

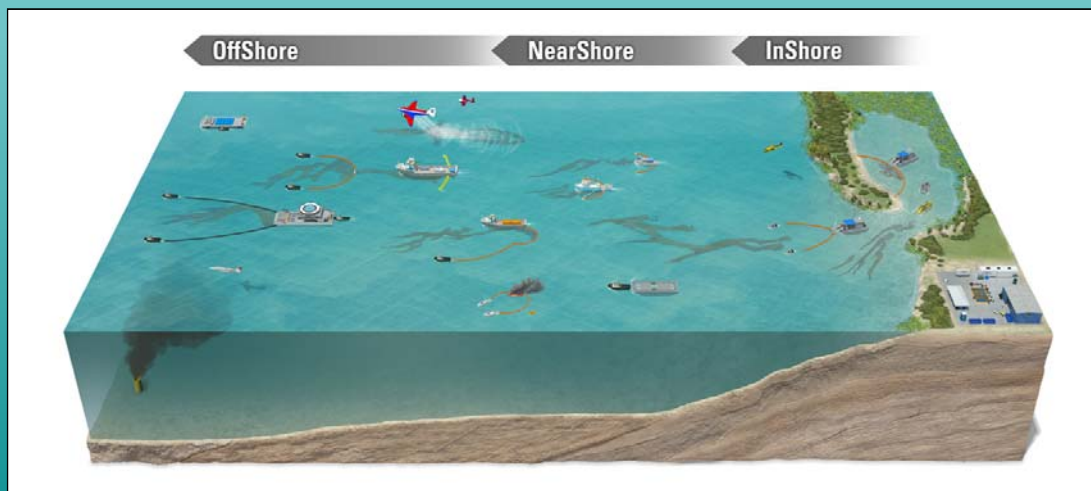
Offshore Mechanical Oil Recovery Systems NOAA NRPT


Galveston, TX
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Clean Gulf Associates




OFFSHORE RESPONSE






MSRC Responder Class OSRV




- 15 Dedicated Oil Spill Response Vessels nationwide
 - Dedicated special purpose
- High capacity skimming systems
 - Boom-oil containment
 - Storage
- Floating inventory of ocean boom for enhanced "U" skimming
 - ~2,240m on Gulf of Mexico OSRVs post DWH

- 210 ft (64m) length
- 12 knot speed of advance
- 4,000 bbl (636m³) temporary storage
- 2 Oil water separators


- Berthing for 38
- Medical facility
- Helicopter deck
- Command and control capability






MSRC Spill Response Capabilities – OSRVs

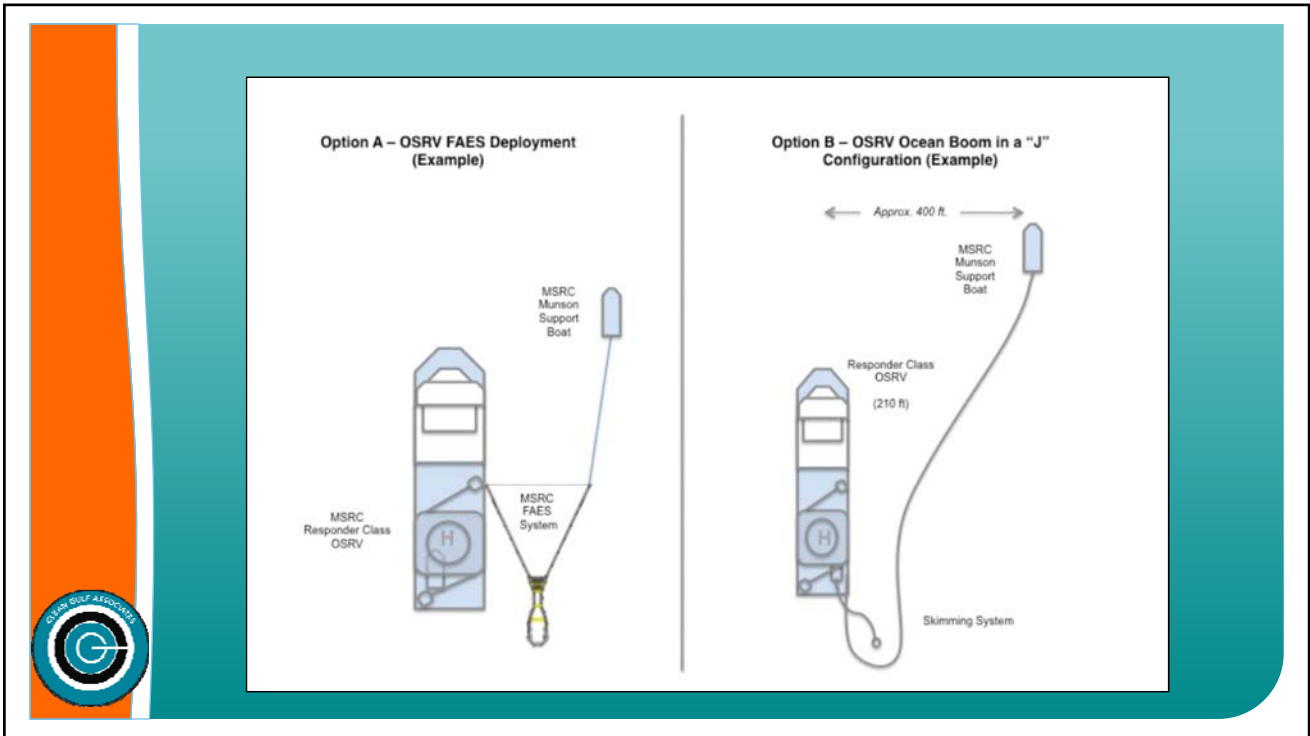
- 15 Responder Class OSRVs (7 in Gulf of Mexico)
 - Dual option recovery systems
 - Significant on-board storage (4,000 bbl.) to ensure continuous operations
 - Accommodates 38 personnel for sustained offshore operations
 - 13 ft. draft design provides nearer to shore capability



