Boom Deployment Exercise

November 6,2007

BOOM Components

5 Parts of a Boom

1. Universal Connector

2. Main Tension Member

4. Floatation

3. Ballast

5. Skirt

Boom Types

TYPES

- Fence
  - No chain for ballast tension
  - Rigid
  - Poor response to waves
  - Flexi usually used in sheltered areas
  - Foam floatation chamber w/ ballast skirt

TYPES

- Fence
- Curtain
  - Flexible material
  - Ballast skirt
  - Good response to waves
  - Air or foam in top chamber

TYPES

- Fence
- Curtain
- Inflatable
  - Chained tension member
  - Heavy duty fabric
  - Good for cascade booming

Applications and Limitations

Booming just far enough away from bulkheads, etc. can save clean up costs

Hatchery being protected using boom and anchor points . . .

Lots of them!

Protecting River

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Creating Recovery Areas

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Limitations

There are limitations on the effectiveness of any boom:

Splash-Over from wind & breaking waves.

Changing tides & shifting currents.

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Containment

Overstressed due to high volume of oil. Gross oil loss or entrainment will follow.

In ***all cases*** of boom deployment…

consideration must be given to conditions on-scene AND protecting the **safety** of personnel.

Booming Configurations

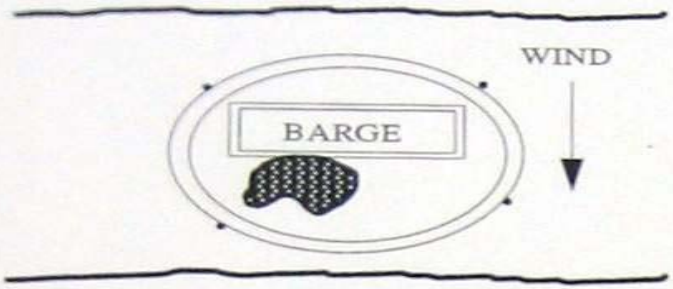
TOOL

1. A Containment Tool (Keep In)

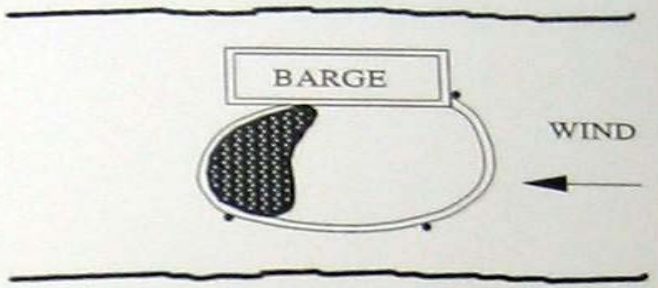
2. A Protective Tool

   a.) Exclusionary Configurations (Keep Out)
   b.) Deflection Configurations (Re-Direct Away)
   c.) Diversionary Configurations (Re-Direct To)

