REGIONAL RESPONSE TEAM IV

Subsea Oil Spill Response: Advances in Practice & Technology

Lee Hunt
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The Route to Bilateral Oil Spill Agreement

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Council on Foreign Relations

Policy Innovation Memorandum "***Addressing the Risk of a Cuban Oil Spill***" –

RDML Melissa Bert

Multilateral Workshops: US, Cuba, Mexico, Jamaica, the Bahamas

William Riley

Bob Wood

RAC/REMPEITC-Caribe	District 7	Havana
Felton Gilmore	RDML William Baumgartner	Derek Cromwell
Paul Lattanzi	John Slaughter	Beto Torres (Dept. State)
Keith Donohue	Joe Uzmann	Ambassador De Laurentis,
Matt Richards	Forest Willis	(Dept. State)

The Route to Bilateral Oil Spill Agreement

- 2010 Initial Meetings Between IADC and CUPET: One Gulf
- 2011 Multiple Conferences Addressing Issues
- 2012 The Multilateral Workshops Initiated
- 2014 MTOP: Multilateral Technical Operations Procedures
- 2016 The US-Cuba Oil Spill Agreement
- 2018 Current Status

Sub-Sea Source Control: Tier 3's Third Dimension

Tier 3 Spills:

- Large volume spills requiring substantial resources and support from regional or international oil spill co-operatives to mitigate effects.
- Surface Response: Capabilities are extensive, experienced and widely available for surface source spills.
- The Third Dimension of Tier 3: Depth, when the source is seabed.
- Subsea capabilities are exotic, technically complex, limited availability

Capping Stacks: Global Supply

Since GOM Macondo Spill Several Capping Stack Suppliers…

- Marine Well Containment Company (MWCC)
- HWCG (formerly Helix Well Control Group)
- Oil Spill Response Limited (OSRL)
- Wild Well Control
- Boots & Coots Services

Critical, Limiting Factors to Sub-Sea Response in Cuban EEZ

- One: Distance, time of deployment required from Global Position to Cuban EEZ
- Two: US Embargo on US sourced manufacture and components of equipment exported to Cuban EEZ (“The Blockade”)
- Specific export license required from US Dept of Commerce Bureau of Industrial Security (BIS) and Office of Foreign Asset Controls (OFAC) required for export of capping stacks for use in Cuba

Global Positioning of Capping Stacks

- MWCC: 3 stacks positioned in US (Houston, Corpus Christi); Contractually limited to use in US-GOM. Will require export license.
- HWCG: 2 stacks positioned in US (Houston); Contractually limited to use in US-GOM. Will require export license.
- OSRL: 4 stacks positioned in Norway, Singapore, South Africa and Brazil. Likely require export license.
- Wild Well Control: 2 stacks positioned in Aberdeen and Singapore. Will require export license.
- Boots & Coots Services: 1 stack positioned in US (Houston). Export license pending approval.

