
AVG	2.83	2.4	2.4	2.4	2.33	2.22	2.5	2.5	2.13	2.67	2	2						
STD	0.41	0.55	0.55	0.7	0.5	0.44	0.76	0.53	0.35	0.58	0	0						
#RES	6	5	5	10	9	9	8	8	8	3	3	3						

	IEC			IMO			ISO			JIS			AVERAGE SCORES		
	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR	APP	TECH	CLAR
SUM	15	17	15	33	24	23	33	31	31	25	21	18			
AVG	2.14	2.43	2.14	2.75	2	2.09	2.2	2.07	2.07	2.78	2.63	2.25	2.53	2.3	2.16
STD	0.38	0.53	0.38	0.45	0.6	0.7	0.68	0.7	0.7	0.44	0.52	0.46	0.55	0.49	0.45
#RES	7	7	7	12	12	11	15	15	15	9	8	8			

	#3		#4				#5									
	More	Less	A.	B.	C.	D.	A.	B.	C.	D.	E.	F.	G.	H.	I.	J.
SUM	16	3	48	38	33	56	43	59	26	41	31	46	46	45	40	40
AVG	1	1	2.67	2.11	1.74	3.29	2.05	2.81	1.28	2.28	1.55	2.19	2.19	2.14	1.9	2
STD	0	0	0.97	0.96	0.87	1.05	0.67	0.87	0.44	0.83	0.6	0.87	0.81	0.79	0.77	0.73
#RES	16	3	18	18	19	17	21	21	21	18	20	21	21	21	21	20

	#5 cont'd			#8			#9			#10			#11			
	K.	L.	M.	A.	B.	C.	A.	B.	C.	A.	B.	C.	A.	B.	C.	D.
SUM	44	49	42	9	4	3	7	3	8	9	4	4	4	12	6	3
AVG	2.1	2.33	2	1	1	1	1	1	1	1	1	1	1	1	1	1
STD	0.62	0.66	0.84	0	0	0	0	0	0	0	0	0	0	0	0	0
#RES	21	21	21	9	4	3	7	3	8	9	4	4	4	12	6	3

	#12				#13				
	A.	B.	C.	D.	A.	B.	C.	D.	E.
SUM	41	40	36	35	50	52	59	52	48
AVG	2.41	2.22	2.12	2.06	2.5	2.6	2.81	2.48	2.4
STD	0.62	0.43	0.86	0.66	0.69	0.68	0.4	0.75	0.82
#RES	17	18	17	17	20	20	21	21	20



- 1 = Strongly Agree
- 2 = Agree
- 3 = Disagree
- 4 = Strongly Disagree
- # = Response Percentage

SURVEY ANALYSIS

QUESTION #1

- Nonshipyards tended to give higher ratings than shipyards
- Nonshipyards had lower standard deviations than shipyards
- Overall NVIC had the highest average applicability rating (2.82)
 - ABS (2.7)
 - CFR (2.7)
 - NAVSEA (2.47)
 - IEEE (2.35)
 - ASTM (2.34)
 - MILSP (2.34)
 - ANSI (2.27)
 - USPHS (2.12)
 - MARAD (2.04)
 - EPA (1.89)
- Overall IEEE had the highest average technical rating (2.42)
 - CFR (2.41)
 - ABS (2.37)
 - NVIC (2.35)
 - ASTM (2.28)
 - ANSI (2.26)
 - MILSP (2.13)
 - NAVSEA (2.1)
 - USPHS (2.06)
 - EPA (1.95)
 - MARAD (1.92)
- Overall ASTM and IEEE had the highest clarity ratings (2.31)
 - ABS (2.27)
 - NVIC (2.24)
 - ANSI (2.19)
 - USPHS (2.06)
 - NAVSEA (1.96)
 - MARAD (1.88)
 - CFR (1.85)
 - EPA (1.84)
 - MILSP (1.79)

- For shipyards CFR had the highest applicability rating (2.77)
 - NVIC (2.73)
 - ABS (2.67)
 - NAVSEA (2.4)
 - ASTM (2.31)
 - IEEE (2.23)
 - MILSP (2.2)
 - ANSI (2.19)
 - MARAD (2)
 - USPHS (2)
 - EPA (1.71)
- For shipyards CFR had the highest technical rating (2.31)
 - NVIC (2.27)
 - ANSI (2.29)
 - ABS (2.2)
 - IEEE (2.15)
 - ASTM (2.06)
 - MARAD (2)
 - MILSP (1.97)
 - NAVSEA (1.97)
 - USPHS (1.91)
 - EPA (1.78)
- For shipyards ANSI had the highest clarity rating (2.24)
 - ABS (2.2)
 - IEEE (2.15)
 - ASTM (2.12)
 - NVIC (2.09)
 - USPHS (1.91)
 - NAVSEA (1.79)
 - MARAD (1.75)
 - MILSP (1.75)
 - CFR (1.62)
 - EPA (1.56)

- For nonshipyards NVIC had the highest applicability rating (3)
 - ABS (2.73)
 - CFR (2.64)
 - NAVSEA (2.53)
 - MILSP (2.47)
 - IEEE (2.46)
 - ASTM (2.37)
 - ANSI (2.36)
 - USPHS (2.29)
 - MARAD (2.09)
 - EPA (2)
- For nonshipyards IEEE had the highest technical rating (2.69)
 - ABS (2.53)
 - CFR (2.5)
 - NVIC (2.5)
 - ASTM (2.47)
 - MILSP (2.29)
 - USPHS (2.29)
 - NAVSEA (2.24)
 - ANSI (2.21)
 - EPA (2.21)
 - MARAD (1.85)
- For nonshipyards NVIC had the highest clarity rating (2.5)
 - ASTM (2.47)
 - IEEE (2.46)
 - ABS (2.33)
 - USPHS (2.29)
 - ANSI (2.14)
 - NAVSEA (2.12)
 - EPA (2.1)
 - CFR (2.07)
 - MARAD (2)
 - MILSP (1.82)

International

- Overall BMT had the highest applicability rating (2.75)
 - IMO (2.63)
 - JIS (2.63)
 - GL (2.57)
 - DNV (2.47)
 - DIN (2.29)
 - IEC (2.1)
 - ISO (2)

- Overall BMT had the highest technical rating (2.43)
 - IEC (2.4)
 - JIS (2.4)
 - DIN (2.38)
 - DNV (2.31)
 - IMO (2.06)
 - ISO (2.04)
 - GL (2)
- Overall BMT had the highest clarity rating (2.29)
 - DIN (2.23)
 - IEC (2.2)
 - JIS (2.15)
 - GL (2.14)
 - DNV (2.06)
 - IMO (2)
 - ISO (1.96)
- For shipyards BMT and GL had the highest applicability ratings (2.5)
 - DNV (2.43)
 - IMO (2.43)
 - JIS (2.43)
 - DIN (2)
 - IEC (2)
 - ISO (1.7)
- For shipyards BMT and DIN had the highest technical ratings (2.5)
 - IEC (2.33)
 - IMO (2.17)
 - JIS (2.14)
 - DNV (2.13)
 - GL (2)
 - ISO (2)
- For shipyards IEC had the highest clarity rating (2.33)
 - DIN (2.25)
 - GL (2.25)
 - BMT (2)
 - DNV (2)
 - JIS (2)
 - IMO (1.83)
 - ISO (1.8)
- For nonshipyards BMT had the highest applicability rating (2.83)
 - JIS (2.78)
 - IMO (2.75)
 - GL (2.67)
 - DNV (2.5)

- DIN (2.4)
- ISO (2.2)
- ISC (2.14)
- For nonshipyards JIS had the highest technical rating (2.63)
 - DNV (2.5)
 - IEC (2.43)
 - BMT (2.4)
 - DIN (2.33)
 - ISO (2.07)
 - GL (2)
 - IMO (2)
- For nonshipyards BMT had the highest clarity rating (2.4)
 - JIS (2.25)
 - DIN (2.22)
 - IEC (2.14)
 - DNV (2.13)
 - IMO (2.09)
 - ISO (2.07)
 - GL (2)

QUESTION #2

- Overall preferred standards responses
 - ABS (13)
 - ASTM (13)
 - MILSP (9)
 - CFR (8)
 - NAVSEA (6)
 - ANSI (5)
 - IEEE (5)
 - NVIC (5)
 - MARAD (2)
 - EPA (1)
 - USPHS (0)
- Preferred shipyard standards responses
 - ABS (7)
 - ASTM (5)
 - MILSP (5)
 - CFR (5)
 - NAVSEA (4)
 - NVIC (4)
 - ANSI (2)
 - IEEE (2)
 - MARAD (0)

	EPA	(0)
	USPHS	(0)
--	Preferred nonshipyard standards responses	
	ASTM	(8)
	ABS	(6)
	MILSP	(4)
	ANSI	(3)
	IEEE	(3)
	CFR	(3)
	MARAD	(2)
	NAVSEA	(2)
	EPA	(1)
	NVIC	(1)
	USPHS	(0)

International

--	Overall preferred standards responses	
	DNV	(3)
	JIS	(3)
	IMO	(2)
	ISO	(2)
	BMT	(1)
	DIN	(1)
	GL	(1)
	IEC	(0)
--	Preferred shipyard standards responses	
	DNV	(1)
	DIN	(1)
	GL	(1)
	IMO	(1)
	JIS	(1)
	BMT	(0)
	DIN	(0)
	IEC	(0)
	ISO	(0)
--	Preferred nonshipyard standards responses	
	DNV	(2)
	ISO	(2)
	JIS	(2)
	BMT	(1)
	DIN	(1)
	IMO	(1)
	GL	(0)
	IEC	(0)

QUESTION #3

- The majority of both shipyards and nonshipyards want their specifications written using more standards.

QUESTION #4

- Shipyards want to see more standards written in the area of design of shipboard structure systems, followed by procured components and materials.
- Nonshipyards want to see more standards written in the area of procured components and materials, followed by design of shipboard structure systems.

QUESTION #5

- See the histogram on page A-12.

QUESTION #6

- Shipyards seem to believe that standards reduce repetitious processes and make us more efficient; however, the majority do not feel that the standards we currently have are accomplishing this. Some also feel that standards protect shipbuilders because they keep the performance standards of the shipbuilders approximately the same.
- Nonshipyards also believe that standards would reduce repetitious processes and make us more efficient if the current standards were brought up-to-date more quickly. They believe that the majority are out-of-date due to the lag time before their up-dates. In addition, many feel that the standards are not easily accessible or understandable, while the lack of organization and coordination makes them difficult to work with or actively pursue changes. The bureaucracy involved with standards is too great for their benefits.

QUESTION #7

- The major problems that shipyards have with standards has to do with their poor organization and coordination, as well as their lack of easy access and clear understanding. They want improved quality in standards. The support of standards in the international market is a highly questionable issue among them. Many believe that if we had improved standards--onvert to metric, reduce lag time before up-dating, and allow more control over them--that we would be in a much better competitive position. Some feel that we also have to reduce the strictness of our standards and make them more comparable to foreign standards in order to build ships more quickly and economically.

- Nonshipyards have strong opinions about standards supporting us in the international market. They feel that if we do not convert to metric that we can never be competitive. They also feel that we need to improve the organization and coordination of the standards and standards organizations. They believe that the lag time before up-date must be eliminated if standards are to be an asset rather than a hindrance. Many also believe that there exists enough control over the standards if only people were to get involved and take responsibility.

QUESTION #8

- Shipyards generally use the standards only when invoked on the ship specifications.
- Nonshipyards generally use the standards even if they are not invoked on the ship specifications.
- Few nonshipyards never use the standards, compared to shipyards who try not to use standards if they are not required.

QUESTION #9

- The majority of shipyards feel that the ASTM shipbuilding standards are not appropriate for them.
- The majority of nonshipyards feel that the ASTM shipbuilding standards apply to their needs at least most of the time.
- Shipyards feel that there should be a greater emphasis on standards involving equipment material like piping and electrical systems, structural detail, and construction and design techniques.
- Nonshipyards feel that there should be a greater emphasis on standards involving the shipbuilding process, modulation, and products, all with the design perspective in mind.

QUESTION #10

- Shipyards are split on whether technical content of the individual ASTM standards are appropriate for their needs.
- The majority of the nonshipyards said that the technical content of the individual ASTM standards was appropriate for them.
- Shipyards vary on whether they feel standards should be more general or more detailed. Some feel that they are too general to apply to their needs, while others feel that they are not sufficiently detailed enough. Some feel

that they are simply too detailed with irrelevant conditions instead of pertinent aspects. They feel that standards should be simplified and aid in making ships more producible. They also feel that standards should be updated more quickly and should incorporate the use of state-of-the-art materials.

QUESTION #11

- The majority of shipyards use standards only when they apply to current contracts or they work with writing and regulatory bodies in the development of industry standards.

- The majority of nonshipyards work with standards-writing and regulatory bodies in the development of industry standards.

QUESTION #12

- The majority of people believe that material standards that define preferred purchased items are the most utilized form of standards. Design standards that are drawings for items, or assemblies that appear several times in a ship's design, are also used a great deal.

QUESTION #13

- The majority of responses indicated that they would like to see a future U.S. shipbuilding standards program that included an index and central repository of all approved U.S. shipbuilding standards, as well as the adoption of international and foreign standards that would replace and/or supplement domestic standards.

NSRP STANDARDS REPORTS AND ABSTRACTS

1. Rosenblatt and Son, Inc. *Propulsion Plant Feasibility Study Report - Subtask I - Forecast for Propulsion Plant Standards*. New York, NY, June 1974. 42 p. Sponsored by Maritime Administration. NSRP 0042, UMTRI 70714.

This report contains the commercial shipbuilding forecast for the Propulsion Plant Standards Feasibility Study and estimates the requirements for propulsion equipment installations by U.S. shipyards between 1975 and 1985. The results of this forecast indicated that the volume of shipbuilding was sufficient to warrant the application of propulsion plant standards.

2. Rosenblatt and Son, Inc. *Propulsion Plant Feasibility Study - Subtask II - Technical Analysis on Determination of Standards Candidates*. New York, NY/Bath Iron Works Corp. January 1975. 200 p. Sponsored by Maritime Administration. NSRP 0046, UMTRI 70716.

This report consists of a technical evaluation of the propulsion plants that reflect the requirements of the ships forecast to be ordered in U.S. shipyards in 1986. The main purpose of this task was to select viable standards candidates for further economic analysis. This reported noted that emphasis for standards on propulsion plants should be first placed on steam turbine and then diesels and gas turbines. The selection of standards for economic analysis was based on the potential savings to be expected from each of the following four groups of standards: Equipment Standards, including the main condensate pump, starting air compressor and main boiler; Total Plant Standards on two plant systems including a 26,000 SHP steam turbine and a 14,000 SHP medium speed diesel; Equipment Envelope Standards for a 26,000 SHP geared steam turbine.

3. Rosenblatt and Son, Inc. *Propulsion Plant Feasibility Study Report - Subtask III - Economic Analysis of Selected Standards Candidates..* New York, NY/Bath Iron Works Corp. February 1975. 200 p. Sponsored by Maritime Administration. NSRP 0047, UMTRI 70717.

This report contains the results of an economic analysis performed on four groups of standards related to propulsion plants as recommended in Subtask II - Determination of Standards Candidates. The overall potential cost savings were predicted by using an economic analysis on the four groups of propulsion plant standards, and generalizing on the predicted savings of other similar standards in each group that were not economically analyzed.

4. Bath Iron Works Corp. *Executive Summary - Propulsion Plant Standards Feasibility Study*. June 1975. 10 p. Sponsored by Maritime Administration. NSRP 0049, UMTRI 48961.

This executive summary highlights the objective, recommendations, and conclusions of this feasibility study.

5. Litton Systems. *Ship Producibility Task S-1: Propulsion Plant Standards Feasibility Study*. Ingalls Shipbuilding Division, Pascagoula, MS/Bath Iron Works Corp., ME. June 1975. 100 p. Sponsored by Maritime Administration. NSRP 0050, UMTRI 70715.

The report supplements a major effort by M. Rosenblatt and Son, Inc., on the same subject. The major efforts of the report were to define and lay out four propulsion plants for a 150,000 dwt. tanker, including steam, medium speed diesel, heavy duty gas turbine, and an aircraft derivative gas turbine plant. Each of these four propulsion plants contains three levels of standards: a full description of the component by a data package; performance specification for overall components of a given size range; and standard procurement specification. This report also studies the cost differential by applying these three levels of standards to each propulsion plant and summarizes the merits of each type of proposed standard, the acceptability of the types of standards, and the approximate cost of developing the data for each type of standard.

6. Ingalls Shipbuilding Division. *Final Report - Propulsion Plant Standards Feasibility Study*. Bath Iron Works Corp., ME. August 1975. 100 p. Sponsored by Maritime Administration. NSRP 0052, UMTRI 48962.

The purpose of the study was to assess the technical feasibility and economic benefits and/or drawbacks of the development and implementation of propulsion plant standards. Emphasis was placed on reducing shipbuilding costs and delivery time in the United States by defining standards that could be useful to the maritime industry.

7. General Dynamics/Quincy. *Standard Structural Arrangements*. Bath Iron Works Corp., ME. July 1976. 250 p. Sponsored by Maritime Administration. NSRP 0057, UMTRI 48971.

This report determined the value of standard structural arrangements and was to be used in reducing the cost of U.S.-built ships by producing a series of standard structural arrangements. This report is divided into three sections: Structural Detail Guidelines, Misalignment Tolerance Guidelines, Tripping Bracket Guidelines.

8. Bath Iron Works Corp. *Executive Summary - Feasibility of Shipbuilding Standards*. October 1976. 8 p. Sponsored by Maritime Administration. NSRP 0059, UMTRI 48958.

This report summarizes findings and conclusions regarding the feasibility of a shipbuilding standards program. Conclusions are that standards already exist and are in use, but additional standards are needed. Recommendations include the development and support of a national shipbuilding standards program.

9. Bath Iron Works Corp. *Castine Report S-15 Project: Shipbuilding Standards*. October 1976. 100 p. Sponsored by Maritime Administration. NSRP 0061, UMTRI 48959.

This is a report on the proceedings of a workshop on the feasibility of developing national shipbuilding standards, which was held in Castine, Maine, in June, 1976. It was at this workshop that the need for a national coordinated effort for the development of shipbuilding standards was identified.

10. Corporate-Tech planning, Inc. *A Compendium of Shipbuilding Standards - Consolidated Pilot Phase Report*. Bath Iron Works Corp. October 1978. 300 p. Sponsored by Maritime Administration. NSRP 0078, UMTRI 71146.

One of the first studies to be done before commencing a coordinated national standards development effort was to identify those standards that existed and were being used by

industry. This report is a compendium of all existing standards that have applications in marine sectors. The objectives of this pilot phase were to design a catalog system, process a sample of U.S. and foreign standards, and analyze a sample number of standards for completeness, duplication, and conflict.

11. Corporate-Tech planning, Inc. *Interim Report on Subtask I, Regulatory Body and Classification Body Shipbuilding Standards*. Bath Iron Works Corp. 1979. 59 p. Sponsored by Maritime Administration. NSRP 0082, UMTRI 71147.

This report is part of a three-subtask effort to review shipbuilding and other industrial standards for possible use in the National Shipbuilding Standards Program. This report catalogues existing shipbuilding standards that dominate U.S. shipbuilding. The three organizations whose standards are most commonly promulgated--the American Bureau of Shipping, the Maritime Administration, and the U.S. Coast Guard--are included in this report.

12. Corporate-Tech planning, Inc. *Interim Report on Subtask III, Foreign Shipbuilding Standards*. Bath Iron Works Corp. March 1979. 302 p. Sponsored by Maritime Administration. NSRP 0087, UMTRI 71149.

This report is part of a three subtask effort to review shipbuilding and other industrial standards for possible use in the National Shipbuilding Standards Program. This report is a compendium of foreign shipbuilding standards that are valuable for reference or are suitable for use in the United States. The report concludes that there are many ISO standards that are suitable for immediate use in the U.S. shipbuilding industry with little or no change in the text of the standard.

13. Corporate-Tech planning, Inc. *A Compendium of Shipbuilding Standards - Index to Shipbuilding Regulations and Standards*. Bath Iron Works Corp. April 1979. 600 p. Sponsored by Maritime Administration. NSRP 0088, UMTRI 70718.

This catalog of standards contains 2,580 entries from regulatory sources. These standards have been sorted in four ways: Organization, Ship Work Breakdown Structure, Recommended F-25 Subcommittee, and Subject.

14. Corporate-Tech planning, Inc. *Interim Report on Subtask II, Industrial Standards in Shipbuilding Use*, Bath Iron Works Corp. May 1979. 38 p. Sponsored by Maritime Administration. NSRP 0089, UMTRI 71148.

This report is part of a three subtask effort to review shipbuilding and other industrial standards for possible use in the National Shipbuilding Standards Program. This report identifies industrial standards that are in use by the shipbuilding community and catalogues them by originating organization, by Ship Work Breakdown Structure (SWBS) number, by subject, and by the subcommittee of the ASTM Committee F-25 on Shipbuilding.

15. Corporate-Tech planning, Inc. *A Compendium of Shipbuilding Standards - Final Report*. Bath Iron Works Corp. September 1979. 44 p. Sponsored by Maritime Administration. NSRP 0093, UMTRI 48960.

This summary report outlines the results of the Compendium of Shipbuilding Standards. This summary report recommends a management system for the development of an integrated

family of U.S. shipbuilding standards under ASTM Committee F-25 on Shipbuilding. This report also summarizes the charts and data tables from the Compendium with several recommendations made from reviewing these charts and tables.

16. Sandor, L.W. *Weld Defect Tolerance Study*. Bath Iron Works Corp. June 1980. 124 p. Sponsored by Maritime Administration. NSRP 0107, UMTRI 48968.

The objective of this project was to examine the possibility of decreasing the high cost of weld repair in commercial shipbuilding through the development and application of weld defect tolerance standards. A comprehensive survey was made of international literature and existing codes. In addition, quality control data were acquired from four major U.S. shipbuilders. The fitness-for-purpose philosophy represents an important advance over present weld acceptance standards, which, in general, are much too conservative and workmanship-based.

17. Bath Iron Works. *National Shipbuilding Standards Program Status Report No. 1*. June 1980. 24 p. Sponsored by Maritime Administration. NSRP 0108, UMTRI 48963.

