



April 2024 SUT ETM Decommissioning Challenges for Subsea Assets

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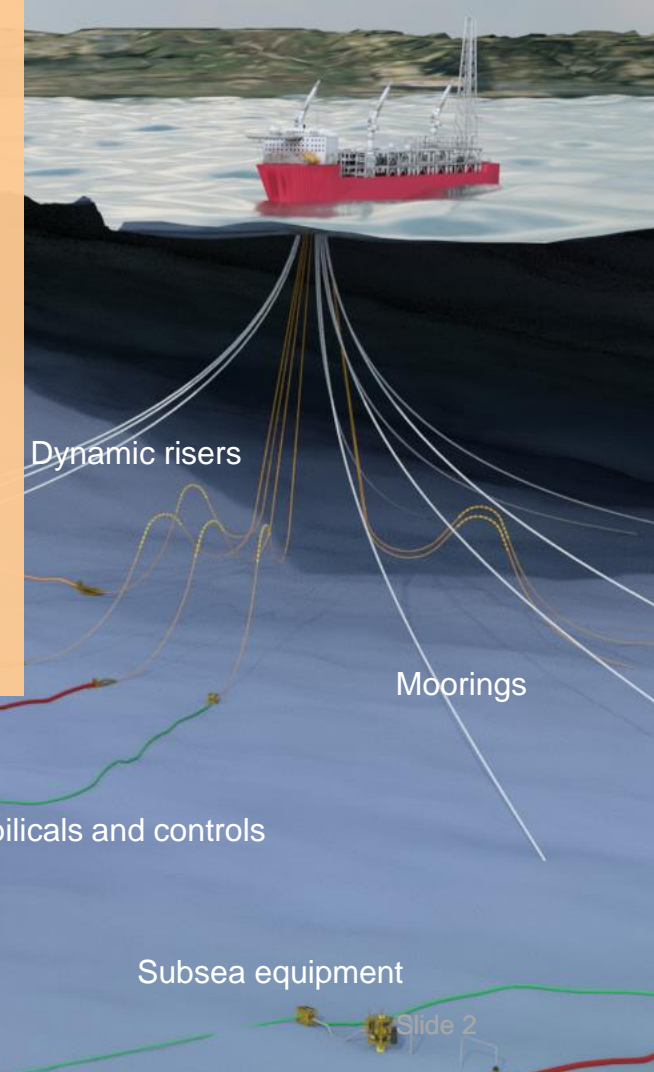
17th April 2024



A little bit about what Atteris does...

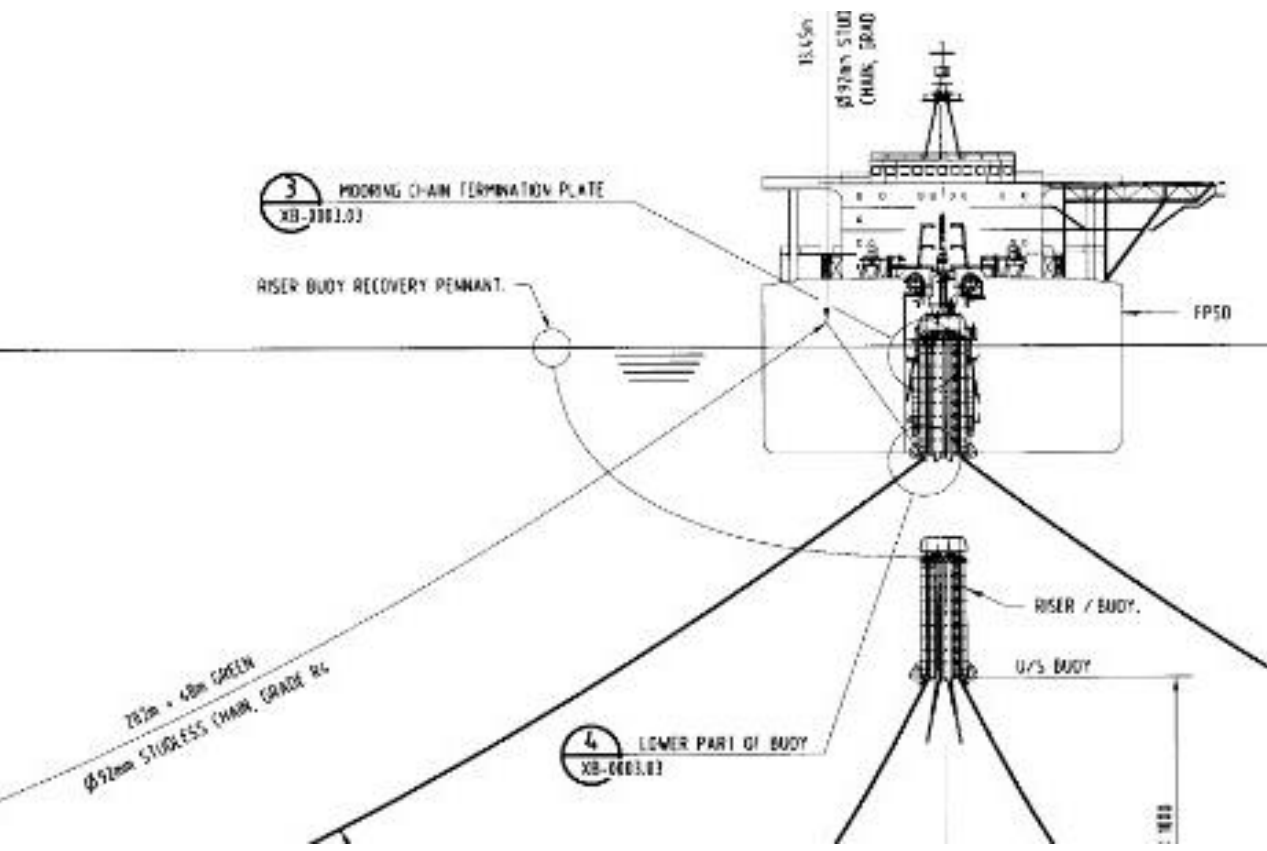
In the decommissioning space:

- Degradation assessments
- Concept level decommissioning studies
- Environmental assessments
- Detailed decommissioning engineering
- Offshore engineering support
- Safety and risk engineering
- Offshore renewable energy



Flow assurance and subsea process design

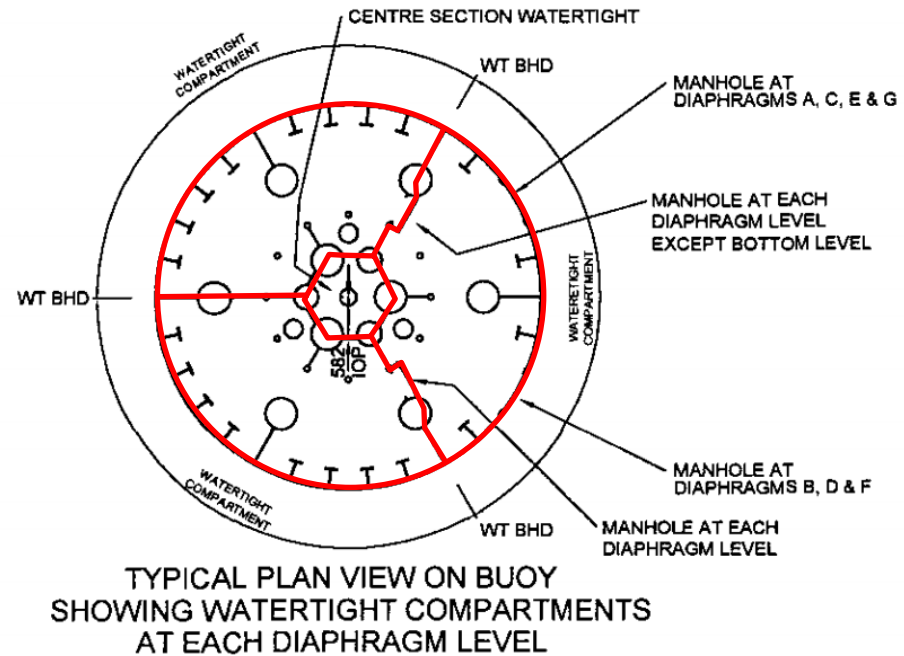
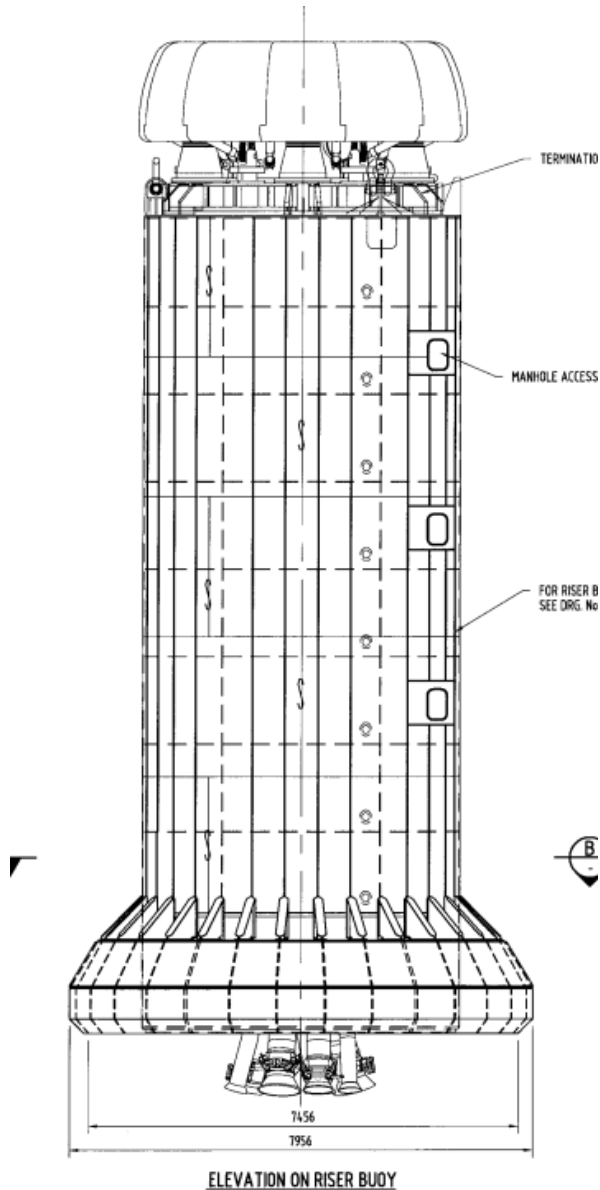
**Why don't we just take it
out the way we put it in?**



