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Final Report

Computerized Compendium Of Standards

NSRP 0361

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16. Abstract The objective of this project was to develop a compendium of standards (international, national, military, and regulatory) that have relevance to the U.S. shipbuilding and repair industry. The intended benefits are 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.			
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**COMPUTERIZED COMPENDIUM OF STANDARDS
TABLE OF CONTENTS**

Report Documentation Page.....i

Table Of Contents.....ii

I. Foreword 1

II. Introduction.....2

III. Problem Definition.....4

IV. Technical Approach.....5

V. Information Handling Service (IHS)7

VI. Final Results8

VII. Conclusions and Recommendations.....9

VIII. References 10

Appendixes

A. Example of IHS File Output A-1

B. List of Compendium Organizations..... B-1

C. Compendium User's Manual..... C-1

 I. Introduction..... C-2

 II. How to Access the Data Base Disk..... C-6

 III. Using the Data Base to Locate Information C-8

 IV. Printing Reports.....C-12

 V. AdministrativeC-15

I. FOREWORD

This report is a product of a program directed by the National Shipbuilding Research Program (NSRP) and the Ship Production Committee (SPC) of the Society of Naval Architects and Marine Engineers (SNAME). This particular research project was sponsored by the Maritime Administration (MARAD) of the United States Department of Transportation (DOT). Peterson Builders Incorporated (PBI) was the prime contractor; University of Michigan Transportation Research Institute (UMTRI) worked under a Subcontract, purchase order #1009-0006.

Under the SPC Panel SP-6 proposal, the technical objective of this project was to develop a compendium of standards (international, national, military and regulatory) 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.

The project was performed at the UMTRI by Albert W. Horsmon, Jr. and Kurt W. Hagemester, assisted by student Sean Callan. Howard M. Bunch was project director.

II. INTRODUCTION

Standards are key elements in the efficient design, construction, and repair of ships and vessels in all shipyards. As a result, there is a continuous need by many designers, engineers, managers, and other people associated with marine work to reference standards from a wide range of regulatory bodies, government agencies, technical societies, and private industry groups. Traditional methods of locating standards center around referencing many documents and books of standards issued by diverse individual organizations. This can not be not only time consuming, but may result in either not finding a standard or developing a new standard where a suitable one may already exist.

As a result, Panel SP-6 of the Ship Production Committee of SNAME has identified the need for an up-to-date computerized compendium of standards pertinent to shipbuilding and ship repair. The development of the Computerized Compendium of Standards was contracted for under SP-6 Project P-67. The purpose of this report is to describe the final Compendium data-base and the process used in its development.

Section III describes the previous standards-compendium project, some of its limitations, new requirements for a standards compendium based on industry need, and the goals of this project.

Section IV explains the four main tasks of this project. The first task was to examine the previous standards compendium and decide how much of it to use as a starting point. Second, a new data-base structure was developed and incorporated into a data-base on a personal computer. Third, new sources for marine standards were researched and a new method to incorporate them into the computer data-base was developed. Finally, data copies of the Compendium and User's Manual were produced to make transfer of the data-base to the industry as efficient as possible.

Section V describes the Information Handling Service (IHS) CD-ROM-based standards library and how it was used to gather much of the updated standards information finally incorporated into the Compendium.

Section VI summarizes the final results of the project including some size parameters of the final data-base, which information is included, which information is not included, uses for the data-base, and details of some of the major standards types included (i.e., military, ABS, Coast Guard, international).

Section VII presents some conclusions of the project with corresponding recommendations of actions to be taken in the future.

Finally, the References and Appendix contain supporting information for this report, including a User's Manual.

III. PROBLEM DEFINITION

The most recent development of a standards compendium was completed in September 1979 under an NSRP Project titled "A Compendium of Shipbuilding Standards", NSRP 0088, compiled by Corporate Tech Planning for Bath Iron Works under a MARAD contract. The resultant data-base was in the form of a hard-copy paper listing of 2,580 entries from mainly domestic regulatory agencies. At that time, the data-base was issued to the marine industry, only as hard copy, as a reference guide with no provision for ongoing maintenance.

The limitations of the 1979 project relative to today's needs were recognized by SP-6 in approving this project. These limitations are:

1. Since 1979, many new standards have been developed, many existing standards have been revised, and some standards have been deleted. Since the original compendium was not revised, it has become outdated and incomplete.
2. The cumbersome form of a hard copy listing makes finding a given standard difficult. With the availability of powerful personal computers and highly flexible data-base software, search times can be greatly reduced with more thorough results.
3. There was no ongoing maintenance requirement defined that provided for input from users into the data-base content or periodic updates based on evolving industry standards.

Therefore, in addition to updating the listing of standards to reflect all of the changes since 1979, a major goal of this project was to develop a format for the compendium, which would be easily distributed to users, flexible in manipulating information and searching, and easily maintainable. Also, due to the increased need to reference international standards, the Compendium needed to be broadened to include some of the major foreign standards bodies.

The main objective of this project was to arrange all existing standards applicable to U.S. shipbuilding and ship repair into an easily usable computerized data-base that can be updated efficiently on a regular basis.

IV. TECHNICAL APPROACH

The approach used to complete the project consisted of four main tasks. These tasks were not necessarily sequential in completion and actually had to be refined as aspects of the other parts were developed.

The first task was to examine the 1979 Compendium and decide which parts, if any, of it were to be saved. It was quickly decided that all of the data would be retained, at least until it was found to be outdated (if that happened at all). Thus, all twelve data fields for all 2,580 records were retained. This was felt to be the most conservative approach to use and would eliminate any chance of deleting potentially valuable data.

The second task was to develop a new data-base format using PC-based software, which would incorporate the fields from the old Compendium, add any new fields that could be useful, and be relatively easy to use for shipyard personnel. The resulting data-base has 12 fields in a rearranged format, which is easier to read in hard copy form. A sub task here was to select a PC data-base software package with which to develop the new format. The main criteria used in this selection were ease of use and learning, flexibility in performing searches, creating reports, etc., and the ability to import and export data in other data-base software formats. This last point is important due to the diversity of data-base programs being used across the industry. As a result, the Alpha Four™ program was selected for data-base development. However, the Compendium is shipped as a dBase IV® data-base at the request of the SP-6 Panel as more commonly in use at shipyards. It is available in Alpha Four on special request from UMTRI.