This first status report of the National Shipbuilding Standards Program covers activities from the origin of the Program in June, 1976 until June, 1980. The report includes information on the reactivation of Panel SP-6 and the formation of ASTM Committee F-25 on Shipbuilding Standards.

18. Bath Iron Works. *National Shipbuilding Standards Program Status Report No. 2*. November 1980. 250 p. Sponsored by Maritime Administration. NSRP 0116, UMTRI 48963.

The second status report of the National Shipbuilding Standards Program covers developments from July to November, 1980. This report covers the development of many SP-6 draft standards that were input into Committee F-25 for processing as National Shipbuilding Standards.

19. Sandor, L.W. *Navy Weld Defect Tolerance Study*. Bath Iron Works Corp. March 1981. 30 p. Sponsored by Maritime Administration. NSRP 0126, UMTRI 48967.

This study is a statistical analysis of quality control data collected from six major U.S. shipyards involved in naval ship construction. This analysis is confined to noncombatant naval vessels built out of mild steel only. The purpose of the study was to assess the significance of weld discontinuities with a view toward optimizing weld acceptance standards so as to minimize unnecessary weld repair.

20. Bath Iron Works Corp. *National Shipbuilding Standards Program Status Report No. 3*. November 1981. 18 p. Sponsored by Maritime Administration. NSRP 0133, UMTRI 48963.

This document reports the status of the National Shipbuilding Standards Program from December, 1980 to November, 1981. Developments in this report include the publication of ten ASTM standards on shipbuilding and the incorporation of an ASTM F-25 standards into the U.S. Navy GENSPECS.

21. IHI Marine Technology. *Recommended U.S. Shipbuilding Standards Program Long Range Plan - Final Report*. Bath Iron Works Corp. February 1982. 230 p. Sponsored by Maritime Administration. NSRP 0144, UMTRI 48966.

While significant progress has been made during the preliminary phase of this program, it was the consensus of the program participants and other key industry representatives that expert assistance should be solicited to formally recommend a standards long-range plan for the U.S. shipbuilding industry. This plan would include standard program goals, objectives, plans, priorities, and other necessary courses of action. With this background, IHI Marine Technology, Inc., an American subsidiary of Ishikawajima-Harima Heavy Industries Co., Ltd. (IHI), Japan, was selected to perform the task as described above. The principal objective of this task is to present a written recommended long-range plan for the U.S. Shipbuilding Standards Program based upon the knowledge and experience of the Japanese shipbuilding industry, specifically, IHI.

22. Newport News Shipbuilding. *Consensus QA/QC Acceptance Standards*. Bath Iron Works Corp. November 1982. 55 p. Sponsored by Maritime Administration. NSRP 0160, UMTRI 48970.

This report identifies areas where the development of consistent quality assurance/quality control (QA/QC) acceptance standards can benefit the U.S. commercial shipbuilding industry. This project is limited to commercial shipbuilding, overhaul, and repair; Naval shipbuilding is not addressed.

23. McMullen, J.J. *Feasibility Study for the Commercialization of U.S. Navy GENSPECS - 1982 Edition*. Bath Iron Works Corp. July 1983. 124 p. Sponsored by Maritime Administration. NSRP 0174, UMTRI 48969.

This report critically analyzes the imposed military and federal specification requirements in the U.S. Navy GENSPECS to determine the feasibility of converting to commercial standards. This report recommends over 285 commercial standards that could effectively replace the cited Navy standards in the GENSPECS, and recommends that this report be extensively reviewed by industry and NAVSEA to determine if these recommended standards could be implemented in lieu of the current military specifications.

24. Newport News Shipbuilding. *Computerized Application of Standards*. Bath Iron Works Corp. 1985. 94 p. Sponsored by Maritime Administration. NSRP 0212, UMTRI 72256.

The Computerized Application of Standards project successfully proved that MOST developed standards could be applied by an existing computer-aided design system to eliminate manual application of standards. Several groups, including the Computer Center, Industrial Engineering, and Production Engineering, worked together to develop a computer program to apply standards to the pipe detail work package for the bending, fabricating, welding, and machining operations in the pipe shops. The implementation of this program into the computer-aided pipe detail design systems has resulted in improved accuracy and consistency of standards applications.

25. Soik, T. and Rusch, D. *Marine Industry Standards Planning Workshop*. March 1992. 71 p. Sponsored by Maritime Administration. NSRP 0344, UMTRI 82757.

This report is the proceedings of a Marine Industry Standards Planning Workshop. Twenty representatives from the shipbuilding industry and government met to formulate and coordinate a marine industry standardization process by improving the global competitive position of the U.S. shipbuilding industry.

26. William O'Sullivan Assc. *Balloting of Hull and Mechanical Standards*. June 1992. 237 p. NSRP 0349, UMTRI 82574.

This report involves the description of various hull and mechanical standards, their effectiveness, and reliability under Project P-52. A general idea on the improvement, or elimination of each standards listed can be drawn. There is an emphasis on the referencing of other standards and documents.

27. O'Donnell, J.F. *Standard Practice for the Selection and Application of Marine Deck Coverings*. July 1992. 305 p. Sponsored by Maritime Administration. NSRP 0354, UMTRI 82574.

This project is intended for use as a guide to assist in product selection, writing specifications, determining budgetary costs, purchasing and installation of marine deck covering. Data sheets are provided that include description and features of the deck material, specification references, trade names and manufacturers. Budgetary cost coefficients, physical properties, applications methods, cautionary notes, warranty information and construction detail are included. A section of the various marine bodies of influence in the United States, as well as the International Maritime Organization (IMO), briefly describing their activities in the marine industry, has also been included.

28. Horsmon, A.W. and Bunch, H.M. *Computerized Compendium of Standards*. 1992. Sponsored by Maritime Administration. NSRP 0361.

The objective of this project was to develop a compendium of standards (international, national, military and regulatory bodies) that have relevance to the U.S. shipbuilding and repair industry. The intended benefits were to provide shipyards with a ready reference to standards that are of use to shipbuilding, and to eliminate the development of new standards where acceptable standards exist.

29. Horsmon, A.W. and Bunch, H.M. *Providing Administrative Support to the U.S. Technical Advisory Group in its Participation on the International Standards Organization Committee on Shipbuilding*. 1992. Sponsored by Maritime Administration. NSRP 0362.

This project's objective was to provide support for involvement of U. S. representatives in the International Standards Organization (ISO) Committee on Shipbuilding (TC-8). The aim was to assure creditable presence of the U. S. shipbuilding and repair industry in the making of international standards to ensure global competitiveness.

**CHARTER
PANEL SP-6
MARINE INDUSTRY STANDARDS**

Panel SP-6 of the Ship Production Committee of the Society of Naval Architects and Marine Engineers is chartered to plan, oversee the performance of, and facilitate the implementation of the result of research and development projects to advance shipbuilding processes and methodologies. Its goal is to develop and initiate implementation of equipment, procedures, and processes which will result in reducing the cost and improving the competitiveness of American shipbuilding, ship repair, and overhaul.

Panel SP-6 will take its general guidance from the Executive Control Board of the Ship Production Committee, and will augment its efforts through information obtained from the Panel members, based on individual experiences and knowledge.

Panel SP-6 will, when appropriate, join efforts with other panels to produce a common project product.

Panel SP-6 is, by its charter, challenged to perform tasks including, but not limited to, the following areas:

The Marine Industry Standards Panel supports the development, approval, publication and implementation of standards that will have industry-wide application and result in direct benefits in the form of reduced cost and time of design, construction and repair, while maintaining or improving quality. In pursuit of these objectives, the Panel defines a standard as a specification, test method, definition, classification, guide or practice. The Panel coordinates its efforts closely with American Society for Testing and Materials (ASTM) Committee F-25 on Shipbuilding Standards, other ASTM Committees, SNAME Panels, and organizations having mutual interest in standardization.

Panel SP-6 shall compose itself of individuals with ship production, shipyard management, shipyard labor and crafts, ship design and academic expertise who are versed in current and future concepts of shipbuilding. Members should be selected that are knowledgeable of problems of shipbuilding and have a role in the implementation of the solutions to these problems.

Selection of projects shall be by consensus of active shipbuilding and government members of the panel.

CHARTER

DRAFT NUMBER 1

Dated 15 November 1991

NAME PANEL SP-6

MARINE INDUSTRY STANDARDS PROGRAM

SOCIETY OF NAVAL ARCHITECTS AND MARINE ENGINEERS

The Marine Industry Standards Program (Panel SP-6) endorses the concept of standardization as a vital element in the health of the U.S. Shipbuilding Industry.

PANEL SP-6

It is the primary objective of the Panel to identify and initiate action on practical applications of standardization that will directly benefit U.S. Shipbuilding in terms of reduced labor and material costs, shortened design and production cycles, and increased customer satisfaction. The Panel will ensure that all of its actions are driven by shipbuilder demand and have a reasonable prospect for implementation. In pursuit of its objectives the Panel will establish liaison and coordinate activities with industry and standards organizations as appropriate.

ON

MARINE INDUSTRY STANDARDS

Panel membership consists primarily of shipyard representatives but may include representatives of government, design agents, equipment manufacturers, standards bodies, regulatory and classification bodies, and other standardization professionals, as deemed necessary by the shipyard representative members.

BY-LAWS

ISSUE #1 - 24 June 1991

COMMITTEE F-25 ON SHIPBUILDING STANDARDS
LONG-RANGE/STRATEGIC PLAN

Approved by: EXECUTIVE SUBCOMMITTEE F25.90

ISSUE #1 approved: *DA Maranzullo*

February 17, 1992
Revised & Updated August 13, 1992

**SHIPBUILDING & MARINE STANDARDS DEVELOPMENT: IN EUROPE,
THE ROLE OF THE EUROPEAN COMMISSION AND IN AMERICA,
THE MARINE INDUSTRY RESPONSE**

BACKGROUND:

Most of the time, performance and product standards are an unexciting subject. However, there are times when industrial standards can be vital to an industry. The development and selection of standards by a country or an organized group of countries can have a major impact on the commercial viability of the industries covered by the selected standards. The adoption of certain standards by a trading block of countries can be a very effective means of establishing trade barriers to manufactured goods imported into the trading block. This is especially true for the international marine industry. A recent example of this type of action now being initiated in Europe is a move by France and Germany to exclude valves designed and built to American standards for use in the offshore industry. The offshore oil industry started in the U.S. and expanded to European waters in the 1970s. Therefore, standards for offshore oil exploration and production equipment have been based on U.S. standards. A move by Europe under the EC umbrella to not accept U.S. standards in this area could create a major competitive disadvantage for U.S. offshore equipment manufacturers based on this technical barrier, even if the equivalent U.S. valve product was proven in service and less expensive.

The dynamics of Europe 1992 includes a rejuvenated marine standards development and, as they call it, harmonization program. This is after a decade of relative neglect and inattention. During the 1970s, European shipbuilders worked on shipbuilding standards at the individual company level, at the national level through each country's national standards association, and finally at the international level by participation in the International Standards Organization's (ISO's) Technical Committee Number 8 (the Ships and Marine Technology Committee designated TC8). ISO TC8 adopted shipbuilding and marine equipment standards through the consensus approval approach using what was then called the ISO TC8 Steering Committee. The Steering Committee members voted on accepting the standards reviewed by ISO TC8 Subcommittees and acted in a manner similar to the present day ISO TC8 Advisory Group (AG).

During the 1980s, when international shipbuilding activity levels dropped and many shipyards suffered financial losses, standards development was not emphasized by shipyards. During this time, shipyards were concentrating on survival in a period of greatly reduced demand and prices for ships. This was especially true in Europe with the primary exception of West Germany and Denmark, and to a lesser extent, Italy. These three countries maintained a policy of sustaining a commercial shipbuilding program through the hard times, including

continuing work on shipbuilding and marine standards. However, the activity of ISO TC8 greatly diminished during the nineteen eighties until late in the decade. Japan, who has been a leader in developing their own shipbuilding standards, had continued their Japanese Industrial Standards (JIS) development program for shipbuilding. In order to increase standards development at the international level, ISO TC8 decided to elect a chairman in addition to the secretariat function. The secretariat has been located in Delft, The Netherlands, for decades. Presently, it is headquartered at the Netherlands National Standards Organization, NNI. The new chairman is Japanese, which is appropriate considering the large amount of shipbuilding standardization work done in Japan since their recovery from World War II. This chairmanship was established three years ago.

As Europe works on reducing its internal trade barriers, the EC is including a program specifically designed to reduce and, where possible, eliminate technical barriers to shipbuilding, ship operations, and marine equipment product trade within the European Community. This program is being administered by the Directorate General for Industry (DG III) of the European Commission in Brussels. The EC's planned program closely follows work done in IMO. Due in part to leadership being provided by the U.K., a two-part study has been contracted to A&P Appledore and W.S. Atkins in Great Britain. The results of this study, scheduled to be completed by April 1, 1992, will provide the facts on existing technical trade barriers and their estimated costs, and recommend a program plan to systematically remove the identified barriers. An initial draft EC DG III directorate will be presented in May to working party members of those twelve EC member countries interested in marine standards for shipbuilding, ship operation and marine equipment. After review and comments, it is hoped a more formalized draft will be prepared and issued in late 1992 to the EC Council for review and approval. Final acceptance is targeted for 1995 by the EC Parliament, after the normally time consuming member country review and approval process.

With the rapidly diminishing U.S. Navy shipbuilding budgets and the need for U.S. shipyards to enter the international shipbuilding market, the development of new and the harmonizing of existing shipbuilding, ship operating and marine equipment standards becomes of major importance to the U.S. shipbuilding industry. The Shipbuilders Council of America (SCA) has been supporting the emergence of the American shipbuilders into the growing international commercial shipbuilding market by participating in International Maritime Organization (IMO) Steering Committee meetings in comparative tanker designs. These meetings are held in London, thereby providing the opportunity at minimum cost to interview U.K., Netherlands and Brussels based leaders in the new EC initiative to harmonize marine standards. After a January 1992 IMO meeting, Rick Thorpe, a member of the SCA staff, visited the two U.K. marine trade associations; Shipbuilders and Shiprepairs Association, and the British Marine Equipment Council, in London. Then, after a trip to Newcastle, England, the consulting firms of British Marine Technology and A&P Appledore were visited. A flight to Delft, Holland to visit the Nederlands Nordisatie-institute (NNI) and Delft University of Technology was followed by a trip to Brussels, Belgium to interview the Directorates in the Commission des Communautés Européennes (ECC).

In addition to covering the present status of marine standards harmonization in Europe, this paper reviews and summarizes the EC Organizations, in Brussels, the Marine Equipment trade associations in Europe, the European Standards Organization (CEN-CEN elec) and the

International Standards Organization (ISO) Ships and Marine Technology Technical Committee Structure (TC 8). It also describes the U.S. Marine Standards organizations and how they relate to the ISO TC 8 Ships and Marine Technology Committee. This paper thereby becomes a primer on marine equipment trade associations as well as marine standards organizations in Europe and how they relate to their U.S. counterparts.

THE COMMISSION OF THE EUROPEAN COMMUNITIES AND EUROPE'S MARITIME INDUSTRIES

The Europe 1992 common market effort is proceeding. And it includes a special effort to "promote on a European level the Community's maritime interests and, especially, the competitiveness of the EC's maritime industries." The U.S. shipbuilding and marine equipment industries need to be especially tuned to European maritime interests for several reasons. The first is that European shipowners are a viable client base for U.S. built ships. This is true because many European ship operators own specialty ships such as cruise ships and chemical carriers. It is these types of "niche market" ships which U.S. yards can be competitive building for the international market. The second reason is that, with the exception of the U.K., U.S. labor costs are measurably lower than the costs of comparable labor in Western Europe. For instance in Spain, until recently a low cost country, the cost of a fully burdened with overhead labor hour for a shipbuilder skilled in military ship construction is now \$40 per hour! In Germany, Europe's highest cost shipbuilding country, the cost of a similar labor hour is \$48/hour. In contrast the hourly cost of a comparably skilled shipyard worker in the U.S. is in the low to mid thirties. Therefore, the new European maritime market is a good opportunity for both U.S. shipbuilders and U.S. marine equipment manufacturers IF THERE ARE NO TECHNICAL BARRIERS (read special national requirements not harmonized into an international standard acceptable to the USA).

To promote the European maritime industries the EC Commission has established the European Maritime Industries Forum which they call a "Discussion Forum" with representatives of all the maritime industries, research institutes, member states Maritime and Industrial Administrations and the EC Commission. It is intended that the Discussion Forum "contribute to a more precise definition of the type of actions to be developed in order to improve the competitiveness of those EC maritime sectors." It is expected that an EC Maritime industries agency within the EC Commission will result from the Discussion Forum.

To give an indication of the dimension and growth of the EC maritime industry, the Commission estimates that there are roughly 2.5 million people employed in the EC Maritime sector. Short sea transportation, defined as transport along Europe's geographic coastline plus the Med, Baltic and Black Sea coasts plus inland waterway transport will increase greatly with the completion of the internal market and the liberalization process in eastern Europe. There is strong European pressure to move transport off the now heavily congested land routes and onto waterborne transportation systems.

An important action item in the EC Commissions maritime industry's plan is the elimination of marine equipment technical trade barriers. The EC is preparing a draft directive which will "harmonize technical regulations related to marine equipment used on board merchant ships. It is envisaged that the directive will include marine equipment for which it is essential

to promote the safety of life at sea, and for the protection of the marine equipment from pollution by hazardous substances."

The reader can see from the above quote that the EC Commission intends to have European standards closely follow the lead of guidelines developed by the International Maritime Organizations (IMO's) two Committees, Marine Safety Committee (MSC) and Marine Environment Protection Committee (MEPC). The SOLAS and MARPOL conventions held over the years have produced guidelines which must be incorporated in each countries marine standards at the national level. For EC members IMO requirements will work their way into national standards through the EC Commission DG III harmonization process.

As mentioned in the introduction to this paper, the draft directive on European marine standards will be based on results from the two U.K. studies of the technical harmonization of marine equipment. The first part has been accomplished by A&P Appledore, a well known international marine consultant located in Wallsend on Tyne in North East England. According to the senior consultant who did this £25,000 job, John Clark, his study has identified all technical barriers within the EC for the trade of marine equipment. Technical barriers include specific requirements in excess of IMO and special country "agency approvals". A&P Appledore then made recommendations on how these barriers can be removed. This Appledore study was the basis for an economic analysis of the barriers done by W.S. Atkins for £25,000. The W.S. Atkins study identifies the economic impact of these technical barriers, including estimating the value of the market in the effected marine products. Both studies are documented in final reports which were completed during May and June of 1992.

Directives on life saving and fire fighting equipment were discussed by the EC "Discussion Forum" members at a Brussels meeting in May. The objective of this meeting was to initiate the preparation of draft directives. Complete consultation on a package of directives by all participating member countries is scheduled to be completed by May 12, 1993. EC Council approval is targeted for November 6, 1993. This can lead to having enabling legislation by May 18, 1995.

You can tell by the above schedule that the EC Council (the EC decision making body) moves with deliberate speed (slowly) through its ministerial meetings. The same is true of the European Parliament which is an elected body and passes enabling legislation. On the other hand, the EC Commission which proposes Community policy and legislation, and then implements the decisions taken by the Council of Ministers, is moving very quickly to study and formulate a maritime strategy and action plan for the EC. This is because the responsible Directorate (DG III) on Internal Market and Industrial Affairs is under the able leadership of Dr. Martin Bangemann from Germany. Mr. Bangemann has selected the Maritime Sector as a high priority industry to develop and implement EC directives. He has established October 1992 as the target date to have a detailed Maritime Industry Plan in place with full implementation action underway. His point man for this maritime initiative is Mr. Tony Morrall, EEC DG III/E/4 who is on loan to Brussels from BMT in the U.K. These two capable professionals are pushing through a Community Program to make the EC maritime industries responsive to the Europe 92 time schedule.

For those readers who desire to know how the European Community works, a description is attached.

The EC plans to issue a series of equipment directives as follows:

1. Life saving
2. Fire fighting
3. Navigation
4. Communications
5. Structural Fire Protection
6. Pollution Prevention

You can see this closely follows IMO SOLAS and MARPOL conventions and guidelines.

THE EUROPEAN MARINE EQUIPMENT COUNCIL: A NEW ORGANIZATION TO SUPPORT THE EC MARINE STANDARDS HARMONIZATION PROGRAM

In conjunction with the International Marine Equipment Club (IMEC) meeting in September 1990 in Hamburg, a separate meeting of the EC members of IMEC was held with Tony Morrall from the EEC in Brussels to start organizing a new European marine association called the European Marine Equipment Council (EMEC). The council members are the national marine equipment associations from seven of the twelve European Community countries and three from non-EC European Countries. The President of EMEC is Mr. Hans A. P. Koomen from Holland.

As indicated in the above paragraph, an important organization element in the structure of EMEC is the possibility for non EC-member states to apply for an associated EMEC membership. So far Norway, Sweden and Finland have joined EMEC as associates. The possibility for an associated EMEC-membership is especially important with regard to subjects like the technical harmonization of marine equipment. However with regard to subjects that are exclusively of an EC-nature, the associated organizations have no voting rights when decisions are made.

The general objectives of EMEC are:

- The promotion of the mutual European interests of its members.
- To intensify contacts between national representative organizations in Europe.
- The representation of the interests of the European industry on a Community level.

EMEC is actually involved in the work of the European Maritime Industries Forum, participation in all four working groups:

- Economic Analysis;
- Research and Development;
- Safety and Environment and
- Maritime Transport.

EMEC is represented in the Forum's plenary sessions by its President and Vice-President, Mr. Brian Tayler from the United Kingdom, who recently succeeded Peter Hammersley as director of BMEC.

A major function of the EMEC will be to assist and support the marine equipment standards harmonization program. As Tony Morrall explains, the EMEC can be very helpful to the effort by doing such administrative things as:

- providing addresses for questionnaires
- hosting large meetings to identify trade barriers
- reviewing draft reports and studies on technical harmonization

The SCA is a member of IMEC and will use this club as a basis for continuing close contacts with those members of IMEC who are also members of EMEC. This relationship can be useful for any and all american marine equipment and service firms as well as U.S. shipbuilders who have any interest in the international market for marine equipment.

To help visualize the complex world of Marine Equipment Organizations, a listing and a block diagram of interrelations between the many associations is attached as chart 1.