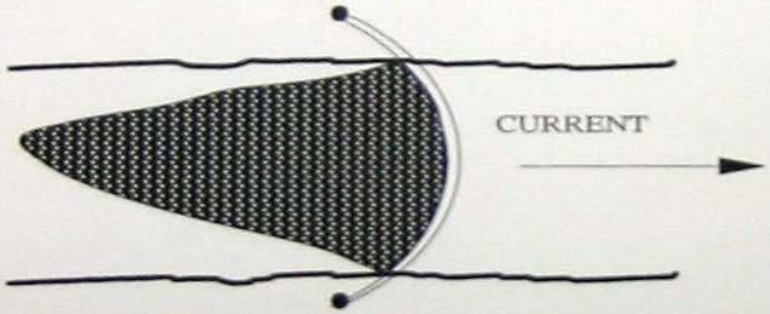
CONTAINMENT BOOM CONFIGURATIONS



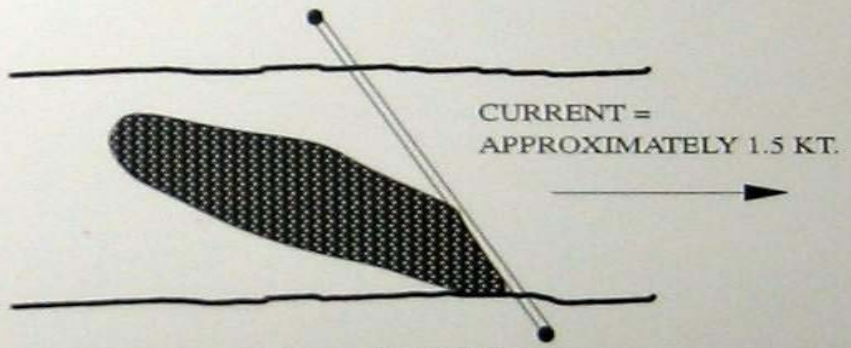
COMPLETE ENCIRCLEMENT
(NEGLIGIBLE CURRENT)



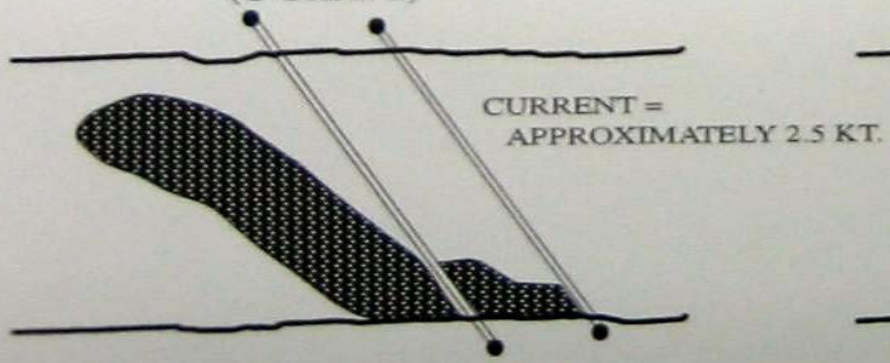
PARTIAL ENCIRCLEMENT
(NEGLIGIBLE CURRENT)



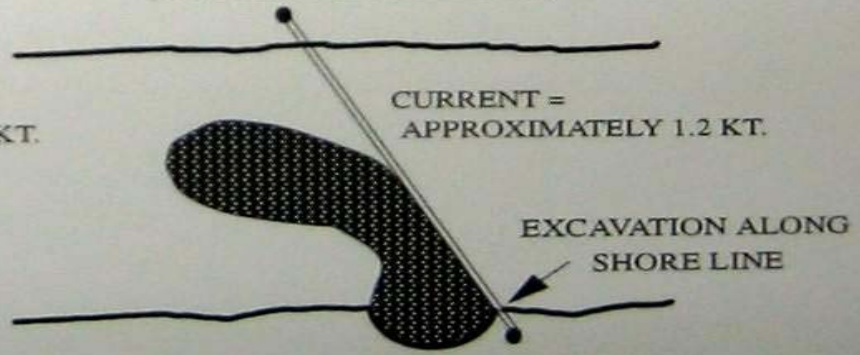
CATENARY
(U-SHAPE)



ANGLED CONTAINMENT BOOM
(MODERATE CURRENT)



DOUBLE CONTAINMENT BOOMING
(SWIFT CURRENT)



ANGLED CONTAINMENT BOOM
WITH RECOVERY PIT

Use Boom to contain Debris

Secure product from going into Body of Water

Protective Tool

((Exclusionary or Deflection Configurations))

Goal of most containment and recovery strategies is to collect the spilled oil from the water

and

prevent it from reaching sensitive resources.

This is not always possible & the goal will shift to:

Minimizing environmental injury using a variety of booming techniques **to keep the oil out or direct the oil away** from sensitive natural resources or cultural artifacts.

What are some of those areas to be protected ????