After developing the PC data-base file, it was necessary to begin importing standards. The first major block of data was from the original Compendium. However, since it was not in a format directly readable by Alpha Four, the data-base had to be converted into a form that Alpha Four could understand. This was done using an optical character reader, which could read text into a structured format that a data-base program such as Alpha Four can recognize as a data-base¹. Once this was done, the next major task was to begin adding new standards to the data-base.

The third task was to research existing information sources to find new standards not already in the Compendium. In particular, an index to international and military shipbuilding related standards needed to be greatly expanded in the new data-base. Due to the volume of standards being sought, the only way to

¹ This task was performed by Frank Darvalics in San Diego, CA.

efficiently assimilate them into the Standards Compendium was to reference an electronic standards source. For this reason, the Information Handling Service (IHS) CD-ROM data-base was used as a major reference source. (This is described in the next section of the report). In addition, the Code of Federal Regulations and miscellaneous other standards sources not available in electronic format were entered manually.

The final task was to produce the Compendium in a format that is easily usable by shipyard personnel and transferable to personal computers anywhere in as efficient a manner as possible. This involved creating an easy-to-follow User's Manual, which explained precisely how to install the Compendium, how to locate information easily, and where to call in case help is required. In addition, report formats were developed that would enable hard copies of searches to be printed quickly. Finally, a method of compressing the Compendium data-base files into an easily shipped form was required due to the volume of data involved. The PKZIP[®] software program was selected for this task. As a result, eight high-density floppy disks' worth of data was compressed onto one disk for shipping to users. With one command (described in the User's Manual) all of the files are loaded onto the user's computer in their original size.

V. INFORMATION HANDLING SERVICES

As explained earlier in the report, a need was identified at the beginning of the project to find and capture large amounts of standards information electronically. This was deemed the only way to efficiently import to the data-base file the thousands of new standards necessary to make the Compendium a truly useful tool for industry users. Although this added to the technical complexity of the project, the resource savings in data-entry hours justified the extra programming and computer problem-solving time.

As a result, a subscription to the Information Handling Services® (IHS) standards was purchased. IHS provides a data-base subscription service in a CD-ROM format for many data-bases, including standards. The data-bases are updated on a regular basis to reflect additions, changes, or deletions to standards across a wide spectrum of domestic and foreign standards organizations. The Project Team concluded it was the most complete and easily accessible standards resource available.

The IHS data is sent out to subscribers in the form of a CD-ROM disk with accompanying software once each quarter. Using a computer, searches for standards can be carried out included organizations using select criteria specified by the user. In most cases, the search results can be saved to a file or printed for further reference. An example of a search result is in Appendix A.

Search criteria were developed that would ensure that most if not all of the marine-related standards were extracted for organizations included on the IHS disks. This task was made easier due to IHS' use of subject indexes and keywords, which helped to eliminate duplicate and non marine standards. A final list of organizations included in the Compendium is included in the Appendix.

One final limitation of the IHS disks is that the American Bureau of Shipping standards are not coded to an acceptable level of detail. The original compendium has a much more complete listing for ABS, and these were retained in the current Compendium. In addition, both Coast Guard Navigation and Vessel Inspection Circulars (NVICs) and marine related cites from the Code of Federal Regulations (CFRs) had to be obtained directly. CFR cites were manually entered at the CFR "section" level.

VI. FINAL RESULTS

The final Compendium data-base contains 10,379 standards from 50 different organizations. This represents a 300 percent increase in size from the 1979 Compendium. With the expansion in military standards, Coast Guard regulations, and foreign standards such as JIS, DIN and BSI³, the Compendium offers a much more complete reference source for shipyard personnel. Every standard record entry contains the organization acronym, standard number, descriptive title, and SWBS (Ship Work Breakdown Structure) number. Thus, with the flexibility of the data-base software, searches can be run to find standards meeting a variety of criteria defined by the user. This is a significant improvement from the original Compendium project.

The User's Manual, with a more detailed description of the compendium and how to access it, is attached to this report as Appendix C.

³ JIS is Japanese Industrial Standards, DIN is Deutsches Institute fur Normung (Germany), and BSI is British Standards Institute

VII. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions with corresponding recommendations are hereby presented:

1. In order to make the Compendium an ongoing, usable tool, it will need to be maintained so that it reflects updated standards and references, new standards sources, and archiving of obsolete standards. Also, users will need support and specialized services such as custom searches and ready access to hard copies of standards .

RECOMMENDATION: Approve funding for continued maintenance and development of the Compendium. This also includes renewed subscriptions to IHS data.

2. In an effort to continually build the data-base, smaller standards-generating organizations that do not fall into the IHS data-bases and other standards directories should be researched and added.

RECOMMENDATION: Approved funding per item 1. This should be included in a maintenance effort.

3. Military standards should be extended to include 2nd-tier standards for those standards referenced by the major (1st-tier) standards. This would improve the usefulness of the data-base even more, especially for military users.

RECOMMENDATION: Should maintenance projects be approved, work with IHS or the Navy to develop a method of extracting 2nd-tier standards.

VIII. REFERENCES

1. "A Compendium of Shipbuilding Standards" NSRP 1979 by Corporate Tech Planning for Bath Iron Works.
2. Information Handling Services, Denver Colorado, CD-ROM subscription service, 1991-1992.
3. Code of Federal Regulations, U.S. Government printing office, October 1990, parts 1-588.8.

