



INTERMOOR

INTERMOOR



an **ACTEON** company

KNOWLEDGE FORUM

Quick disconnect of mooring lines (for MODUs)



Introduction

- InterMoor + Pty Ltd
- Engineering and operations office in Perth (140 St Georges Terrace)
- Equipment supply base in Karratha

Engineering & Design

200+
Mooring design and analysis
Installation analysis
Hydrodynamic analysis
Structural analysis
each year

Mooring Equipment

60+
Suction & driven piles
fabrication

Global Inventory
Sales & Rental

Marine Operations

100+
Prelay/insert/piggyback
installation

200+
Rig moves annually

Inspection, Maintenance, Repair

988ft/day
Average chains
inspected over 3 years

Transportation & Installation

World record

Conventional mooring installation at 8,431ft
(2,570m) Buntal exploration with Murphy &
PCSB

Over 40 Permanent moorings globally

Since 2012

10 Installations / 6 Replacement / 5 Decomm
FPSOs / SPAR / Semi submersible / SPM



Outline

- **Mobile moorings for MODUs: an introduction, installations**
- **Quick release of mooring lines: what it is, what it is for**
- **Design your mooring system to include a quick disconnect device**
- **Nice to have features of your quick disconnect device**
- **Some pretty pictures and videos**

MODU mooring

- Spread mooring system
- 8, 12, 16 lines

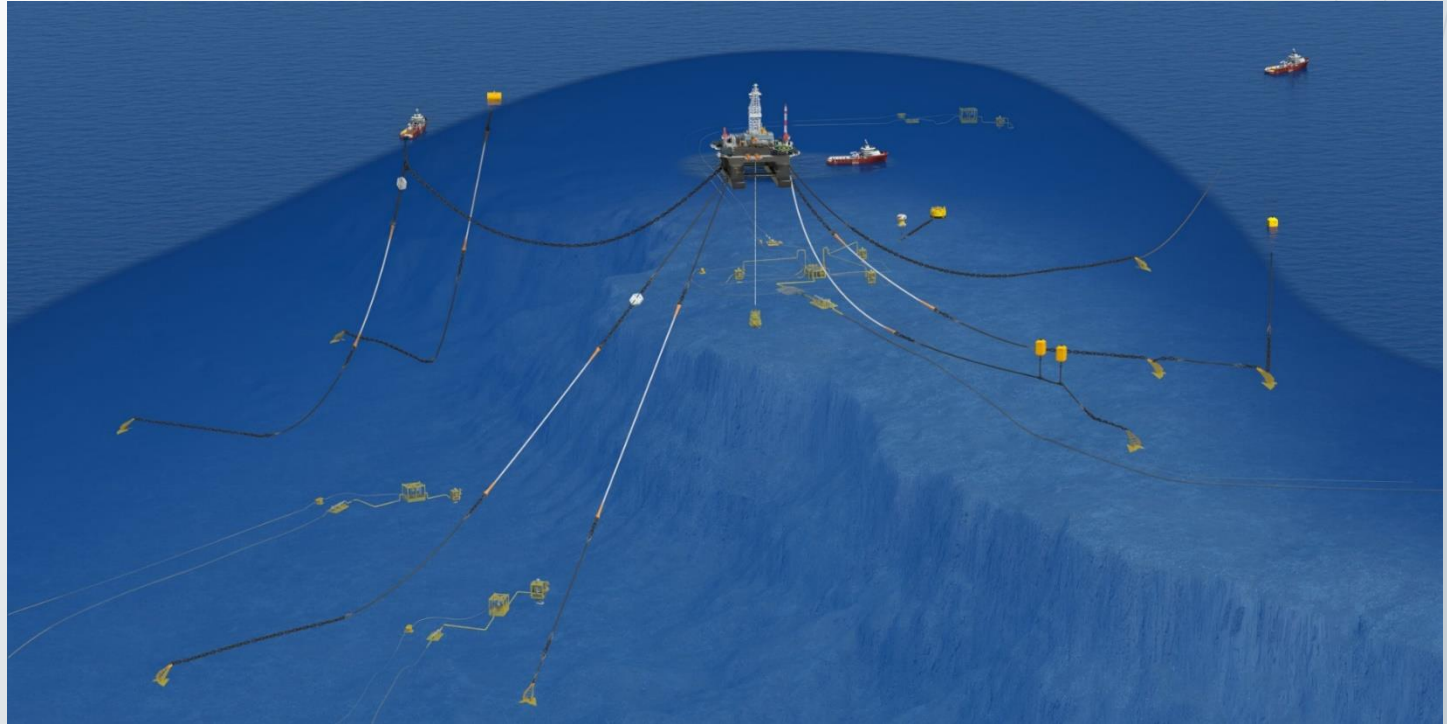
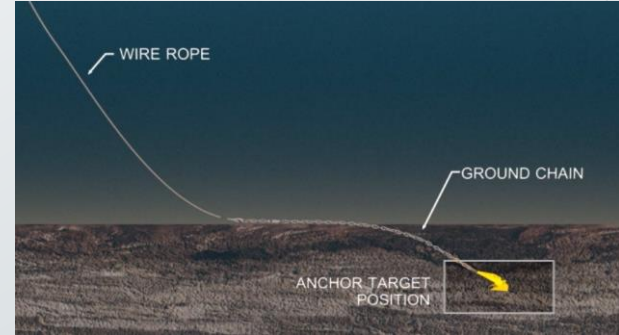
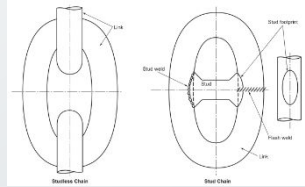
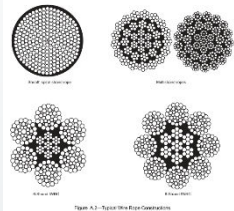


