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GUIDE FOR FACILITY SITE EVALUATION FOR PROPOSED MARINE TERMINAL--ETC(U)
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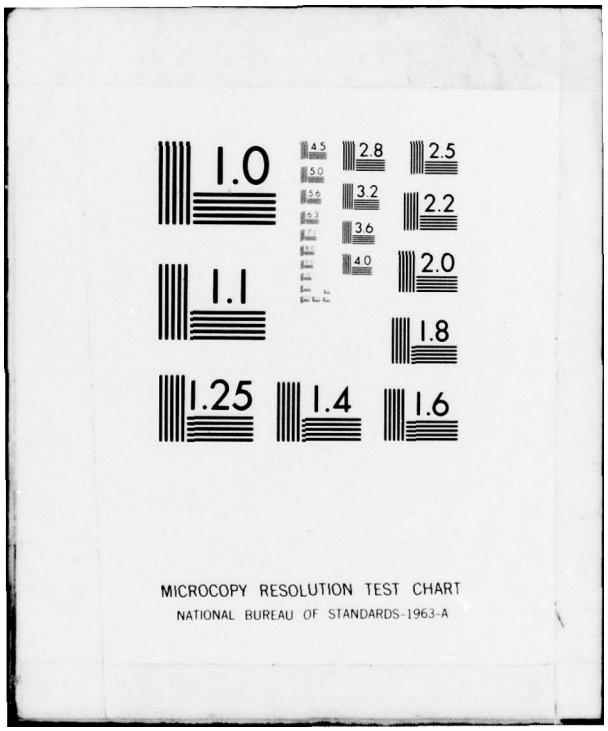
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Report No. CG-D-45-79

LEVEL II (14 86)

Guide For Facility Site Evaluation For Proposed Marine Terminals Handling Cargoes Of Particular Hazard

Planning Research Corporation
Systems Services Company
7600 Old Springhouse Road
McLean, Virginia 22102

AUGUST 1979
FINAL REPORT

Prepared for

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD
Office of Research and Development
Washington, D.C. 20590

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The Coast Guard research project leader for this task was Dr. John S. Gardenier, assisted by LCDR Frank J. Scaraglino. Responsible project monitors for the Port Safety and Security Program were, successively, LCDR Edward H. Bonekemper, and Mr. Richard D. White.

16. Abstract

A guide has been developed to present a servicewide standard set of factors to be considered when commenting on facility site evaluations for proposed marine terminals handling Cargoes of Particular Hazard (COPH) and Class A Explosives. Coast Guard involvement in facility siting is one indirect control via operational safety regulations and enforcement by advising all concerned parties of operation constraints and safety criteria to be applied. The Coast Guard also has the responsibility to review and comment on environmental impact statements for proposed facility sites and their involvement. The requirements for locating marine terminals handling COPH should satisfy factors designed to minimize the risk of accidents in the navigable waterway approach and at the berth and facility site and to minimize detrimental effects to the environment as well as considering the economic and public impact of vessel operation in port areas. The guide discusses the authority and responsibility of the Coast Guard and other federal organizations and presents factors to be considered to enable a consistent judgment and evaluation of proposed facility sites by Coast Guard personnel.

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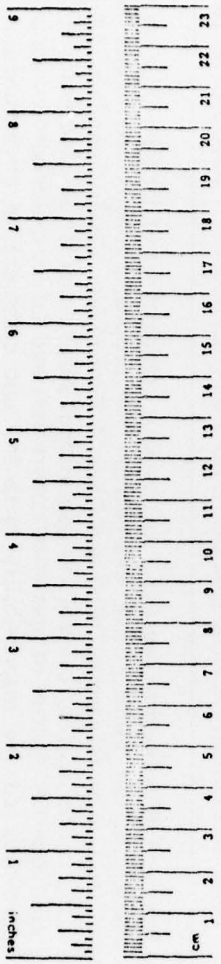
METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
	LENGTH			
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
	AREA			
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
	MASS (weight)			
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
	VOLUME			
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
	TEMPERATURE (exact)			
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

*1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures. Price $2.25. SD Catalog No. C13.10:286.



Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
	LENGTH			
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
	AREA			
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
	MASS (weight)			
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
	VOLUME			
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
	TEMPERATURE (exact)			
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F

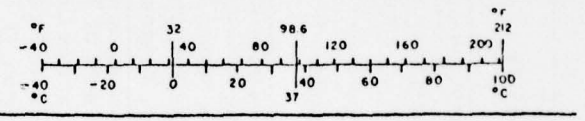


TABLE OF CONTENTS

I. INTRODUCTION

This guide has been developed to present a servicewide standard set of factors that must be considered by the Coast Guard when commenting on facility site evaluations for proposed marine terminals handling Cargoes of Particular Hazard (COPH) and class A explosives, both military and commercial. Cargoes of particular hazard are listed in title 33 CFR 124.14(b). (Note tables 1 and 2.) Class A explosives are listed in title 46 CFR 146.29-100 (military explosives) and title 49 CFR 172.101 (commercial explosives).

Much new building and rebuilding of port facilities is expected over the next decade to handle very hazardous cargoes. The U.S. Coast Guard, with its wide ranging responsibilities for port safety, is consulted by the marine industry, public interest groups and federal, state and local authorities about the safety, vessel traffic, and waterfront facility operations aspects of siting these marine terminals.

Coast Guard involvement in the matter of facility siting is one of indirect control via operational safety regulations and enforcement. Specified geographical locations for facilities are determined by state and local regulatory and zoning authorities. Coast Guard responsibility involves advising all concerned parties of operational constraints and safety criteria to be applied should the proposed site be approved and to determine whether vessels will be permitted access to a proposed site. Among the possible actions Coast Guard officials may take in carrying out these responsibilities are the establishment and operation of vessel traffic services, the control of vessel traffic in hazardous situations, the establishment of procedures and standards for the handling, loading, discharging, storage and movement of hazardous materials on water and waterfront structures and the establishment of water and shoreside safety zones.

