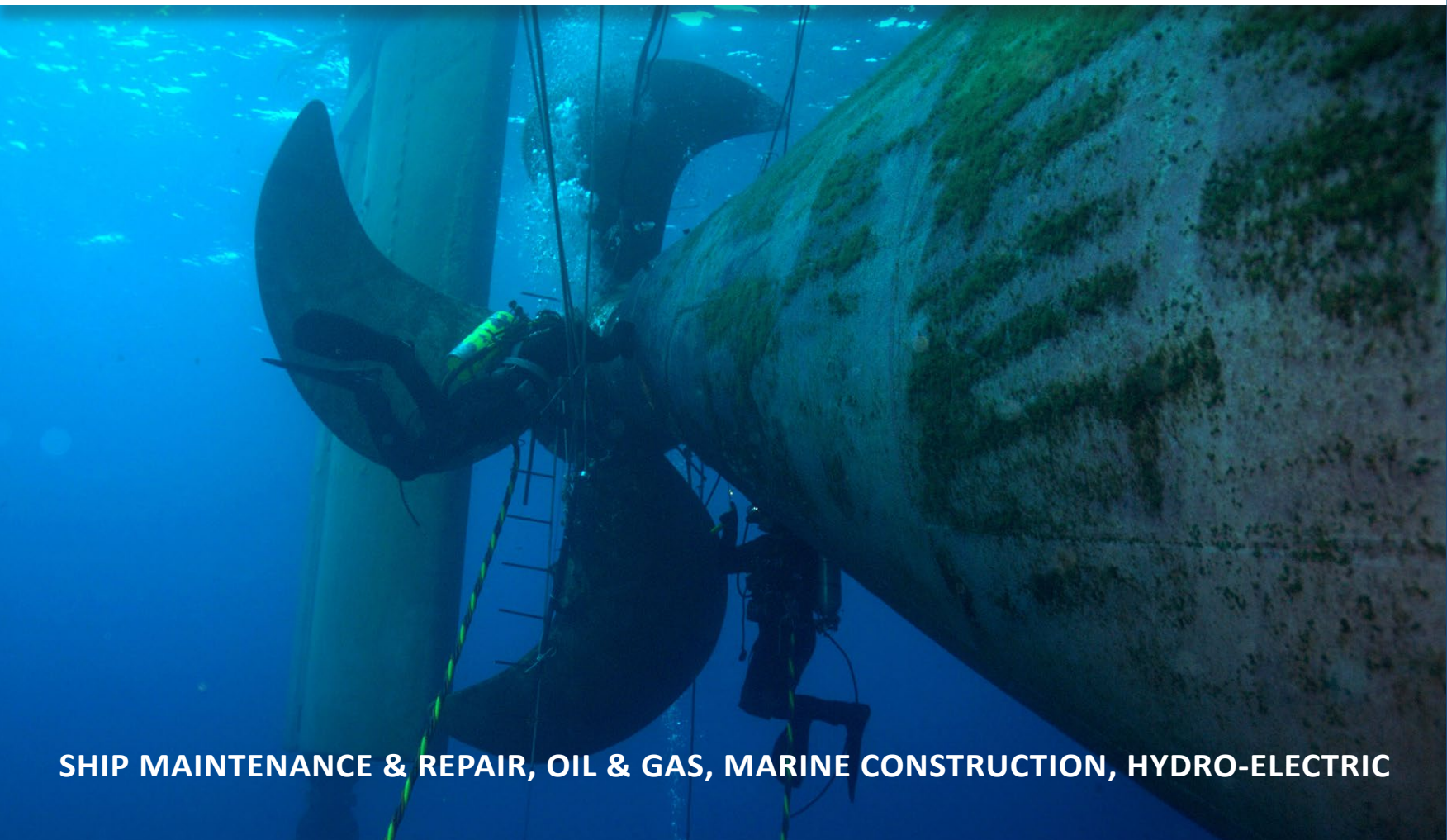




SUBSEA GLOBAL
S O L U T I O N S



SHIP MAINTENANCE & REPAIR, OIL & GAS, MARINE CONSTRUCTION, HYDRO-ELECTRIC

SUBSEAGLOBALSOLUTIONS.COM

THE ONE SOURCE FOR
GLOBAL UNDERWATER
SOLUTIONS



SUBSEA GLOBAL SOLUTIONS provides the fastest response time and the most cost effective and innovative underwater ship repair solutions, worldwide. Bringing together the resources and expertise of leading companies in underwater ship repair, we provide you with high quality class approved service wherever you are.

Our team provides factory trained service personnel and specialized equipment to carry out maintenance or highly specialized repairs underwater, anywhere in the world. SUBSEA GLOBAL SOLUTIONS was created to keep ships in operation longer!

