

INCH-POUND

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MILITARY STANDARD
DAMAGE CONTROL BOOK FOR SUBMARINES,
PREPARATION AND REVISION OF



AMSC 4302

AREA TMSS

DISTRIBUTION STATEMENT A Approved for public release; distribution unlimited

MIL-STD-797C(SH)
25 March 1988

DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND

Washington, DC 20362-5101

Damage Control Book for Submarines

1. This Military Standard is approved for use by the Naval Sea Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.
2. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Sea Systems Command, SEA 5523, Department of the Navy, Washington, DC 20362-5101 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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FOREWORD

It is the intent of this standard to establish the requirements for the preparation, reproduction, and revision of damage control books for all types of submarines, both conventional and nuclear-powered (excluding NR-1 and AGSS-555). This standard describes the requisite contents of, and the procedures for preparation of, the two part Standard Submarine Damage Control Book. Part 1 will address standard submarine damage control and part 2 will be concerned with information that is specific to individual submarines.

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1. SCOPE

1.1 Purpose. This standard is intended to be used as a model in the delineation of the requisite contents of the new Standard Submarine Damage Control Book (SSDCB). Part 1 shall cover standard submarine damage control; part 2 shall address information that is specific to individual submarines. This standard covers life-cycle maintenance and the agenda for the processing of the damage control submarine books.

1.2 Application. The requirements of this standard shall be applied to the procedures for originating, reproducing, and revising the new SSDCB for submarines of all types, conventional and nuclear. The SSDCB shall be used to outline the damage control capabilities of submarines and shall describe how these capabilities shall best be utilized.

2. REFERENCED DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. Unless otherwise specified, the following specifications and standards of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this standard to the extent specified herein.

SPECIFICATIONS

MILITARY

MIL-M-15071 - Manuals, Technical, Equipments and Systems Content Requirements for.

MIL-M-38784 - Manuals, Technical: General Style and Format Requirements.

STANDARDS

MILITARY

MIL-STD-12 - Abbreviations for Use on Drawings, Standards, and Technical Documents.

MIL-STD-15 - Electrical Wiring Equipment Symbols for Ships' Plans, Part 2.

MIL-STD-17 - Mechanical Symbols (Other than Aeronautical, Aerospacecraft and Spacecraft Use), Part 1.

2.1.2 Other Government publications. The following other Government publications form a part of this standard to the extent specified herein.

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PUBLICATIONS

NAVAL SEA SYSTEMS COMMAND (NAVSEA)

SL720-AA-MAN-010 - Fleet Modernization Program, Management and Operations Manual.

S9510-AB-ATM-010 - Nuclear Powered Submarine Atmosphere Control Manual.

(Copies of specifications, standards, and publications required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.2 Other publications. The following documents form a part of this standard to the extent specified herein. The issues of the documents which are indicated as DoD adopted shall be the issue listed in the issue of the DoDISS specified in the solicitation. The issues of documents which have not been adopted shall be those in effect on the date of the cited DoDISS.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

Y32.2 - Graphic Symbols for Electrical and Electronics Diagrams. (DoD adopted)

Y32.9 - Graphic Symbols for Electrical Wiring and Layout Diagrams Used in Architecture and Building Construction. (DoD adopted)

(Application for copies should be addressed to the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.)

(Nongovernment standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

2.3 Order of precedence. In the event of a conflict between the text of this standard and the references cited herein, the text of this standard shall take precedence.

3. DEFINITIONS

3.1 Advance change notice (ACN). An ACN is an advance or an interim change to a damage control book, which is issued when a deficiency or problem with the book requires immediate correction and time does not permit issuance of a permanent change or revision.

3.2 Binder. A binder is the cover of the book, and associated hardware.

3.3 Change. A change is used to correct reported deficiencies (errors, omissions and inadequacies), add new procedures, and change existing procedures where the requirement for such change does not constitute an urgent situation. Changes are issued in the form of change pages to the damage control books.

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3.4 Diagrams. Diagrams are foldout illustrations whose reproduction requires a page wider than normal trim width and whose height, including border spaces, equals the trim height of the publication.

3.5 Drafting mylar. A drafting mylar is an unsensitized sheet which is receptive to ink. This material is used for drafting.

3.6 Feedback form. A feedback form is a technical manual deficiency/evaluation report (TMDER) form that provides a path for the user to:

- Supply data that would enhance the book's contents,
- Notify Naval Sea Systems Command (NAVSEA) of any ship alteration that affects ship's damage control capability.

3.7 Final book. Final book applies to the final edition of the SSDCB issued to a ship following construction, or to the final revised edition issued to a ship following overhaul.

3.8 Follow yard (new construction yard). When two or more yards are building ships from one set of working plans, the subsequent yards shall be designated as the follow yards.

3.9 Front matter. Generally, front matter is the pages preceding the main text of the publication.

3.10 Group master copy damage control book text and associated graphics. When a class of submarines is being built by several shipyards, the lead building yard produces the first damage control book for the class and furnishes a copy of this material to the follow yards. The follow yards will modify this material and use it to produce a damage control book part 2 for each individual submarine they are building.

3.11 Illustrations. The term "illustrations" will apply to all single page, book-size illustrations. This includes graphs and diagrams.

3.12 Lead building yard (LBY). When two or more yards are building (new construction) submarines from one set of working plans, one yard is designated as the lead building yard.

3.13 NAVSEA. NAVSEA is the Naval activity responsible for providing requirements for the outline, content and formatting of the overall SSDCBs. NAVSEA is responsible for approving all changes to SSDCBs, with the exception of changes to part 2 resulting from hardware changes specifically authorized in overhaul.

3.14 Overhaul yard. The overhaul shipyard is the activity responsible for preparing, reproducing and distributing updated material pertaining to the SSDCB part 2 resulting from ship hardware changes accomplished during overhaul.

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3.15 Planning yard. The planning yard is the naval shipyard or other activity designated by NAVSEA that is responsible for the technical documents in support of accomplishing SHIPALTS including engineering, design, and drawing preparation for ships specifically assigned.

3.16 Preliminary book. A submarine damage control book is considered to be "preliminary" until it has been reviewed and approved by NAVSEA.

3.17 Revision. A revision is a complete rewrite or reorganization of the book. It is used to incorporate all previous changes, and add or delete data.

3.18 Ships master damage control book. A ships master damage control book is a printed copy of the damage control book that is set aside by the submarine's commanding officer and kept up-to-date to reflect changes made to the submarine by the ship's force.

3.19 SSDCB (master copy). A SSDCB (master copy) is an original camera ready copy of the SSDCB retained in storage by the submarine's planning yard.

3.20 Supervisor of shipbuilding (SUPSHIP). The term "SUPSHIP" as used in this standard shall be understood to apply to the Government activity responsible for the building conversion or overhaul of a ship, such as SUPSHIP or commander of a naval shipyard.

3.21 Tab sheets. A tab sheet is a ledger sheet used to separate the parts and chapters of the SSDCB.

3.22 Technical activity. A technical activity is any activity that may originate and submit for approval an advance change notice or identify the need for a permanent technical manual change or revision to an approved individual ship damage control book.

3.23 Technical manual identification number (TMIN). A TMIN is an identification number assigned by Naval Sea Data Support Activity (NSDSA) Port Hueneme, CA.

3.24 Type book. The "type book" is a copy of the standard submarine damage control book that is provided by NAVSEA via SUPSHIPS to the building yard. The book is used for guidance in preparing damage control book contents for submarines under construction.

4. GENERAL REQUIREMENTS

4.1 Format of the SSDCB. The SSDCB shall be a two-part publication consisting of appropriate text, tables, diagrams and illustrations. Part 1 shall address damage control issues common to all submarines. Part 2 shall address damage control information and unique characteristics that pertain to the specific submarine for which the damage control book is being prepared.

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4.2 Book format. Book format requirements shall be in accordance with this standard and the type book provided by NAVSEA or SUPSHIPS.

4.3 Requirements. In general, the book shall consist of two parts which shall include, for example:

	<u>Page no.</u>
" a. Part 1	
Cover page.....	
Title page.....	
List of effective pages.....	
Record of changes.....	
Table of contents.....	
Preface.....	
1- Introduction (cover page).....	
Table of contents.....	
Introduction.....	
2- Damage control communications (cover page).....	
Table of contents.....	
Damage control communications.....	
References.....	
3- Damage control equipment, uses and locations (cover page).....	
Table of contents.....	
List of tables.....	
Types and locations of damage control equipment....	
References	
4- Loss of control surface response (cover page).....	
Table of contents.....	
List of illustrations.....	
Loss of control surface response.....	
References.....	
5- Flooding (cover page).....	
Table of contents.....	
List of illustrations.....	
Flooding.....	
References.....	
6- Fire fighting (cover page).....	
Table of contents.....	
Fire fighting.....	
References.....	
7- Electrical equipment emergencies (cover page).....	
Table of contents.....	
List of illustrations.....	
List of tables.....	
Electrical equipment emergencies.....	
References.....	
8- High pressure gas and main steam system.....	
Emergencies (cover page).....	
Table of contents.....	
Gas system emergencies.....	
References.....	

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Page no.

- 9- Atmosphere contamination and ventilation (cover page).....
 - Table of contents.....
 - List of illustrations.....
 - List of plates.....
 - Atmosphere contamination and ventilation.....
 - References.....
- 10- Damage from external sources (cover page).....
 - Table of contents.....
 - Damage from external sources.....
 - References.....
- 11- Distressed submarine/DSRV operations (cover page)...
 - Table of contents.....
 - Submarine/deep submergence rescue vehicle.....
 - Operations (DSRV).....
- 12- Ship characteristics (cover page).....
 - Table of contents.....
 - Ship characteristics.....
- 13- Damage restricting ship's operations (cover page)...
 - Table of contents.....
 - Damage restricting operations.....
 - References.....
- b. Part 2
 - Table of contents.....
 - Record of page revisions (a capital letter following the last letter of the "table of contents").....
 - Procedure for revising and handling standard submarine damage control books.....
 - Preface.....
- 1- Introduction (cover page).....
 - Table of contents.....
 - Introduction.....
- 2- Damage control communications (cover page).....
 - Table of contents.....
 - Damage control communications.....
 - References.....
- 3- Damage control equipment locations (cover page).....
 - List of tables.....
 - Types and locations of damage control equipment....
 - References.....
- 4- Loss of control surface response (cover page).....
 - Table of contents.....
 - List of illustrations and diagrams.....
 - Loss of control surface response.....
 - References.....

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Page no.

- 5- Flooding (cover page).....
 - Table of contents.....
 - List of illustrations and diagrams.....
 - List of tables.....
 - Flooding.....
 - References.....
- 6- Fire fighting (cover page).....
 - Table of contents.....
 - List of tables.....
 - Fire fighting.....
 - References.....
- 7- Electrical equipment emergencies (cover page).....
 - Table of contents.....
 - List of contents.....
 - List of illustrations and diagrams.....
 - List of tables.....
 - Electrical equipment emergencies.....
 - References.....
- 8- High pressure gas and main steam system.....
 - Emergencies (cover page).....
 - Table of contents.....
 - List of tables.....
 - Gas system emergencies.....
 - References.....
- 9- Atmosphere contamination and ventilation
(cover page).....
 - Table of contents.....
 - List of illustrations and diagrams.....
 - List of tables.....
 - Atmosphere contamination and ventilation.....
 - References.....
- 10- Damage from external sources (cover page).....
 - Table of contents.....
 - List of tables.....
 - Damage from external sources.....
 - References.....
- 11- Distressed submarine/DSRV operations (cover page)...
 - Table of contents.....
 - Submarine/deep submergence rescue vehicle
operations (DSRV).....
 - References.....
- 12- Ship characteristics (cover page).....
 - Table of contents.....
 - List of tables.....
 - Damage from external sources.....
 - References.....

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4.4 Writing. The SSDCB shall be written at the knowledge level of the diving officer of the watch (officers and senior petty officers). It shall be a factual presentation of the data necessary to prevent or minimize damages that might be sustained by the submarine. Without assuming the form of an instruction manual, pertinent information shall be conveyed clearly and succinctly, substantiated by illustrations, if necessary. Design limitations and potentially unsafe operations shall be clearly delineated. No cartoons, illustrations, or diagrams existing in training aid booklets or in ship information books shall be duplicated in the SSDCB.

4.5 Format for illustrations and diagrams. The format for illustrations and diagrams listed as camera ready components as shown in table I, namely, items 2 through 8 listed as components of part 1, and items 3 through 21 listed as components of part 2, shall be in general accordance with MIL-M-38784 and with the examples as shown in the type book provided by NAVSEA. Component parts of wiring and schematic diagrams shall be symbolized in accordance with ANSI Y32.2 and ANSI Y32.9.

4.6 SSDCB camera ready components. A set of SSDCB components shall be as shown in table I, which provides an inventory of the required camera ready elements for the submarine master copy of the SSDCB.

TABLE I. Inventory of required camera ready components.

Components of part 1

Item	Title	Paragraph no.
1 Printed text and tables	Camera ready text and tables	Numerous
2 Illustration	Theoretical flooding rate versus depth (2 and 4 inch hole)	5.2.2.5
3 Illustration	Flooding rate versus depth (5 to 12 inch internal pipe size)	5.2.2.5
4 Bar graph	Numbers of reported incidents by fire class	5.2.2.6
5 Illustration	Material property damage report	5.2.2.6
6 Graph	Effects of carbon monoxide on personnel	5.2.2.6
7 Illustration and graph	High velocity fog pattern	5.2.2.6
8 Illustration and graph	Low velocity fog pattern	5.2.2.6
9 Illustration	All purpose nozzle	5.2.2.6

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TABLE I. Inventory of required camera ready components. - Continued

Components of part 1

Item		Title	Paragraph no.
10	Graph	Half life increments for contaminant removal	5.2.2.9
11	Graph	Carbon dioxide buildup in percent versus time and number of personnel	5.2.2.11
12	Graph	Personnel versus time for reduction of oxygen percentage from 21 to 18.4	5.2.2.11
13	Graph	Relationship of oxygen partial pressure and volume concentration to total pressure	5.2.2.11
14	Graph	Personnel versus time for oxygen bank exhaustion	5.2.2.11
15	Graph	Personnel versus time to reach 5 atmospheres using air bleed - bow compartment (typical)	5.2.2.11
16	Graph	Personnel versus time for service air bank depletion using air bleed - engine room (typical)	5.2.2.11
17	Graph	Personnel versus time before exhaustion of lithium hydroxide	5.2.2.11
18	Graph	Toxicity of carbon dioxide short time exposures	5.2.2.11
19	Graph	Toxicity of carbon dioxide long time exposures	5.2.2.11
20	Graph	Personnel versus time to reach 5 atmospheres using EAB masks - bow compartment (typical)	5.2.2.11
21	Graph	Personnel versus time to reach 3.2 atmospheres using EAB masks - engine room (typical)	5.2.2.11

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TABLE I. Inventory of required camera ready components. - Continued

Components of part 2

Item		Title	Paragraph no.
1	Printed text and tables	Camera ready text tables	Numerous
2	Table	Allowed and on board quantities of damage control equipment	5.4.2.3
3	Illustration	Keel depth versus percent of forward MBT volume blown using EMBT blow	5.4.2.4
4	Illustration	Submerged operating envelope	5.4.2.4
5	Illustration	Time history of events for a stern plane dive jam	5.4.2.4
6	Illustration	Time history of events for a stern plane rise jam	5.4.2.4
7	Illustration	Computer predicted trajectories showing effectiveness of recovery measures	5.4.2.4
8	Illustration	Effect in delay in EMBT blow 15, 30 or 60 seconds	5.4.2.5
9	Illustration	Theoretical effect of time to secure flooding on depth from which recovery can be made	5.4.2.5
10	Illustration	Theoretical effect of speed on ability to recover versus time to secure flooding	5.4.2.5
11	Illustration	Effect of speed on recoverability with or without EMBT blow	5.4.2.5
12	Illustration	Load supportability characteristics	5.4.2.5
13	Diagram	Hull penetrations that may be open while submerged below periscope depth	5.4.2.5

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TABLE I. Inventory of required camera ready components. - Continued

Components of part 2

Item		Title	Paragraph no.
14	Illustration	SS power generation and distribution system	5.4.2.7
15	Illustration	CO ₂ removal rate (to 2.5 percent) versus initial concentration using pump bleed cycling	5.4.2.9
16	Illustration	CO removal rate (to 25 parts per million) versus initial concentration using pump bleed cycling and CO-H ₂ burners	5.4.2.9
17	Illustration	CO ₂ removal rate (to 1 percent) versus initial concentration using pump bleed cycling scrubbers and LiOH receptacles	5.4.2.9
18	Illustration	Cross curves of stability	5.4.2.12
19	Illustration	Plot of minimum GM while trimming down	5.4.2.12
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22	Illustration	Ships variable ballast location form	5.4.2.12
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24	Illustration	Statical stability curve	5.4.2.12
25	Illustration	Form characteristics	5.4.2.12
26	Illustration	Location of draft marks	5.4.2.12
27	Illustration	Moment diagram	5.4.2.12

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4.7 Responsibility for preparation of the SSDCB during new submarine construction.

4.7.1 NAVSEA. NAVSEA shall be responsible for preparing the format and contents of part 1 and the general outline of part 2. NAVSEA shall furnish a copy of the type book to the LBY via the SUPSHIP.

4.7.2 LBY. The LBY is responsible for preparing the specific contents and obtaining NAVSEA's approval of part 2 for each of the submarines it builds. The LBY shall forward an example copy of the complete SSDCB to the follow yards.

4.7.3 Follow yard. The follow yard shall use the provided example of the SSDCB to prepare a damage control book for each of the submarines which it is building. The follow yard is responsible for preparing the specific contents of part 2.

4.8 SSDCB preparation instructions.

4.8.1 Printing of book. The preparation of the text and tables shall be in accordance with MIL-M-38784.

4.8.2 Illustrations. Illustrations shall be prepared on mylar or equivalent material. All line work shall be drawn with pen and ink, using only black ink that will adhere to the mylar, will not flake off, and will reproduce a good image. No free hand shall be permitted.

4.8.3 Lettering. All letters, words and numbers on illustrations shall be klrtype or equivalent material. The size and type of lettering shall be as shown in table II as follows:

- (a) NG - New gothic
- (b) MG - Monotone gothic
- (c) LG - Lining gothic

TABLE II. Lettering and numbers, final size and type.

Legend	Final size and type
Upper title block:	10MG
"Confidential" (omit if unclassified)	24LG
Ship number	10MG
Ship class	10MG
"DAMAGE CONTROL DIAGRAM"	36LG
Diagram number	14MG
Diagram name	
Lower title block:	
"NAVAL SEA SYSTEMS COMMAND"	12MG
Date	8NG
"OVERHAUL ACTIVITY CORRECT MASTER PLASTICS"	8NG
Frame numbers	8NG
Compartment names	6NG or 8NG
Compartment numbers	6NG

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TABLE II. Lettering and numbers, final size and type. - Continued

Legend	Final size and type
Fitting numbers	6NG or 8NG
"KEY"	12MG
Description of symbols	12MG
"NOTE"	12MG
Description	8NG
Capacities (moment diagram)	8NG
Miscellaneous	<u>1/</u>

1/ Lettering numbers, and so forth, not covered above shall be of such size that they are legible and consistent with space available on illustrations.

4.8.4 Folding and punching of diagrams. Diagrams shall be folded in accordance with MIL-M-38784 and shall be punched to suit the binders.

4.8.5 Pages within chapters numbering. Page numbering within chapters numbering shall be in accordance with MIL-M-38784.

4.8.6 Paragraph and side head numbering. Paragraph and side heads shall be numbered in accordance with MIL-M-38784.

4.8.7 Ship identification. Part 1 will not be identifiable to a specific submarine class or hull. Part 2, the ship's hull number shall be placed on the corner opposite the binder edge.

4.8.8 Security classification. The SSDCB, part 1, and part 2 are classified "Confidential". The following instructions shall apply:

- (a) The binder and inside title page for parts 1 and 2 shall be prepared in accordance with the formats shown on figures 1 and 7.
- (b) Classification procedures for individual paragraphs and tables within the text, and for all illustrations and diagrams shall be in accordance with MIL-M-38784.
- (c) Security classification or declassification and distribution instructions as specified in this section shall be printed on the cover and the general layout of the cover shall be in accordance with MIL-M-38784.

4.9 TMIN. The SUPSHIP or overhaul yard shall be requested to obtain a TMIN for the damage control book of each ship, subsequent permanent change or revision. They shall request the number from Naval Ship Weapon Systems Engineering Station (Code 5712), NSDSA, Port Hueneme, CA 93043.

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4.10 Procedure for updating planning yard master copy book.