The Coast Guard also has a responsibility to review and comment on environmental impact statements for proposed facility sites and their alternatives. For these responsibilities to be effective, there has to be not only an understanding of the factors involved but also a consistent application of these factors. The requirements for the location of a waterfront facility handling cargoes of particular hazard should satisfy factors designed to minimize the risk of accidents in the navigable waterway approach and at the berth and facility site and to minimize detrimental effects to the environment as well as considering the economic and public impact of vessel operation in port areas. For purposes of this guide, the

term "minimize" is used relative to the preferences among specified reasonable and feasible alternative sites or site characteristics that can meet the operational requirements of the proposed facility.

This guide discusses the authority and responsibility of the Coast Guard and other federal organizations and annotates selected legislation regarding facility siting. In the final section, considerations are presented along with all current applicable Coast Guard regulations to enable a consistent judgment and evaluation of proposed facility sites by Coast Guard personnel.

Table 1

Cargoes of Particular Hazard (COPH)

33 CFR 124.14(b)
(July 1, 1978)

Acetaldehyde	Ethylenimine
Acetone Cyanohydrin	Ethyl Ether
Acrolein	Hydrofloric Acid
Acrylonitrile	Hydrogen Chloride
Allyl Chloride	Hydrogen Fluroide
Anhydrous Ammonia	Methane
Butadiene	Methyl Acetylene
Butane	Methyl Bromide
Butene	Methyl Chloride
Butylene Oxide	Motor Fuel Anti-Knock Compounds
Carbon Disulfide	Oleum
Chlorine	Phosphorus - Elemental
Chlorosulfonic Acid	Propane
Dimethylamine	Propylene
Epichlorohydrin	Propylene Oxide
Ethane	Sulfur Dioxide
Ethylene	Toluene Diisocyanate
Ethylene Oxide	Vinyl Chloride

Table 2. Ports Handling Cargoes of Particular Hazard

1976

■ DISTRICT OFFICES
● PROPOSED FACILITIES
Ⓟ PROPOSED COPH

DISTRICT

CARGOES OF PARTICULAR HAZARD	COTP	1ST			2ND								3RD			5TH			7TH					8TH						9TH								11TH		12TH		13TH			14TH	17TH		
		BOSTON ■	PORTLAND	PROVIDENCE	ST. LOUIS ■	PITTSBURGH	HUNTINGTON	CINCINNATI	LOUISVILLE	NASHVILLE ●	MEMPHIS	PADUCAH	MINNEAPOLIS/ST. PAUL	NEW YORK ■	NEW LONDON	NEW HAVEN	ALBANY	PHILADELPHIA ●	NORFOLK ■	BALTIMORE	WILMINGTON	MIAMI ■	CHARLESTON	SAVANNAH ●	JACKSONVILLE ●	KEY WEST	TAMPA ●	SAN JUAN	NEW ORLEANS ■	MOBILE	PORT ARTHUR	GALVESTON	HOUSTON ●	CORPUS CHRISTI	CLEVELAND ●	BUFFALO	TOLEDO	DETROIT	CHICAGO	MUSKEGON	MILWAUKEE	SAULT STE. MARIE	DULUTH	LA/LB ● ●	SAN DIEGO	SAN FRANCISCO ● ●	MONTEREY	HUMBOLDT BAY	SEATTLE ■	PORTLAND	HONOLULU ●	GUAM	JUNEAU ●	ANCHORAGE	VALDEZ ●
ACETALDEHYDE																																																
ACETONE CYANOHYDRIN																																X	X																
ACROLEIN																																																
ACRYLONITRILE							X		X			X																X		X	X	X																
ALLYL CHLORIDE																																																
AMMONIA ANHYDROUS					X	X	X	X		X		X						X	X		X				Ⓧ	Ⓧ	X		X	X	X	X	X	X			X					Ⓧ		X			X			
BUTADIENE						X		X			X							X										X			X	X	X			X												
BUTANE		X	X	X	X	X							X					X	X									X	X		X		X	X						X		X			X		X		
BUTENE																																																
BUTYLENE OXIDE																																				X												
CARBON DISULFIDE																																																
CHLORINE						X	X		X	X		X		X				X											X		X	X	X	X									X	X			X		
CHLOROSULFONIC ACID																		X																														
DIMETHYLAMINE																		X																														
EPICHLOROHYDRIN														X																		X	X														
ETHANE																																																
ETHYLENE									Ⓧ									X									X																					
ETHYLENE OXIDE																		X																														
ETHYLENIME																																																
ETHYL ETHER																																																
HYDROFLUORIC ACID																																																
HYDROGEN CHLORIDE																		X																														
HYDROGEN FLUORIDE																		X																														
METHANE		X	Ⓧ															Ⓧ		Ⓧ			Ⓧ																		Ⓧ							Ⓧ	Ⓧ	
METHYL ACETYLENE																																																
METHYL BROMIDE																																				X												
METHYL CHLORIDE																		X																														
MOTOR FUEL–ANTI KNOCK COMPOUNDS																											X				X	X															
OLEUM						X	X	X			X			X				X	X											X	X		Ⓧ															
PHOSPHORUS–ELEMENTAL																																																
PROPANE								Ⓧ	X	X				X				X	X			X				X	X		X	X			X									X						X	X	X
PROPYLENE								Ⓧ	X	X																	X				X		X																
PROPYLENE OXIDE						X								X				X											X				Ⓧ																
SULFUR DIOXIDE														X				X																														
TOLUENE DIISOCYANATE														X				X											X		X																	
VINYL CHLORIDE						X								X				X								X			X		X	X																

BASED ON U.S. COAST GUARD INFORMATION

II. COAST GUARD RESPONSIBILITIES

The Port and Tanker Safety Act of 1978, as did its predecessor the Ports and Waterways Safety Act of 1972, provides the Coast Guard with considerable authority regarding vessel and port operations. The act states:

"The Congress finds and declares -

"(a) that navigation and vessel safety and protection of the marine environment are matters of major national importance;

(b) that increased vessel traffic in the Nation's ports and waterways creates substantial hazard to life, property, and the marine environment;

(c) that increased supervision of vessel and port operations is necessary in order to -

(1) reduce the possibility of vessel or cargo loss, or damage to life, property, or the marine environment;

(2) prevent damage to structures in, on, or immediately adjacent to the navigable waters of the United States or the resources within such waters;

(3) insure that vessels operating in the navigable waters of the United States shall comply with all applicable standards and requirements for vessel construction, equipment, manning, and operational procedures; and

(4) insure that the handling of dangerous articles and substances on the structures in, on, or immediately adjacent to the navigable waters of the United States is conducted in accordance with established standards and requirements; and

(d) that advance planning is critical in determining proper and adequate protective measures for the Nation's ports and waterways and the marine environment, with continuing consultation with other Federal agencies, State representatives, affected users, and the general public, in the development and implementation of such measures."