THE INTERNATIONAL STANDARDS ORGANIZATION (ISO); A BETTER ORGANIZATION THAN THE EUROPEAN COMMITTEE FOR STANDARDIZATION (CEN) FOR HARMONIZING EC MEMBER COUNTRY MARINE STANDARDS?

As stated in the introduction to this paper, ISO has been the top level harmonization organization for marine standards for decades. Its activities are being rejuvenated under its chairman, Dr. Katashi Taguchi from Japan. The United States is participating through Charlie Piersall as chairman of the U.S. Technical Advisory Group operating officially through ANSI. The membership of the ISO/TC8 Advisory Group is given below:

P-Member Body of ISO/TC8

Representative to the Advisory Group

Japan (chairman ISO/TC8)	Dr. Kataski Taguchi
Brazil (ABNT)	Mr. B.P. Mader Goncalves
Bulgaria (BDS)	Mr. I. Milev
China (CSBS)	Mrs. Chen Guo-min
Cuba (NC)	-
Czechoslovakia (CSN)	-
Denmark (DS)	Mr. A.W. van Dijk
France (AFNOR)	Mr. P. Vauthier
Germany (DIN/HNA)	Mr. H. Ch. Schade
India (ISI)	Mr. N.S. Vijayaraghavan
Italy (UNAV)	Mr. A. Robotti
Japan (JMSA)	Mr. Y. Ageta
Korea, Dem.P.Rep.of (CSK)	-
Korea, Rep. of (KBS)	-
Netherlands (NNI)	Mr. S. Hengst
Norway (NSF)	Mr. S. Osterlie
Poland (PKNMIJ)	Mr. A. Szemro
Romania	-
United Kingdom (BSI)	Mr. N.S. Miller
U.S.A. (ANSI)	Mr. C.H. Piersall
CIS (?) (GOST)	Mr. S.V. Bravikov

As in most organizations, there are especially key personnel who put in more than average effort to product results. In ISO TC8, beside the Secretariat and the Chairmen, these European individuals include the following:

Denmark

Mr. A.W. van Dijk
 General Manager
 Odense Linde Shipyard
 P.O. Box 176 - DK - 5100 C
 Odense, Denmark
 Fax: 45 09 97 44 44
 Phone: 45 09 97 66 13

France

Mr. H. ch. Schade
Standardization Bureau for Shipbuilding
(HNA within DIN)
Secretary to CEN Committee 15
Spaldingstrasse 110 A
D-2000 Hamburg Y, Germany
Fax: 49 40 23 47 36
Phone: 49 40 23 1484

Italy

Mr. Aldo Robotti
UNAV (Italian Standards Organization for Shipbuilding)
Via al Molo Giomo Calata Grazie
16126 Genova
Phone: 39 10 599 5795

U.K.

Mr. Niel S. Miller
BSI
Consultant from Yard Ltd.
Charing Cross Tower
Glasgow 62 4 PP Scotland
Fax: 44 41 221 6435
Phone: 44 41 204 2737

During the last two years, the ISO/TC8 has concentrated on finishing up previous standards work not completed during the 1980s, and on strengthening relationships with standards organizations at the national level. It's goals are now to establish a closer relationship with the IMO, and to prepare a long range plan which will include priorities for future standardization work in the 1990's.

On the subject of marine standards harmonization in Europe, Mr. van Elk, the ISO TC8 Secretariat, stated that the EC Commission has issued a policy that will require all European Products to have an EC Mark. The EC mark is a certification that the product so marked conforms to European requirements. There will be an EC directorate to that effect on European marine equipment. There now is a directive in effect for all recreational craft from 2.5 to 24 meters long requiring a CE mark.

The existing European Standards Organization for Electrical and non-electrical equipment is called CEN/Cenelec. In French CEN stands for the Joint European Standards Organization (Commune Europeenne de Normalization). CEN/Cenelec has a central secretariat which is the guardian of the authoritative versions of the European Standard (s) and is responsible for keeping master texts in written or other media form. It is also responsible for making European

Standards available to the Commission of the European Communities. The central secretariat is located in Brussels.

The present CEN/Cenelec guidelines are that when ISO standards exist, they should be proposed as European standards. At the present time there are no CEN marine standards in Europe. Present guidelines also state that all CEN standards, when they exist, should be accepted by European countries and that national standards should be replaced by CEN standards.

CEN is growing fast. CEN now has about 250 technical committee members versus the 30 to 40 it had three years ago. However, at this time there are no CEN subcommittees or working groups established to address the harmonization of marine standards. An entire new infrastructure of subcommittee's will have to be built within the CEN organization to address marine issues, if Europe does not agree to let the harmonization of marine standard be done by the existing subcommittee/working group structure of ISO TC8.

In January of 1992 France and Germany proposed that the harmonization of European marine standards be done by CEN. On the other hand the EC Commission DG III Directorate, the U.K. (SSA, BMEC, BMT, A&P Appledore), the newly formed EMEC and last, but not least ISO TC8 Secretariat all desire the new harmonization effort to be done at the international level by ISO TC8 subcommittees.

France and Germany have commercial reasons to promote establishing a brand new infrastructure within CEN to address marine standards. They can use their relatively large size and (for Germany) continually active commercial shipbuilding professional manpower to staff the new CEN subcommittees and influence the marine equipment market through the selection of technical requirements. On the other hand, the rest of the EC member countries would feel more comfortable if the European marine standards could be harmonized with the participation of the USA, Japan and other large, non European countries to help balance the French/German influence. These European countries (ex France and Germany) also believe that their marketing to the worldwide market would be better served if Europe's standards are harmonized with input from non European countries.

ISO TC8 Secretariat says that the harmonizing of European standards will be done by the same core of European professionals - a limited supply of people. If the work is done by CEN, the time of these people won't be available to support ISO TC8 subcommittee work.

From a U.S. point of view, we should favor the harmonization of Europe's marine standards using the ISO TC8 committee/subcommittee structure. It is established, and we are starting to work in it. Since our shipbuilding industry must play catchup, we can benefit by the work done at the ISO level. We can quickly learn the presently accepted processes, procedures and product requirements while providing our input to the standards developing process.

THE UNITED STATES PARTICIPATION IN ISO TC8; THE BEGINNING OF A NEW ERA OF INTERNATIONAL COOPERATION

As stated at the beginning of the previous section, the United States is participating in the rejuvenated efforts of ISO TC8 through the American National Standards Institute's (ANSI) Technical Advisory Group (TAG) to ISO TC8.

The membership of this TAG is as follows:

- Chairman:** Charles H. Piersall, Jr.
Amadis, Inc.
10590 Newport Church Road
Charlotte Hall, MD 20622
Tel. & Fax 301 934 4655
- Members:** Glenn Ashe, American Bureau of Shipping
713 873 0700
Edward Barrett, Military Sealift Command
202 433 0205
Harian T. (Tom) Haller, Associate Administrator
Maritime Administration 202 366 5737
Howard L. Hime, U.S. Coast Guard (G-MTH)
202 267 0002
RADM Thomas Hopkins, USN (Ret.)
703 821 2826
Richard W. Thorpe, Vice President, Shipbuilders Council of America
703 276 1700

The TAG's relationship to ISO TC8 and to U.S. maritime organizations is shown on Chart 3. The Naval Sea Systems Command (NAVSEA) is considering the use of international and foreign commercial vessel standards and processes including the ISO 9000 family of quality assurance systems/documentation. Therefore, having a senior executive of NAVSEA be a TAG member is under consideration. Also, having a senior executive of an U.S. flag ship operating company on the TAG is also being considered.

In order to complete the description of the U.S. involvement in ISO TC8 the American senior members of TC8 working groups, subcommittee and Liaison officers to other ISO Technical Committees are listed below:

WORKING GROUPS:

- WG-24** Review of Existing Maritime Standards
Richard W. Thorpe, U.S. TAG - Member
- WG-25** Incinerators On-Board Ships
Howard Hime, U.S. TAG - Convener

WG-26 Ship Machinery
RADM Thomas Hopkins, U.S. TAG - Convener

SENIOR U.S. MEMBERS OF TC-8 SUBCOMMITTEES:

SC-9 Life Saving Equipment
J.R. Capin, Project Engineer, Newport News Shipbuilding
804 380 3969

SC-10 Deck Machinery
Eugene Coughlin, Executive Vice President, Lakeshore, Inc.
906 774 1500

SC-15 Computer Applications in Shipbuilding
K.E. Meland, Project Manager, Computer Engineering
Newport News Shipbuilding 804 380 3844

SC-20 Ship's Bridge Layout
E.S. Zavada, Engineer V, Newport News Shipbuilding
804 688 9031

US TAG (ISO TC8) LIAISON OFFICERS TO OTHER ISO TC'S:

to TC 67 Materials and Equipment for Petroleum and Natural Gas Industries
Charles Piersall, U.S. TAG Chairman

to TC 70 Diesel Engines
Paul Danyluk, Vice President Engineering, Colt Industries

to TC 115 Pumps
Joe Motisi, Manager, Marine & Navy Marketing, Dresser Industries

to TC 176 Quality Management (ISO 9000)
Charles Piersall, U.S. TAG Chairman

OTHER POINTS OF INTEREST

Because IMO meetings are held in London and because the U.K. contributes greatly to the intellectual well-being of the international marine industry, several U.K. leaders in shipbuilding, marine equipment and consultancy were interviewed while in England.

Nick Granger is the Managing Director of the British Shipbuilders and Shiprepairers Association (SSA). He has been most helpful in alerting the SCA to marine standards development in Europe. He believes that the ISO TC8 should be used to harmonize European Marine Standards, rather than utilizing CEN.

The BMEC Director is now Mr. Brian Tayler as stated on page 6. Peter Hammersley is the managing director of the British Marine Equipment Council (BMEC). BMEC is a Council of several British trade associations covering ships and offshore equipment. Peter is very interested in the American marine industry standards activity, having worked with several U.S. shipyards during his Royal Navy career. He believes in the following:

1. Use ISO TC8 to coordinate European standards harmonization.
2. Don't use CEN except in purely European applications areas.
3. Increase the use of standards at the international level.

Peter believes the SCA should brief IMEC on recent U.S. marine standards actively which the SCA was prepared to do at the June meeting before it was canceled by COFRENA. This briefing may now be done at the next IMEC meeting now scheduled for October 1, 1992.

BMT CORTEC Ltd. in Wallsend on Tyne was visited because for several decades British Marine Technology (BMT) and its predecessor British Ship Research Association (BSRA) was the leader in developing the U.K.'s shipbuilding and marine standards. Mr. Derek Maidment, BMT CORTEC's Project Services Manager, was the host. Time was spent with Peter Milne, the Managing Director, Chris Elliot, his Deputy and Mr. Frederick Birkert, Manager of Manufacturing Processes. Fred has been the manager of standards development at BMT for years. He provided useful background history on past marine standards development in the U.K., including the preparation of steel shipbuilding standards.

Marine Standards in the U.K. are called the BSMA series of the British Standards Institute (BSI) national standards. They consist of performance oriented high level engineering standards for both shipbuilding processes and equipment, plus product oriented design standards for items like deck outfitting (bollards, etc.) and ladders. In the past, the U.K. has concentrated on the following four categories of standards.

1. Shipbuilding Steel Manufacturing (fabrication standards)
2. Outfitting
3. Quality Assurance
4. Purchasing

The Japanese, Germans and British have been the past leaders in marine standards development.

A&P Appledore is a well known international consultancy firm which has provided planning and helped operate shipyards all over the world. They are also located in the Wallsend area at Tyne & Wear at their Tyne repair yard. Several areas of interest were reviewed at A&P Appledore. The first was their consultancy report on technical barriers within the EC for Tony Morrall at the EC Commission, as previously discussed. Mr. John Clark said the EC Commission DG III should be able to issue a final draft directive next August or September (92) to implement a plan for expediting standards harmonization and development in Europe which would work at the international level for at least life saving, fire fighting and pollution prevention equipment, if not all six equipment categories listed on page 5. These directives would:

1. Obtain agreement on IMO safety and pollution control performance implementation standards at the national level.
2. Obtain agreement on test and certification procedures.
3. Approve additional Testing Laboratories for certification, especially environmental testing labs.

John Clark said we should expect a major increase in shipbuilding standards review and for census approval activity next fall after the A&P Appledore report and the EC Commission final draft directive on standards are issued in final draft form.

John also predicts that in the future there will be effort spent to reduce technical barriers and delays caused by lack of agreement between classification society requirements, especially special testing requirements. The Class Societies will fight this, but it should be done.

Two other areas of interest to the NSRP were reviewed at A&P Appledore. The first was A&P Appledore's upgraded process of reviewing shipyard technology and performance. This method was applied to U.S. yards during the late 1970's, and was well received by the American yards that participated. Mr. Peter Williams described the review as an audit survey of such shipbuilding functions as steel work production, outfit production, facilities layout, environment and amenities, and ship design, drafting and technical information. Output of the review includes an assessment of the yards overall performance levels and recommendations for action to upgrade the yards shipbuilding technology. Each yard surveyed is given a special, proprietary presentation on the assessment of its yard. The NSRP has considered the benefits of sponsoring a follow-up survey as U.S. yards shift gears to compete internationally in commercial ship construction. In May 1992 the Executive Control Board (ECB) of the NSRP approved a FY 93 project which included an updating and expansion of the review of U.S. shipyards done in the seventies.

The second other area of interest reviewed while at the A&P Appledore offices was their shiprepair market intelligence service which provides detailed computerized data on ship port calls and repair history. This data is tailored for each client repair yard's requirements and physical restraints. The information is programmed for specific "catchment areas" of coastline. Mr. James Daltry demonstrated this repair information system on A&P Appledore's computer system. It is an excellent repair yard marketing tool, and as a secondary function, can be used to measure ship repair brokerage performance. The NSRP is considering sponsoring this market intelligence system for the U.S. coastline.

RECOMMENDED ACTION:

The new long range plan for U.S. marine standards development should heavily emphasize the review and adoption of existing international standards. An efficient way of accomplishing this is to participate in ISO TC8 standards work. Since Europe is at the beginning of a major effort to harmonize their marine standards, now is an ideal time to work with Europe in a systematic harmonization program. If Europe does their harmonizing behind the closed doors of CEN, then they do not benefit from our technical expertise and support and we do not benefit from the experience of evaluating Europe's existing standards. We also may find ourselves locked out of some European marine equipment markets. ISO TC8 loses the technical support of the European engineering professionals who will be devoting their donated company time to review, evaluation and analysis as members of CEN rather than ISO TC8 subcommittees.

As a result of the information obtained during these interviews of European leaders in marine standards harmonization and marine equipment trade associations, the SCA Council staff recommends that the shipbuilding industry support a significant involvement in ISO TC8 subcommittee work. We also recommend supporting the ISO TC8 Advisory Group in having the harmonization of European marine standards be done by the ISO TC8 Advisory Group and its subcommittees. The shipbuilding industry support to ISO TC8 should be applied through all of the following conduits:

- | | | |
|----|---|--|
| 1. | SNAME PC ECB | Overall policy and program review and approval |
| 2. | SNAME PC Panel SP-6 | Management of project initiation, selection, and oversight of project implementation |
| 3. | NSRP Projects | Program Management and accomplishment as a contractor |
| 4. | ASTM F-25 Subcommittees | Review and consensus approval of U.S. marine standards |
| 5. | ANSI TAG to ISO TC8 | Membership and top level guidance to membership |
| 6. | ISO TC8 Subcommittees | Membership and accomplishment of assigned tasks |
| 7. | Commerce Department EC 92 Standards Program | Work with the Commerce Department in their involvement with EC 92 standards |

The two final goals should be;

1. As marine standards are harmonized by ISO TC8 subcommittees and accepted as CE certified, those suitable for U.S. application will become certified for use in the U.S. by USCG and be documented in our U.S. standards and shipbuilding systems.
2. Marine standards developed by ASTM F-25 subcommittees and other organizations should be processed through the ANSI TAG to ISO TC8 for incorporation as ISO TC8 international standards.

The above action is in no way suggested to preclude actions by the U.S. to review and adopt useful marine standards from non European countries or to develop new marine standards where desirable.

MARINE EQUIPMENT TRADE ASSOCIATIONS AND CLASSIFICATION SOCIETIES

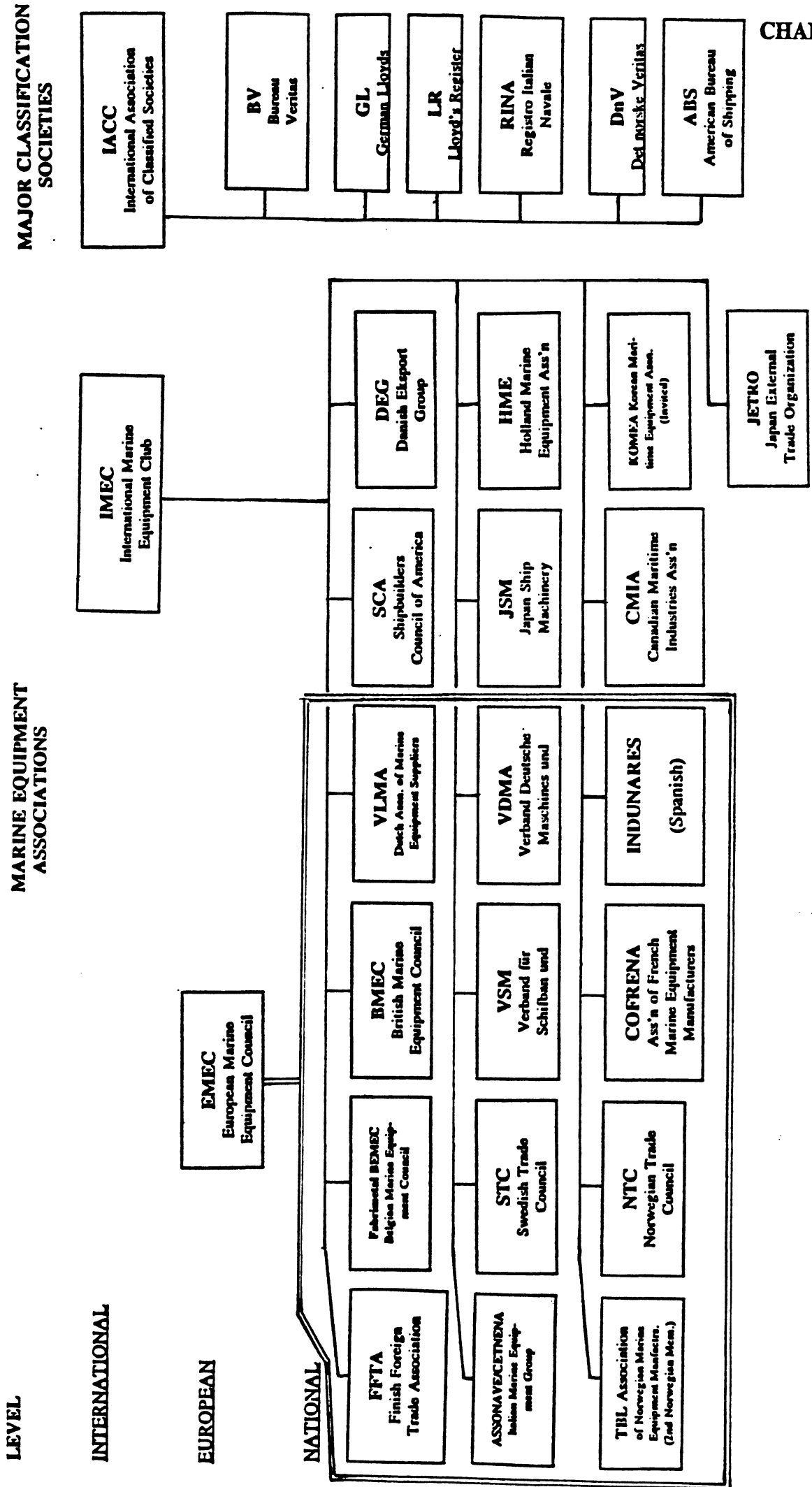
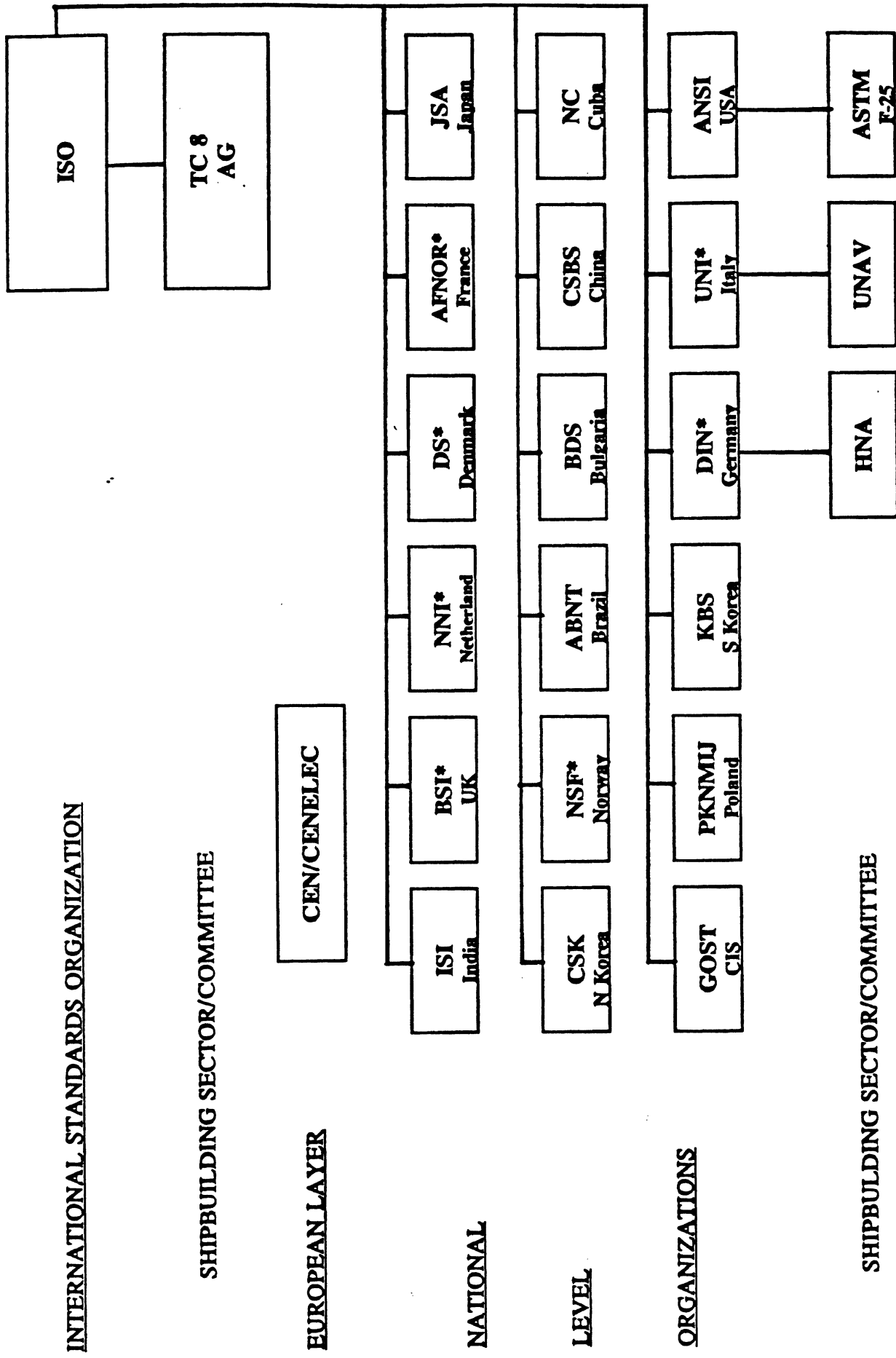


