Manual Offshore Recovery

A manual for the use of the offshore recovery unit for binders

Acknowledgement

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Disclaimer

This User Manual has been developed as a Manual for the handling of gear to recover floating sorbents from the water surface after an oil spill. It describes the different steps that have to be taken into account to ensure a safe, fast and efficient operation in case of an emergency. It is necessary to deal with the equipment and to learn the operation procedures in advance through exercises. Although every effort has been made to produce a complete manual, no responsibility can be taken to ensure that this Manual covers all situations when in use.

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Foreword

This manual is designed for the user of the offshore recovery unit in case of sorbent application at sea.

The aim of this manual is the safe and correct use of the gear while using sorbents to respond to a marine oil spill.

This manual describes the handling of the gear to recover floating sorbents from the water surface.

Content

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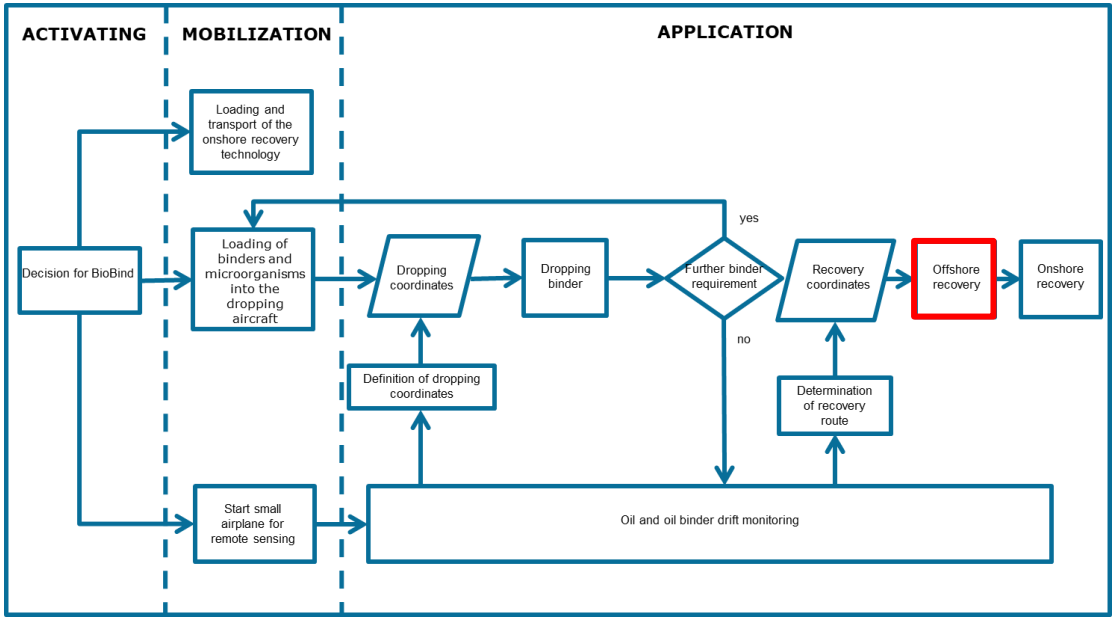
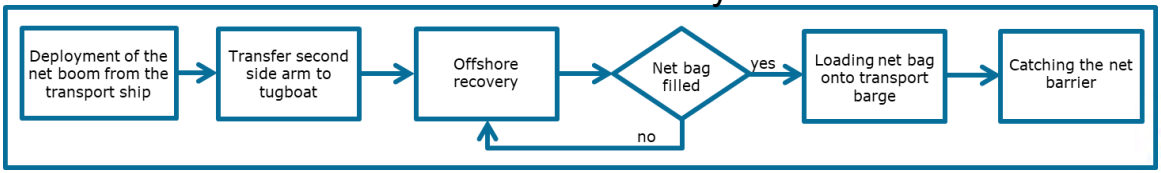
Flow chart



Offshore recovery



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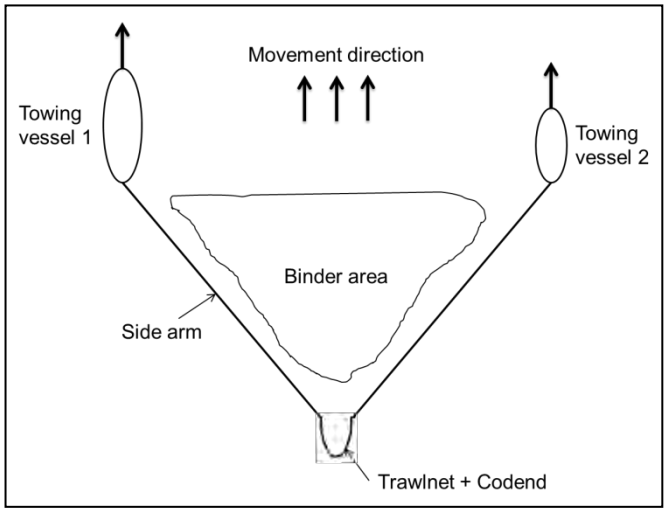
Proposed set-up of the Offshore-Recovery



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Safety https://www.safetysign.com/iso-mandatory-symbol-labels






If good operational procedures are followed and correct Personal Protective Equipment (PPE) is worn, operations should pose minimum risk to health. However there are, as with other such activities, potential risiks to all participants.

These risks can be minimised by:

- Conducting a omprehensive risk assessment process and implementing mitigation measures to reduce them where applicable
- Communicating the risks and mitigations in place through a safety brief prior to any operations being carried out.

Minimum PPE standards:

- Ear lugs/ muffs whilst machinery is running
- Gloves
- Safety shoes
- High visibility clothing
- Life-Jacket
- Coveralls

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Risks and mitigations

Risks	Impacts	Mitigation Measures
Man overboard.	Potentially leading to hypothermia, drowing.	When working on the back deck personal flotation devices to be worn. Any open access to be secure.
Unsecured load. Lashing/welding equipment to the deck.	Potential crush injuries from unsecure loads.	Welding to be carried out by a competent and trained person. Equipment to be secured to the deck properly and checked by person nominated Deck In Command (IC) prior to vessel steaming.
Exposure to Volatile Organic Compounds (VOCs) and potentially also Hydrogen Sulphide H_2S from the oil that has been spilt.	Could cause nausea and if H_2S is present, death in extreme cases.	Enforce a site entry protocol. Provide gas monitoring devices and appropriate respiratory PPE.
Manual handling.	Potential for back injuries.	Before any deployment commences, manual handling training should be given to anyone involved. Ensure that weights are clearly marked on the packages. Make sure that lifting equipment is available as appropriate.
Slips, trips and falls.	Potential for minor injuries such as cuts, bruises or minor fractures.	Appropriate footwear to be worn. Handrails to be used. There should be an awareness of the sea conditions. Good housekeeping will also minimise the incidences of slips, trips and falls.
Noise (85-90dBA).	Danger of damage to hearing if exposed to loud machinery for prolonged periods of time.	Ear defenders to be provided and worn.

According to Field Guides from Oil Spill Response Limited (OSRL)

! While this table lists some of the common hazards that are likely to be present when conducting offshore containment and recovery operations, it does not constitute a risk assessment. A full site-specific risk assessment should always be conducted prior to operations commencing.

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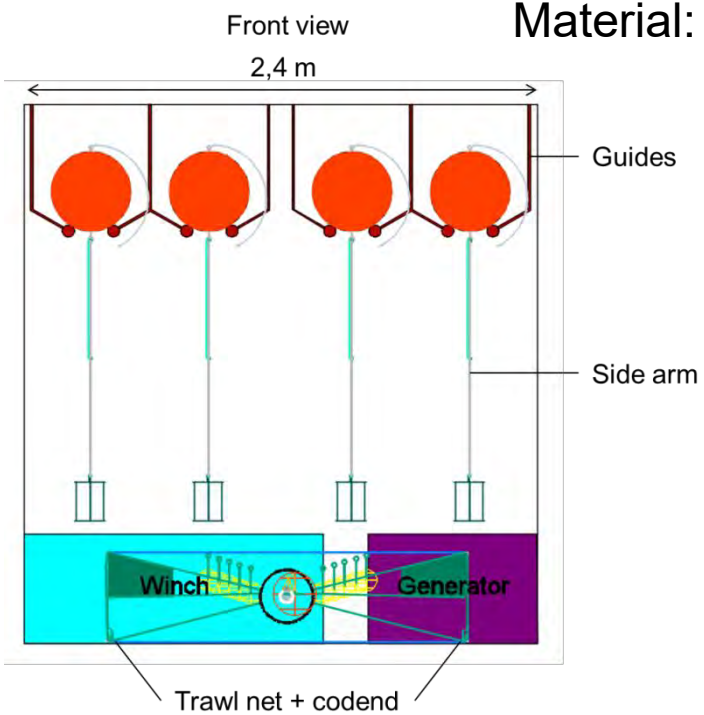
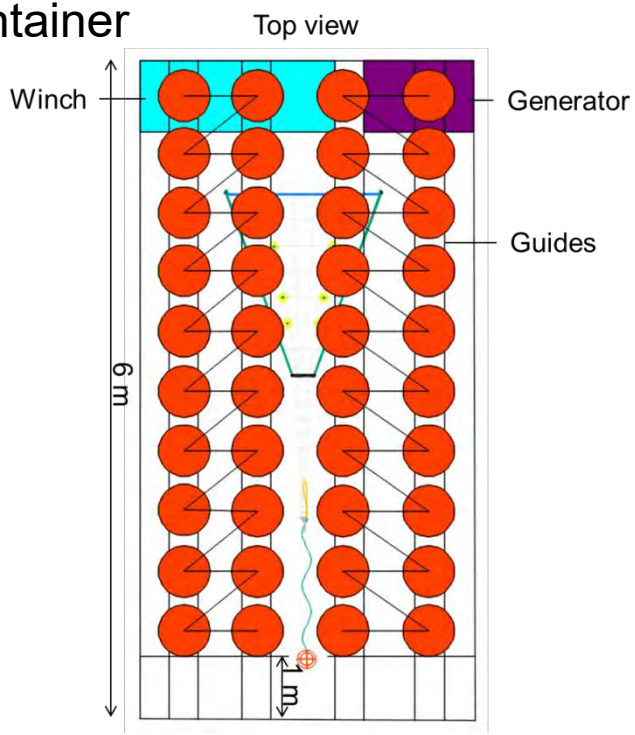
Material: Container