Enhanced Encounter Rate with Norwegian Buster




J Configuration/Transrec for debris-laden conditions



MSRC Deep Blue Program: Low Visibility Capability

- Capability added to Gulf area OSRVs, OSRBs and PSVs
 - Rutter X-Band Oil Spill Detection & FLIR Infra Red
 - Communications on OSRBs
- Expansion to 8 remaining "Responder" Class OSRVs in '12



95' Fast Response Vessel

- ◆ All Aluminum Construction with 200 mile range and speed in excess of 24 knots
- ◆ Equipped with Aptomar SECurus Integrated Oil Detection System
- ◆ Has (2) Sided Mounted 3-Brush Skimmers
- ◆ (4) GOM Based Vessels



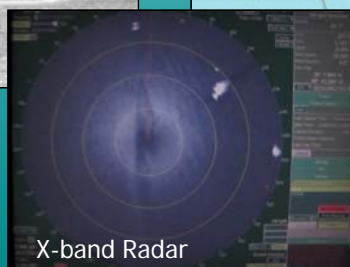
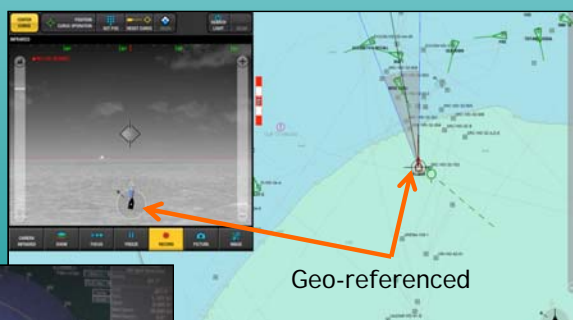
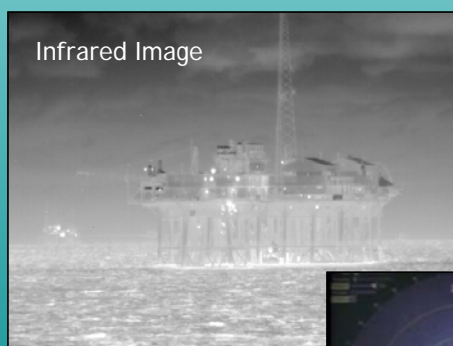
APTOMAR-RUTTER INFRARED CAMERA/X-BAND RADAR



- ◆ Nitrogen-Cooled Infrared Camera
- ◆ X-band Radar
- ◆ Data Transfer capability for still and video images
- ◆ Gyro-Stabilized camera
- ◆ Accurate Geo-Referenced to chart information