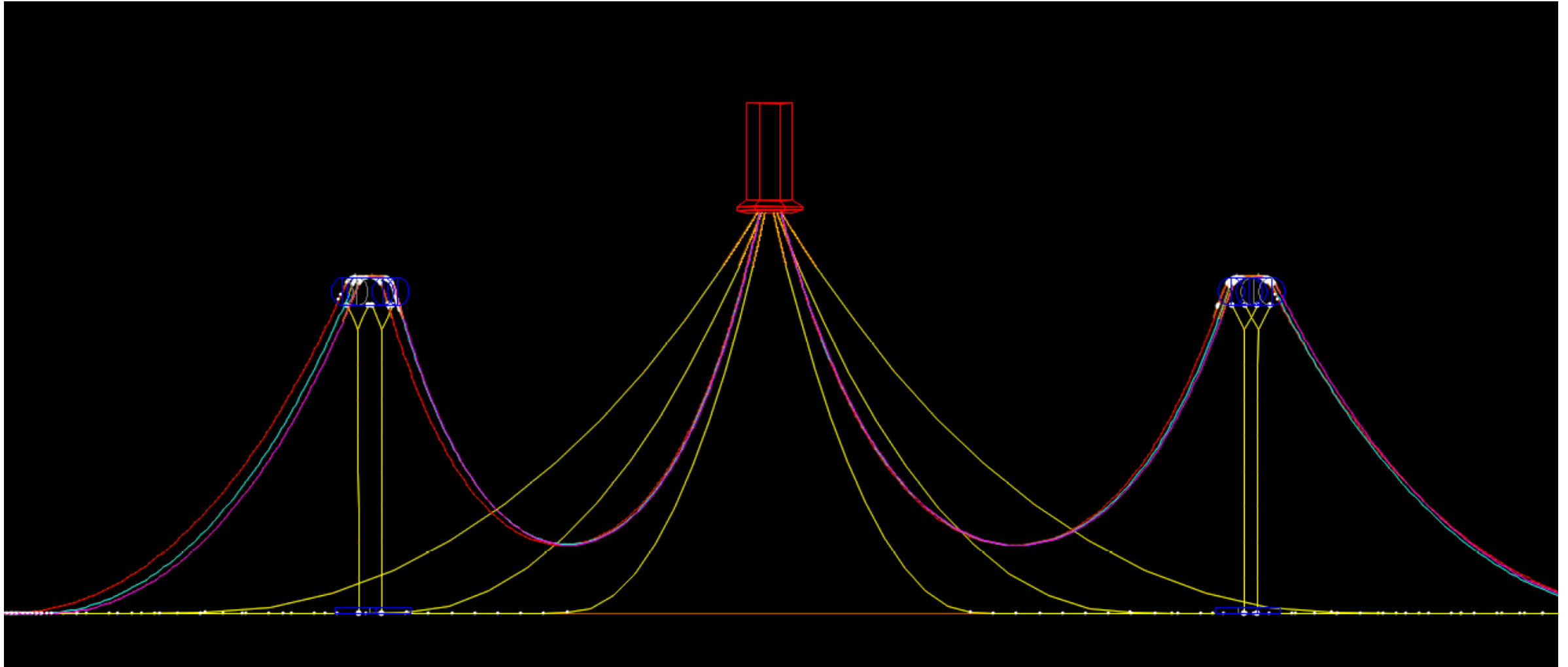
Project #1 Single Point Mooring Buoy

SPM Buoy Construction

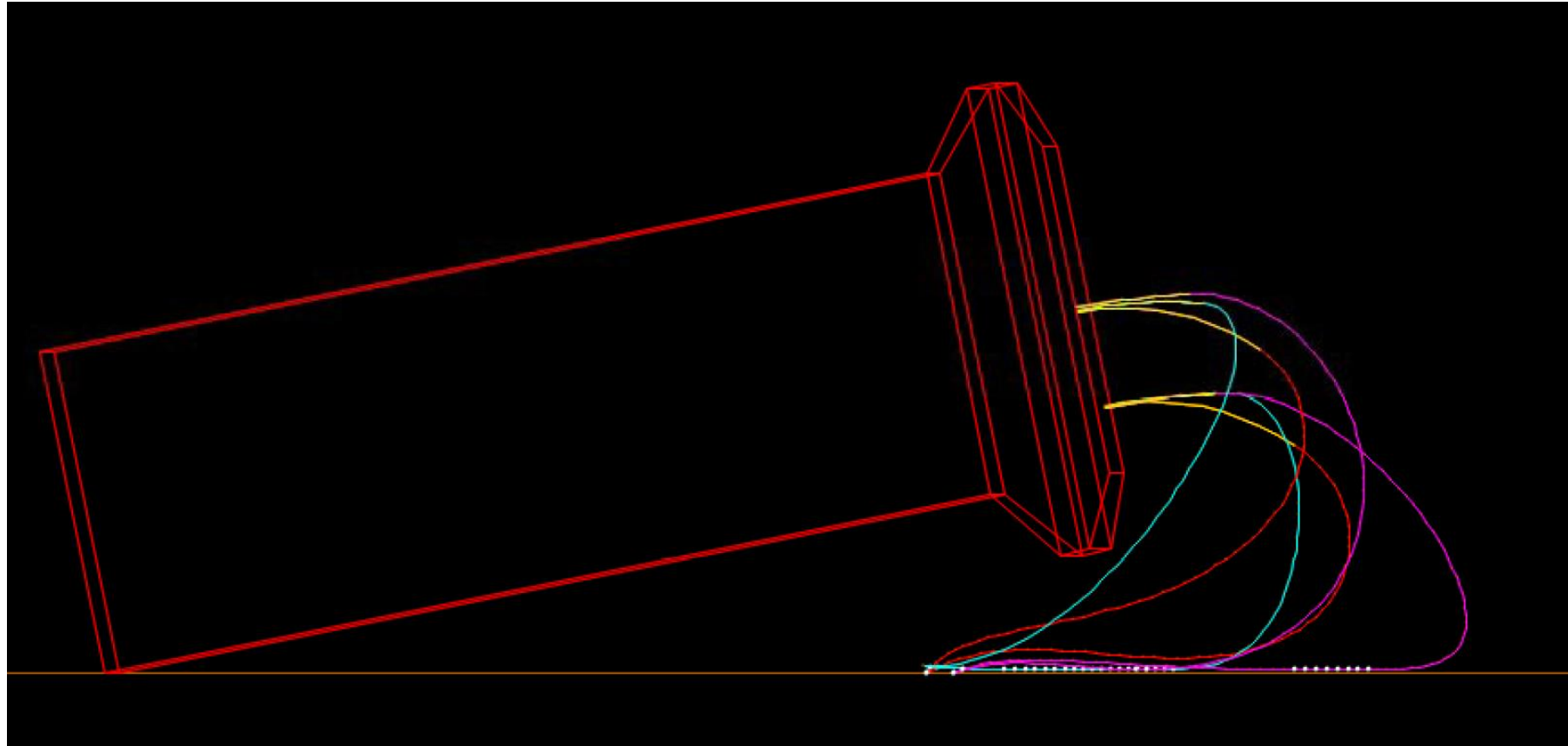
- Buoy has 9 “watertight” layers
- Each layer has 4 x “watertight” compartments
- 275 Te in air as installed



How it was left



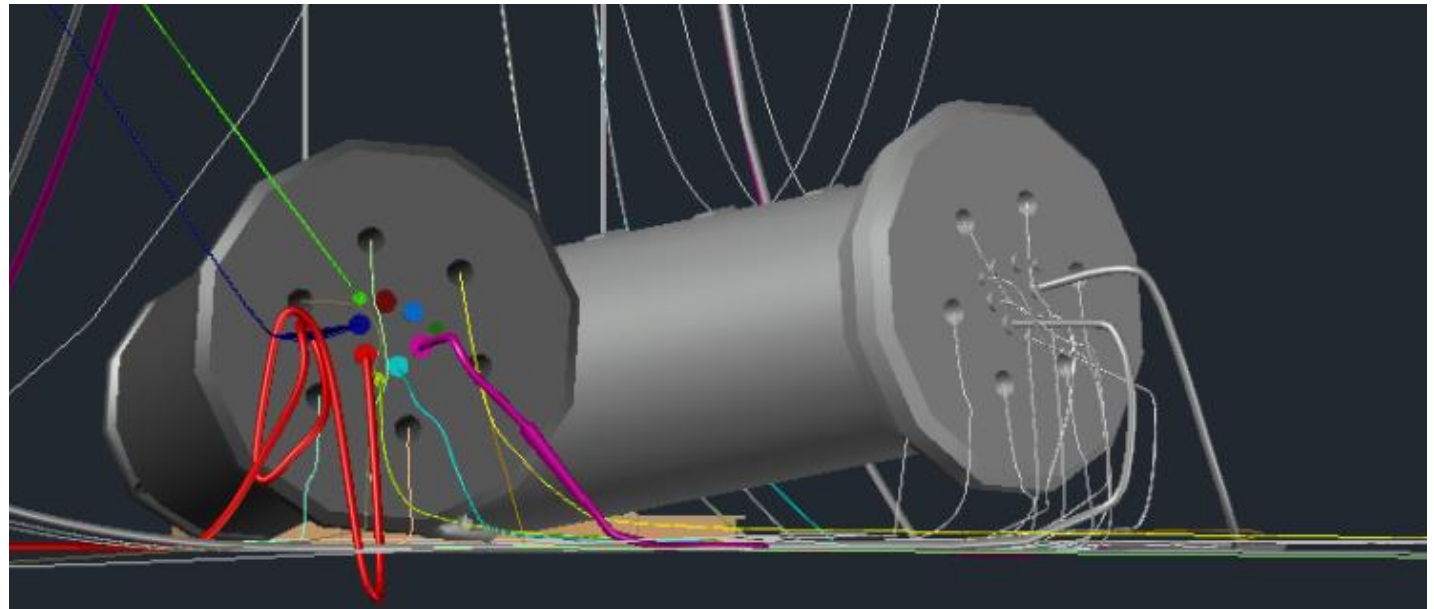
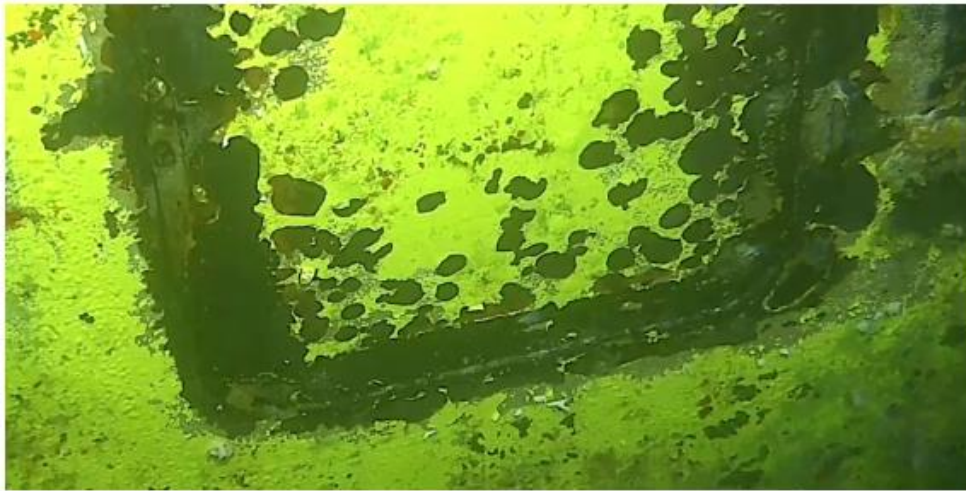
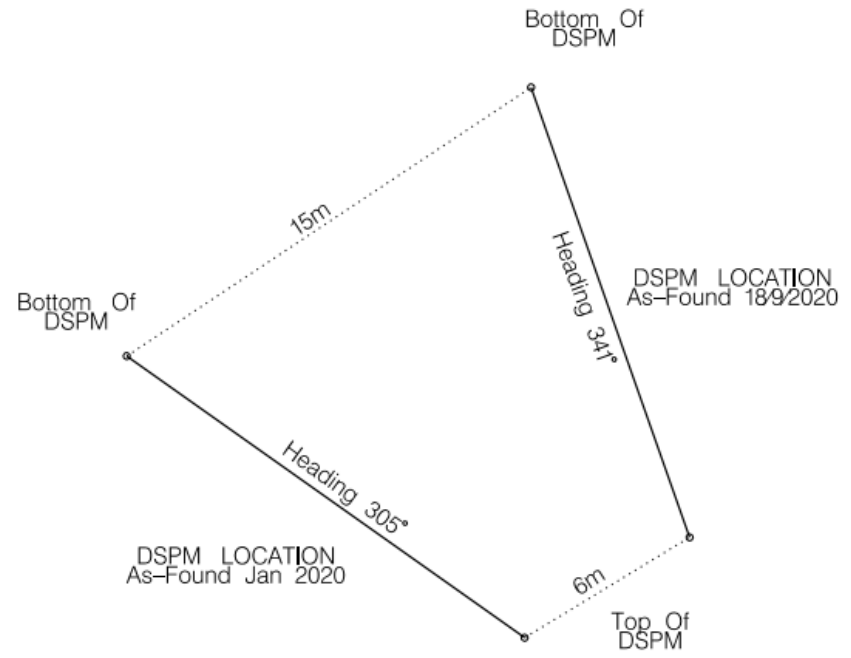
How it was found



