

Near-shore oil spill response techniques



Maritime and Coastguard Agency



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Near-shore oil spill response

- Part One
 - Oil-sensitive resources can be protected from the effects of spilled oil by the use of booms
- Part Two
 - The spilled oil contained by the boom may also be collected and recovered using skimmers or vacuum devices



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Part One Inshore booming



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Booms

- Booms are barriers that prevent oil from contacting oil-sensitive resources and containing oil prior to recovery
- Booms are produced in several types:
 - Offshore
 - Inshore skirt
 - Shore-sealing
- Booms are produced in standard lengths
 - Typically 10 metres or 20 metres



Inshore Protection Who does What

- MCA – Resources, expertise, provides contractors
- EA – Equipment, expertise
- Local Authority – logistics, assistance, manpower
- Oil spill contractors – Equipment, expertise, manpower

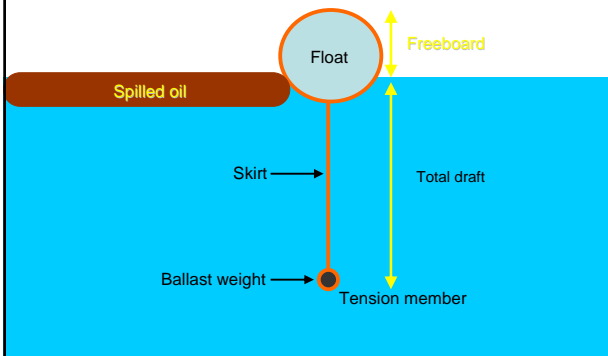


Boom deployment

- Technically complex
- Requires great expertise and manpower levels – mostly underestimated
- Significant H&S implications
- In major spills – insufficient resources
- Site prioritisation essential
- Think about oil recovery and temporary storage



A typical skirted boom



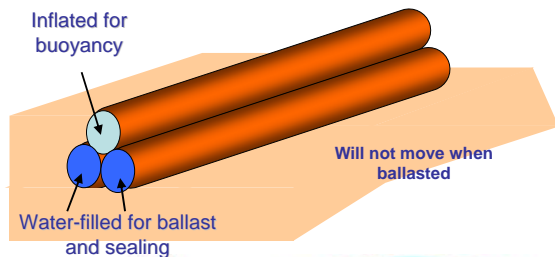
Skirted boom



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Shore-sealing boom

Useful for inter-tidal areas



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Shore-sealing boom



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Ancillary equipment

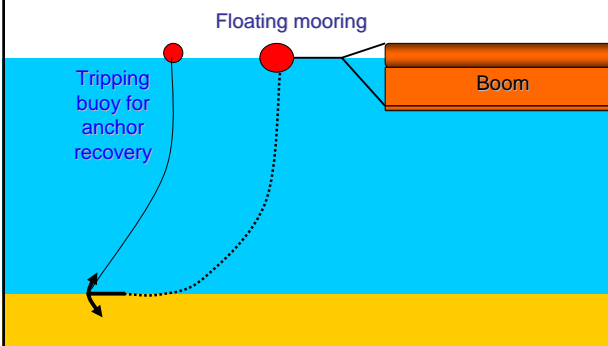
- MCA boom housed in 10 foot containers with all ancillaries required for deployment
- Deployment can fail on account of a missing shackle
- Ancillaries must be fit for purpose
 - Anchors, towing bridles, shackles, rope, chain, buoys, tirlor, blowers, water pumps, fixing screws, measuring rope or range finder



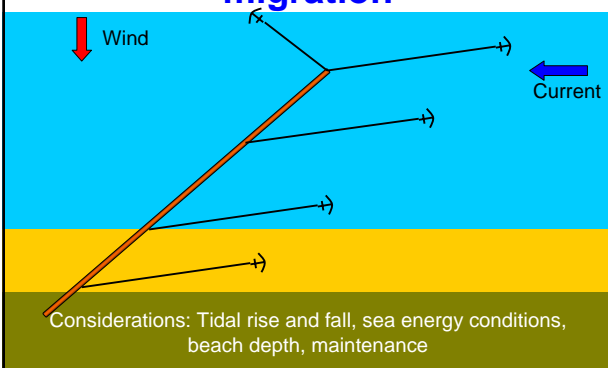
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Deploying a boom in shallow water



