



JFD PRESENTS:

NAVIGATING NEW DEPTHS:

Tactical Diving Vehicles as Adaptable Platforms
for Next-Gen Maritime Operations

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COMBINED NAVAL EVENT 2024

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NAVIGATING NEW DEPTHS:

Tactical Diving Vehicles as Adaptable Platforms for Next-Gen Maritime Operations

JFD has 40 years proven expertise designing and manufacturing pioneering underwater systems and platforms which can play a vital role underwater battlespace and supporting distributed maritime operations.

With global instability putting a focus on adaptability and re-configurability, JFD is looking towards enhanced technologies and innovations necessary to explore and exploit maximum effect in littoral waters.



KEY POINTS COVERED

- 1 Bridging the current capability gap: Offering diverse littoral manoeuvre and operational capability in denied environments
- 2 Independent and flexible operational configurations overcome contested logistic situations
- 3 Interoperability in action; crewed and uncrewed system synergy; embracing emerging technologies for future operations



THE CHALLENGE:

Maritime operations are evolving rapidly, presenting an urgent need for Navies to employ the use of versatile platforms to maintain dominance across contested waters.

In an age of precision-strike weapon proliferation, a big-ship navy needs a wider array of deployable capabilities from ship to shore from a safe stand off distance.

There is a need for smaller more versatile combatant craft that can fulfil a wide range of missions covering: sense & detect; respond as well as re-supply in a A2/AD environment.

Solution: TDVs





LITTORAL MANOEUVRE SOLUTIONS BRIDGING THE WATER GAP

THE CHALLENGE:

For both submarines and surface fleet operations in littoral waters within a A2/D2 denied environment, access needs to be via discreet and low observable means.

STRATEGIC IMPORTANCE:

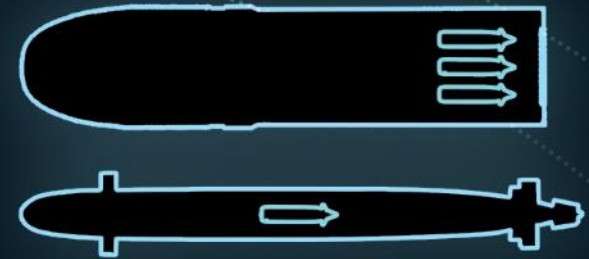
Shallow littoral zones are often key areas for maritime security, coastal defence and protection of critical infrastructure

Anti-Access Area Denial
Danger Zone

Littoral Zone

Open Waters

Littoral Zone



Over-the-horizon
launch

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Open Waters

JFD



BENEFITS OF A MODULAR CAPABLE TDV PLATFORM

Conventional surface craft insertion is no longer an option:

Single Mode Surface Craft

- Rapid over the horizon capability
- Transportation of an effective team size



- Large signature (no discretion capability)
- Little to no environmental protection
- Little to no ballistic protection

Multi-Mode Surface Craft

- Rapid over the horizon capability
- Transportation of an effective team size



- Signature reduction (semi-submerged & awash)
- Increased environmental protection
- Ballistic protection potential



BENEFITS OF A TDV OVER SDV PLATFORM

For more covert operations from a submarine – there are also constraints.

Swimmer Delivery Vehicle (SDV)

- Covert transportation
- Can operate in Littoral waters



- Precise targeted operations
- Not a modular platform
- Unable to perform surface operations

Multi-Mode Surface Craft

- Enhanced Covert Manoeuvrability
- Ability operate at different modes



- Extended Duration for over the horizon
- Independently operated from launch platform
- Greater comfort for prolonged missions



ADAPTABLE PLATFORMS FOR ENHANCED OPERATIONAL FLEXIBILITY

A Solution:

Traditional craft are unable to adapt to the large variety of mission profiles required of them.

An adaptable, flexible, modular platform is needed to meet the rapidly evolving battlespace.

