



High Performance Containment and Cleanup Products

ABASCO OIL CONTAINMENT BOOM

OPERATIONS AND REPAIR MANUAL

TABLE OF CONTENTS

I) GENERAL INFORMATION	3
II) DEPLOYMENT AND ANCHORING	4
A) Boom Deployment.....	4
B) Boom Anchoring	4
III) BOOM TOWING	4
A) Straight Line Towing.....	4
B) Cantenary Towing ("U" Configuration)	5
IV) BOOM RETRIEVAL	5
V) BOOM MAINTENANCE AND REPAIR	6
A) Cleaning and Preparation of Surfaces Prior to Repair.....	6
B) REPAIRING TORN OR WORN AREAS IN BOOM FABRIC.....	7
1. Repair with HH-66 Vinyl Cement	7
2. Repair With Heat Gun	7
C) REPLACEMENT OF END CONNECTOR ON COMPLETELY SEVERED BOOM SECTION	8
VI) SPECIFIC INSTRUCTIONS FOR ABACO SELF-INFLATING NEO BOOM.....	8
A) INTRODUCTION	8
B) TO INFLATE NEO BOOM	8
C) TO RETURN NEO BOOM TO STORAGE	9

This document is distributed by ABASCO LLC. to provide familiarization with Oil Containment Boom. It is intended to provide basic information to spill response planners and on-site supervision regarding the selection, installation, maintenance, repair and storage of Oil Containment Booms.

I) GENERAL INFORMATION

UNPACKING: ABASCO Oil Boom is typically shipped bundled on pallets. Upon arrival, each item should be inspected for shipping damage. Damages, if they exist, should be settled with the shipper. Care should be exercised in handling the bundles so as not to cut the packaged boom. ABASCO Universal or ASTM connectors are attached to both ends of every section of boom. These connectors provide a versatile means of joining sections of boom together and are designed to mate with the end connectors of several other manufacturers' boom. To connect boom sections merely slide the mating connectors together, top to bottom and lock the connectors together by inserting one of the lanyard attached toggle pins into the lock pin holes provided.

STOWAGE: Oil boom must be stored under cover from the sun. It may be stowed laying flat in a container, "accordion" back and forth, layer upon layer. If stowed in this manner, it is important to assure that the skirt and ballast are consistently located on the same side of the flotation logs. A preferable stowage method is to employ the same stowage pattern described above but with the flotation logs standing on end. This method facilitates rapid deployment of the boom, particularly when multiple sections are already connected in the stowage container and the container has a "front opening" door.

DEPLOYMENT: Deployment from a stowage container where the boom is "standing on end" can be accomplished at speeds up to 5 knots by simply having the stowage container at or near the water's edge where a boat can pick up a tow line attached to the leading edge of the boom. Using a tow bridle, the boat can pull the boom from the stowage container directly into the water. Note: A tow bridle should always be used when towing or anchoring ABASCO oil containment boom.

RECOVERY: After use, the boom should be removed from the water for cleaning and reloading into the stowage container. Care must be exercised during boom removal not to drag the boom across sharp surfaces, rocks, concrete walls, etc. If the boom must be moved over such an area, providing a protective covering, such as a tarp or even some heavy polyethylene sheet between the boom and the surface can prevent damage.

CLEANING: Find a suitable area where the boom can be spread out as much as possible. Spray with a commercially available industrial detergent and water solution. Scrub with a brush or broom as necessary. Rinse and allow to dry before storage. Steam cleaning of ABASCO boom is permissible, however, care must be exercised not to overheat the material by concentrating a steam jet in one area for any length of time. In some instances removal of heavy oils may require a solvent such as kerosene or diesel oil. Delay in cleaning will make the task more difficult.

BOOM REPAIR: Repair of rips, tears or abrasions may be made in the field by drying and thoroughly cleaning the area to be repaired. Reference the Repair section of this manual for specific instructions

II) DEPLOYMENT AND ANCHORING

A) Boom Deployment

1. Deployment From a Bundle
 - a. Position bundled boom section at deployment site.
 - b. Attach tow bridle to boom end connector and secure with toggle pin.
 - c. Cut boom section bundle tying straps and pull or float boom into water.
 - d. Repeat steps for succeeding boom sections.
 - e. Connect boom section end connectors and secure with attached toggle pin.
2. Deployment From a Stowage Container
 - a. Position the container at the water's edge with the container doors facing the water.
 - b. Open the container doors.
 - c. Attach a tow bridle and secure with a toggle pin to the end connector of the first section of boom.
 - d. Attach a tow-line between the tow bridle and a tow boat.
 - e. Pull the boom into the water at a speed up to 5 knots.
 - f. If not already connected, connect boom sections and secure with toggle pin as the boom sections are deployed.

B) Boom Anchoring

Each section of boom contains anchor points. The anchor points are located on each end of connector and if requested at time of purchase at center location(s) of the boom skirt. Anchoring the boom is like the mooring of any other similar configuration boom. In anchoring a section of boom it is best to place and set the anchors before attaching the anchor line to the boom. In tidal or other conditions where the boom may be subject to loading from either side it is best to anchor the boom from both sides so that a wind or current change cannot allow the boom to override the anchors or pull them free.