Figure 1—Spread Mooring

MODU rig system

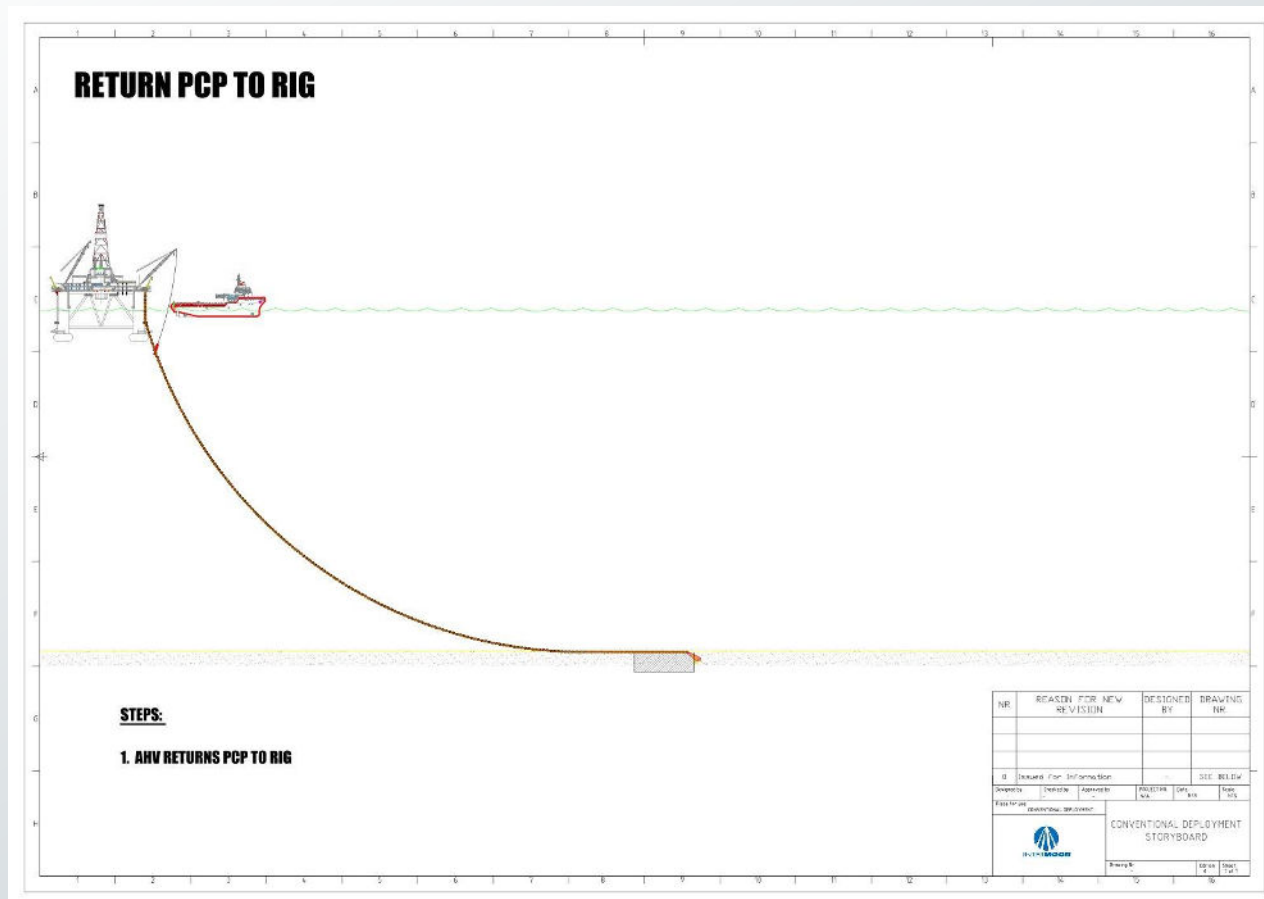
- Mooring system that goes with the rig
- chain / chain + wire & drag embedment anchors



MODU rig system



Conventional deployment



MODU pre-laid mooring system

- Mooring system pre-installed on the field and then hooked up to the rig
- chain / wire / fibres / buoys / anchors



MODU pre-laid mooring system

- Pre-laying, hooking up, disconnect, recovery

- reasons




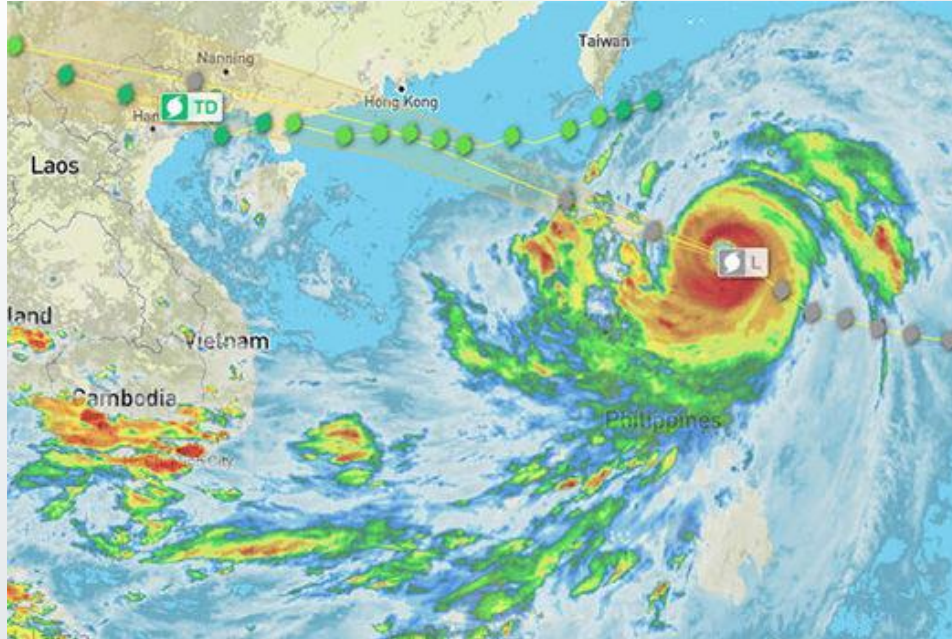
MODU mooring system

- Lengthy operations
- Operational risks
- Inability to disconnect



MODU mooring system

 Once connected, you stay connected



Disconnect for improving

🌀 Length of operations : **operational efficiency**

🌀 Ability to disconnect

🌀 Risks

Rig Time	Conventional	Pre-laid
Mooring operations duration per well	5 days	3 days
Number of wells	3	3
Total duration	15 days	9 days
Spread Cost (AUD 800,000 per day est.)	12,000,000	7,200,000