Map of Global Stack Positioning

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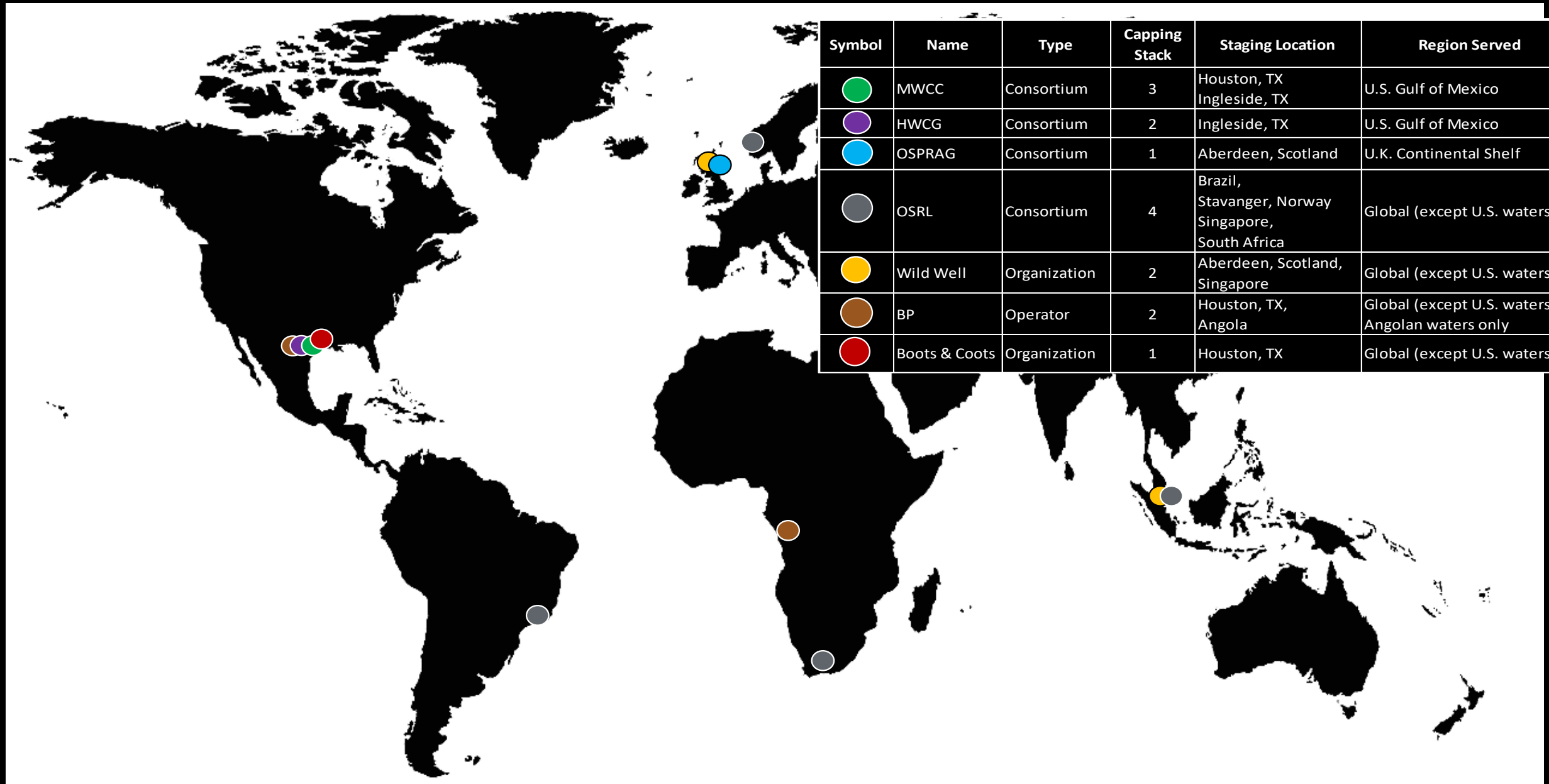
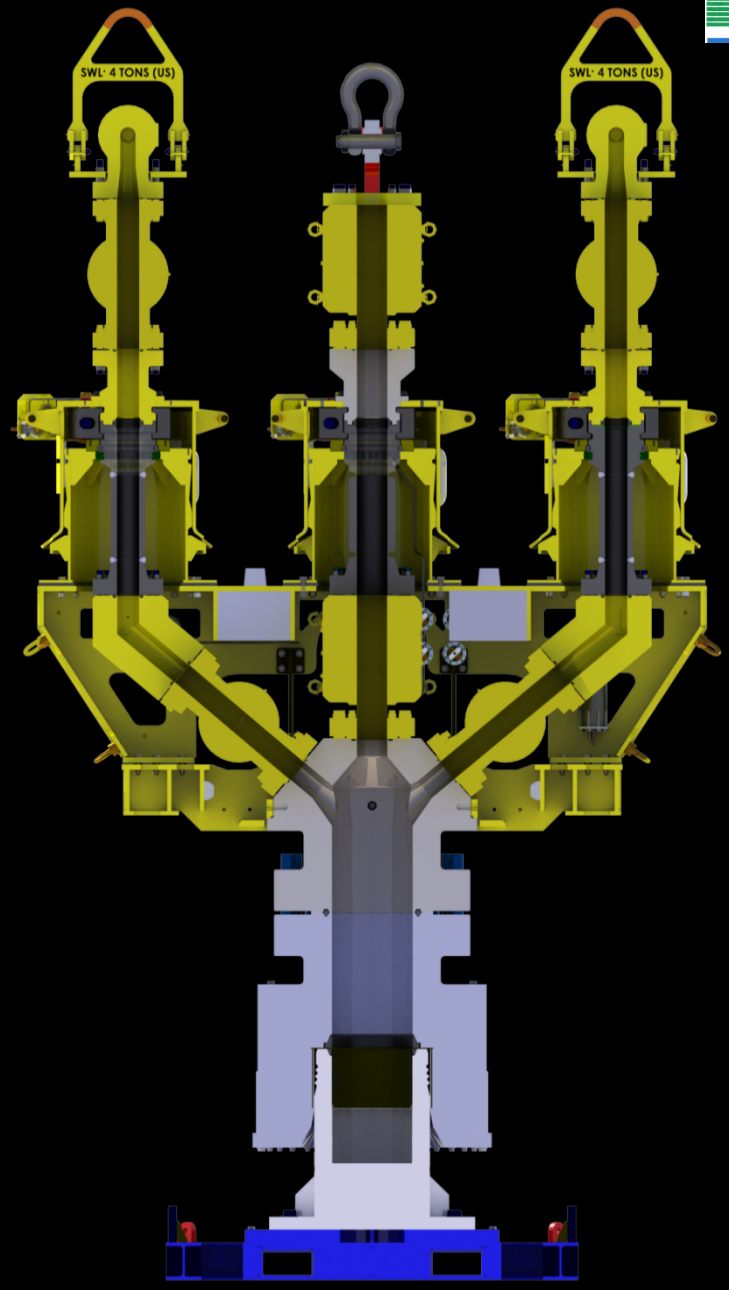
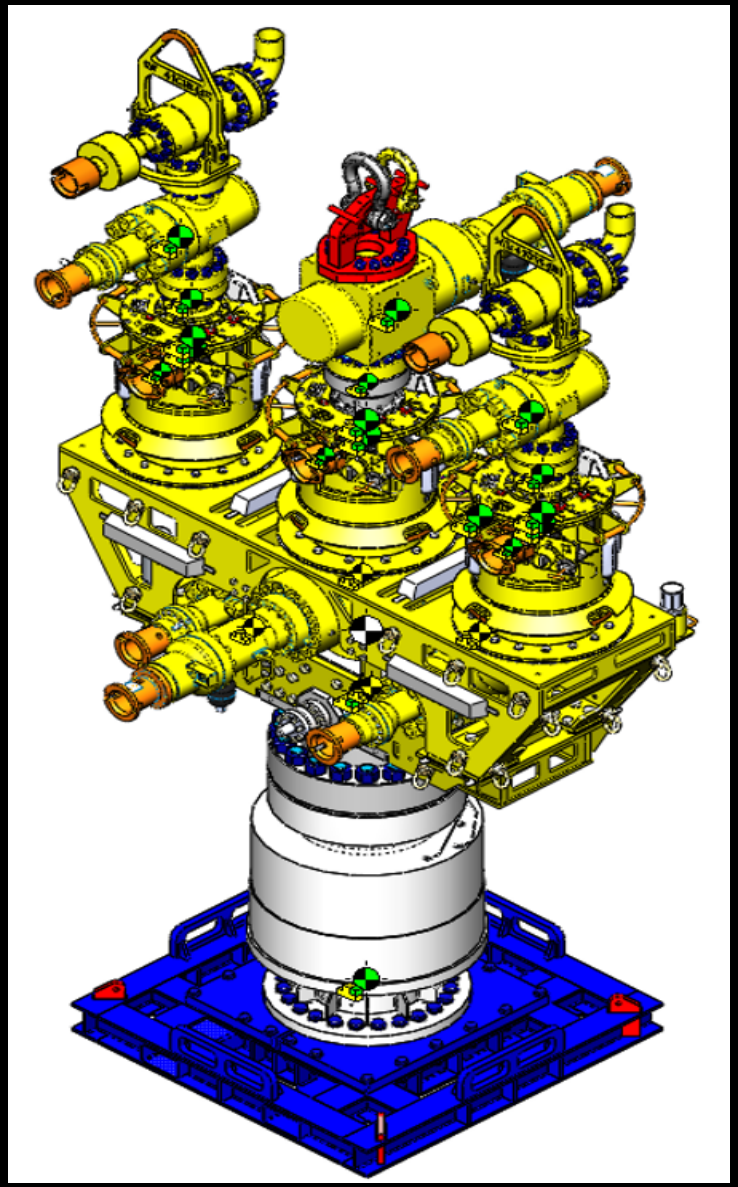