- The material is inside the 20ft. Container:
  - Trawl net (Codend)
  - Two side arms
  - hydraulic Winch
  - Generator

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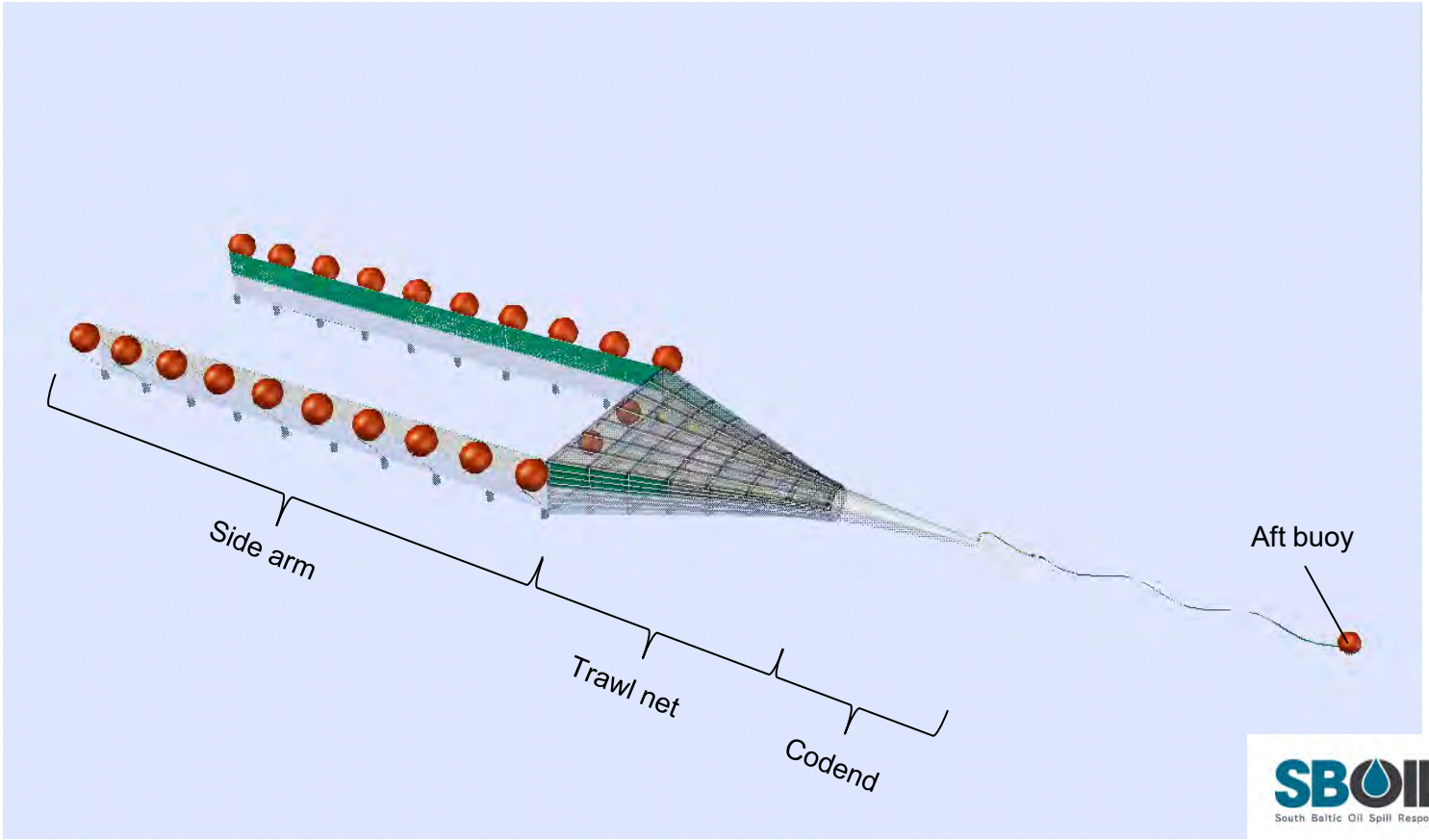
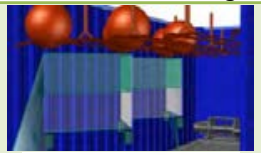
Material: Net-boom



Components

Illustration Drawing	Real image	Name	Illustration Drawing	Real image	Name
		bouy with fastening			segment sidearm in container
		codend			shakel
		eyelet for pulling			trawl net
		fast-shakel			weight
		hook			

Product Sheet:
Oil-Sorbent: BioBind

Technical Data:

Thickness	3,5 to 4,2 mm
Dimension Binder	50 x 50 mm
Density	250 to 280 kg/m³
Bulk density	110 to 120 kg/m³
Material	Spruce Wood (Picea abies)
Additives	3 % latex or wood extractives
Oil	Light Oil, Crude Oil, Heavy Oil
Oil sorption rate per m³ (bulk)	230 to 260 kg
Oil sorption rate per m³ (Particle volume)	600 kg
Oil sorption rate per m³ (Binder surface)	2,4 kg
Oil sorption rate per kg	2,1 kg
Coverage dosage	> 0,11 m²/m²
Float Time	> 3d
Customs-Tariff-Number	44013920

Application for oil spills on water surface (e.g. oceans, lakes, rivers) especially for marine application; Suitable for air- and ship borne distribution; Suitable for application during bad weather conditions and on shallow water territories; Ship borne recovery by net booms;

The BioBind oil binder is made of biodegradable wood-fiber causes no environmental impact. It shows a high oil absorption capacity of approx. 600 kg m-³ especially for thin oil films down to 0.03 mm and a high retention capacity for oil. On water surface, the binder achieves an oil recovery rate of approx. 80 % with a coverage dosage of 11 %. The binder floats for more than 3 days. The binder material can be equipped with oil degrading microorganisms.

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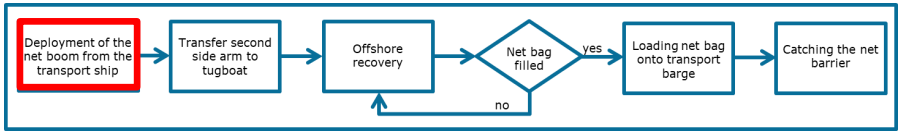
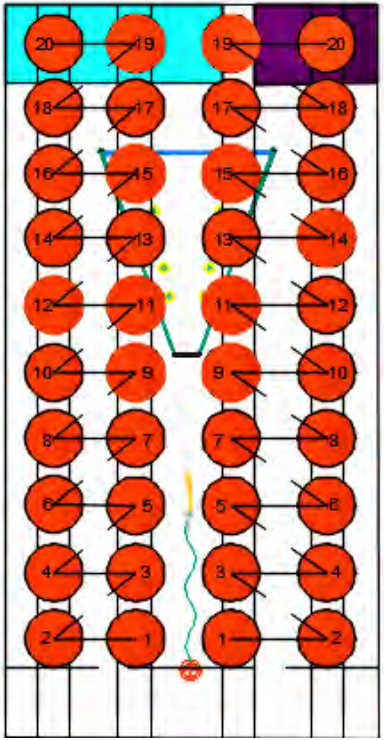


Step 1: Pull the net out of the container and put it together on the deck



If there is enough space on the deck, the net can be prepared on the way to the site! Otherwise, the net must be assembled and placed in the water directly at the place of use.

- 1.1 Pull trawl net out of the container
- 1.2 Remove sidearms buoy by buoy from container and connect to weights
- 1.3 Connecting the sidearms to trawl net

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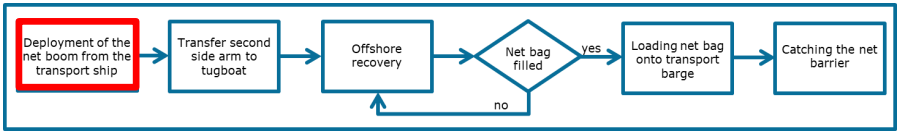
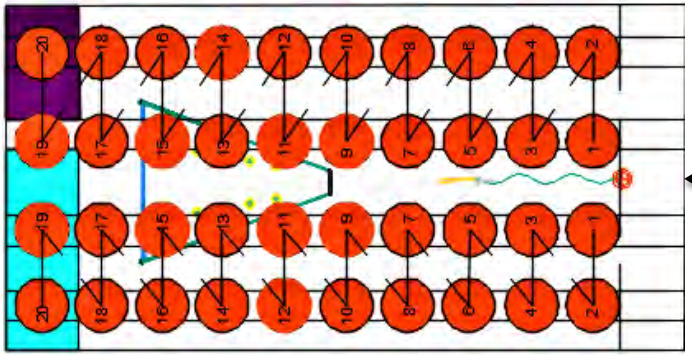


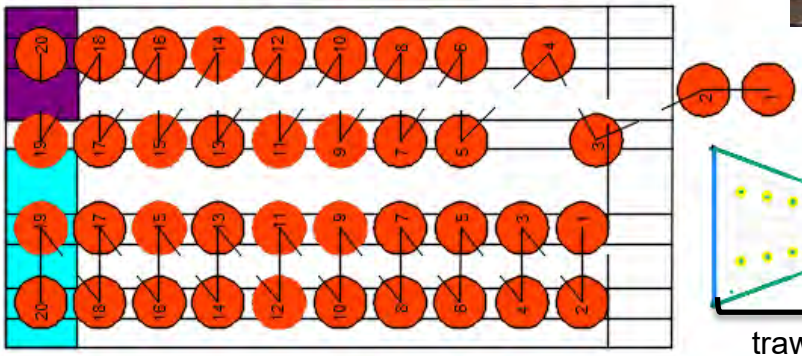
Step 1.1: Pull trawl net out of the container