III) BOOM TOWING

A tow bridle should always be used when towing or anchoring ABASCO oil containment boom.

A) Straight Line Towing

When all the boom is afloat it may be towed in a straight line at a maximum speed of 10 knots. The boom should be towed at a distance astern of the tow vessel such that the tow bridle connector lies approximately horizontal just above the surface and the boom planes on the surface for the first few feet. The boom will gradually assume its normal vertical orientation about 30 feet aft of the tow bridle. The boom will tow indefinitely in this configuration in seas of 3 feet or less and in winds of 20 knots or less. If a quartering wave or a heavy gust of wind should cause a twist to occur in the boom, the best plan is to continue to tow at the same speed to allow the twist to uncoil itself and pass out the rear end of the boom.

B) Cantenary Towing ("U" Configuration)

Upon reaching the spill area decisions will have to be made by on-scene personnel as to how best to attack the spill. From the standpoint of boom performance alone it would be most efficient, particularly if winds exceed 15 knots and waves are over 3 feet, to plan a downwind capture of the oil in order to minimize splash over at the apex of the cantenary.

To form the cantenary, or U towing, configuration of the boom, a second tow vessel must pick up the second tow bridle at the rear of the boom, and then drop the boom astern while the two tow vessels assume a parallel course and proceed into the spill area.

The boom will successfully retain oil in the rear of the cantenary when the speed of the system through the water is 0.75 knots or less. Above this speed a deterioration of efficiency will occur with more oil entraining under the boom as speed is increased.

The boom efficiency in retaining trapped oil will also be affected by the direction of tow with respect to the wind and waves. In a crosswind/crosswave tow orientation the likelihood of a wave causing some spillage by lifting the entrapped oil over the boom freeboard as the wave rolls by is increased over that experienced during downwind or upwind towing orientations.

It is important, under all conditions, to maintain the speed of the tow vessels slow enough to hold the entrapped oil in the rear of the cantenary. This speed is nominally 0.75 knots or less. It could be slightly greater under calm conditions, and slightly less under more severe conditions.

IV) BOOM RETRIEVAL

1. Select a boom retrieval site free of sharp objects that can damage the boom.
2. Position the boom at the retrieval site.
3. Remove one boom section at a time by removing the toggle pin and disconnecting the boom end connectors.
4. Using a retrieval crew, lift the boom section from the water and layout on a clean, flat surface.
5. Clean boom and allow to dry.
6. Tie skirt to flotation.
7. Fold boom into bundle and secure with tying straps.
8. Move boom bundle to stowage location.

9. Repeat steps for succeeding boom sections.
10. Cover boom bundles for UV protection.

V) BOOM MAINTENANCE AND REPAIR

A) Cleaning and Preparation of Surfaces Prior to Repair

Three methods are recommended for cleaning and preparation of boom surfaces prior to repair. The three methods are:

1. High pressure water cleaning - 1300 psi max
2. Scrubbing with commercially available detergent
3. Steam cleaning

NOTE: Dependent on the condition and severity of the soiled area, the three methods can be used singly or in combination.

1. High Pressure Water Cleaning

- a. Apply high pressure water to the soiled area of the boom without concentrating full pressure (1300 psi) for long periods of time (maximum of 5 minutes) to anyone spot on the boom fabric.

Caution: Concentrating high pressure water in one spot for long periods of time may result in damage to the fabric and foam.

- b. Use a long handle brush to assist the water pressure in cleaning the boom fabric.
- c. Allow the boom fabric to dry after cleaning.

2. Scrubbing With Commercially Available Detergent

- a. NOTE: The boom fabric manufacturer recommends non-abrasive liquid detergents such as "Simple Green."
- b. Prior to detergent scrubbing, wash boom with clean water to remove surface dirt and debris.
- c. Using a bucket or container, mix detergent solution in accordance with the manufacturer's label instructions.
- d. Apply detergent solution to boom fabric soiled area and scrub with long handle brush.
- e. Rinse scrubbed area with clean water.
- f. Allow boom to dry after cleaning.

3. Steam Cleaning

- a. Use a commercial steam cleaner to remove dirt and debris from boom fabric and hardware.

CAUTION: Wand of steam cleaner should be kept in constant motion to avoid damage to boom fabric with high heat concentration (1800 F at 80 psi.).

- b. Allow boom fabric to dry after cleaning.

B) REPAIRING TORN OR WORN AREAS IN BOOM FABRIC

1. Repair with HH-66 Vinyl Cement

- a. Using the fabric supplied in the repair kit, cut a patch 2 in. (50mm) larger in all directions than the damaged area.
- b. Thoroughly clean the damaged area a minimum of 2 in. (50mm) beyond the damaged area in all directions. The repair area must be free of oil and grease. Use appropriate cleaning agents if necessary. Acetone or lacquer thinner works well.
- c. Using the abrasive strip supplied in the repair kit, roughen both the patch and the repair area.
- d. Apply an even coat of HH-66 vinyl cement to BOTH surfaces and let dry only 2-5 minutes.
- e. Press fabrics together. Bond strength increases with age as cement sets. The repair is both waterproof and flexible.