The act further directs the Coast Guard to consider, at least, the following topics in carrying out its responsibilities in establishing vessel operating requirements:

1. The scope and degree of the risk or hazard involved;
2. Vessel traffic characteristics and trends;
3. Port and waterway configurations and variations in local conditions of geography, climate and other similar factors;
4. The need for granting exemptions;
5. Proximity of fishing grounds, oil and gas drilling and production operations;
6. Environmental factors;
7. Economic impact and effects;
8. Existing vessel traffic services; and
9. Local practices and customs.

Planning documents have stated that one of the concerns of the Coast Guard is "location siting for waterfront facilities handling hazardous materials." The Coast Guard's Port Safety Program has a clear impact on vessels, their cargo and the waterfront facilities through which the cargo passes. Great importance will be attached to a review of how well the Port Safety Program is accomplishing social, environmental and economic objectives.

On 7 February 1978, the Coast Guard and the Materials Transportation Bureau signed a Memorandum of Understanding (MOU) regarding the regulation of waterfront liquefied natural gas (LNG) facilities. Under the MOU, the Coast Guard has regulatory responsibility for:

1. Facility site selection as it relates to management of vessel traffic in and around a facility.
2. Fire prevention and fire protection equipment, systems, and methods for use at a facility.
3. Security of a facility.
4. All other matters pertaining to the facility between the vessel and the last manifold (or valve) immediately before the receiving tank(s).

The MOU provides that the Materials Transportation Bureau is responsible for:

1. Facility site selection except as provided in (1) above.
2. All other matters pertaining to the facility beyond (and including) the last manifold (or valve) immediately before the receiving tank(s) except as provided in (2) and (3) above.

The current regulations pertaining to navigation and port safety which relate, in varying degrees, to facility siting are found in:

Title 33 CFR

Subchapter A - General
Subchapter C - Aids to Navigation
Subchapter D - Navigation Requirements for Certain Inland Waters
Subchapter E - Navigation Requirements for the Great Lakes and St. Mary's River
Subchapter F - Navigation Requirements for Western Rivers
Subchapter G - Regattas and Marine Parades
Subchapter I - Anchorages
Subchapter J - Bridges
Subchapter K - Security of Vessels
Subchapter L - Waterfront Facilities; Security Zones; and Regulated Navigation Areas
Subchapter O - Pollution
Subchapter P - Ports and Waterways Safety

Title 46 CFR

Subchapter A - Procedures Applicable to the Public
Subchapter D - Tank Vessels
Subchapter I - Cargo and Miscellaneous Vessels
Subchapter N - Dangerous Cargoes
Subchapter O - Certain Bulk Dangerous Cargoes

Title 49 CFR

Subtitle B
Subchapter C - Hazardous Materials Regulations.

III. RESPONSIBILITIES OF OTHER FEDERAL ORGANIZATIONS

A. U. S. Army Corps of Engineers

The U.S. Army Corps of Engineers is an agency involved in port and waterway activities. Title 33 CFR 320-329 describes the U. S. Army Corps of Engineers permit program. A permit is required when locating a structure, excavating, or discharging dredged or fill material in or affecting navigable waters of the United States or transporting dredged material for the purpose of dumping it into ocean waters.

Some of the typical activities requiring permits are as follows:

- Artificial Canals
- Artificial Islands
- Beach Nourishment
- Boat Ramps
- Breakwaters
- Bulkheads
- Dams, Dikes, Weirs
- Discharging:
  - Sand
  - Gravel
  - Dirt
  - Clay
  - Stone
- Dolphins
- Dredging
- Filling
- Groins and Jetties
- Intake Pipes
- Levees
- Mooring Buoys
- Ocean Dumping
- Outfall Pipes
- Pipes and Cables
- Piers and Wharves
- Riprap
- Road Fills
- Signs
- Tunnels

A useful pamphlet providing basic, general information on the permit program is entitled: "U.S. Army Corps of Engineers Permit Program. A Guide for Applicants," EP 1145-2-1, dated 1 November 1977. It may be obtained from the:

Department of the Army
Office of the Chief of Engineers
Washington, D.C. 20314

B. Environmental Protection Agency (EPA)

The Environmental Protection Agency is an independent agency of the executive branch. The EPA is charged with administering portions of the Federal Water Pollution Control Act and the Clean Air Act, among others. This responsibility entails reviewing state programs for effluent and emission standards, issuing federal standards and regulating the discharge, dumping or other factors affecting water or air quality.

The EPA is responsible for most air and water quality programs including aspects of oil pollution control and implements and enforces standards in this area. All projects affecting the marine environment must receive a water quality certificate and approval issued by EPA before work can commence.

The EPA shares authority with the Coast Guard in the enforcement of marine pollution laws and response efforts. In addition, the EPA and the Coast Guard coordinate on research and development of pollution abatement systems.

C. Federal Energy Regulatory Commission (FERC)

The Federal Energy Regulatory Commission is an agency of the Department of Energy. The Natural Gas Act of 1938 (15 USC 717 et seq.) provides the Federal Energy Regulatory Commission with the authority to regulate the transportation of natural gas by pipeline in interstate or foreign commerce. This includes the authority over the site, design, construction and operation of liquefied natural gas import and export terminals, storage facilities and pipelines in interstate commerce.

The National Environmental Policy Act of 1969 (42 USC 4321 et seq.) authorizes FERC to consider the safety aspects of proposed natural gas facilities. This responsibility is included in the preparation of detailed environmental impact statements for such facilities which may affect the quality of the human environment.

D. Council on Environmental Quality (CEQ)

The Council on Environmental Quality is an independent agency of the executive branch and coordinates environmental programs of all federal agencies.