RAPID COST EFFECTIVE UNDERWATER SOLUTIONS

- Propeller Straightening Repair & Modification
- Stern Seal Replacement & Repair
- Permanent Shell Plating Replacement & Repair
- Marine Construction
- Azimuthing and Tunnel Thruster Replacement & Repair
- Machinery Replacement & Repair
- Underwater Maintenance and Inspection Services
- Oil and Gas Services

UNDERWATER MAINTENANCE & INSPECTION SERVICES

Ships account for 5% of the world's total oil consumption, and fuel constitutes the single largest operating cost of a vessel today. Hull and propeller efficiency are critical to the operational and economic success of any vessel.

PROPELLER POLISHING:

Subsea Global Solutions uses a multi-stage polishing system to deliver a propeller polish that is capable of exceeding a Rubert Scale "A" finish. Higher propeller efficiency equals lower fuel consumption and less greenhouse gas emissions.

BIOFOULING & HULL CLEANING:

Subsea Global Solutions prides itself in "Managing your coating". Regular biofouling grooming assures the most consistent hull efficiency between dry dock intervals, with minimal to no degradation of the hull coating. We utilize specialized hydraulic multi-brush systems designed to clean the most sensitive coatings, without adversely affecting their integrity, and offer In-Water Cleaning with Capture (IWCC) - both diver controlled and remote cleaning ROV's.

SHIP INSPECTION:

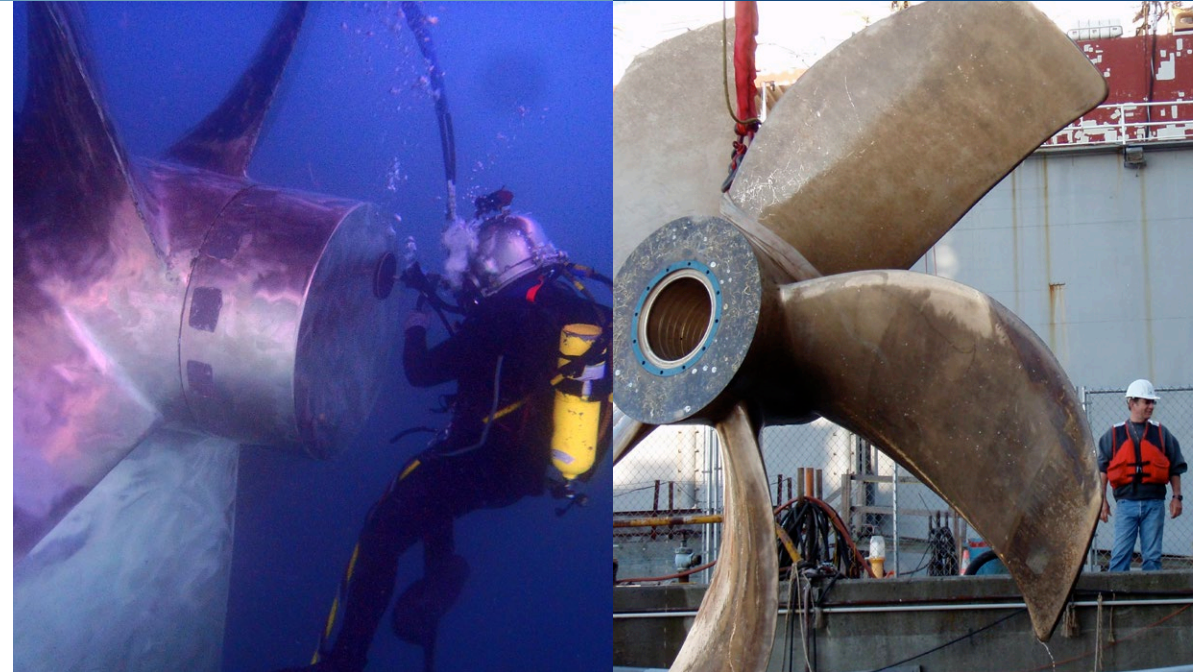
Subsea Global Solutions is class approved to inspect and certify vessels for condition and structural integrity. We maintain certifications with Lloyd's Register, DNV, The American Bureau of Shipping, Bureau Veritas, Rina, NK class and other certifying agencies. We also regularly include non-class inspections in conjunction with our propeller polishing, and other routine services. Regular inspections help assure that any issues are discovered early and addressed quickly, at the lowest possible cost with minimal operational impact.

FLEET MANAGEMENT:

Subsea Global Solutions has the equipment, personnel and expertise to become your trusted fleet management partner. We currently hold fleet management contracts with some of the world's largest cruise lines and shipping companies, successfully managing 1000+ vessels worldwide. By adhering to a regular schedule of inspections, hull cleanings, and propeller polishes, Subsea Global Solutions helps ensure corporate regulatory and environmental compliance, as well as providing a direct reduction to any vessel's bottom line. Fleet Service Agreement benefits include:

- Fixed, lump sum pricing
- Advanced planning of maintenance services
- Accurate reporting in a consistent format
- Single point of contact

UNDERWATER PROPELLER STRAIGHTENING & REPAIR



Subsea Global Solutions provides fast response worldwide for all underwater propeller repair and maintenance requirements. The team offers you technicians who are qualified to accurately assess propeller condition and determine the best repair solution to maximize propulsive efficiency.

