

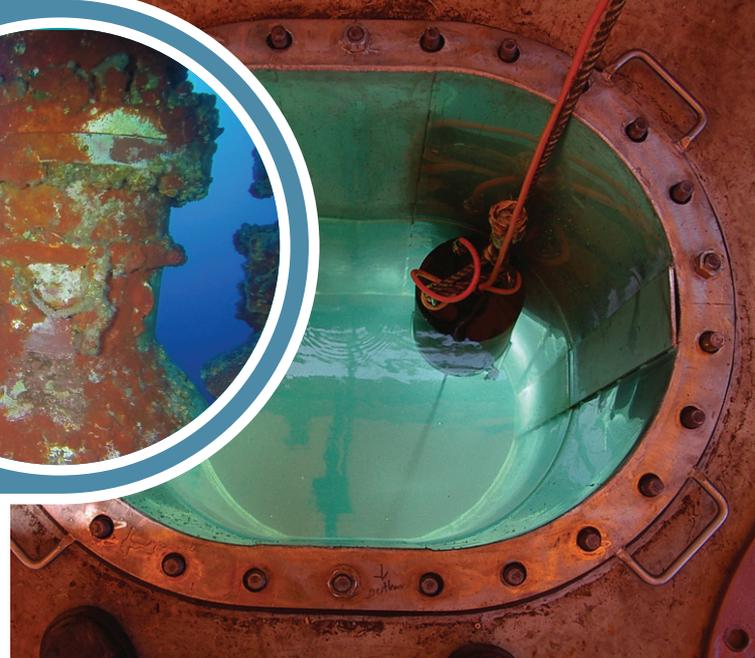
# FPSO SUPPORT

Whilst ROVs don't presently carry out all the inspection tasks of a diver, their capabilities are constantly improving and have surpassed those of divers for:

- Mobility - The ROV has a longer umbilical and can work in stronger currents than a diver. The ROV can be launched and recovered from anywhere on the FPSO deck, and can reach anywhere on the hull from that point. Also able to move throughout the depth range.
- Quality - With high resolution cameras, high power lighting and active stability, the ROV provides excellent inspection video.
- Convenience - A two man crew reduces POB issues, and hard isolations of pumps, intakes and ICCP systems are not required. This results in lower impact on your other operations.

## key points

- Can be launched from any point on the FPSO in up to 3m swell
- Control system can be operated outdoors under "Hot Work"
- Active Stability to counter the effects of turbulence and surge
- 350m tether excursion as standard
- High thrust to counter the stronger currents often found in shallow water
- Inspection grade colour zoom cameras, HiDef video options
- Digital Stills for exceptional resolution and clarity
- Accurate 3d Modelling of inspected items



## Turret and mooring inspections

Small ROV's, deployed from the FPSO itself enable efficient and effective operations.

Furthermore, the ROVs can often inspect the mooring system right down to the seabed, eliminating the requirement for a support vessel completely.

By deploying the ROV's from the FPSO we can work safely within the risers and anchor chains, under the guidance and control of the vessel crew.

We also gain the benefit of a large, stable platform so can launch and recover in otherwise challenging weather conditions.

Deployed from any part of the vessel using our man-portable ROV deployment systems, our powerful inspection ROVs have earned a reputation for successfully operating in significant weather and currents.

By implementing necessary controls, we have even inspected a semisub hull whilst the vessel was on DP.

Data can immediately available to the onboard surveyor or crew for review.

Cleaning of chains and other items is easily accomplished using surface powered water blasters.

Once cleaned, we can conduct general and close visual inspections, and even produce 3d models of chains showing wear and corrosion.

IE has been successfully carrying out ROV based hull and FPSO mooring inspections since 2006 and has the experience necessary to carry out safe, effective works from your FPSO with the minimum interruption to your ongoing operations.



if you don't have a back up, you don't have a plan

# Hull inspection

Whilst inwater hull inspections by divers typically require significant resources to execute (5 man dive team, DDC's, compressors and even a support vessel); and significant administrative overhead to plan (Diving Project Plan); there is often a viable alternative in using ROVs for the works.

IE has been successfully carrying out ROV based hull and ballast tank inspections in association with a range of class societies since 2006.

Our ROVs can cover the entire of the hull from a single launch point. This avoids relocating equipment spreads and eliminates the need for a specialist dive vessel.

Our ROV stability, combined with our HD cameras provides the best possible combination of mobility and stability.

We can also attach to the hull if required.

ROVs can also be used to inspect the butterfly valves in operation by either entering the overboard pipes, or deploying small cameras.

## Hull Cleaning

By using HP water through pressure balanced, zero reaction rotary cleaning heads, ROVs can clean sections of the hull without damaging coatings.



# Riser inspection

Deployed from the FPSO, our inspection ROVs can easily and safely inspect the upper regions of the risers, including guide cones, risers, bend stiffeners, buoyancy modules and other associated equipment.

The small size of the ROVs allows unfettered access, intimate close up inspection and reduces the risk of damage to your asset.

Riser catenaries can be followed to seabed, and we have even followed a riser down to a depth of 360m from a deck launch.



# Ballast tank inspections

IE has been successfully carrying out ROV based internal tank inspections in associations with a range class societies since 2006. Our equipment enables productive but safe operations, with surprising capabilities. Lightweight portable equipment allows rapid mobilization when required.

Our services include:

Ballasting System Inspections

Wall Thickness Measurements

Damage/ Deformation Assessments including 3D Modelling



# Cleaning

Our ROV's are easily capable of effective cleaning using surface powered water-blasters. Our smaller blasters can be used without "retro's" and have proven capability in spot cleaning marine growth from seawater intakes, chains and other appurtenances.

By using specialised counterbalanced nozzles, larger blasters† up to 12000psi can also be controlled by the ROVs for heavy duty cleaning of large areas.



# FPSO Turret entry inspection

This ongoing project involves the inspection of the internal areas of an FPSO turret, whilst flooded, immediately prior to disconnect or following reconnect.

By utilising an ROV to inspect these areas, operators can safely ensure all is in order before actuating the turret locking system.

This eliminates the requirement to drain the turret and conduct manned inspection.



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