Estimated spread (rig) cost is inclusive of full equipment and personnel spread

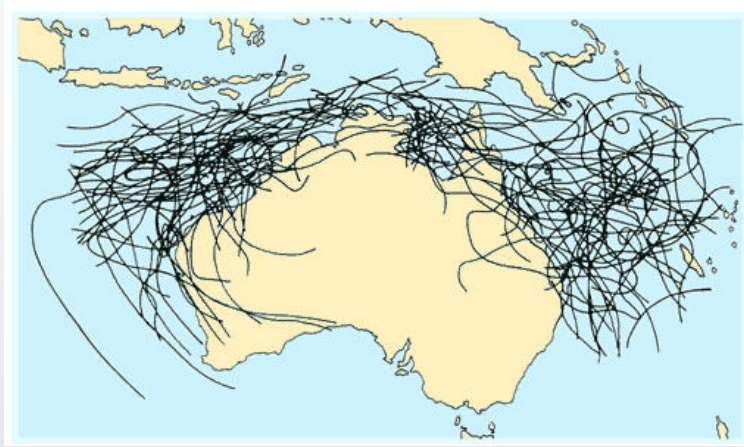
Rig time saving of 6 days i.e. AUD 4,800,000!

Disconnection of 12 pre-laid mooring lines, using TWO anchor handling vessels is estimated in 1 day

➔ if quick release then **800,000AUD** per move of additional savings x well

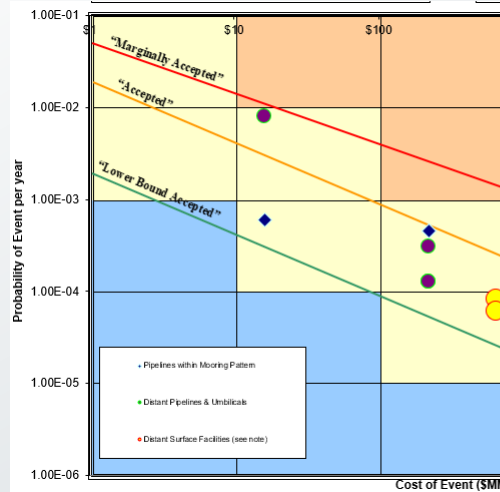
Disconnect for improving

- Length of operations : operational efficiency
- Ability to disconnect : **weather avoidance**
- Risks



Disconnect for improving

- Length of operations : operational efficiency
- Ability to disconnect : weather avoidance
- Risks : **strength requirements & mooring operations risks**