Solution: TDVs

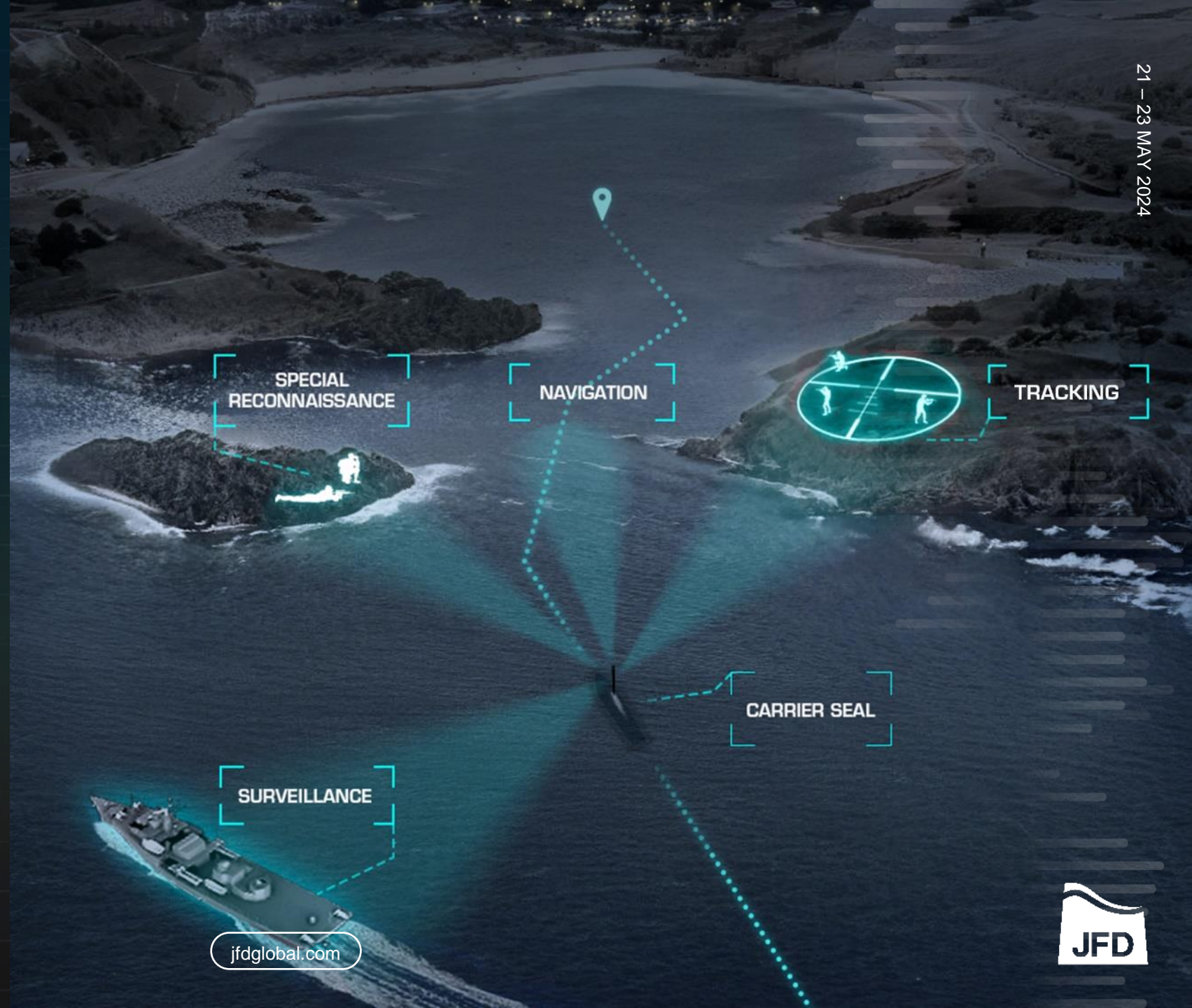




Sense & Detect:

ISTAR OPS

- Covert deployment
- Setting an underwater sensor network
- Tactical electro optical mast
- Semi-submerged mode
- Fully submerged – Harbour survey



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Rapid Response:

MARITIME INTERDICTION

- Counter Terrorism
 - Counter Narcotics
 - Counter Weapon Smuggling
 - Fishery protection
-
- Delivery direct to the target
 - No need for long swim approaches
 - Operator performance is enhanced