CHART 1

WORLDWIDE STANDARDS ORGANIZATIONS



INTERNATIONAL STANDARDS ORGANIZATION

SHIPBUILDING SECTOR/COMMITTEE

EUROPEAN LAYER

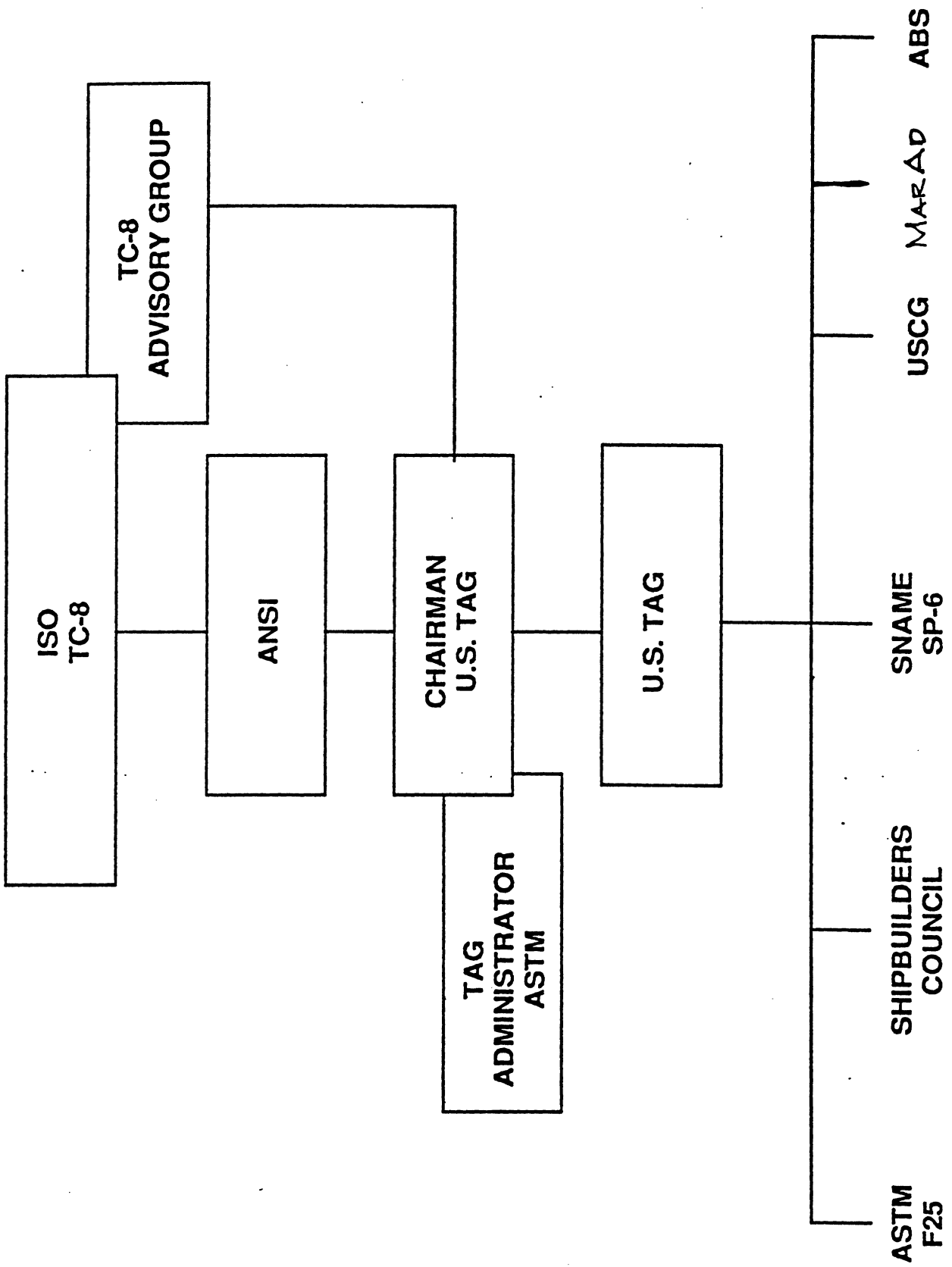
NATIONAL

LEVEL

ORGANIZATIONS

SHIPBUILDING SECTOR/COMMITTEE

*National Level Organizations included within the European Layer: CEN/CENELEC



How the Community works

The United Kingdom became a Member State of the European Community on 1 January 1973. Strictly speaking, there are three European Communities to which the 12 Member States all belong:

- the European Coal and Steel Community (ECSC), set up by the ECSC Treaty signed in Paris on 18 April 1951;
- the European Economic Community (EEC), set up by the EEC Treaty signed in Rome on 25 March 1957;
- the European Atomic Energy Community (EURATOM), set up by the EURATOM Treaty also signed in Rome on 25 March 1957.

The term 'European Community' (EC) is commonly used to describe the three Communities together.

The Single European Act, which came into force on 1 July 1987, amended the three Treaties in a number of ways, in particular by extending the use of majority voting. Most single market proposals are now subject to majority voting by the Member States, although items relating to taxation, the free movement of persons and the rights and interests of employees will continue to require unanimity. The Single European Act also enables the European Parliament to play a more active part in decision-making on single market proposals.

There are four main Community institutions: the Commission, the Council, the European Parliament and the Court of Justice.

THE COMMISSION

The Commission:

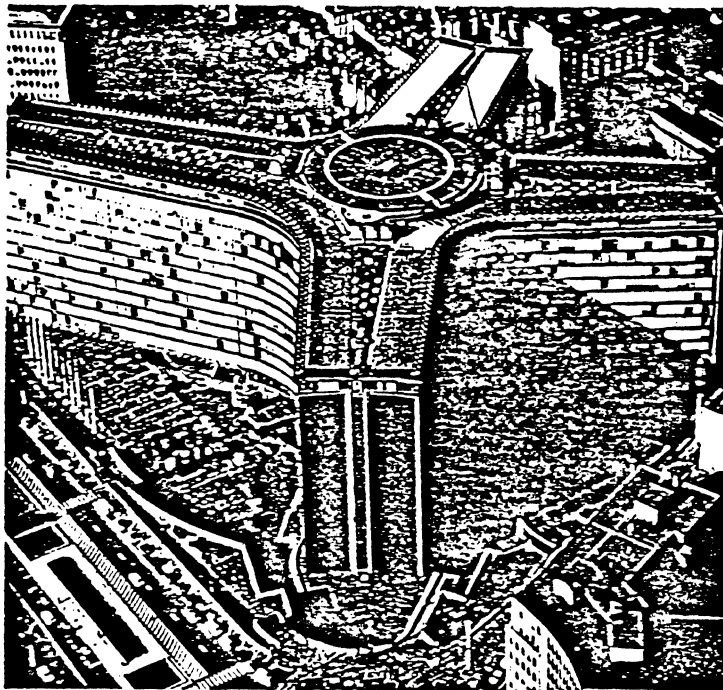
- proposes Community policy and legislation. It is then for the Council of Ministers to discuss and, if appropriate, adopt or amend the proposals;
- implements the decisions taken by the Council of Ministers and supervises the day-to-day running of Community policies;
- is the 'guardian of the Treaties' and can initiate action against Member States which do not comply with EC rules;
- has its own powers under the Treaties in some areas, notably competition policy and the control of Government subsidies.

In looking at the Commission, it is important to distinguish between the Commissioners themselves, their cabinets and the Commission services.

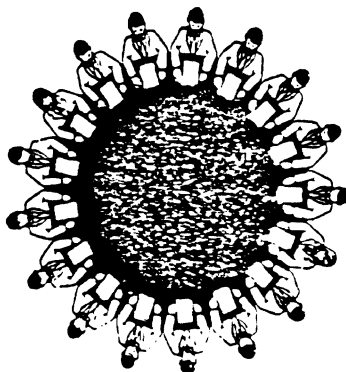
The Commissioners themselves act as the broad equivalent of a board of directors. They are normally referred to simply as 'the Commission'. There are 17 members appointed by the Community governments, two from each of the larger Member States and one from each of the smaller.

Commissioners are not appointed as national delegates, but act in the interests of the Community as a whole. Of the 17 Commission members, one is President, six are Vice-Presidents and the remaining ten are Members of the Commission.

Commissioners are appointed for a four-year term. In January 1989, the new European Commission took office. Its term lasts until the end of 1992.



The Berlaymont building in Brussels, headquarters of the European Commission.



■ THE COMMISSION



The College of Commissioners whose four year mandate began in January 1989.

President of the Commission

Jacques Delors
(France)

- Secretariat-General and Legal Services
- Monetary Affairs

Vice-presidents

Frans Andriessen
(Netherlands)

- External Relations and Trade Policy
- Cooperation with other European Countries

Henning Christophersen
(Denmark)

- Economic and Financial Affairs
- Coordination of Structural Funds

Manuel Marin
(Spain)

- Overseas Cooperation and Development
- Fisheries

Filippo Maria Pandolfi
(Italy)

- Science, Research and Development
- Telecommunications, Information and Innovation

Martin Bangemann
(Federal Republic of Germany)

- Internal Market and Industrial Affairs
- Relations with the European Parliament

Leon Brittan
(United Kingdom)

- Competition
- Financial Services

Members

Carlo Ripa di Meana
(Italy)

- Environment
- Nuclear Safety
- Civil Protection

Antonio Cardoso E Cunha
(Portugal)

- Energy and EURATOM Supply Agency
- Small and Medium Sized Enterprises, Distributive Trades and Tourism
- Cooperatives
- Commission Personnel and Administration

Abel Matutes
(Spain)

- Mediterranean Policy
- Relations with Latin America
- North-South Relations

Peter Schmidhuber
(Federal Republic of Germany)

- Budget
- Financial Control

Christiane Scrivener
(France)

- Taxation and Customs Union

Bruce Millan
(United Kingdom)

- Regional Policy

Jean Dondelinger
(Luxembourg)

- Audio-visual and Cultural Affairs
- Information and Communication
- People's Europe

Ray MacSharry
(Ireland)

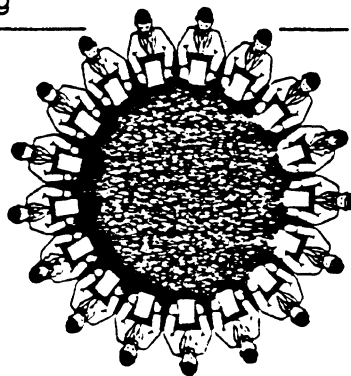
- Agriculture
- Rural Development

Karel Van Miert
(Belgium)

- Transport
- Credit and Investments
- Protection and Promotion of Consumer Interests

Vasso Papandreou
(Greece)

- Employment, Industrial Relations and Social Affairs
- Human Resources, Education and Training



Commission working methods

Each Commissioner is in charge of an area of Community policy. The Commission is currently divided into 23 Directorates-General (DGs) plus a number of specialised services. Each DG or service has a Commissioner responsible for its work.

Commissioners formulate proposals within their area of responsibility aimed at implementing the Treaties, for example by achieving the single market. Such proposals are discussed by the Commissioners as a body who then decide on the nature of the final proposal. Decisions are taken within the Commission by a simple majority vote, in other words at least nine out of the 17 Commissioners in favour.

Each Commissioner has a '*cabinet*' of six or more permanent administrators plus secretarial support. Unlike most Commission units, the majority of cabinet staff are the same nationality as their Commissioner. The cabinets have an important part to play in the decision-making process. It is often useful to talk to them directly.

There is a structure of inter-cabinet committees (called '*chefs de cabinet*', or '*chefs*' for short) which are designed to identify those issues on which Commissioners need to focus at their weekly meetings and to settle many less contentious items subject to formal approval by the Commissioners.

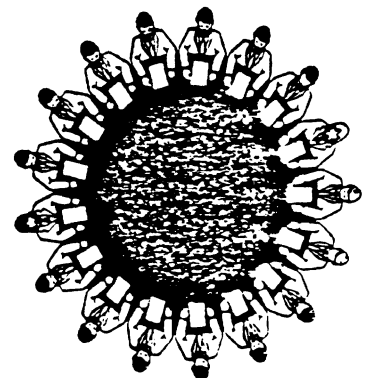
The main bulk of the Commission's personnel are referred to as the *services*, to distinguish them from the Commissioners and their cabinets. Grouped in 23 Directorates-General,

they are responsible for the technical preparation of legislation and its implementation. The services are staffed mainly by career officials recruited by competitive exam from the 12 Member States. They should normally be the first port of call to find out Commission thinking and to seek to influence it.

Commission delegated powers

In general, legislative power in the Community rests with the Council. However, in many cases the Council delegates powers to the Commission to take decisions on the detailed application of Community legislation or to adapt the details to changed circumstances. Such powers are generally exercised by the Commission with the assistance and advice of committees composed of representatives of the Member States.

More details about the Commission and its organisation and staff gradings are given in Annexes A and B.



DIRECTORATES-GENERAL OF THE COMMISSION

DG I	External Relations
DG II	Economic and Financial Affairs
DG III	Internal Market and Industrial Affairs
DG IV	Competition
DG V	Employment, Social Affairs and Education
DG VI	Agriculture
DG VII	Transport
DG VIII	Development
DG IX	Personnel and Administration
DG X	Information, Communication and Culture
DG XI	Environment and Nuclear Safety
DG XII	Science, Research and Development
DG XIII	Telecommunications, Information Industries and Innovation
DG XIV	Fisheries
DG XV	Financial Institutions and Company Law
DG XVI	Regional Policy
DG XVII	Energy
DG XVIII	Credit and Investments
DG XIX	Budgets
DG XX	Financial Control
DG XXI	Customs Union and Indirect Taxation
DG XXII	Coordination of Structural Instruments
DG XXIII	SME (Small and Medium Sized Enterprises) Task Force

Consumer affairs, previously in DG XI, now (February 1989) a separate directorate, not in any Directorate-General

THE COUNCIL

The Council is the Community's decision-making body. It agrees ('adopts') legislation on the basis of proposals from the Commission. The term 'Council' embraces not only Ministerial meetings (the Council of Ministers) but also working groups (Council Working Groups) of officials from the Member States and the Committee of Permanent Representatives of the Member States in Brussels (COREPER) which prepares discussions in the Council of Ministers.

Over the course of time, 'specialist' Councils have evolved dealing with particular areas of policy. The main ones are:

- Foreign Affairs (including trade policy and general issues)
- Agriculture
- Budget
- Finance
- Industry
- Internal Market
- Research

Councils are attended by the relevant Ministers from Member States and by the Commission, which is present as of right and participates in discussion as an equal partner. The relevant UK Minister is usually obvious from the title of the Council. The UK is represented on the Internal Market Council, as well as on the Industry and Research Councils, by a DTI Minister.

Council Working Groups are attended for each Member State by an expert official from the relevant Department in the national capital and/or by the desk officer from its Permanent Representation.

COREPER meetings are attended by the Permanent Representative (national officials of Ambassador rank based in Brussels) or their deputies, depending on the subject.

The Council's headquarters and General Secretariat are in Brussels, although in April, June and October, meetings of the Council of Ministers are held in Luxembourg.

In addition to normal Council meetings, the *European Council*, often referred to as the European Summit, comprising Heads of State/Heads of Government now meets twice a year to discuss broad areas of policy.

Council meetings are chaired by the Member State holding the Presidency. The Presidencies between now and 1992 are as follows:

- 1989 first half — Spain
- second half — France
- 1990 first half — Ireland
- second half — Italy
- 1991 first half — Netherlands
- second half — Luxembourg
- 1992 first half — Portugal
- second half — United Kingdom

Council decision-making

The Treaties provide for three methods of decision-taking, depending on the nature of a given proposal and the Treaty Article on which it is based:

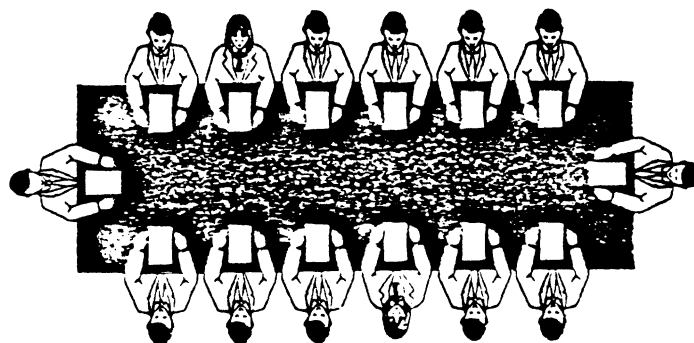
- *unanimity*: strictly, 'nobody against' as abstention does not prevent unanimity
- *simple majority voting*, i.e. at least seven Member States in favour
- *qualified (weighted) majority voting* based on the relative size of the Member States by population.

Most single market proposals are subject to qualified majority voting, depending on the provision of the Treaty under which they are made.

The table below gives the relative weights of the votes held by the Member States under the qualified majority system.

Member States	No. of votes
United Kingdom	10
Germany	10
France	10
Italy	10
Spain	8
Belgium	5
Greece	5
Netherlands	5
Portugal	5
Denmark	3
Ireland	3
Luxembourg	2
	76

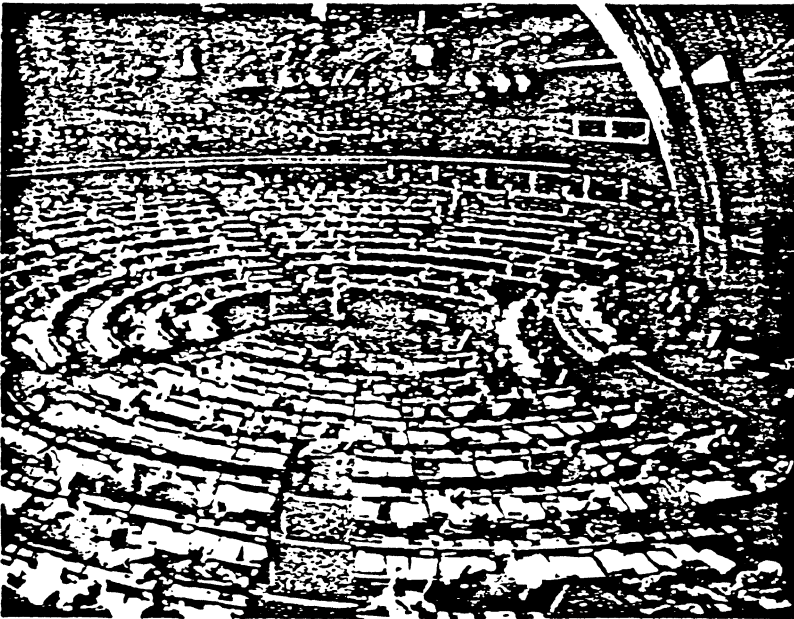
For a measure to be adopted by qualified majority, 54 votes (out of the total of 76) are required. A 'blocking minority' is therefore 23 votes, in other words a minimum of three Member States (for example two large plus one small Member State).



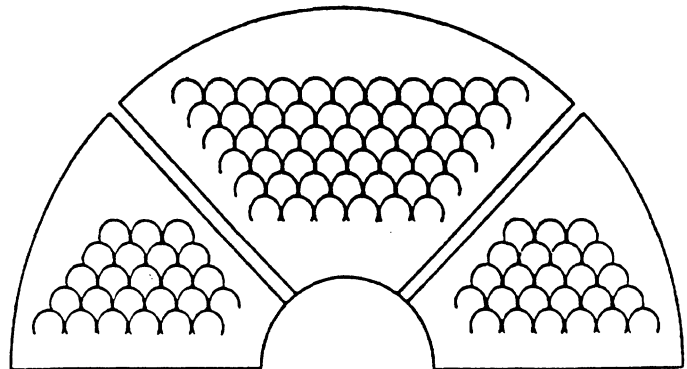
THE EUROPEAN PARLIAMENT

The European Parliament is a directly elected body of 518 members, 81 of them from the UK. Under the EC Treaties its formal opinion is required on most proposals before they can be adopted by the Council. Members are elected for a period of five years: 1989 is an election year. The Secretariat of the Parliament is in Luxembourg, although the Parliament's plenary meetings are held in Strasbourg and its Committee meetings in Brussels.

Most of the detailed work in the Parliament is done by its *specialist committees*, divided by subject area, who examine Commission proposals before they are put to the Parliament as a whole. When the Parliament is consulted on a proposal, it refers it to one of these committees. The committee appoints a 'rapporteur' for the proposal, that is, an MEP charged with preparing a report on it. The committee then discusses that report and may amend it. Each report includes a draft opinion on the Commission's proposal. This draft opinion is put to the Parliament as a whole by the specialist committee, and is adopted (sometimes with further amendments) as the Parliament's opinion.

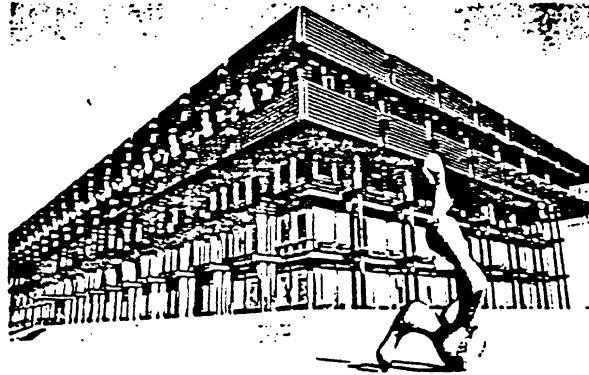


The European Parliament in plenary session in Strasbourg.