Our certified propeller technicians perform sophisticated, shop quality, underwater propeller repairs and design modifications.

PROPELLER REPAIR:

- Straightening large bends
- Removal of damaged blade sections
- Crack repair and propagation control
- Restoration of hydrodynamic edge contours
- Hydrodynamic and static balancing (calculations on-site)
- Replacement of C.P. blades and blade seals

PROPELLER DESIGN MODIFICATION:

- Pitch and camber alteration
- Diameter and blade area reduction
- Correction of propeller induced engine overload
- Contour modification to eliminate cavitation
- Edge modification, including anti-singing edge correction

UNDERWATER STERN SEAL REPLACEMENT & REPAIR

Subsea Global Solutions provides rapid, factory authorized underwater stern seal repairs worldwide. TransHab is a lightweight, inflatable habitat that is fitted around the stern seal to provide a dry environment in which repairs are carried out.

Professional technicians trained and certified by the major seal manufacturers carry out replacements and repairs at anchor or dockside. Subsea Global Solutions offers complete rebuilds, including the bonding of new seal rings underwater, using TransHab.

We are OEM authorized for the global servicing of *SKF Marine (Simplex)*, *Wartsila*, *Japan Marine Technology (JMT)*, *DeepSeaSeals*, and *Cedervall* seals. Additionally, we are the exclusive agent for servicing *Lagersmit* seals in North America and the Caribbean.



UNDERWATER STERN SEAL REPLACEMENT & REPAIRS:

- Lip seals - dry repair and replacement of complete systems. Seal ring bonding
- Face seals - wet repairs and replacement (Deep Sea, Cedarvall)
- Controlled Pitch blade palm seal replacement
- Bow/Stern thrusters - shaft seal, blade palm seal, gear case seal replacement
- Stabilizers - fin shaft seal, crux replacement
- Stern tube sealing to facilitate inboard repacking of water lubricated stern seals



UNDERWATER PERMANENT SHELL PLATING REPAIRS

Subsea Global Solutions provides fast response for underwater permanent shell plating repair needs worldwide. Using specially designed cofferdams and hyperbaric chambers, defective shell plating sections can be replaced underwater by class approved permanent dry welding. When necessary, custom fabrication of habitats is carried out on-site.

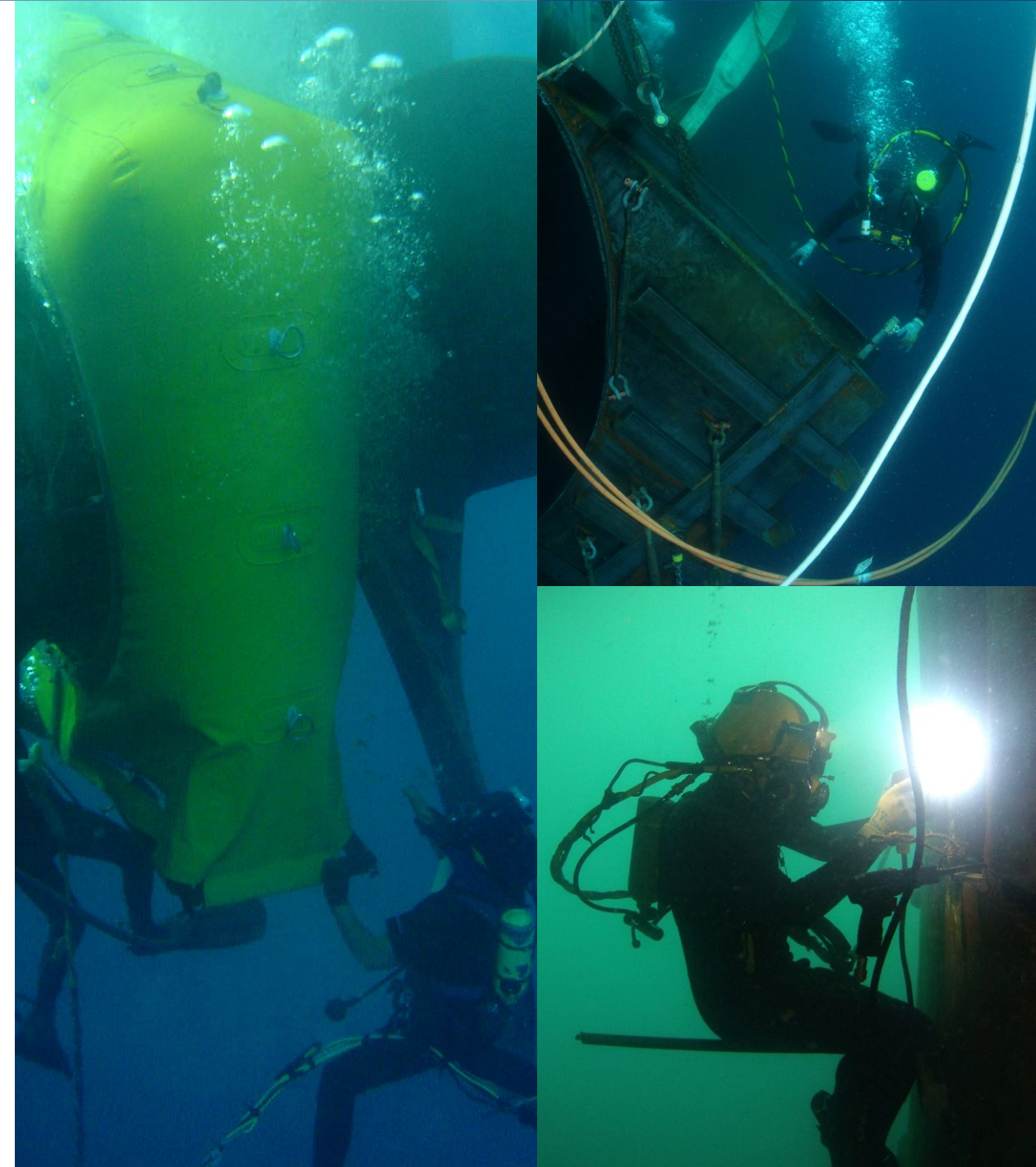
In addition, Subsea Global Solutions has certification for proprietary wet welding procedures accepted as permanent repairs. Underwater welding services include:

- Dry weld permanent repair of shell plating and appendages
- Dry weld installation and replacement of hull apertures
- Multi-joint, multi-position "Class A" wet weld repairs (temporary and permanent repairs)
- Anode installation

UNDERWATER MACHINERY REPLACEMENT & REPAIR

Subsea Global Solutions provides quality technical repairs and complete replacement of underwater machinery, in both wet and dry environments, using lightweight cofferdams and habitats. We offer fast response worldwide for your underwater repair needs.

- Bow/Stern Thruster internal repairs and complete unit replacement
- Stabilizer crux internal repairs and complete fin & flap replacement
- Azimuth drive internal repairs and complete unit replacement
- Becker rudder repairs and component replacement
- Transducer replacement (echo sounder, speed log)
- Impressed current cathodic protection component repair and replacement

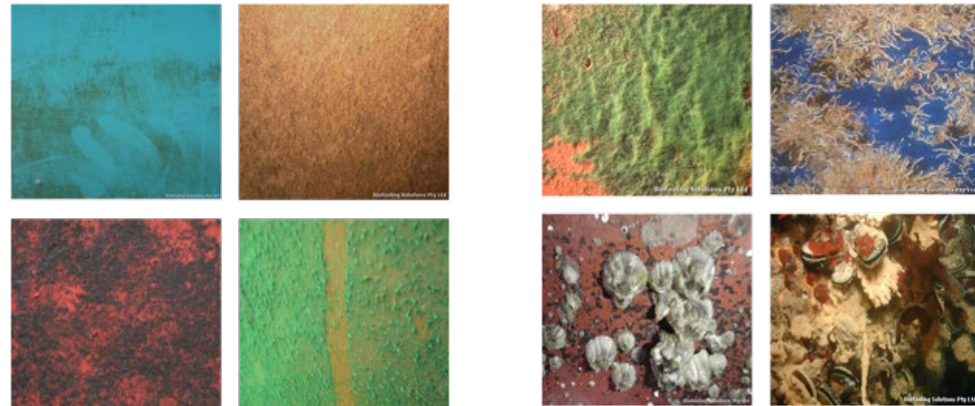


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BIOFOULING & HULL CLEANING

Biofouling typically attaches to hull within days or weeks of launching with fresh paint, first as biofilms and algae microfouling, then as the antifouling paint ages and begins to lose effectiveness, calcareous forms of macrofouling. This heavier marine growth such as barnacles and tube worms will begin to appear in the niche areas like thruster tunnels and seachests, spreading onto the flats and corners of the hull.



Microfouling

Macrofouling

Biofouling negatively impacts ship operations and marine environments via the transportation of Invasive Aquatic Species (IAS), as well as impacting vessel performance and compliance with EEXI and CII targets.