DODISS 92-03

Information Handling Services

Page 1

Document Number	St	Title
MIL-O-39A	A	OARS
MIL-M-69A (1)	A	MATS, CARGO
MIL-L-221C	A	LADDERS, JACOB'S
MIL-F-243E (2)	A	FURNITURE, SHIPBOARD, STEEL, GENERAL SPECIFICATION FOR
MIL-C-486B CANCEL 1	H	CHAIRS, SHIPBOARD, STEEL (USE AA-C-275)
MIL-G-613C (1)	A	GRAPNELS, MARINE, TRIP WIRE, AND CRASH TRUCK
MIL-F-902J (2)	A	FURNITURE, SHIPBOARD, ALUMINUM: GENERAL SPECIFICATION FOR
MIL-M-1158B (3)	H	MIRRORS, GLASS, SHIPBOARD USE
MIL-A-2673	H	ANCHOR, STEEL, NAVY TYPE OR STOCKED
MIL-B-2680	A	BUOYS, ANCHOR, SPAR
MIL-G-2697A (2)	A	GLASSES, PORTLIGHT, CIRCULAR, HEAT TREATED
MIL-S-2734B (1)	A	STRAP, BERTH, MATTRESS RETAINING
MIL-G-2767C (1)	A	GUARDS, RAT, SHIP
MIL-F-2807A CANCEL 1	H	FENDER, MARINE COIR ROPE
MIL-G-2860E	A	GLASSES, SIGHT-FLAT, CLEAR, BOROSILICATE
MIL-H-2946 CANCEL 1	H	HOISTS, AMMUNITION, AUTOMATIC-DREDGER- TYPE, AND POWER-EQUIPMENT
MIL-A-3339C VALID 1	A	ANCHORS, SEA, LIFE RAFT
MIL-W-3459D	A	WIPERS, WINDOW, ELECTRIC, PENDULUM TYPE (MARINE SERVICE, HEAVY DUTY)
MIL-H-3496D	A	HOOKS, BOAT (BALL POINT)
MIL-B-3715B	H	BERTH BOTTOM, DUCK COTTON CLOTH (CANVAS), BIAS CUT
MIL-R-3768B CANCEL 1	H	REPAIR EQUIPMENT, PLYWOOD BOAT AND PONTON, PACKAGING
MIL-B-5006 CANCEL 1	H	BUOYS, SEAPLANE MOORING
MIL-I-5284A	H	INTERFERENCE LIMITS, AIRBORNE LIFEBOAT GENERAL SPECIFICATION FOR
MIL-I-6142 CANCEL 1	H	AIRCRAFT EMERGENCY ESCAPE SYSTEM, IDENTIFICATION OF (SUPERSEDED BY MIL-A-25165)
MIL-O-8626A CANCEL 1	H	OAR, METAL, SECTIONAL
MIL-P-11064C CANCEL 1	H	PAD EYES: DECK SNUBBING
MIL-F-11435A CANCEL 1	H	FENDERS, MARINE, RUBBER-FILLED
MIL-B-12203B CANCEL 1	H	BAG, BOAT PADDLE
MIL-R-12500A CANCEL 1	H	REPAIR KIT ROLL, PNEUMATIC FLOAT, TOOL, DUCK COTTON CLOTH
MIL-P-12581B CANCEL 1	H	REPAIR KIT, INFLATABLE CRAFT, FOR BLADDER TYPE OR NONBLADDER TYPE BOATS, PACKAGING OF
MIL-A-13480A CANCEL 1	H	ANCHOR, MARINE, FLUKED, KEDGE TYPE, WELDED, 100 LB.

Appendix A

Standards Compendium

Standards Organizations and Sources in Database

ABS	American Bureau of Shipping Rules for Building and Classing Steel Vessels
ABS 01	Nondestructive Inspection of Hull Welds
ABS 02	Approved Welding Electrodes Wire-Flux & Wire Gas Combinations
ABS 03	Offshore Mobile Drilling Units
ABS 04	Steel Barges for Offshore Service
ABS 05	Bulk Carriers for Service on the Great Lakes
ABS 06	River Rules '71
ABS 07	Inert Gas Installations on Vessels Carrying Oil in Bulk
ABS 08	Certification of Cargo Containers
ABS 09	Manual for Making Bronze Propeller Repairs
ABS 10	Repair, Welding, Cladding & Straightening of Tail Boilers
ABS 11	Burning Crude Oil & Slops in Main & Auxiliary Boilers
ABS 12	Steel Floating Drydocks
ABS 13	Underwater Inspection in Lieu of Drydocking Survey
ABS 14	Construction of Shipboard Elevators
ABS 15	Certification of Construction & Survey of Cargo Gear on Merchant Vessels
ABS 16	Certification of Self-Unloading Cargo Gear on Great Lakes Vessels
ABS 17	Single Point Moorings
ABS 18	Aluminum Vessels
ABS 19	Classification of Nuclear Ships
ABS 20	Submersible Vessels
ABYC	American Boat and Yacht Council, Incorporated
AFNOR	Association Francais de Normalisation (France)
AMCA	Air Moving and Conditioning Association, Incorporated
ANSI	American National Standards Institute
API	American Petroleum Institute
ASTM	American Society for Testing and Materials
BSI	British Standards Institute
Bundesam	German Standards

CGNVIC	U.S. Coast Guard Navigation and Vessel Inspection Circular
DEF - S	British Defense Standards
DIN	Deutsches Institute fur Normung (Germany)
DOD	Department of Defense
DOL	Department of Labor
EPA	Environmental Protection Agency
FCI	Fluid Controls Institute, Incorporated
FED-SPEC	Federal Specification
GL	Germanisher Lloyd
HEI	Heat Exchange Institute
HI	Hydraulic Institute
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers, Incorporated
IES	Illuminating Engineering Society
IMCO	Intergovernmental Maritime Consultive Organization
IPCEA	Insulated Power Cable Engineers Association
ISO	International Organization for Standardization
JIC	Joint Industrial Council
JIS	Japenese Industrial Standards
MARAD	Maritime Administration
MASS	MARAD Standard Specification
MASSD	MARAD Standard Specification - Diesel
MIL	Military Specification
MSS	Manufacturers Standardization Society of the Valve & Fittings Industry
NBS	National Bureau of Standards
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NNI	Netherlands Normalisatie Instituut
OCMIF	Oil Companies International Marine Forum
PCC	Panama Canal Company
SAA	Standards Association of Australia
SCA	Suez Canal Authority
SNAME	Society of Naval Architects and Marine Engineers
SOLAS	Safety of Life at Sea
SSPC	Steel Structures Painting Council
TEMA	Tubular Exchanger Manufacturers Association