DIRECT ASSAULT
FROM THE
VEHICLE

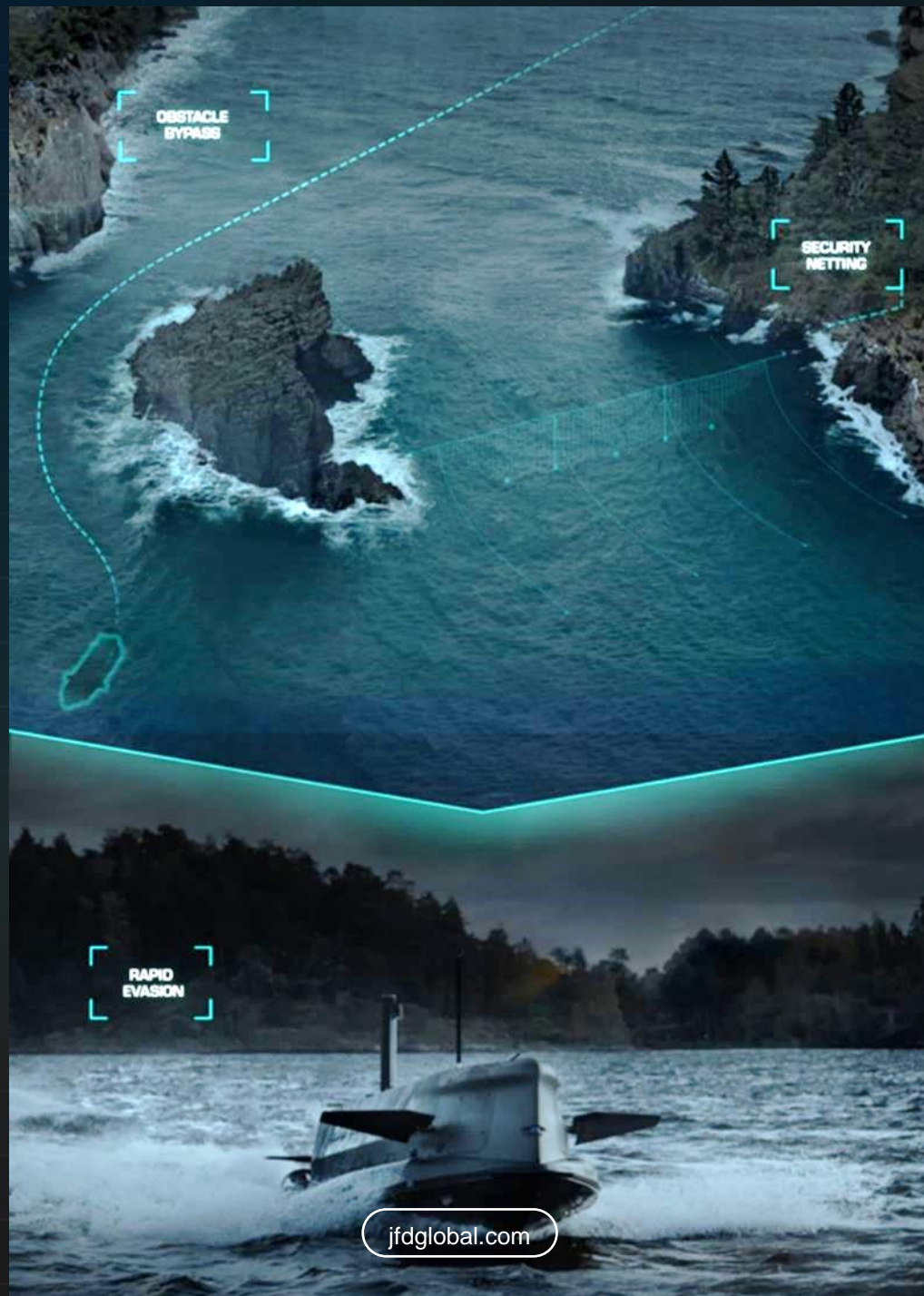
DELIVERY
TO THE
TARGET



RAPID INFIL/EXFIL

Rapid Stealth Exfiltration

Farnborough, UK



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COST EFFECTIVE PROTECTION AND ASSET PRESERVATION

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THE CHALLENGE:

Risking large, highly expensive and critical assets such as submarines and Ships to provide a launch platform to operationally limited SDV's and surface craft presents inherent danger to these assets and the large number of crew aboard them.