Exclusionary & Deflection Booming

- Performed prior to the advance of the oil - Used to prevent or exclude oil from entering:
  - Harbor Inlets
  - Sloughs
  - Marshes
  - Estuaries
  - Water Intakes

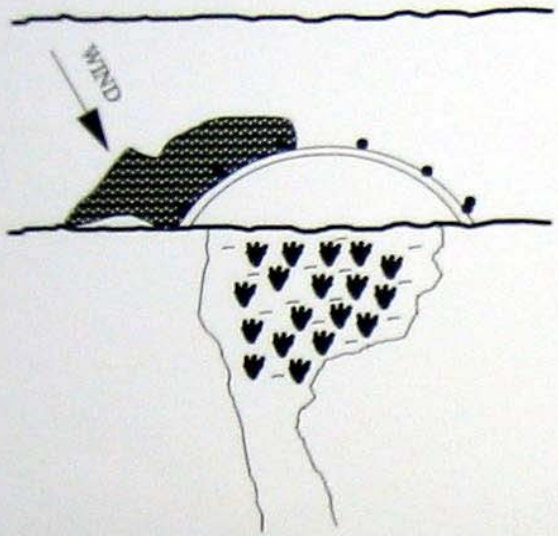
- Hard boom alone, or in combo with sorbent boom, can be used for these configuration.

  Factors for consideration:
  - Type
  - Size of Boom
  - Natural Forces of Water Body
  - Wind
  - Tide
  - Currents

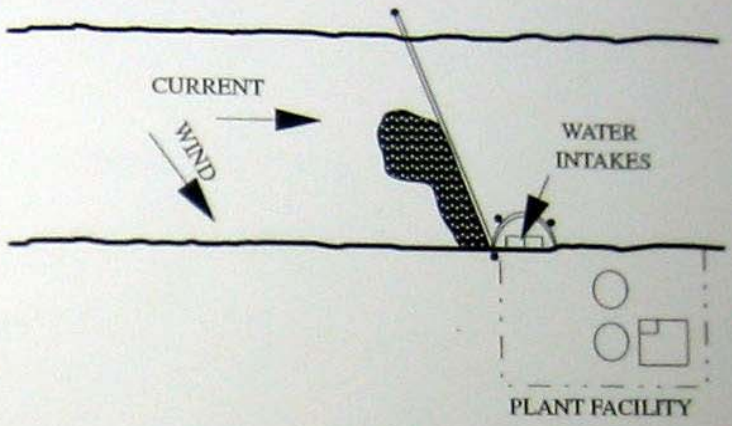
- These factors can be pre-determined by:
  - A Priority System (GRP)
  - Regularly Training, and
  - Local Knowledge of the Waters

