

**DEPARTMENT OF TRANSPORTATION  
UNITED STATES COAST GUARD**

U.S. COAST GUARD (G-MHM-3)  
WASHINGTON, D.C. 20593

NVIC 5-81  
26 May 1981

NAVIGATION AND VESSEL INSPECTION CIRCULAR NO. 5-81

Subj: Literature Concerning Hazardous Cargoes

1. PURPOSE. To provide references to information on hazardous materials.
2. DIRECTIVES AFFECTED. Navigation and Vessel Inspection Circular No. 1-79 is canceled.
3. DISCUSSION. Enclosure (1) of this Circular is a list of suggested references which contain data on the physical properties (such as vapor pressure, boiling point and flash point), toxicological effects, fire fighting techniques, safe handling procedures, etc. for most hazardous cargoes subject to regulation.
4. ACTION. Coast Guard units and recipients in industry who are involved with the shipment of hazardous cargoes are encouraged to use enclosure (1) for guidance.



**CLYDE T. LUSK, Jr., CAPT, USCG**  
**Deputy Chief, Office of Merchant Marine Safety**

- End: (1) List of Suggested References  
(2) Chemical Hazards Response Information System, Procedures for Obtaining Manuals  
(3) Emergency Response Guidebook, distributors' addresses

Non-Standard Distribution:

Ce: Baltimore (75); San Francisco, Mobile, Pittsburgh, Providence, Norfolk (50); Galveston (30); Cleveland, Portland OR, Sturgeon Bay (25); San Diego, Savannah, Buffalo, Corpus Christi (20); Tampa, Valdez, Milwaukee, Louisville, Detroit, Toledo, Nashville, Anchorage (15); Portland ME, Duluth, Charleston, Huntington, Minneapolis-St. Paul (Dubque), Guam, San Juan (10); Juneau, Cincinnati, Memphis, Wilmington, Miami, Paducah, Albany (5) extra

Cm: New Orleans (250); New York (200); Seattle (100); Houston (50); Terminal Is. (LA-LB), Philadelphia (40) extra

Em: New London, Houma, (30); Ludington (8) extra

En: Ketchikan, Kenai, Kodiak, Lake Charles (5) extra

## List of Suggested References

1. CG-388, Chemical Data Guide for Bulk Shipment by Water, U.S. Coast Guard, 1976 edition. Available from the U.S. Government Printing Office, Washington, D.C. 20402 (Stock No. 050-012-00117-1). This guide contains physical, chemical, fire and explosion hazards, health hazards, and reactivity data for a significant number of chemicals shipped by water.
2. Chemical Hazards Response Information System (CHRIS), Hazardous Chemical Data, Commandant Instruction M16465 (old CG-446), Manuals 1-4, U.S. Coast Guard. These publications may be ordered through the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. These volumes list physical data, fire and health hazards, and recommended procedures in case of a spill or accident for most hazardous chemicals. See Enclosure (2) to this Circular for detailed information.
3. Liquefied Natural Gas and Liquefied Petroleum Gas Views and Practices, Policy and Safety, Commandant Instruction M16616.4, (old CG-478), 6 March 1980, U.S. Coast Guard, Department of Transportation, Washington, D.C. 20593. This booklet outlines Coast Guard views and policies for the transportation of liquefied natural gas and liquefied petroleum gas by water.
4. CG-329, Fire Fighting Manual for Tank Vessels, U.S. Coast Guard, 1974. This manual is intended to help seagoing personnel to familiarize themselves with the nature and hazards of fire on board vessels.
5. CG-174, A Manual for the Safe Handling of Flammable and Combustible Liquids and Other Hazardous Products, U.S. Coast Guard, 1976. This manual is intended as a basic guide for those persons involved in the transport or transfer of flammable or combustible liquids.
6. Hazardous Materials, 1980 Emergency Response Guidebook, Materials Transportation Bureau, U.S. Department of Transportation. This guide, developed for use by firefighters, police and other emergency services, describes initial actions and procedures to be followed in response to an incident involving hazardous materials. See Enclosure (3) to this Circular for distributors addresses.
7. NIOSH/OSHA Pocket Guide to Chemical Hazards, 1980, U.S. Dept of Health and Human Services. Available from the U.S. Government Printing Office, Washington, D.C. 20402 (Stock No. 017-033-00342-4). This pocket guide presents information relating to exposure limits, chemical and physical properties, health hazard information, respiratory protection, and personal protection and sanitation practices for 380 specific chemicals for which there are Federal regulations.
8. Summary of NIOSH Recommendations for Occupational Health Standards, October 1980, NIOSH, Publications Dissemination, 4676 Columbia Parkway, Cincinnati, OH 45226. A pamphlet containing the summary of the major environmental and medical recommendations found in the criteria documents published by NIOSH.
9. TLVs, Threshold Limit Values for Chemical Substances and Physical Agents in the Workroom Environment with Intended Changes, published annually (August) by The American Conference of Governmental Industrial Hygienists, P.O. Box 1937, Cincinnati, OH 45201. This publication lists adopted and proposed Threshold Limit Values (TLVs) of chemical substances and physical agents.

10. Documentation of the Threshold Limit Valves, Fourth Edition, 1980. American Conference of Governmental Industrial Hygienists, Inc. This companion piece to the TLV booklet, contains the rationale for both the adopted and proposed TLVs.
11. Marine Fire Prevention, Firefighting and Fire Safety, Maritime Administration, U.S. Department of Commerce. Available from U.S. Government Printing Office, Washington, D.C. 20402 (Stock No. 003-007-00099-5). This manual is a comprehensive source of material for the field of prevention, control, and extinguishment of fires aboard commercial vessels.
12. Evaluation of the Hazard Of Bulk Water Transportation of Industrial Chemicals, A Tentative Guide, National Research Council, National Academy of Sciences, contains a systematic guide to rating the relative hazards of chemicals shipped in bulk over the waterways. Available from the National Technical Information Service, Springfield, VA 22161, NTIS No. PB189845.
13. Radiological Emergency Procedures for the Non-Specialist, U.S. Atomic Energy Commission, 1969, describes procedures to be followed in the event of an accident involving radioactive materials. Available from the National Technical Information Service, Springfield, VA 22161, NTIS No. PB187267.
14. NFPA 306, Control of Gas Hazards on Vessels, 1980. National Fire Protection Association, Inc., 470 Atlantic Ave., Boston, MA 02210. This NFPA standard includes the special requirements for entry into all hazardous compartment spaces on all Marine Vessels. It supersedes all previous editions.
15. Fire Protection Guide on Hazardous Materials, SPD-1D, National Fire Protection Association, seventh edition, 1978, contains information about the flash point index of trade name liquids; fire hazard properties of flammable liquids, gases and volatile solids; hazardous chemical data; a manual of hazardous chemical reactions; and a recommended system for the identification of the fire hazard of materials.
16. National Fire Codes, volumes 1-16, published annually in March, National Fire Protection Association, Boston, MA, contains nationally recognized codes and standards for handling, storing and testing various materials such as ammonium nitrate, explosives, grain and plastic film.
17. Fire Officer's Guide to Dangerous Chemicals, No. FSP-36A, Charles W. Bahme, second edition, 1978, National Fire Protection Association. Information on reactions of unstable materials in fires, spills, leaks; and explosions.
18. Transport of Dangerous Goods, United States Committee of Experts on the Transport of Dangerous Goods (ST/5G/AC.10/1/Rev. 1), revised edition 1977. This publication contains a list of the most commonly carried hazardous dangerous goods with the UN Number, classification, packaging, labeling and consignment procedures for packaged hazardous materials.
19. U.P.S. Guide for Shipping Hazardous Materials, United Parcel Service, 51 Weaver Street, Greenwich Office Park 5, Greenwich, CT 06830. The Guide contains packaging specifications, in a simplified format as derived from Title 49 of the Code of Federal Regulations. The Guides' recommended packaging meets or exceeds the requirements of the D.O.T. regulations.

20. The Condensed Chemical Dictionary, Van Nostrand, Reinhold Publishing Corporation, New York, tenth edition, 1981, contains shipping, safety and trademark information for a large number of chemicals.
21. The Merck Index, 9th ed. 1976, Merck & Co., Inc., Ranway, NJ 07065. This is a general reference book with fairly comprehensive chemical, physical, toxicity, and therapeutic information.
22. Dangerous Properties of Industrial Materials by N. Irving Sax, Reinhold Publishing Corporation, New York, fifth edition, 1979, contains hazard analysis information for more than 16,000 common industrial and laboratory materials.
23. Patty's Industrial Hygiene and Toxicology, John Wiley and Sons, New York, NY, third edition, contains information of a practical nature regarding hygiene and toxicology for chemical elements and compounds used in industry.
24. Handbook of Chemistry and Physics is published annually by CRC Press, Cleveland, OH 44128. This is a general reference book having fairly comprehensive chemical and physical data.
25. Matheson Gas Data Book, 6th edition, 1981. Matheson Gas Products, P.O. Box 85, East Rutherford, NJ 07073. This book covers more than 130 common and uncommon gases. It gives physical constants, thermodynamic properties, vapor pressure curves, and infrared spectra. The gases are identified by both their common and Chemical Abstracts names.
26. Effects of Exposure to Toxic Gases: First Aid & Medical Treatment, 2nd edition, 1977. Matheson Gas Products. Describes symptoms of exposures to all classes of gases and first aid measures.
27. Chemicalweek Buyer's Guide, published annually in October, McGraw-Hill, Hightstown, NJ 08528. The guide lists the names and telephone numbers of manufacturers for most industrial chemicals. This guide is useful if it is necessary to contact a manufacturer for data about a particular product.
28. Farm Chemicals Handbook, published annually in January, Meister Publishing Co., Willoughby, OH 44094. This buyer's guide lists information on plant foods, pesticides, fertilizers, and the manufacturers of these chemicals.
29. Hygienic Guide Series, American Industrial Hygiene Association, 475 Wolf Ledges Parkway, Akron, OH 44311. These data sheets provide information concerning hygienic standards, properties, industrial hygiene practice and specific first aid and medical procedures for many common industrial chemicals.
30. Chemical Hazard Fact Finder, National Safety Council, 425 N. Michigan Avenue, Chicago, IL 60611, lists the flash point, severity and types of hazards, precautions, first aid, health hazards, flammability, reactivity, oral toxicity, action on skin, and references for many industrial chemicals.
31. Data Sheets, National Safety Council. Of the many data sheets there are almost 100 concerned with chemicals and chemical related interest. The data sheets on individual chemicals contain information on properties, uses, shipping and storage, personal protective equipment, ventilation and more.

32. A Handbook of Industry Terms, The Soap and Detergent Association, second edition, 198L This comprehensive dictionary of over 200 terms is designed for the layman. The definitions are non-technical, or at times semi-technical.
33. Encyclopedia for the User of Petroleum Products, Lubetext D400, Exxon Company, USA, P.O. Box 2180, Houston, TX 7700L The encyclopedia is a concise source of basic information on petroleum products.
34. Tables of Useful Information, Lubetext D400, Exxon Company, USA. This booklet contains a wide variety of information with emphasis on petroleum products.
35. Toxic & Hazardous Industrial Chemicals Safety Manual, 1980 revised edition, the International Technical Information Institute (Japan), available through Lab Safety Supply, P.O. Box 1363, Jonesville, WI 53545. This book lists physical properties, fire and health hazards, handling and storage and emergency treatment for over 700 chemicals.
36. Control of Hazardous Material Spills, Proceedings of 1980 National Conference on Control of Hazardous Material Spills. Vanderbilt University, Nashville, TN 37232. This compilation. of the papers presented to the Conference is divided into 16 categories dealing with all aspects of hazardous materials spills.
37. Tanker Safety Guide (Chemicals), 4 volumes, 1971, International Chamber of Shipping, 30-32 St. Mary Axe, London, EC3A 8ET, England. This publication outlines safety practices for all aspects of the operation of chemical tankers. Specific areas treated include fire protection, chemical reactivity.
38. Tanker Safety Guide (Liquefied Gas). International Chamber of Shipping. This guide deals with all aspects of the safe operation of LPG, ethylene and LNG vessels.
39. Chemistry of Hazardous Materials by Eugene Meyer, Prentice-Hall, Inc., Englewood Cliffs, NJ 1977, is a basic introductory text for newcomers to the field of hazardous materials.
40. Handbook of Industrial Loss Prevention, McGraw Hill Book Company, 330 West 42nd Street, New York, NY, second edition, 1967, contains recommended practices for the protection of property and processes against fire, explosion, lightning, wind, and earthquake.
41. Handbook of Reactive Chemical Hazards, by L. Bretherick, 1975. CRC Press, 18901 Cranwood Parkway, Cleveland, OH 44128. This book is a source of stability data on single specific compounds, on possible violent interaction between two or more compounds, general data on a class of compounds, and chemical structure associated with explosive instability.
42. Essentials of Toxicology, 3rd edition, 1978, by Ted A. Loomis. Describes mechanisms and other factors involved in the production of harmful effects of chemicals on biological cells, systems or whole animals.
43. Safety and Accident Prevention in Chemical Operations, H.H. Fawcett and W.S. Wood, John Wiley and Sons, New York, NY, 1965, contains practical information regarding personal safety, industrial health and loss prevention where chemicals are handled or used.

CHEMICAL HAZARDS RESPONSE INFORMATION SYSTEM (CHRIS)

MANUAL 1 COMDTINST M16465.11 A CONDENSED GUIDE TO CHEMICAL HAZARDS

Intended for use by response personnel who may be the first to arrive at the site of an accidental discharge or fire to assess the dangers and consider the appropriate large-scale response necessary to safeguard life and property (contains 1000 chemicals).

MANUAL 2 COMDTINST MI 6465.12 HAZARDOUS CHEMICAL DATA

This manual is the cornerstone of CHRIS. It lists the specific chemical, physical and biological data for about 1000 chemicals needed for the preparation and use of other components of the system. It is intended for use primarily by the On-Scene Coordinator (OSC) and by regional and National Response Centers for devising, evaluating and carrying out response plans.

MANUAL 3 COMDTINST M16465.13 HAZARD ASSESSMENT HANDBOOK

Describes procedures to be used for estimating the quantities of a hazardous chemical discharge onto a navigable waterway during shipment. also describes how to estimate its concentration in air and water as a function of time and distance from the discharge. Methods for predicting the resulting toxicity, fire, and explosion effects are also described.

MANUAL 4 COMDTINST M16465.14 RESPONSE METHODS HANDBOOK

Describes cautionary and corrective response methods for reducing and eliminating hazards that result from chemical discharge. Written specifically for Coast Guard personnel with training or experience in pollution response.

NOTE: Coast Guard offices can obtain CHRIS manuals at no cost through the directives system. All others must purchase the manuals from the Government Printing Office. Any questions with regard to the CHRIS system should be referred to:

Commandant (G-WER-2)  
Coast Guard Headquarters  
2100 2nd Street, S.W.  
Washington, DC 20593

CHRIS  
CHEMICAL HAZARDS RESPONSE INFORMATION SYSTEM  
PROCEDURES FOR OBTAINING MANUALS

ORDER FROM: SUPERINTENDENT OF DOCUMENTS  
GOVERNMENT PRINTING OFFICE  
WASHINGTON, D.C. 20402  
(202)-783-3238

Please confirm availability and price with GPO before placing your order.

MANUAL 1 COMDTINST M16465.1.1 A CONDENSED GUIDE TO CHEMICAL HAZARDS

CONTENTS order number: 050-012-00146-4  
BINDER order number: 050-012-00151-1

MANUAL 2 COMDTINST M16465.12 HAZARDOUS CHEMICAL DATA\*

CONTENTS order number: 050-012-00147-2  
BINDER order number: 050-012-90251-8

Enclosure(1) to MANUAL 2 Graphs of Temperature Dependent physical properties.\*

CONTENTS order number: 050-012-00158-S  
BINDER order number: 050-012-90251-8

MANUAL 3 COMDTINST M16465.13 HAZARD ASSESSMENT HANDBOOK

CONTENTS order number: 050-012-00160-0  
BINDER order number: 050-012-90251-8

MANUAL 4 COMDTINST M16465.14 RESPONSE METHODS HANDBOOK

CONTENTS order number: 050-012-00152-9  
BINDER order number: 050-012-90251-8

\* Manual 2 and Enclosure (1) to Manual 2 are two volume sets and two (2) binders are needed for each set.

REVISIONS:

- o Change 1 to MANUAL. 1; addition of 85 Chemicals and subsequent new "Index of Codes" for COMDTINST M16465.11  
order number: 050-012-00162-6
- o Change 2 to MANUAL 2; Addition to 85 chemicals and subsequent "Index of Codes" for COMDTINST M16465.12 and Enclosure (1) to MANUAL 2  
order number: 050-012-00165-1

Hazardous Materials, 1980 Emergency Response Guidebook Distribution Addresses

Emergency services (firefighters, police, first aid, and Civil Defense) may obtain the guidebook from:

The International Association of Fire Chiefs Attention ERG, 139  
18th Street, N.W.  
Washington, D.C. 20036

Industry may obtain the guidebook from any of the firms listed below:

American Trucking Assoc., Inc.,  
Customer Service Section  
1616 P Street, N.W.  
Washington, D.C. 20036  
(202) 797-5384

Labelmaster  
7525 N. Wolcott  
Chicago, IL 60626  
(800) 621-5808  
(312) 973-5100

J. J. Keller  
145 Wisconsin Avenue  
Neenah, WI 54956  
1-800-558-5011

UNZ and Company  
190 Baldwin Avenue  
Jersey City, NJ 07306  
(800) 631-3098  
(201) 795-5400 (NJ), (212) 432-1205 (NY)