Symbol	Name	Type	Capping Stack	Staging Location	Region Served
	MWCC	Consortium	3	Houston, TX Ingleside, TX	U.S. Gulf of Mexico
	HWCG	Consortium	2	Ingleside, TX	U.S. Gulf of Mexico
	OSPRAG	Consortium	1	Aberdeen, Scotland	U.K. Continental Shelf
	OSRL	Consortium	4	Brazil, Stavanger, Norway Singapore, South Africa	Global (except U.S. waters)
	Wild Well	Organization	2	Aberdeen, Scotland, Singapore	Global (except U.S. waters)
	BP	Operator	2	Houston, TX, Angola	Global (except U.S. waters), Angolan waters only
	Boots & Coots	Organization	1	Houston, TX	Global (except U.S. waters)

Overview

- Modular design
- Lightweight assembly
- Dual barriers
- Gate valve provides metal-to-metal seal
- 7-1/16” mainbore for light intervention
- 5-1/8” side outlets
- Fully qualified and FAT tested





CONVENTIONAL TECHNOLOGY

Statistics:

Temperature 250ºF

Pressure 15,000 psi

Dry weight 170 tons

Depth 10,000 ft

40 ft × 20 ft

SAM required

GEN III TECHNOLOGY

Statistics:

Temperature 250ºF

Pressure 15,000 psi

Dry weight 45 tons

Depth 12,000 ft

25 ft × 9 ft

ROV operated

Gen II Technology	Gen III Technology
Large RAM-based systems	Next generation gate-valve design
Elastomer seals *Designed for pressure control, not flow*	Metal-to-metal seals *Industry standard for flowback operations*
Subsea accumulator required	ROV operated – no hydraulics required
Complex assembly – surface and subsurface	Only one flanged connection
Restricted vessel availability	Larger fleet of available deployment vessels
Large cranes – dockside	Minimal dockside requirements
Geographic constraints – prolonged transit times	Rapid global response times