E. Department of the Interior (DOI)

The Department of the Interior requires permits to be issued where construction or operation of facilities affect the wildlife of the area. The agencies most involved within the DOI are the Bureau of Land Management, the Geological Survey and the U.S. Fish and Wildlife Service.

F. Federal Communications Commission (FCC)

The Federal Communications Commission requires licenses to be issued for all radio operations, including those of all facilities.

G. Materials Transportation Bureau (MTB)

The Office of Pipeline Safety Regulation, a division of the Department of Transportation's Materials Transportation Bureau, establishes and enforces safety standards for all pipelines in interstate or foreign commerce. The Coast Guard and the Materials Transportation Bureau have signed a Memorandum of Understanding regarding the division of responsibilities for liquefied natural gas waterfront facilities.

H. U.S. Maritime Administration (MARAD)

The Maritime Administration, an agency of the Department of Commerce, provides financial assistance for the construction and operation of certain U.S. flag vessels. It conducts programs to develop ports, facilities and intermodal transport and to promote domestic shipping. MARAD also carries out research and development on many maritime activities including the safe operation and navigation of vessels.

Note: Other federal organizations may have an impact on facility siting. Many state and local agencies have key responsibilities in facility siting.

IV. SELECTED LEGISLATION ANNOTATED

A. Port and Tanker Safety Act of 1978

(P.L. 95-474; 92 Stat. 1471, 33 USC 1221 et seq.)

The Port and Tanker Safety Act of 1978 amends the Ports and Waterways Safety Act of 1972 and provides the Coast Guard with authority to prescribe standards and regulations to promote safety of vessels and structures in or adjacent to the navigable waters of the United States and to protect such waters and their resources from environmental harm due to damage or loss of vessels and structures.

B. Federal Water Pollution Control Act Amendments of 1972

(P.L. 92-500; 86 Stat. 816, 33 USC 1321 et seq.)

Section 401 requires any applicant for a federal license or permit to conduct any activity which may result in a pollutant being discharged into the navigable waters of the United States to provide a certificate from the state in which the discharge originates or will originate and to indicate the discharge will comply with the appropriate effluent limitations and water quality standards. A certificate for the construction of any facility must also fulfill the requirements for the operation of such facility.

C. Department of Transportation Act of 1966

(P.L. 89-670; 80 Stat. 931, 49 USC 1651 et seq.)

Establishes the Department of Transportation and places the Coast Guard under its jurisdiction. Declares that the general welfare, the economic growth and stability of the nation and its security require the development of national transportation policies and programs conducive to the provision of fast, safe, efficient and convenient transportation at the lowest cost consistent therewith and with other national objectives, including the efficient utilization and conservation of the nation's resources.

D. Dangerous Cargo Act of 1952
(46 USC 170)

Directs the Coast Guard to identify all dangerous cargoes, prescribe regulations establishing standards for the transportation and handling of explosives and other dangerous cargoes and for inspection to ensure compliance with these regulations.

E. Magnuson Act of 1950
(50 USC 191-2)

When the President determines the security of the United States is threatened, the Magnuson Act authorizes the Coast Guard to establish rules and regulations governing the anchorage and movement of any vessel, foreign or domestic, including the control of such vessel to prevent damage or injury to any harbor or waters of the United States. Executive Orders 10173, 10277, and 10352 are the Presidential determinations. These determinations authorize the Coast Guard to supervise and control the marine transportation, loading and unloading of dangerous cargoes, and to require facility owners and operators to obtain a Coast Guard permit for the waterfront facilities used to handle such cargo.

F. Transportation Safety Act of 1974
(P.L. 93-633; 88 Stat. 2156, 49 USC 1801 et seq.)

Declares the policy of Congress to protect the nation adequately against the risks to life and property which are inherent in the transportation of hazardous materials in commerce.

Authorizes the Secretary of Transportation to designate those materials in commerce which may pose an unreasonable risk to health and safety of property as hazardous materials and to regulate any safety aspect of the transportation of such materials.

G. Deepwater Port Act of 1974
(P.L. 93-627; 88 Stat. 2126, 33 USC 1501 et seq.)

Permits the Secretary of Transportation to authorize and regulate the location, ownership, construction and operation of deepwater ports beyond the territorial limits of the United States. Provides for the protection of the marine and coastal environment to prevent or minimize adverse impacts of deepwater ports. Protects the rights and responsibilities of the states and communities to regulate growth, determine land use and otherwise protect the environment.

H. National Environmental Policy Act of 1969
(P.L. 91-190; 83 Stat. 852, 42 USC 4321 et seq.)

Declares national policy to promote efforts to prevent or eliminate damage to the environment and to stimulate the health and welfare of man, to enrich the understanding of the ecological systems and natural resources important to the nation and to establish the Council on Environmental Quality. The act requires that major federal actions significantly affecting the quality of the human environment be accompanied by a detailed statement of the impact to the environment.

I. Federal Power Act of 1920, as amended
(41 Stat. 1063, 16 USC 791a et seq.)

Authorizes the Federal Energy Regulatory Commission (formerly the Federal Power Commission) to issue licenses to construct, operate and maintain dams, water conduits, reservoirs, power houses, transmission lines or other projects for the development and improvement of navigation and utilization of power along or over the navigable waters of the United States. When such project will affect the navigable capacity of the waterway approval must be obtained from the Corps of Engineers.

J. River and Harbor Act of 1899
(30 Stat. 1151, 33 USC 401 et seq.)

Authorizes the Corps of Engineers to protect navigation and the navigable capacity of the nation's waters. The act requires permits for construction of structures, excavating and discharging dredged, fill materials or refuse matter into navigable waters of the United States. The act also permits the establishment of harbor lines indicating the navigable areas to be protected.

K. Coastal Zone Management Act of 1972
(P.L. 94-370; 90 Stat. 1013, 16 USC 1451 et seq.)

Provides assistance in the form of annual grants, to any coastal state to aid in the development of a management program for the protection and restoration of resources in the coastal zone. Each management program shall be approved by the Secretary of Commerce. All federal agencies conducting activities affecting a state's coastal zone will comply, to the maximum extent possible, with the approved state coastal zone management program. Any activity in a state's coastal zone requiring a federal license or permit shall comply with the state's management program and shall be so certified by the state.