Protecting Marsh Areas using exclusion strategies

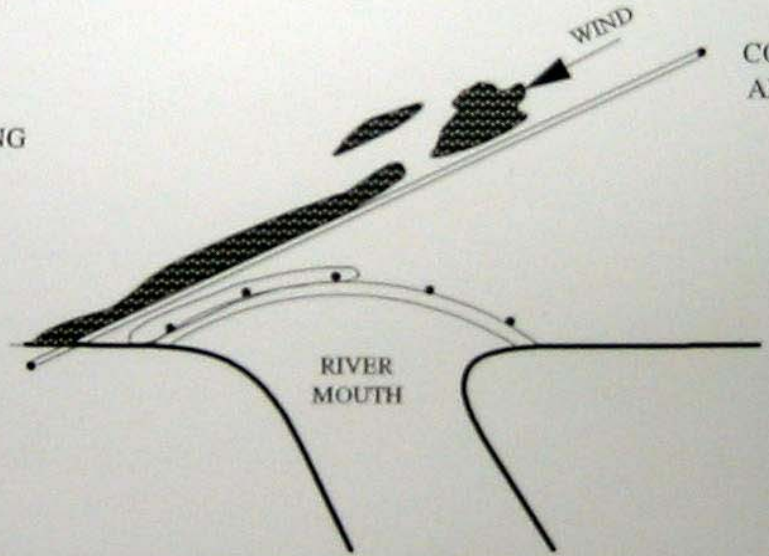
EXCLUSIONARY AND DEFENSIVE BOOMING CONFIGURATIONS



EXCLUSIONARY BOOMING
OF TIDAL FLAT



COMBINATION OF EXCLUSIONARY
AND CONTAINMENT BOOMING TO
PROTECT WATER INTAKES



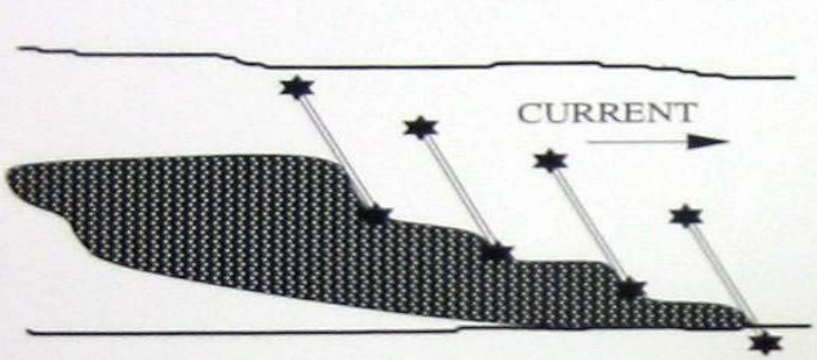
COMBINATION OF DEFLECTION AND
EXCLUSIONARY BOOMING TO PROTECT
EXTRANCE TO RIVER

Protection - Exclusionary

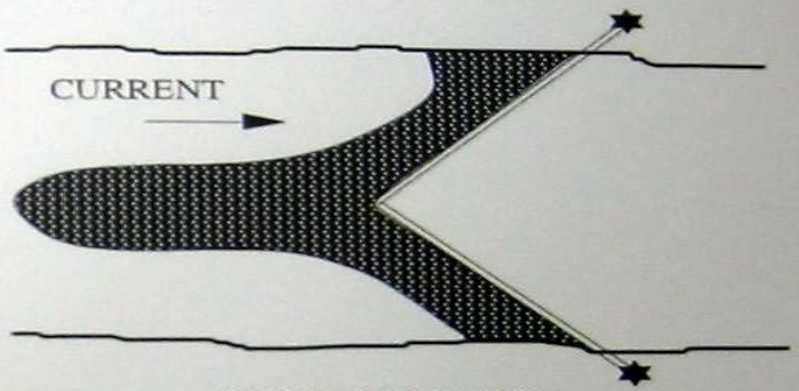
Diversionary Booming

- **Purpose: To divert the direction of the oil to a recover site.**
- **Oil velocity for this booming strategy should be reduced to under 0.7 knots.**
- **Accomplished by:**
  Angling the boom in relation to the current's direction,
  reducing the velocity of the floating oil in relation to the boom.
- **Diversionary booms can be set up in series along a waterway**
  to increase their effectiveness.
- **Reminder: The boom needs to be tended and monitored as weather and**
  tidal conditions change.

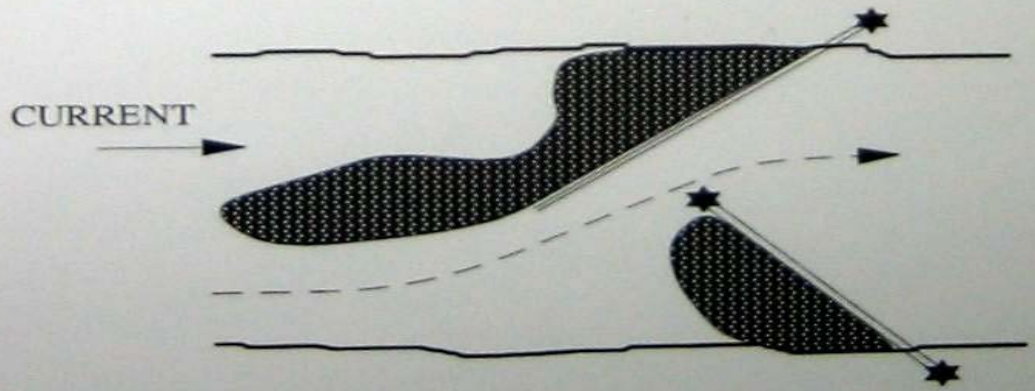
DEFLECTION BOOMING CONFIGURATIONS



CASCADE



CLOSED CHEVRON



STAGGERED CHEVRON
(Allows Boat Movement)

Cascade booming in fast moving currents.
Staggered sections stepwise along the shoreline

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Divert Oil from Wetlands

Natural collection areas for debris and trash are signs of where spilled oil will end up. These natural collection spots can be part of an ACP for this area.