UL	Underwriters Laboratories, Incorporated
USCG	United States Coast Guard
USDA	United States Department of Agriculture
USN	United States Navy
USPHS	United States Public Health Service

STANDARDS COMPENDIUM DATA-BASE

USER'S MANUAL

Table of Contents

I. Introduction	2
II. How to Access the Data-base Disk.....	5
III. Using the Data-base to Locate Information.....	7
IV. Printing Reports	11
V. Administrative.....	14

STANDARDS COMPENDIUM DATA-BASE USER'S MANUAL

I. INTRODUCTION

Overview

The Standards Compendium Data-base has been developed to provide an up-to-date reference list of all existing marine-related standards. The data-base is intended as a resource to the shipbuilding, ship design, and maritime industries for standards that have been developed by various organizations to aid in boat and ship construction. Users will be able to locate standards of interest using a DOS PC and the data disks provided by UMTRI, (currently the organization responsible for developing and maintaining the data-base). The Standards Compendium will be updated periodically to reflect changes in the current body of marine standards as well as to enhance the system based on user input.

The data-base contains basic descriptive information of each standard (organization, number, title) along with current revision and administrative data. There will be sufficient information on each standard so that a user can determine if it is suitable for a given purpose. A user should then be able to determine whether it is necessary to reference a detailed standard.

All major standards-generating organizations have been included, both U.S. and international. See Appendix B for a list of the organizations included in the Compendium. In developing the Standards Compendium data-base, the 1979 National Shipbuilding Standards Program data-base was used as a starting point, with these standards being updated and new ones added. The basic data-base structure was kept intact and some new fields were added.

The Compendium was developed using PC-based data-base software; Alpha Four™ and dBASE IV® versions are available.

Contents of the Users Manual

This User's Manual contains information to help new users of the Compendium install the data-base on their computers, learn how to find information quickly, print out reports, and locate help should problems arise. The manual is divided into 6 main sections:

- I. Introduction
- II. How to Access The Data-base Disk
- III. Using the Data-base to Locate Information
- IV. Printing Reports
- V. Administrative
- VI. Appendix

Hardware and Software Requirements

The following are recommended hardware and software requirements for the Standards Compendium.

- * IBM PC compatible, at least a 286
- * 640K RAM with 1 megabyte or more
- * Hard drive with at least 8 megabytes free
- * 5.25 or 3.5-inch high-density disk drive
- * Major data-base software program such as dBASE IV, Paradox, Alpha Four, etc.
- * Dot matrix or laser printer (if printing is desired)

Note that the Compendium can be shipped in different floppy-disk sizes and data-base formats, depending on each user's requirements.

Data Included in the Data-base

In general, the data in the Compendium has been obtained from the most recent versions of the standards available. Not all data field information is available for each standard. These fields were left blank, although there is a possibility they will be filled in a future revision of the data-base.

The following are names and descriptions of each of the data fields in the Standards Compendium:

<u>FIELD</u>	<u>DESCRIPTION</u>
ORGAN	Standards organization that originated the

	standard (see the listing in the Appendix of organizations included)
SWBS	Navy ship work breakdown structure applicable to the standard (see the listing in the Appendix of this manual)
STD_NO	Standard number as assigned by issuing organization
TITLE	Descriptive title of the standard
ORIGDATE	Date the standard was originally issued
REV_NO	Revision number
REV_DATE	Date the standard revision was issued
SUBJECT	Major work breakdown structure category
MOD_REQD	Code indicating whether a revision is due or not (<u>Y</u> es or <u>N</u> o)
STD_TYPE	Code for the type of standard: <ul style="list-style-type: none"> 1 The standard establishes definitions or classifications. 2 The standard is used primarily in design. 3 The standard is used primarily in production operations. 4 The standard is used primarily in test and/or inspection activities. 5 The standard defines limits or boundaries (specifications) on the characteristics of materials, items, systems, or services.
ENGLISH	Code that indicates whether an English version of the standard is available (<u>Y</u> es or <u>N</u> o)
ADDTL_STD	Other standards relating to the current standard

Note: It is expected that not all of the above fields will be pertinent to every standard. Also, some data will not be available. However, these fields will encompass most of the useful information for each standard in the Standards Compendium data-base.

Notes on Military Standards

Most references to military standards in the data-base were taken from the Information Handling Services (IHS) standards disks. However, due to program limitations, it was only possible to extract basic fields such as title, standard number, and organization. Future revisions of the data-base will correct this problem so that other fields such as revision number and revision date can be extracted easily. All military standards are coded in the Compendium under the organization DOD.

There were 2,601 new military standards obtained for this Compendium. Most of these standards are primary first-level standards. There are a great many more standards referenced by these first-level standards. For example, a fuel-oil service-system standard may refer to a standard for copper-nickel piping, among many others. The reference standards are not included in the Compendium in most cases. For government applications, these references are available through the Naval Sea Systems Command, NAVSEA

Where to Call With Questions/Problems

If you are having any problems with the Compendium or have questions about any aspect of using it, call the University of Michigan Transportation Research Institute (UMTRI) at (313) 764-5308, (FAX 313-936-1081). Or, you can write to:

University of Michigan
Transportation Research Institute
Marine Systems Division
2901 Baxter Rd.
Ann Arbor, MI 48109-2150
Attn: Standards Compendium

II. HOW TO ACCESS THE DATA-BASE FILE

General

The data-base will arrive on one 3.5" disk in dBASE IV format. The first necessary task will be to make a backup copy of the database. This will protect valuable data in case of hard-drive or floppy-disk damage. Use the DOS DISKCOPY command with this format:

DISKCOPY A: A: (To copy using a one drive system with the same type of disk) or

DISKCOPY A: B: (To copy using a two drive system from the 5.25" disk to a 3.5" disk)

Note: It is important to number each of the copy disks (if you receive more than one disk) the same as the originals. This will help ensure that the disks are read onto the hard drive in the correct order.

