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SCOPE

This section provides a summary of standards and other references associated with the planning and design of marine terminal facilities, including terminal layout and berth spacing, vessel maneuvering requirements, cargo transfer equipment, and general safety systems. It does not cover shore side "offsite" facilities such as tankage, pumping systems, metering stations, marine terminal piping and manifolding other than fire protection layout and emergency shutdown and isolation systems. For guidance in these areas refer to [Offsites Design Practices \(Section XXIII\)](#).

REFERENCES

See attached **Table 1** and **Appendix A**

INTRODUCTION

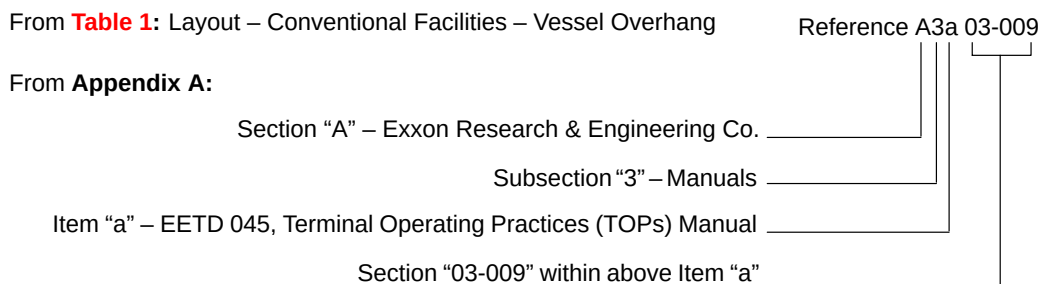
Petroleum industry marine terminal engineering is a relatively new and specialized technology field which has only come into being within the last 30 years. Currently, there are no universities or technical schools offering professional degrees in marine terminal engineering and technical specialists in the field do not have the ready references available to engineers working in civil, mechanical, chemical, or other long established engineering disciplines.

Many of the references and standards that are available in the marine terminal engineering field have been developed within the last 10 to 20 years, and have not been indexed or listed in a single comprehensive document for ready reference. Within Exxon, design standards for marine facilities have evolved to cover all aspects of marine terminal design, but only a few of these standards have been documented in International Practices [IP's] or Design Practices [DP's].

The purpose of this Design Practice is to provide a summary listing of available standards and other references approved for the design of marine terminals until more specific Exxon Design Practices can be developed.

DESIGN STANDARDS AND OTHER REFERENCES

Table 1 provides a summary of Standards and Other References for the listed topics associated with the design of Marine Terminals. Reference numbers are provided in the following format: Section/Subsection/Item/Section Within Item. For example, in **Table 1**, under Topic 5, "Layout – Conventional Marine Facilities – Vessel Overhang", the listed reference is A3a03-009. The associated reference in **Appendix A** is under **Section A** (Exxon Research & Engineering Co.), **Subsection 3**. (Manuals), **Item a**. (Document EETD 045, Terminal Operating Practices (TOPs) Manual) and **Section 3-009** within the referenced document as shown below:



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DESIGN STANDARDS AND OTHER REFERENCES (Cont)

The references in **Appendix A** are listed, under the following three major sources and numbered subsections to further categorize the documents by type and source:

1. Exxon Research and Engineering Company
 - a. International Practices
 - b. Design Practices
 - c. Manuals
2. Exxon USA Marketing Practices
3. Industry and Government Publication and Standards
 - a. OCIMF Oil Companies International Marine Forum
 - b. SIGTTO Society of International Gas Tanker and Terminal Operators
 - c. OCIMF/SIGTTO Joint Industry Publications – 1 & 2 Above (Plus Others)
 - d. USCG U.S. Coast Guard, Department of Transportation
 - e. US Army U.S. Army Corps of Engineers
 - f. API American Petroleum Institute
 - g. ABS American Bureau of Shipping
 - h. NFPA National Fire Protection Association
 - i. ASTM American Society for Testing Materials
 - j. BSI British Standards Institute
 - k. US Navy United States Naval Facilities Engineering Command
 - l. PIANC Permanent International Association of Navigational Congresses
 - m. MOD UK United Kingdom Ministry of Defense
 - n. AISC American Institute of Steel Construction
 - o. ANSI/ASME American National Steel Institute/American Society of Mechanical Engineers

Table 1 and **Appendix A** are not all inclusive lists. For example, in some cases local laws or regulations may be more stringent, and must be applied. There may also be additional guidelines, such as ER&E R&D reports, available in specific technical areas. Engineers seeking additional information should consult with senior technical personnel of ER&E's Marine Engineering Section.

In **Table 1**, the references listed under "Standards" are generally considered to provide the minimum design criteria which should be used in most situations unless the specific conditions associated with the location or berth justify a deviation.