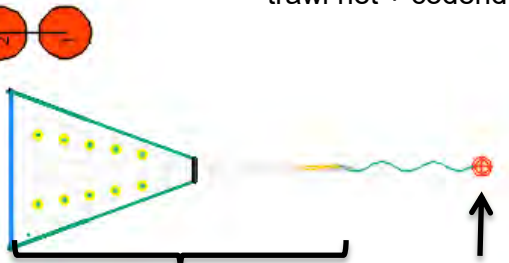


Initial position

trawl net + codend

aft buoy





trawl net + codend

aft buoy

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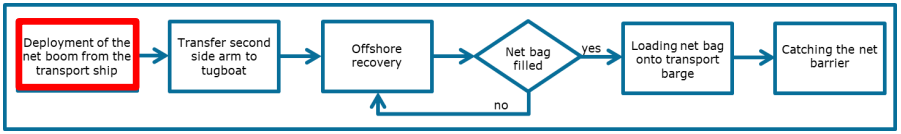

Step 1.2: Connecting the side arm to trawl net

trawl net

Open the shakel!
Two connections per site!

side arm

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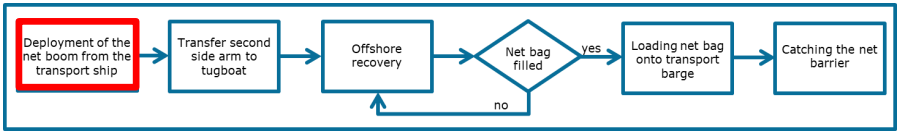
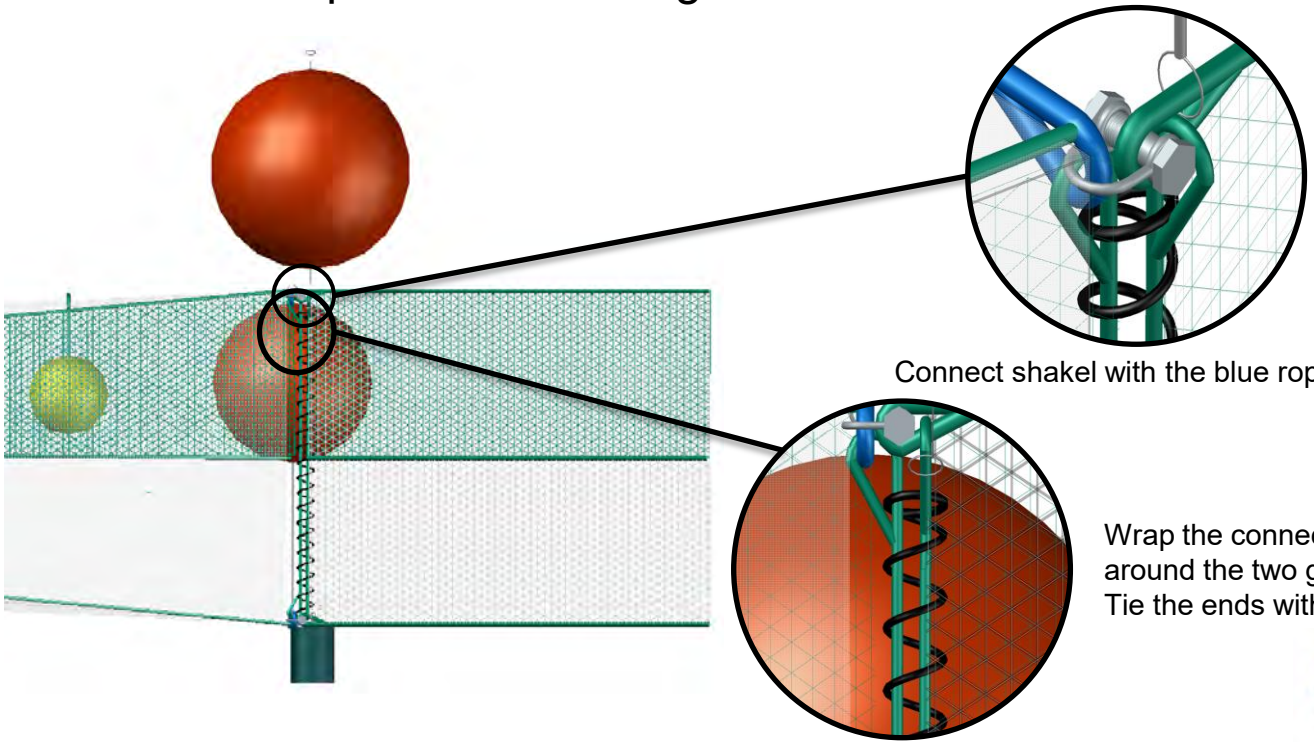


Step 1.2: Connecting the side arm to trawl net



Connect shakel with the blue rope!

Wrap the connecting rope around the two green ropes. Tie the ends with a knot.

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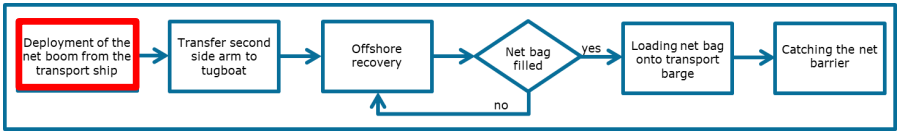
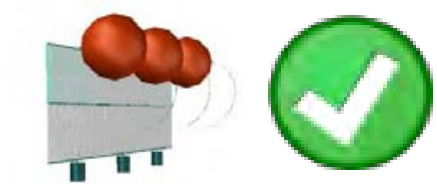
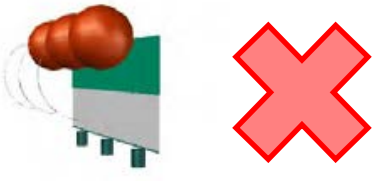


Step 1.3: Connecting buoys to weights

1. **2.** **3.** **4.** **5.**

Take the free hanging metal rope from the buoy and connect the loop at the end of this rope to the fast shackle on the weight!
The buoy must NOT be on the side of the green courtain.





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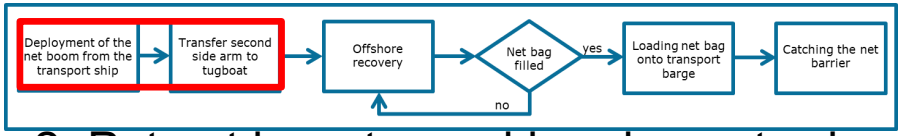
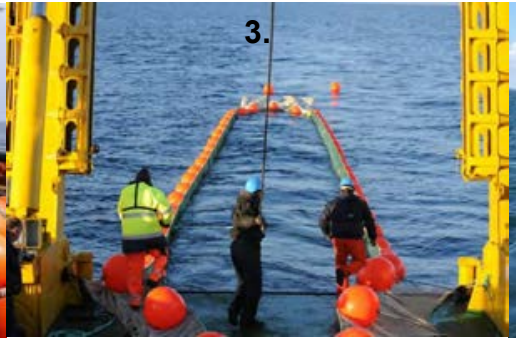


Step 2: Put net in water and hand over towing line

- Ship must move forward as slow as possible („Dead slow“)
- 1. Moor towing rope from the sidearm to the ship
- 2. Put aft buoy and trawl net in the water
- 3. Let the buoys slip into the water step by step
- 4. Hand over the auxiliary rope with the towing rope of the other side arm to the second ship
- 5. Moor towing rope on the second ship

IMPORTANT! Buoys form the outside of the U and the green courtain is on the inside.



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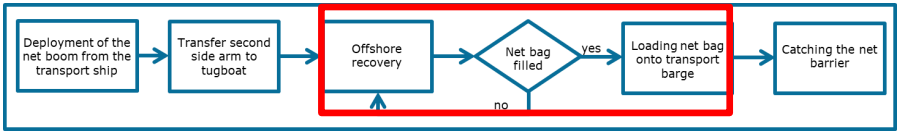
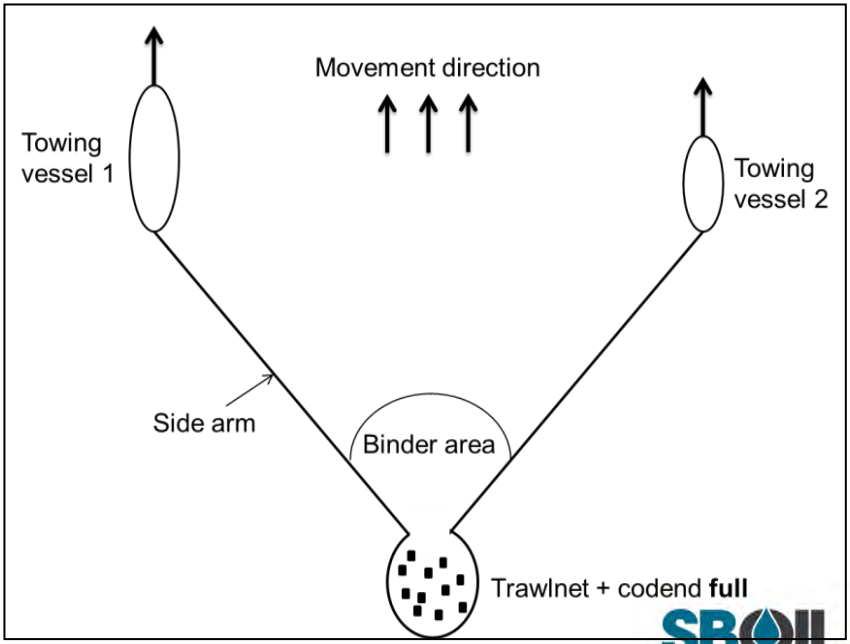


Step 3: Netboom towing

- The structure corresponds to a classic oil barrier
- Ships travel forward at slow speed until the cod end is **full**
- There are two ways to empty the codend:
  - Retract the net and dump sorbents (Step 4a p. 20)
  - Retract the net and replace the codend (Step 4b p. 28)



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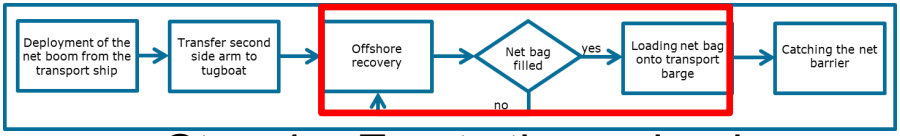

Step 4a: Empty the codend

Retract the net and dump sorbents

Recovery with two ships

1. Towing vessel 2 moves close to the side of towing vessel 1!
2. Handover the second side arm! Towing vessel 2 moves to the end of the net boom!
3. Use a crane to pull out the codend by the yellow rope!
4. Hold the codend over an oil-safe container!
5. Open the codend!
6. Empty the codend!
7. Close the codend again and hang it back into the water!