Subsea Debris Removal Kit


BROSHUIS
OVERSIZE

Transportation Configurations - Land

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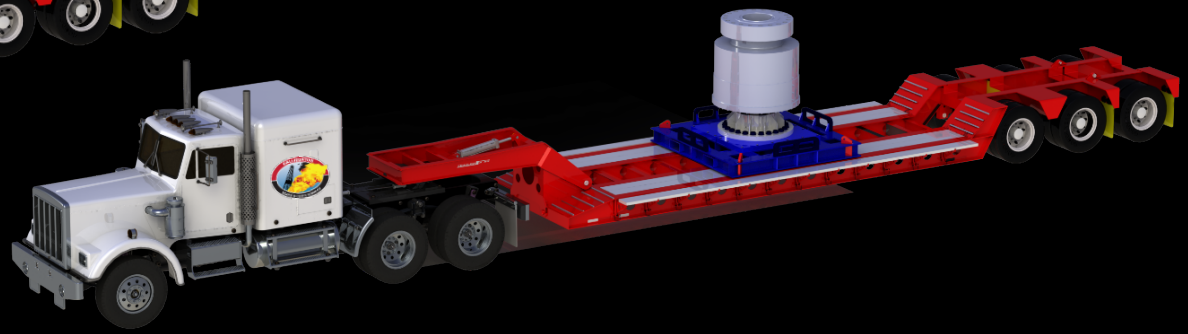
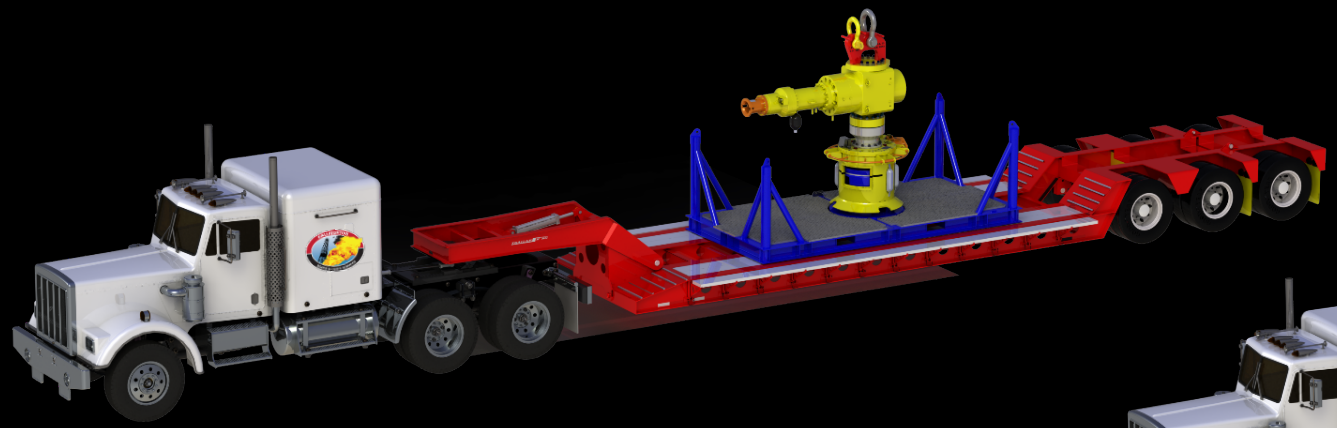
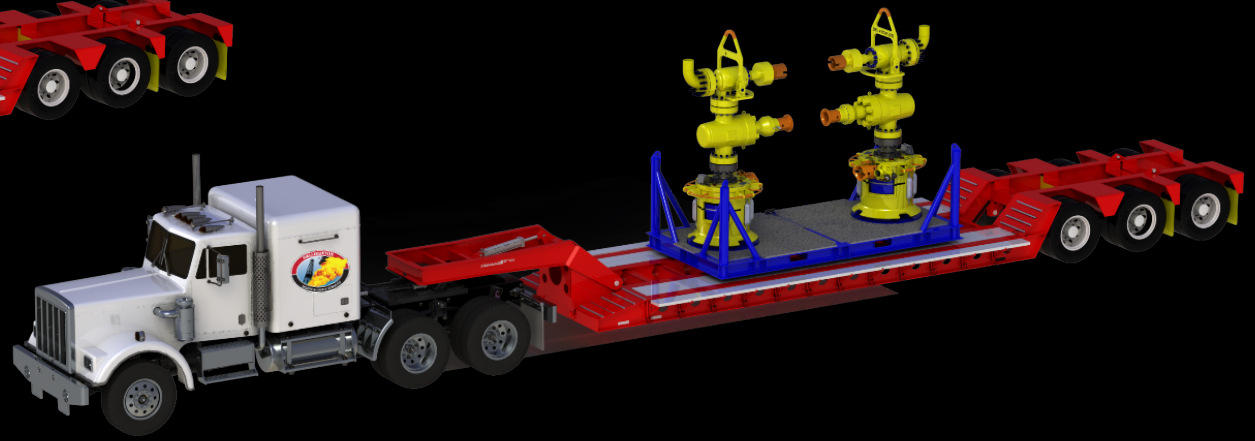
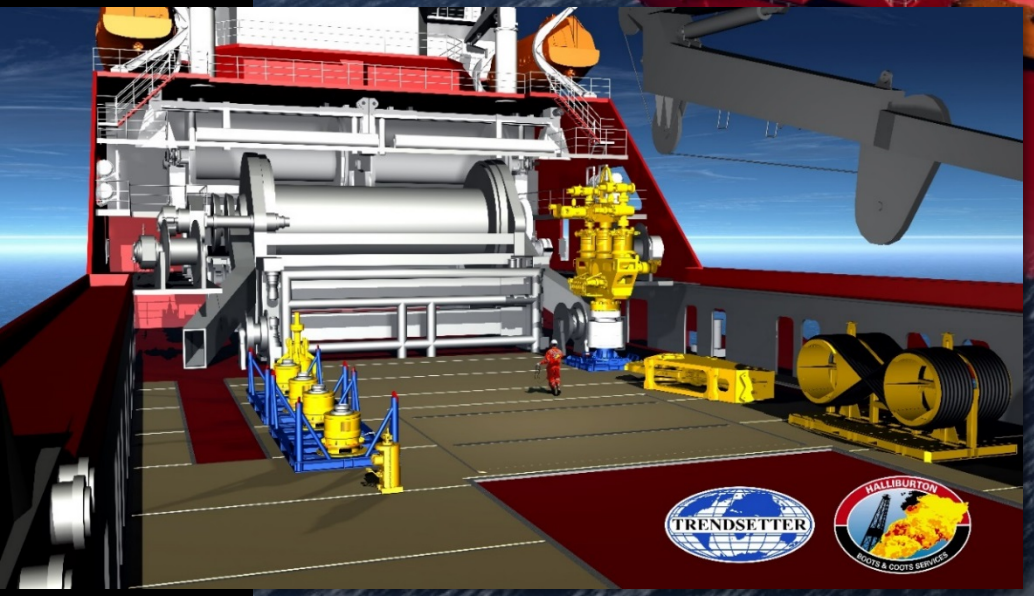