Length Safety Factor vs Return Period
Hurricane Season

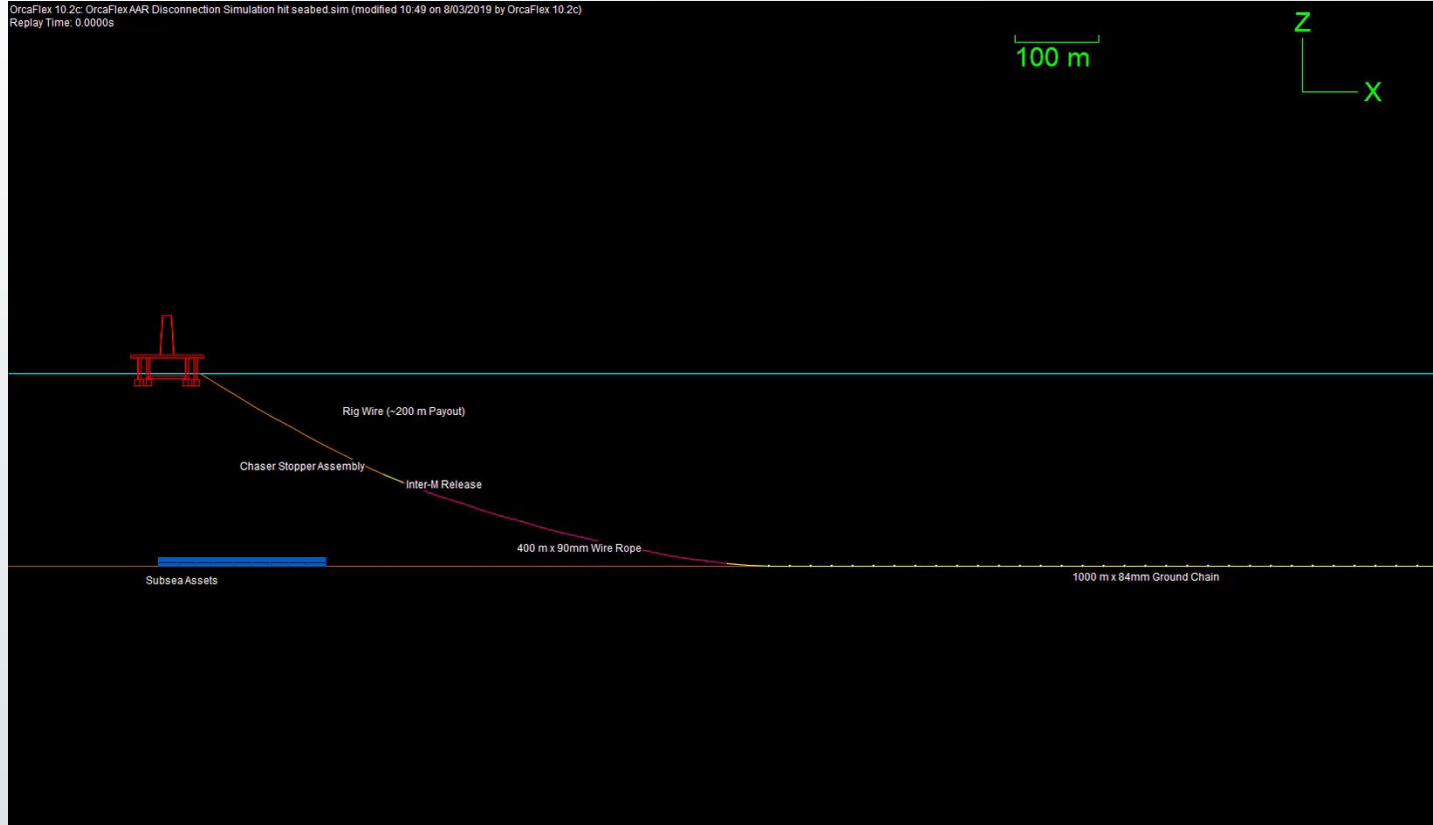


environmental headings analyzed.

Mooring line configuration



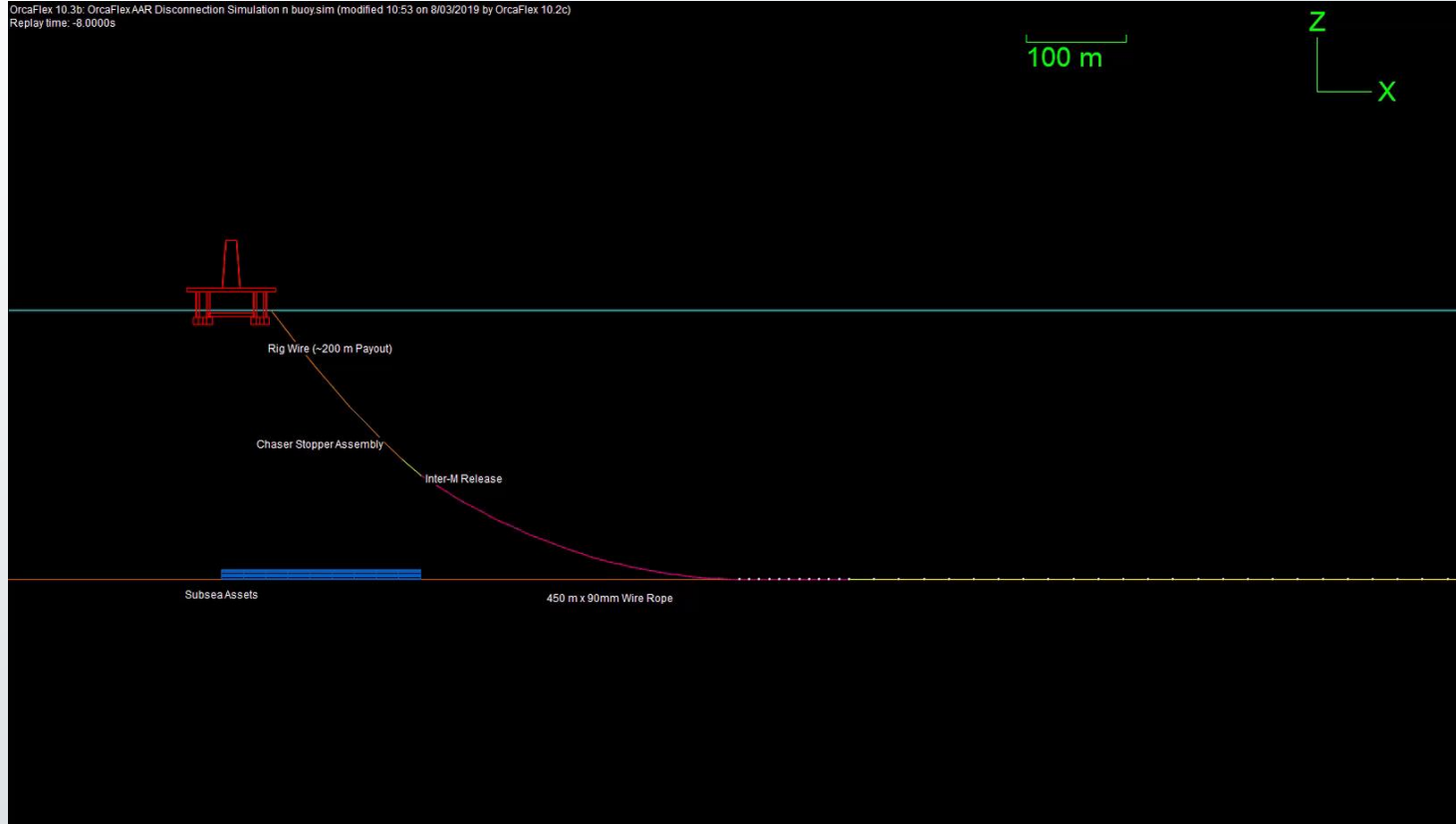
What to look for: what happens once the mooring line is disconnected?



