



# MDS<sup>3</sup>: Improving Subsea Mattress Installation

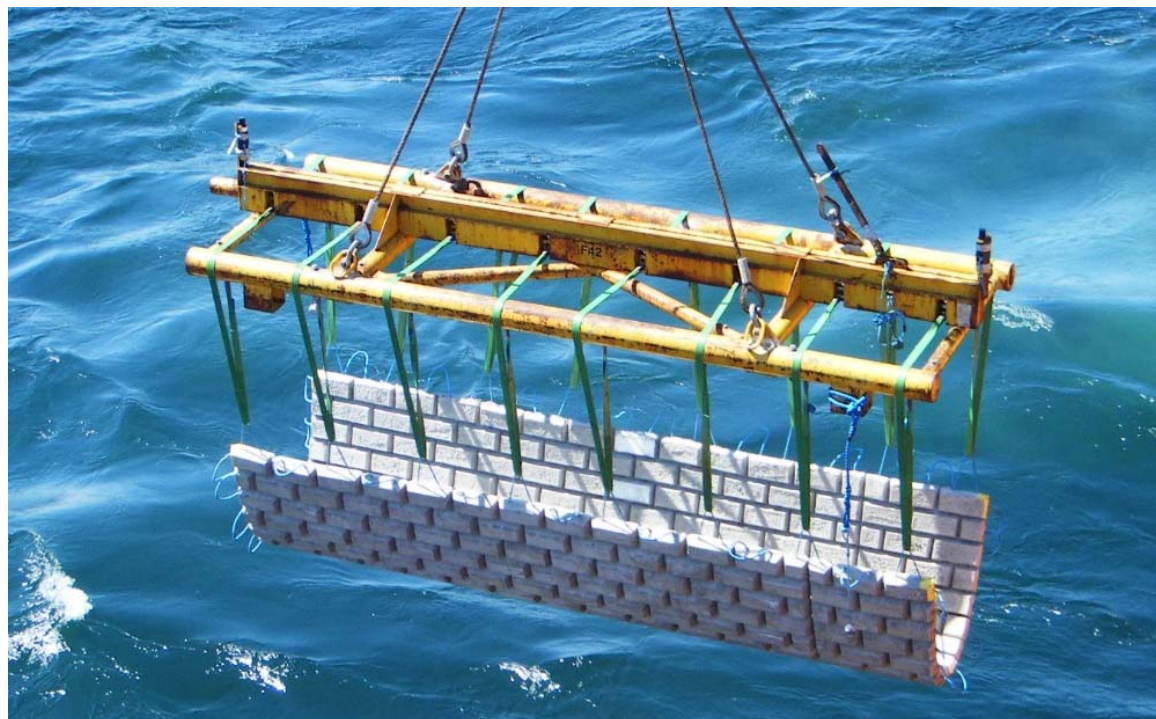


# The Traditional Method

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- ▶ Requires ROV or diver intervention
- ▶ 1 mattress per deployment
- ▶ 60 minutes on average to install a single mattress



# The Challenge

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## Safety:

- ▶ Safety concerns of using divers
- ▶ Possibility of ROV-Umbilical interaction

## Efficiency:

- ▶ Achieving 3 mattresses in under 75 minutes
- ▶ Reducing mobilisation on deck rigging & recovery time
- ▶ Improving the positioning method



# The Solution – MDS<sup>3</sup>

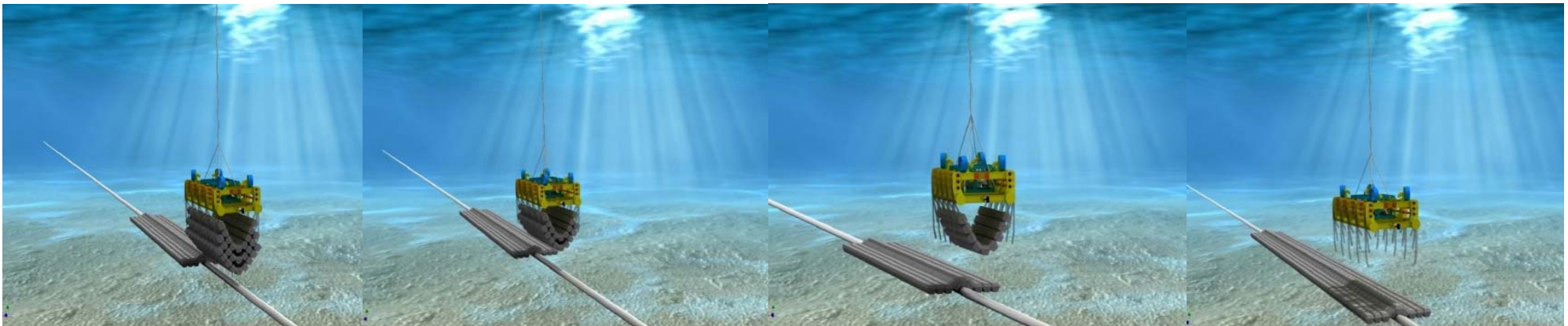
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# How it works

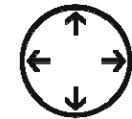
- ▶ MDS<sup>3</sup> carries the mattresses to the seabed and is positioned remotely via a self propelled thruster system with no additional ROV or divers required
- ▶ Installation is accelerated by laying multiple mattresses per deployment



# How it works



- ▶ On-board sensors are controlled from the vessel control cabin allowing monitoring of the positioning and allowing for remote release.



Navigation	Release Mechanism	Sensors	Control	Capacity
3x Video Cameras (fwd, aft, umbilical)	30 pins & straps	Attitude & Depth	4 x Thrusters, release actuators and sensors	Vehicle Frame 6m x 3m x 1.2m
TOGS 3000m Subsea Gyro	Connecting pins controlled remotely	2 responders/transponders	Operates as an ROV	Up to 3 x Concrete Mattresses: 6mx3mx0.30m
2x Blue View sonar (poor visibility imagery)	Remote controlled from surface unit	Gyroscope	Remote survey screens	Up to 6x Rock Filter Bags
USBL Transponders	Single Umbilical	Load Cells	Communications to crane/vessel – Clear-com and radio	
		Diagnostic sensors	Full survey interface	



# How it works

MDS<sup>3</sup> Control Cabin is the main control hub for the system it provides:

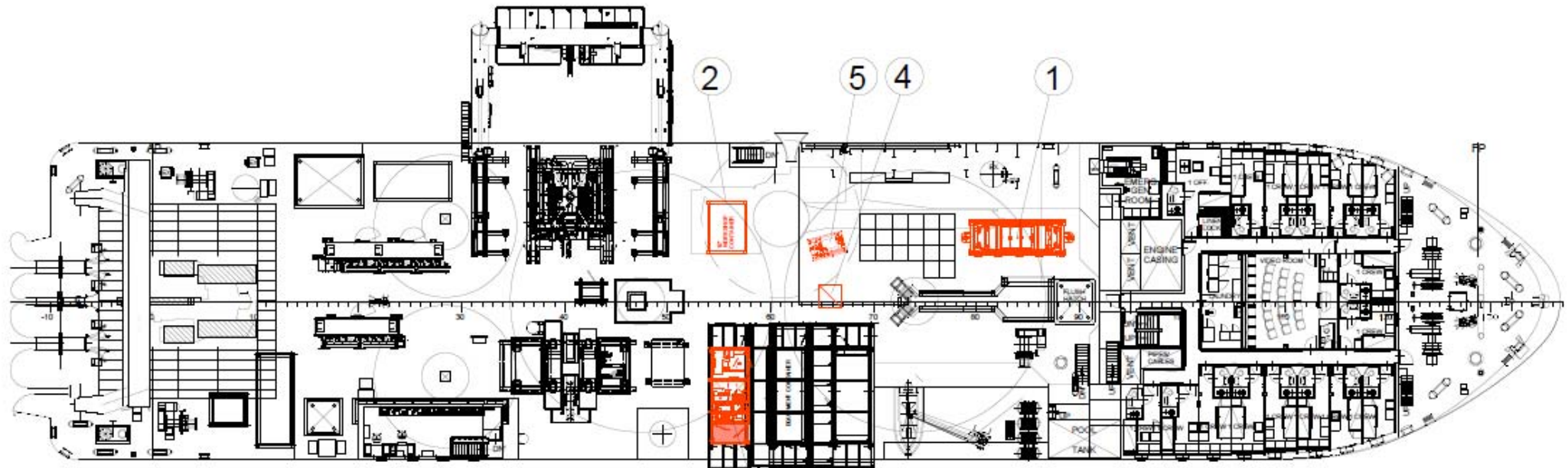
- ▶ Control of MDS<sup>3</sup> subsea control unit
- ▶ Monitoring of MDS<sup>3</sup> Alarms and diagnostics
- ▶ Monitoring of sensor information
- ▶ 4 x monitors for display Camera and sonar images monitoring:
  - ▶ Visual identification of uncovered assets on seabed – pre-lay
  - ▶ Monitoring of seabed approach
  - ▶ Verification of mattress touching points & mattress release
  - ▶ Full survey interface



# How it works – Deck Equipment



- ▶ 440 & 240 volt power distribution
- ▶ Power transformer to 3kv distribution
- ▶ HPU for hydraulic supply to tether Winch



(NOTE 3)

PLAN VIEW  
ON 'A-DECK'

1	MDS3 - Vehicle	7550 kg
2	16ft. MDS3 - Workshop Container	6550 kg
3	16ft. MDS3 - Control Container	6500 kg
4	MDS3 - Hydraulic Deck Pack	1500 kg
5	MDS3 - Winch	3000 kg
No.	EQUIPMENT LIST	Mass (kg)



# Results - Safety

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- ▶ No Divers required – removing risk of injury
- ▶ No risk of ROV Umbilical-MIF interactions
- ▶ Monitoring in relation to other subsea assets



# Results - Installation Time



Activity	MDS <sup>3</sup>	Activity	Single Frame ROV/Diver
	Time (mins)		Time (mins)
Load Mattresses	15	Load Single Mattress	10
Deploy to Seabed	10 (35m WD)	Deploy to Seabed	10 (35m WD)
Position 1st Mattress	10	Position 1st Mattress	15
Release 1st Mattress and Reposition MDS <sup>3</sup>	10	Release 1st Matt & Recover to Deck	20
Release 2nd Mattress and Reposition MDS <sup>3</sup>	10	Load 2nd Mattress	10
Release 3rd Mattress	10	Deploy to Seabed	10
Recover to Deck	10 (35m WD)	Position 2nd Mattress	15
		Release 2st Matt & Recover to Deck	20
		Load 3rd Mattress	10
		Deploy to Seabed	10
		Position 3rd Mattress	15
		Release 3rd Matt & Recover to Deck	20
<b>TOTAL TIME FOR 3X MATTRESS:</b>	<b><u>75 mins</u></b>	<b>TOTAL TIME FOR 3X MATTRESS:</b>	<b><u>165 mins</u></b>

# Results - Efficiency



- ▶ More vessel back deck space for storage potentially reducing port calls
- ▶ Improved environmental operability
- ▶ Positioning in shallow water areas
- ▶ Less lifts/ deployments

Parameter	Standard ROV System	MDS <sup>3</sup>
Sea State	4 - 5	4 - 5
Significant Wave Height	1.5m (limited to ROV)	2.5m
Wind Speed	30 knots	30 knots
Current	1.5 knots	2.5 knots

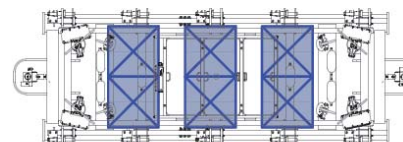
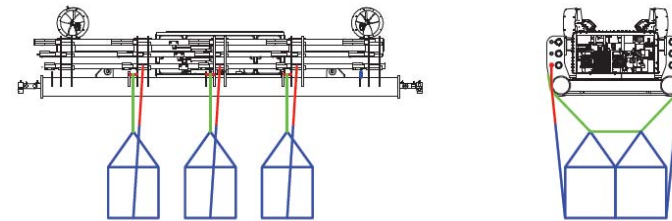
No. of Mattresses	Minimum Water Depth
1	4.0m
2	5.0m
3	6.0m

# Case Study



Used for Offshore Wind farms, telecoms cables, Oil & Gas, Nuclear site development

- ▶ 200+ mattresses across Europe on multiple projects
- ▶ New project award 12,000 mattress installation
- ▶ Additional use for rock filter bag placement



# Summary

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MDS<sup>3</sup> provides:

- ▶ A positive impact to health & safety
- ▶ A cost & time efficient tool solution for the market
- ▶ No Diver Intervention or ROV support required
- ▶ More vessel back deck space for storage, potentially reducing port calls
- ▶ Rapid mobilisation time
- ▶ Working in extreme environments

# MDS<sup>3</sup>

Thank You For Your Time,  
any Questions?

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