Uncompressing the Files, Loading onto the Hard Drive

The Compendium will be sent to users in a compressed-file format so that the data-base and all associated files can fit on one data disk. The data-base files have been compressed using the PKZIP.EXE program into one file called COMPEND.ZIP. In order to load the Compendium files onto the hard drive and restore them to normal size, it will be necessary to use the PKUNZIP command.

After making a backup copy of the Compendium disk, use the copy to load the database to the hard drive in your computer. It will be necessary to use the PKUNZIP command to uncompress (extract) the files and load them onto the hard drive. This program will be included on the disk each user receives and can be run using the following command (at the DOS prompt):

```
B:\> PKUNZIP COMPEND.ZIP C:\COMPEND\
```

In this example, the user has the Compendium disk in the B drive (on some computers this will be the A drive) and is extracting the data-base files from the Compend.Zip file into the COMPEND directory on the computer's C hard drive (The user can name the directory by some other name if desired). The Compendium data-base can be put in any directory or subdirectory desired. However, it would be a good idea to put the files in an easy-to-find location. Once the PKUNZIP command has been successfully completed, all of the

necessary data-base files will be on the User's hard drive ready to access with the data-base program.

There will need to be at least eight megabytes of free memory space on the computer hard drive in order to load the Compendium data-base and its supporting files. If there is insufficient memory, options for obtaining more space include deleting obsolete files to create more space, finding another computer with enough free memory, or obtaining a larger hard drive.

Using Different Data-base Programs

The Standards Compendium was developed using the Alpha Four data-base software program. However, the Compendium is supplied in dBASE IV. The Alpha Four version is available upon request from UMTRI. The data-base files can be accessed with other data-base programs if saved in the correct file format. In either case, it will be possible to directly read the files with your data-base program without any file-conversion programs.

Problems with Accessing the Compendium Data-base

Upon successful loading of the Compendium onto the computer, it can be accessed simply by loading the data-base software program into memory and choosing MAIN.DBF as the active data-base file. If MAIN is not available as a choice, it may be necessary to change the default directory currently set up in the data-base software to C:\COMPEND (or whichever directory path the data files were moved to). The default directory is the location where the software program automatically looks to find files to load. This directory can be named whatever one wants. Most users choose an easy to remember name where they want all their data-bases to reside.

III. USING THE COMPENDIUM TO LOCATE INFORMATION

This manual uses the dBASE IV command language to describe search methods. Most data-base software programs use similar, if not identical commands. The title of the command may be different, but usually the function is the same. This section of the manual will describe the basic steps for locating the available information. Experienced data-base-software users will be able to use more advanced techniques tailored to their individual needs.

Assuming that the data-base program is loaded onto the computer hard drive, call it up using the appropriate command at the DOS prompt, (or if you are in the Windows environment, double click on the program icon under non-Windows Applications). At the Control Center, the data-base, the queries, and the reports are available by command.

There are two ways to look at the Main data-base file. You can use the Query command at the Control Center or you can use the ORGANIZE command when editing data. We recommend using the QUERY command. Both methods are described below.

Searching the Data-base

There are a variety of ways to search the data-base depending on what information is being sought and how often the query will be required. dBASE IV is very flexible in letting users define queries using either very broad criteria or narrow search parameters. This section gives a general description of how to set up queries as well as examples of some common queries that will be used with the Standards Compendium.

Each of the popular data-base software programs has very flexible command structures for creating queries. Most programs allow a search for key words or character strings from one or more data fields concurrently. Also, it is usually possible to link different search criteria using logical operators such as AND or GREATER THAN.

For example, a query can be set up in dBASE IV to find all ABS standards pertaining to boilers with a standard number greater than 25. Remember the expression field has to be enclosed in quotes. This would involve setting up three search criteria as follows:

<u>CRITERIA</u>	<u>FIELD</u>	<u>OPERATOR</u>	<u>EXPRESSION</u>
1	ORGAN	=	ABS
2	STD_NO	>	25
3	TITLE	\$	BOILER

In the above, \$ is a dBASE IV operator, which tells the program to search for any occurrence of the word *boiler* in the specified field.

Another simple, commonly used type of search is to find all records with the same entry in the primary index. For example, if the current query is By Organization (within dBASE IV), the Find command can be used to jump to the first SNAME record, for example. The user can then page through the records.

The searches that Compendium users will probably employ most of the time are:

1. Search for a specific standard number - possibly within a given organization.
2. Search for standards with a specific SWBS - possibly within a given organization.
3. Search for all standards related to one or several key words or expressions (for example, all standards related to Halon Systems).

Using Queries

To use established queries, simply activate one of them. For example, to find all standards issued by the American Boat and Yacht Council in the short version, you would activate the Organization Order - short version (ORGSHORT) Query.

Creating a new query is desirable if you want to view the records using a field other than the established ones as the main sort. To create a query sorted in order of the ASTM subcommittee responsibility, select QUERY from the dBASE IV Control Center. There are complete instructions on how to do this in the dBASE IV Manual (Using dBASE IV, Chapter 6).

Queries Available

The data-base can be displayed on the screen sorted by any field desired. Each sort of the data-base is called a query. A query is called up from the Control Center. The main data-base file is exactly the same no matter which query is chosen. The records will simply be displayed in a different order. Within the query file there are primary indexes and secondary indexes. The primary index is the field used to sort the records on the screen. The secondary index(es) is the field to sort by within the primary index field. For example, within the Organization primary index field, one may want to sort all entries by Standard Number (the secondary index field).

The Compendium has been shipped with four Queries available (these were the ones that are considered most useful):

<u>Query Type</u>	<u>dBASE IV Name</u>
1. By Organization Order - short version	ORGSHORT
2. By Organization Order - long version	ORGANLND
3. By SWBS Order - short version	SWBSSHRT
4. By SWBS Order - long version	SWBSLAND

If there are other queries that would be useful, the Query Create command can be used to set up and save a new query.

Saving Queries and Query Results

Frequently accessed queries should be saved under a file name for use in the future. Queries can also be saved as a new (mini) data-base. In dBASE IV, this can be done using the "LAYOUT - SAVE THIS QUERY" command in the Query Menu. If the query is needed again in the future, it can be retrieved easily at the Control Center.