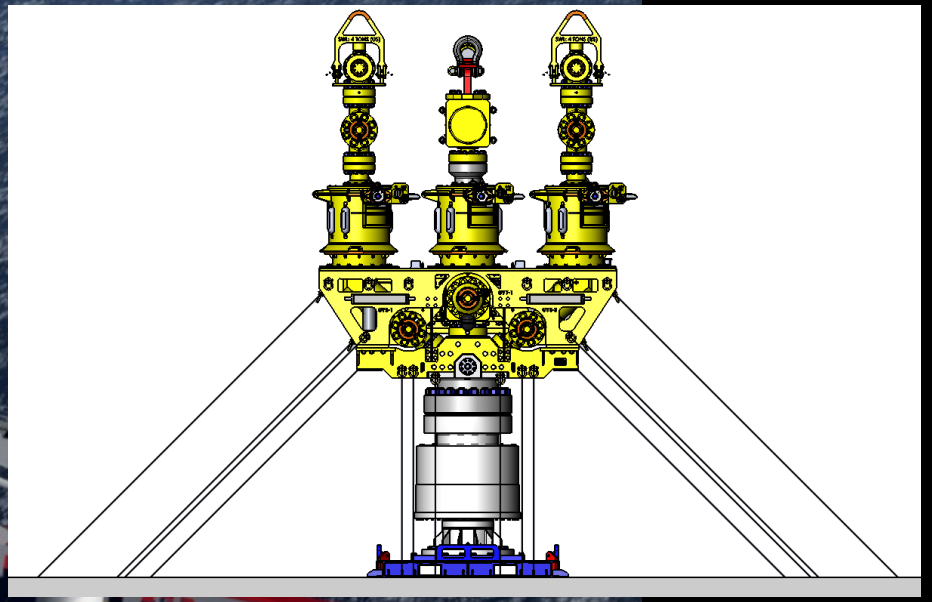




Transportation Configurations – Air (747)