Inshore booming, minimise oil migration

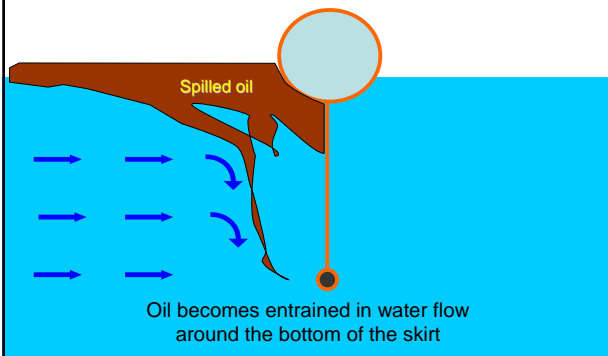


Boom Failures

- Oil loss due to excessive water flow
 - When water flow exceeds 0.75 – 1.0 knots, perpendicular to boom, oil loss is inevitable
- Boom tensile failure
- Drainage failure
 - Boom collection point is “full up”
- Splash-over failure
 - Waves take oil over boom

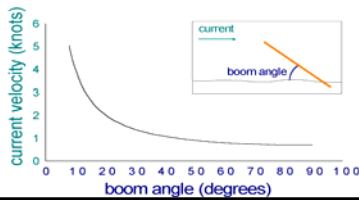


Oil loss due to excessive water flow



Current in Knots	Boom to Bank Angle	Length of Boom in relation to River Width
0,7	90°	1,0 times river width
1,0	45°	1,4 times river width
1,5	30°	2,0 times river width
2,0	20°	3,0 times river width
2,5	16°	3,5 times river width
3,0	15°	4,3 times river width
3,5	11°	5,0 times river width
4,0	10°	5,7 times river width
5,0	8°	7,0 times river width

Effect Of Current On Boom Angle



Excessive Flow



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Weather Limitations



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Difficult Terrain



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Soft Mud



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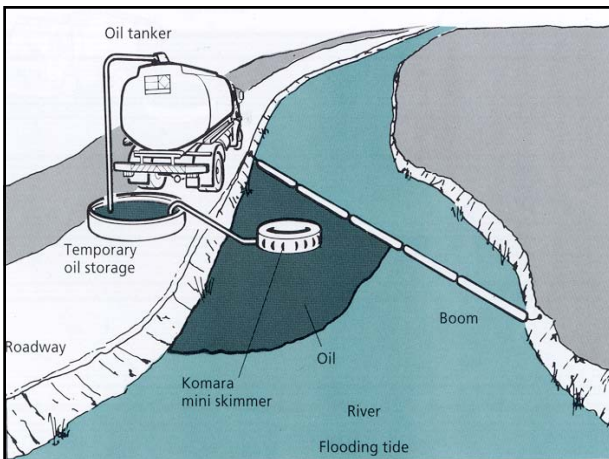
Formal plan for each validation



Part Two

Inshore Recovery





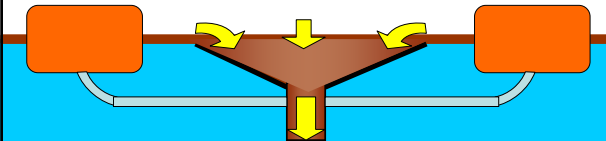
Recovering oil from the water surface

- Skimmers
 - Weir
 - Oleophilic
 - Vacuum
 - Mechanical



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Weir Skimmer

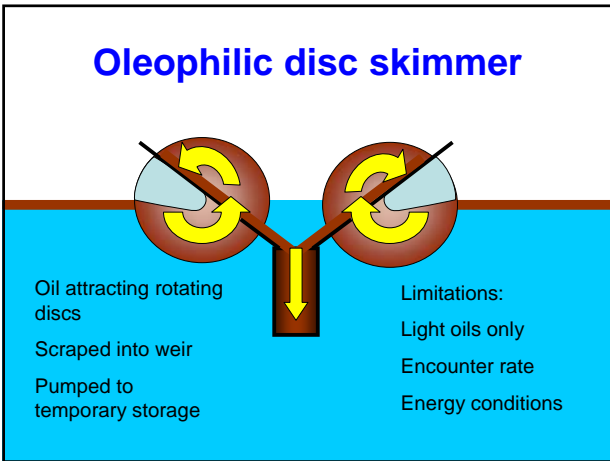


Lip of weir is adjusted to be at water surface so that oil flows into skimmer and is pumped away

Weir skimmer – requires calm conditions, good for viscous oils









Heavy oil skimmer



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Vacuum equipment

- Suction head and Vacuum tanks
- Limitations:
 - Encounter rate – thickness / distance from power pack
 - Oil viscosity
 - Vacuum head



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Vaculite tanks – lightweight – can access where trucks cannot



Tractor vac units – highest capacity if encounter rate favourable



Maximise oil recovery, minimise water uptake



Temporary storage tanks or lined pits