Using Indexes

To use an established index, simply activate one of them. For example, to find all standards created by the American Boat and Yacht Council in the short version, the user would activate the Organization (ORGAN) Index.

With the main data-base active, the user can choose an index other than the current index as long as he/she is in the dBASE IV Control Center. Press F2 (Data), select ORGANIZE and highlight ACTIVATE INDEX FILE. dBASE IV will then present a list of the available indexes which can be selected by simply highlighting and entering.

Creating a new index may be desirable if the user needs to view the records using another field as the main sort. An example of this would be to create an index sorted in order of the Subject category. To do this, select ORGANIZE from the dBASE IV Control Center and choose CREATE AN INDEX. dBASE IV will then ask for the filename under which the index file is to be saved. There are complete instructions on how to do this in the dBASE IV Manual (Using dBASE IV, Chapter 5).

Browsing Through Records

From the dBASE IV Control Center, begin browsing through records by using the F2 (Data) command. dBASE IV starts at the beginning of the database by default and shows multiple records at once. This is called the Browse mode, and will display each record on one line. It will still be possible to see other data fields within the record by scrolling to the right until the desired field comes onto the screen. To look at a single record at a time, press the F2 (Data) button, this will put you in the Edit mode. To go back to Browse mode (multiple records at a time) press the F2 button again. Using the Tab key causes the cursor to move one field at a time. To scroll forward 17 records, use the Page-Down key, using the Page-Up key results in a backward scroll of 17 records.

Exporting Data from the Data-base

If necessary, records can be exported to another file in a selected data-base software format. This is done in dBASE IV using the TOOLS/EXPORT DATA command. There is a lot of flexibility in determining which fields and records are selected for export. One advantage to doing this is the ability to manipulate some of the data in another file without altering the structure of the original data-base.

IV. PRINTING REPORTS

Printing reports can be done in several different ways. The Compendium has been sent out with report formats already set up. To print, enter the Report menu and select the desired report format. Another way is to design a custom report using the software. This is of course, much more time consuming. However, it does afford a lot more flexibility in tailoring a report to specific needs. This section of the manual provides printer and hardware requirements necessary for printing, describes the available report formats, and briefly explains how to design reports using dBASE IV.

Hardware Requirements

dBASE IV, or any of the common data-base software packages, functions well with either dot matrix or laser printers. The software provides a menu of printers from which a user can select one that is compatible with his/her printer. Either letter size or wide computer paper can be used to print listings of standards. Several of the report formats provided with the Compendium are designed to fit on letter size paper. A desirable feature for printers is the ability to use "compressed mode". This is helpful when printing large listings of standards, so that more information can be fit onto a page.

Report Formats Available

In the dBASE IV version shipped to Compendium users, there are four report formats available to choose from. These were the listings assumed to be the most useful for the majority of users. Any of the four formats can be used to print a list of standards of any length. Below are descriptions of each:

1. Organization order - short version
This report lists the standards in alphabetical order of the originating organization. Within each organization, the standards are in ascending numerical order. The fields included are the ones expected to be of the most interest: Organization, Standard Number, Standard Title, Origination Date, and Revision Number.
2. Organization order - long version
This report lists standards in the same order and logic as the above report, except that all data fields are included. In order to print this report a wide carriage printer and paper are required.

3. SWBS order - short version

This report lists the standards in ascending SWBS order with organization being the secondary sort. The fields included are ORGANIZATION, STANDARD NUMBER, STANDARD TITLE, ORINATION DATE, AND REVISION NUMBER.

4. SWBS order - long version

This report lists standards in ascending SWBS order with organization being the secondary sort. All data fields are included in this report. Again, a wide carriage printer is required in order to fit all of the columns onto one page.

When ready to print, dBASE IV displays a list of report formats to choose from under the Control Center Report Menu command.

How to Print a Report

Printing a report is straightforward using one of the predefined formats in dBASE IV. Basically, this tells the program which fields to print, in what order on the page and in which locations. Also, the format tells the program what to print on the top and bottom of the page in the way of heading and summary information.

The dBASE IV commands to use in printing are simple, once a report has been created to print from a query/main data-base. Suppose a search is run that results in a list of 150 records. It is necessary to tell dBASE IV to begin printing. All 150 records will be printed using the format chosen.

Creating a Custom Report

Printing does not have to be done using one of the predefined report formats. The software will allow users to design a report form. This usually takes a little effort, but may be worth it depending on which fields are most useful as well as what is the best order to print in.

In dBASE IV, the basic command to use in setting up a new report is Reports, and then Create/Modify a Report. After the report has been set up, in the Layout Save This Report, a file name will be needed to store the report in, a report description, and which data fields need to be printed in the report.

The further details of how to create a custom report are beyond the scope of this manual. However, the software user's manual will provide detailed

instructions on all the commands. Beyond this, it will take some working with the software to become proficient at setting up a report.

Examples of Reports

Following the administrative section are example pages of the different report formats available.

V. ADMINISTRATIVE

How to Obtain Revised Copies of the Data-base

The Standards Compendium can be obtained through a written request to the University of Michigan Transportation Research Institute (UMTRI), Marine Division, 2901 Baxter Rd., Ann Arbor, Michigan 48109-2150, or via a phone call to the NSRP Documentation Center at the same address at (313) 763-2465.

Custom Services Available

Custom searches and information retrieval from the Standards Compendium is available at moderate cost from UMTRI. Requests should be made to the address and phone listed above.

Making Change Requests

Proposed changes can be made to the Compendium in writing using the form included at the end of this appendix. Changes may take the form of:

1. Additions of new standards
2. Changes to one or more fields included in the current version of the Compendium.
3. Deletions of standards in the Compendium.
4. Changes to the Compendium program and data-base structure. This would include adding new data fields or different report formats, for example.

All change requests will be reviewed by the Compendium program administrator. The main criteria for acceptance will be usefulness to users, availability of data, and cost. The originator will be notified in writing of the decision by the program administrator. If a change of general benefit to users involves significantly higher cost than current funding allows, the change will be discussed at an SP-6 meeting.