Mooring line configuration



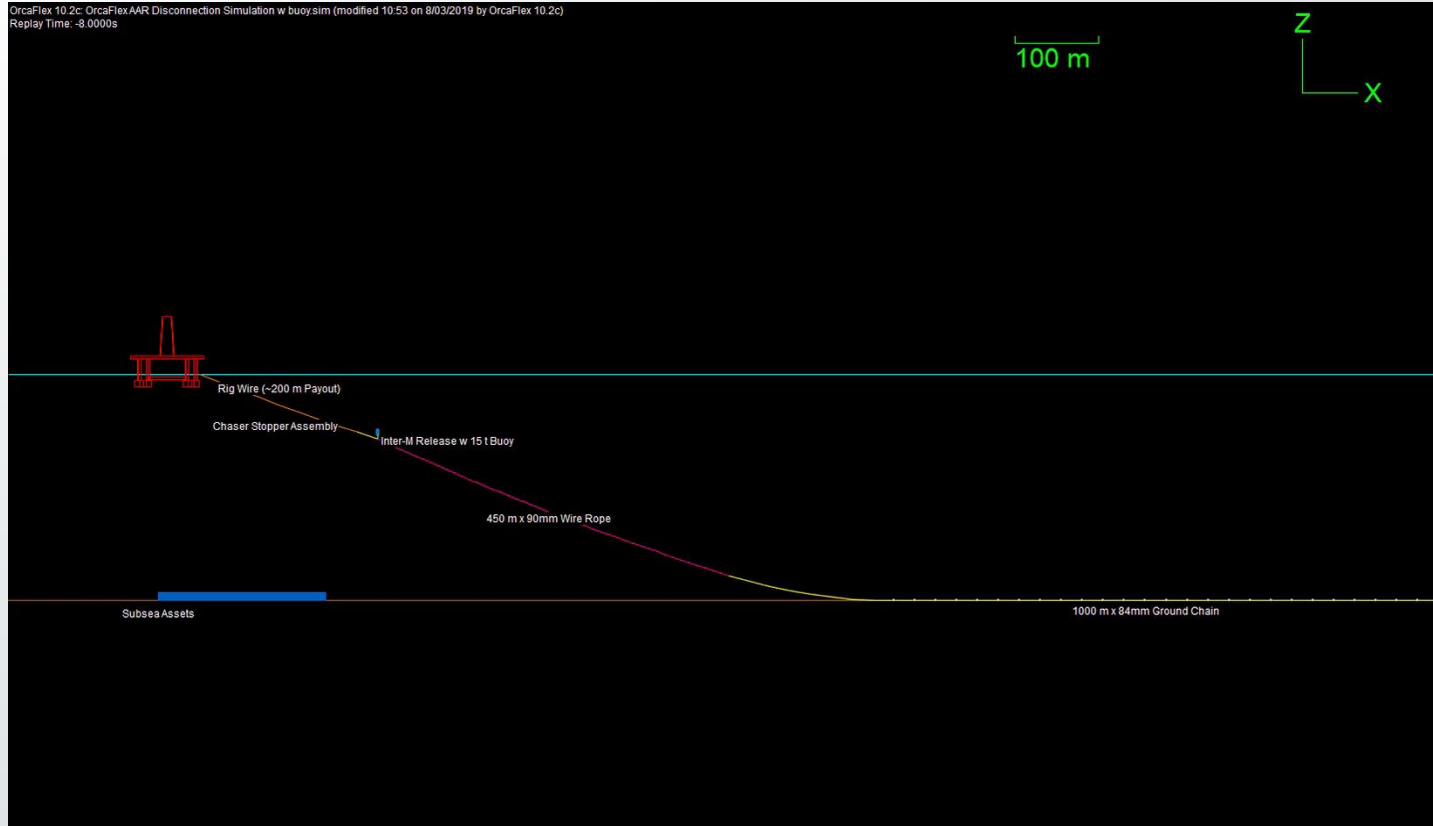
What to look for: what happens once the mooring line is disconnected?



Mooring line configuration



What to look for: what happens once the mooring line is disconnected?



How does it work



Quick disconnect device features

~~Must~~ have

- Strength
- Flexibility
- Handling
- Class Approval
- Durability
- Reliability & Redundancy
- Resistance
- Ease of usage
- Coms
- Maintenance

Quick disconnect device features

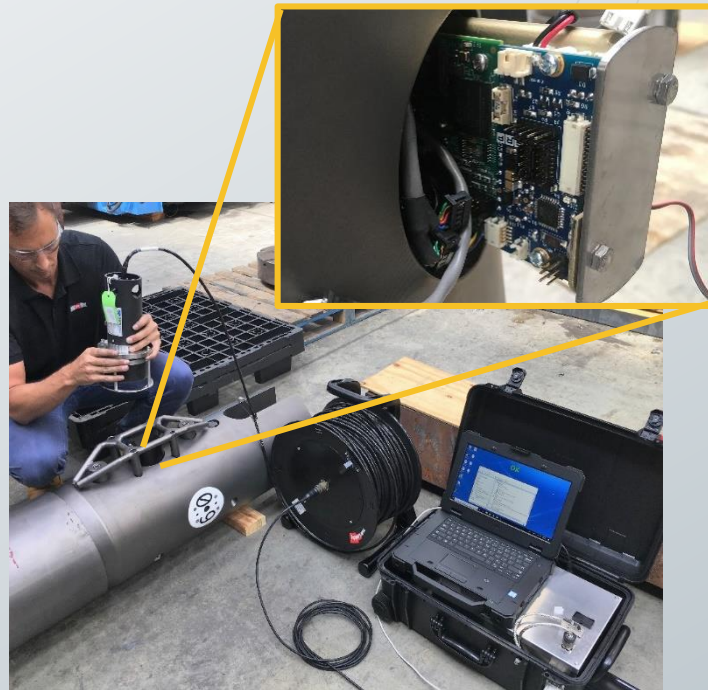
Communications, reliable and available

Reliability

- Not to be activated by mistake
- unique domain key, 18.4×10^{18} combinations
- 250 modem addresses in domain