2. Repair With Heat Gun

- a. Use a flat clean, dry area to work. Clean the area to be patched. Acetone or lacquer thinner works well.
- b. Cut the patch approximately 2 inches longer than the tear and 2 to 3 inches wider.
- c. Hold the patch against the top spot in the middle of the patch with the roller. Place the heat gun under the patch and above the tear, move the gun toward you, moving the roller at the same time on top of the patch. The rate of progress must be adjusted to be slow enough to allow melting of the vinyl, but not so slow as to bum the fabric. Seal the other end of the patch as explained above, directly over the tear.
- d. After the center of the patch is sealed over the tear, proceed along the open sides using the same procedure in step #3.
- e. Allow to cool and check for proper melting of the patch and tom area. If the patch does not stick, use steps #3 and #4 again until proper seal is reached.
- f. ALLOW HEAT GUN TO COOL OFF BEFORE SHUTTING GUN OFF. To do this, set heat control to zero and run until you can pick up the gun by the metal nozzle with your hand.

C) REPLACEMENT OF END CONNECTOR ON COMPLETELY SEVERED BOOM SECTION

NOTE: Undamaged hardware is reusable

1. Remove shackles to separate the ballast chain and cable from the connector.
2. Remove all connector screws and nuts. Remove end connector, back-up plate and toggle pin from the boom.
3. Clean and square off the severed boom fabric.
4. Cut a piece of repair fabric by approximate length and width, and seam new fabric to cleaned up end of boom using heat gun and roller.
5. Obtain a bolt rope (1/4" line required length).
6. Turn end of boom over.
7. Lay 2" of boom fabric back over the 1/4" bolt rope and, using the heat gun and roller, seam the fabric around the bolt rope and to cleaned up end of the boom to form a new bolt rope.
8. Using a connector back-up plate, lay it against the bolt rope and mark the location of the bolt holes to attach the connector and back-up plate to the boom fabric.
9. With the point of a utility knife, cut a small X in the fabric at each bolt hole location.
10. Install boom end connector and back-up plate making sure that the ballast chain shackle hole, which is below the back-up plate, is at the bottom of the connector.
11. Install cable shackle, toggle pin and retainer cable.
12. Install shackle and ballast chain to bottom of boom end connector.
13. Tighten all screws and nuts.

VI) SPECIFIC INSTRUCTIONS FOR ABACO SELF-INFLATING NEO BOOM

A) INTRODUCTION

1. ABASCO NEO Boom is a self-inflating containment boom that has the strength and durability of conventional boom and the compactness of air boom. Unlike air boom, however, NEO Boom is unsinkable. NEO will continue to float even if the flotation chambers are breached.
2. NEO Boom is shipped from ABASCO's manufacturing plant in its deflated condition.
3. NEO Boom is inflated by opening air valves and allowing the boom to self-inflate. There is no need for blowers or other forced air supply.
4. After use, NEO Boom can be deflated and returned to storage.

B) TO INFLATE NEO BOOM

1. Each section of NEO Boom has two air valves, one at each end of the section. The boom is inflated by removing the air valve cap and opening the check valve. **Important: The check valve must be locked in the open position for proper inflation.**
2. To lock the check valve open, reach inside the valve with your thumb and forefinger, push the valve plate down and rotate clockwise until it stops (approximately 15 degrees rotation).
3. If the boom is stored on a reel, unwind the boom and open each valve as it becomes accessible.
4. If the boom is stored in a container, remove the boom from the container prior to opening the valves.
5. The boom may be deployed directly into the water, even though the boom is not fully inflated. **Important: While deploying the boom, ensure that the air valves do not fall below the water line.**
6. Once the boom has fully inflated, all check valves should be closed and valve caps installed. To close the check valves, reverse Step 2.

C) TO RETURN NEO BOOM TO STORAGE

To deflate NEO Boom, remove all valve caps and lock check valves in their open position (See Step 2, above). This will allow the air to escape when compacted. **Warning: Failure to lock the check valves open will rupture the flotation chamber.**

There are several ways to store NEO Boom. It may be rolled, folded, or placed on a boom reel.

1. To roll NEO Boom, fold the boom in half so both end connectors are together. With the air and check valves locked open, start on the opposite end from the connectors and roll the boom tight to force the air out. If preferred a vacuum may be used withdraw the air. Close the air valves and secure the roll.
2. To fold NEO Boom, use a vacuum to remove the air and collapse the boom. Closed the air valves, fold, and secure the boom.
3. To store the NEO Boom on a reel, open air and check valves at each end. While the reel turns, apply enough tension on the boom to collapse it and force the air out. Leave the air and check valves in their open position.