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BOOM ANGLES FOR VARIOUS CURRENTS

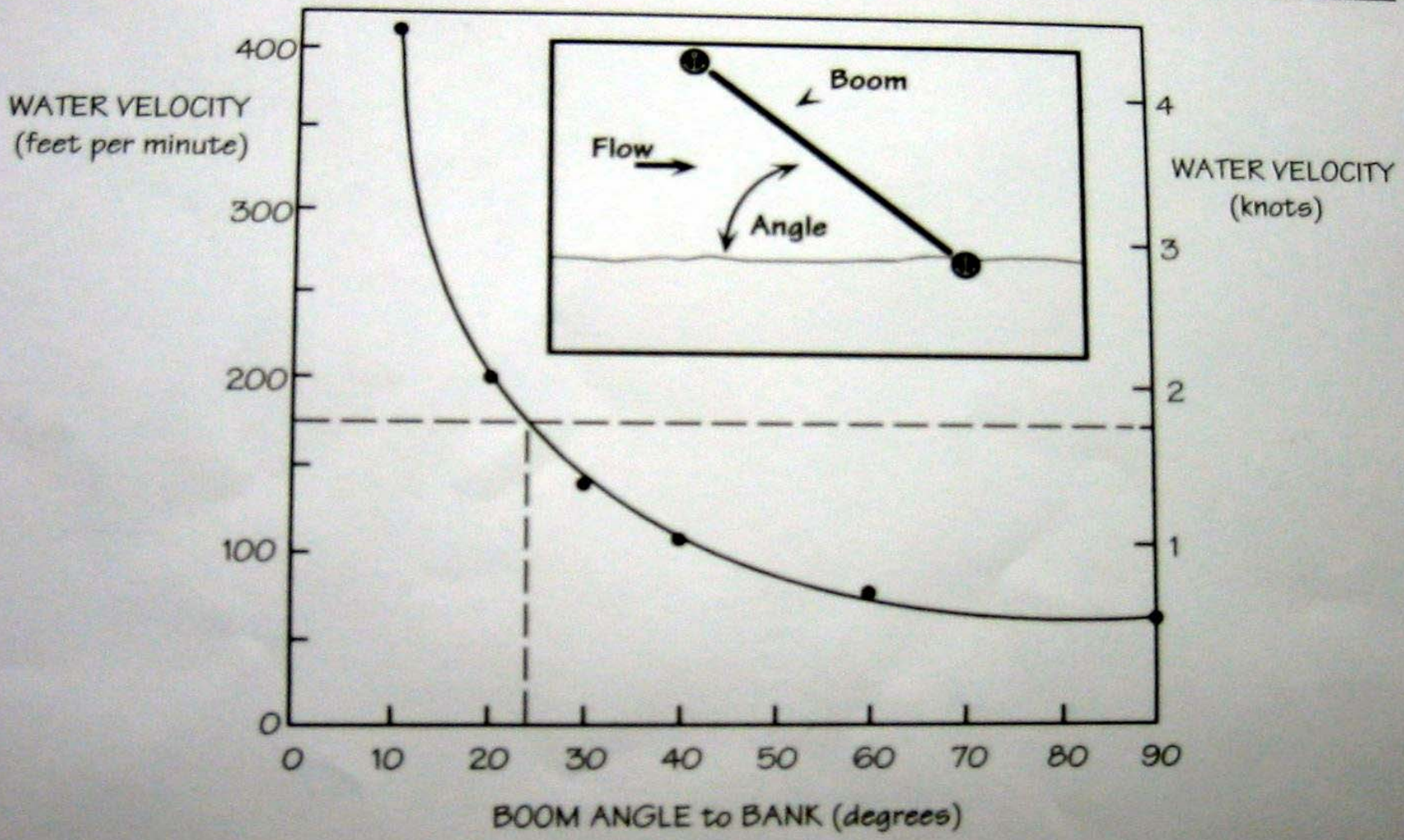


Figure 7. Plot of the maximum angle for boom deployment at increasing current velocities.

Boom Deployment

Boom is sometimes wound onto reels and stored for easy access and maneuverability. In lieu of reels, boom may be stowed methodically on response trailers for rapid deployment.