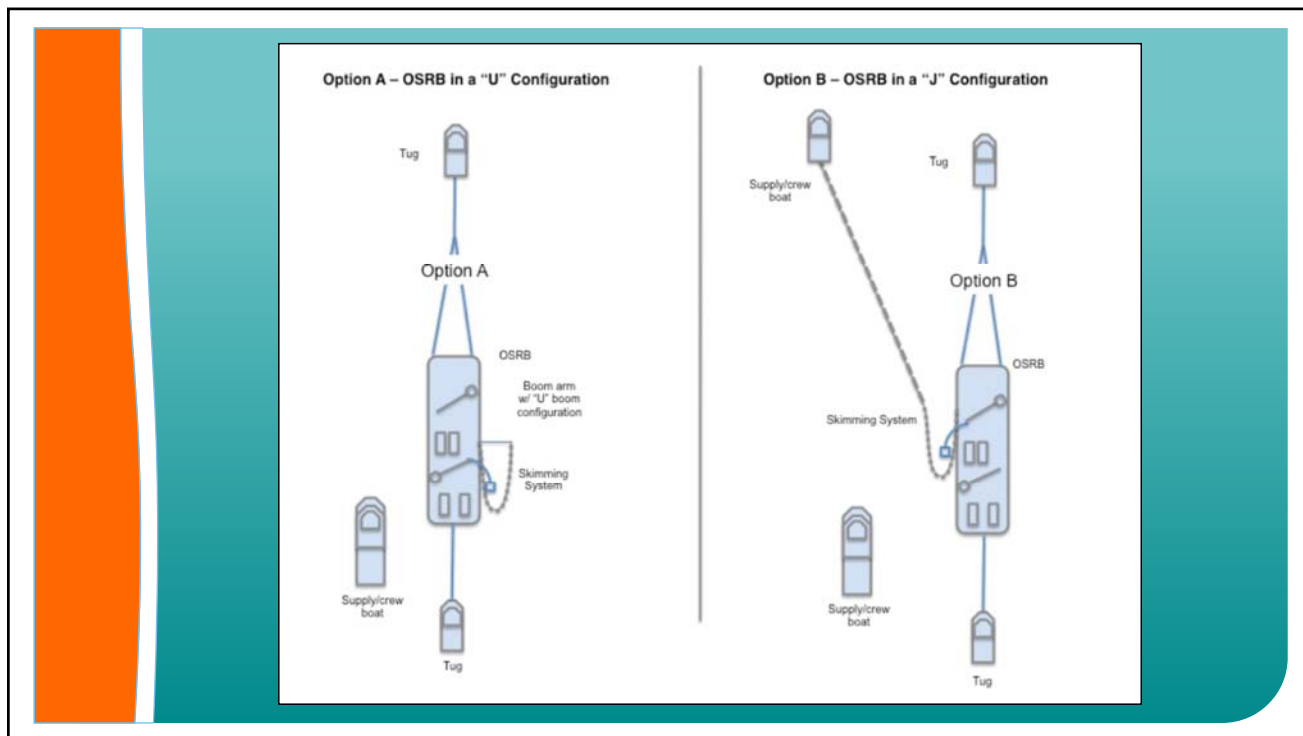
24-Hour Skimming Operations





Oil Spill Response Barges (OSRBs)

- **Converted from oil storage to skimming barges**
- **19 Barges Nationwide**
 - Dedicated
- **High capacity skimming systems**
 - New technology dual skimmers
 - Boom-oil containment
 - Storage
- **Floating inventory of ocean boom for enhanced "U" skimming**
 - Approximately 2,600 ft each post-DWH



High Volume Open Sea Skimming System (HOSS)



- ◆ Constructed for Well Blowouts
- ◆ 72K Barrel/day recovery rate
- ◆ New (4) 5-Brush Lamor skimmers
- ◆ Massive Swath - 2,640' 67" Sea Sentry Boom
- ◆ 4,000 Barrel Storage Capacity
- ◆ Helipad
- ◆ Based in Harvey, LA



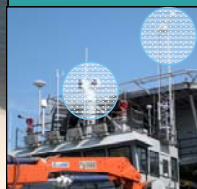
High Volume Open Sea Skimming System (HOSS)

Capable of Skimming 24/7



Offshore during MC-252 spill

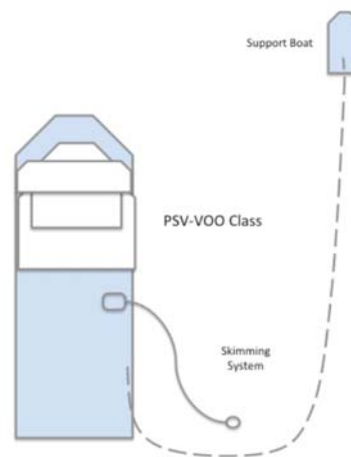
- ◆ 12 personnel to operate
- ◆ Equipped with Aptomar-Infrared Camera/X-Band for low/no light tracking of spills