STANDARDS COMPENDIUM LISTING
Short Version By SWBS

12/04/92

Page No. 1

SWBS	ORGANIZ. NAME	STANDARD NO.	STANDARD TITLE	ORIGINATION DATE	REV NO.
****	***** ISO	***** 799	***** Green Bananas - Guide to Storage and Transport First Edition	*****	***
000	API	PUBL 441	Development and Evaluation of the OCD/API Model		
000	API	PUBL 430	Offshore Petroleum Operations on Cold Water Marine Mammals, Effects of; A Literature Review		
000	CGNVIC	14-82	REGIONAL EXAMINATION CENTERS; ADMINISTRATION POLICY FOR THE ISSUANCE OF MERCHANT MARINE LICENSES AND CERTIFICATES	1982	
000	CGNVIC	9-82	MSD CERTIFICATION	1982	
000	CGNVIC	13-83	COAST GUARD RETENTION OF COMMERCIAL VESSEL PLAN REVIEW CASE FILES	1983	
000	CGNVIC	11-83	REGULATIONS FOR VERY LARGE 46 CFR SUBCHAPTER T PASSENGER VESSELS	1983	
000	CGNVIC	4-91	PILOT TRANSFER ARRANGEMENTS	1991	
000	CGNVIC	7-91	DETERMINATION OF COLD WATER AREAS	1991	
000	CGNVIC	3-88	ISSUANCE OF LETTERS OF COMPLIANCE TO FOREIGN DOCUMENTED MOBILE OFFSHORE DRILLING UNITS OPERATION ON THE OUTER CONTINENTAL SHELF OF THE UNITED STATES	1988	
000	DEF S	NES 20	Functions and Responsibilities of Warship Procurement and Design Authorities Issue 1 (11/82)		
000	DOD	NAVSEA 4710.	11/18/82 (SEA 0743/TLC) PRIVATE SECTOR DEPOT-LEVEL AVAILABILITY PLANNING FOR NAVAL SURFACE SHIPS; POLICIES, PROCEDURES, AND RESPONSIBILITIES FOR		
000	DOD	NAVSEA 5450.	08/01/83 (05A4/JP) NAVAL SEA SUPPORT CENTER, ATLANTIC, PORTSMOUTH, VA AND NAVAL SEA SUPPORT CENTER, PACIFIC, SAN DIEGO, CA; MISSION AND FUNCTIONS OF		

ORGANIZ. NAME	SWBS	STANDARD NO.	STANDARD TITLE	ORIGINATION DATE	REV NO.
***** ABS	**** 074	***** 30.13	***** WELDING STRUCTURE, CLASSIFICATION, JOINT, WELDED, WELD, HEAT TREATMENTS	*****	*** 3
ABS	074	30.35	RADIOGRAPHY, BOILER AND PRESSURE VESSEL RADIOGRAPHY, PIPE CONNECTION		3
ABS	074	30.37	TEST, HYDROSTATIC, TEST, BOILER		3
ABS	074	30.39	METAL, FILLER, TEST, WELD, TEST, WELD, NONDESTRUCTIVE		3
ABS	074	30.49	WELDER, QUALIFICATIONS		3
ABS	074	44.17	RIVET, BOILER, BOILER RIVET		3
ABS	074	44.19	FORGING, MACHINERY, STEEL FOR TEST, STEEL FORGING		3
ABS	074	44.23	CASTING, STEEL FOR MACHINERY, BOILER AND PRESSURE VESSEL TEST, CASTING, STEEL CASTING, REPAIR		3
ABS	074	44.25	CASTINGS, NODULAR IRON FOR MACHINERY TEST, IRON CASTING		3
ABS	074	44.27	CASTINGS, GRAY IRON FOR MACHINERY TEST, GRAY IRON CASTINGS		3
ABS	095	35.161	TRIALS, ELECTRICAL EQUIPMENT		3
ABS	095	41.83	TEST, AUTOMATIC CONTROL SYSTEM TRIALS, AUTOMATIC CONTROL SYSTEM		3
ABS	100	3	MATERIALS, SCANTLINGS, STRUCTURAL SECTION		3
ABS	100	43.1	STEEL, HULL, TESTS AND INSPECTIONS, STEEL, HULL, PLATE THICKNESS TOLERANCES		3
ABS	100	43.3	STEEL, HULL, STEEL, HULL, TREATMENT OF SURFACE DEFECTS		3
ABS	100	43.5	STEEL, HULL, HIGHER STRENGTH		3
ABS	100	43.6	STEEL, FOR LOW TEMPERATURE REQUIREMENTS		3
ABS	100	43.7	CASTING, HULL STEEL, TEST, HULL STEEL CASTING		3
ABS	100	43.9	FORGING, HULL STEEL, TEST, FORGING, HULL STEEL		3

