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Dry Dock Standard

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PREFACE

This initial edition of *Dry Dock Standard*, ASCE/COPRI 77-22, is intended to address a deficiency in commercial shipyards, specifically safety certification of drydocking facilities. The US Navy has a standard (MIL-STD-1625) for certifying facilities that drydock their ships. The US Coast Guard has a procedure (SFLC 8634) for certifying facilities that drydock their ships. However, there is no commercial standard for certifying dry docks. Many dry dock owners/operators obtain "commercial certifications" from third-party engineers; however, these certifications are not performed to a standard and are typically focused on the structural capacity.

The dry dock standard provides requirements for issuing a certification that encompasses the structural design, material condition, maintenance practices, and operating procedures. This standard is intended for use by dry dock owners, Dockmasters, dry dock maintenance engineers, engineers engaged in dry dock inspection and certification, ship owners, and port engineers.

There have been many dry dock accidents over the past two decades that are attributable to inadequate maintenance and inspections. The intent of this standard is to minimize the risk to personnel and the ships being drydocked. In addition, emphasis on maintenance and inspection will provide the insight for facility owners/operators to enable repairs before the catastrophic loss of their capital asset.

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CHAPTER 1
GENERAL

1.1 SCOPE

This dry dock standard, herein referred to as the "standard," defines the minimum requirements to obtain and sustain dry dock certification. This standard covers the evaluation, inspection, maintenance, and operation of drydocking facilities.

To obtain dry dock certification in accordance with this standard, each drydocking facility shall undergo a *condition assessment*. On completion of the condition assessment, a dry dock certification, in the form of a Dry Dock Capacity Certificate, shall be issued for the dry dock's certified rated capacity and stability limitations (as applicable) by the certifying agency who conducted the condition assessment.

To maintain dry dock certification in accordance with this standard, the shipyard shall

- Establish and follow a maintenance program,
- Operate the facility in a safe manner as defined by this standard,
- Maintain records, and
- Have a certifying agency conduct periodic certification inspections.

Prior to the expiration date of the certification period, the shipyard shall have a dry dock certifying agency conduct *certification inspections* of the drydocking facility. On completion of the certification inspection, the certifying agency will issue an updated Dry Dock Capacity Certificate for the dry dock's certified rated capacity and stability limitations (as applicable). If the certification inspection discovers deficiencies that affect the dry dock's capacity, operational limitations, stability limitations (as applicable), or safe operation, the certifying agency shall require a new condition assessment for the deficient items.

This standard does not cover the following:

1. Personnel safety requirements;
2. Shipyard health and safety requirements;
3. Environmental and pollution compliance and control systems;
4. Design and construction of drydocking facilities;
5. Vessel handling equipment such as lines;
6. Vessel transfer systems;
7. Weight handling systems such as cranes;
8. Service systems such as potable water, heating, and ventilation; and
9. Industrial systems such as welding, burning equipment, and abrasive blast equipment.

Section 1.3 contains definitions, symbols, and notations used in this standard. Appendix A contains sample dry dock certification inspection checklists. Appendix B contains sample dry dock maintenance tasks. Appendix C contains sample drydocking checklists for use before, during, and after a drydocking operation.

1.2 APPLICATION

This standard applies to floating dry docks, graving docks, marine railways, and vertical lifts.

1.3 DEFINITIONS, SYMBOLS, AND NOTATION

Explanations of basic terms used in this standard.

Anode: An electrode at which oxidation of its surface is occurring. *See* **Cathodic Protection**.

Aspect Ratio: The ratio of a block's height divided by its base dimensions.

Ballast: Liquid or solid mass loaded on a vessel, dry dock closure gate, or floating dry dock to improve stability and trim. Temporary ballast is usually water stored in dedicated tanks. Permanent ballast is usually solid lead castings or concrete.

Baseline Height: A horizontal plane of the ship used as a reference for vertical measurement. Usually, the top of the keel blocks and identified on the docking plan.

Block Load: The force on a keel or side block owing to gravity, seismic, and wind forces acting on a vessel.

Bollard: A mooring bit, usually located alongside the top of a dry dock wall.

Bulkhead: (1) A vertical *structural* partition dividing a vessel's interior into various compartments for strength and safety purposes, (2) term applied to vertical partition walls subdividing the interior of a vessel, closure gate, or floating dry dock into separate compartments, or (3) a retaining wall used as a form of coastal management, akin to a seawall.

Buoyancy: The upward push of water pressure, equal to the weight of the volume of water that the vessel or dry dock displaces.

Capstan: Steel warping drum that rotates on a vertical axis for the handling of mooring lines.

Caisson (Caisson Gate): (1) The floating entrance gate to a graving (basin) dry dock, or (2) a cast in place concrete pile/column, usually of large diameter.

Cathodic Protection: A method to reduce corrosion of steel structures by minimizing the difference in potential between the anode and cathode. The two main types used in dry docks are *sacrificial anode protection systems*, which utilize sacrificial aluminum, magnesium, or zinc anodes; and *impressed current cathodic protection systems* (ICCP), which utilize current flow to the anode from an external power source.

Center of Buoyancy: The centroid of the submerged volume of a vessel or vessel/dry dock system.

Center of Gravity: The location at which an object's weight could be replaced by a concentrated force without changing its behavior.