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## Standard Terminology Relating to Spill Response Barriers<sup>1</sup>

This standard is issued under the fixed designation F 818; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

<sup>ε1</sup> NOTE—Editorial changes were made throughout in November 1998.

### 1. Scope

1.1 This document defines the terminology used in the field of spill response barriers. Only those terms commonly used or peculiar to this field have been included; no attempt has been made to list all terms used. Where a second term is in common use, “aka” is used to mean “also known as.”

1.2 Design, engineering, and performance terms are listed separately: barrier design terminology (3.1), barrier engineering terminology (3.2), and barrier performance terminology (3.3).

### 2. Referenced Documents

#### 2.1 ASTM Standards:

F 625 Practice for Classifying Water Bodies for Spill Control Systems<sup>2</sup>

### 3. Terminology

3.1 *Barrier Design Terminology*—Terms associated with Spill Response Barrier Design:

#### General

**boom**—floating mechanical barrier used to control the movement of substances that float.

**boom section**—length of boom between two end connectors.

**boom segment**—repetitive identical portion of the boom section.

#### Types

**air bubble barrier**—special-purpose barrier created by rising stream of air bubbles and entrained water, produced by injecting air at some depth below water surface.

**bottom-tension boom**—boom with tension member located along the bottom of the skirt.

**calm water boom**—boom intended for use in calm waters (see

Practice F 625 for environmental descriptors).

**“curtain type” boom**—boom consisting of a flexible skirt supported by flotation.

**“fence type” boom**—boom consisting of a self-supporting or stiffened membrane supported by flotation.

**fire resistant boom (aka fire containment boom)**—boom intended for containment of burning oil slicks.

**ice boom**—boom intended for use in ice-infested waters, designed to withstand effects of ice contact.

**inflatable boom**—boom that uses inflated gas-filled chambers as the flotation.

**net boom**—special purpose boom in which all or part of the membrane material is netting.

**open water boom**—boom intended for use in open waters (see Practice F 625 for environmental descriptors).

**permanent boom**—boom intended for long-term or permanent deployment.

**plunging water jet barrier**—special purpose barrier created by a series of coherent streams of water directed vertically downward into a body of water.

**protected water boom**—boom intended for use in protected waters with moderate environmental conditions (see Practice F 625 for environmental descriptors).

**river boom (aka fast water boom)**—boom intended for use in currents greater than 1 knot.

**shore seal boom**—boom that, when grounded, seals against the shoreline.

**silt barrier**—boom with very deep skirt used to control the movement of suspended sediments.

**sorbent boom**—sorbent material contained or arranged in the form of a long cylinder.

**special purpose boom**—boom that departs from the general characteristics of “fence type” and “curtain type” booms, either in design or intended use.

**submersible boom**—boom that normally resides on the seabed and is positioned by inflating with air, causing it to rise to the water surface.

**water jet barrier**—barrier created by stream of pressurized water spray directed across the water surface.

**weir boom (aka skimming boom/barrier)**—boom that has a weir skimming device(s) built into its face.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 11.04.



## Components

**accessories**—*optional* mechanical devices used on or in conjunction with a boom system but not included with the basic boom and end connector; for example, lights, paravanes, drogues, buoys, anchor systems, storage bags, boxes or reels, bulkhead connectors or repair kits, and so forth.

**anchor point**—structural point on the end connector or along the length of a boom section designed for the attachment of anchor or mooring lines.

**ancillary equipment**—mechanical devices *essential* to the operation of a given boom system; for example, air pumps, hydraulic power supplies, control manifolds, and so forth.

**ballast**—weight applied to the skirt to improve boom performance.

**bridle**—device attached to a boom to distribute the load exerted by towing or anchoring the boom.

**buoyancy chamber (aka flotation chamber)**—enclosed compartment of air or other buoyant material providing flotation for the boom.

**end connector**—device permanently attached to the boom used for joining boom sections to one another or to other accessory devices.

**external flotation (aka outboard flotation)**—flotation element located external to the boom membrane.

**external tension**—external tension member separated from the boom membrane by bridles.

**fin**—portion of the boom membrane above the float.

**float**—separable component of a boom that provides buoyancy.

**flotation**—portion of a boom that provides buoyancy.

**handhold**—any strap, handle, depression, or other provision for grasping the boom by hand.

**hinge**—location between boom segments at which the boom can be folded back 180° upon itself.

**internal flotation**—flotation element located within the boom membrane.

**lifting point**—structural point on the end connector or along the length of a boom section designed for the attachment of a lifting device, such as a crane.