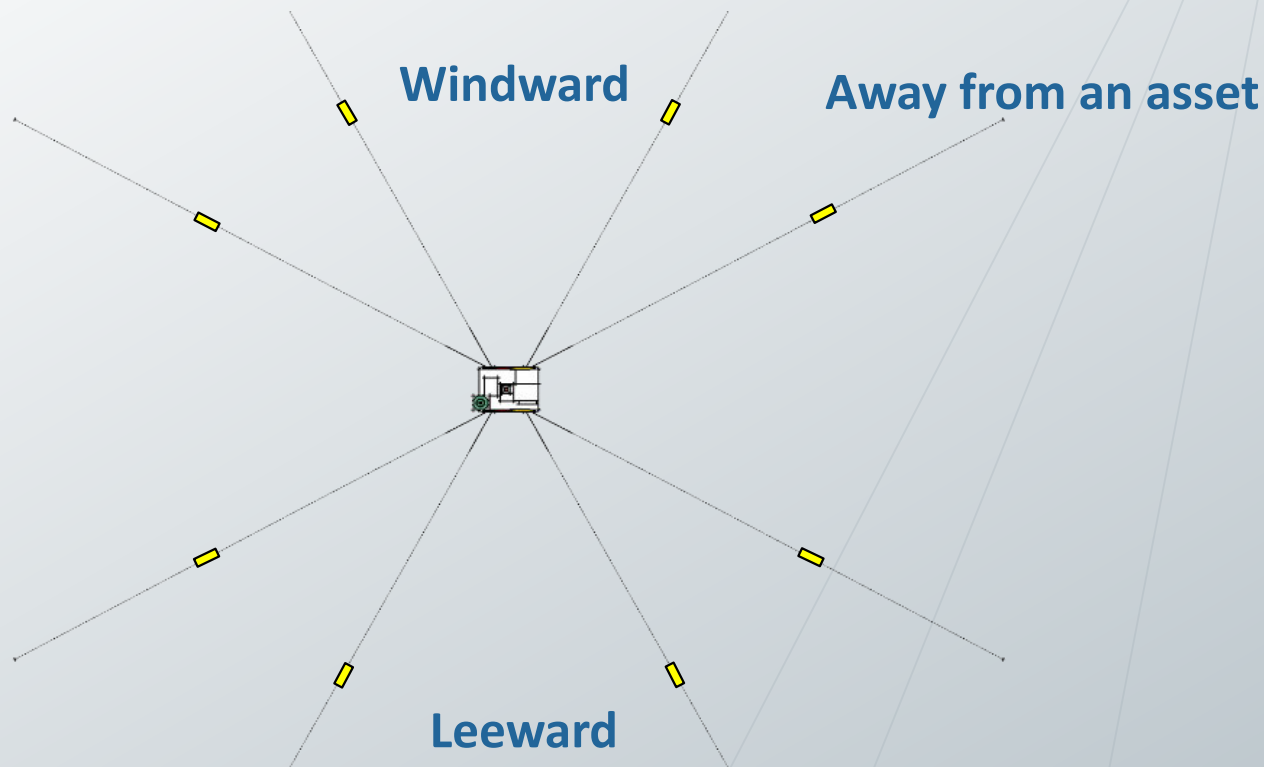
Availability

- LF 8.96–14.08 kHz band
- Error correction
- Data redundancy
- Frequency hopping
- Data on demand: Battery voltage & release pressure
- 3-axis motion and line tension