Flooding

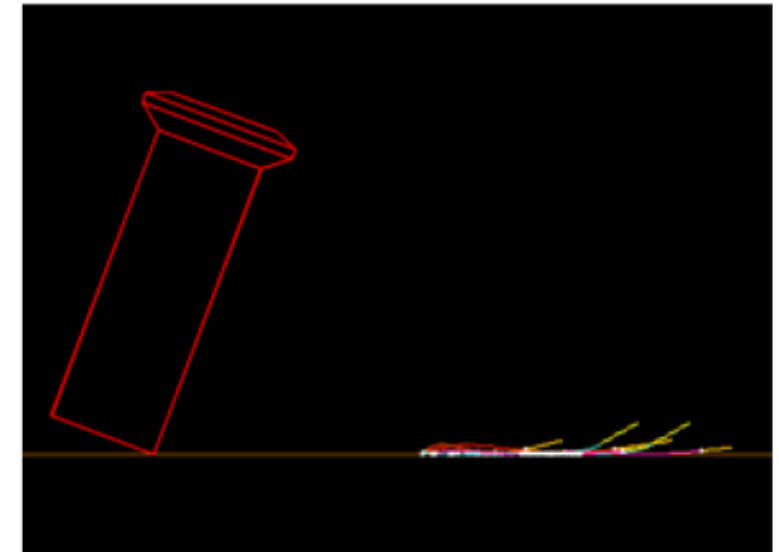
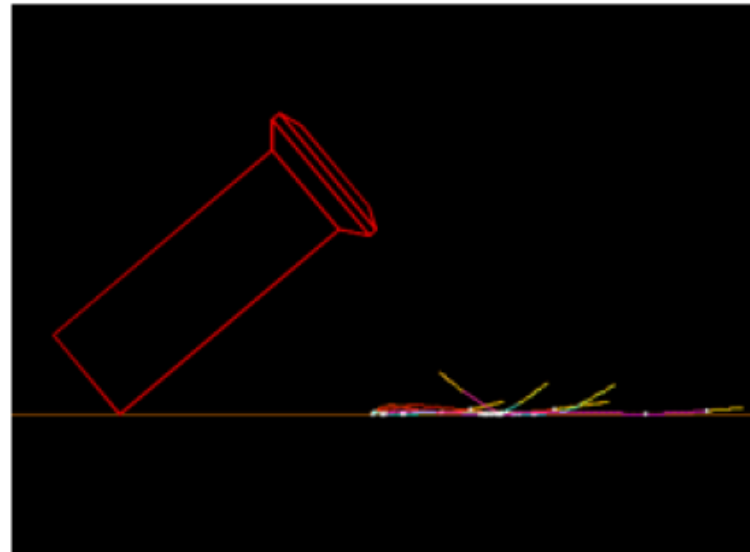
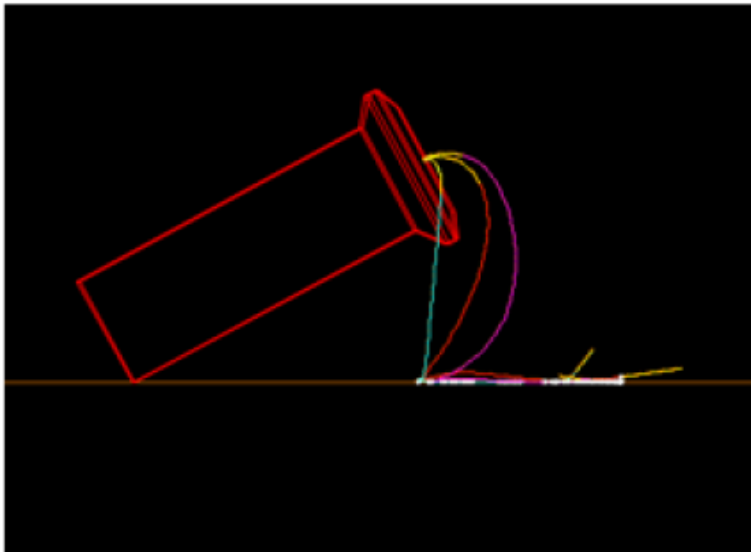
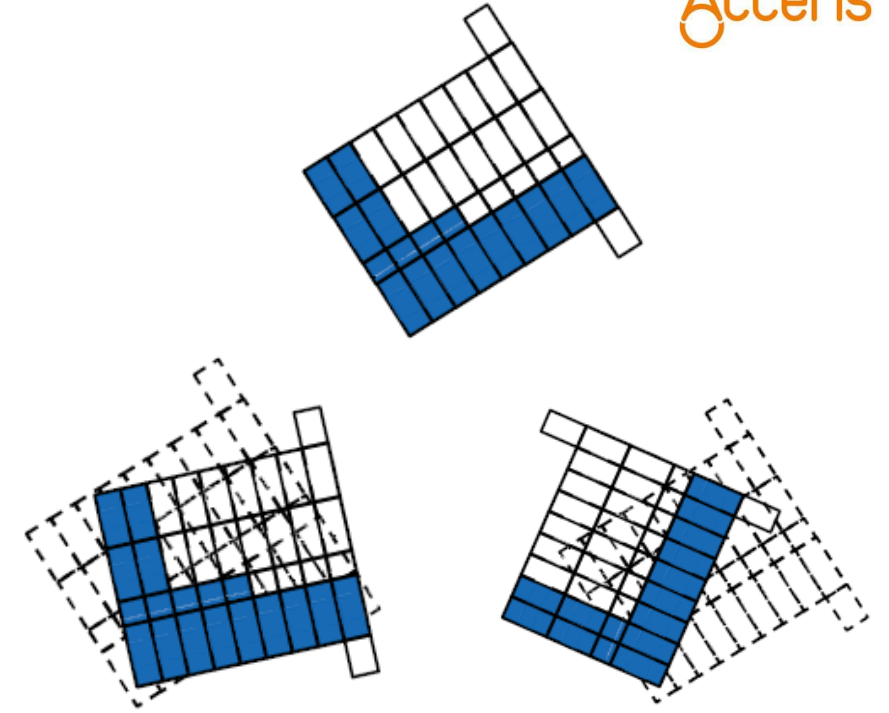