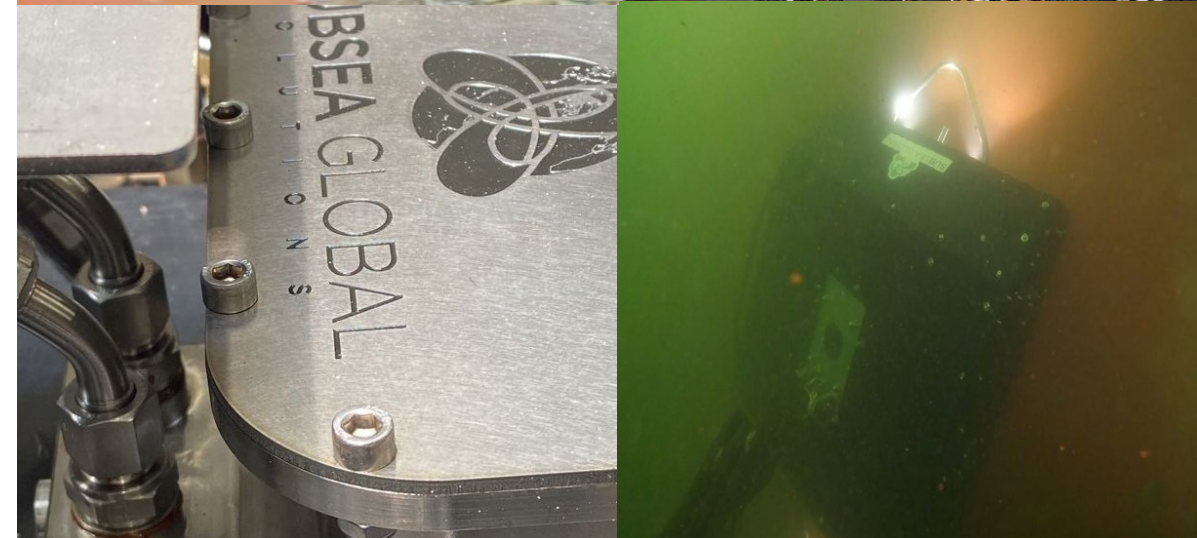
- **Clean hull - reduced fuel consumption and lower costs**
- **Reducing air emissions**
- **Achieve compliance with strict IAS rules like New Zealand MPI.**

Subsea Global Solutions has invested significant capital into research for its environmentally friendly hull cleaning and propeller polishing service offerings. We have developed the tools required to reclaim biofouling and toxic metals like copper/ zinc that are found in large quantities in SPC coatings. Subsea Global reclaim and filtration technology meets the strictest particulate and soluble metal requirements.

By continuing to evaluate new technologies for cleaning and filtration including ROV's as part of fleet contract support. We can combine environmentally compliant hull maintenance with underwater vessel repair globally. In-Water Cleaning and Capture (IWCC) filtration systems can be utilized with brush cart, ROV brush cart and propeller polisher systems.



HULL CLEANING ROV (C-ROV) ECOFRIENDLY WITH RECLAIM & FILTRATION



Subsea Global Solutions cleaning remote operated vehicle (C-ROV) uses a vortex system, designed to remove even the heaviest marine fouling of vessels and offshore structures. The intelligent system is typically steered from a control unit on the diving workboat, or on board the client vessel.

We operate two variations of cleaning ROV. Both cleaning ROV systems can be operated day or night with no time limits, and in many circumstances and locations where manned diver cleaning is restricted, like limited visibility, higher current or swell.

ECOFRIENDLY HULL CLEANING ROV's WITH RECLAIM

With its In-Water Cleaning and Capture (IWCC) system, waste material is reclaimed to the surface in a closed-circuit system. The pumps suck up the removed biofouling with greater than 97%* reclaim efficiency. The reclaimed wastewater and debris mixture is processed with a pre-filter to remove larger biomass waste for discharge ashore within a certified disposal process.

The wastewater then passes through a 3-stage filtration system - filtered to 1 (µm) micron to even remove metal particulates. Before the water is UV treated for any trace spores and then returned. A filtering efficiency of up to 99% is reached.

Periodical and random sampling is undertaken for independent testing to monitor the performance of the cleaning process and the returned water quality in compliance with our internal environmental best practice and comply with any relevant external regulations.

OFFSHORE MOBILE CLEANING ROV WITHOUT RECLAIM

The open loop / open-circuit ROV version is used where regulations permit. Without the reclamation modules of the EcoFriendly version, it is even easier to transport to remote locations and can deploy from any vessel or platform, and is powerful enough to work on heavy macro fouling, where permitted.

Operating hub locations are regularly being added, please refer to our online C-ROV hull cleaning services page for the latest deployment locations. Or to request a fly-away mobile unit deployment, please contact us to discuss your specific project needs, e.g. oil & gas, FSO/FPSO.

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OIL & GAS

Serving the global offshore industry, Subsea Global Solutions applies its already proven methods of repair to the high value vessels operated in this critical and vitally important market segment.

- FPSOs
- Drill Ships
- Semi Submersibles
- Pipe Laying vessels and Barges
- Offshore Construction Vessels
- Anchor Handlers
- Platform Supply Vessels

Focused on underwater repair and maintenance of propulsion equipment and vessel shell plating, Subsea Global Solutions provides its globally proven, OEM and classification society repair methods to any installation.

- Tunnel Thrusters
- Retractable Azimuthing Thrusters
- Demountable Azimuthing Thrusters
- Propellers

Permanent shell plate repairs with dry and “Class A” wet welding processes are fully vetted and approved by most major oil and gas operators and contractors. Subsea Global Solutions provides fully engineered solutions that are documented in industry standard formats to support expedited approvals by Health & Safety departments.

Unique buoyancy control solutions, state of the art rigging plans, and equipment overhaul processes allow for in-water exchange of large azimuthing thrusters without the high rental cost of crane barges and expensive rigging equipment.