THE COURT OF JUSTICE

The European Court of Justice (ECJ) rules on the interpretation and application of Community laws. It has 13 judges, including one from each Community country. Judgements of the Court are binding in each Member State. A Court of First Instance is to be attached to the ECJ to relieve it of some of its excessive workload.



The Court of Justice

OTHER BODIES

The Treaties also provide for:

— the Economic and Social Committee, based in Brussels. It is an advisory body of 189 members, 24 of them from the UK, consisting of representatives of employers, trade unions and consumers; it must be formally consulted by the Commission on proposals relating to economic and social matters;

— the Court of Auditors, based in Luxembourg, whose role is to audit the Community's revenue and expenditure;

— the European Investment Bank, which also has its headquarters in Luxembourg. The EIB is the European Community's bank which lends money to finance capital investment projects which contribute to the balanced development of the Community.

THE PROCESS OF LEGISLATION

Community legislation is the result of a complex and often lengthy process of consultation and negotiation.

Under the Treaties, only the Commission can propose legislation. Where the Council wants action taken, it may request the Commission to undertake studies and submit appropriate proposals.

Role of the Commission

Before legislation is proposed to the Council, the Commission will often discuss its ideas informally with national experts and, where applicable, professional and business organisations, although such discussion is not obligatory under the Treaties. This is a very important stage, and one where it is vital for UK business to make its voice heard.

All new proposals for legislation coming from the Commission must be accompanied by a statement (the 'fiche d'impact') which attempts to assess the impact on business of new proposals. The Small and Medium Enterprise (SME) Task Force oversees the fiche d'impact system. Businesses need to be aware of this system and work with the Commission to ensure that fiches d'impact provide adequate assessments of the effect of new proposals on business.

The process of legislation starts formally with the adoption of proposals by the Commission. These are then submitted to the Council which must, in all but a few cases, consult the Parliament and the Economic and Social Committee.

Cooperation procedure

Most single market proposals are subject to the 'cooperation procedure' under which the Parliament gives its opinion twice: first, when the Commission proposal is submitted to the Council, and again after the Council has reached an agreement in principle (a 'Common Position'). At both stages it can propose amendments. The cooperation procedure is summarised in Annex D.

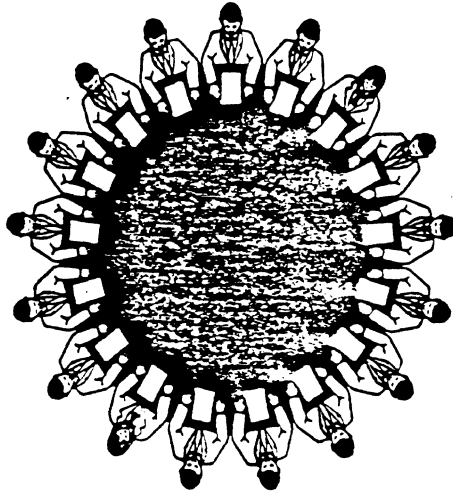
Role of the Council

Proposals are then put to the Council, which may adopt Commission proposals as drafted, request the Commission to amend them, amend them itself, reject them, or simply take no decision. Under the Treaties, however, it may amend a Commission proposal against the Commission's will only by unanimous agreement.

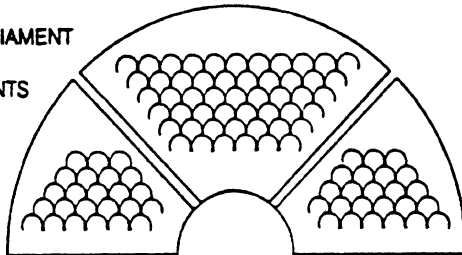
Within the Council, the Commission's proposals will normally be considered first by a Working Group of officials from the Member States, and then by the Committee of Permanent Representatives or their deputies. Finally, Ministers themselves, in the relevant specialist Council, will deal with any issues unresolved by officials and take the formal decisions.

■ THE PROCESS SUMMARISED

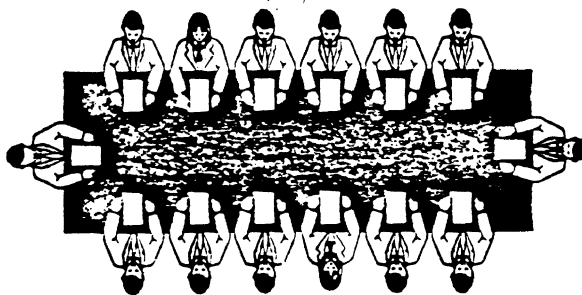
THE COMMISSION
MAKES PROPOSALS



THE EUROPEAN PARLIAMENT
GIVES OPINIONS AND
PROPOSES AMENDMENTS



THE COUNCIL
DECIDES



2.1.2. The specific case of the electrotechnical field

From the end of the nineteenth century the development of consistent grid systems was seen as one of the essential conditions for the wider use of electricity.

The need to draw up new rules guaranteeing a level of safety sufficient to ensure that the new form of energy was socially accepted was also recognized at a very early stage.

Because of these two requirements the industries concerned equipped themselves with collective facilities (laboratories and standardizing bodies) well before other industries.

At the turn of the century 'electrotechnical committees' composed mainly of electricity supply companies and manufacturers of equipment using electricity made their appearance in the main European countries and in the United States of America.

From 1946 these bodies maintained institutionalized relations at European level with the CEE-el (International Commission on rules for the approval of electrical equipment), and in particular the Cenel and Cenelcom, merged in Cenelec in 1973.

Relations at international level were established even earlier with the emergence of the IEC founded in London in 1906 following decisions taken in 1904 at the Saint-Louis Congress.

As generally speaking the national electrotechnical committees predated the formal establishment of national standards institutions covering all economic sectors, they have in most countries retained a high degree of independence from these general standardizing bodies (see list in Annex 2).

Nevertheless, the procedures used to prepare standards in the electrotechnical sector are virtually identical to those used by national institutions, which in any case generally take over responsibility for the final phase of circulating the draft standard for public comment.

At European and international level this is reflected in the gradual adoption of common rules for CEN and Cenelec on the one hand and for ISO and IEC on the other. This development is necessary because of the increasing interpenetration of technologies, blurring the dividing line between the electrotechnical and other sectors. Logically, then, the closer ties between CEN and Cenelec are essential to the success of European standardization, which also has to make allowance for the degree of autonomy required by the various partners involved (see 2.2.4.).

2.2. The European structure

2.2.1. CEN/Cenelec

The European Committee for Standardization (CEN) is a non-profit-making international association of a scientific and technical nature registered in accordance with Belgian law. Its statutes were published on 29 January 1976 in the *Moniteur belge*. Set

up in 1961, it moved to Brussels in 1975 where it shares premises with its sister organization, Cenelec. These two constitute what is commonly called the Joint European Standards Institution.

CEN: the visible part of CEN is its central secretariat which currently has a staff of about 30 although this is steadily increasing as European standardization develops. However, the central secretariat is only what might be called the tip of the CEN iceberg which consists of 16 national standards institutions in the member countries of the European Economic Community (EEC) and the European Free Trade Association (EFTA). For the time being Luxembourg is represented by the Institut belge de normalization but in 1988 the CEN should have two new members: Luxembourg itself and Iceland, which will also be joining Cenelec (Luxembourg is already a member).

The members of CEN and Cenelec, which are also members of international standards organizations (ISO or IEC for electrotechnical standardization), are listed in Annex 2.

The main purpose of CEN/Cenelec is to draw up European standards to promote the competitiveness of European industry throughout the world and to help establish the European internal market.

One of the means available to them is the transposition of international ISO and IEC standards to European level. At the same time CEN and Cenelec promote the application of international standards in the different countries.

European standardization offers a unique forum for organizing and facilitating contacts between all the parties involved in Europe.

European standardization also contributes towards the attainment of the European internal market through cooperation with Community institutions and EFTA by means of a number of tools described below (see 3.2).

2.2.2. The working of European standardization

An organizational chart showing the internal structure of CEN follows. That of Cenelec is very similar except that its General Assembly also serves as the Administrative Board.

The working of European standardization is described in the joint CEN/Cenelec internal regulations which have been radically amended in recent years and most of which came into force on 1 January 1987.

The main technical features of European standardization are as follows:

- (a) The technical work is generally done by technical committees, the Secretariat of which goes to one or other of the CEN/Cenelec members in accordance with precise rules, although always on a voluntary basis, and wherever possible following the principle that the Secretariat in Europe is allocated to the member holding the Secretariat of the corresponding ISO or IEC Committee. The

technical committees have a wide degree of autonomy under the authority of the Technical Board which establishes and disbands them.

- (b) To ensure consistent planning, programming and coordination of European standardization activities within a particular sector, CEN/Cenelec may also set up programming committees responsible for drawing up a European standardization programme. This is an innovation introduced by the new internal regulations so as to ensure that the priorities for the construction of Europe are taken into account. The members of these committees are as far as possible chosen from circles representative of the main interests involved. At the present time there are two programming committees in CEN and four in Cenelec.
- (c) To ensure that European standards have maximum impact and to avoid wasting human and financial resources, the members of CEN/Cenelec have committed themselves through a standstill agreement not to publish national standards on a subject on which European work is in progress throughout the duration of that work, except in exceptional circumstances.

The members of CEN/Cenelec have also committed themselves not 'to take any other action which could prejudice the harmonization intended'. The standstill agreement does not apply when a European prestandard (ENV) is being prepared.

- (d) Voting procedures in CEN/Cenelec for harmonized documents in Europe are based on the qualified majority but in accordance with general standardizing principles every effort is always made to obtain unanimous approval. The weighting coefficients are based on those in Article 148 of the Treaty of Rome for the EEC Member States and were decided by common agreement for the EFTA countries on the basis of economic and political considerations.

In the context of European standardization the qualified majority rule does not mean a simple two-thirds majority: there are other additional conditions for the adoption of a European document in order to ensure that the standard is the outcome of an agreement involving the largest possible number of countries.

Consequently the number of countries voting against, the number of abstentions and the number of votes against are taken into account.

Finally, there is an appeal procedure designed to ensure that the decisions taken are fair.

- (e) The European documents stemming from the harmonization work approved by voting may be either European standards (EN), harmonization documents (HD) or European prestandards (ENV). The EN and HD are known by the general term of CEN/Cenelec standards.

The EN and HD differ essentially in the degree of obligation on the members: it is mandatory to implement an EN at national level by giving it the status of a national standard and withdrawing any national standard conflicting with it. An

EN is implemented either by national publication of an identical text or by endorsement (either by publication of an endorsement sheet or by announcement in the member's official publication). It is mandatory to implement an HD at national level at least by announcing publicly the title and number of the HD and by withdrawing any national standard conflicting with it. However, a member is free to maintain or issue a national standard on a subject within the scope of the HD provided that it is equivalent in technical content.

The HD also allows 'national deviations' under special conditions. Without going into details of procedure, there are two categories of deviations: 'A deviation' to allow for a national legal or regulatory obligation and 'B deviation' to allow for a technical problem. These deviations are normally only temporary. Generally speaking the members of CEN/Cenelec prefer an EN to an HD so as to have an identical text in all countries.

To supplement what was said earlier about the voting rules, once an EN or HD is adopted even those countries that voted against it are obliged to implement it. This is a crucial innovation as previously only those countries that had voted in favour had any obligation to apply the European document. When a vote is held on an EN or HD and the first result is negative, a second count is made of the votes of the EEC member countries only and if the results are then positive all the EEC countries are obliged to implement the document, together with those EFTA countries that voted in favour.

It is these voting rules that distinguish the European standards from international standards, for which there are no such obligations.

The ENV may be drawn up as prospective standards for provisional application in technical fields in which the innovation rate is high or when there is an urgent need for guidance and primarily where the safety of persons and property is not in question. This category of European document was created to meet the challenge of information technology (see 3.2) and because of the way in which it is prepared, which puts speed above consensus, the CEN/Cenelec members decided that the obligations should be less strict than for the EN and HD. Members have to make the ENV available at national level promptly in an appropriate form and announce its existence in the same way as for an EN or HD. However existing national standards that conflict with the ENV may be kept in force until the final decision on the conversion of the ENV into an EN or HD is taken. The maximum life of an ENV is 5 years, after which it must be converted into an EN or HD or be withdrawn.

- (f) The CEN/Cenelec standards exist in their own right and are published in the three official languages of the European standardizing body: English, French and German, except for the ENV, the text of which may at first be available in only one of the three languages.

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I. INTRODUCTION

This document has been prepared for ASTM Committee F-25, Shipbuilding Standards, by Subcommittee F25.91, Long-Range Planning. The F-25 Committee has had a series of long-range plans in the past. They have largely focused on the specific efforts required to develop the standards base. There has been a three-year hiatus in issuing the updates to the plan. At the May 1989 meeting in Annapolis, it became clear that a broader Long-Range/Strategic Plan was required to help the Committee focus on common goals and to assist in planning and operation.

A. Purpose of Long-Range/Strategic Plans

The purpose of the Long-Range/Strategic Plan is to serve as a working document and to set goals for the F-25 Shipbuilding Standards Committee over the next decade. The plan reflects our vision of what the committee's support to the industry must be. This Strategic Plan addresses the long-term objectives and strategies; and the short-term goals and action items (in the Business Plan) that must be accomplished to make our vision a reality.

This plan will be reviewed on an annual basis and updated as needed to reflect changing goals from the society and the industry. Upon acceptance by the F-25 Executive Subcommittee, this plan will serve as a guide for main and subcommittee activities over the next seven to ten years. The business plan will deal with actions and completion dates needed to achieve short-term objectives.

B. Terms and Definitions

The nomenclature of strategic plans varies widely from organization to organization. While there is no single, correct terminology, the ASTM F-25 Planning Committee has settled on the following terms and definitions for F-25's Strategic Plan:

Mission - ASTM/Committee F-25 mandate.

Vision - Committee F-25's prediction of the need for standards in the future.

Strategic Objectives - Long-term general outcomes supportive of the mission and vision.

Business Plan - Short-term goals, action items, time lines to goal completion, and responsible individuals.

II. MISSION

A. Mission of ASTM

ASTM is a nonprofit corporation organized for the purpose of developing voluntary consensus standards on characteristics and performance of materials, products, systems, and services and the promotion of related knowledge.

ASTM committees develop standards in virtually every conceivable area of endeavor. F-25, Shipbuilding Standards Committee, was established to address the specific needs of the shipbuilding community.

B. Mission of F-25

The mission of F-25 shall be:

(1) To produce and maintain consensus standards (specifications, test methods, guides, and practices) for the design, construction, and repair of marine systems and equipment. Through the development of a body of National Shipbuilding Standards, the industry will realize improved productivity, improved quality, reduced risk and reduced cost.

(2) To facilitate adoption and implementation of standards by shipyards, design agents, ship operators, manufacturers, Government agencies, and international agencies.

III. GOALS AND OBJECTIVES

A. F-25 Visions of the Future

Our vision of the future is predicated on the belief that a decrease in world tensions will lead to an increased amount of world trade, much of it carried by ship. We foresee the possibility of increased shipbuilding on a worldwide basis. The most probable niche for American shipbuilding is the construction and conversion of unique, high value-added vessels, as opposed to simple bulk carriers.

Internationalism. Standards will be used across national boundaries. Equipment and materials will come from many sources as long as they comply with recognized standards. American suppliers may be able to compete in many more areas if standards use system international (SI) metric units as their primary measurements.

Standards will drive Products/Standardization. Due to the rapid changes in technology, product life cycles are becoming shorter. The customer wants to protect his investment; therefore, a greater emphasis will be placed on products meeting accepted standards. Standards must be developed concurrently with new technology. Standards must be focused on interchangeability and performance, rather than detail design, to allow improved technology to be used.

CAD/CAM. The scope and content of standards will change in the future. As computer-aided manufacturing becomes more available, the information to produce products should become part of the standard.

Shortened Design Cycles. To convert technology advancements into products in a timely manner, the design cycle will be shortened. A body of current standards is required so that new technology can be combined with existing technology in a building block approach.

Electronic Document Distribution and Maintenance. With the increasing availability and capability of on-line computer systems, standards will be located, reviewed, coordinated, and updated electronically.

Quality and Producibility. To support all of the visions of how standards will fit into the world of the future, the standards must be of the highest quality to define high quality, cost effective products. They must also define a product that can be manufactured, installed, used, and supported safely and efficiently.

B. F-25 Committee Goals

ASTM as a whole has defined specific long-term goals for the overall organization. Many of these should be complemented by specific goals of F-25. In support of the ASTM Goals the following seven goals are set forth for the

Shipbuilding Standards Committee.

1. To develop a set of national shipbuilding standards to support both Government and commercial ship construction and repair. (ASTM 1)
2. To develop a set of standards that reflect current and emerging technologies in the marine industry and to keep them up-to-date. (ASTM 3)
3. To develop a committee structure and development practices that are conducive to producing quality standards in a minimum amount of time. (ASTM 2 and 4)
4. To increase the visibility, usability, and credibility of ASTM shipbuilding standards. (ASTM 5)
5. To identify and develop new applications for ASTM shipbuilding standards and the knowledge, skills and abilities of the committee membership. (ASTM 6)
6. To increase the number and diversify the membership of the committee. (ASTM 7)
7. To increase the visibility and utilization of ASTM shipbuilding standards in world markets. (ASTM 8)

C. Membership

Membership conforms to ASTM policies of users, producers, and general interest members. The main committee and technical subcommittees are balanced in accordance with ASTM regulations.

Committee F-25 must be active in recruitment and retention of representatives in all aspects of shipbuilding and ship operation in order to develop and maintain National Shipbuilding Standards that will be used by the industry. In this regard, both private and public shipyard representation must be encouraged, enhanced, and maintained. Increased participation of ship design agents, operators, and manufacturers is also required. Emphasis must be given to more active volunteer standards preparation by individual members and their corporations.

D. Special Publications

In order for Committee F-25 to perform its mission, it may become necessary to publish material to train its members, to gain publicity to attract new participants, or to aid the standards development process. These publications will be maintained and distributed by Committee F-25. However, if they have a more general application, ASTM may be requested to generalize, maintain, and distribute such

documents under its cognizance rather than F-25. One example is the Handbook to Assist in the Navy Document Conversion Program.

E. Symposia

Committee F-25 may sponsor symposia to provide increased knowledge in one or more technical areas. These symposia shall be used to keep members current with the state-of-the-art and are a means of attracting new members. This will generally be coordinated with ASTM committee weeks or major marine industry exhibitions.

F. International Presence

ASTM is a member of the International Standards Organization (ISO) via the American National Standards Institute (ANSI). Current participation has been limited to responding to ballots from ISO.

Two major objectives to improve our involvement in ISO are: to have representatives participate at ISO meetings; and to propose ASTM standards to ISO for international adoption.

IV. MEASURES

A. Membership

Membership drives within individual subcommittees and/or within the main committee shall be encouraged for participation in targeted areas. Annual local/metropolitan area membership drives shall also be encouraged. In addition, membership packages and applications shall be sent periodically to all shipyards, manufacturers, government agencies, design agents, ship operators, etc. A database of all such organizations shall be maintained, updated semi-annually, and published annually.

B. Standards

The number of standards processed annually shall be determined by the following:

- New starts
- Original subcommittee ballots
- Reballoted in subcommittee
- Main committee ballots
- Reballoted in main committee
- Society ballots
- Approved ballots
- Adopted by the Navy

C. Industry Impact

The impact of standards on industry and government shall be determined by the application and benefits of utilization in various user groups such as ship operators, repairers, builders, government, component manufacturers, and international organizations.

D. Other Accomplishments

Accomplishments should include, but not be limited to, such things as handbooks, publications, training materials, symposia, and the like.

V. ORGANIZATION

A. Structure

The principle work of the F-25 Committee is carried out by technical and administrative subcommittees. These subcommittees are formed and dissolved at the direction of the Executive Subcommittee as deemed necessary to execute the charter and bylaws of the F-25 Committee.

The present structure of the Main Committee is as follows:

- F25.01 Coatings/Processes
- F25.02 Insulation/Processes
- F25.03 Outfitting
- F25.04 Hull Structures
- F25.07 General Requirements
- F25.10 Electrical, Electronics and Automation
- F25.11 Machinery
- F25.13 Piping
- F25.80 ISO Standards
- F25.90 Executive
- F25.91 Planning

In the next five years the Committee may add technical committees in accordance with the Regulations Governing ASTM Technical Committees (Green Book) to address such subjects as Fiber Optics, Computer Technology (CAD/CAM), and environmental protection issues.

Technical Subcommittees. The technical subcommittees are tasked to develop standard specifications, test methods, guides and practices which will improve productivity, improve quality, reduce risk, and reduce cost in the shipbuilding and marine industry.

Administrative Subcommittees. The administrative subcommittees consist of the executive subcommittee, the planning subcommittee, and subcommittees established by the executive subcommittee when specific administrative functions cannot be adequately addressed by the two established administrative subcommittees.

Chairmen of Subcommittees. Chairmen of subcommittees are selected by the executive subcommittee from the committee membership and are tasked with the proper operation of the subcommittee and the fulfillment of the subcommittee's scope of effort. The chairman shall focus the subcommittee membership on developing standards that will be of the most benefit to the shipbuilding industry. He actively seeks new projects and finds task group leaders for development of those projects. The chairman shall review proposals for projects and identifies volunteers

to champion those projects. If a volunteer cannot be identified, the chairman may propose that the project be submitted to the SNAME SP-6 Panel for funding.

Each subcommittee's chairman must be the public relations person for ASTM F-25 in the subcommittee's area of expertise. The chairman shall recognize the accomplishments of the members of his subcommittee and communicate with the members' company or organization to encourage standards development and dissemination.

Members of Subcommittees. All members of subcommittees should take an active interest in the development of standards undertaken by the subcommittee. The membership should actively engage their organization in supporting the development, adoption and acceptance of these standards. The balance of members shall be as specified in the Green Book. All subcommittees shall be encouraged to attract expertise in new areas (i.e., fiber optics and CAD/CAM).