Corroded Manhole

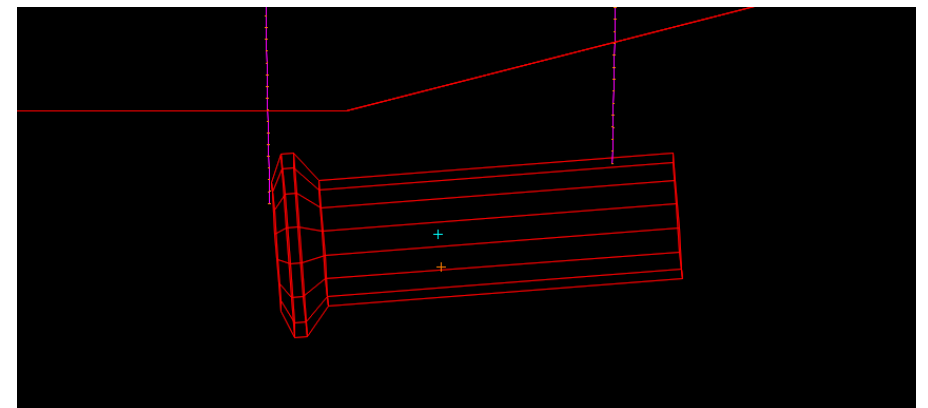
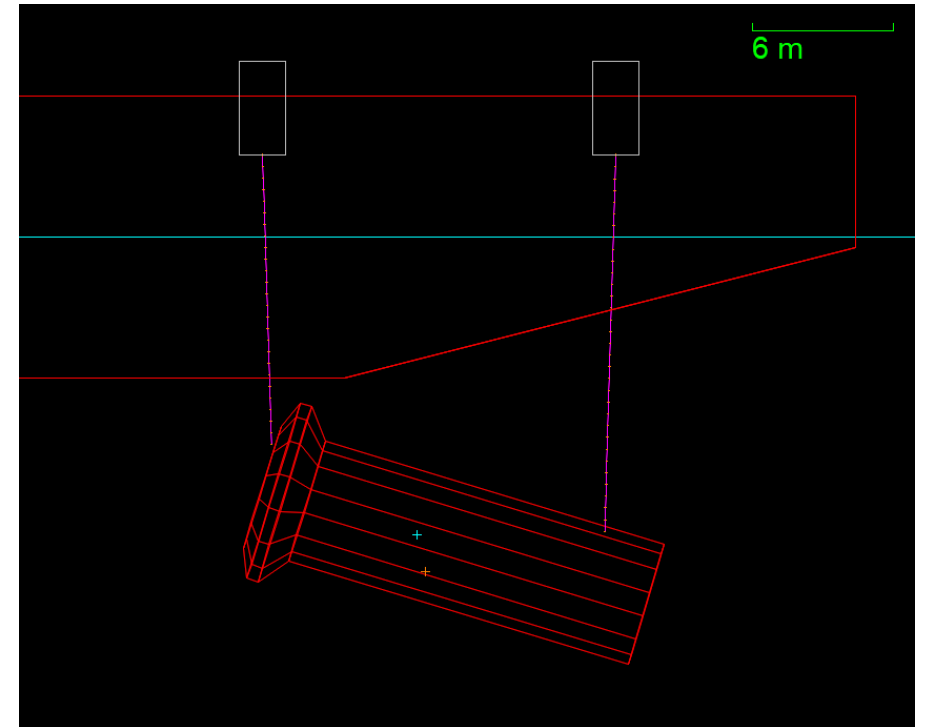
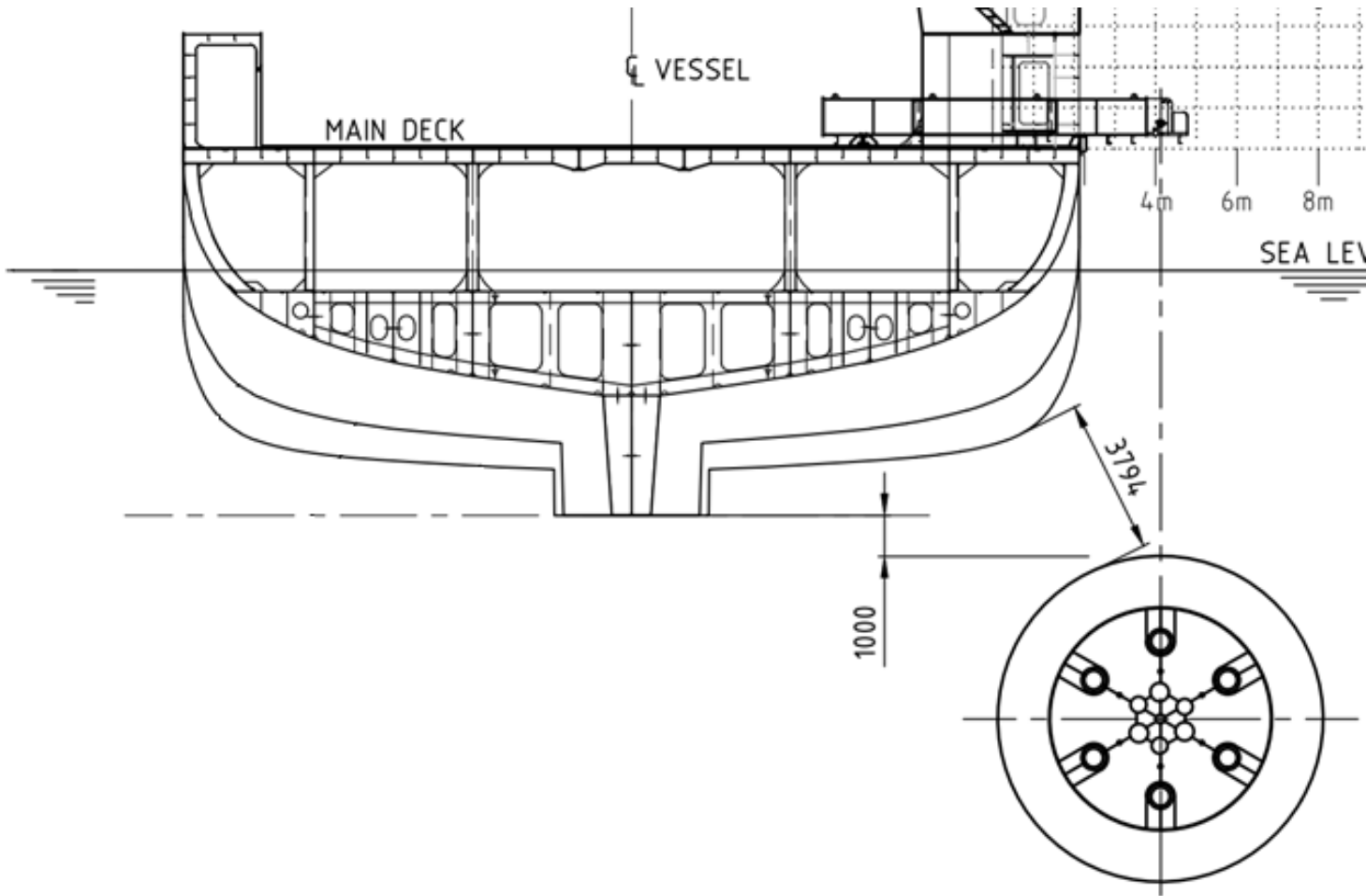


Flooding Estimates

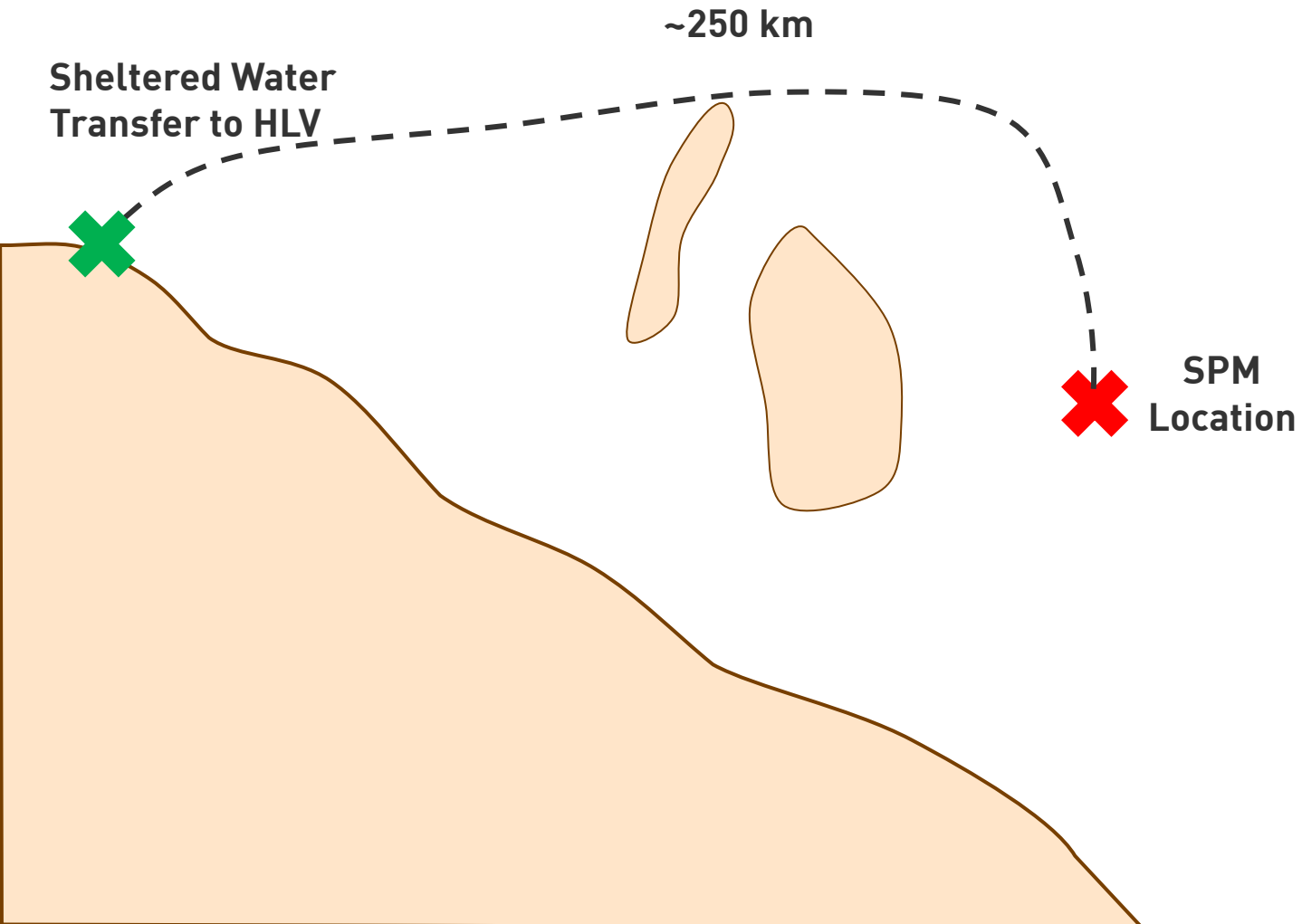
	Weight (Te)	
	Submerged	In-Air
Lower Bound	0	380
Best Guess	70	450
Upper Bound	174	554