STANDARDS COMPENDIUM LISTING

12/04/92

Sort By SWBS - Long Version

Page No. 1

SWBS	ORGAN	STANDARD NUMBER	TITLE OF STANDARD	STD TYP	ORIGIN. DATE	REV NO.	REVISION DATE	REV STA	MOD REQ	SUBJECT	ENGL VER?	ADDITIONAL STANDARDS
****	*****	*****	*****	***	*****	***	*****	***	***	*****	****	*****
	ISO	799	Green Bananas - Guide to Storage and Transport First Edition				01-01-00	No			Yes	
000	API	PUBL 441	Development and Evaluation of the OCD/API Model				01-01-00	No			Yes	
000	API	PUBL 430	Offshore Petroleum Operations on Cold Water Marine Mammals, Effects of; A Literature Review				01-01-00	No			Yes	
000	CGNVIC	14-82	REGIONAL EXAMINATION CENTERS; ADMINISTRATION POLICY FOR THE ISSUANCE OF MERCHANT MARINE LICENSES AND CERTIFICATES		1982							
000	CGNVIC	9-82	MSD CERTIFICATION		1982							
000	CGNVIC	13-83	COAST GUARD RETENTION OF COMMERCIAL VESSEL PLAN REVIEW CASE FILES		1983							
000	CGNVIC	11-83	REGULATIONS FOR VERY LARGE 46 CFR SUBCHAPTER T PASSENGER VESSELS		1983							
000	CGNVIC	4-91	PILOT TRANSFER ARRANGEMENTS		1991							
000	CGNVIC	7-91	DETERMINATION OF COLD WATER AREAS		1991							
000	CGNVIC	3-88	ISSUANCE OF LETTERS OF COMPLIANCE TO FOREIGN DOCUMENTED MOBILE OFFSHORE DRILLING UNITS OPERATION ON THE OUTER CONTINENTAL SHELF OF THE UNITED STATES		1988							
000	DEF S	NES 20	Functions and Responsibilities of Warship Procurement and Design Authorities Issue 1 (11/82)					No			Yes	
000	DOD	NAVSEA 4710.	11/18/82 (SEA 0743/TLC) PRIVATE SECTOR DEPOT-LEVEL AVAILABILITY PLANNING FOR NAVAL SURFACE SHIPS; POLICIES, PROCEDURES, AND RESPONSIBILITIES FOR									
000	DOD	NAVSEA 5450.	08/01/83 (05A4/JP) NAVAL SEA SUPPORT CENTER, ATLANTIC, PORTSMOUTH, VA AND NAVAL SEA SUPPORT CENTER, PACIFIC, SAN DIEGO, CA; MISSION AND FUNCTIONS OF									
000	DOD	OPNAV 4760.1	08/25/80 (OP-35) FLEET INTRODUCTION PLAN FOR GUIDED MISSILE CRUISER TICONDEROGA (CG 47)									
000	DOD	SPAWAR 4860.	07/31/90 (SPAWAR 003-211) GOVERNMENT FURNISHED EQUIPMENT (GFE) MANAGEMENT SYSTEM (GMS)									
000	DOD	SECNAV 7700.	08/01/90 (NIG-00) INFORMATION REQUIREMENTS FOR SEMIANNUAL REPORT TO THE CONGRESS									
000	DOD	SECNAV 5031.	05/17/89 (CHINFO) SHIP NAMING, CHRISTENINGS AND COMMISSIONINGS									
000	DOD	SECNAV 5740.	10/22/54 (SO-4:RSH) MEMORANDUM OF AGREEMENT BETWEEN THE DEPARTMENT OF DEFENSE AND DEPARTMENT OF COMMERCE,									

STANDARDS COMPENDIUM LISTING
Sort By Organization - Long Version

12/04/92

Page No. 1

ORGANIZ.	SWBS	STANDARD NUMBER	TITLE OF STANDARD	ORIGIN. TYP	REV NO.	REVISION DATE	REV STA	MOD REQ	SUBJECT	ENGL VER?	ADDITIONAL STANDARDS
*****	****	*****	*****	***	*****	***	*****	***	*****	****	*****
ABS	074	30.13	WELDING STRUCTURE, CLASSIFICATION, JOINT, WELDED, WELD, HEAT TREATMENTS	5	3						
ABS	074	30.35	RADIOGRAPHY, BOILER AND PRESSURE VESSEL RADIOGRAPHY, PIPE CONNECTION	4	3						
ABS	074	30.37	TEST, HYDROSTATIC, TEST, BOILER	4	3						
ABS	074	30.39	METAL, FILLER, TEST, WELD, TEST, WELD, NONDESTRUCTIVE	4	3						
ABS	074	30.49	WELDER, QUALIFICATIONS	4	3						
ABS	074	44.17	RIVET, BOILER, BOILER RIVET	5	3						
ABS	074	44.19	FORGING, MACHINERY, STEEL FOR TEST, STEEL FORGING	5	3						
ABS	074	44.23	CASTING, STEEL FOR MACHINERY, BOILER AND PRESSURE VESSEL TEST, CASTING, STEEL CASTING, REPAIR	5	3						
ABS	074	44.25	CASTINGS, NODULAR IRON FOR MACHINERY TEST, IRON CASTING	5	3						
ABS	074	44.27	CASTINGS, GRAY IRON FOR MACHINERY TEST, GRAY IRON CASTINGS	5	3						
ABS	095	35.161	TRIALS, ELECTRICAL EQUIPMENT	5	3						
ABS	095	41.83	TEST, AUTOMATIC CONTROL SYSTEM TRIALS, AUTOMATIC CONTROL SYSTEM	4	3						
ABS	100	3	MATERIALS, SCANTLINGS, STRUCTURAL SECTION	5	3						
ABS	100	43.1	STEEL, HULL, TESTS AND INSPECTIONS, STEEL, HULL, PLATE THICKNESS TOLERANCES	4	3						
ABS	100	43.3	STEEL, HULL, STEEL, HULL, TREATMENT OF SURFACE DEFECTS	5	3						
ABS	100	43.5	STEEL, HULL, HIGHER STRENGTH	5	3						
ABS	100	43.6	STEEL, FOR LOW TEMPERATURE REQUIREMENTS	5	3						
ABS	100	43.7	CASTING, HULL STEEL, TEST, HULL STEEL CASTING	4	3						
ABS	100	43.9	FORGING, HULL STEEL, TEST, FORGING, HULL STEEL	5	3						
ABS	100	6	HULL GIRDER STRENGTH CALCULATION, DECK, STRENGTH, ARRANGEMENT, HATCH	5	3						
ABS	100	C	STRENGTH, HULL GIRDER, TANKER, TANKER	2	3						

CHANGE REQUEST FORM

Standards Compendium Database

ORIGINATOR:

ORGANIZATION:

PHONE:

ADDRESS:

ACTION REQUESTED:

ADD

DELETE

CHANGE

PROGRAM CHANGE

DATE REQUEST MADE:

STANDARD ORGANIZATION:

STANDARD NUMBER(S):

DESCRIPTION OF CHANGE:

REASON:

SIGNATURE OF ORIGINATOR: _____

TITLE OF ORIGINATOR: _____

FOR STANDARD DATABASE MANAGEMENT

REVIEWED BY:

DATE:

ACTION:

DATE UPDATED:

DATE COPY SENT TO ORIGINATOR: