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An American National Standard

Standard Guide for Marine Vessel Structural Inspection Considerations[1]

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1. Scope

1.1 This guide covers information to develop and implement a marine vessel inspection process. It is intended to provide considerations for persons interested in planning, organizing, and implementing a structural survey plan for a marine vessel, especially during the design phase of the vessel. It is intended to be used in conjunction with any other required inspection or survey requirements but can form the basis for such planning in the absence of other such applicable requirements.

1.2 This guide provides owners, operators, shipyards, and designers with a plan for developing a detailed inspection process that covers all stages of the operating life of a marine vessel, including the design, construction, and in-service periods. This plan may be developed and used in concert with classification society and flag state surveys and inspections.

1.3 This guide also provides the basis for development of a recommended corrective action plan for typical structural deficiencies or deviations, or both.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

1.5 All portions of this guide may not be applicable to all vessels or shipyards since many yard-specific standards to ensure contracted level of quality are in existence.

2. Referenced Documents

2.1 *ASTM Standards:* [2]

F 1053/F 1053M Guide for Steel Hull Construction Tolerances [Metric][3]

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *blind spots*, *n*—areas of a vessel's structure that cannot be visibly or electronically inspected for failure.

3.1.2 *large tanks*, *n*—tanks of such dimension as to have uninspectable heights greater than 10 m.

3.1.3 *telltale areas*, *n*—areas of a ship's structure identified by analyses and investigations during design development as being subject to higher stresses or more susceptible to fatigue than others, even though the higher stresses are still within allowable limits. Also, areas identified after the vessel is placed in service that continue to experience active or recurring cracking in the watertight envelope or that affect the structural integrity of the vessel.

4. Introduction

4.1 As stated earlier, the intent of this guide is to assist in the preparation of an inspection plan for a marine vessel during its design, construction, and in-service stages and to plan for inspection during the design. This guide should be used in the preparation of a specific inspection program for the construction of a specific marine vessel. It is not intended to set any stringent requirements for the structural inspections of any particular vessel. The suggestions for various inspection considerations in this guide are presented for the purpose of making available for review and use a broad set of guidelines.

4.2 This guide is applicable to all commercial and pleasure marine vessels. Although the references generally apply to steel and aluminum welded hulls, the overall aspects may be applied to any material or type of construction.

4.3 At any point of its construction or service life, the vessel may require classification society or flag state regulatory inspections, or both, as well as shipowner's surveys. The surveys, depending on occasion, should consider the general condition of the vessel, provide a detailed condition assessment, obtain data to determine corrosion rate and damage, or obtain information for repair specification development, or a combination thereof. The inspection plan should take into account all of these types of information in its development. On occasions, the surveys also should obtain data on rate of coating breakdown.

4.4 Because of severe loadings, excessive wastage, poor structural design, improper use of materials, excessive fatigue cycling, and so forth, failure may occur at any structure component at some stress value that is much less than the theoretically allowable limit. Therefore, detection of such

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Withdrawn.

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