Recovery Method



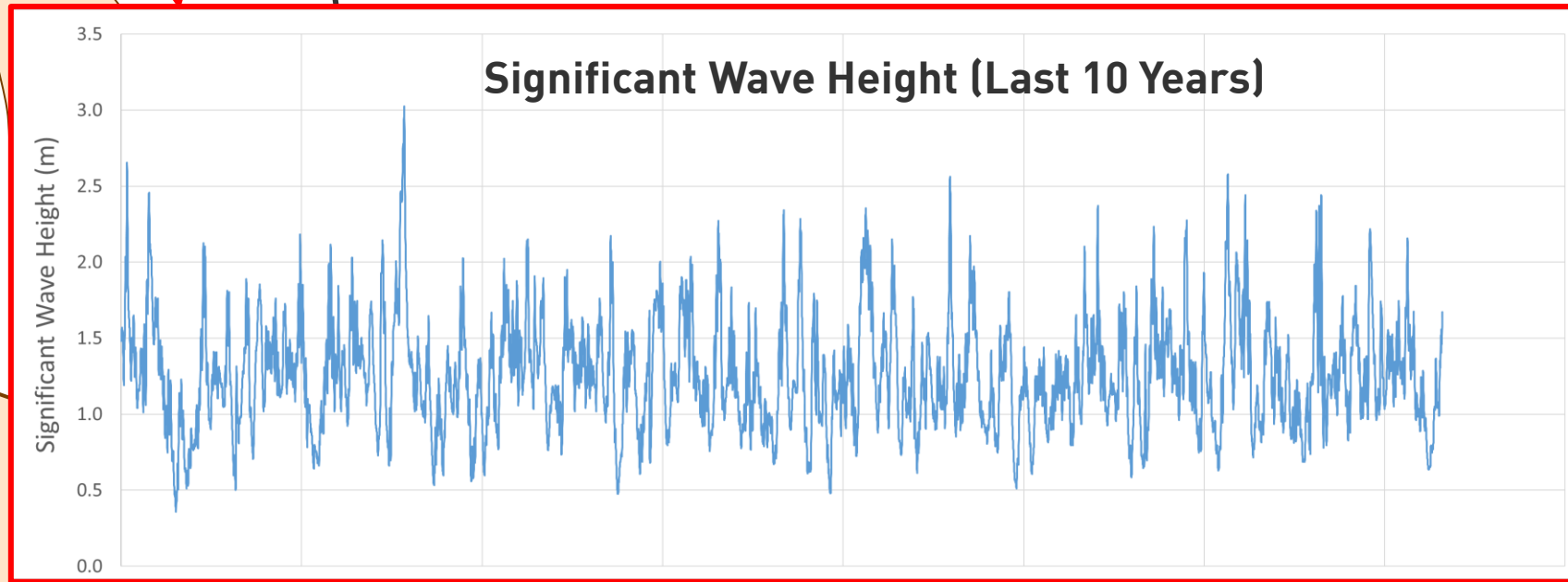
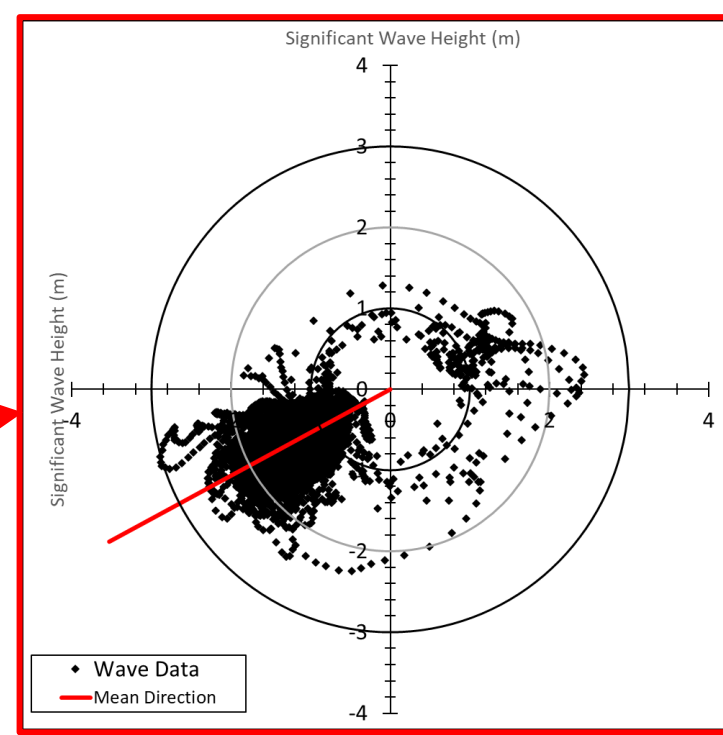
Towing Back to Shore



Towing Back to Shore

Sheltered Water
Transfer to HLV

~250 km

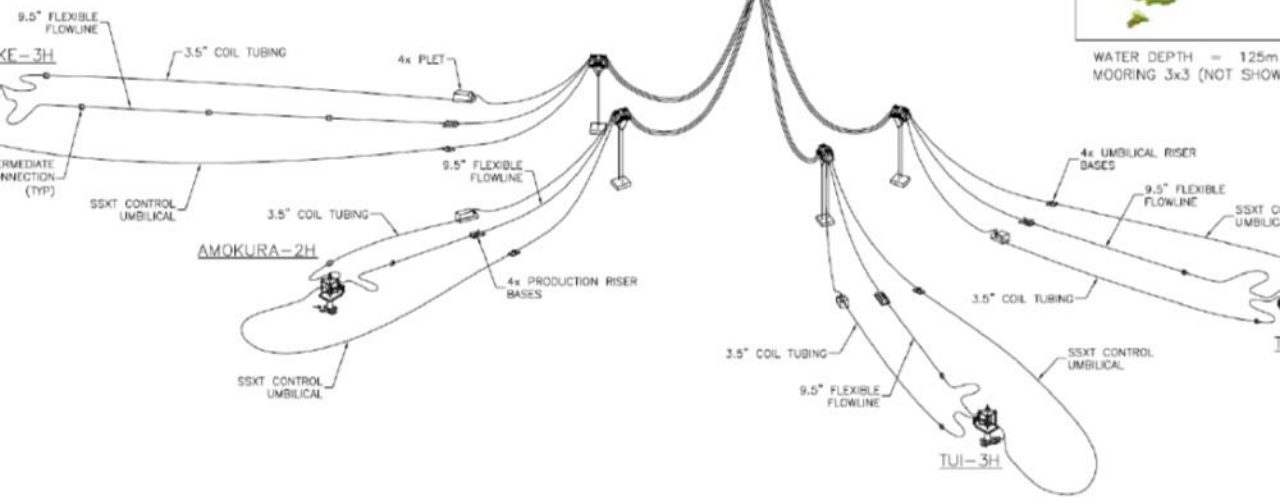


Actual Recovery





LINE INFORMATION	
LOCATION	LENGTH ON TRACK
AMOKURA-2H	
PRODUCTION RISER	375m
GAS LIFT RISER	375m
FLOWLINE	1520m
UMBILICAL	1659m
GAS LIFT COIL TUBING	1449m
GAS LIFT JUMPER	35m
PATEKE-2H	
PRODUCTION RISER	375m
GAS LIFT RISER	375m
FLOWLINE	1517m
UMBILICAL	1593m
GAS LIFT COIL TUBING	1602m
GAS LIFT JUMPER	35m



WATER DEPTH = 125m
MOORING 3x3 (NOT SHOWN)

