Designation: F 1657 – 96 (Reapproved 2002)

Standard Practice for Emergency Joining of Booms with Incompatible Connectors[1]

This standard is issued under the fixed designation F 1657; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice provides a standard practice for the joining of oil spill containment boom connectors in emergencies.

1.2 The use of this connection method may adversely affect the total tensile strength of the connected booms.

1.3 These criteria are intended to define mating requirements that will allow the emergency or occasional connection of unlike connectors.

1.4 This practice is not intended to replace Specification F 962.

1.5 This practice does not address the compatibility of spill control equipment with spill products. It is the user's responsibility to ensure that any equipment selected is compatible with the anticipated spilled material.

1.6 There is no guarantee that all of the connectors in use today can accept the holes spaced as required without interfering with existing bolt holes or other connector features.

1.7 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.8 *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.* For a specific precautionary statement, see 3.2.

2. Referenced Documents

2.1 *ASTM Standards:*

F 818 Terminology Related to Spill Response Barriers[2]

F 962 Specification for Oil Spill Response Boom Connection[2]

F 1093 Test Methods for Tensile Strength Characteristics of Oil Spill Response Boom[2]

F 1523 Guide for Selection of Booms in Accordance With Water Body Classifications[2]

3. Significance and Use

3.1 The use of this practice for the emergency joining of booms will not guarantee the effective performance of the joined boom sections, since each boom design and the environmental conditions of each incident govern the overall performance.

3.2 Historically, different types of end connectors have been produced. This practice addresses the operational need to connect different types, during spill incidents. (**Warning**—Use of this practice with similar or different sizes of boom may cause the transmission of unwanted loading such as, tension loading and bending moments on certain boom parts resulting in possible premature failure of the containment system.)

3.3 There are a wide range of boom connector configurations presently in use. These connectors were based upon some or all of the following design criteria:

3.3.1 Connect and transfer tensile loads between boom sections,

3.3.2 Minimize oil leakage between boom sections,

3.3.3 Be easily connectable in the presence of dirt, oil or ice, or a combination thereof,

3.3.4 Be quickly and easily connected and disconnected, in and out of the water,

3.3.5 Maintain boom performance (freeboard, heave response, conformance, stability, and so forth),

3.3.6 Be unaffected by temperature extremes,

3.3.7 Have no protruding parts that could snag, injure, or puncture,

3.3.8 Be light weight and buoyant,

3.3.9 Be operatively symmetrical,

3.3.10 Require no special tools for installation or removal,

3.3.11 Require no loose parts for connection,

3.3.12 Extend to the full height and draft of the boom,

3.3.13 Resist distortion (that is, winding boom on a reel), and

3.3.14 Be inherently safe to personnel.

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[1] This practice is under the jurisdiction of ASTM Committee F20 on Hazardous Substances and Oil Spill Response and is the direct responsibility of Subcommittee F20.11 on Control.

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[2] *Annual Book of ASTM Standards*, Vol 11.04.

4. Design Criteria

4.1 In order to comply with this practice for the emergency joining of boom with incompatible connectors, each boom connector, regardless of design, will incorporate the requirements described herein or use the adaption method in 5.3:

4.1.1 A minimum of two holes sized to accommodate 13 mm (½ in.) diameter 304 stainless steel bolts will be provided as shown in Fig. 1. Using the boom design water line as a reference point, the center of the first hole is to be 12 cm above the water line, the second hole will be 30 cm below the first hole depending on the connector overall length. For larger connectors additional holes will be placed at 30 cm increments from the first two holes. Each hole is to be sealed to prevent leakage when not in use.

4.1.2 Use of this practice shall not significantly impact the original design criteria in 3.4.

4.1.3 Incorporation of this practice shall not reduce the tensile strength of the boom system below the values stated for that class of boom, (see Guide F 1523) when mated in its normal configuration.

4.1.4 The manufacturer should establish the load carrying capability of two of his connectors joined by this practice by testing in accordance with Test Methods F 1093.

5. Operational Consideration

5.1 A suitable non-metallic gasket sealing material may be inserted by the user between the surfaces to be joined. The gasket material must be impervious to the products contained by the boom.

5.2 The user must consider the transmission of tensile loading between the joined sections. This will include tensile loads on boom fabric, primary and secondary tension members, and the orientation of the tension members (loads may be offset at the joint depending on boom design).