MARINE CONSTRUCTION

Subsea Global Solutions offers support for a wide range of inland and offshore construction projects. We are recognized as a market leader in underwater marine construction, with long-term service contracts in place for some of North America’s largest ports and harbors. Our marine construction division is staffed by project managers who have spent decades in the field and in the water refining their skills and knowledge base. We employ staff engineers who can support your project from initial design to final completion.

Subsea Global Solutions is proud to be one of the only professional underwater service companies capable of offering high quality, turnkey solutions for our client’s most critical marine construction needs.

MARINE CONSTRUCTION EXPERTISE:

- New Marine Infrastructure Construction
- Existing Marine Infrastructure Rehabilitation
- Underwater Saw Cutting & Demolition
- Inspections & Surveys
- Debris Removal & Recovery Services
- Sheet Pile Installation Support & Repair
- Cathodic Protection System Installation & Maintenance
- Water Jetting & High Pressure System Cleaning
- Wood, Steel, & Concrete Pile Repair
- Underwater Form-Building & Concrete/Grout Pumping
- Maintenance & Inspection of Piers and Wharfs



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UNDERWATER WELD REPAIRS

Subsea Global Solutions is a market leader in the development and execution of underwater wet welding techniques. With over 50+ welder-divers certified to "Class A" requirements as outlined in AWS D3.6M: Underwater Welding Code. "Class A" underwater wet welds exhibit mechanical properties comparable to their surface welded counterparts.

PERMANENT UNDERWATER WELD REPAIRS

In September 2014, Subsea Global Solutions was granted permission by class DNV-GL (now DNV) as the first company world-wide to carry out certain permanent repairs by means of underwater wet welding. Our expertise in underwater wet welding saves our clients from considerable dry-docking and off-hire costs.

IN-HOUSE WELD TRAINING PROGRAM

Subsea Global Solutions maintains its position as the preeminent developer of in-water welding techniques through our in-house training program, overseen by a Senior Weld Engineer in conjunction with our most seasoned, expert welder-divers. Our 55,000-gallon training tanks at both our Miami and Long Beach USA locations allow us to facilitate training and certification in a controlled environment.

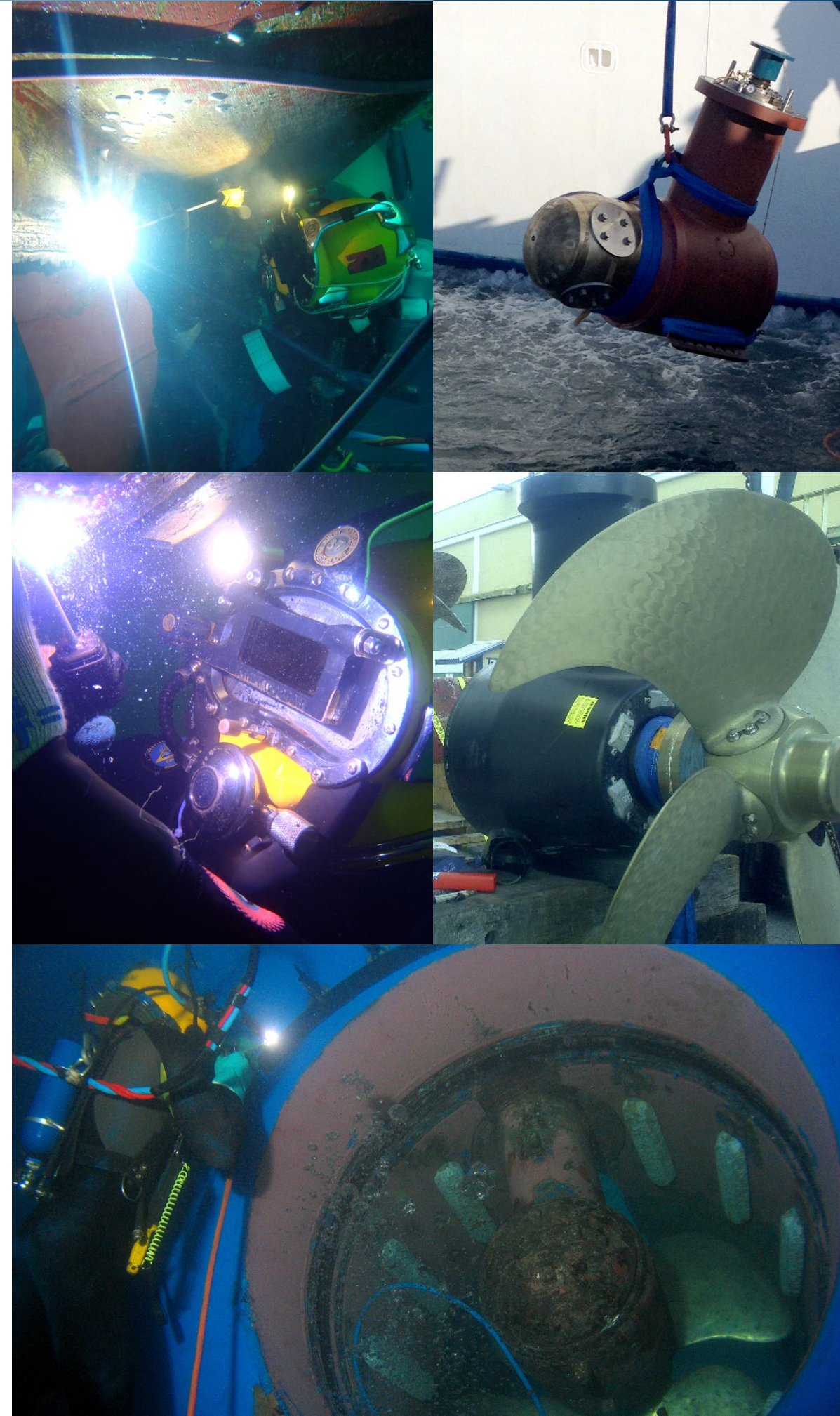
TUNNEL THRUSTER REPAIR / REPLACEMENT

Subsea Global Solutions has the equipment and personnel to rapidly deploy anywhere around the world with minimal to no lead-time to perform underwater tunnel thruster repairs. Flexible Hyperbaric Cofferdams and tooling, packaged for baggage transport on commercial airliners, makes for a portable repair solution which can be utilized worldwide. Bow Thrusters, Stern Thrusters and all other Tunnel thrusters can be repaired underwater either completely wet or in a dry hyperbaric environment. Commercial Divers trained as factory technicians in the inspection and repair of tunnel thrusters makes Subsea Global Solutions the only choice for a fully manufacturer warranted repair.

Wet or Dry, we are able to put your Tunnel Thrusters back in service quickly.

COMPLETE TUNNEL THRUSTER EXCHANGES

Complete Tunnel thruster exchanges can be done either completely wet or with Flexible Hyperbaric Cofferdams. Instead of waiting for the dry dock to execute critical tunnel thruster maintenance, Subsea Global Solutions can provide fixed price tunnel thruster exchanges in it's home port locations as part of a long term maintenance program. Exchanges will be done while vessels remain in service with no impact to a vessels schedule or itinerary.



SAFETY & TRAINING

SAFETY: EVERY DAY, EVERYONE

"Safety: Every Day, Everyone" is one of our core values at Subsea Global Solutions. We demand the very best of our employees, and the equipment they use. We employ a full time Health, Safety And Environment team that ensures our facilities, dive stations, and daily work practices meet and exceed established standards. Our dedicated in-house maintenance staff ensures that our equipment and fleet of vessels are always safe and fully functional before being mobilized for any project.