Project #2 Tui Field MWA, GB and Wellhead Recovery

Tui Field

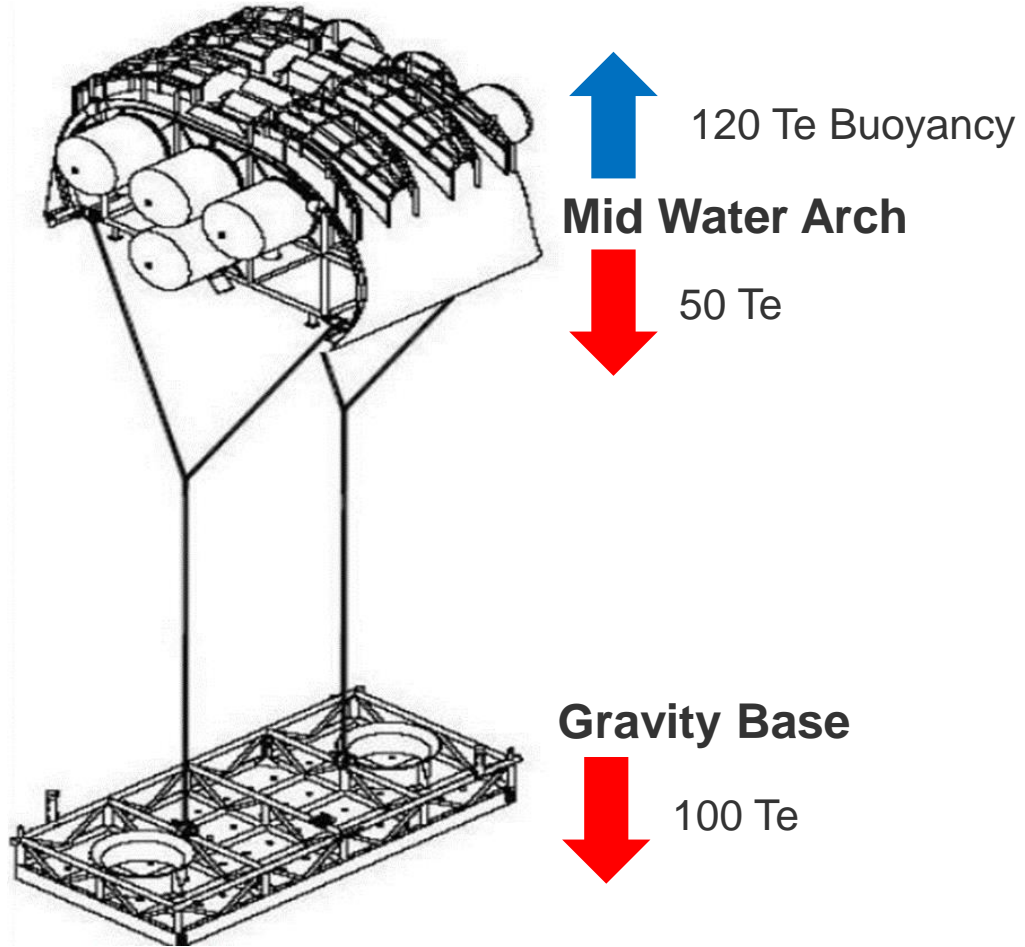
Sapura Constructor

Harsh Weather Conditions

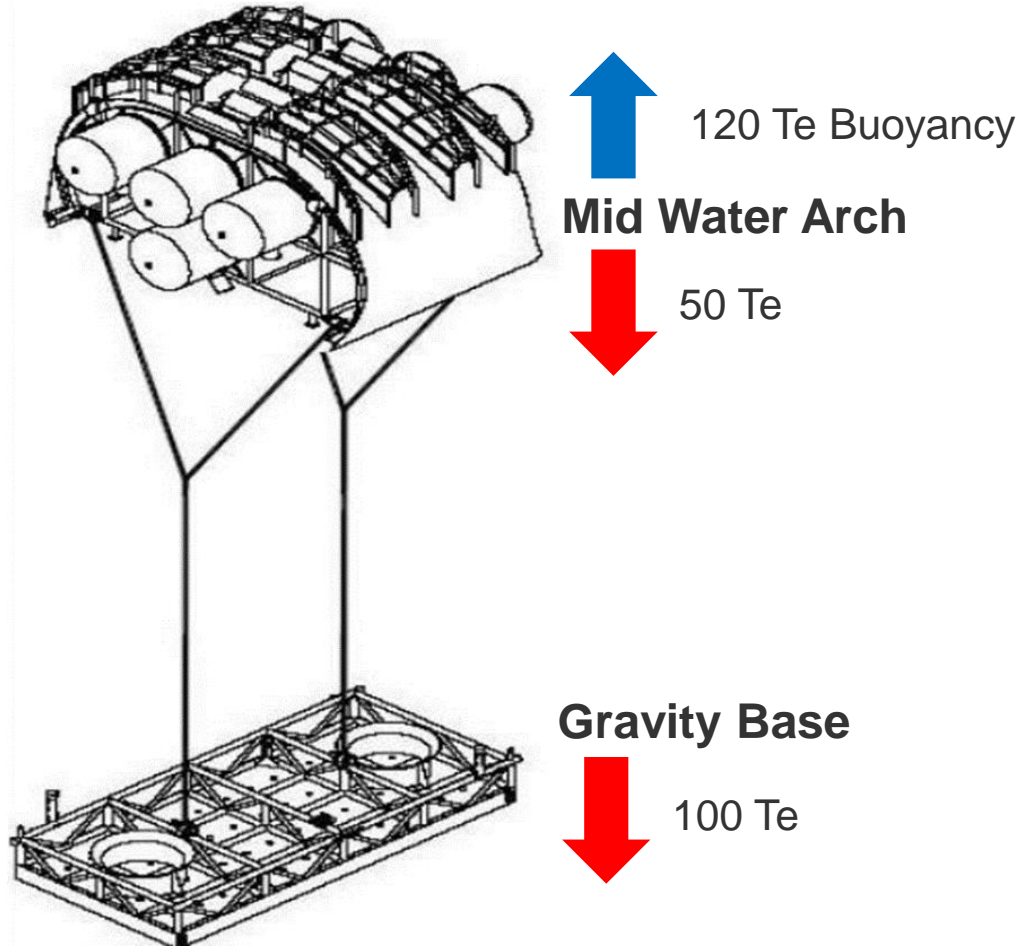
Hs (m) / Tp (s)	6-8	8-10	10-12	12-14	14-16	16-18	18-20	Cumulative Total
0.00-1.00	0.00%	0.00%	0.10%	0.60%	0.30%	0.10%	0.10%	1%
1.00-1.25	0.10%	0.10%	0.20%	2.70%	2.90%	0.70%	0.30%	8%
1.25-1.50	0.10%	0.10%	0.20%	2.70%	2.90%	0.70%	0.30%	15%
1.50-1.75	0.20%	0.60%	0.60%	3.60%	6.30%	1.50%	0.50%	28%
1.75-2.00	0.20%	0.60%	0.60%	3.60%	6.30%	1.50%	0.50%	42%
2.00-2.25	0.00%	1.20%	0.80%	2.70%	5.30%	1.60%	0.50%	54%
2.25-2.50	0.00%	1.20%	0.80%	2.70%	5.30%	1.60%	0.50%	66%
2.50-2.75	0.00%	1.00%	0.90%	1.50%	3.30%	1.00%	0.30%	74%
2.75-3.00	0.00%	1.00%	0.90%	1.50%	3.30%	1.00%	0.30%	82%
>3.00	0.00%	1.40%	4.00%	3.20%	5.80%	2.80%	0.60%	100%



Mid Water Arches

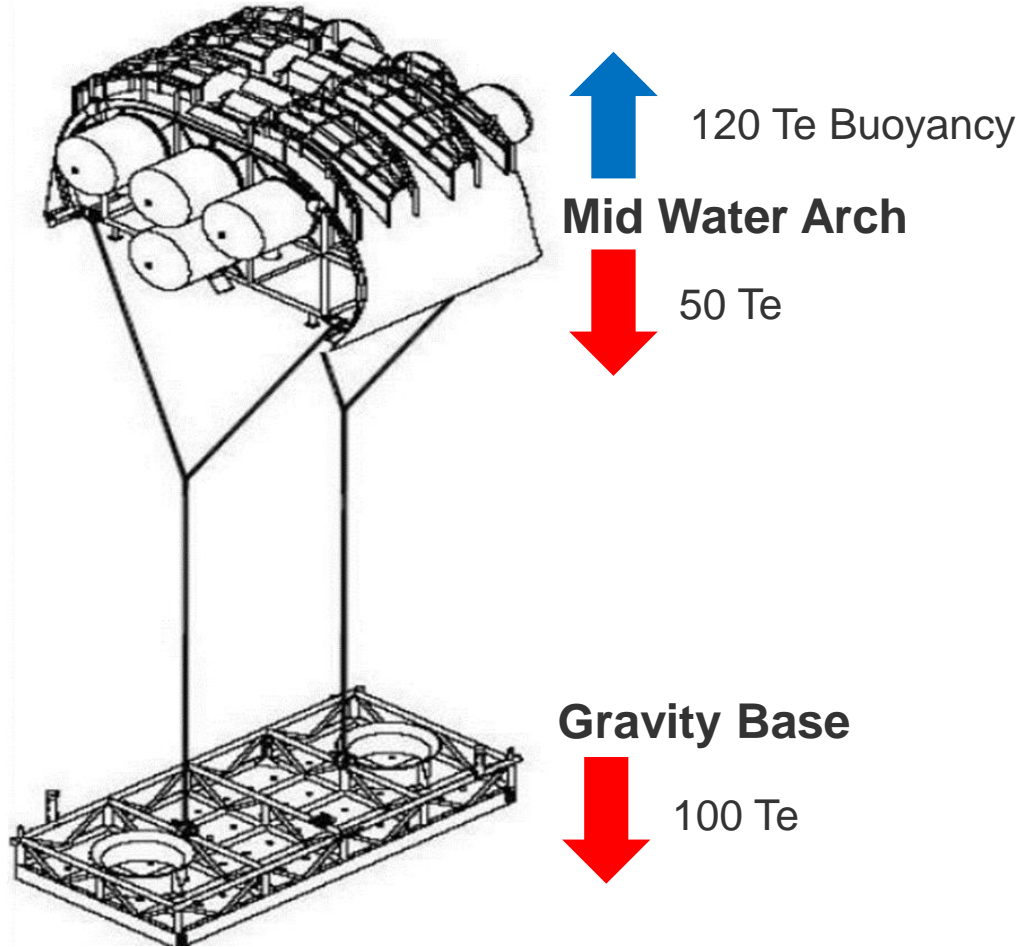


Mid Water Arches



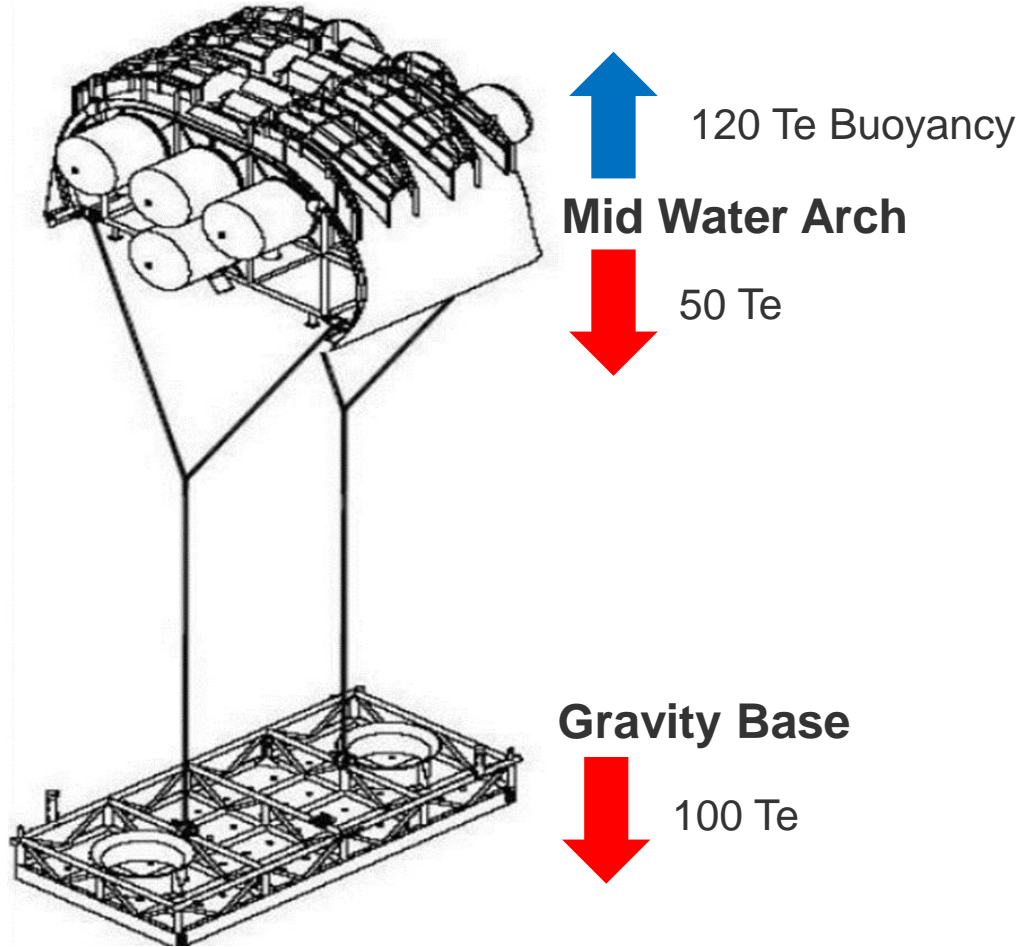
What's our recovery options?