4.10.1 Change in ship's classification or numbers on diagrams. When the classification or ship's number is changed, the upper identifying title block on the diagram shall be changed in accordance with the following:

(a) Before change in classification:

	<u>Size of klrtype</u>
SSN 679	36LG
SSN 637 class	10MG

(b) After change in classification:

	<u>Size of klrtype</u>
SSN 609	36LG
(EX SSBN 609)	10MG
SSN 609	10MG

4.10.2 Pages to be revised. All pages, including the title page, having changes, shall be retyped.

4.11 Responsibility for preparing changes and revisions to the SSDCB during the life cycle of a submarine.

4.11.1 NAVSEA. NAVSEA shall be solely responsible for preparing changes and revisions to part 1 and general information in part 2.

4.11.2 Planning yard. Between overhauls the planning yard shall be responsible for preparing, reproducing and distributing authorized changes pertaining to the damage control book for each submarine assigned. Changes to part 1 shall not be made without prior NAVSEA authorization.

4.11.3 Overhaul yard. During the overhaul, the overhaul yard shall update part 2 of the SSDCB to reflect submarine hardware changes accomplished during the overhaul. In addition the overhaul yard shall incorporate NAVSEA authorized changes to part 1 submitted through the planning yard or SUPSHIP.

4.12 Binders.

4.12.1 Temporary binders. A semi-cardboard binder, appropriately classified, loose-leaf, three ring type, shall be required for the distribution of the preliminary SSDCB.

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4.12.2 Permanent binder. When the book is final, the book shall receive a permanent binder. This binder shall be made of tennite or equivalent and provided with 3 holes 3/16-inch in diameter and spaced 4-1/4-inches on center for insertion of metal screw post. The binder shall be green to indicate classification, lettering black with the NAVSEA seal silkscreened and centered on the face. In addition, the word "CONFIDENTIAL" shall be silkscreened in black, in 30 pt. alternate Gothic number 3 type, all caps, at the top left and bottom right of front and back covers.

4.13 Tab sheets. The chapters in part 1 shall be identified by blue tab sheets with green used in part 2.

4.14 Distribution of the final SSDCB. Distribution of the final SSDCB shall be in accordance with existing Navy requirements and appendix A.

4.15 Packaging and shipping.

4.15.1 Packaging. The original camera ready components of the SSDCB, parts 1 and 2, as shown in table I, shall be packaged flat, and reproduced copies shall be folded as necessary or packaged flat.

4.15.2 Shipping. Camera ready reproduced SSDCB material shall be packaged and shipped by registered mail in accordance with the current security regulations.

4.16 Quality assurance provisions. Quality assurance provisions shall be accomplished in accordance with MIL-M-38784.

4.17 Deliverable data. Deliverable data prepared in accordance with the requirements of sections 4 and 5 of this standard and identified on the DD Form 1423, Contract Data Requirements List, shall be prepared in accordance with the instructions in the applicable DIDs (see 6.2).

5. DETAILED REQUIREMENTS

5.1 SSDCB, part 1. This part is applicable to all submarines except NR-1 and AGSS-555. The text, tables, diagrams and illustrations shall be prepared as a cohesive unit. The text shall discuss damage control capabilities and procedures emphasizing emergencies peculiar to submarines. Tables shall be prepared to present factual data when this type of presentation is more efficient than a lengthy word description. Diagrams and illustrations shall be prepared to support the text and shall be confined to graphical information not adequately covered elsewhere (that is, in training booklets, ship information books, ship systems manuals, reactor plant manual, electrical plant operating manual, and technical manuals). All figures and tables shall be placed in proximity to the supporting text. Material shall be presented in such a manner as to provide a maximum ease of comprehension and visual impact.

5.2 Contents of part 1. The SSDCB, part 1, shall contain the following chapters arranged in an appropriate order to provide complete information for an understanding of the submarine's damage control capabilities and their employment in preventing, controlling and recovering from emergencies.

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Front matter

- 1- Introduction
- 2- Damage control communications
- 3- Damage control equipment, uses and locations
- 4- Loss of control surface response
- 5- Flooding
- 6- Fire fighting
- 7- Electrical equipment emergencies
- 8- High pressure gas and main steam system emergencies
- 9- Atmosphere contamination and ventilation emergencies
- 10- Damage from external sources
- 11- Distressed submarine/DSRV operations
- 12- Ship characteristics
- 13- Damage restricting ship's operations

5.2.1 Front matter. Standard front matter, listed in the normal sequence of appearance, shall be as specified in 5.2.1.1 through 5.2.1.10.

5.2.1.1 Cover page.

5.2.1.2 Title page. The title page shall be as shown on figure 1.

5.2.1.3 List of effective pages. List of effective pages shall be as shown on figure 2.

5.2.1.4 Record of changes. The change record shall be as shown on figure 3.

5.2.1.5 Part 1, table of contents. The table of contents shall be as shown on figure 4. It shall follow the title page of each chapter, appendix and major division of the book.

5.2.1.6 Chapter table of contents. The chapter table of contents shall be as shown on figure 5.

5.2.1.7 List of illustrations. An individual list of illustrations shall appear with each chapter and major division of the book.

5.2.1.8 List of diagrams. An individual list of diagrams shall appear with each chapter and major division of the book.

5.2.1.9 List of tables. An individual list of tables shall appear with each chapter and major division of the book.

5.2.1.10 Preface. The preface shall be as shown on figure 6.

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5.2.2 Text.

5.2.2.1 Introduction. The introduction shall describe part 1 and shall state the basic purpose, philosophy, and scope of the SSDCB. In brief, it shall state that the book is not intended as a basic textbook to be used to qualify ship's personnel in the various aspects of damage control but, rather, presents facts which, when assimilated, will broaden its readers' understanding of the damage control capabilities and limitation of their ship; but its use should be encouraged for the on board qualification and requalifications programs and as a reference in basic and advanced submarine schools. It shall emphasize that, from a submarine standpoint, damage control consists of actions which cope with an emergency yet enable the ship's crew to retain submerged ship control or to return it to, and retain it in, a surfaced condition. The introduction shall list the emergencies to be discussed in the remainder of the book. Normally, the introduction shall contain neither illustrations nor tabular material.

5.2.2.2 Damage control communications. This chapter of the book shall examine networks that are most likely to be used for damage control and emergency communication, and shall discuss their vulnerability to disruption and interference. Normally, this chapter shall not contain illustrations since the physical configurations of the various communication and alarm circuits are covered elsewhere and ship's personnel are considered to be familiar with them.

5.2.2.3 Damage control equipment, uses and locations. This chapter of the damage control book shall discuss ship's equipment that can be used to reduce the seriousness and extent of an emergency, protect the crew, and to effect temporary repairs. It shall describe the equipment, emphasizing capabilities and limitations. However, in the case of radiac, or in situations involving first aid or diving equipment, no attempt shall be made to include equipment operating procedures, applicable training publications, or manufacturer's instructions. Specific locations of damage control equipment shall not be included, but shall be placed in part 2.