Use of bridle and amount of boom should not exceed 500 ft

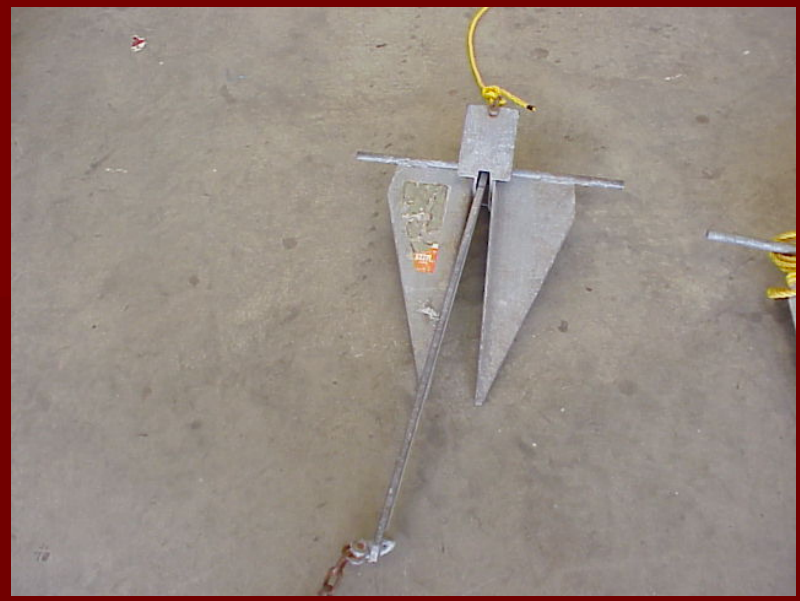
Towing section with a float attached

Damage

Boom selection and tow speed are some of many critical factors in mechanical recovery.

The wrong choice can lead to compounding problems during a response event.

Boom Anchoring



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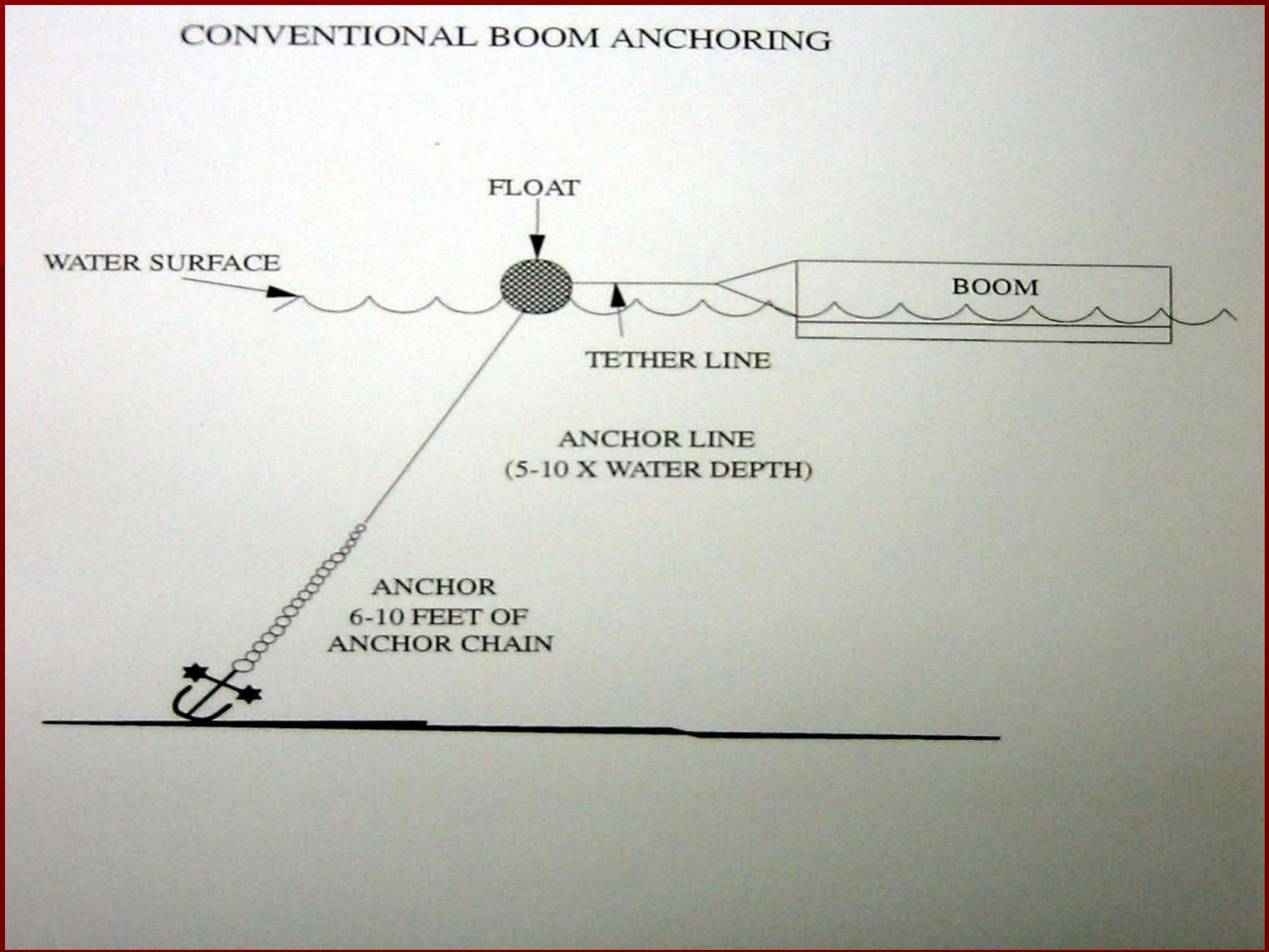