5.3 When the original connector design prevents the use of this practice, a suitable number of adapters should be provided to facilitate connection to this emergency joining practice.

5.4 This practice will also allow for multiple boom connections at one point.

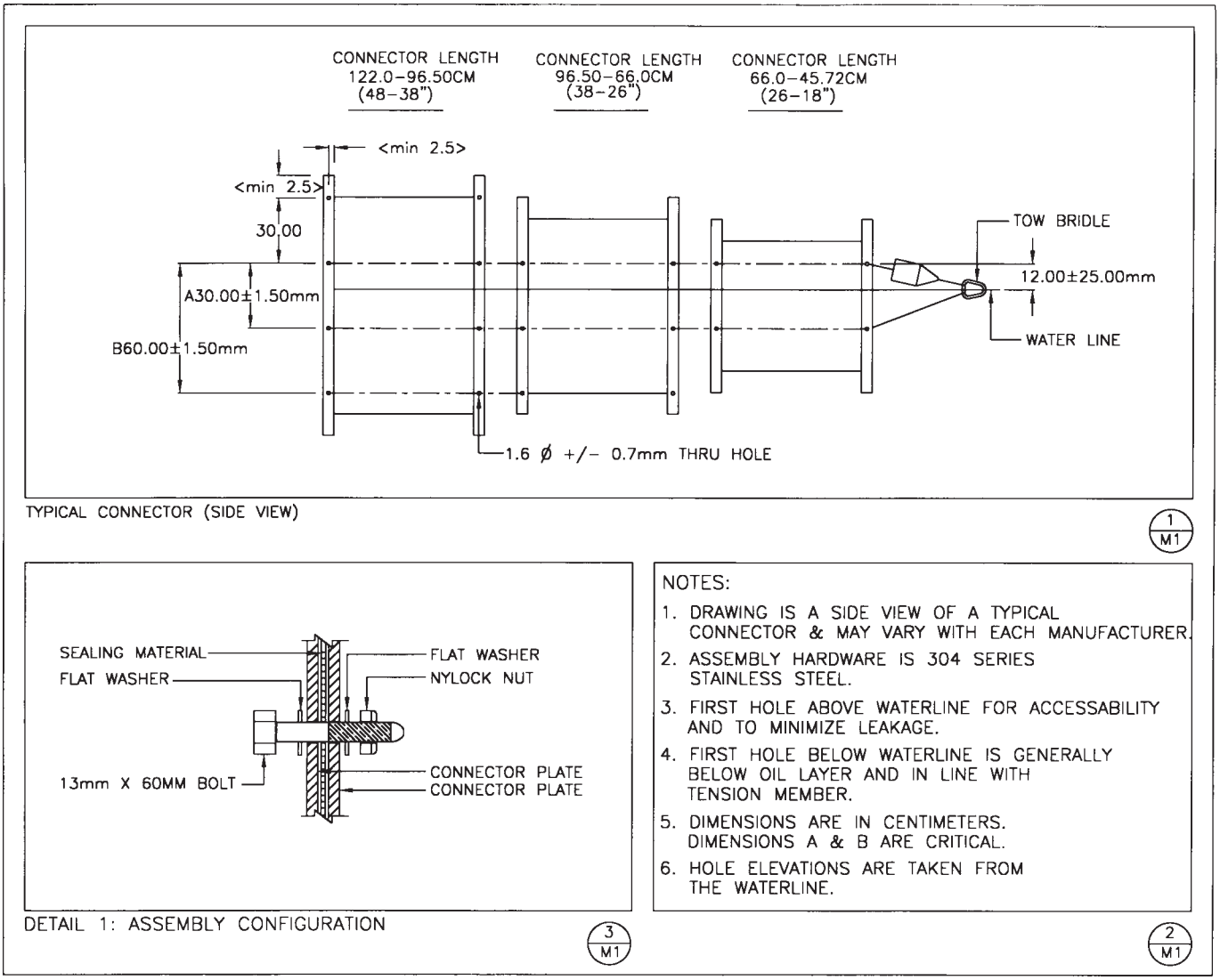

FIG. 1 Side View of a Typical Connector

6. Keywords

6.1 boom; boom connector; connector; incompatible boom connector; oil spill response