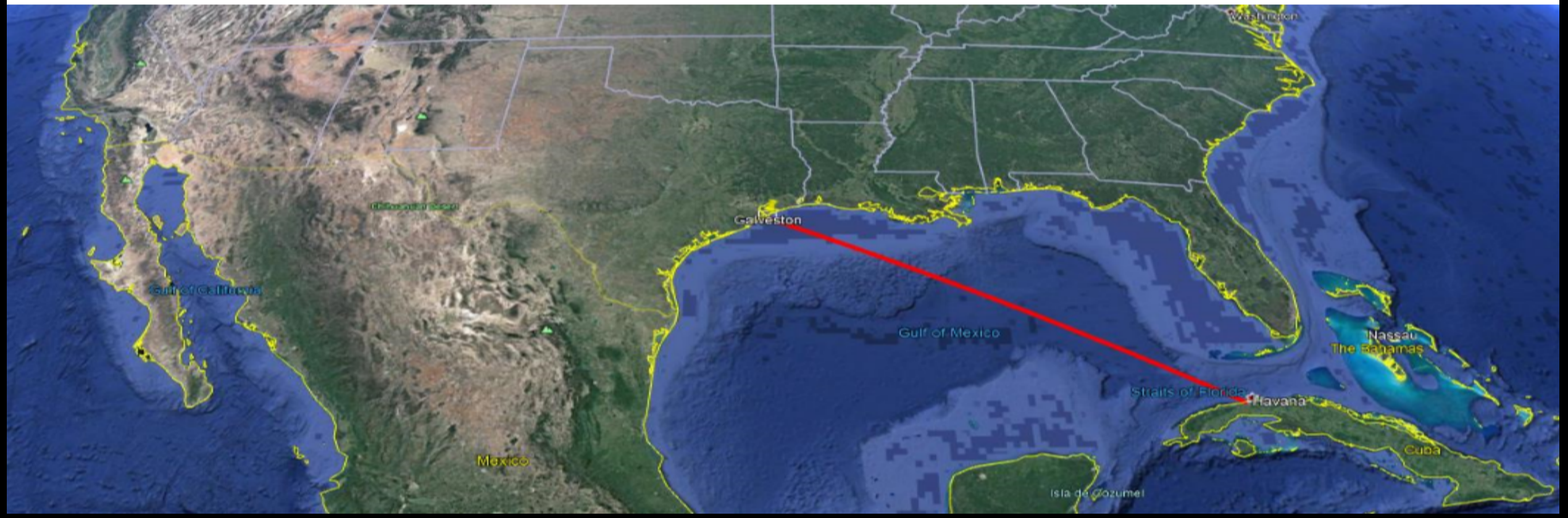
Transportation Configurations - Sea





GRIP Seaborne Deployment – RTM North West, Cuba

Task Name	Duration
Rapid Cap- From Galveston Port to North West Cuba (Sea Freight)	**3.36 days**
Notification, Activation and Initial Response	0.17 days
Source Vessel of Opportunity	1 day
Capping Stack transport from GRC to Galveston Port for handover	0.4 days
Capping stack assembled/tested and ready for deployment at dockside	0.5 days
Load vessel	0.25 days
Sea voyage time to Incident Site	1.9 days



- **Mobilization**
  - Air Transport / Land Transport to Dock
  - Re-assembly (swap connector - H4 or HC as necessary)
    - Perform Level 1 test
  - Loadout at Quayside
  - Sea Transport to Incident Well
    - Pre-deployment checklist
  - Site Prep – LMRP / BOP Debris Removal

- **Installation**
  - ROV moves in to lock connector
  - ROV disconnects shackle
  - Topside acoustic transceiver

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