L. Marine Protection, Research and Sanctuaries Act of 1972, as amended
(P.L. 92-532; 86 Stat. 1052, 16 USC 1432)

Provides authority to the Environmental Protection Agency and the Corps of Engineers to issue permits for ocean dumping subject to regulations issued by the Coast Guard. The act stipulates that the Secretary of Commerce in coordination with the Coast Guard and the Environmental Protection Agency shall initiate a program of monitoring and research regarding the effects of ocean dumping. The act also provides authority to the Secretary of Commerce, after consultation with other interested federal agencies, to designate areas on the Continental Shelf, coastal areas and the Great Lakes as marine sanctuaries to preserve or restore such areas for their conservation, recreational, ecological or aesthetic values.

M. Preservation of Historical and Archaeological Data Act of 1974
(P.L. 93-921; 88 Stat. 174, 16 USC 469 et seq.)

Provides for the recovery, protection and preservation of significant scientific, prehistorical, historical or archaeological data in connection with any federal construction or federally licensed project which may cause irreparable loss or destruction of such data.

N. National Historic Preservation Act of 1966
(P.L. 89-665; 80 Stat. 915, 16 USC 470)

Declares the federal government shall provide leadership in preserving, restoring and maintaining the historic and cultural environment of the nation. Creates the National Register of Historic Places. Establishes a program to preserve, protect and designate historic places.

O. Wild and Scenic Rivers Act of 1968
(P.L. 90-542; 82 Stat. 906, 16 USC 1271 et seq.)

Designates and provides for future designation of selected rivers or sections thereof to be preserved in their free-flowing condition to protect the water quality of such rivers and to fulfill other vital national conservation purposes. All federal agencies shall give due consideration in their planning for the use and development of water and related land resources on all designated waters or those with potential for future designation.

P. Endangered Species Act of 1973
(P.L. 93-205; 87 Stat. 884, 16 USC 1531 et seq.)

Provides a means to protect the endangered and threatened species of fish, wildlife and plants by conserving the ecosystems upon which the species depends. It is the declared policy of Congress that all federal departments and agencies utilize their authorities to conserve and protect endangered and threatened species.

Q. Fish and Wildlife Coordination Act of 1958
(P.L. 85-624; 72 Stat. 563, 16 USC 661 et seq.)

Recognizes the vital contribution of our wildlife resources to the nation and provides that wildlife conservation shall receive equal consideration with other features of water resource development programs. Requires consultation with the U.S. Fish and Wildlife Service whenever the waters of any stream or other body of water is controlled or modified for any purpose including navigation or construction.

R. Fish and Wildlife Act of 1956
(16 USC 742a et seq.)

Declares that the fish, shellfish, and wildlife resources of the nation make a valuable contribution to our economy and food supply. Requires the Secretary of Commerce to take such steps as may be required for the development, advancement, management, conservation and protection of the fisheries and wildlife resources of the country.

V. USE OF GUIDE

This guide is designed to assist Coast Guard personnel in replying to inquiries relating to the siting of new facilities which are to handle cargoes of particular hazard (COPH) and class A explosives, both military and commercial. It provides basic, general guidance to be used in conjunction with the experience and knowledge of local officials, persons involved with marine activities and public interest groups for information submitted on specific sites and proposed alternatives. This guide may also be used for the preparation of comments for other proposed waterfront facilities.

This guide does not apply to existing facilities or to the expansion of existing facilities (i.e., additional storage tanks, increasing berth size, modernizing plant, adding land for buffer zone). Portions of the the guide may be used to provide advice under these conditions, but it is not intended for this purpose.

Coast Guard responsibility for facility siting is one of indirect control by way of operational safety regulations and enforcement. Approval of specific geographic locations for facilities is a matter for state and local authorities. Coast Guard responsibility involves advising all parties of operational constraints and safety criteria to be applied should the proposed site be approved and determining whether and under what operating restraints vessels will be permitted access to a proposed site. It should also be noted that these Coast Guard actions may impact other maritime traffic and operations by restricting other vessel traffic or by terminating other transfer operations.

Each geographic area is unique and communities differ in their perceptions of safety for marine transportation. Care must be taken in the application of the "factors to be considered," listed in section VII when providing comment on facility siting. The differences in and between river and ocean ports must be well understood and considered in the application of each factor. All factors should be considered in relation to one another in a systematic manner. This approach will involve necessary tradeoffs between safety, environmental and economic factors. Potential hazards may be effectively mitigated by design criteria or self-imposed operational constraints.

Evaluating the impact of the proposed facility as perceived by the public requires an understanding of local attitudes. The Port and Tanker Safety Act of 1978 recognizes this fact when it discusses Coast Guard duties and responsibilities in establishing vessel operating requirements by stating:

> "at the earliest possible time, consult with and receive and consider the views of representatives of the maritime community, ports and harbor authorities or associations, environmental groups, and other parties who may be affected by the proposed action."

Bear in mind that the primary authority of the Coast Guard involves a determination of whether or not or under what conditions vessels will be permitted access to a proposed site and the operations to be conducted on facilities adjacent to the navigable waters of the United States. However, as has been stated, the Port and Tanker Safety Act of 1978 requires the Coast Guard to "take into account all relevant factors concerning navigation and vessel safety and the protection of the marine environment." Due consideration of all factors involved is, therefore, essential.

VI. CATEGORIES TO BE CONSIDERED

A. Port and Waterway Safety Considerations

1. Depth of Water
2. Width of Channel
3. Aids to Navigation
4. Vessel Traffic Patterns
5. Anchorage Area
6. Maneuvering Area
7. Exposure to Weather
8. Tides and Currents

B. Waterfront Facility Safety Considerations

1. Land Area Available
2. Location
3. Availability of Emergency Response
4. Operational Plans
5. Contingency Plans
6. Security
7. Proximity of Fault Zones

C. Public Interest Considerations

1. Population Density
2. Hazardous Facilities
3. Economic Impact
4. Local Zoning
5. Local Infrastructure

D. Environmental Considerations

1. Physical Impact
2. Biological Impact
3. Historical or Archaeological Impact
4. Operational Plans
5. Contingency Plans

VII. FACTORS TO BE CONSIDERED

A. Port and Waterway Safety Considerations

OBJECTIVE: To minimize the possibilities of collisions, rammings, and groundings by vessels carrying COPH while enroute to a marine terminal.