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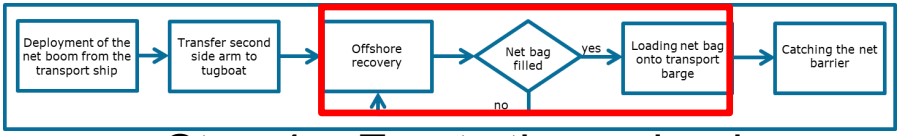
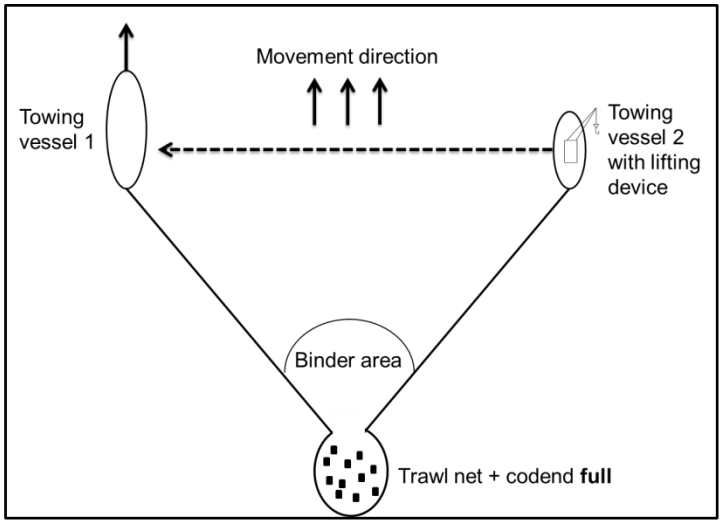


Step 4a: Empty the codend

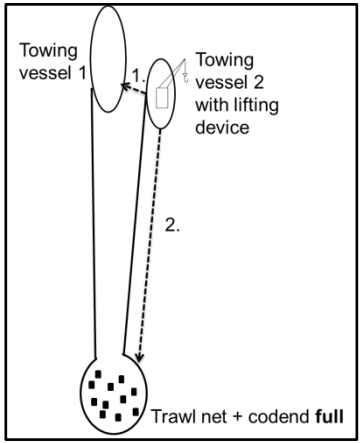
Retract the net and dump sorbents

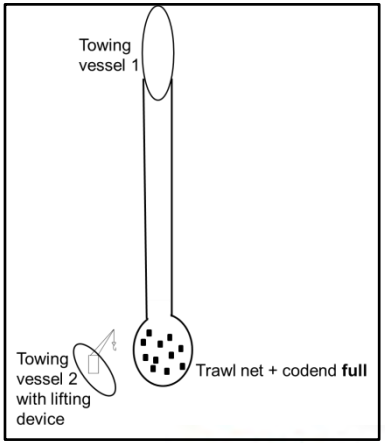
Recovery with two ships

Towing vessel 2 moves to the side of towing vessel 1!



Handover the second side arm!
Towing vessel 2 moves to the end of the net boom!





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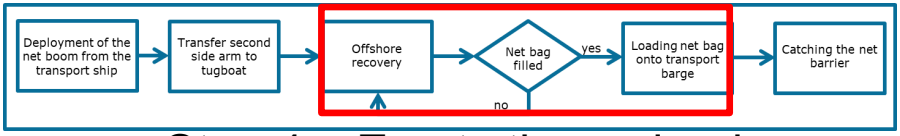

Step 4a: Empty the codend

Retract the net and dump sorbents

Recovery with three ships

1. Vessel 3 moves to the end of the net boom!
2. Use a crane to pull out the codend by the yellow rope!
3. Hold the codend over an oil-safe container!
4. Open the codend!
5. Empty the codend!
6. Close the codend again and hang it back into the water!

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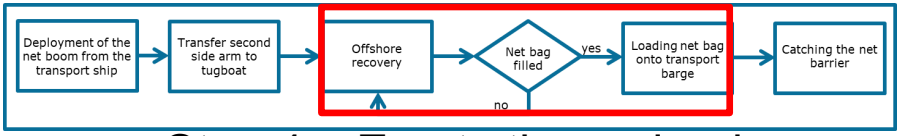
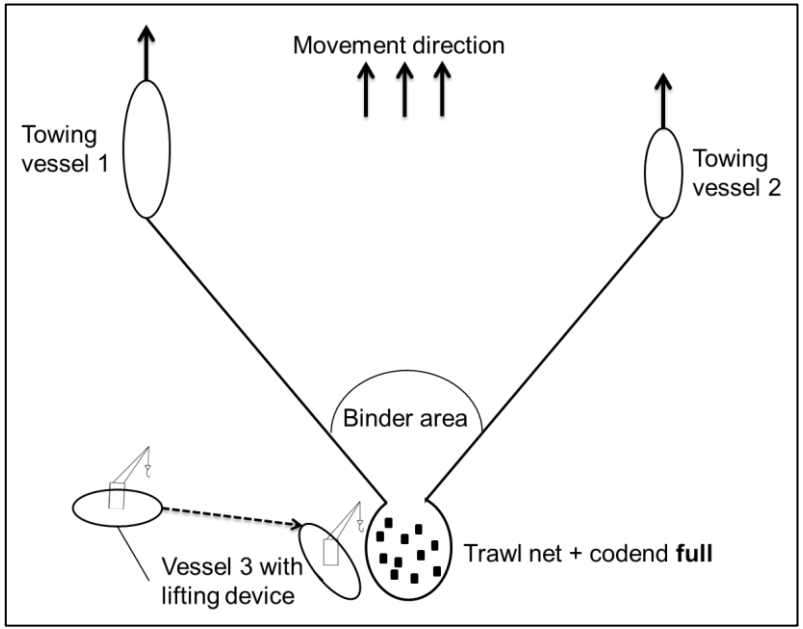


Step 4a: Empty the codend

Retract the net and dump sorbents

Recovery with three ships



Vessel 3 moves to the end of the net boom!

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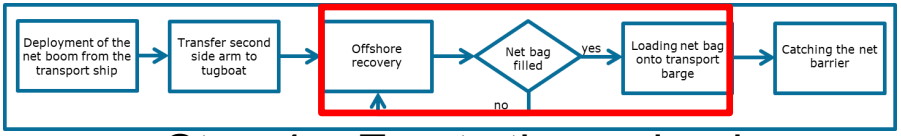
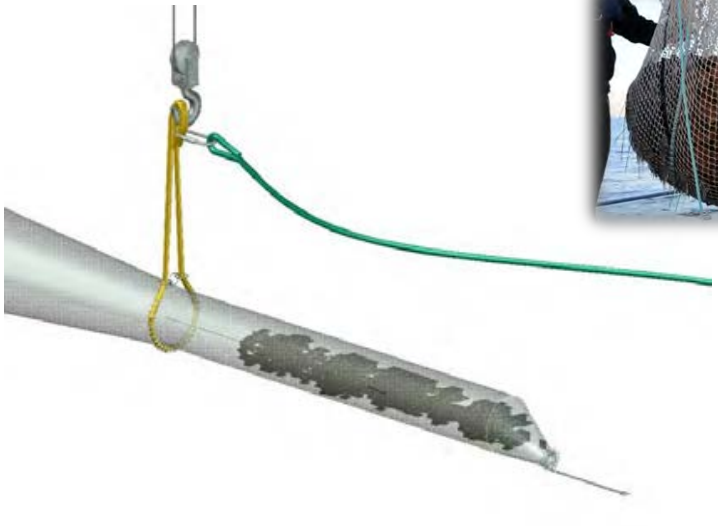


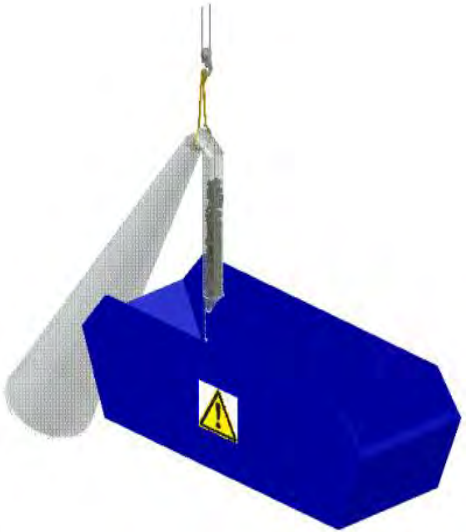
Step 4a: Empty the codend

Retract the net and dump sorbents

Use a crane to pull out the codend by the yellow rope!



Hold the codend over an oil-safe container!