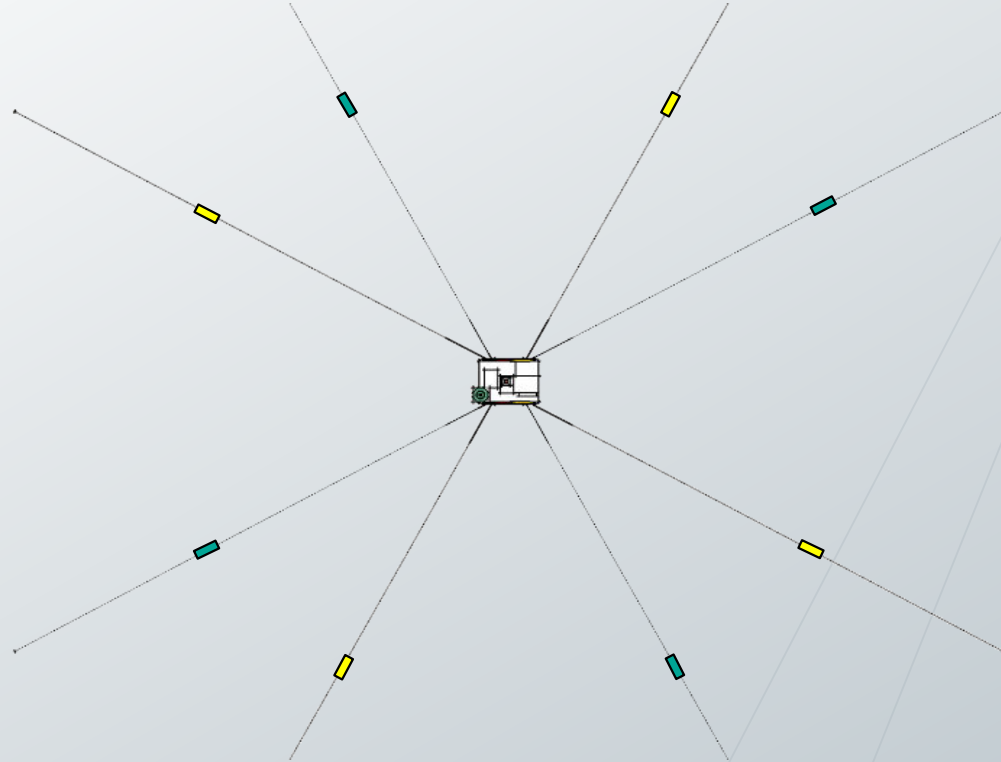
Quick disconnect device features

Flexibility



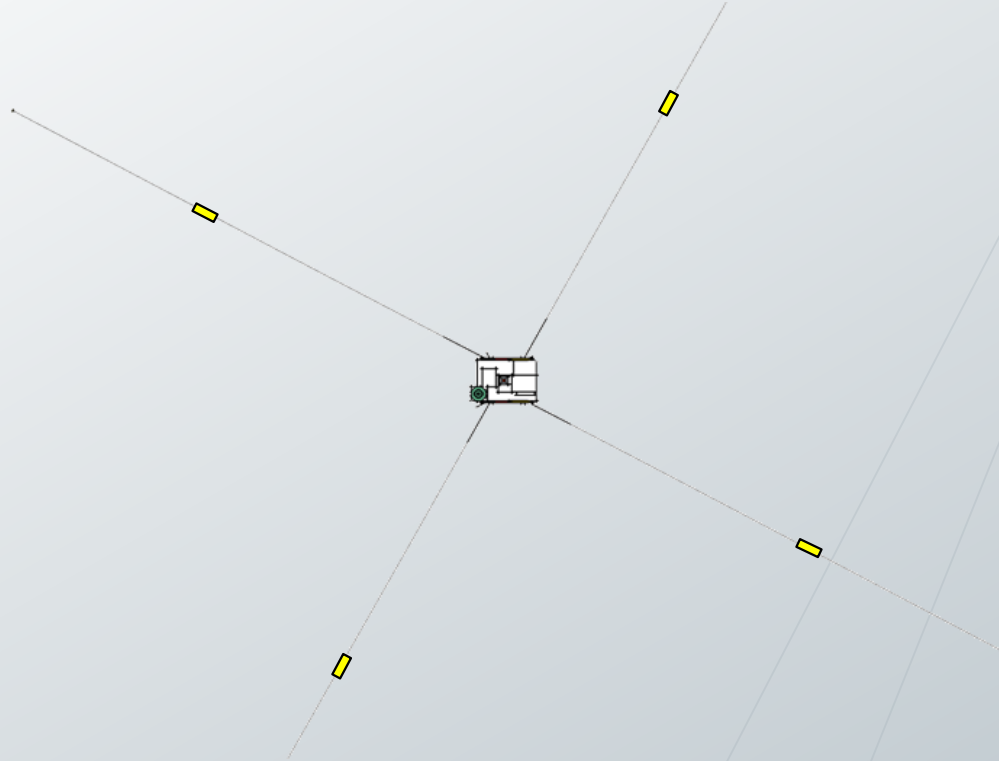
Quick disconnect device features

Flexibility



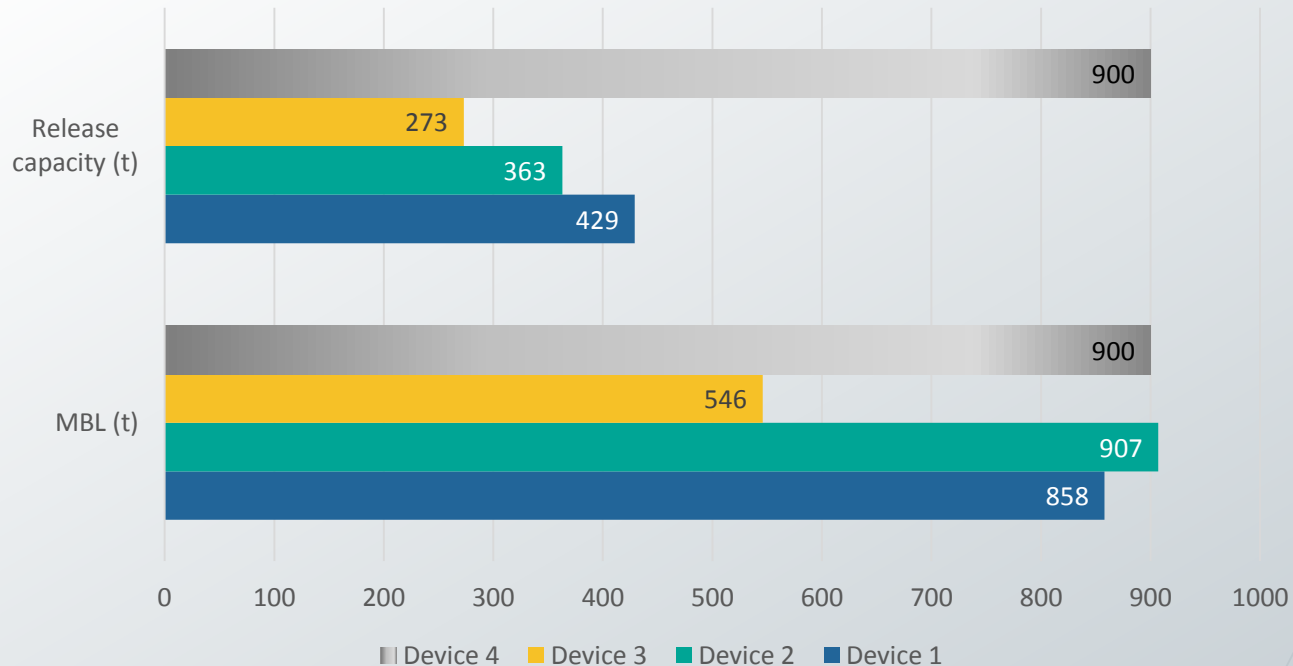
Quick disconnect device features

Flexibility



Quick disconnect device features

Release Capacity & Strength



Quick disconnect device features

Redundancy, Reliability

- Rigorous tests and qualifications programs

Improved Reliability



Quick disconnect device features

Redundancy, Reliability

- ROV actuated redundancy
- Long battery life and good acoustic system
- Manual or Programmable Disconnect

Improved Reliability



Quick disconnect device features

Classed

- Approved for use offshore by class Societies

Certification



DNV GL
Certificate No:
N141RA18-Rev.0

PRODUCT CERTIFICATE

Particulars of Manufacturer and Purchaser
Manufacturer: Subsea Riser Products Ltd
Manufacturer's order No: 9353-PEO-0006
Purchaser: Intermoor Inc.
Purchaser's order No.: PO 20931