Mid Water Arches



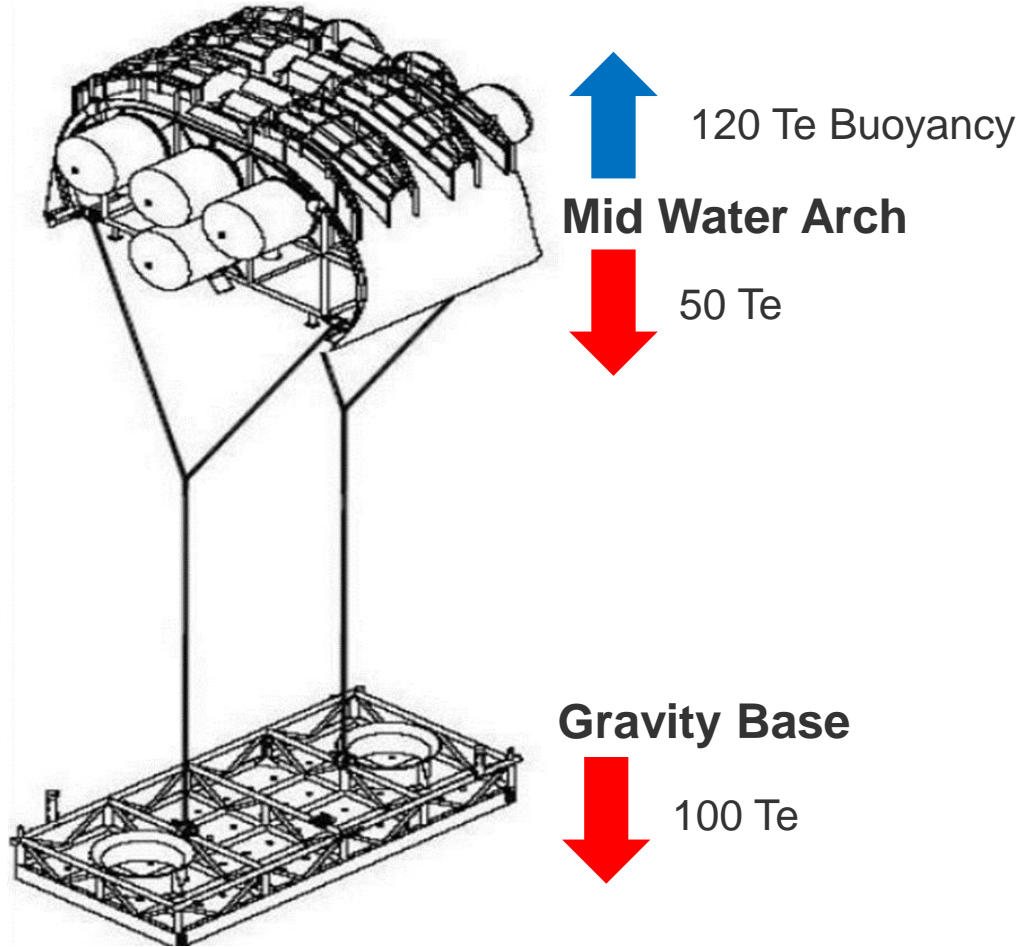
**Lift together with
the chains?**

Mid Water Arches



MWA chain from a different project

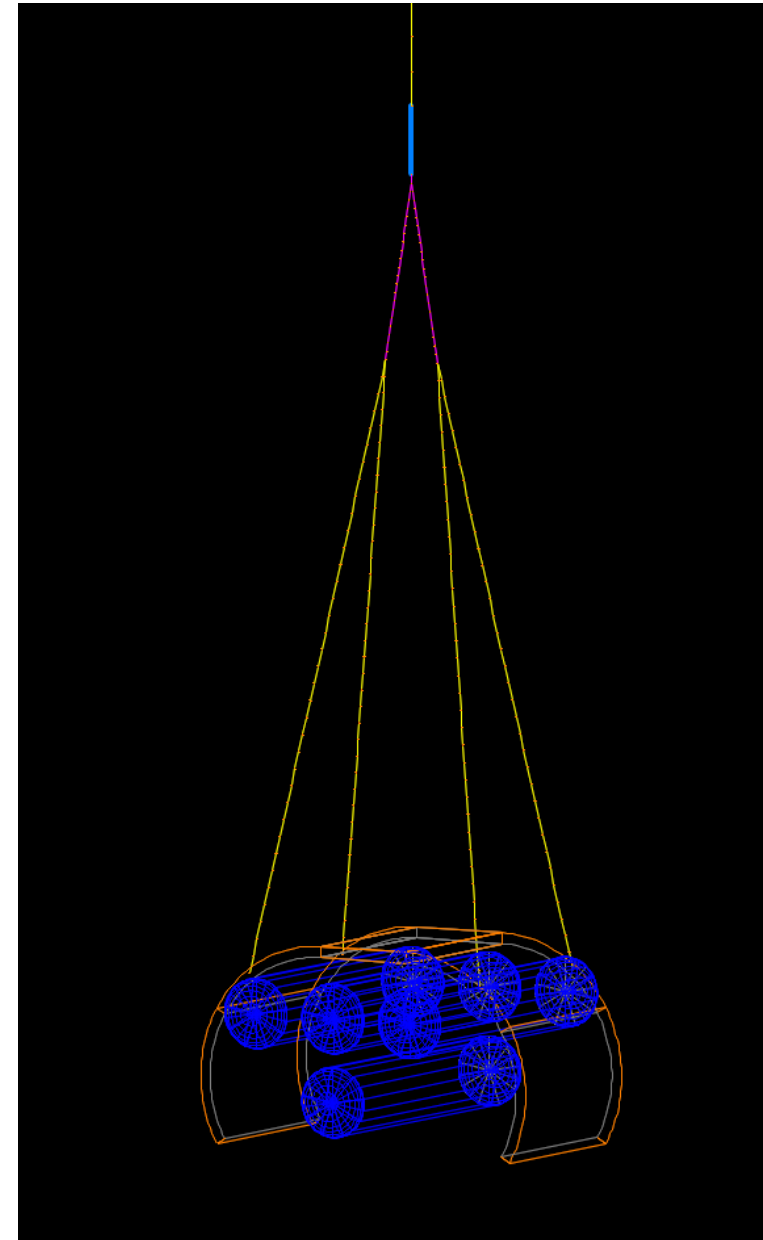
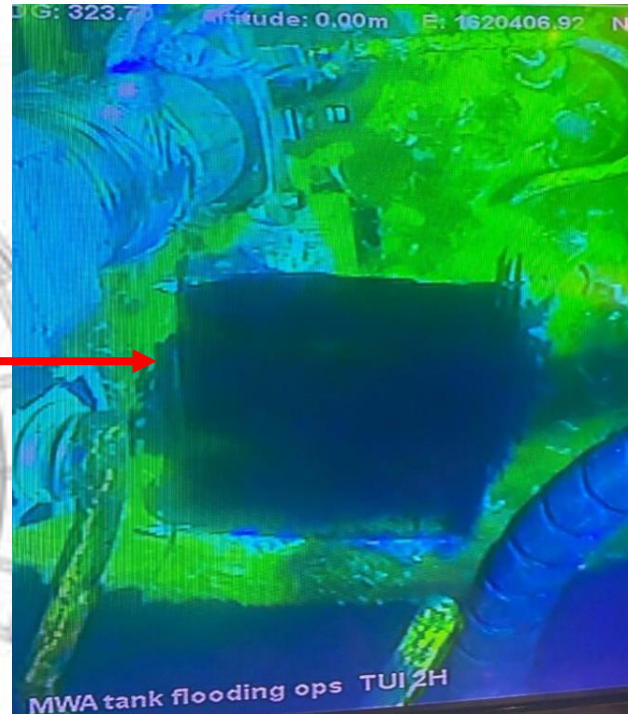
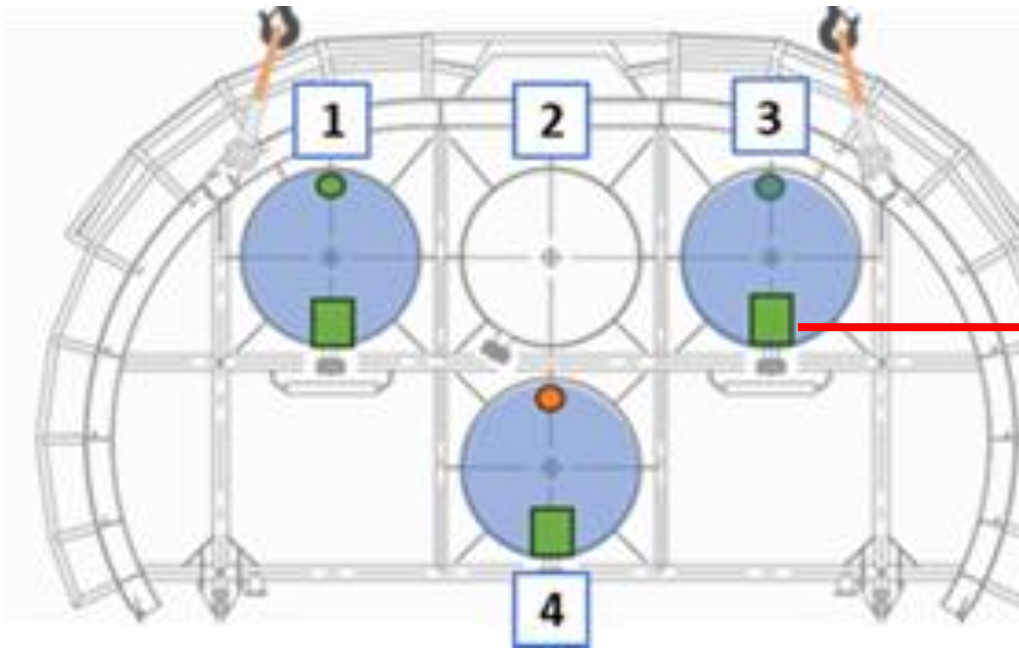
Mid Water Arches



**Cut the chains and
let it float?**

The Solution

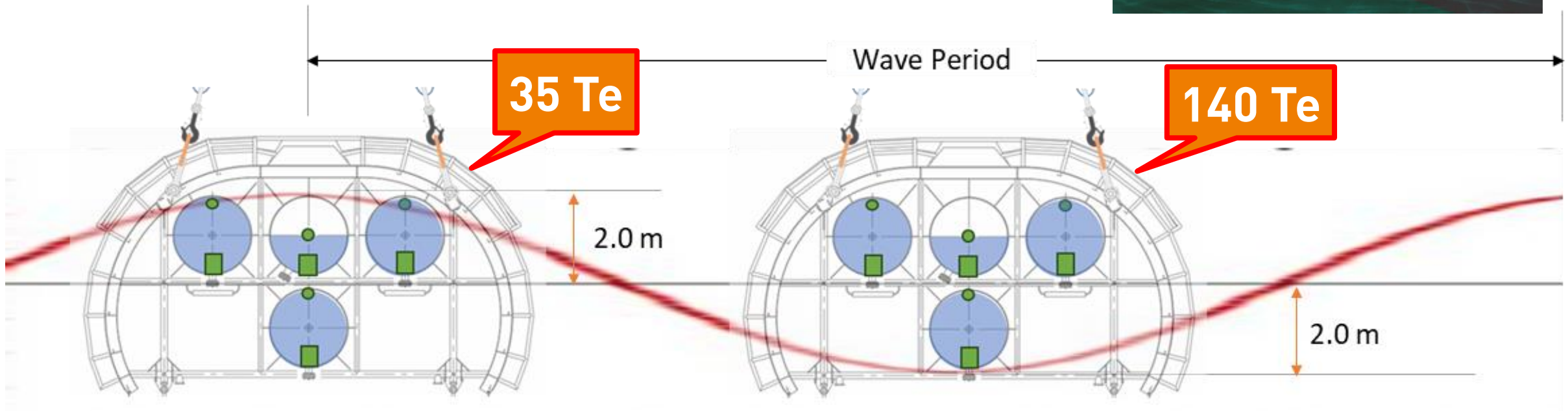
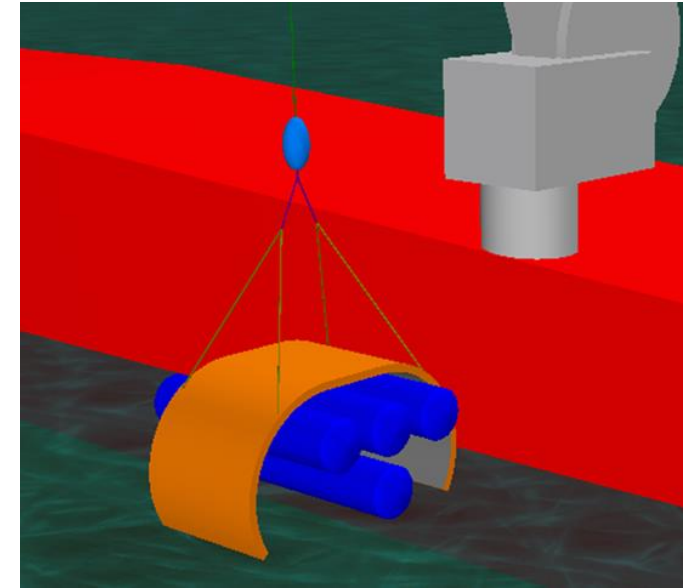
1. Cut holes to flood at least 3 tanks
2. Transfer Weight to Crane
3. Cut tether chains with ROV
4. Recover MWA to deck