5.2.2.4 Loss of control surface response. This chapter shall discuss:

- (a) Possible causes of loss of plane and rudder response.
- (b) Means to eliminate or reduce the possibility of such loss.
- (c) The submarine's reaction to the loss of plane and rudder response.

This chapter shall not include illustrations of ship's systems, unless they present material of value to understanding damage control problems and are not repeated in other publications; such as a simplified illustration showing rudder and plane hydraulic pump power sources.

5.2.2.5 Flooding. This chapter, one of the most important in the entire damage control book, shall complement but not duplicate the ship's flooding bill. It shall outline steps that can be taken by the ship to reduce its flooding potential. It shall discuss ship evolutions that can be restricted to increase ship's safety when maximum flooding resistance is required. This chapter shall also discuss the effect of secured sea systems on ship's operating characteristics, and steps that can be taken to recover from a flooding emergency. Also

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included is a discussion on non-isolable flooding and response to non-isolable flooding. A discussion of the effects of flooding while on the surface at sea and in port shall be included with emphasis on prevention. In addition, illustrations showing theoretical flood rate versus depth (2 and 4 inch hole) and flooding rate versus depth (5 to 12 inch internal pipe size) shall be included.

5.2.2.6 Fire fighting. This chapter based on the premise that any fire can seriously damage or destroy the ship (if prompt corrective action is not initiated), shall discuss shipboard extinguishing agents and equipment, provide guidance in firefighting techniques, locate areas where fire hazards are greatest, and discuss practical applications of fire procedures in reaction to representative fires. The chapter shall include illustrations describing:

- (a) Numbers of reported incidents by fire class.
- (b) Material property damage report.
- (c) Effects of carbon monoxide on personnel.
- (d) High velocity fog pattern.
- (e) Low velocity fog pattern.
- (f) All purpose nozzle.

5.2.2.7 Electrical equipment emergencies. This chapter shall complement but not duplicate the electrical plant operating manual. It shall discuss the reliability of the ship's electrical systems, and the mechanics of isolating specific items of electrical equipment. It shall identify electrical loads that will be lost as a result of securing various components in the electrical system and emphasize the effect on ships' recovery ability.

5.2.2.8 High pressure gas and main steam system emergencies. This chapter shall discuss possible effects of high-pressure gas system emergency on equipment and personnel; steam system emergencies (if applicable) and the cause and prevention of compression ignition in air systems and contamination of oxygen systems.

5.2.2.9 Atmosphere contamination and ventilation. This chapter shall complement but not duplicate the information in accordance with S9510-AB-ATM-010. It shall discuss toxic gases, aerosols, and radioactive contaminations (if applicable) that may exist in the atmosphere of a submerged submarine. It also shall discuss the damage control application of shipboard contaminant control and detection equipment. This chapter shall not incorporate directives that are promulgated by other sources, for example, atmosphere control procedures and limits which are contained in the above mentioned publication and other submarine operating procedures. This chapter shall include an illustration describing half-life increments for contamination removal.

5.2.2.10 Damage from external sources. This chapter, shall identify areas of possible damage to the ship caused by severe pressure changes resulting from explosion, excessive depth, grounding, stranding, or collision. It shall include discussions of types of damage that can occur in these areas and how to recognize and assess them. The purpose of this chapter shall be to establish a realistic level of confidence in the ship and to alert the crew that specific hull emergencies may produce side effects which may not be readily apparent.

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5.2.2.11 Distressed submarine/DSRV operations. This chapter shall discuss the DSRV mating and rescue operations relative to capabilities of the vehicle, mother submarine and distressed submarine. It shall describe the initial conditions, survival capabilities and limitations, air revitalization, communication, habitability, and mating. The chapter shall include illustrations describing:

- (a) Carbon dioxide buildup in prevent versus time and number of personnel.
- (b) Personnel versus time for reduction of oxygen percentage from 21 to 18.4.
- (c) Relationship of oxygen partial pressure and volume concentration to total pressure.
- (d) Personnel versus time for oxygen bank exhaustion.
- (e) Personnel versus time to reach 5 atmospheres using air bleed - bow compartment (typical).
- (f) Personnel versus time for service air bank depletion using air bleed - engine room (typical).
- (g) Personnel versus time before exhaustion of lithium hydroxide.
- (h) Toxicity of carbon dioxide short time exposures.
- (i) Toxicity of carbon dioxide long time exposures.
- (j) Personnel versus time to reach 5 atmospheres using EAB masks - bow compartment (typical).
- (k) Personnel versus time to reach 3.2 atmospheres using EAB masks - engine room (typical).

5.2.2.12 Ship characteristics. This chapter shall discuss stability and equilibrium, density of liquids and storage capacities of life support systems.

5.2.2.13 Damage restricting ship's operations. This chapter shall discuss damage that would restrict the ship's speed, maneuvering and depth capabilities.

5.2.2.14 Addenda. Addenda material is prohibited.

5.3 Part 2. The text, tables, diagrams and illustrations shall be prepared as a cohesive unit. The text shall discuss damage control and associated problems peculiar to the individual submarine. When a lengthy word description proves to be inefficient, tables shall be prepared to present factual data. Diagrams and illustrations shall be prepared to support the text and shall confine themselves to data not adequately covered elsewhere (example: training aid booklets, ship information books, ship system manuals, operating manuals, general information books, and technical manuals). It shall contain sufficient text to explain considerations that are submarine specific. This shall vary according to the degree of uniqueness of the submarine.

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5.4 Contents of part 2. SSDC, part 2, shall contain the following chapters, arranged in appropriate order to provide specific operating limits and recovery measures which can be used to confidently understand the individual ship's damage control capabilities:

- Front matter
- 1- Introduction
- 2- Damage control communications
- 3- Damage control equipment locations
- 4- Loss of control surface response
- 5- Flooding
- 6- Fire fighting
- 7- Electrical equipment emergencies
- 8- High pressure gas and main steam system emergencies
- 9- Atmosphere contamination and ventilation emergencies
- 10- Damage from external sources
- 11- Distressed submarine/DSRV operations
- 12- Ship characteristics

5.4.1 Front matter. Standard front matter, listed in the normal sequence of appearance, shall be as specified in 5.4.1.1 through 5.4.1.10.

5.4.1.1 Cover page.

5.4.1.2 Title page. The title page shall be as shown on figure 7.

5.4.1.3 List of effective pages. The list of effective pages shall be as shown on figure 2.

5.4.1.4 Record of changes. The record of changes shall be as shown on figure 3.

5.4.1.5 Part 2, table of contents. The table of contents shall be as shown on figure 4.

5.4.1.6 Chapter table of contents. The chapter table of contents shall be as shown on figure 5.

5.4.1.7 List of illustrations. An individual list of illustrations shall appear with each chapter and major division of part 2.

5.4.1.8 List of diagrams. An individual list of tables shall appear with each chapter and major division of part 2.

5.4.1.9 List of tables. An individual list of tables shall appear with each chapter and major division of part 2.

5.4.1.10 Preface. This page shall be as shown on figure 6.

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5.4.2 Text.