**membrane**—continuous portion of a boom that serves as a barrier to the movement of a substance.

**pressure inflated**—inflatable boom that requires pressurized gas for its flotation.

**self-inflating**—boom that automatically inflates as it is deployed.

**skirt**—continuous portion of the boom below the floats.

**solid flotation**—boom that uses solid buoyant material for the flotation element.

**stiffener**—component that provides support to the membrane.

**tension member**—any component that carries horizontal (axial) tension loads imposed upon the boom.

## Characteristics

**boom weight**—dry weight of a fully assembled boom section including end connectors.

**compactibility**—measure of a boom's storage volume per unit length ( $m^3/m$ ).

**draft**—minimum vertical depth of the membrane below the water line.

**freeboard**—minimum vertical height of the boom above the waterline.

**height**—sum of draft and freeboard.

**maximum draft**—maximum vertical dimension of the boom below the water line.

**overall height**—maximum vertical dimension of boom.

3.2 *Barrier Engineering Terminology*—Terms associated with Spill Barrier Engineering:

**catenary drag force**—load imposed on a boom, deployed in a catenary configuration, resulting from towing, current, and/or wind forces.

**current response**—change in freeboard or draft due to current forces acting to displace the boom from rest.

**gross buoyancy**—weight of fresh water displaced by a boom totally submerged.

**gross buoyancy to weight ratio**—gross buoyancy divided by boom weight.

**heave response**—ability of the boom to react to the vertical motion of the water surface.

**maximum dynamic load**—sum of all instantaneous dynamic loads including those due to acceleration, wave forces, and so forth.

**reserve buoyancy**—gross buoyancy minus boom weight.

**reserve buoyancy to weight ratio**—reserve buoyancy divided by boom weight.

**roll response**—rotation of the boom from rest due to wave, wind, or current forces.

**straight line drag forces**—load on a boom that results from towing it from one end.

**wind response**—change in freeboard or draft due to wind force acting to displace the boom from rest.

3.3 *Barrier Performance Terminology*—Terms associated with Spill Response Barrier Performance:

**apex (aka pocket)**—pocket formed at the downstream end of a U, V, J, or W shaped configuration.

**boom planing**—heeling over of a boom and loss of draft.

**boom submergence (aka submarining)**—containment failure due to loss of freeboard.

**bridging failure**—portions of a boom emerging from the water due to poor wave conformance, with resulting containment failure.

**catenary configuration (aka “U,” “J” configuration)**—booming configuration formed by towing or anchoring each end of a length of boom, resulting in a characteristic “U” or “J” shape.

**cascading booms**—booming configuration formed by positioning two or more booms in a deflection mode such that successive booms progressively move oil to the desired area.

**chevron configuration**—booming configuration used in narrow watercourses, formed by positioning two lengths of boom in a deflection mode, the leading end of each length is positioned in the middle of the watercourse and the trailing ends lead to opposite shores.

**conformance**—ability of a boom to maintain freeboard and



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draft when subjected to a given set of environmental conditions.

**containment mode**—placement of a boom to prevent free movement of a floating substance.

**deployment**—placing a boom in the water and making it operational.

**diversion mode**—placement of a boom to redirect the movement of a floating substance.

**drainage loss**—oil accumulating and pooling against the boom skirt and escaping with the flow of water down and along the skirt.

**entrainment loss**—oil droplets escaping with the flow of water diverted under the skirt.

**exclusion booming**—placement of a boom to protect an area from the entry of a floating substance.

**first-loss tow/current velocity**—minimum tow/current velocity normal to the membrane at which oil escapes past a boom.

**gap ratio**—sweep width divided by boom length.

**loss rate**—rate at which oil is lost past a boom ( $\text{m}^3/\text{h}$ ).

**performance**—ability of a boom to contain or deflect oil under

a given set of environmental conditions.

**retrieval**—removing a deployed boom from the water.

**splashover**—oil splashing over a boom's freeboard.

**stability**—resistance to overturning moment.

**sweep width (aka swath)**—width intercepted by a boom in collection mode, the projected distance between the ends of a boom deployed in a “U,” “V,” or “J” configuration.

**sweeping mode**—movement of a boom relative to the water for the purpose of controlling or collecting a floating substance.

**towing**—transporting a boom from one place to another by pulling from one end.

**vortex loss**—oil escaping past a boom due to drainage vortices produced at the boom.

**“J” configuration**—boom positioned in a “J” shape.

**“U” configuration (aka catenary configuration)**—boom positioned in a “U” shape.

**“V” configuration**—boom positioned in a “V” shape.

**“W” configuration (aka “3” configuration)**—boom positioned in a “W” shape.

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