1. Depth of Water

The depth of water in the channel and at the berth must provide sufficient underkeel clearance for the safe maneuverability of the vessel to minimize the possibilities of groundings. The depth of water required to provide for safe maneuvering is affected by such factors as the range of tides, type of bottom, climatic conditions and speed of the vessel among other things. In open water at the entrance of a harbor channel a larger margin of safety for underkeel clearance may be necessary to compensate for the roll and pitch of the vessel.

GUIDANCE: No absolute Coast Guard criteria exist. The Corps of Engineers states that "The design depth of the channel will be premised upon the drafts of the design vessel while in motion, including the effect of squat, rolling, and pitching; plus a nominal clearance of 2 or more feet; plus an allowance for frequent low tides that are below mean low water, when vessel delay is uneconomical, or minus an allowance for some stage above mean low water when the resulting delay of vessels is not uneconomic."[1] Other federal and state agencies have used a 10 percent safety margin over the minimum depth at mean low water compared to the operating draft of the vessel as a guide. This figure is not a requirement and shall be adjusted on the basis of local conditions and practices.

2. Width of Channel

The width of the channel must be sufficient to minimize the possibilities of collisions, rammings, and groundings. The width of channel needed to provide a reasonable margin of safety is affected by such factors as the amount

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1. Department of the Army, Engineering and Design. Tidal Hydraulics (Office of the Chief of Engineers, Engineer Manual EM 1110-2-1607, August 2, 1965), p. 7.

of traffic, type of vessels, waterway configuration, channel contours and obstructions among others. If potential vessel control problems exist due to the width of the channel, they may be subject to mitigation by the use of such operational requirements as reduced vessel speed, tug assistance, bridge-to-bridge communications and vessel traffic services among others.

> GUIDANCE: No Coast Guard criteria exist for the width of a channel. The Corps of Engineers has no formula for channel width[1] but does have a formula for channel width in bends.[2] Other federal and state agencies have used a figure of three times the beam of the vessel, plus a 10 percent factor of safety for one-way traffic in straight channels. This figure is not a requirement and shall be adjusted on the basis of local conditions, practices, and operational requirements. Operational requirements may be imposed by the Coast Guard on the navigating vessel or other vessel traffic.

3. Aids to Navigation

The aids to navigation in the channel and the berth area should be sufficient and properly maintained for the safe navigation of vessels. Updated and detailed charts for the area should be available and in use. A consideration should be made for the need of additional aids to navigation to minimize the possibility of vessel accidents.

> GUIDANCE: The Coast Guard is authorized to establish and maintain aids to navigation to serve the needs of maritime commerce (33 CFR Part 60) and to enforce the appropriate Rules of the Road (33 CFR Parts 80-96). The Coast Guard is authorized to permit the establishment of private aids to navigation (33 CFR Part 66). The Coast Guard requires certain vessels to have on board and use updated charts for the area of operation (33 CFR Part 164).

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1. Department of the Army, Engineering and Design. Tidal Hydraulics (Office of the Chief of Engineers, Engineer Manual EM 1110-2-1607, August 2, 1965), p. 10.
2. Department of the Army, Channel Widths for Navigation in Bends (Office of the Chief of Engineers, Engineer Technical Letter No. 1110-2-225, July 1, 1977).

4. Vessel Traffic Patterns

Vessel traffic patterns in a harbor should be such as to minimize the possibilities of vessel accidents. In areas of moderate to heavy traffic, well defined traffic patterns, local practices and customs and established vessel traffic services are mitigating factors. The use of tugs, speed restrictions or other operational requirements should be considered. Where needed, an appropriate vessel traffic service or regulated navigation area should be considered.

GUIDANCE: The Coast Guard has the authority to regulate vessel traffic, to establish appropriate operating requirements and to establish vessel traffic routing schemes (33 CFR Part 160).

5. Anchorage Area

An anchorage area, designated for vessels carrying COPH, located near the harbor entrance may be beneficial in emergency situations and in minimizing the possibilities of vessel accidents. The need for designated anchorage areas is affected by many factors such as berth availability, occurrences of restricted visibility, operational restrictions, amount of harbor traffic and occurrences of adverse weather conditions among others.

GUIDANCE: The Coast Guard is authorized to establish anchorage areas whenever the maritime or commercial interests of the United States requires them for safe navigation (33 CFR Part 109). Requirements for vessels at anchor are contained in 33 CFR Part 164. The Corps of Engineers states that, "The depth of water within the anchorage will be based on the static draft of the design vessel in the as-loaded condition at the site of the anchorage, plus 1 foot for maneuvering. Consideration will be given to increased depth to provide for below normal tides."[1]

6. Maneuvering Area

Maneuvering areas located in the vicinity of berths may be beneficial in minimizing the possibilities of vessel accidents. The need for maneuvering areas is affected by factors such as operational requirements for mooring

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1. Department of the Army, Engineering and Design. Tidal Hydraulics (Office of the Chief of Engineers, Engineer Manual EM 1110-2-1607, August 2, 1965).

the vessel with the bow toward the sea or downstream, width of channel, traffic volume, barge fleeting areas, and adverse currents among others. The size of maneuvering areas is affected by factors such as vessel equipment (i.e., bow thrusters, twin screws), availability and use of tugs, type of other traffic (barge, vessel, recreational boats), and geography of the area among others.

GUIDANCE: No absolute Coast Guard criteria exist for maneuvering areas. The Corps of Engineers states that, "The depth of water within the turning basin should be based on the static draft of the design vessel in the as-loaded condition at the site of the turning basin, plus 1 foot for maneuvering. The total width of the channel and the turning basin will normally be 150 percent of the length of the design vessel. Its shape will be that of a trapezoid with the long side tangent to the edge of the channel. The short side will normally be 150 percent of the length of the design vessel. The ends will make angles of 45 degrees with the edge of the channel."[1] Other federal and state agencies have stated the need for turning basins near the berth with a diameter of twice the length of the vessel. This figure is not a requirement.