B. Customers

Feedback from all customers including standards users, ship designers, government, shipyards, equipment manufacturers and end users shall be encouraged.

C. Interfaces

Other ASTM Committees. Liaison with other ASTM Committees should be encouraged to exchange information and ensure narrative input to standards that may impact the maritime industry. All F-25 Committees and their members shall do so in accordance with the appropriate ASTM business practices.

Marine Industry. Every effort shall be made to interface with the marine industry. Their expertise and opinions/input shall be sought in order to produce shipbuilding standards that more effectively meet their needs.

US Government.

NAVSEA, Naval Sea Systems Command, is represented in ASTM F-25 by the Director, NAVSEA Engineering Standards Subgroup, SEA 55Z. He will be the NAVSEA voting member at the Main Committee level. He coordinates NAVSEA's participation in each Subcommittee by ensuring that the appropriate functional codes are represented and voting. The NAVSEA representative will coordinate activities within NAVSEA for ASTM. ASTM Subcommittee representatives may rely upon the expertise of NAVSEA technical codes in attempting to resolve identifiable problems/issues.

USCG, United States Coast Guard

TBD

MSC, Military Sealift Command, is the Navy's arm for civilian-manned, commercially operated ships which serve the DoD in three broad categories: Strategic Sealift, Naval Fleet Auxiliary Force, and Special Mission. MSC's design and operating concept is commercially based beginning with the design, followed by construction, and ending with life-cycle operation. As such, MSC interfaces with shipyards, ship operators, component manufacturers, design agents, NAVSEA and USCG.

MARAD, Maritime Administration

TBD

Other Standards Bodies.

ISO, International Standards Organization, is a key worldwide standards organization recognized by the EC92 community. ISO is structured with a shipbuilding standards group which further has subcommittees (Technical Advisory Groups, TAGs), such as Machinery and Piping. The ASTM link to the Marine ISO organization is through ANSI, which is the legal US representative to ISO. ASTM F25.80 shall be the Maritime link for the U.S. into ISO.

Proposed ISO standards are to be delivered to the chairman of F25.80 (ISO). These standards should be those which have the most impact on ships and marine equipment produced in the United States. ISO standards must be prepared in the specified format which is translatable from the ASTM format. All measurement units must be in SI "hard" metric.

ANSI, American National Standards Institute, is the U.S. liaison to ISO.

IEEE, SAE - Single relationship to ASTM is in ensuring no standards are duplicated.

SNAME SP-6, Society of Naval Architects and Marine Engineers Ship Production Panel 6. Subcommittee chairmen may furnish recommendations for development of draft standards to SP-6 for inclusion in their program. Committee F-25 should receive draft standards from SP-6 or other panels for promulgation as ASTM standards.

VI. OPERATIONAL GUIDELINES

A. Policies

ASTM F-25 is to be structured and operated within ASTM regulations as set forth in the Regulations Governing ASTM Technical Committees, and within bylaws and guidelines as issued by the F-25 committee to conduct business in good order. F-25 shall operate flexibly within the guidelines to enhance efficiency and productivity at meetings and during standards development. F-25 shall strive to tailor operating policies to reflect and meet emerging maritime trends.

B. Administration

Publicity. In order to increase visibility in and be useful to the shipbuilding industry, efforts shall be focused toward increased advertisement of F-25 activities (ie. semi-annual meetings, individual committee meetings, and major accomplishments). This shall be accomplished through use of the various marine industry publications, including the Maritime Reporter and Marine Log; NAVSEA in-house publications, including the OBSERVER and DECKPLATE; and any other forms of advertisement that might more effectively notify the marine industry community of ASTM Committee F-25 efforts .

Awards. Awards are bestowed on selected committee members and companies deserving of special recognition for their performance in support of ASTM and Committee F-25.

An Awards Committee shall be appointed by the Committee Chairman to coordinate and screen recommendations for awards, prepare nominations for society awards, and make selections for those proposed to receive awards under the cognizance of Committee F-25. Award nominations and selections are subject to the approval of the Chairman of Committee F-25. The Awards Committee shall consist of a Chairman and at least two members, all of whom must be members of Committee F-25.

The John Haas Memorial Award and the Robert Taylor Award for Participating Companies, both unique to F-25, will be considered for presentation annually. Other awards will be those applicable to various ASTM accomplishments and as specified in the 1990 ASTM Directory.

Reporting. Depending on the number of standards produced annually, an announcement shall be made to all marine industry related organizations/ companies listed in the F-25 address database.

C. Standards Development

Prioritization. Setting priorities in a voluntary organization is a difficult task.

There are many sources for identifying needs; the Navy's drive towards the use of commercial standards, the Coast Guard's desire to eliminate CFR requirements, industry's desire to have a common definition for products and processes, and the emergence of new technology and products. These interested parties can raise the priorities on standards by developing draft standards or by setting up task groups to develop the standard.

If a backlog exists within a subcommittee that requires some standards to be delayed while others proceed through the balloting process the subcommittee will have to set the priorities. Some general questions to be asked in setting priorities or whether to develop the standard are:

Is there a stronger user interest/need?

Are there existing standards that could be used in the interim for the product?

Will this standard increase safety or reduce environmental hazards?

Will this standard increase the competitiveness of the American shipbuilding industry?

What is the dollar value of the products represented by the standard?

Is the standard designed to increase the shipbuilding industrial base?

Metrication?

Standards Tracking and Reporting. There is a dedicated information system for tracking and reporting the status of F-25 Committee standards. The system is currently operational on the NAVSEA VAX cluster with toll-free numbers and is a menu driven, multi user application. The system has two broad categories of information, general information available to all members of the committee and restricted information used by NAVSEA to manage internal activities and document flow. Documentation for accessing the system can be obtained by contacting Howard Wildman at NAVSEA (703-602-0490) or Charles Sinche at JJH (703-920-3435). Copies will generally be available at main committee meetings.

The reporting system is only as good as the data in it. Currently, most information for updating comes from subcommittee chairmen and from ASTM ballots and reports. Subcommittee chairmen are encouraged to contact NAVSEA about subcommittee ballots and results, and resolution of negative comments.

At each main committee meeting, subcommittee chairmen will be provided a hard copy report of the documents on his subcommittee and their status.

Productivity Enhancement. There are a number of steps that could be taken to enhance productivity in the standards development process. Automation of the balloting and comment resolution phases of the development process have the greatest potential for speeding the overall process. Based on current announcements in software this capability could be available commercially in the near future. ASTM headquarters has been investigating additional automation activities that they could apply throughout the Society. The F-25 committee could volunteer to be one of the test committees. The other alternative is for the F-25 committee to implement its own system for commenting and resolving those comments.

There are a number of benefits to an on-line balloting and commenting system. Ballot totals can be automatically recorded and analyzed. Comments will

not have to be collated by subcommittee chairmen and forwarded to task group leader for adjudication. The revised document and the comment resolution audit trail will remain with the document in electronic form, available for review by interested parties.

D. Training

Committee Member Training. New members attending F-25 meetings are invited to attend an orientation session which briefly reviews ASTM's origin and the organization's structure and philosophy. The orientation also provides a cursory explanation of the balloting process and the consensus standard development process. During the orientation session, Main and Subcommittee officers provide new members with information on the work and direction of the Shipbuilding Committee.

Though attending a meeting is the best way to gain first hand experience with and knowledge of a committee and its work, new members can also be reached through the mail. A brochure entitled "What is ASTM?" answers those questions most frequently asked by members, both new and experienced. Copies of the ASTM Regulations are available and give the reader the details of the regulations which govern all ASTM technical committees. Finally, a Membership Information Packet (MIP) provides members with a list of the subcommittees and the chairmen responsible for leading the activity.

Officer Training. During September of the odd-numbered years, ASTM headquarters staff conducts an Officers Conference. All committee, subcommittee and task group officers are invited and encouraged to attend. This conference consists of a number of workshops offered over a two-day period. The workshop topics include: balloting, officer duties, handling negative votes, developing a draft document, editing, symposia, long-range planning, Society structure, terminology and precision bias.

Also available to aid officers is the ASTM Technical Committee Officers Handbook. This handbook provides the officer with an explanation of his/her duties and responsibilities as well as a list of support services and materials offered by headquarters.

Miscellaneous. Upon request by the committee or executive subcommittee, the staff manager is available to conduct workshops on a number of topics during meetings. Workshop topics include: balloting, handling negative votes, editing documents, and officer duties.

Special Presentations. Special presentations will be scheduled as needed. Depending upon the topic and potential audience, these presentations may be scheduled for the Main Committee meeting, the Executive Subcommittee meeting, or a separate time period reserved for the presentation during the two-day Committee meeting period. Topics will usually be general in nature so as to be of interest to all Subcommittee Chairmen and/or all F-25 members. Suggested topics include: DoD

Current Policy and/or Changes, Metrication, Conversion of Military Specifications to ASTM, Navy/NAVSEA Practices, and Automation Efforts in Standardization of Shipyard/Manufacturer's Practices.

VII. BUSINESS PLAN

GOAL #1: To develop and execute a work plan for standards to be developed, reviewed and revised.

A. Develop and execute a schedule for new standards in development, future standards for development, Navy standards to be converted and standards for ISO consideration.

1. Prepare form for technical subcommittee chairmen to fill out detailing their respective standards in development, for development, to be converted to non-government and for ISO consideration.

- a. Person responsible: Elaine Fournier
- b. Completion date: 5/91 (completed)

2. Subcommittee chairmen attach completed schedules to meeting minutes, submit to Secretary.

- a. Person responsible: Subcommittee Chairmen
- b. Completion date: Semi-annually during Committee Week

3. Input lists into computer.

- a. Person responsible: Charlie Sinche
- b. Completion date: Semi-annually

4. Review submitted ballot schedules.

- a. Person responsible: Planning Subcommittee
- b. Completion date: Semi-annually

B. Prepare list of ASTM standards which are more than 4 years old to be reviewed.

1. Acquire from ASTM F-25 Staff Manager all standards assigned to each subcommittee with revision due date.

- a. Person responsible: Elaine Fournier
- b. Completion date: 6/91

2. Input into computer.
 - a. Person responsible: Charlie Sinche
 - b. Completion date: 8/91
3. Update computerized list.
 - a. Person responsible: Teresa Cendrowska
 - b. Completion date: Semi-annually following each meeting

GOAL #2: To increase participation and membership in ASTM Committee F-25.

- A. Obtain/prepare mailing list of key personnel from public & private shipyards, Port Engineer Societies, Supships, ship owners, supply activities and planning activities for F-25 Membership Information Packet (MIP) mailing.
 - a. Person responsible: Howard Wildman
 - b. Completion date: 8/91
- B. Obtain/prepare mailing list of equipment manufacturers where conversion work is planned.
 - a. Person responsible: Howard Wildman
 - b. Completion date: 8/91
- C. Obtain/prepare mailing list of equipment manufacturers where ASTM standards are planned.
 - a. Person responsible: Howard Wildman
 - b. Completion date: 8/91
- D. Update address database.
 - a. Person responsible: Howard Wildman
 - b. Completion date: 10/91
- E. Mail F-25 MIP.
 - a. Person responsible: Teresa Cendrowska
 - b. Completion date: 11/91

- F. Prepare letter to SNAME/ASNE local chapter chairmen to encourage involvement of membership in ASTM F-25 (include brochures).
 - a. Person responsible: Howard Wildman
 - b. Completion date: 8/91

- G. Distribute brochure at F-25 symposia, ASE, ASNE, SNAME Meetings and other technical society meetings.
 - a. Person responsible: Whomever mans booths/table
 - b. Completion date: When events are held

- H. Get brochures to members to pass along at meetings.
 - a. Person responsible: Howard Wildman
 - b. Completion date: 11/91

GOAL #3: To increase awareness of ASTM F-25 activities.

- A. Advertise F-25 activities/meetings in Maritime Reporter and Marine Log.
 - a. Person responsible: Teresa Cendrowska
 - b. Completion date: 10/91, 3/92, 10/92 (2 mos. prior to event)

- B. Prepare an F-25 write-up for the "TECH List" section of the publication, "Standards News". Write-up should entail one aspect of what is being done in F-25 at the time.
 - a. Person responsible: Teresa Cendrowska and Subcommittee Chairmen
 - b. Completion date: Quarterly or more frequently if there is something newsworthy

- C. Work with membership to ensure adequate manning for ASNE and SNAME booths.
 - a. Person responsible: Teresa Cendrowska
 - b. Completion date: One month prior to symposiums

- D. Prepare Newsgram of ASTM activities and distribute to mailing list developed by membership .
 - a. Person responsible: Howard Wildman
 - b. Completion date: Quarterly beginning 9/91

- E. Update F-25 member and non-member information packages.
1. Review existing F-25 Brochure and suggest changes to it.
 - a. Person responsible: Howard Wildman
 - b. Completion date: 3/8/91 (completed)
 2. Mail existing brochure with Business Plan draft to Planning Subcommittee members and Executive Subcommittee members requesting review and comments due to Elaine Fournier by April 15.
 - a. Person responsible: Elaine Fournier
 - b. Completion date: 3/15/91 (completed)
 3. Provide status report to Executive Subcommittee and Main Committee.
 - a. Person responsible: Ed Barrett
 - b. Completion date: 5/91 (Committee Week)
 4. Organize and print updated information packet in lieu of brochure.
 - a. Person responsible: Teresa Cendrowska
 - b. Completion date: 11/91
 5. Provide new copies of updated F-25 Information Packet.
 - a. Person responsible: Teresa Cendrowska
 - b. Completion date: 12/91 (Committee Week)

GOAL #4: To conduct mini-symposia, at least once a year, in conjunction with F-25 Main Committee meetings.

- A. Coordinate, with second vice-chairman in charge of programs, mini-symposium on the same day as the SP-6 meeting to optimize attendance at both meetings.
- a. Person responsible: Charlie Sinche
 - b. Completion date: 3/91 (completed)
- B. Develop candidate topics for symposia and mini-symposia.
- a. Person responsible: Planning Committee
 - b. Completion date: Semi-annually (one month prior to each semi-annual Committee Week) beginning 19 April 1991

- C. Determine topic for first mini-symposium and schedule it in conjunction with the December meeting.
 - a. Person responsible: Executive Subcommittee
 - b. Completion date: 5/8/91
- D. Assign a symposium committee to assist second vice chairman in arrangements and obtaining speakers for symposia and mini-symposia.
 - a. Person responsible: Jim Wilkins
 - b. Completion date: 5/8/91
- E. Develop presenter list, prepare announcements, distribute them, and schedule room and time for symposium.
 - a. Person responsible: Symposium Committee
 - b. Completion date: 11/1/91
- F. Attend first semi-annual F-25 mini-symposium.
 - a. Person responsible: Everyone
 - b. Completion date: 12/91
- G. Determine topic for second mini-symposium and follow actions stated above.
 - a. Person responsible: Executive Subcommittee
 - b. Completion date: 12/91 (Committee Week meeting of Executive Subcommittee)

GOAL #5: To increase ASTM F-25 participation in development of International Standards.

- A. Prepare procedures for submittal of candidate standards to ISO.
 - a. Person responsible: Elaine Fournier
 - b. Completion date: 5/91 (completed)
- B. Prepare list of standards for ISO consideration.
 - 1. Prepare form for technical subcommittee chairmen to fill out detailing their respective standards for ISO consideration. (Done in conjunction with Goal #1 (A))
 - a. Person responsible: Elaine Fournier
 - b. Completion date: 5/91 (completed)

2. Subcommittee chairmen submit completed form to F25.80 Chairman.
 - a. Person responsible: Subcommittee Chairmen
 - b. Completion date: Semi-annually during Committee Week
 3. Attach list to meeting minutes.
 - a. Person responsible: F25.80 Chairman
 - b. Completion date: Semi-annually
 4. Input list into computer.
 - a. Person responsible: Charlie Sinche
 - b. Completion date: Semi-annually
- C. Prepare procedures for ASTM endorsement of candidate ISO standards.
- a. Person responsible: Elaine Fournier
 - b. Completion date: 5/91 (completed)

VII. BUSINESS PLAN

GOAL #1: To develop and execute a work plan for standards to be developed, reviewed and revised.

- A. Develop and execute a schedule for new standards in development, future standards for development, Navy standards to be converted and standards for ISO consideration.
 - 1. Prepare form for technical subcommittee chairmen to fill out detailing their respective standards in development, for development, to be converted to non-government and for ISO consideration.
 - a. Person responsible: Elaine Fournier
 - b. Completion date: 5/91 (completed)
 - 2. Subcommittee chairmen attach completed schedules to meeting minutes, submit to Secretary.
 - a. Person responsible: Subcommittee Chairmen
 - b. Completion date: Semi-annually during Committee Week
 - 3. Input lists into computer.
 - a. Person responsible: Howard Wildman
 - b. Completion date: Semi-annually
 - 4. Review submitted ballot schedules.
 - a. Person responsible: Planning Subcommittee
 - b. Completion date: Semi-annually
- B. Prepare list of ASTM standards which are more than 4 years old to be reviewed.
 - 1. Acquire from ASTM F-25 Staff Manager of all standards assigned to each subcommittee with revision due date.
 - a. Person responsible: Teresa Cendrowska
 - b. Completion date: Semi-annually during Committee Week

2. Input into computer.
 - a. Person responsible: Bart Walsh
 - b. Completion date: 5/92 (before May meeting)
3. Update computerized list.
 - a. Person responsible: Bart Walsh
 - b. Completion date: Semi-annually following each meeting

GOAL #2: To increase participation and membership in ASTM Committee F-25.

- A. Obtain/prepare mailing list of key personnel from public & private shipyards, Port Engineer Societies, ship owners, supply activities and planning activities for F-25 Membership Information Packet (MIP) mailing.
 - a. Person responsible: Howard Wildman
 - b. Completion date: 3/92
- B. Obtain/prepare mailing list of equipment manufacturers where conversion work is planned.
 - a. Person responsible: Howard Wildman
 - b. Completion date: 1/92
- C. Obtain/prepare mailing list of equipment manufacturers where ASTM standards are planned.
 - a. Person responsible: Howard Wildman
 - b. Completion date: 1/92
- D. Update address database.
 - a. Person responsible: Howard Wildman
 - b. Completion date: 3/92
- E. Mail F-25 MIP.
 - a. Person responsible: Teresa Cendrowska
 - b. Completion date: 3/92

- F. Prepare letter to SNAME/ASNE local chapter chairmen to encourage involvement of membership in ASTM F-25 (include brochures).
 - a. Person responsible: John Nachtsheim
 - b. Completion date: 3/92
- G. Distribute brochure at F-25 symposia, ASE, ASNE, SNAME, Meetings and other technical meetings.
 - a. Person responsible: Whomever mans booths/table
 - b. Completion date: When events are held
- H. Give MIP to members to pass along at meetings.
 - a. Person responsible: Howard Wildman
 - b. Completion date: 1/92
- I. Prepare presenter F-25 presentation materials.
 - a. Person responsible: Norm Lemley
 - b. completion date: 5/92

GOAL #3: To increase awareness of ASTM F-25 activities.

- A. Advertise F-25 activities/meetings in Maritime Reporter, SNAME, ANSE and Marine Log.
 - a. Person responsible: Teresa Cendrowska
 - b. Completion date: 10/91, 3/92, 10/92 (2 months prior to event)
- B. Prepare an F-25 write-up for the "TECH List" section of the publication, "Standards News". Write-up should entail one aspect of what is being done in F-25 at the time.
 - a. Person responsible: Teresa Cendrowska and Subcommittee Chairmen
 - b. Completion date: Quarterly or more frequently if there is something newsworthy
- C. Work with membership to ensure adequate manning for ANSE and SNAME booths.
 - a. Person responsible: Teresa Cendrowska and Bart Walsh
 - b. Completion date: One month prior to symposiums

- D. Prepare Newsgram of ASTM activities and distribute to mailing list developed by membership.
 - a. Person responsible: Howard Wildman
 - b. Completion date: 5/92

- E. Update F-25 member and non-member information packages.
 - 1. Reviewing existing F-25 Brochure and suggest changes to it.
 - a. Person responsible: Howard Wildman
 - b. Completion date: 3/8/91 (completed)

 - 2. Mail existing brochure with Business Plan draft to Planning Subcommittee members and Executive Subcommittee members requesting review and comments due to Elaine Fournier by April 15.
 - a. Person responsible: Elaine Fournier
 - b. Completion date: 3/15/92 (completed)

 - 3. Provide status report to Executive Subcommittee and Main Committee.
 - a. Person responsible: Ed Barrett
 - b. Completion date: 5/91 (Committee Week completed)

 - 4. Organize and print updated information packet in lieu of brochure.
 - a. Person responsible: Teresa Cendrowska
 - b. Completion date: 11/91 (completed)

 - 5. Provide new copies of updated F-25 Information Packet.
 - a. Person responsible: Teresa Cendrowska
 - b. Completion date: 12/91 (Committee Week completed)

GOAL #4: To conduct mini-symposia, at least once a year, in conjunction with F-25 Main Committee meetings.

- A. Coordinate, with second vice-chairman in charge of programs, mini-symposium on the same day as the SP-6 meeting to optimize attendance at both meetings.
 - a. Person responsible: Charlie Sinche
 - b. Completion date: 3/92

- B. Develop candidate topics for symposia and mini-symposia.
 - a. Person responsible: Planning Committee

- b. Completion date: Semi-annually (one month prior to each semi-annual Committee Week) beginning 19 April 1991
- C. Determine topic for first mini-symposium and schedule it in conjunction with the December meeting.
 - a. Person responsible: Executive Subcommittee
 - b. Completion date: 5/92
- D. Assign a symposium committee to assist second vice chairman in arrangements and obtaining speakers for symposia and mini-symposia.
 - a. Person responsible: Norm Lemley
 - b. Completion date: 5/92
- E. Develop presenter list, prepare announcements, distribute them, and schedule room and time for symposium.
 - a. Person responsible: Symposium Committee
 - b. Completion date: 5/92
- F. Attend first semi-annual F-25 mini-symposium.
 - a. Person responsible: Everyone
 - b. Completion date: 12/92
- G. Determine topic for second mini-symposium and follow actions stated above.
 - a. Person responsible: Executive Subcommittee
 - b. Completion date: 12/92(Committee Week meeting of Executive Subcommittee)

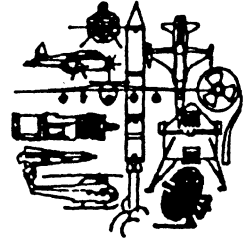
GOAL #5: To increase ASTM F-25 participation in development of International Standards.