CONVENTIONAL BOOM ANCHORING
FLOAT
WATER SURFACE
BOOM
TETHER LINE
ANCHOR LINE
(5-10 X WATER DEPTH)
ANCHOR
6-10 FEET OF
ANCHOR CHAIN

Anchor Procedure

Anchor Procedure

- Attach the anchor to the ring on the Boom at the connection point
- Let all your line out until you get 2-3 feet from the chain.
- Cleat rope off to forward cleat and start to back down pulling the boom where you need it.
- Keep Chain and Anchor on side of boat.
- Put boat in Neutral when boom is in position and remove line from cleat.
- Drop Anchor.

Your Response Trailer

Specifications of Trailer

- 20FT 10,000 lbs
- 8ft Wide
- 3 compartment
- 2-5/16 Ball
- Electric Brakes
- Tongue Weight:
- Rear drop down door
- Complete with Key and pad locks

Forward Compartment

Forward Compartment Supplies On Left Wall

- 20 Lb Anchors.
- 6ft Chain
- Shackles are on Anchors already
- 10 Anchor Buoys

Front Compartment on Right Wall

- Long Handled Brooms and Shovels.
- Sledge Hammers

- 8 Towing Bridles with Thimbles. Is fitted with a universal slide connector to fit both the 18” an 12”

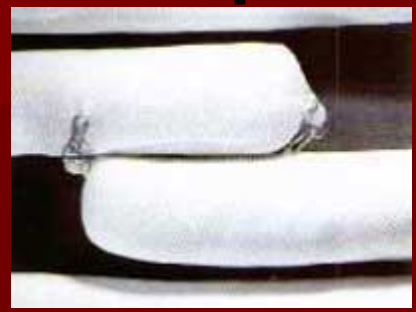
Front Compartment Rear Wall

- Caution Tape
- First Aid Kit
- Eye Wash
- Chicken Boots
- Hand Cleaner
- Duct Tape
- Nitrile and leather gloves
- Safety Glasses
- Tool Box w/ Pliers, Cable Ties, Extra pins for Boom
- Portable Lights
- 3 xl Tyvek
- 5 spools of ½ inch rope

Middle Compartment

Middle Compartment

- 5 Bales of Sorbent Boom
- 2 Bales of Snare
- 5 bags of Speedy dry
- 10 rebar Steel Rods
- 5 bales of pads



Middle Compartment

- 12”, 18”, 24” inflatable bladder for storm culvert.
- All fittings are on bladders
- Electric powered Air Compressor
- 2000 Watt generator

Rear Compartment

Two types of Boom

- (8) 100 ft sections of 18 inch harbor with Universal connectors.
- (4) 50ft sections of 12 inch harbor boom with Universal connectors.