How Many Tanks to Flood?

3 tanks = Too light – bob up and down and get slack slings

4 tanks = Too heavy - overload the existing shackles on the MWA

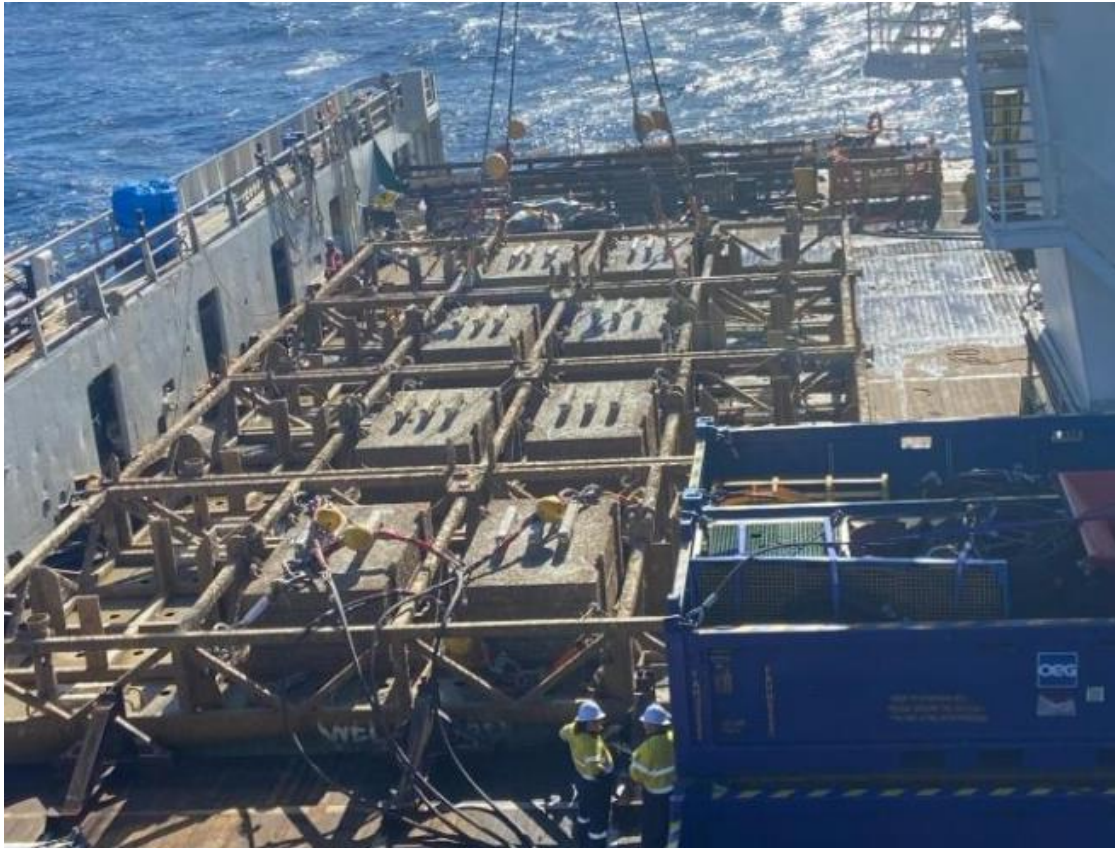


Actual Operations - MWAs



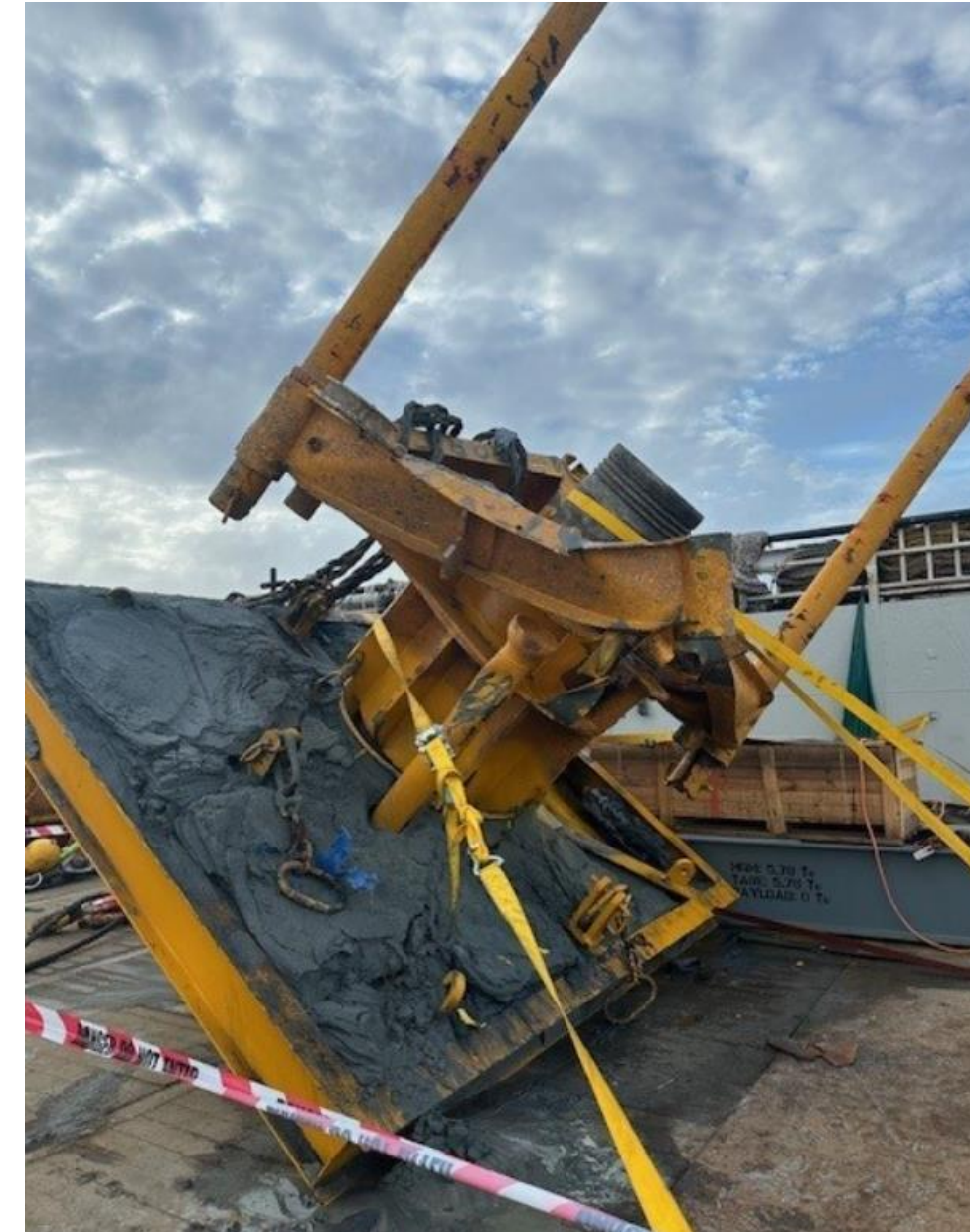
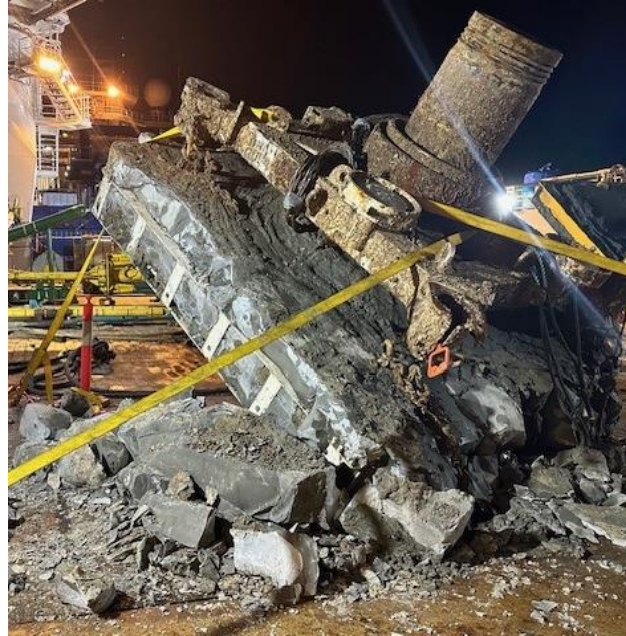
MWA	Tanks Flooded	Load (Te)		
		Submerged	Splash Zone	In-Air Dry
Tui 2H	3.5	34	147	~60
Tui 3H	3.5	37	90	~60
Pateke-3H	3.5	34	110	~60
Amokura-2H	3.5	36	125	~60

Actual Operations - GBs



GB	Load (Te)	
	Splash Zone	In-Air Dry
Pateke-3H	154	95
Amokura-2H	130	95

Actual Operations - Wellheads



Wellhead	Breakout Load (Te)
Pateke-3H	28
Amokura-2H	17



Thank You



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