- A. Prepare List of standards for ISO consideration.
 - 1. Prepare form for technical subcommittee chairmen to fill out detailing their respective standards for ISO consideration. (Done in conjunction with Goal #1 (A))
 - a. Person responsible: Elaine Fournier
 - b. Completion date: 5/91 (completed)

2. Subcommittee chairmen submit completed form to F25.80 Chairman.
 - a. Person responsible: Subcommittee Chairmen
 - b. Completion date: Semi-annually during Committee Week
 3. Attach list to meeting minutes.
 - a. Person responsible: F25.80 Chairman
 - b. Completion date: Semi-annually
 4. Input list into computer.
 - a. Person responsible: Ed Barrett
 - b. Completion date: Semi-annually
- B. Prepare procedures for ASTM endorsement of candidate ISO standards.
- a. Person responsible: Elaine Fournier
 - b. Completion date: 5/91 (completed)



AEROSPACE TECHNICAL COUNCIL



A Report

on

AEROSPACE STANDARDIZATION MANAGEMENT

by the

Ad Hoc Standardization Management Committee

(This established the AIA/SMPG)

T A B L E O F C O N T E N T S

I	Preface and Summary
II	Introduction
III	Background
IV	Current AIA Activities
V	Trends
VI	Conclusions
VII	Recommendations
VIII	Appendices

P R E F A C E

Standardization is recognized as one of the basic functions of a trade association. The Aerospace Industries Association, as the focal point for the aerospace industry and with its unique ability to serve the national interests, needs to be aware of and respond to the recent strong interest expressed in the area of standardization by the Government and in the form of public laws.

The Department of Commerce publication, "The Directory of National Associations of Businessmen", contains this definition:

"A trade association may be defined as a non-profit voluntary cooperative organization of business competitors, designed to assist its members and its industry in dealing with mutual business problems in such areas as accounting practices, business ethics, market and technical research, standardization, statistics and trade promotion, as well as in relations with the industry's employees, Government agencies and the general public."

In particular, standardization with regard to minimizing variety of piece parts to reduce costs and to increase the effective use of material is of major concern. This report constitutes an attempt by the Aerospace Industries Association (AIA) to develop recommendations to cope with new dynamic standardization trends and requirements to better serve the aerospace industry and the government.

S U M M A R Y

This report, the result of a study by the AIA Ad Hoc Standardization Management Committee, deals with certain problems and recent trends in the area of aerospace standardization. Its purpose is to present recommendations to the Aerospace Technical Council designed to improve standardization management in the aerospace industry.

The committee's recommendations relate to: (1) the need for a formal definition of AIA's responsibility in the area of standardization management, (2) the necessity for an expanded organizational capability within AIA, (3) methods which AIA might assist the Department of Defense in reducing the number of items coming into the military supply system, (4) the AIA-SAE relationship including funding aspects and (5) the need for additional staff support within AIA to meet new requirements in the standardization management area.

At the outset it was concluded that the main thrust of the committee's review should be a review of activity limited to those piece parts, and design criteria for development and use, which are of interest to the aerospace industry.

Even though the AIA has established its status as the authoritative spokesman for the aerospace industry in the area of standardization for piece parts and design criteria largely through the accomplishments of the National Aerospace Standards Committee (NASC), there exists no clear definition of AIA's full responsibility. The committee recommended the following:

"Full responsibility" means that the AIA has the obligation to monitor the total aerospace standardization effort and to (a) determine what needs to be done, (b) take the

appropriate action necessary to get the job done, either in-house or through arrangements with other organizations, i.e., with other trade associations or professional societies, and (c) assure that satisfactory results are obtained.

Full responsibility also means the complete range of aerospace products standardization, both nationally and internationally, and with the Government.

Full responsibility does not mean that the AIA should take over the creation of all aerospace standards.

Based on the current increased emphasis on standardization management by government, national and international bodies, the report reflects the need for a more aggressive and extensive standardization program within AIA. The committee recommended an organizational change which would establish a policy group, reporting to the Technical Specifications Division (TSD), with membership of representatives from each of the following product areas: Air Vehicle, Electronics, Equipment and Propulsion.

With respect to assisting DOD, the TSD and policy group would work toward the establishment of incentives to achieve optimum standardization, improving industry responsiveness to innovation in military standardization in policies and objectives, developing uniform procedures in the area of AIA and SAE standards, recommendations regarding re-use of items in new design, improving methods to avoid duplication of industry and DOD documents, and in the development of techniques to prevent the entry of unnecessary items into the military supply system.

The AIA would increase its activity with USASI with the objective of improving communications and cooperation with non-government standardization activities. It would also work toward the achievement of greater visibility of existing items so they may be used where adequate, in preference to generation of new documentation and, to achieve more effective procedures for generating new standards and selection of preferred parts.

On the international side, the AIA should coordinate and establish an aerospace industry position with respect to items before the International Organization for Standardization, Technical Committee on Aircraft (ISO/TC-20, Aircraft) and coordinate those positions with other organizations as appropriate. The TSD and its policy group could also, in conjunction with the recently organized AIA Office of Air Commerce, contact the Air Transport Association of America (ATA) and develop the best method for representing the aerospace industry in ISO activities. The AIA should also coordinate and establish an aerospace industry position with respect to items before the International Civil Aviation Organization (ICAO) - this would require closer coordination with the FAA which represents the United States in ICAO.

With respect to funding in support of SAE Aerospace Council activities, the committee recommended that the AIA Aerospace Technical Council select one of three approaches contained in this report to be presented to the AIA Board of Governors for their consideration.

Finally, the committee recommended that one additional man should be added to the AIA ATC staff to support the standardization management activities.

I N T R O D U C T I O N

In April 1966 the AIA Aerospace Technical Council agreed that a study should be conducted by knowledgeable standardization specialists from AIA member companies with the purpose of investigating the overall standardization situation and recommending to the Council a broad approach for a more effective alignment of the AIA with respect to government, national and international activities.

Specifically, seven objectives were established to guide the activities of the special ad hoc group. The original seven objectives are included in Appendix I.

In September 1966 the AIA Aerospace Technical Council Executive Committee approved the proposed membership of the ad hoc group and Mr. I. G. Hedrick of Grumman was appointed Chairman.

Ad Hoc Standardization Management Committee Activities

The Committee held five meetings between October 1966 and August 1967, all of which were attended by the total or high majority of members, Sub-task groups held additional meetings in order to develop findings and ideas which led to the conclusions and recommendations contained in this report.

The following is the membership of the Ad Hoc Standardization Management Committee:

<u>Company Representative</u>	<u>Company</u>	<u>Aerospace Technical Council Member</u>
I. G. Hedrick, Chairman	Grumman Aircraft	
J. Coutinho, Alternate Chairman	Engineering Corp.	
J. D'Amico, Secretary		
J. F. Cramer, Sr.	The Boeing Company	G. C. Martin

<u>Company Representative</u>	<u>Company</u>	<u>Aerospace Technical Council Member</u>
G. N. Cole	United Aircraft	E. Martin
G. M. Garcia	General Motors	G. E. Holbrook
G. Gilbrech	Aerojet-General	C. C. Ross
K. W. Truhn	The Bendix Corp.	G. A. Rosselot
M. Frontjes	Lear Siegler	H. Thiry
W. C. Newman	Beech Aircraft	J. N. Lew
P. A. Piper	Martin Marietta	A. C. Hall
E. Wall	McDonnell Douglas	K. Perkins
L. J. Catlin		
S. H. Watson	Radio Corporation of America	D. Shore
J. M. Houston	AIA Staff	

Discussion at the first meeting on October 28, 1966, resulted in agreement with the general scope of the study. It was decided, however, that the seven specific objectives contained in Appendix I should be reduced to the several major elements that promised the most return to the industry from a concentrated effort. Accordingly, the following four tasks were established as follows:

Task a. The development of a revised relationship with SAE to establish methods of better coordination and control, including improved financial support procedures beyond FY1967.

Task b. The development of effective procedures to assist the DOD and Military Departments in improving their standardization programs. Particular attention should be directed to the objectives of DOD Directive 4120.3.

Task c. Increased surveillance of advanced planning of the Military Departments by the NASC Steering Committee to determine high priority areas for standardization activities.

Task d. The development of a position paper clearly defining the AIA relationship with the USA Standards Institute; the development of policies and procedures to assure support of USASI and stronger participation among national and international standardization bodies.

Subsequent discussion resulted in a decision that the Task c. objective should be accomplished within the present operation of the NASC Steering Committee. One of the factors behind this involved the unavailability of classified long-range Military Planning documents. It was thought best to keep abreast of government activity through government liaison representatives who are now members of NASC.

The Committee, early in its efforts, adopted the definition of Standardization contained in the Department of Defense Directive 4120.3:

"...Standardization is the adoption and use (by consensus or decision) of engineering criteria to achieve the objectives of section V. These criteria are applied, as appropriate, in design, development, procurement, production, inspection, supply, maintenance and disposal of equipment and supplies. Such agreements or decisions are normally recorded in authorizations for new developments; in standards, specifications and drawings for design, development, procurement, production and identification; and military supply standards for logistics management."

The Committee further defined a Standard, in concert with the above as:

"A Standard is a document that establishes engineering and technical limitations and application for items, materials, processes, methods, design and engineering practices."

The Committee also concluded that the AIA is organized and is satisfactorily achieving its objectives to accomplish standardization in all areas covered by the definition except for hardware piece parts. Therefore, the Committee adopted the following resolution as the scope of its activity:

"The activity of this Committee will be limited to those piece parts, and design criteria for their development and use, which are of interest to the aerospace industry."

It was noted, with respect to this scope, that the "Guidelines for AIA Committee Activities" contains the following:

"Although it is recognized that the aerospace industry generally produces nonstandard items of unique design, in furtherance of the national defense and industrial preparedness objectives of the Association it may be desirable, from time to time, to undertake product standardization and simplification programs to advance the 'state of the art' in the field of aerospace.

Each program of standardization should seek to accomplish one or more of the following goals: Further buyer product selection and delivery, facilitate product improvement and interchangeability, and avoid confusion or misunderstandings between manufacturers and purchasers."

Each of the Sub-task groups prepared individual reports which were presented and discussed at each of the meetings and were the basis for the majority of this report. In addition, detailed minutes were prepared and distributed after each meeting. The individual Sub-task reports, minutes and other related matter are in the Committee secretary's and AIA files.

B A C K G R O U N D

Government Standardization Activities - DOD

The military services have a long history of standardization in the technical or procurement requirements for equipment, components, materials, processes and design practices. Each service has prepared and continues to maintain specifications and standards which were developed by their own laboratories or agencies. In addition, each service has been directed to avoid duplication and to use, wherever possible, the standards developed by other military, government and industry agencies. This requirement has generated inter-service and inter-agency coordination activities which have evolved into the current Department of Defense Standardization Program. An extensive treatment of that evolution is not the purpose of this report, however, a few highlights may serve to put the present situation in perspective.

The need for inter-service standardization became evident with the extensive use of aircraft during the first World War. The Army-Navy Aeronautical Board established a Working Committee for Standardization in 1919. The Working Committee was responsible for the creation of the AN specifications and standards, some of which are still in active use. The Aeronautical Board was dissolved in 1948. However, by joint action of the Secretaries of the Navy and the Air Force, an Aeronautical Standards Group (ASG) was created to continue the standardization efforts of the Working Committee.

Originally, the ASG worked under the direction of the Aircraft Committee of the Munitions Board and used the coordination procedures contained in the Munitions Board Standards Agency Manual of Policies

and Procedures. When the Department of Defense was established, the Munitions Board Standardization functions were absorbed into the DOD Standardization Program. The ASG has continued to serve the joint interests of the Navy and Air Force on aircraft and missile standards and to provide coordination with the expanding network of DOD and Service agencies and the aerospace industry.

Department of Defense Directive 4120.3, the Defense Standardization Program, was originally issued in 1953 and cancelled the Munitions Board memorandums of 1949 and established a program concerned with standardization of: material, components, equipment, processes and engineering practices approved for use by the Army, Navy and Air Force.

The purposes of this Directive were:

- a. To improve the efficiency and effectiveness of logistical support and operational readiness of the Army, the Navy and the Air Force.
- b. To conserve money, manpower, time, production facilities and natural resources.

The objectives were:

- a. Adoption of the minimum number of sizes, kinds or types of items and services essential to military operations.
- b. Achievement of the optimum degree of interchangeability of the component parts used in these items.
- c. Development of standard terminology, codes and drawing practices to achieve common understanding and clear interpretation of the description of items and practices.
- c. Preparation of engineering and purchase documents to insure the design, purchase and delivery of items

consistent with the scope of Defense Standardization Program.

- e. Providing the military departments with the most reliable equipment possible by the adoption of materiel which has been evaluated in accordance with established Government specifications and standards.

The Directive also established a plan whereby the then Office of Assistant Secretary of Defense (Supply and Logistics) would assign to the military departments, responsibilities for portions of the program. The plan included: methods of preparation and coordination; relationship to the Federal Standardization Program and coordination with civil agencies of the government; and coordination with industry.

The Directive remained in effect for almost eleven years. During this time the following was accomplished:

- The Defense Supply Agency was established.
- Defense Standardization Manual, M200, consolidating previous policies and procedures was issued in January 1960.
- DOD Directive 4120.8, "Use of Standardization Documents issued by Industry", was issued in August 1960.
- DOD Directive 4100.32, "Controlling the Entry of Items into the Military Supply System", was issued in January 1961.
- MIL-STD-143, "Specifications and Standards, Order of Preference for the selection of", was issued in June 1960. This was a consolidation and clarification of previous directives and practices. The specification has been imposed on most military contracts and requires design

activities to select and use specifications and standards which are technically suitable in five orders of priority.

- Group I Coordinated Federal, Military and Industry Specifications and Standards. Limited coordination Military and Industry Specifications and Standards.
- Group II Industry Specifications and Standards, not coordinated but listed for use by a government requiring activity.
- Group III Government Specifications and Standards not previously listed by a requiring activity.
- Group IV Industry Specifications and Standards not previously listed for use by a government requiring activity.
- Group V Company Specifications and Standards. Use of these items shall be discontinued upon the issuance of an interchangeable item of equivalent quality in the higher groups.

- The Office of Technical Data and Standardization Policy (OTDSP) was established reporting to the Assistant Secretary of Defense (Installation and Logistics).

The Standardization Program included many other activities which provided the needed base of specifications and standards for commonly used material, hardware and processes. However, this was also an era of rapidly changing technology, new product developments, with heavy emphasis on systems engineering and improved performance and reliability. The standardization program was unable to keep pace with technology advances. Existing standards became obsolete and were replaced by company standards

or program peculiar documentation. There were massive increases in the number of supply items entering the government inventory and no effective means for screening and feeding back the new developments into the government standards.

As a result of intensive studies by the government and in industry, a major reorganization of the Defense Standardization Program is being accomplished under a revised Directive 4120.3, issued April 23, 1965. Whereas the former emphasis was on standardization as a production and logistics function, new emphasis will be placed on standardization in the design and development stages. The Directive defines the responsibilities of DDR&E, I&L, the Military Departments and the Office of the Director of Technical Data and Standardization Policy for managing the Standardization Program. The Military Departments and Defense Agencies are required to prepare and submit implementing documents to DDR&E and I&L. The latest revision of Directive 4120.3 is dated January 1967.

Defense Standardization Manual, M200, as mentioned above, contains the detail standardization policies, procedures and instructions for the DOD standardization program. It governs the preparation and coordination of military standards and specifications. The original issue of January 1960 has been revised, supplemented and reissued as M200B, April 1966. M200B is presently being revised and will be reissued as Defense Standardization Manual 4120.3-M.

The Manual also contains a list of 72 industry groups which have been furnished clearance in accordance with DOD Instruction 4120.8. This clearance permits the DOD components to adopt industry standardization documents issued by these industry groups. The AIA is one of the industry organizations listed.

Although primarily an internal government document, aerospace contractors make frequent use of the manual with respect to military standards and also as a guide for uniformity in the preparation of company specifications and standards.

Government Standardization Activities - NASA

Standardization of parts and specifications has been less formal in NASA than in the Military Services. The policy has been to use existing parts and specifications whenever technically suitable and to develop specifications on a program or Center basis as needed. However, there is a Parts Steering Committee with a chairman from the NASA Headquarters Office of Reliability and Quality Assurance and representatives from each of the Centers. This committee provides the means for exchanging qualification information, coordinating and encouraging the use of common standards.

The Electronic Research Center (ERC) of NASA has an important function in failure history, materials and component research to provide common standards of performance and environmental testing, standards theory and design criteria to set standards to qualify parts. ERC is expected to influence standardization and qualification by the performance of needed research.

Government Standardization Activities - NBS

The National Bureau of Standards (NBS) was established in 1901 as a part of the Department of Commerce, with a basic function of developing and maintaining a system of National Standards of measurement. Other functions included determination of physical constants and properties of

matter, developing test procedures and performing tests for the Government, and providing advisory service and aid to other agencies on scientific and technical matters.

The measurement standards mission has remained fundamental to the NBS program from its inception, however, subsequent action and legislation have resulted in additional responsibilities. Typical of these are the establishment of the Clearinghouse for Federal Scientific and Technical Information and the National Standard Reference Data System.

NBS is currently organized into three basic Institutes as follows:

Institute for Basic Standards

Institute for Materials Research

Institute for Applied Technology

Although all these functions concern standards of one type or another, the Office of Engineering Standards in the Institute for Applied Technology provides for the establishment of Commodity Standards (commercial products), Mandatory Standards (established by law) and maintenance of a Standards Communication Center.

New Commodity Standards are voluntary trade standards for manufactured products. These include standards for plywood, chain-link fencing, window units, medicine cabinets and other similar products.

Mandatory Standards are those written into law by Congress. These include standards for flammable fabrics, brake fluids, refrigerator doors, safety belts and automobile safety items.

NBS staff participates heavily in national and international standardization bodies such as ASTM, USASI and ISO.

National Standardization Activities - AIA

Aerospace Industries Association standardization activity dates back to 1941 when various assignments and agreements were made between the Office of Production Management (OPM) and industry groups. The OPM requested that AIA, through the National Aircraft Standards Committee, assume the responsibility for airframe structures including standard parts and systems and installation such as hydraulic systems, electrical systems, power plant installations, etc.

At that time only four permanent committees existed in the AIA's Technical Service; the Aircraft Technical Committee (ATC), the Engine Technical Committee (ETC), the Propeller Technical Committee (PTC) and NASC which was a subcommittee of the ATC. Government specifications of interest to these industry segments were coordinated through their respective committees. The actual coordinating task in the aircraft segment was normally assigned to NASC as a convenience for a central handling source both in the companies and in AIA.

The establishment and maintenance of the National Aerospace Standards series of documents also began that year and has remained a major responsibility of the NASC. Many of these NAS documents have received Group II status through listing in ANA Bulletin 147. A few enjoy Group I status through coordination and listing in the DOD Index of Specifications and Standards (DODISS).

Later years saw the addition of more committees to the AIA Technical Service. Civil Airworthiness Regulations were handled by the Airworthiness Requirements Committee (ARC). Other committees covering accessory equipment, electronic systems, manufacturing methods and quality control were added.

The AIA Councils and Committees that have evolved provide the industry and its customers with a mechanism whereby an industry-wide consensus can be established on standardization items of interest, and member companies and customers may present standardization proposals for consideration.

The NAS series is used to document standards developed within AIA by any of its councils and committees. More than 1100 NAS documents have been issued in the series with approximately 760 of these still active. These NAS documents have been developed by the following committees within the AIA:

Airworthiness	10
Electronic Systems	29
Manufacturing	110
Materials and Structures	17
National Aerospace Standards	941
Quality Control	<u>16</u>
Total	1123

Currently the maintenance of all NAS documents, except the ones in the Manufacturing Committee area, is the responsibility of the NASC. This responsibility includes format, indexing, printing, distribution and promulgation of the NAS series of documents.

With regard to the development of NAS's, the basic policy has been to prepare NAS standards only when there is no government documentation covering the item. Further, modification or updating of government standards is done by requesting the government to revise their existing standard; not through the issuance of an NAS.

National Standardization Activities - SAE

The Society of Automotive Engineers (SAE) standardization activities in the aeronautical field date back to 1917. However, its modern era began in 1939 with the formation of the Aircraft Materials Division. Additional emphasis on this activity came in 1941 when the Office of Production Management requested that the SAE assume the responsibility for providing an industry series of material specifications for the entire aeronautical field and standards covering aircraft engines, propellers and part accessories.

The Aerospace Material Specifications (AMS) were given additional recognition in 1947 when, as a result of a conference between AIA and the military services, the engine manufacturers were granted the right to use these documents in preference to military documents.

At the same time, SAE formed an Engine and Propeller Standard Utility Parts Committee to develop standards in this field not covered by military standards. The standards developed by this Committee have been primarily issued as military standards.

The current aerospace standardization activities of the SAE are managed by an Aerospace Council and its five Divisions (Aerospace General Projects, Aerospace Equipment, Aerospace Propulsion and Aerospace Part Standards) which oversee the activities of approximately 110 committees and subcommittees.

National Standardization Activities - EIA

The Electronic Industries Association (EIA) was founded in 1924 as a manufacturers' organization. It was formerly known as Radio Manufacturers' Association (1950), Radio-Television Manufacturers'

Association (1953) and Radio-Electronics-Television Manufacturers' Association. It consists of 330 members who include manufacturers of radio, television, phonograph, radar and electronic equipment and parts.

The present organization has an engineering department composed of a group of committees, the engineering panels and the Joint Electronic Devices Engineering Council. A major portion of the engineering department activity takes place in the engineering panels. These include consumer products, components, micro-electronics, industrial electronics and government electronics.

The primary thrust of the EIA standardization activities is to provide a long range program which will result in a comprehensive compendium of EIA engineering literature, general standards and Registration Formats, and provide a national focal point for voluntary formal registration of electronic components by producers of these products.

National Standardization Activities - USASI

The United States of America Standards Institute (USASI) is a privately financed federation of national trade associations, professional societies, manufacturing concerns and consumer organizations organized to coordinate on a national level, the voluntary standardization efforts of the nation.