7. Exposure to Weather

Exposure to abnormal weather conditions should be considered to minimize the possibilities of vessel accidents. Weather conditions affecting the safe operation of vessels are such things as high winds, hurricanes, tsunamis, flooding, restricted visibility and ice formation. These factors should be considered in determining the safety of navigation and the safety of a vessel while moored. Consideration should also be given to mitigating factors such as special operating requirements to regulate traffic and design features such as breakwaters, bulkheads, moorings and berth alignment.

GUIDANCE: The Coast Guard is authorized to control vessel traffic and restrict vessel operations under adverse weather conditions and reduced visibility. In addition, the

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1. Department of the Army, Engineering and Design. Tidal Hydraulics (Office of the Chief of Engineers, Engineer Manual EM 1110-2-1607, August 2, 1965), p. 13.

Coast Guard may direct the anchoring, mooring or movement of a vessel when necessary to prevent damage to or by that vessel or her cargo, stores, supplies or fuel (33 CFR Part 160).

8. Tides and Currents

Tides and currents should be considered in minimizing the possibilities of collisions, rammings and groundings. High ranges of tides and strong currents or crosscurrents may cause navigational or mooring problems. Where deemed appropriate, consideration could be given to mitigating factors such as special operating requirements for the use of tugs and design features to eliminate hazards of cargo transfer operations and line tending among others.

GUIDANCE: Coast Guard requirements for tide and current considerations during transfer operations from portable tanks are contained in 46 CFR subpart 98.30. No other absolute Coast Guard criteria exist except for the safety of navigation and operations. Some federal and state agencies specify tide and current limitations.

B. Waterfront Facility Safety Considerations

OBJECTIVE: To minimize the possibilities and potential effects of accidents at waterfront facilities handling COPH.

1. Land Area Available

The land area available should be sufficient to minimize the potential effects to the port area of an accident at the waterfront facility. The provision of sufficient land area is affected by many factors including type of operation, commodity handled, type of adjacent facilities and design features (i.e., dikes, berms) among others.

GUIDANCE: The Coast Guard has no absolute criteria for determining the amount of land required. Some federal and state agencies do require specified land area for certain facilities.

2. Location

The specific location of a facility should be such as to minimize the potential effects of accidents. Remote or industrial areas are preferred. The location is affected by many factors including the type of present and projected population densities, type of commodities handled on or at adjacent facilities and the design of the facility among others. Other considerations include access to distribution lines, such as pipelines, rail and truck routes and local zoning.

GUIDANCE: The Coast Guard has no criteria for land side location of facilities. This determination is made by state and local authorities. Coast Guard regulations for deepwater port site evaluations are contained in 33 CFR Part 148.

3. Availability of Emergency Response

Emergency response should be available to minimize the potential effects of accidents at waterfront facilities. Emergency response encompasses fire fighting, rescue and medical assistance. The need for outside emergency response is affected by factors such as in-house capability, completeness of disaster plans, containment features and commodities handled among others. For effective emergency response, the facility should be rapidly accessible by road and should have communications capability. Where outside emergency

equipment and personnel are depended upon in times of need, training and education for those personnel in the commodities handled and in the configuration of the facility is highly desirable.

GUIDANCE: The Coast Guard is considering a requirement for all facilities to have an emergency manual and trained personnel for emergency situations. Some federal and state agencies require emergency response capabilities.

4. Operational Plans

Operational plans should be formulated to minimize the possibilities of accidents at waterfront facilities. Operational plans could include a description of the facility, operating procedures, type and quantity of commodities routinely handled, duties and responsibilities of operating personnel, names and telephone numbers of supervisory personnel and emergency organization, location and facilities of any personnel shelter, description of any training program and a description of any maintenance, repair and retest programs for operational, emergency and safety equipment, among others.

GUIDANCE: The Coast Guard has no requirement for operational plans for facilities handling COPH. However, the Coast Guard is considering a requirement for all facilities to have an approved operations manual. An Operations Manual for large oil transfer facilities is required by 33 CFR Part 154.

5. Contingency Plans

Contingency plans should be formulated to minimize the potential effects of accidents at waterfront facilities. Contingency plans could include procedures for general emergencies, fire control and fire fighting systems, emergency lighting and power systems, emergency shutdown, first aid, dock emergencies, response to release of commodity and response to other potential emergency situations. The contingency plan should include names and telephone numbers of persons or organizations to contact and the designation of a person-in-charge. The contingency plan should address proposed actions in the event of cargo release into the water and onto the facility.

GUIDANCE: The Coast Guard has no requirement for facilities to have contingency plans for COPH. However, the Coast Guard is considering a requirement for all facilities to have an approved emergency manual. An Operations Manual for large oil transfer facilities covering some of the above items in the Contingency Plan is required by 33 CFR Part 154. Emergency procedures for unmanned barges carrying bulk dangerous cargoes are required by 46 CFR Part 151.

6. Security

Security systems are important to minimize the possibilities of accidents at waterfront facilities. Security systems include physical or man-made boundaries to provide a reasonable degree of control to limit unauthorized access. The security system should also be designed to provide adequate surveillance, detect fire hazards, and check the readiness of protective equipment. The type of facility and the commodities handled along with the extent of the security plans and the availability of security oriented personnel are factors to be considered.

GUIDANCE: Present security regulations for waterfront facilities are contained in 33 CFR Parts 6, 121, 125 and 126. The Coast Guard is considering a regulation for security requirements for all facilities. Some federal and state agencies require security systems to be installed.

7. Proximity of Fault Zones

The proximity of fault zones should be considered to minimize the possibilities of accidents at waterfront facilities. Facility sites in areas with a low degree of seismic activity are preferred. The stability of soils and bedrock, construction codes and design standards are factors to be considered in siting facilities.

GUIDANCE: The Coast Guard has no criteria for the proximity of fault zones to facility sites. Some federal and state agencies have such criteria.

C. Public Interest Considerations

OBJECTIVE: To consider the potential detrimental effects to the public of vessels and facilities carrying or handling COPH.