5.4.2.1 Introduction. The introduction shall state the basic purpose, philosophy, and scope of the SSDCB, part 2. It shall explain that part 2 shall discuss damage control systems and equipment that are peculiar to a specific class of, or to a singular, submarine. The introduction shall list the material to be included in part 2 of the SSDCB.

5.4.2.2 Damage control communications. This chapter of part 2 shall discuss communications and alarm circuits peculiar to a specific class of, or to a singular, submarine. Normally, this chapter shall not contain illustrations since the physical configurations of the various communications and alarm circuits are covered elsewhere.

5.4.2.3 Damage control equipment locations. This chapter of part 2 shall provide a list of damage control equipment that is peculiar to a class of submarine or to a singular submarine. The list shall include all assigned damage control equipment, amount of equipment on board, and the compartment where each item is stowed or installed. A table (see figure 8) shall be used as an example for constructing the list.

5.4.2.4 Loss of control surface response. This chapter of part 2 shall discuss specific results applicable to a class of submarines or individual submarine which will result in the loss of plane and rudder response and the specific corrective actions to be taken in the event of such loss. It shall describe, for a class or individual submarine, the effectiveness of EMBT blow system at various depths, present the applicable submerged operating envelope, and define the particular jam dive and jam rise boundaries. In addition, recommended rudder deflection action and recommended recovery measures from a stern plane jam shall be presented. This chapter shall include class and individual submarine specific graphs and curves which present:

- (a) Keel depth versus percent of forward MBT volume blown using EMBT blow.
- (b) Submerged operating envelope.
- (c) Time history of events for a stern plane dive jam.
- (d) Time history of events for a stern plane rise jam.
- (e) Computer predicted trajectory showing effectiveness of recovery measures.

Other class or individual submarine specific graphs and curves which present data essential to the understanding of damage control problems which are not repeated in other publications shall be included.

5.4.2.5 Flooding. This chapter of part 2 shall provide class or individual submarine specific characteristics that support the SSDCB, part 1, chapter 5. The chapter shall illustrate the reaction of the ship to different flooding emergencies including the effect of various emergency recovery actions. Load supportability curves shall graphically display the ship's ability to carry additional weight using speed and angle. The chapter shall be supported with an

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adequate number of tables which list all flooding control stations, their locations, method of control, operation, type of opening and parent system. In addition, illustrations shall be provided that shall show the class or individual submarines' hull penetrations, type and size of each penetration, and variables affecting the flooding rate. The following graphs shall be included:

- (a) Effect in delay in emergency main ballast tank blow 15, 30, or 60 seconds.
- (b) Theoretical effect of time secure on depth from which recovery can be made.
- (c) Theoretical effect of speed on ability to recover versus time to secure flooding.
- (d) Effect of speed on recoverability with or without emergency main ballast tank blow.
- (e) Load supportability characteristics.
- (f) Hull penetrations that may be open while submerged below periscope depth.

5.4.2.6 Fire fighting. This chapter, based on the premise that any fire can seriously damage or destroy the ship (if prompt corrective action is not initiated), shall discuss shipboard fire prevention problems and extinguishing agents and equipment that are peculiar to a specific class or individual submarine.

5.4.2.7 Electrical equipment emergencies. This chapter shall discuss the reliability of the ship's electrical systems, and the mechanics of isolating specific items of electrical equipment that are peculiar to a specific class or individual submarine. This chapter shall be supported by an illustration covering SS Power Generation and Distribution System.

5.4.2.8 High pressure gas and main steam system emergencies. This chapter shall discuss the possible effects of gas system emergencies that are peculiar to a specific class or individual submarine.

5.4.2.9 Atmosphere contamination and ventilation. This chapter shall discuss items of shipboard contaminant control, detection equipment and ventilation emergencies that are peculiar to a specific class or individual submarine. The chapter shall be supported by various illustrations including:

- (a) CO₂ removal rate (to 2.5 percent) versus initial concentration using pump bleed cycling.
- (b) CO₂ removal rate (to 25 parts per million) versus initial concentration using pump bleed cycling and CO-H₂ burners.
- (c) CO₂ removal rate (to 1 percent) versus initial concentration using pump bleed cycling scrubbers and LiOH receptacles.

5.4.2.10 Damage from external sources. This chapter shall identify areas of possible damage to the ship caused by severe pressure changes resulting from explosion, excessive depth, grounding, stranding, or collision that are peculiar to a specific class or individual submarine. It shall include discussions of types of damage that may occur in these areas and how to recognize and assess them. This chapter shall include a table that provides recommended ship's speed and depth limitations for damaged masts and antennas.

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5.4.2.11 Distressed submarine/DSRV operations. This chapter shall discuss the DSRV and operations features that are peculiar to a specific class or individual submarine. It shall describe the initial conditions, survival capabilities and limitations, air revitalization, communications, habitability, and mating.

5.4.2.12 Ship characteristics. This chapter shall discuss stability and equilibrium and shall describe storage capacities of life support systems which are peculiar to a specific class or individual submarine. A table shall be supplied that provides storage capacities of life support systems (oxygen banks, air banks, potable water tanks and sanitary tanks). Illustrations shall be included that show the following characteristics:

- (a) Cross curves of stability.
- (b) Plot of minimum GM while trimming down.
- (c) Equilibrium polygon.
- (d) Equilibrium polygon example.
- (e) Ships variable ballast location form.
- (f) Ships variable ballast location form example.
- (g) Statical stability curve.
- (h) Form characteristics.
- (i) Location of draft marks.
- (j) Moment diagram.

5.4.2.13 Addenda. Addenda material is prohibited.

5.5 Content topic depth coverage. A depth of coverage for each damage control topic (see table III) shall be provided by NAVSEA as a guide for establishing the content level of writing. These levels are light treatment (L) which shall denote general information, moderate treatment (M) which is the equivalent to the operator information level, and detailed treatment (D) which is comparable to the maintenance information level. Generally operator and maintenance levels of writing are defined in accordance with MIL-M-15071.

TABLE III. Topic depth coverage.

Chapter	Topic	Depth coverage
1	Introduction	M
2	Damage control communications	
	MC systems	
	Sound powered telephones	L
	Alarms	L
	Operating procedures	
	MC systems	L
	Sound powered telephones	L
	Alarms	L
	Reporting	L
	NOTE: Damage control detailed guidance and treatment of the subject is provided in Doctrine for Submarine Interior Communications.	

