BASIC BOOMING TACTICS

GENERAL CONSIDERATIONS

Boom is a containment barrier used to intercept, control, contain, and concentrate spreading oil on water. Boom comes in a variety of forms and may be deployed in a number of possible configurations. Booming tactics are a dynamic process and considerations need to be given to the ongoing maintenance of the system as environmental conditions change.

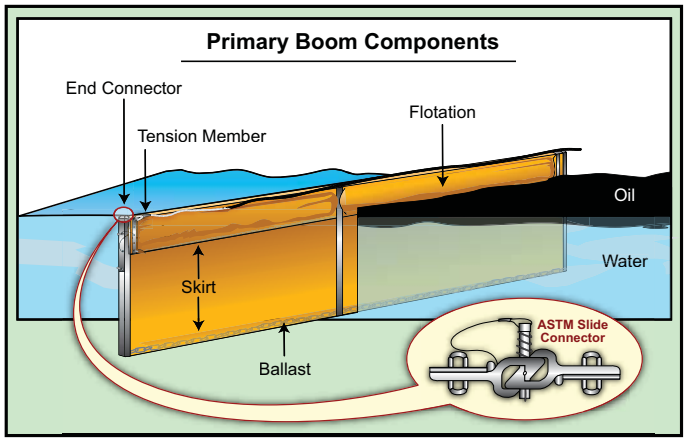

Figure B-1. Boom Components and Bridle Components.

Boom Components

Figure B-1 shows the typical components of boom. The portion of the boom above the water surface is referred to as the sail and usually includes a flotation mechanism; the portion below the surface is referred to as the skirt. A tension member (such as a piece of cable) of greater strength than the fabric prevents the fabric from tearing under stress and some sort of ballast, such as chain or weights, is attached to the bottom of the fabric to keep the boom vertical in the water.

Flotation material keeps the boom afloat. There are several different designs and methods of flotation. Floats may be rigid or flexible. Inflatable air chambers may be used to provide flotation. Freeboard is the vertical height of a boom above the water line. The freeboard prevents oil from washing over the top of the boom. If there is too much freeboard, however the boom may be pushed over in high winds. The skirt prevents oil from being swept underneath the boom. End connectors are used to connect sections of boom together. Since there are many different types of boom, there are many different end connectors, with the vast majority of end connectors being standard American Society for Testing and Materials (ASTM) slide connectors as shown in Figure B-1.

Boom Types and Classification Systems

Different types and sizes of boom may be referred to by a variety of names, some of which may vary regionally. There are two major classification systems for selecting boom according to water body classification. The STAR manual uses the classification

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system developed by the ASTM, as it corresponds to the operating environment classifications used in this manual. The ASTM classification system divides boom into four categories, based on the operating environment in which it may be used:

- Calm water boom (sometimes referred to as "harbor boom")
- Fast water boom (calm water/fast current boom)
- Protected water boom
- Open water boom (sometimes referred to as "ocean boom")

The following table describes the properties of these four boom types.

Boom Property	Calm Water	Calm Water-current (fast water)	Protected Water	Open Water
Height (in)	6 to 24	8 to 24	18 to 42	36 to 90+
Minimum reserve buoyancy to weight ratio	2:1	3:1	3:1	7:1
Minimum total tensile strength (lbs)	1,500	5,000	5,000	10,000
Minimum skirt fabric tensile strength (lbs/in) 2TM=2 tension members; 1TM=1 tension member	2TM - 300 1TM - 300	2TM - 300 1TM - 300	2TM - 300 1TM - 400	2TM - 400 1TM - 400
Minimum skirt tear strength (lbs)	100	100	100	100

Boom Angles

Effective booming tactics require that boom be placed and adjusted to maximize efficiency. If boom is not deployed correctly, oil may entrain (escape underneath the boom) and the boom may sustain damage or fail.

A key consideration in deploying boom is the boom angle, which is directly related to the velocity of the current. Figure B-2 may be used to select the appropriate boom angle to keep oil from entraining under the boom. Note that the angle relative to the current decreases rapidly as the current increases. Where currents exceed three knots, the boom must be almost parallel to the current to prevent entrainment. In currents exceeding three knots, a cascade of boom arrays may be used; the first boom array will slow the velocity of the slick allowing subsequent arrays to deflect the oil.

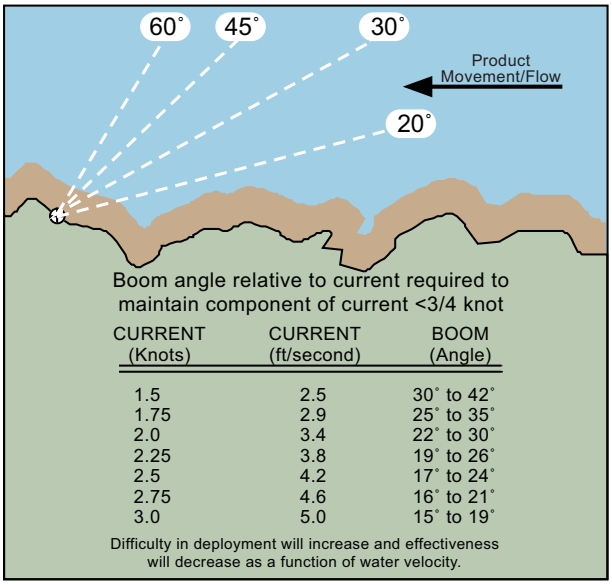

Figure B-2. Boom angles for various current velocities.

Anchoring Systems

Boom is secured in place using standard anchoring systems. Anchor sizes will vary depending on the boom type and the operating environment.

Anchor systems must be selected based on the maximum stress that might be expected to occur on the boom array, considering stronger currents and winds than when the anchor is set.