USASI had its beginning in 1918, when five leading engineering societies formed the American Engineering Standards Committee. In 1928 the Committee was reorganized into the American Standards Association. ASA was incorporated under the laws of the state of New York in 1948. At this time, as a result of a Department of Justice ruling, government

participation was changed from an active role to one of liaison or observer. In 1966 as a result of the Department of Commerce Report of the Panel on Engineering and Commodity Standards of the Commerce Technical Advisory Board ("La Que Report"), ASA again reorganized into the United States of America Standards Institute, with an intended broader membership base of company members.

The principal standardization activity in USASI takes place under the auspices of the Member Body Council (formerly the Standards Council), its 17 Standards Boards and numerous USA Standards Committees. USA Standards result from existing organizational standards (SAE, ASTM, etc.) proposed as national standards, or are developed by a USA Standards Committee. These are then reviewed by a Standards Board and the Member Body Council, who determine that a national consensus exists.

Other National Standardization Activities

The La Que Report identified some 300 standards writing organizations in the United States which have developed in excess of 13,000 standards. As shown in Figure 1 (which was used in the La Que Report), more than half of these originate in just four organizations: ASTM, SAE, AIA and ASA (USASI). As noted, the Defense Standardization Manual, M200B, lists 72 industry groups whose standards documents have clearance for adoption by the DOD components.

A review of these two lists indicates that only a small number of these organizations have significant impact on aerospace standardization. However, those that do are the producers of the largest numbers of standards, and include the four largest groups of standards previously noted.

Origins of U.S. industrial standards . . .

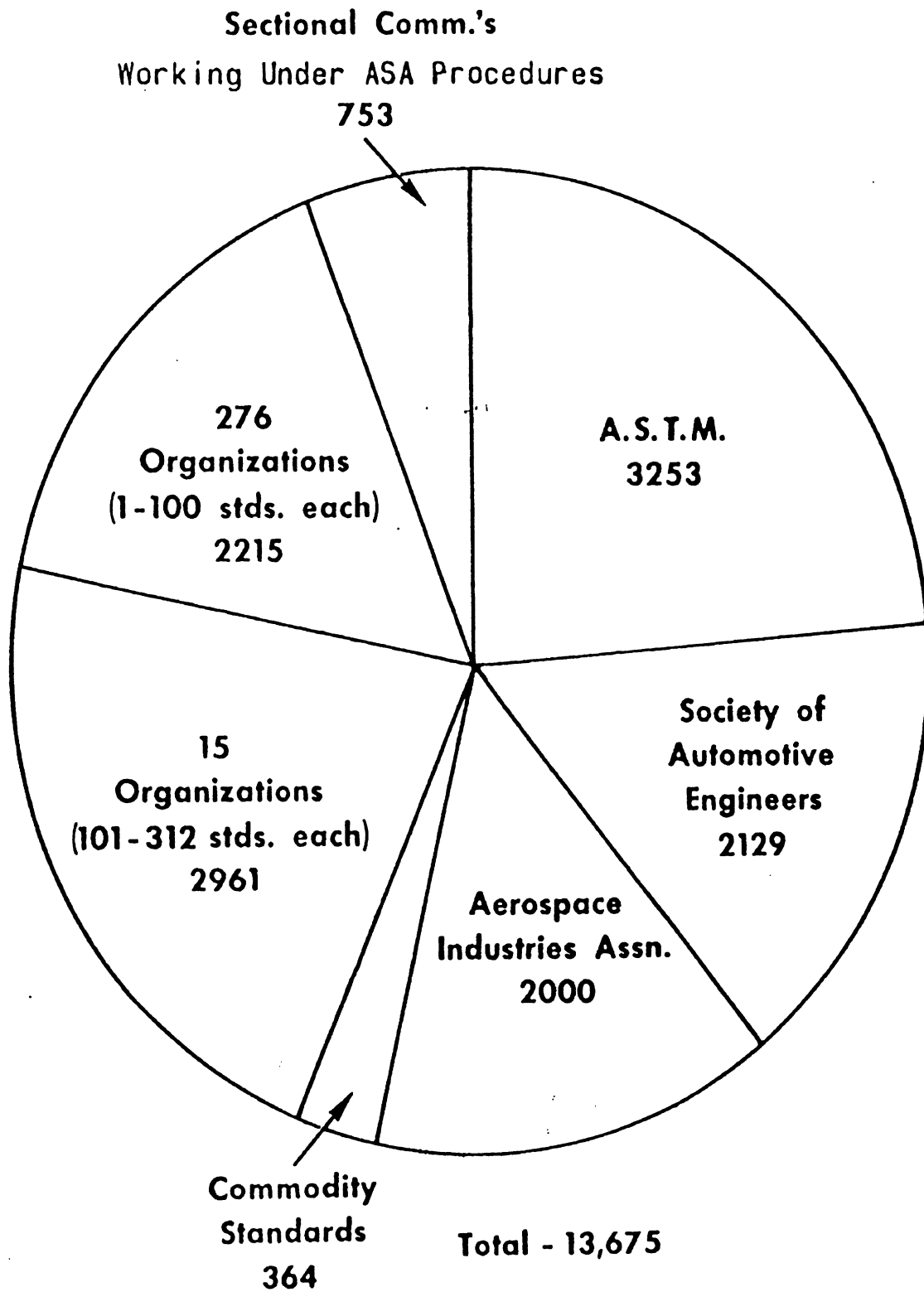


Figure 1

The activities of the AIA, SAE, EIA and USASI have been discussed earlier in this report. The remaining one of principle interest is the American Society for Testing and Materials (ASTM), with upwards of 3,000 standards principally in the area of materials test procedures and materials specifications. The test procedures are used extensively in the aerospace industry and many are specified for use by government and industry documents. The materials specifications of ASTM are oriented generally towards the construction industry. However, there is a possibility that the ASTM may increase its activities in the aerospace materials area.

Other organizations are of limited interest to the aerospace industry because of their small number of standards documents and their limited scope of interest. A partial listing of these organizations include:

- ASME - American Society of Mechanical Engineers
- AWS - American Welding Society
- IEEE - Institute of Electrical and Electronics Engineers
- RWMA - Resistance Welder Manufacturers Association

International Standardization Activities - ISO

The International Federation of the National Standardizing Association (ISA), comprised of the National Standardizing Associations of about 20 countries, was established in 1926. The ISA laid the foundations for international cooperation in the field of standardization, and made a great effort to further the unification of its members and national standards.

In 1944, the United Nations Standards Coordinating Committee (UNSCC), comprising the national organizations of 18 allied countries, succeeded ISA with a view to coordinating the activities of its members national industries.

In 1946, the UNSCC established the International Organization for Standardization (ISO). The objective of ISO is to promote the development of standards in the world with a view to facilitating international exchange of goods and services and to developing mutual cooperation.

The ISO members are the National bodies most representative of standardization (one from each country) who have agreed to abide by the Organization's Constitution and Rules of Procedure.

Some years ago, there was organized under ISO procedure a Technical Committee on Aircraft, ISO/TC-20. A few years ago, USASI, on the advice of United States industry, requested participating status in the committee. In December 1964, the SAE Aerospace Council was designated as the United States National Committee for coordination with the ISO/TC-20.

The work of other ISO Technical Committees is being evaluated by the United States National Committee to determine if the United States aerospace interests are adequately represented.

International Standardization Activities - ICAO

The International Civil Aviation Organization (ICAO) was formally instituted as a permanent organization of the United States in April 1947. This organization was created by the Convention on International Civil Aviation at Chicago in December 1944. United States participation was formally recognized and acknowledged by President Truman on August

6, 1946.

Membership on ICAO is presently held by 112 countries whose representatives form an Assembly. From this Assembly, 27 members are chosen as a Council to act for and in behalf of the organization between sessions of the Assembly. The organization carries on specific tasks through specialized committees including an Air Navigation Commission, a Committee on Joint Support of Air Navigation Services, and Air Transport Committee, a Legal Committee, as well as technical divisions, a secretariat, and regional air navigation meetings. The President of the Council, elected for a period of three years, acts as an international civil servant, in a similar manner as does the Secretary General of the United Nations. The Secretariat for ICAO is located in Montreal, Quebec, Canada.

The International Civil Aviation Organization was organized for the purpose of developing international air navigation practices, the orderly growth of international civil aviation, and the prevention of economic injustices in the international air transport field. It also encourages the design and operation of aircraft for peaceful purposes. From this it should be noted that its interests cover every phase of aviation from the design of the airplane, to navigation, to environment, to legal and economic problems, to airports and passengers. Because of its broad purposes, every member country has an opportunity to present to the organization its problems related to the civil aviation field, no matter in what area they fall, for solution and agreement on an international level.

Problems presented to the ICAO for solution cover personnel licensing, airports, navigation aids, meteorological information, and rules of the air on an international basis. The Organization maintains

current statistics on aviation and studies air transport matters in addition to recommending and promoting agreements in the movement of air passengers and freight across international boundaries.

The North Atlantic Ocean Stations Agreement, covering a network of ocean weather observation ships, is administered by ICAO. These ships furnish to aircraft, in addition to weather information, such services as rescue aid, communication services, etc. The Organization also participates in programs sponsored by the United Nations to train personnel in developing countries by sending aviation missions, and operates training centers under the United Nations Development Program in more advanced countries.

A representative from the State Department represents the United States on the ICAO Council. However, the FAA, through an inter-agency coordination group, develops positions presented by the United States.

International Standardization Activities - ABC - Industry

In 1943, the Combined Production and Resources Board initiated a program for the unification of the engineering standards of Canada, United Kingdom, and the United States of America. The American-British-Canadian (ABC) Unification of Engineering Standards is a cooperative industry program of the three countries.

The purpose of America-British-Canadian Unification of Engineering Standards is to further the economic and military strength of the United States, Great Britain and Canada, and is concerned with joint interest to military services and industry.

The objective of ABC is to unify the engineering standards and procedures of the United States, the United Kingdom and Canada. This

means that the selected engineering practices of one country are in common with, or clearly understood by, the other two; so that manufacturers in the three countries, in receipt of engineering data, shall be able to interpret and utilize the data with a minimum of inconvenience or delay. ABC seeks neither to produce ABC Standards nor to compete with established national and international standardization agencies, but ABC consultation will frequently assist progress in such standardization agencies.

Up to 1952, American participation was directed largely by Governmental agencies assisted by industry administration. Following a meeting in 1952, the American Standards Association (now USASI) has been used as the coordinating organization for the United States with the British Standards Institution and the Canadian Standards Association. Leadership in the United States for participation planning, conference by conference, has been centered in Sectional Committee B1, Screw Threads, under the sponsorship of ASME and SAE, with the USASI staff assisting. Sectional committees on other subjects have been invited to appoint delegates to meetings, develop American points of view, and arrange for continuity of work between meetings to move unification as rapidly as possible.

Representatives from the military, technical societies and industry who had been active participants in past conferences were invited to meet on September 24, 1963, to discuss plans for future American participation. After a review of the history of the ABC program and its objectives, the meeting voted to request the Standards Council of ASA (now USASI) to approve the creation of an American ABC steering committee, the United States National Committee for American-British-Canadian Unification of Engineering Standards.

The USNC-ABC acts as an advisory group to the USASI Standards Council on all questions involving American-British-Canadian standardization matters. In addition, it also appoints the United States members to the Joint Steering Committee of the American-British-Canadian Unification of Engineering Standards.

International Standardization Activities - ABC - Military

The Military Services participate in ABC standardization activities through the Air Standardization Coordination Committee (ASCC) Working Party 17. The ASCC is composed of Military people from the ABC countries. Recently Australia and New Zealand have become members of the ASCC. This group has established and released air standards that have a direct effect on the U. S. aerospace industry. At present these standards are being referenced on Military specifications and standards.

CURRENT AIA ACTIVITIES

National Aerospace Standards

The current AIA activity in the development and maintenance of the NAS series is centered in two committees, the NASC and the Manufacturing Committee.

NASC has 52 active projects and surveys covering development of new standards on piece part hardware, and revision of existing NAS documents to bring them current. New standards are being developed for high strength steel bolts, blind rivets, electrical connectors and other aerospace hardware items.

NAS standards are developed primarily in areas where government standards are non-existent or inadequate for current requirements. In one area, that of mechanically locked spindle blind rivets, NASC has been assigned full responsibility by the Department of Defense for the necessary standards documentation.

The Manufacturing Committee has a continuing program of developing and updating standards on machine tools and packaging standards.

Interface with Government

Following the concept of the reorganization of 1965, the AIA Technical Committee activity has been oriented primarily to the coordination and review of government documents that affect the aerospace industry. Each committee reviews and prepares recommendations on documentations that fall within its assigned scope. Examples of AIA ATCouncil Committee activity on standardization documents include:

- Structural design criteria and material specifications - MSC
- Uniformity program on basic electronic system requirements - ESC
- Basic specifications on turbine and rocket engines - APC
- RPC
- Hardware and miscellaneous equipment standards specifications - NASC

Meetings with government representatives are arranged as a follow-up to the submitted industry recommendations for discussion and resolution of industry positions.

In 1959 the Department of Defense established a policy whereby the Services designated representatives to serve as liaison members to the NASC. Currently there are 18 representatives from the Services and NASA serving in this capacity with the NASC. These liaison members attend meetings, participate in discussions and perform specific functions as outlined in the NASC Handbook.

Mr. I. G. Hedrick, Chairman of this Committee, met with Colonel O. C. Griffith, DOD Director of Technical Data and Standardization Policy in April 1967 and discussed the major standardization problems of the Department of Defense. As a direct result of this meeting, on 4 May 1967 the Deputy Director, DDR&E and the Assistant Secretary of Defense (I&L), forwarded to the President of AIA, a letter summarizing key topics for possible study by the committee which is contained in Appendix II.

The AIA has cooperated with the National Bureau of Standards in a number of areas. NASC and APC representatives are participating in an NBS project to revise Handbook 28 on Screw Threads. AIA's Traffic Committee is providing funds and manpower in a research project on shock mitigation in connection with the transport of large

booster vehicles over highways. Advice is provided to NBS on needs and requirements of the industry relative to calibration services through the AIA Quality Assurance Committee. Other AIA committees have conducted surveys and provided information to NBS on Standard Reference Materials and the National Standard Reference Data Program.

Interface with SAE

In the covering letter of their 1966 report on their Cooperative Engineering Program, the SAE noted the distinction between the purposes of a trade association and a professional society as follows in relating SAE and AIA activities:

"AIA is the trade association and spokesman of the aerospace manufacturing industry; as such it is responsible for establishing policies and formal industry positions and presenting them to Government agencies and others on all matters affecting the aerospace industry, including standards and specifications. SAE is a professional engineering society which generates technical standards and reports in the field of transportation vehicles for voluntary acceptance by various industry and Government agencies. Thus SAE does not represent the aerospace industry, but rather the collective technical viewpoint of its individual engineering members."

The AIA Aerospace Technical Council currently maintains liaison with the SAE through three groups:

ATCouncil Ad Hoc AIA/SAE Liaison Committee (annual SAE budget review)

Civil Aircraft Standards Management Group (CASMG)
of the Airworthiness Requirements Division (ARD)

Joint Air-Breathing Propulsion Committee and Rocket
Propulsion Committee Project Group

The AIA/SAE Liaison Committee, which is comprised of three ATCouncil members, receives, reviews and makes recommendations to the ATCouncil regarding the yearly SAE budget request for AIA support to cover staff expenses associated with the SAE Aerospace Council activities. The Ad Hoc Committee considers the reports of the other two groups described below in making their review. The ATCouncil's recommendation is submitted for approval to the AIA Board of Governors.

The Civil Aircraft Standards Management Group is primarily responsible for providing advice to the SAE Committees regarding the need for standards to be developed. The CASMG also reviewed SAE's Civil Aircraft Standard development and has recommended that SAE discontinue its FAA oriented document development in favor of industry-oriented document development. This recommendation has been accepted by the SAE. The CASMG plans to indicate to the SAE the areas in which their development of industry standards should be focused.

The Joint Air-Breathing Propulsion Committee and Rocket Propulsion Committee Project Group are responsible for providing guidance to the operations and activities of SAE Committees E-21, Design and General Standards for Aerospace Propulsion Systems, AE-1 (a Subcommittee of E-21), Engine Accessory Installation, and E-25, Engine and Propeller Standard Utility Parts. The propulsion industry member segment of the AIA is well satisfied with the standards activities of these three SAE Committees.

With respect to funding of SAE staff support, the AIA Board of Governors, in a resolution adopted in 1945, established as a broad

general principle that AIA technical committees should control and coordinate aircraft industry participation in cooperative technical activities appropriate to their respective fields. With reference to aeronautical standards, the technical committees should have complete discretion as to the work being done within AIA or through professional societies. The Board also decided that the direct costs of formulating these standards should be financed by participating companies entirely apart from their AIA dues.

In 1965 the AIA Aerospace Technical Council recommended and the Board of Governors agreed that the 1966 solicitation for SAE financial support would be made by the AIA from all AIA member companies. The procedure for payment was also changed to where the AIA collected all member company contributions and forwarded them to SAE.

Several problems which could seriously inhibit the development of a truly effective AIA standardization program still exist with regard to the current funding arrangements with SAE.

Interface with EIA

AIA and EIA have maintained a liaison interface since 1955 to prevent wasteful duplication of effort. Current efforts in Electronic Design (Uniformity Program) and Electromagnetic Compatibility have combined the Government-AIA-EIA efforts into a single productive program. Efforts are currently underway to realize similar coordination in Semiconductor and Microelectronics policies and General Standards.

AIA and EIA have also been major contributors to a number of CODSIA standardization cases in the areas of engineering drawings, configuration management, data management and other government management systems.

Interface with USASI

AIA currently holds membership on the USASI Member Body Council, Mechanical Standards Board and various Standards Committees covering screw threads, fasteners, bearings, small tools and other mechanical areas.

To date, NAS Standards have not been proposed as USA Standards because they are unique to the aerospace industry and are generally not applicable to broad commercial usage. The benefit to AIA of promulgating its standards to USA Standards is not commensurate at this time with the effort and time requirements involved.

AIA's participation in USASI dates back to 1946 when NASC became an ASA member.

Interface with Other National Organizations

The AIA does not have an interface with other National standardization organizations such as ASTM, ASME and others discussed earlier in this report. However, many individual AIA member companies support the activities of these other organizations and the standards developed by these organizations are used throughout the aerospace industry.

Interface with ISO

The AIA does not currently have an interface with ISO. However, several individuals of AIA member companies are actively participating in the United States National Committee for ISO/TC-20 which was discussed earlier in this report.

Interface with ICAO

The AIA, through the ATCouncil Airworthiness Requirements Division and its committees, does review and present an aerospace industry position to the FAA, when requested by the FAA, on items before ICAO. Since countries are represented on ICAO by their governments, direct industry participation in ICAO would not be appropriate.

Interface with ABC - Industry

In 1964 two members of the NASC were assigned as representatives to the U. S. National Committee for the ABC (industry) organization. However, as previously noted, USASI represented the United States in this activity.

Interface with ABC - Military

The Air Standardization Coordination Committee work is carried out through twenty Working Parties. Aeronautical Standards Parts are covered by Working Party 17.

The documents resulting from these efforts are published as American-British-Canadian (ABC) Air Standardization Agreements. The AIA, through the NASC and Engine Committees, participated in the early work of WP-17, from 1951 to 1962, through industry coordination of the draft ABC Air Standards. These standards covered areas of ground servicing fittings and threaded fasteners.

The military services have not seen a need to provide industry with copies of ABC agreements as they are implemented through preparation or revision of military specifications and standard drawings. Present

military policy has also eliminated industry coordination of draft

ABC Air Standards.

Report on 1991 NSRP Long Range Planning Meeting

The Executive Control Board, panel chairmen, and program managers of the National Shipbuilding Research Program met October 9-10, 1991 to evaluate the progress of the NSRP since the last long range planning meeting (12/90), and to synthesize new goals and objectives for the NSRP. First, the mission of the NSRP was reaffirmed: "To assist the U.S. Shipbuilding and Repair Industry in achieving and maintaining global competitiveness with respect to quality, time, cost, and customer satisfaction." What follows are the five year goals of the program, along with the supporting detailed objectives.

Goal #1: Reduce the overall design, acquisition, construction and repair process times.

Objectives:

- A. Reduce amount of time of shipbuilding construction spent on the building ways and outfitting pier by 30%.
- B. Develop a library of reusable standard design modules for a range of ship machine plants, structure and accommodation.
- C. Continue efforts to get U.S. regulators' body approval of foreign standards.

Goal #2: Reduce cost to design, build and repair ships.

Objectives:

High Priority

- A. Reduce shipyard manhours by 20%.
Examples of action items:
 - design and construction standards,
 - engineering quality,
 - design improvement (pre- and post-contract award),
 - procurement,
 - production (concentrate on ways & piers),
 - government regulations (EPAS, OSHA, etc.).

- B. Reduce material cost by 10%

Action area examples:

- material standards,
- USCG approval of international rules and standards (equivalency program),
- government regulations affecting material,
- new materials (plastic pipe etc.), and
- central (bulk) procurement.

Lower Priority

- C. Reduce indirect costs (tbd)

Examples of action areas:

- redundant reports, processes and procedures,
- environmental regulations, and
- inspection costs.

- D. Reduce time dependent costs - this is partially a by product of Goal 1 - examples:

- depreciation,
- utilities, and
- services (crane ops, security, etc.).

Goal #3: Promote a commitment to quality and customer satisfaction through people and processes.

Objectives:

- A. Develop measures of performance in quality/customer satisfaction.
- B. Provide feedback to industry on quality/customer satisfaction performance.
- C. Provide information on programs available to achieve quality/customer satisfaction.
- D. Sponsor industry seminar to improve quality through people and processes.
- E. Disseminate information on successful program/initiatives.
- F. Improve the quality of working life in shipyards.

Goal #4: Obtain a 3% share of the international shipbuilding market.

Objectives:

- A. Develop and maintain information on international customer needs and on competitive benchmarks to identify strategic opportunities.
- B. Actively support the capability to build to international standards and specifications.

Goal #5: Become the nationally recognized forum to advance shipbuilding and ship repair technology.

Objectives:

- A. Increase membership to include all principal shipbuilding and ship repair yards and regulatory bodies.
- B. Increase funding to \$5 million per year within two years.
- C. Improve mechanisms for marketing, disseminating and implementing NSRP product results.
- D. Increase the number of NSRP sponsored workshops and other activities within shipyards.
- E. Senior shipyard management solicits NSRP assistance.
- F. ECB action.