Particulars of Product
The product is intended for: Interim Rental business - Operated by Intermoor as the "Inter-M Release Connector"
Yard: _____

Yard No: _____
Name of Vessel: _____
DNV GL Id No: _____

This is to certify:
that the product: **ROCKSTEADY Quick Disconnect Subsea Mooring Connector with release-under-load mechanism**
9353-DGA-0001
Mobile Mooring according to DNVGL-OS-E301 July 2018

Type designation: _____
Intended purpose: _____

Serial No(s): _____
Has been built and tested in accordance with the relevant requirements of: ☒ Naval ☐ Offshore
Choose a rule set Rules for Classification: ☐ HSLC ☐ Ships
☐ Other standards: **DNVGL-OS-E302 July 2018**

Remarks: _____
The product was marked: _____
Issued at **London** on **2018-12-21**

On: _____
for **DNV GL**
Kumar, Ajeth
Ajeth Kumar
Project Manager / Senior Surveyor
Surveyor: S. Manikandan (Great Yarmouth-UK)
Internal Verifier: Pierre-Eric Moulla (Doha)

Revision: 2017-01
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Form code: CMC 231

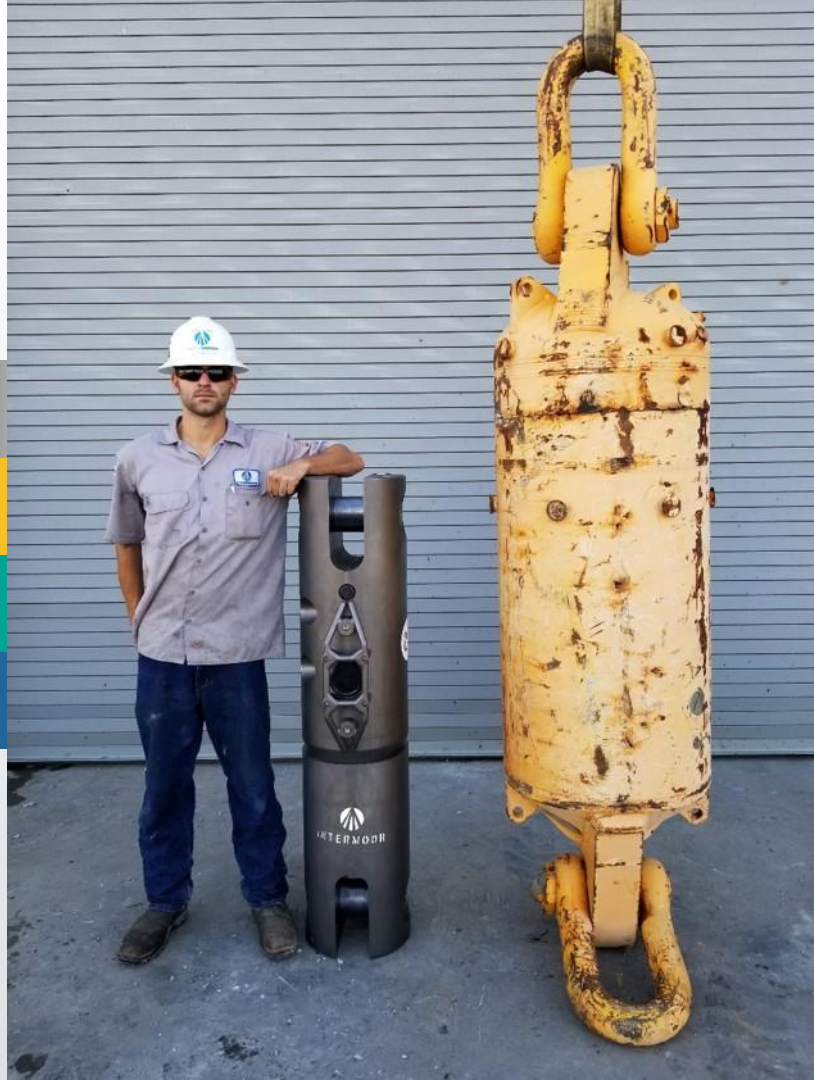


Weight &

Weight (kg)



0

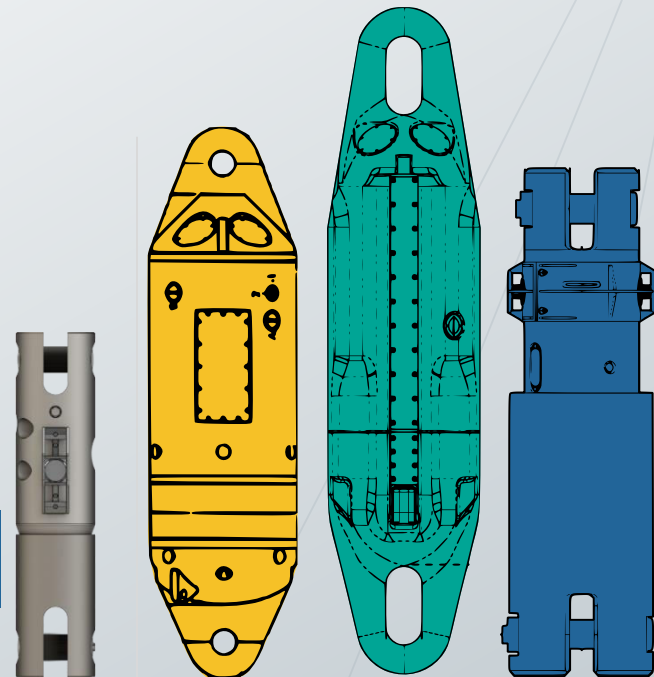


ice features

3062

3000

3500



Quick disconnect device features

Easy to
maintain and
service



Inter-M Release TM



Quick disconnect device features

Strength