Solution: TDVs

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Comms
Link

12 hour Mission Deployment -
Infiltration in hours of darkness

Deployment from
over the horizon

Surface
100 NM @ 25 kts
(4 Hours)

Semi-Submerged
10 NM @ 4 kts
(2,5 Hours)

Submerged
15 NM @ 3.5 kts
(~4,5 Hours)

Action on
Objective

Carrier Seal cached on seabed
during period of action on target



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THE JFD SOLUTION:

The Tactical Diving Vehicle (TDV) increases the capabilities of a Navy to conduct sense & detect as well as react to threats in both offensive and defensive roles.

The TDV forms a modular platform on which a huge variety of mission profiles can be delivered.





Our line-up of TDV's (Tactical Diving Vehicles) are modular platforms which allow for a comprehensive suite of capabilities.

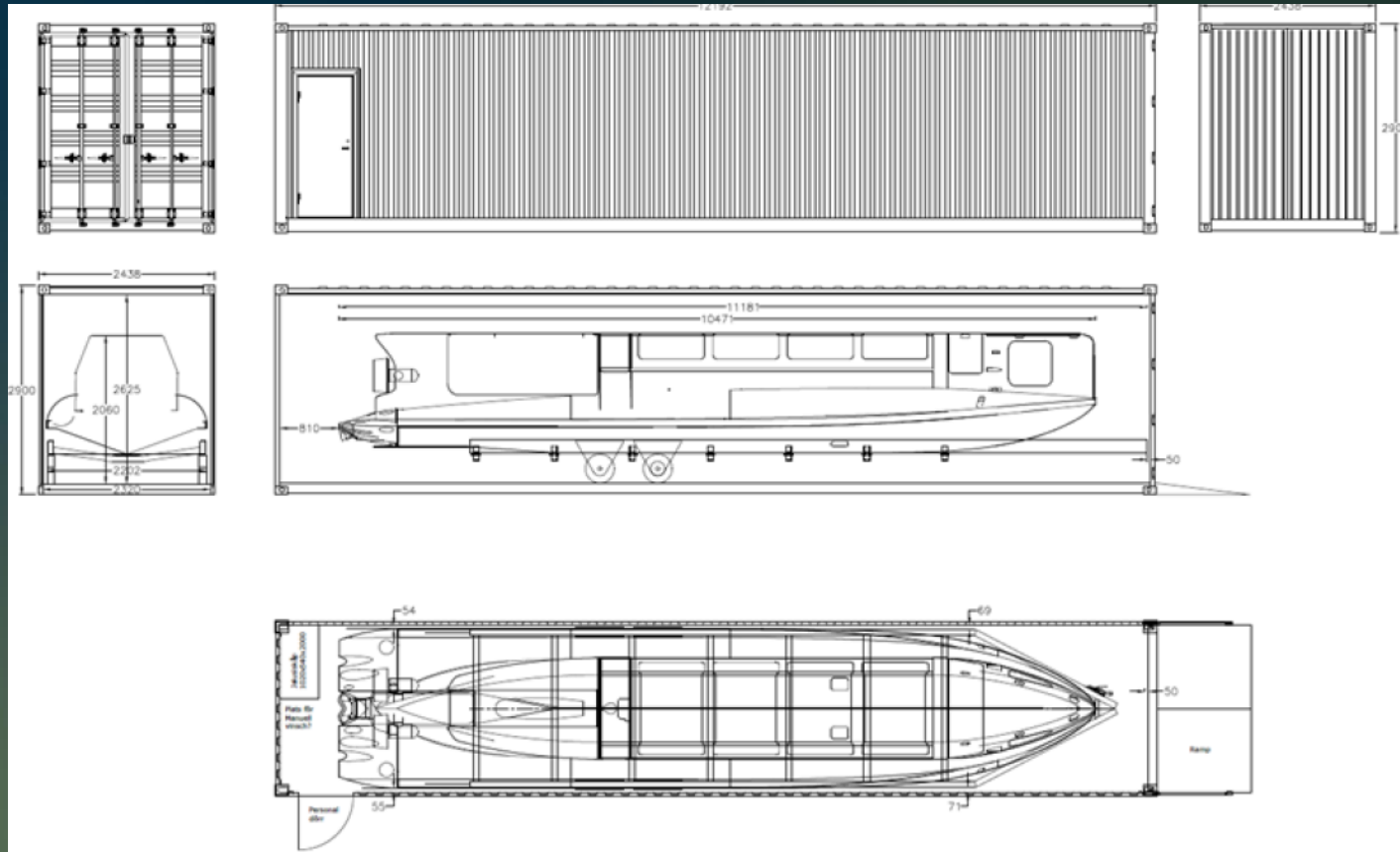


TACTICAL DIVING VEHICLES



CARRIER SEAL

Containerised 'fly away' and 'pod' capability





Consideration of TDV operations in both a crewed and uncrewed configuration:

- Forward deployment of a sensing capability
- Loyal wing man
- Replenishment of stores – Ship to shore logistics in a denied environment



Launch from
Landing Platform Dock



Rapid insertion over water
From ship 100Nm range



Operatives disembark TDV's
to execute their mission

UAV surveillance

Overwatch Carrier Seal

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ISTAR UAV Launch



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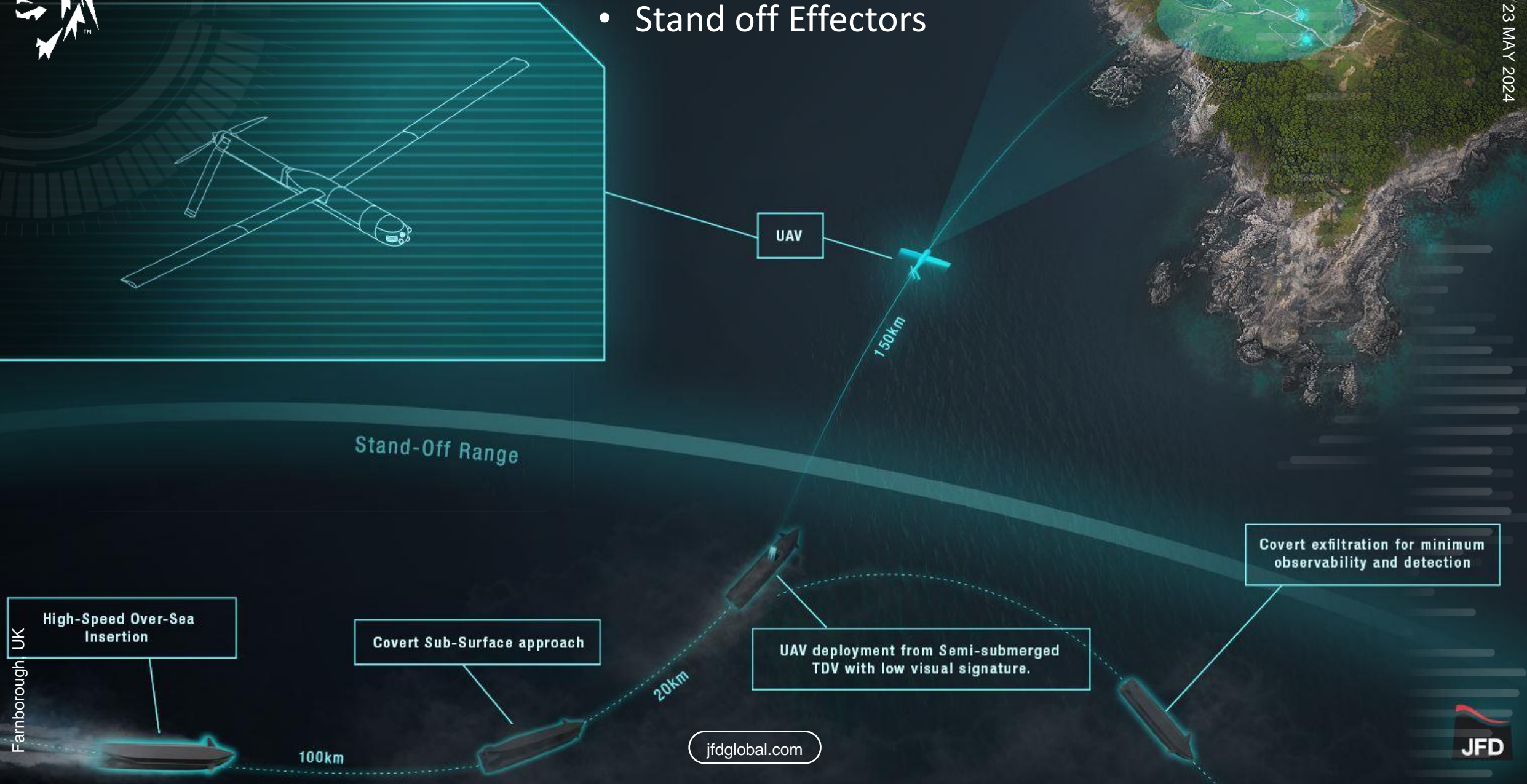
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Response:

- Stand off Effectors





Fostering Collaboration; The Future for Littoral Security

JFD is committed to shaping the future of underwater defence and security.

JFD's platforms can play a vital role in the littoral space;

A shift in doctrine may be required to adapt to hybrid platforms to allow for enhanced operations in littoral and underwater battlespace, especially to cross the water gap from Ship to shore



QUESTIONS?

We're happy to take any questions you might have about the topics discussed.





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CARRIER SEAL

OVERVIEW

Crewed by a driver and vehicle commander, the Carrier Seal is specifically designed for rapid over the horizon surface transportation of a Tactical Diving team of up to eight operators. Where the threat level requires discretion, Carrier Seal may run awash with minimum signature and when required, a fully submerged covert infiltration / extraction may be conducted

Besides the transportation of Tactical Divers, the Carrier Seal can be configured for boarding, reconnaissance, surveillance, deployment of AUV and UAVs, fire support, and stand off attack. The craft is fitted with several multipurpose quick mounts for light to medium machine guns for defense or to provide support to Operators ashore

MATURITY

Carrier Seal is in service with key Special Forces Groups

2 + 6 OPERATOR
CAPACITY



DIMENSIONS & WEIGHT

OVERALL LENGTH:	10.45m / 34ft. 3in.
BEAM:	2.23m / 7ft. 4in.
HEIGHT:	1.65m / 5ft. 5in.
WEIGHT:	4,000kg
PAYLOAD:	1,000kg neutral buoyant (inc . divers)

OPERATIONAL

MAX DEPTH:	40m
TYPICAL TRANSIT DEPTH:	4m
SURFACE MAX SPEED:	30 knots
RANGE SURFACE:	150 nautical miles (75nm fuel bag addition)
SUBMERGED MAX SPEED:	>5 knots
RANGE SUBMERGED:	15 nautical miles (+15nm with additional batteries)





SHADOW SEAL

SPECIFICATIONS

DIMENSIONS & WEIGHT

OVERALL LENGTH: 8.0m / 26ft.3in.

WIDTH: 1.88m / 5ft.11in.

HEIGHT WITH MAST: 2.18m to 4.12m (fully extended mast) / 7ft.2in. to 13ft.6in.

WEIGHT:

2,500kg

TOTAL WEIGHT:

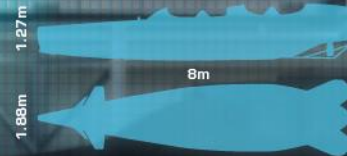
2,500kg + 750kg (Personnel and Equipment)

REMOTE CONTROL

The vehicle has the capability to be remotely controlled expanding its operational employment potential.

BUILT-IN-BREATHING SYSTEM

When submerged, operators use personal life support systems such as oxygen rebreathers, however, Shadow Seal incorporates a Built-In-Breathing System for extended diving profiles and emergency use.



OPERATIONAL STRETCH POTENTIAL

- + Air Drop
- + Extendable Mast
- + Electro optical system
- + Autonomy
- + Remote Control
- + Bespoke Launch And Recovery System
- + Bespoke Trailer
- + Stand-off weapon integration

BUOYANCY SYSTEM

To quickly achieve positive buoyancy for routine or emergency use, Shadow Seal incorporates a buoyancy system supplied by high pressure compressed air.

CLOSED CIRCUIT BALLAST & TRIM SYSTEM

To optimise performance and control, Shadow Seal incorporates a Closed Circuit Ballast & Trim System enabling neutral buoyancy to be readily achieved in a range of operational environments.