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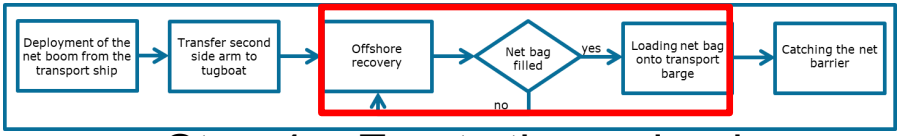
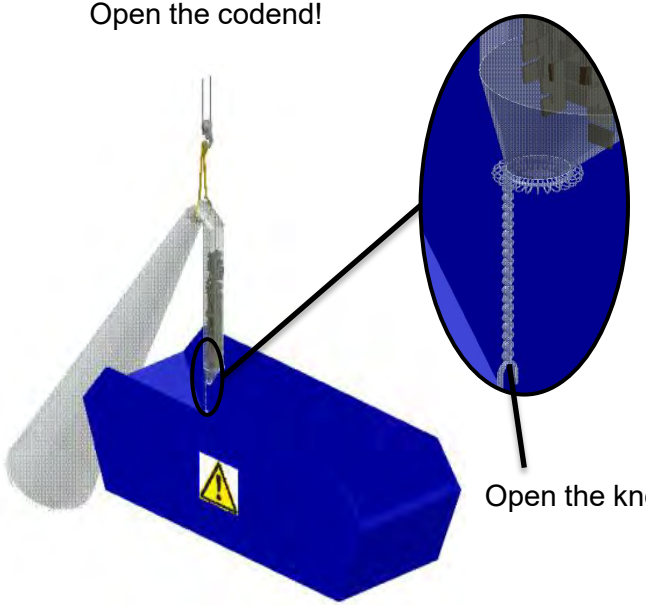


Step 4a: Empty the codend

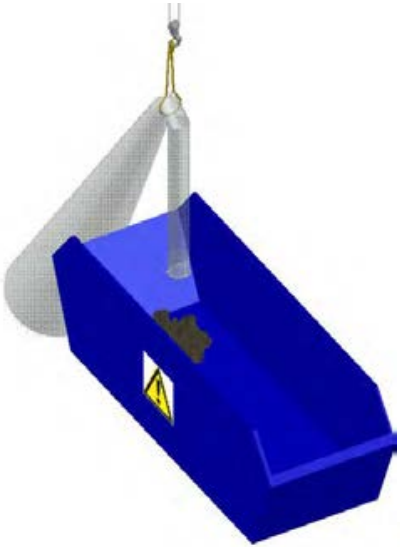
Retract the net and dump sorbents

Open the codend!



Open the knot

Empty the codend!



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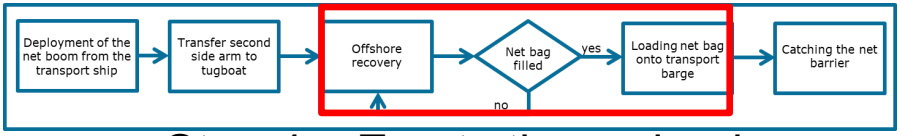
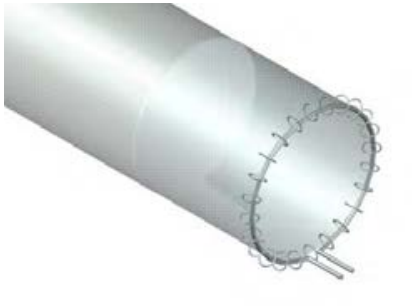


Step 4a: Empty the codend

Retract the net and dump sorbents

Close the codend again and hang it back into the water!



Pull the end of the net tightly together and close with a knot.

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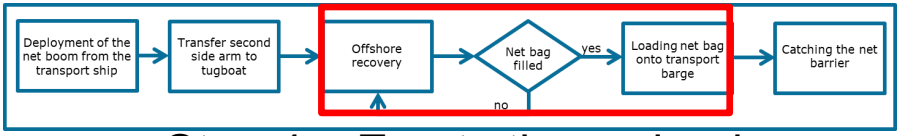
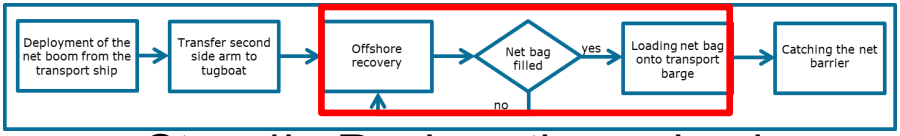


Step 4a: Empty the codend

Retract the net and dump sorbents

If there are still sorbents in the water,
continue with step 2. (p. 18)
Otherwise go to step 5 “Retract the net boom” (p. 38)

SBOIL
South Baltic Oil Spill Response



Step 4b: Replace the codend

Retract the net and dump codend

Recovery with two ships

1. Towing vessel 2 moves to the side of towing vessel 1!
2. Handover the second side arm! Towing vessel 2 moves to the end of the net boom!
3. Use a crane to pull out the codend by the yellow rope!
4. Place the codend in an oil-safe container!
5. Separate codend from trawl net!
6. Attach a new codend and hang it back into the water!
7. Handover the side arm back to the second ship!

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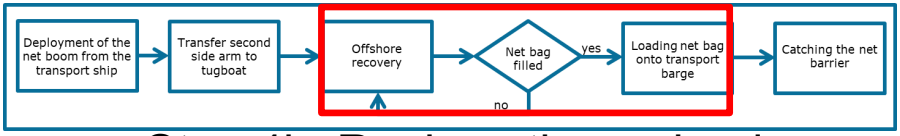
South Baltic Oil Spill Response

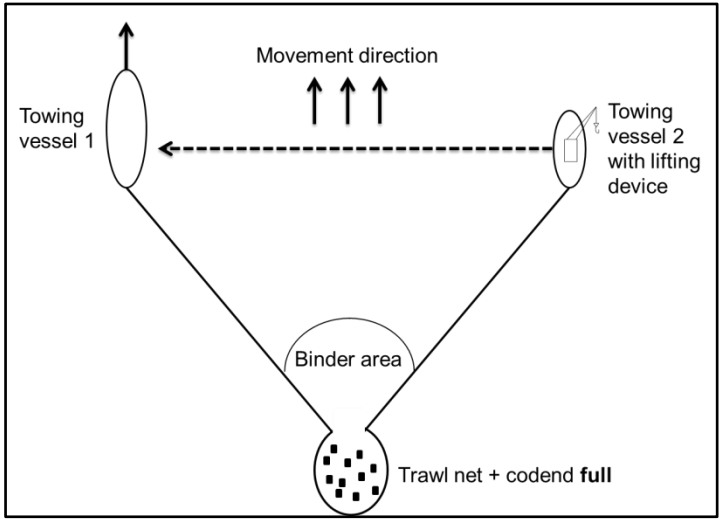


Step 4b: Replace the codend

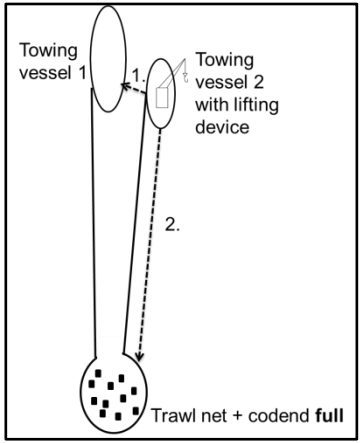
Retract the net and dump codend

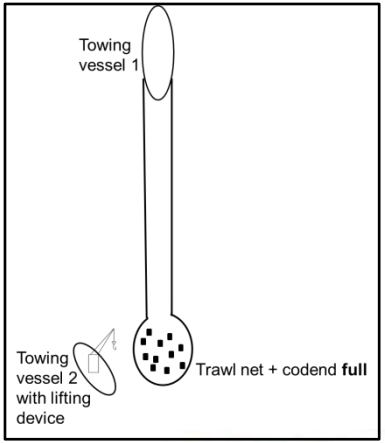
Recovery with two ships

Towing vessel 2 moves to the side of towing vessel 1!



Handover the second side arm!
Towing vessel 2 moves to the end of the net boom!





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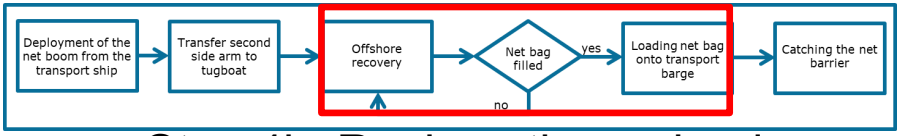
South Baltic Oil Spill Response



Step 4b: Replace the codend

Retract the net and dump codend

Recovery with three ships

1. Vessel 3 moves to the end of the net boom!
2. Use a crane to pull out the codend by the yellow rope!
3. Place the codend in an oil-safe container!
4. Separate codend from trawl net!
5. Attach a new codend and hang it back into the water!

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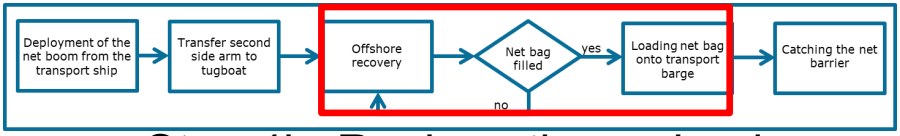
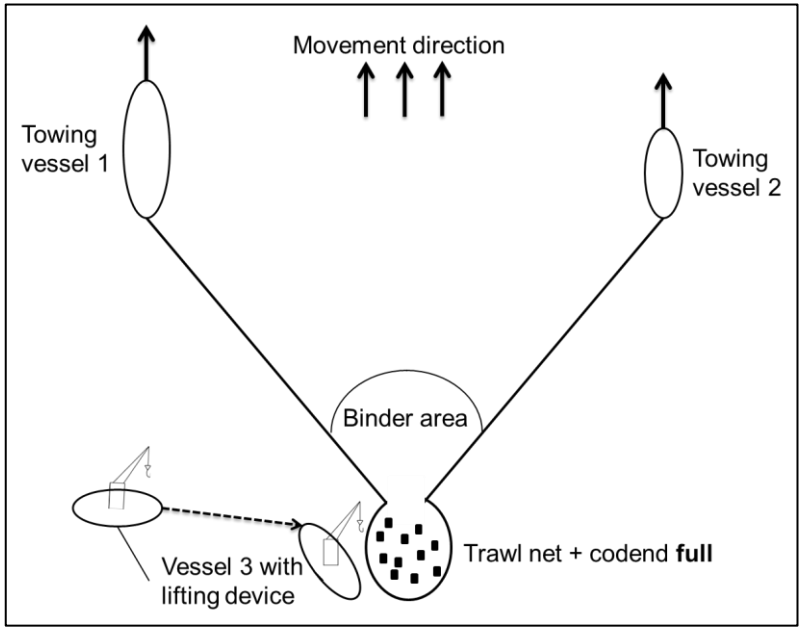
South Baltic Oil Spill Response



Step 4b: Replace the codend

Retract the net and dump codend

Recovery with three ships



Vessel 3 moves to the end of the net boom!