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TABLE III. Topic depth coverage. - Continued

Chapter	Topic	Depth coverage
3	Damage control equipment, uses and locations	
	Tools and material, uses and location	
	Tool rolls	D
	Damage control bags	D
	Pipe patching kits	D
	Band-it kits	D
	Fire extinguishing agents and equipment	
	CO ₂ fire extinguishers	D
	Dry chemical fire extinguishers	D
	Water (shipboard sources, hoses, nozzles, applicators, and so forth)	D
	Breathing aids	
	Oxygen breathing apparatus	M
	Emergency air breathing systems	M
	MK-5 gas masks, portable blowers	M
	Emergency lighting	
	Battle lanterns	M
	Emergency flashlights	M
	Ship's emergency lights	M
3	Radiac equipment	L
	Protective clothing	
	Steam suits	M
	Anti-contamination clothing	L
	Medical equipment	
	First aid kits	L
	Resuscitators	L
	Stretchers	L
	Dewatering facilities	
	Trim and drain systems	L
	Submersible pumps	L
	Diving equipment	
	Light weight diving equipment	L
	Scuba equipment	L
	Miscellaneous equipment - bolt cutters, hammers, crow bars, and so forth	L
NOTE: Damage control equipment and its use shall be described in part 1 as shall general types of locations. Specific location lists of damage control equipment shall be placed in part 2.		

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TABLE III. Topic depth coverage. - Continued

Chapter	Topic	Depth coverage
4	Loss of control surface response Modes of control Causes of losses Recovery of control surface response Factors affecting severity of loss of control surface response Recognition and reaction times Speed Initial depth Initial trim Recovery procedures Computer studies Full scale test results Recommended recovery procedures Typical safe operating limits and its use (the stern plane jam and flooding safe operating limits should appear on a single figure) Post recovery performance	L L L D D M M L L M D L
5	Flooding Variables affecting the flooding rate Piping configuration Depth, coefficient of discharge, hole size relationships to flooding rate NOTE: Illustrative figures are useful in this section, but the use of multiple curves shall be examined critically. Recovery considerations Initial conditions (refer to safe operating limits) Reaction times Time to secure flooding Typical (or limiting) curves showing flooding variables and ability of the submarine to survive.	M M M M M M
	NOTE: The utility for multiple curves should be critically examined.	

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TABLE III. Topic depth coverage. - Continued

Chapter	Topic	Depth coverage
	Compartment pressurization considerations	L
	Factors affecting recovery	
	Loss of seawater systems	L
	Loss of propulsion	L
	Air bank capacities and pressures, MBT blow rates	
	Speed	M
	Trim status	L
	Depth	L
	Effect of pitch angle on air in MBTs	L
	Dewatering with trim and drain systems	L
	Post surfacing considerations	
	Longitudinal stability	L
	Transverse stability	L
	Deep submergence philosophy	L
	Load supportability (including typical curves showing the ship's ability to carry additional weight using speed and angle)	M
6	Fire fighting	
	Types of fires and hazards	M
	Extinguishing agents	
	Characteristics	L
	Recommended extinguishing agent for the various types of fires	M
	Use of the trim system as a fire main	M
	Possible locations and characteristics of submarine fires and methods of fire prevention and combating the fires	
	Hull insulation	L
	Galley	M
	Diesel fuel	M
	Hydraulic and lubricating oil	M
	Pyrotechnics	L
	Electrical equipment	M
	Hydrogen	M
	Oxygen fed fires	M
	Effects of heat on submarine equipment	
	Reactor shielding	L
	Compressed gas cylinders (including tables of gas cylinder safety devices and effects of released gas)	M
	Hydraulic power plant air flasks	L
	Reactor air flasks	L
	Activated carbon filter beds	L
	Weapons	M

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TABLE III. Topic depth coverage. - Continued

Chapter	Topic	Depth coverage
7	Electrical equipment emergencies Electrical system reliability Effects of losses Means of load isolation NOTE: A table of electrical loads and isolation points will be included in the SSDCB part 2.	L L L
8	High pressure gas and main steam system emergencies Personnel and equipment hazards (including a typical table of compart- ment pressures resulting from release of the various high pressure gases) Physiological effects of oxygen deficiency Steam casualties Major steam leaks Minor steam leaks	M L L L
9	Atmosphere contamination and ventilation NOTE: This chapter will be very abbreviated due to the coverage of the subject by NAVSEA S9510-AB-ATM-010. Emergency ventilation Typical ventilation half-lives Methods of computation of time required to reduce contaminant concentration Air bleeding, and bleed and pump cycles External sources of contamination Radioactivity Chemical warfare Biological warfare	L M M L L L
10	Damage from external sources Hull integrity Fatigue cracking Hull surveillance Corrosion and erosion Hull welding Impact damage Factors affecting severity Bottoming Grounding Improper drydocking	L L L L M L L L

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TABLE III. Topic depth coverage. - Continued

Chapter	Topic	Depth coverage
	Pressure damage Excessive depth Underwater shock (including results of shock tests) Piping reliability Piping classes Welding Brazing Non-destructive tests (NDT) Preparation for damage from external sources Depth charge Collision	L M L L L L L L L
11	Distressed submarine and DSRV operations Distressed submarine operations Atmosphere control Body heat retention Waste disposal Means of communication DSRV operations DSRV and mother ship Means of locating distressed submarine Personnel transfer operations	L L L M L M M
12	Ship characteristics Explanation of curves and figures Cross curves of stability Tons per inch immersion Equilibrium polygon Other curves Miscellaneous data (density of liquids, and so forth)	M M M M M
13	Damage restricting ship's operations Main shaft seal malfunction Chilled water system (air conditioning) malfunction Secondary propulsion motor damage Main propulsion system damage Electrical system damage Air system damage Hydraulic system damage	L L L L L L L

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TABLE III. Topic depth coverage. - Continued

Chapter	Topic	Depth coverage
	Potential flooding damage	
	Trim system	L
	Seawater cooling system	L
	Auxiliary fresh water	L
	Missile tube muzzle door	L
	Torpedo tubes	L
	Signal ejector	L
	Trash disposal unit	L

6. NOTES

6.1 Intended use. This standard is intended to be used to establish the requirements for the preparation, reproduction, and revision of the new two-part SSDCB, which covers all classes of submarines, both conventional and nuclear powered.

6.2 Data requirements. When this standard is used in an acquisition which incorporates a DD Form 1423, Contract Data Requirements List (CDRL), the data requirements identified below shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved CDRL incorporated into the contract. When the provisions of DoD FAR Supplement, Part 27, Sub-Part 27.410-6 (DD Form 1423) are invoked and the DD Form 1423 is not used, the data specified below shall be delivered by the contractor in accordance with the contract or purchase order requirements. Deliverable data required by this standard is cited in the following paragraph.

<u>Paragraph no.</u>	<u>Data requirement title</u>	<u>Applicable DID no.</u>	<u>Option</u>
4.17	Standard Submarine Damage Control Book (SSDCB)	DI-TMSS-80513	----

(Data item descriptions related to this standard, and identified in section 6 will be approved and listed as such in DoD 5010.12-L., AMSDL. Copies of data item descriptions required by the contractors in connection with specific acquisition functions should be obtained from the Naval Publications and Forms Center or as directed by the contracting officer.)

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6.3 Subject term (key word) listing.

Advance change notice (ACN)
Damage control communications
Damage control, submarines
Deep submergence rescue vehicle (DSRV)
Emergency assessment, submarine
Life-cycle maintenance
Technical manual deficiency/evaluation report (TMDER)
Technical manual identification number (TMIN)

6.4 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Preparing activity:
Navy - SH
(Project TMSS-N177)

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STANDARD SUBMARINE DAMAGE CONTROL BOOK
FOR SSN'S AND SSBN'S

FOR
DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND
WASHINGTON, D.C.
1984

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FIGURE 1. Example - Part 1 title page.