4 OPERATOR CAPACITY



POWER SYSTEM

Shadow Seal is powered by 8 x 10kwh batteries that drive the propulsion system.

BATTERY PACK: 8 x 10 kWh

PROPULSION THRUSTERS: 2 x 9 kW

RANGE SUBMERGED: 25 nautical miles or 7hrs at 3.5 knots

RANGE SURFACE: 80 nautical miles or 20hrs at 4.5 knots



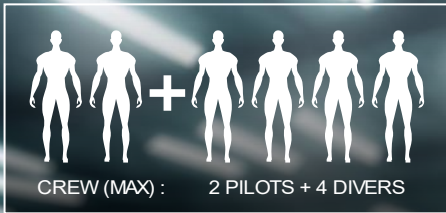
LEOPARD SEAL

LENGTH OVERALL : 9.0M
 BEAM : 1.8M
 HEIGHT TO TOP OF CABIN : 1.5M
 HEIGHT WITH ACTIVATED MAST : 2.5M



LIGHTWEIGHT : NOT MORE THAN 4000KG

MAX SPEED IN ALL MODES : 6KTS
 CRUISING SPEED IN ALL MODES : 4KTS
 SUBMERGED RANGE AT CRUISING SPEED : 40NM



PROPULSION THRUSTERS : 2 X 10KW
 BATTERY PACK : APPROX. 80 KWH (4 X LIPO 20 KWH)



MAXIMUM SEAS : STATE SEMI-SUBMERGED MODE SS2
 OPERATING DEPTH : 24M

COMPRESSED AIR FOR CRAFT : 40 LITRES AT 300 BAR
 BIBS INSULATION OPEN CIRCUIT : 40 LITRES AT 300 BAR
 COMPRESSED AIR EMERGENCY LIFT BAGS : 7.2 LITRES AT 300 BAR