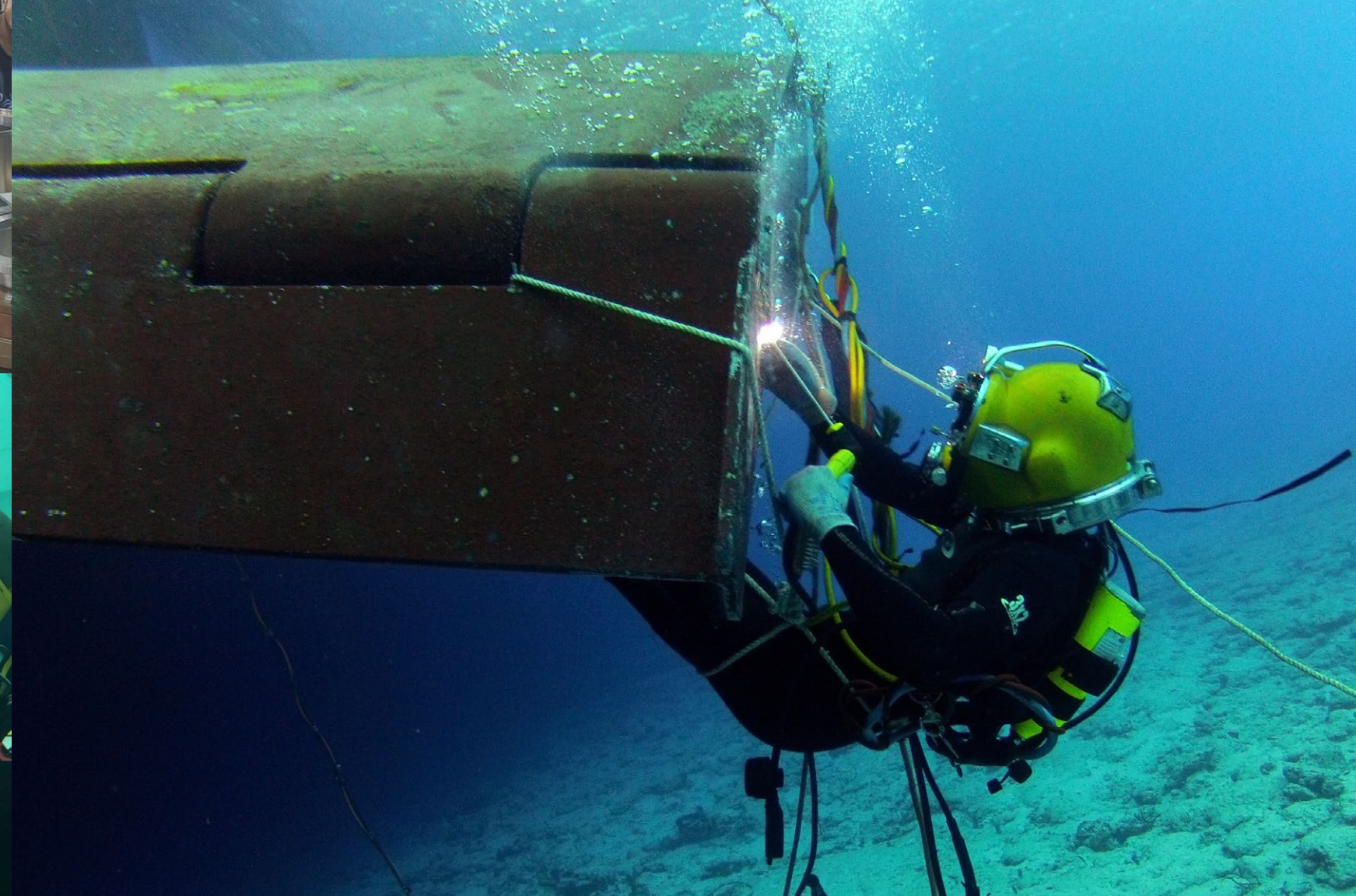
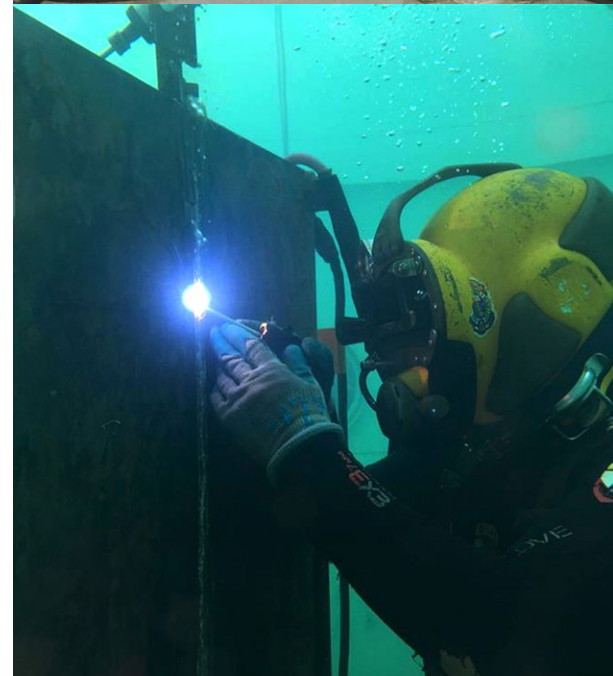
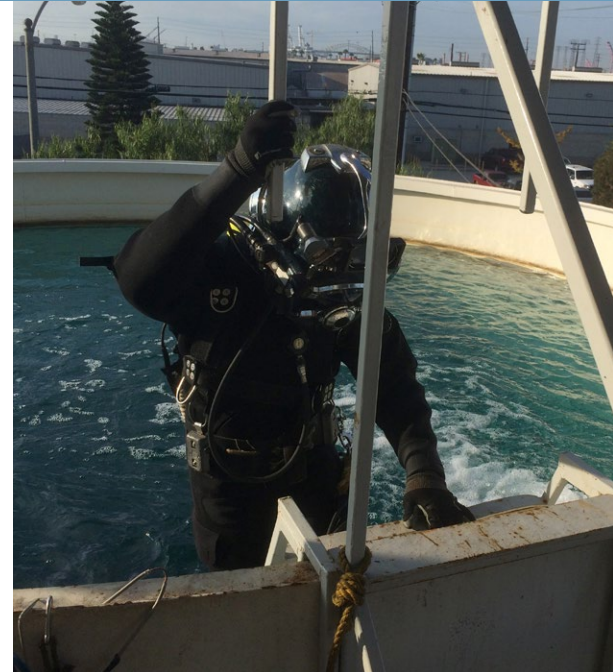
Our commitment to safety includes adhering to the requirements, best-practices, and recommendations of the following associations:

- OSHA • USCG • USN • USACE • HSE UK Inshore
- DCBC • CADC • NSCSA • NBCSA • ISNetwork

- Australia • Singapore • Europe

IN-HOUSE TRAINING PROGRAMS

Subsea Global Solutions employs some of the most experienced diver-technicians in the industry. Decades of knowledge and expertise are passed on through a series of in-house training programs utilizing our Miami and Long Beach training centers, both of which are equipped with 55,000-gallon training tanks. Our diver-technicians are also granted numerous opportunities to participate in advanced Original Equipment Manufacturer (OEM) technical training sessions.





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