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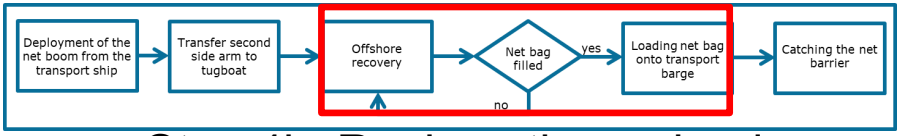
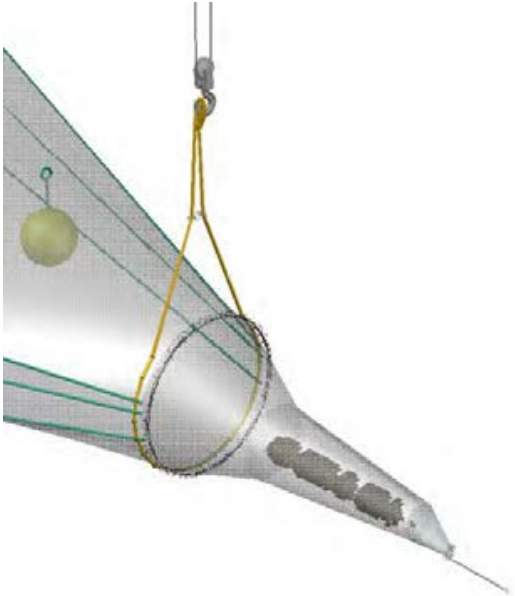


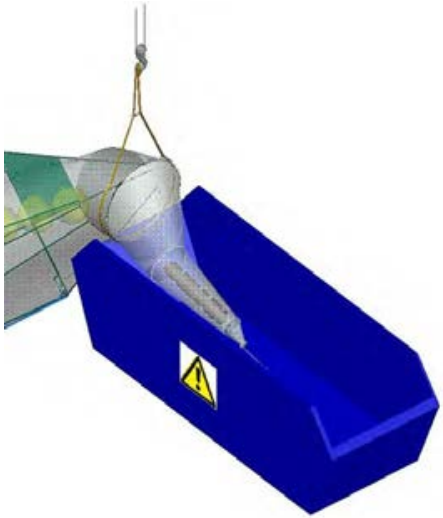
Step 4b: Replace the codend

Retract the net and dump codend

Use a crane to pull out the codend by the yellow rope!



Place the codend in an oil-safe container!



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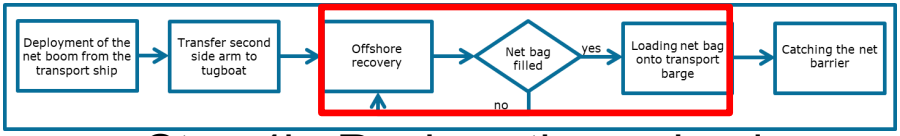
South Baltic Oil Spill Response

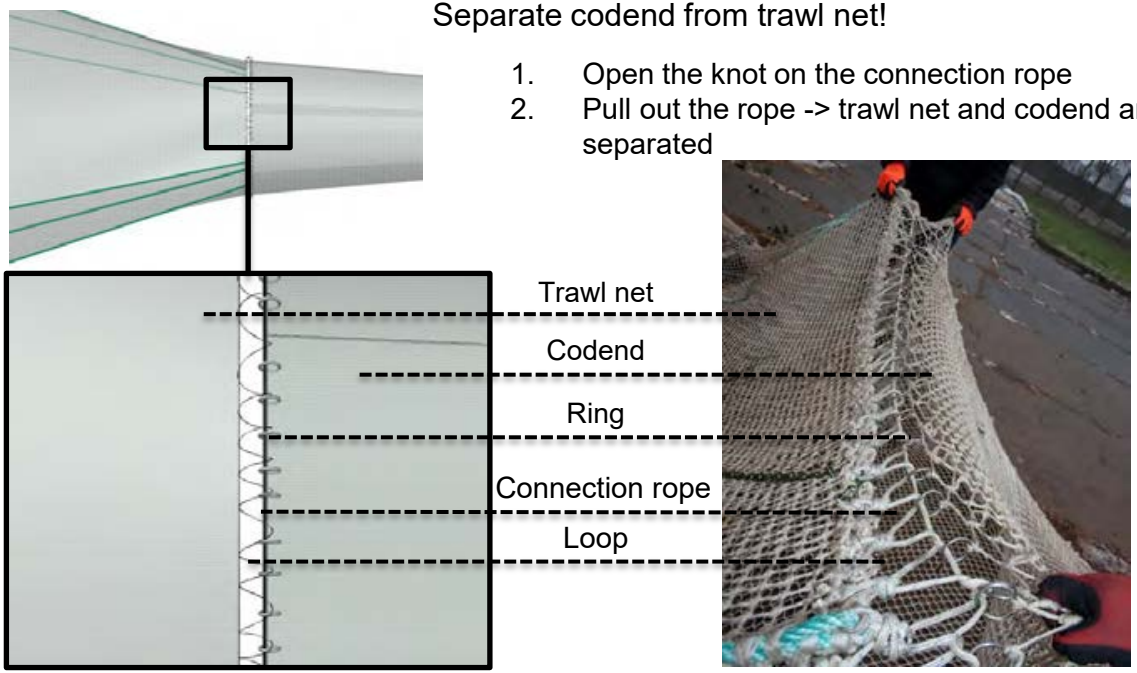


Step 4b: Replace the codend

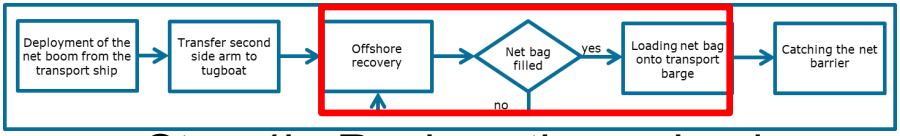
Retract the net and dump codend

Separate codend from trawl net!

1. Open the knot on the connection rope
2. Pull out the rope -> trawl net and codend are now separated



SBOIL
South Baltic Oil Spill Response



Step 4b: Replace the codend

Retract the net and dump codend

Attach a new codend and hang it back into the water!

1. Pull the rope alternately through a loop and a ring until all are connected
2. Close the rope with a knot -> trawlnet and codend are now connected
3. Hang it back into the water

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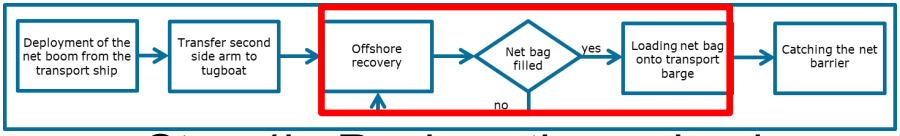
South Baltic Oil Spill Response



Step 4b: Replace the codend

Retract the net and dump codend

If there are still sorbents in the water,
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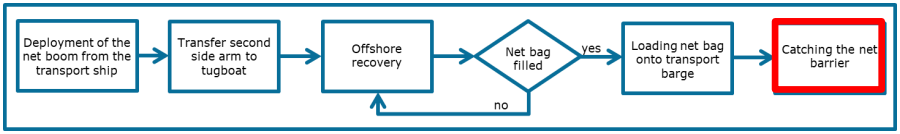
South Baltic Oil Spill Response



Decontamination

All components of these oil recovery unit should and can be reused.

The components are to be cleaned in the decontamination zone provided for in the management plan.

The procedure corresponds to the standard cleaning process.

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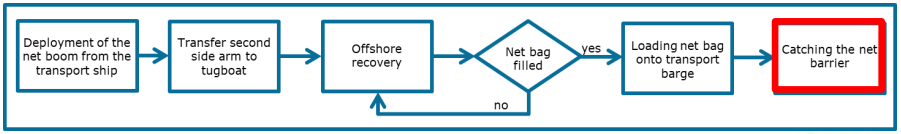
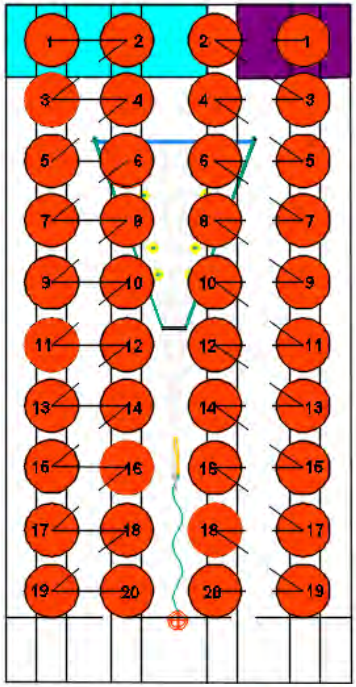
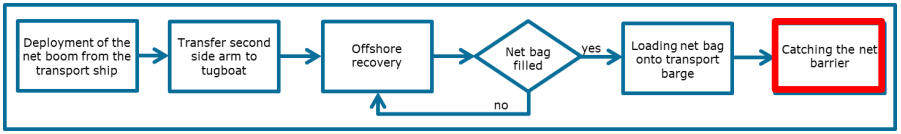
South Baltic Oil Spill Response