1. Population Density

The present and projected population densities along the vessel route and in the general area of the facility should be considered to minimize the potential detrimental effects to the public from vessels and facilities. Exposure to risk and the type of population (i.e., residential or industrial) are factors for consideration. Areas of low residential population are preferred.

GUIDANCE: The Coast Guard has no criteria for population density. Some state agencies have such criteria.

2. Hazardous Facilities

The potential effects to the public of hazardous facilities along the vessel route and adjacent to the facility should be considered. Hazardous facilities would include nuclear plants, major refineries and other facilities that handle COPH or other regulated cargoes. Facility design factors such as dikes and berms, the elimination of potential gas pockets, and isolation of control station equipment and personnel from adverse external hazards would be considered as mitigating factors. Special operational requirements or traffic controls and safety of navigation in the vicinity of the facility should also be considered. In addition, sensitive national defense facilities should be similarly considered.

GUIDANCE: The Coast Guard has the authority to impose special operating requirements to regulate traffic (33 CFR Part 160). Some federal and state agencies have such criteria.

3. Economic Impact

The economic impact of such things as the amount of initial and maintenance dredging required, establishment of vessel traffic services, designation of fairways and traffic separation schemes and the imposition of special operating requirements, among others, should consider the potential effects to the public. Industry considerations of economic impacts include availability of raw materials, market for products, transportation lines for distribution of products, land acquisition, construction costs, disruption to area during construction, availability of skilled labor force, and the quality of life afforded its labor force.

GUIDANCE: The Coast Guard has no specific criteria relating to economic impacts. However, when vessel traffic services, fairways, traffic separation schemes and other Coast Guard operations are studied for implementation, the economic impact is a factor that is considered. The Corps of Engineers, similarly, considers the economic impact on their waterway operations.

4. Local Zoning

Local zoning requirements, comprehensive regional development plans and coastal zone management regulations are enacted by state and local communities. They should be well understood and not conflict with proposed sites for facilities handling COPH.

GUIDANCE: The Coast Guard has no criteria in this area. State and local communities do have specific criteria.

5. Local Infrastructure

The local infrastructure should be considered in regard to the potential effects of facility siting to the public. The infrastructure of a community is affected by many factors including the impact of new facilities on existing facilities, changes in transportation requirements, compatibility with public institutions in the area and suitability of hospitals and emergency services among others.

GUIDANCE: The Coast Guard has no criteria for considering local infrastructure aspects of facility siting.

D. Environmental Protection Considerations

OBJECTIVE: To consider the potential effects to the environment from vessels and facilities carrying or handling COPH.

1. Physical Impact

The physical impact to the environment from vessels and facilities handling COPH should be considered. Initial or maintenance dredging requires approval of the U.S. Army Corps of Engineers (33 CFR 322). Disposal of dredged materials into waters of the United States requires a permit from the Corps of Engineers (33 CFR 323). Ocean dumping sites are regulated by section 103 of the Marine Protection, Research and Sanctuaries Act of 1972. Discharges into the territorial sea are regulated by section 404 of the Federal Water Pollution Control Act Amendments of 1972. The Environmental Protection Agency is responsible for the development of national standards for air quality, emission standards for new stationary sources and emission standards for hazardous substances as well as the development of standards for the land disposal of hazardous waste and technical assistance in the development, management and operation of waste management activities. Local land-use classifications shall be given due consideration as factors reflecting public interest. The Wild and Scenic Rivers Act states that certain selected rivers shall be preserved and protected for the benefit and enjoyment of present and future generations.

GUIDANCE: Coast Guard regulations pertaining to pollution prevention are contained in 33 CFR Parts 151-159. Some federal and state agencies have established criteria in this area.

2. Biological Impact

The biological impact to the environment from vessels and facilities handling COPH should be considered. The site should not jeopardize the continued existence of endangered or threatened species. The Endangered Species Act of 1973 states that it is the policy of the Congress that all federal departments shall use their authorities to carry out this program of conservation. The Fish and Wildlife Act of 1956, the Migratory Marine Game-Fish Act and the Fish and Wildlife Coordination Act express congressional concern regarding the conservation of valuable aquatic habitats. Construction in wetland areas is required to be in accordance with state coastal zone management plans and should be such as not to disrupt this valuable public resource.

GUIDANCE: The Coast Guard has no specific criteria. Some federal and state agencies have established criteria in this area.

3. Historical or Archaeological Impact

The historical or archeological impact to the environment from vessels and facilities handling COPH should be considered. The Preservation of Historical and Archaeological Data Act of 1974 states that in any federal construction project or federally licensed project where historical or archaeological data is threatened the Secretary of the Interior may take action to recover and preserve the data before commencement of the project.

GUIDANCE: The Coast Guard has no specific criteria. Some federal and state agencies have established criteria in this area.

4. Operational Plans

Operational plans should be considered to minimize detrimental effects to the environment from facilities handling COPH. Operational plans could include a description of the facility, operating procedures, duties and responsibilities of operating personnel, names and telephone numbers of supervisory personnel and emergency organization, description of security systems and description of emergency shut-down procedures among others.

GUIDANCE: The Coast Guard has no requirement for operations plans for facilities handling COPH. However, the Coast Guard is considering a requirement for all facilities to have an approved operations manual. An Operations Manual for large oil transfer facilities is required by 33 CFR Part 154.

5. Contingency Plans

Contingency plans should be considered to minimize the detrimental effects to the environment from discharges of COPH. Contingency plans could include general emergency procedures for the control and stoppage of discharges, methods for removal and cleanup, description of commodities handled, description of design features and equipment to mitigate effects of discharges (i.e., dikes, berms, igniters), names and telephone numbers of persons or organizations to contact and designation of person-in-charge among others.

GUIDANCE: The Coast Guard has no requirement for facilities to have contingency plans for COPH. However, the Coast Guard is considering a requirement for all facilities to have an approved emergency manual. An Operations Manual for large oil transfer facilities covering the above items in the Contingency Plan is required by 33 CFR Part 154. Emergency procedures for unmanned barges carrying bulk dangerous cargoes are required by 46 CFR Part 151.