The scope of the anchor line should be at least three times the depth of the water. If the anchor fails to hold, responders should try increasing the line scope to five times the depth of the water and/or double the length of the anchor chain. Finally, if additional anchor holding is required, anchors can be ganged or set in series.

Figure B-3 shows a typical boom anchoring system.

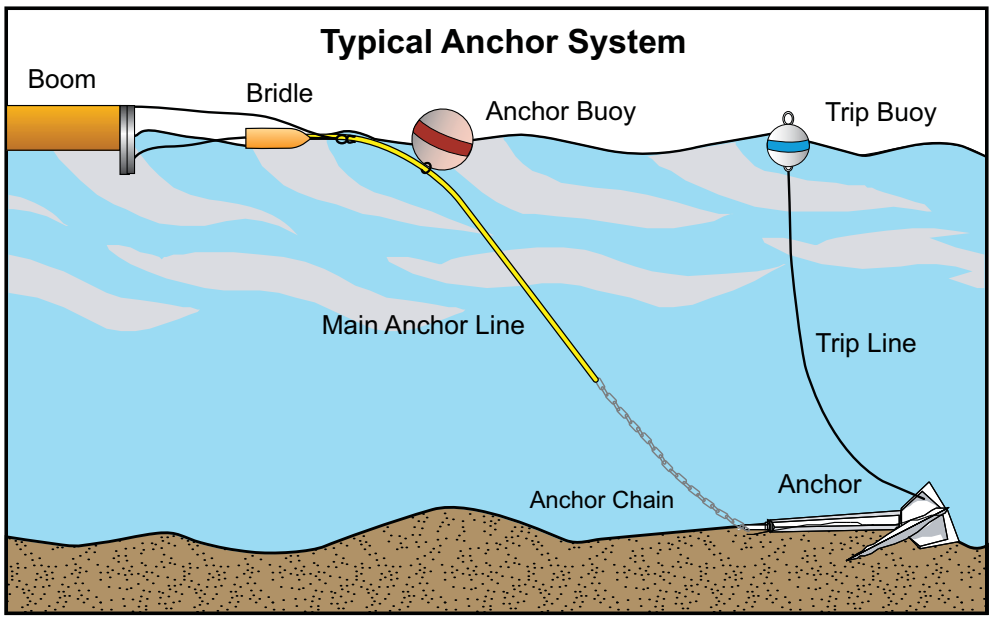

Figure B-3. Typical anchor/boom/bridle configuration system.

Towing and Setting Boom

Most booming tactics will require responders to tow boom from a boat ramp or dock to the deployment site. Towing boom requires experienced vessel operators. It is also important that the vessel be appropriately powered to manage the amount of boom being towed. Figure B-4 provides a rule-of-thumb reference to make sure that a vessel is appropriately powered to tow boom to a deployment site, at various towing speeds. Vessels towing boom should operate slowly and must have at least one crewmember in addition to the operator, to keep an eye on the boom. Particular care should be taken in areas with navigational hazards such as fishing floats or mooring buoys. It is important to note that these speeds refer to vessels towing boom to and from a spill site. Towing speeds for active booming tactics are typically much slower, and are specified in the tactic considerations.

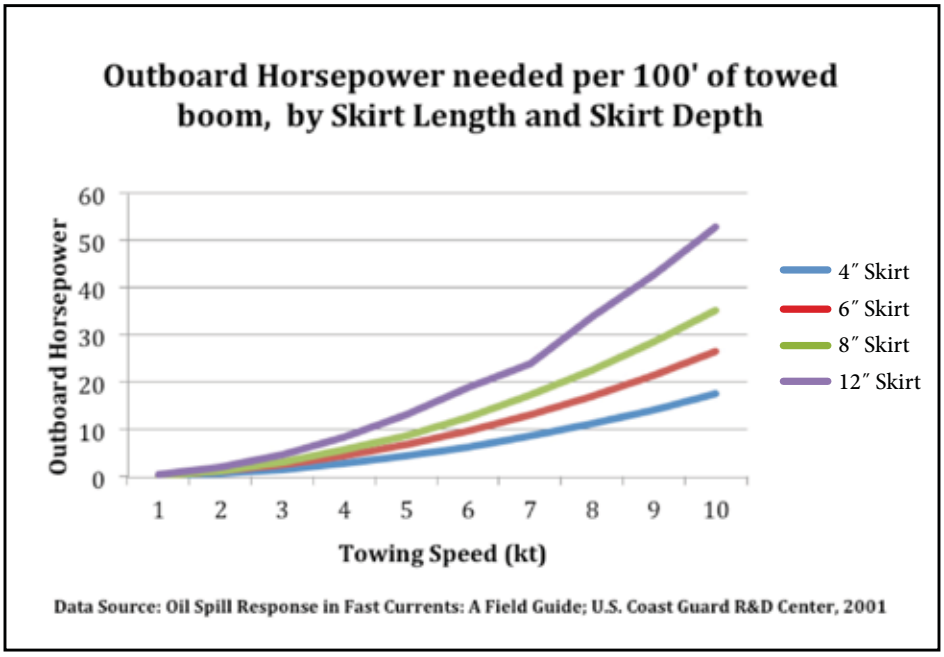

Figure B-4. Rule-of-thumb reference to make sure that a vessel is appropriately powered to tow boom to a deployment site.

OPERATING ENVIRONMENTS

Operating environments generally correspond to those tactics referenced below.

REFERENCES TO OTHER TACTICS

Other tactics associated with Basic Booming include:

- C • Containment Boom
- FO • On-Water Free-Oil Recovery
- NFO • Nearshore Free-Oil Recovery
- DV • Diversion Boom
- SR • Shoreside Recovery
- PR • Passive Recovery
- EX • Exclusion Boom
- DF • Deflection Boom