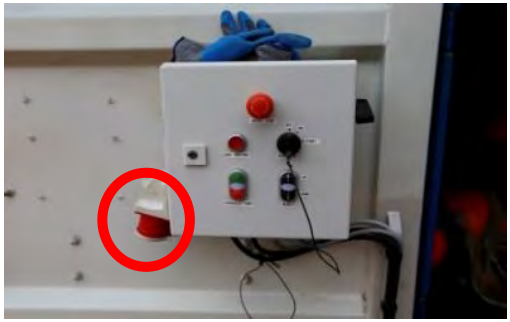
Proposed set-up -container

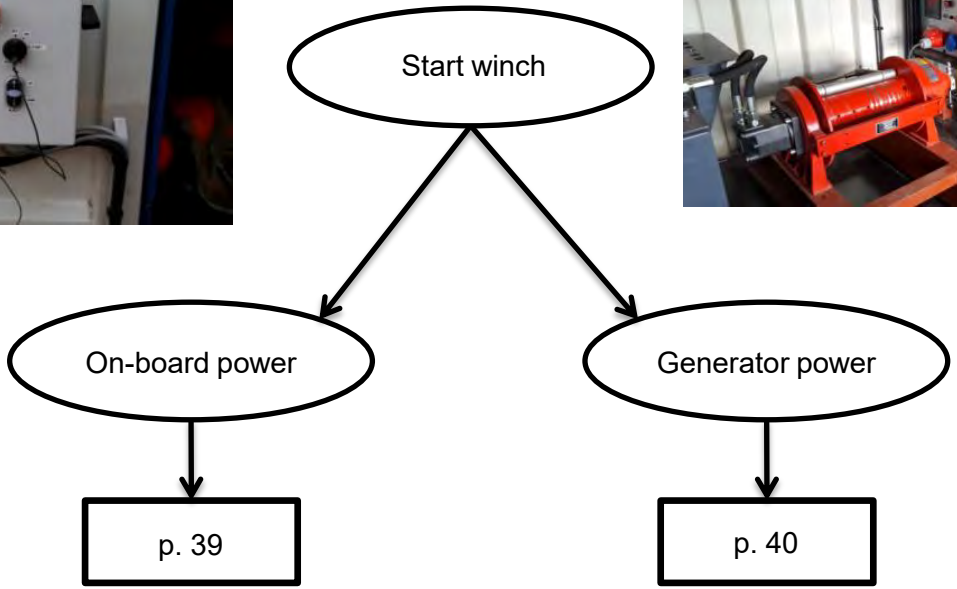


SBOIL
South Baltic Oil Spill Response

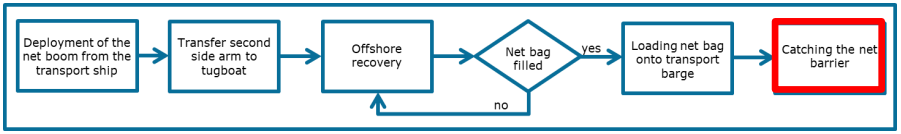


Step 5: Retract the net boom

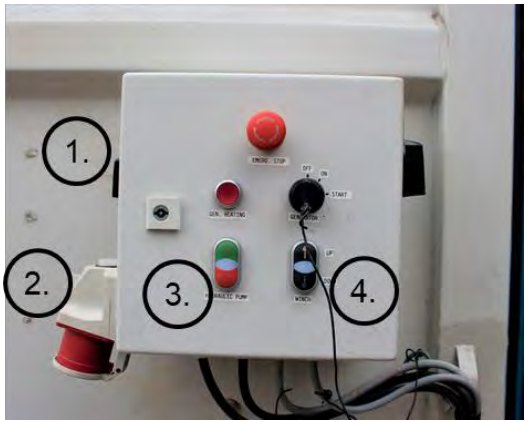




SBOIL
South Baltic Oil Spill Response



Step 5.1: Start winch with on-board power

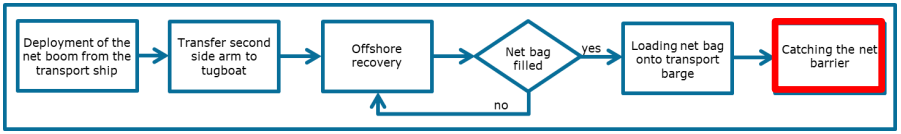


1. Set lever to „2“ (From Socket)
2. Connect the power cable
3. Press the green button

→ Hydraulic pump starts running

4. With Up and Down you can move the winch

SBOIL
South Baltic Oil Spill Response



Step 5.1: Start winch with generator power

1. Set switch to „1“ (From Generator)
2. Set switch „Generator“ to „ON“
3. Press button „Gen. Heating“ for 3s
4. Set switch „Generator“ on „START“ → Generator starts to run
5. Press green button → Hydraulic pump starts running
6. With Up and Down you can move the winch

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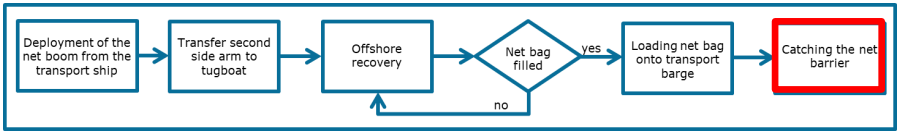
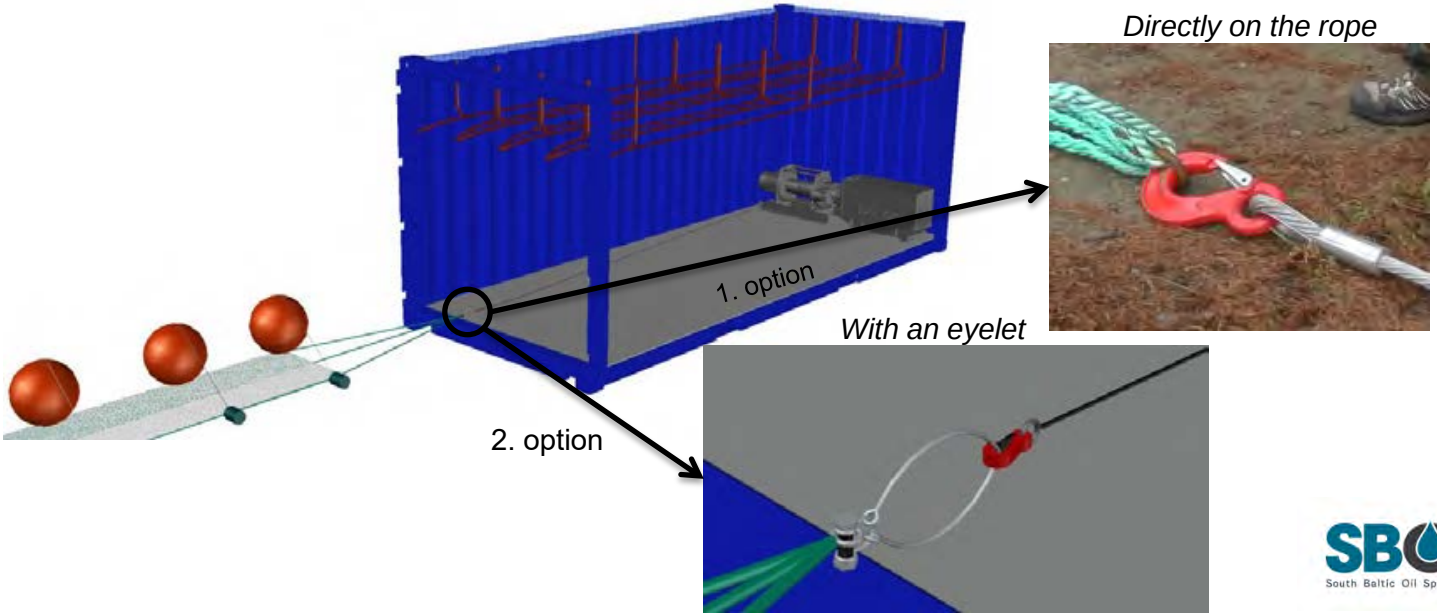
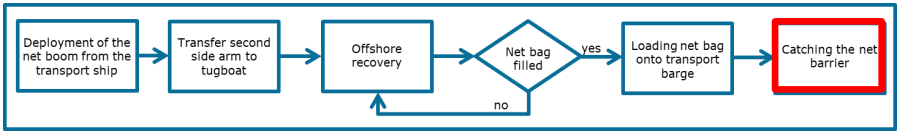
South Baltic Oil Spill Response



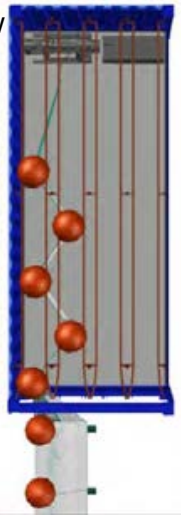
Step 5.2: Attach the rope and pull it in

1. Unrolling the rope from the winch
2. Connect the rope to the net and pull it in (keep "down" pressed at the switch box)