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List of effective pages

Dates of issue for original and changed pages are:

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Total number of pages in this publication is 450 consisting of the following:

Page no.	* Change no.	Page no.	* Change no.
Title.....	2	2-3.....	0
A.....	2	2-4.....	1
1-1.....	0	3-1.....	0
1-2.....	1	3-2.....	1
1-3.....	0	3-2.1.....	2
1-4 1-5.....	2	3-2.2 Blank.....	2
1-6 Blank.....	2	3-3.....	0
2-1.....	2	3-4.....	0
2-2.....	2	4-1.....	0
2-2.1.....	2	4-2.....	0
2-2.2 Blank.....	2	5-1.....	1
		5-2.....	1

* Zero in this column indicated an original page.

Change 2

FIGURE 2. Example of list of effective pages.

[illegible]

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STANDARD SUBMARINE DAMAGE CONTROL BOOK

Table of Contents

NOTE

Some chapters of this book have two parts, each with a separate table of contents and lists of illustrations, diagrams (where applicable), and tables.

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FIGURE 4. Example of SSDCB table of contents.

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CHAPTER 2

DAMAGE CONTROL COMMUNICATIONS

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FIGURE 5. Example of chapter table of contents.

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PREFACE

The three basic objectives of damage control -- to take all practicable preliminary measures before damage occurs, to minimize and localize such damage when it occurs, and to accomplish emergency repairs or restoration after damage occurs -- are cited in Naval Ships Technical Manual, Chapter 079 Vol. II.

Although these objectives apply basically to all naval ships, some ramifications are of secondary importance when applied to submarines. Because the normal habitat of submarines is beneath, rather than upon, the ocean surface, the prime consideration of this book is retaining control of the ship; or if necessary returning the ship to, and maintaining it in a surfaced condition. Once recovery is effected, it is assumed that the ship's force will carry out corrective maintenance which will restore the ship's capability to complete its mission.

WARNING

The data presented in this book represents the best available information on submarine damage control. Some of the material is theoretical. Some specific examples of emergency control methods have been included. The procedures within must be modified to suit the needs and conditions of the ship and made to adhere to the type commanders' standard operating procedures and emergency bills.

FIGURE 6. Example of preface.

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FIGURE 7. Example - Part 2 title page.

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STOWAGE LOCATIONS

ITEM	ON BOARD ALLOWANCE	BOW COMP	OPS COMP UL	OPS COMP ML	OPS COMP LL	MSL COMP UL	AMR 1 ML	AMR 1 LL	REACTOR COMP	AMR 2 UL	AMR 2 LL	ENG ROOM UL	ENG ROOM LL	MANEU. VERING*	TOTAL ON BOARD*
AN/PDR-56 SERIES	3														
AN/PDR-66 SERIES	1														
AN/PDR-70	2														
DT-304/PDR (FRISKER PROBE)	3														
CCVD-RM-3C2	2														
CCVD-E-140-N (FRISKER PROBE BATTERY OPERATED)	1														
COMPUTER INDICATOR CP-297/UD OR EQUIVALENT	2														
DOSIMETER CHARGER PP-43768/PD	4														
DOSIMETER, INDICATING 0-200MR, 1M-9/PD SERIES	200														
DOSIMETER, INDICATING 0-1R, 1M-181/PD	5														
DOSIMETER, INDICATING 0-5R, 1M-135 PD	5														
DOSIMETER, INDICATING 0-200R, 1M-107/PD	5														
DOSIMETER, INDICATING 0-600R, 1M-143/PD	**														
DOSIMETER, TESTER, CESIUM	1														
DOSIMETER, CP-95/PD, READER CASUALTY	1														

*As Determined By Ship's Force

**Authorized Allowance is 0.1x Number Personnel On Board

FIGURE 8. Example - partial submarine damage control equipment list.

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APPENDIX

DISTRIBUTION INSTRUCTIONS

10. SCOPE

10.1 Scope. This appendix furnishes details of the procedures to be followed in the delivery and distribution of the SSDCBs. This appendix is not a mandatory part of the standard. The information contained herein is intended for guidance only.

20. REFERENCED DOCUMENTS

This section is not applicable to this appendix.

30. REQUIREMENTS

30.1 New construction SSDCB. Twelve months prior to delivery of the first submarine of a particular class, the LBY shall submit to NAVSEA Washington, DC (Submarine Director) five printed copies of the SSDCB. At the same time, the LBY shall submit to the follow yards one set of preliminary camera ready components, in accordance with the items as shown in table III of this standard, and one printed copy of the SSDCB to the follow yard.

30.2 Builder sea trials. Two weeks prior to builder sea trials, 10 copies (20 FBMs) shall be delivered to the applicable submarine.

30.3 Final approved SSDCB. Six months after delivery of a new submarine, distribution shall be made to the following:

<u>Activity</u>	<u>Number of copies</u>	<u>Material</u>
Applicable submarine	(10 SSN)/20 SSBN)	Printed SSDCBs
Planning yard	1	1 set master camera ready components (see 4.6)
NAVSEA (Submarine Directorate)	2	Printed SSDCB
NAVSEA technical library	1	Printed SSDCB
COMSUBLANT	1	Printed SSDCB
COMSUBPAC	1	Printed SSDCB
Cognizant submarine command	1	Printed SSDCB
NAVSUBSUPPFAC, New London (for Lant Fleet submarines)	1	Printed SSDCB
NAVSUBSCOL, New London	5	Printed SSDCB
NAVSAFECEN	1	Printed SSDCB
SUBBASE, Pearl (for SUBPAC submarines)	1	Printed SSDCB
Cognizant tender	1	Printed SSDCB
FBM TRACEN, Charleston, SC (for Lant Fleet submarines)	1	Printed SSDCB

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<u>Activity</u>	<u>Number of copies</u>	<u>Material</u>
NAVPUBFORMCEN	15	Printed SSDCB

NOTE: The distribution for one of a kind submarines shall be the same except that procedure outline for the follow shipyards does not apply.

30.4 Changes and revisions. Distribution of changes and revisions shall be made in accordance with 30.3 of this standard.

INSTRUCTIONS: In a continuing effort to make our standardization documents better, the DoD provides this form for use in submitting comments and suggestions for improvements. All users of military standardization documents are invited to provide suggestions. This form may be detached, folded along the lines indicated, taped along the loose edge (*DO NOT STAPLE*), and mailed. In block 5, be as specific as possible about particular problem areas such as wording which required interpretation, was too rigid, restrictive, loose, ambiguous, or was incompatible, and give proposed wording changes which would alleviate the problems. Enter in block 6 any remarks not related to a specific paragraph of the document. If block 7 is filled out, an acknowledgement will be mailed to you within 30 days to let you know that your comments were received and are being considered.

NOTE: This form may not be used to request copies of documents, nor to request waivers, deviations, or clarification of specification requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

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