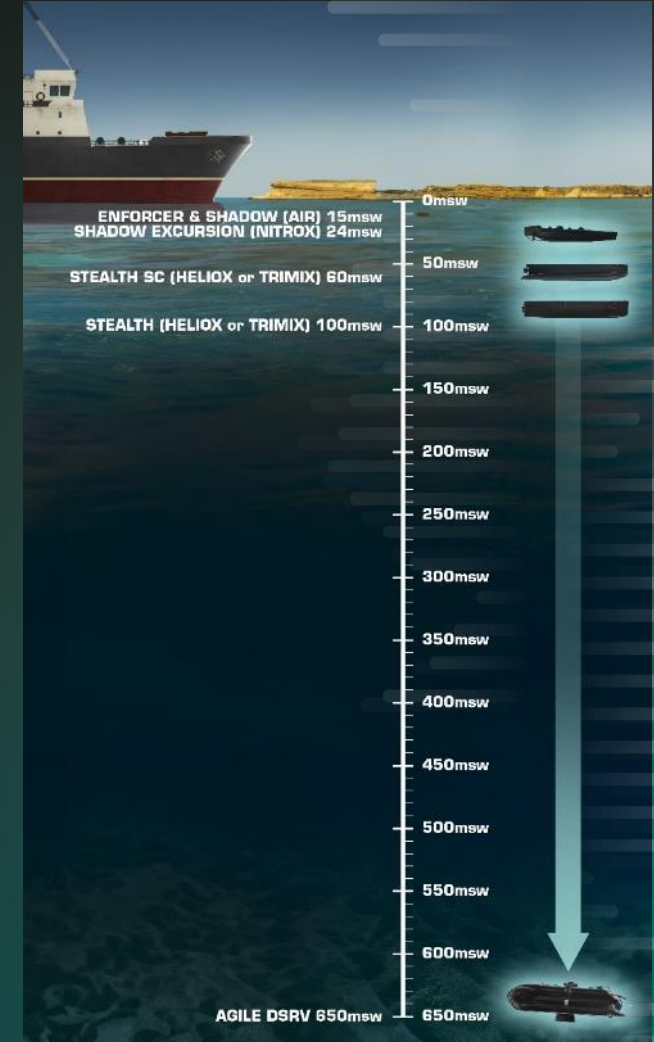
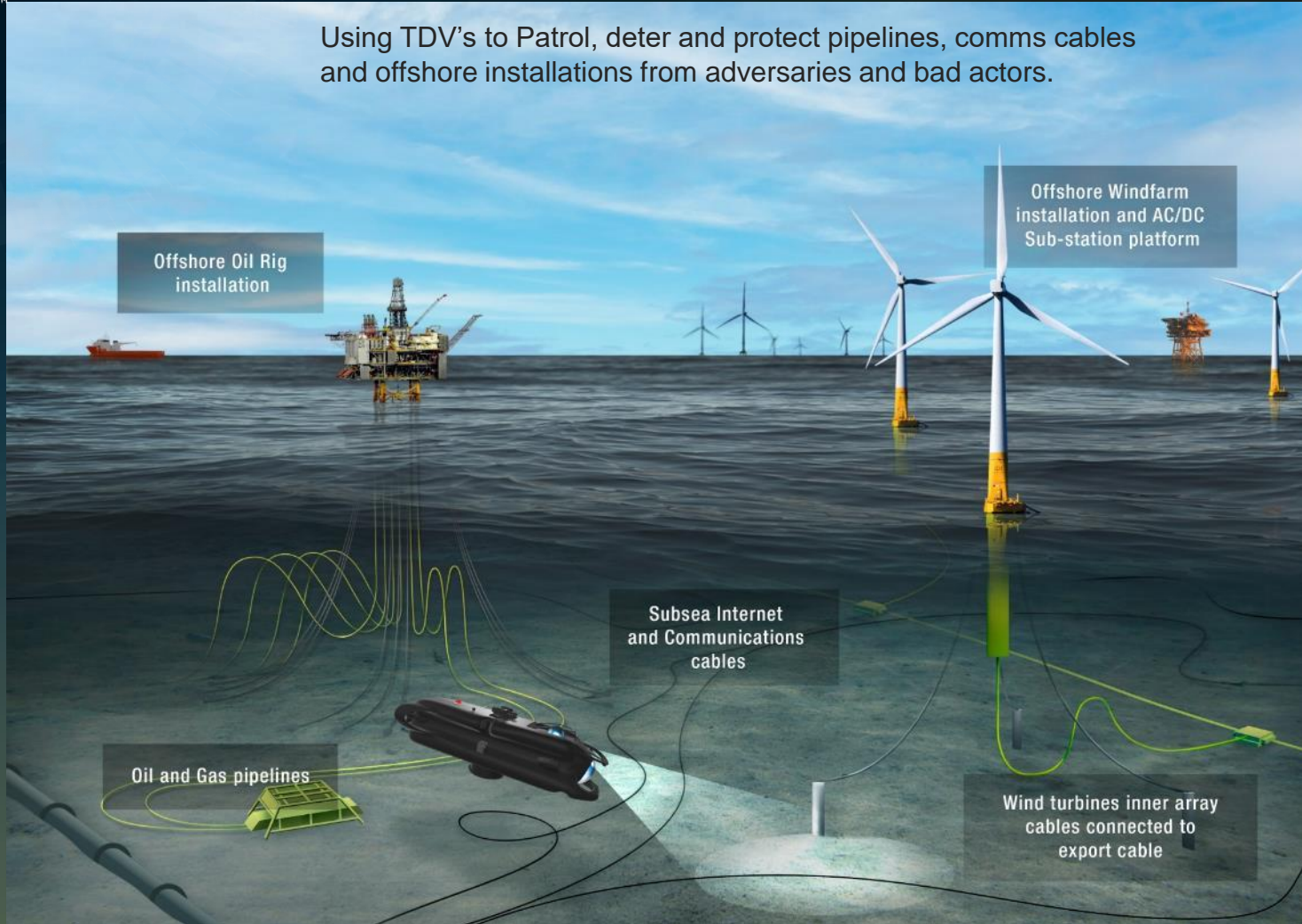
MAX PAYLOAD : 1,000KG
 (PILOTS + DIVERS + CARGO + COMPRESSED AIR)





PROTECTING CRITICAL INFRASTRUCTURE

Using TDV's to Patrol, deter and protect pipelines, comms cables and offshore installations from adversaries and bad actors.





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Deployment from
Covert moon pool.

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