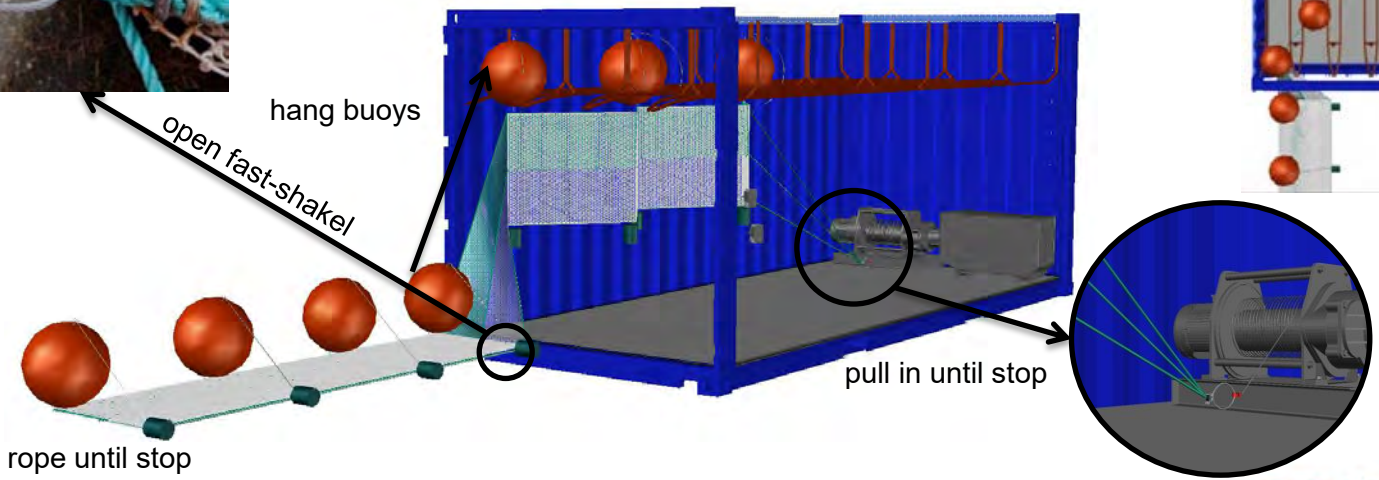




Top view



Step 5.3: Pull it in



Pull in rope until stop
While pulling in:

- Sever the connection between the weight and the buoy (fast-shakel)
- Hang buoys in zigzag (look top view)

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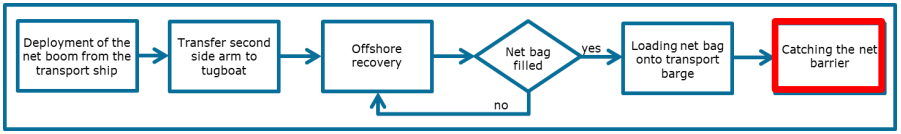
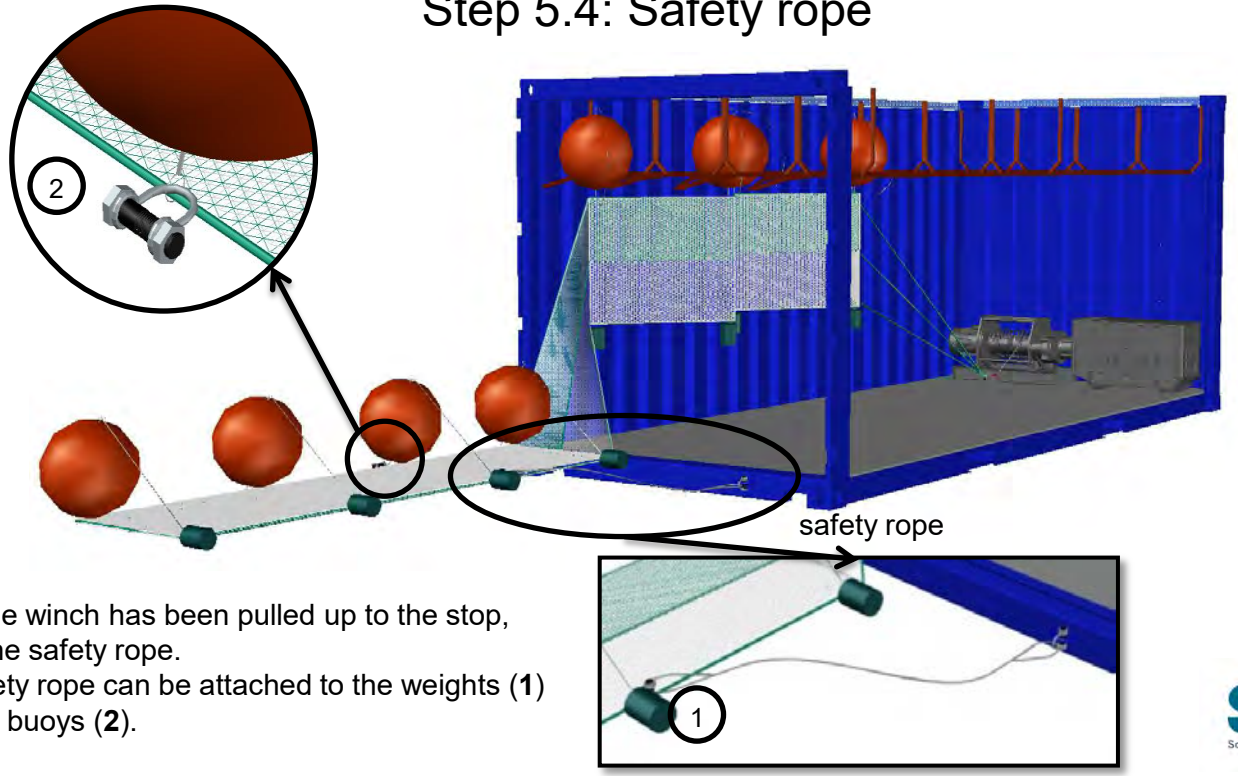
South Baltic Oil Spill Response



Step 5.4: Safety rope



When the winch has been pulled up to the stop, fasten the safety rope.
The safety rope can be attached to the weights (**1**) or to the buoys (**2**).

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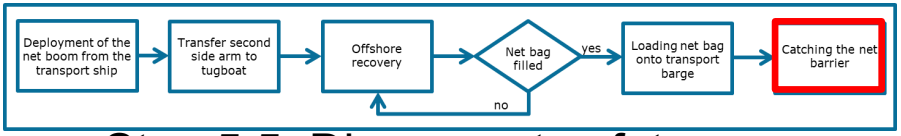
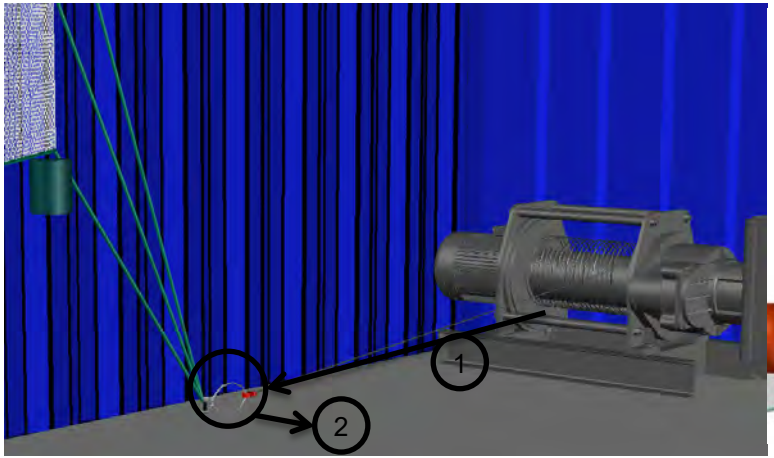
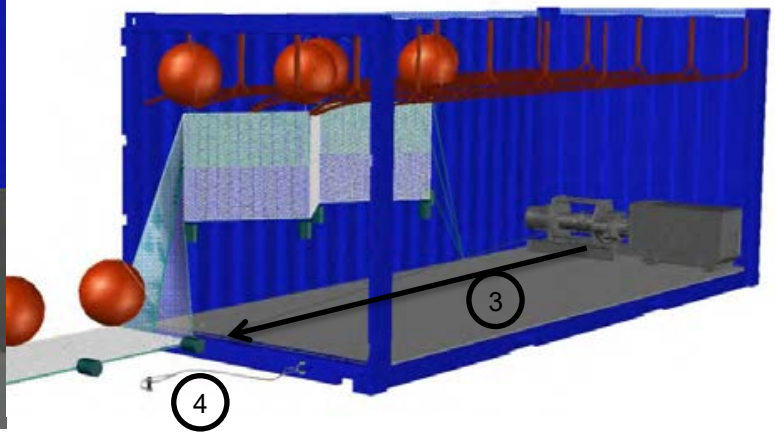
South Baltic Oil Spill Response



Step 5.5: Disconnect safety rope





When the safety rope has been fastened, unwind (**1**) the winch rope slightly.
Disconnect (**2**) the eyelet or the hook from the side arm .
Unwind (**3**) the winch rope and reconnect it to the side arm. You can connect it, with the weight or the buoys.
Disconnect the safety rope from the side arm.

Repeat step 5.3 to 5.5 until both side arms are in the container.

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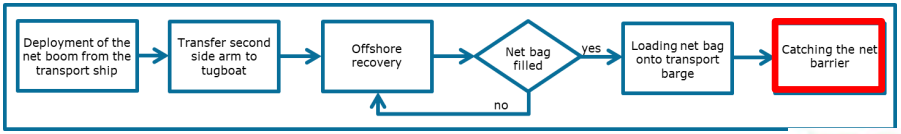
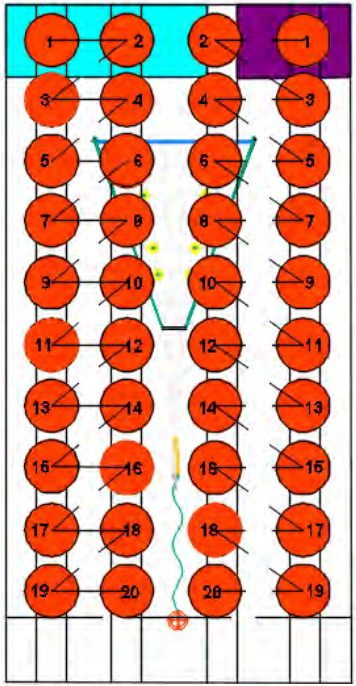
South Baltic Oil Spill Response



Proposed set-up -container



At the end stow the trawl net and the codend on the bottom below the side arms.

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South Baltic Oil Spill Response