Converted Deep Blue Dual Mission PSVs:

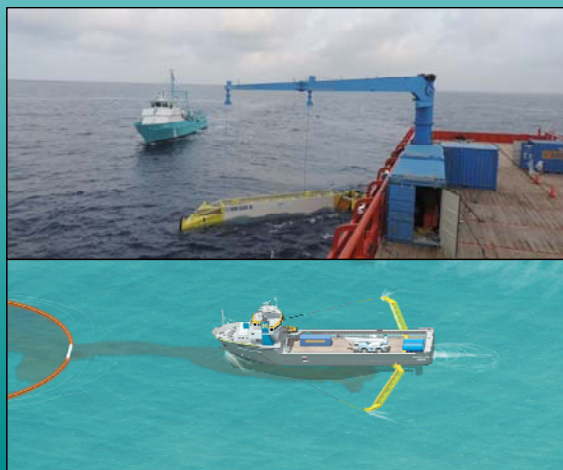


MSRC



KOSEQ Skimming Arms

Dutch High Seas Skimming System



- ◆ Developed, Constructed and Refined for over 46 Years
- ◆ Used during Sea Empress, Erika, Prestige & MC-252 Oil Spills
- ◆ Effective in 10 ft seas



KOSEQ Skimming Arms

Perfectly suited for large Platform or Offshore Supply Vessels



- ◆ Deployable on large Petroleum Industry Dedicated Vessels
- ◆ Rapidly transported by truck and easily assembled
- ◆ Simple to deploy and retrieve
- ◆ Requires no assist vessels



KOSEQ Skimming Arms

Efficient Brush or Weir Skimmer



- ◆ Provides 48-hour surge capability
- ◆ Can be fitted with a weir or brush skimmer



Enhanced Skimming

- ◆ Boom Barge -25K feet Offshore boom
- ◆ Boom "gated" for enhanced swath



Fast Response Unit

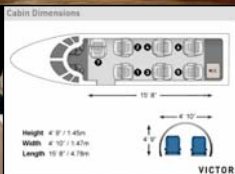


- ◆ Deployable on smaller (140' or larger) Petroleum Industry Dedicated Vessels
- ◆ 100 barrels of storage
- ◆ Rapidly transported by truck and easily assembled
- ◆ Additional 440' of offshore 67" Sea Sentry boom & Reel for enhanced swath width



Offshore Surveillance Capabilities

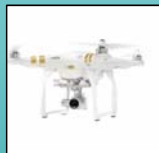
Tactical Skimming Direction



- ◆ Cessna CJ3 Citation
- ◆ 2,000 mile range
- ◆ Unique Rapid Assessment Capability
- ◆ Can Provide Direction to Deployed Skimming Assets
- ◆ Increases Oil Skimming Effectiveness



Offshore Surveillance Capabilities



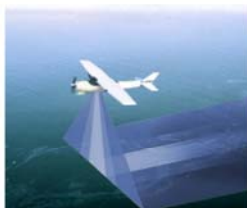
UAS

- ◆ Conducted offshore test
- ◆ 15-20 minute duration
- ◆ Line of Sight
- ◆ 200' Altitude
- ◆ UAS to be deployed major CGA skimming assets within the year



MSRC Level ABC Remote Sensing For Tactical Oil Spill Surveillance

Level A -- Aircraft
Ocean Imaging Corporation



Provides wide-area spill detection, thickness interpretation, and oil distribution mapping

Multispectral/TIR Cameras

Level B -- Balloon
Maritime Robotics



Tethered up to 500 ft. Medium range coverage with long "hang" time

TIR and HD Cameras

Level C -- Close-In



Optimizes close-in recovery techniques

X Band Radar and TIR Camera



Tactics

TACTICS MANUAL

EQUIPMENT GUIDEBOOK
TASK FORCE MODEL

EQUIPMENT GUIDEBOOK SAFETY (SAF)
CONTAINMENT/BOOMING

TASK FORCE MODEL (TFM)
ON WATER RECOVERY GROUP

- 100' Offshore recovery vessel
- 100' On-shore recovery vessel
- 100' Support vessel
- 100' Support vessel
- 100' Support vessel

