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UNDERWATER SHIP MAINTENANCE SPECIALISTS

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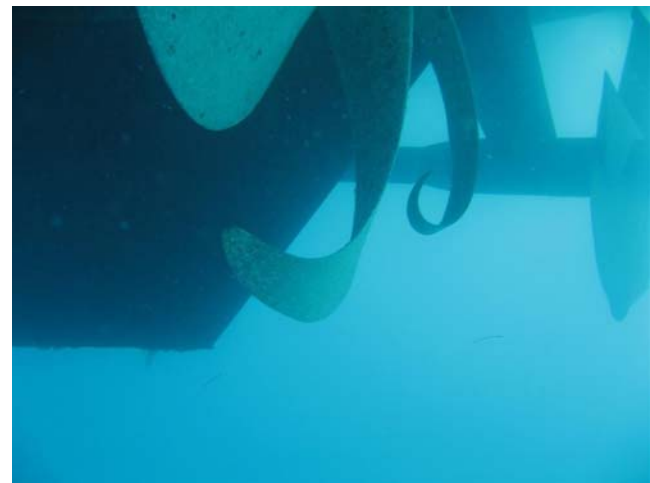
The Netherlands • Malta

Website: [subseasolutions.com](http://subseasolutions.com)

## **Advanced Underwater Propeller Repair Commercial Solutions Applied to today's Mega Yachts**

By Rick Shilling  
PropEL Marine LLC  
Subsea Solutions Alliance

Reputation is everything when you own or operate an exotic one of kind Mega Yacht. It is also a well known fact that yacht sizes continue to grow larger while at the same time owners and charterers are interested to experience far reaching exotic ports that cannot be achieved with a large commercial cruise vessel. Groundings will occur causing damage and potentially disastrous economic impacts due to expensive repair costs and lost chartering time (or even worse cancelled charters). Reputations of vessels could be ruined by high propeller noise or even worse heavy vessel vibrations all caused by damaged propellers. The global cruise industry has understood this fact for many years and has relied on the services of the **Subsea Solutions Alliance** to provide expert repair services on-site anywhere around the world. From the Galapagos to the Micronesian Islands, the expert propeller technicians and their equipment repair these damaged propellers on-site typically within hours without causing embarrassing delays or inconveniences for the vessel in question.



### **Confidential and discrete repair solutions**

The Subsea Solutions Alliance has developed specialized tooling capable of providing permanent repair solutions for damaged propellers. The tooling is designed to be flown on standard commercial aircraft as excess baggage. The support equipment is designed to plug into a vessel's standard 440-460v electrical system. With portable equipment and certified propeller experts capable of providing class approved permanent repairs on-site many owners and yacht captains have found these repair solutions to provide the best overall value and maintain the excellent reputation of the yacht. Recognizing that "reputation" is everything in the yacht business, all underwater interventions from the simplest hull



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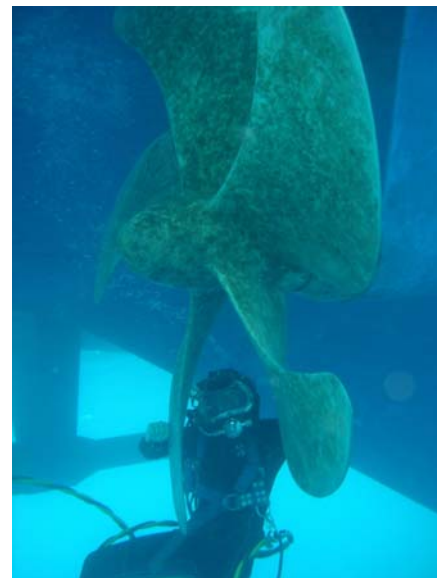
cleaning to the most complex underwater repair is maintained in strict confidence. The services provided are performed to the satisfaction of the most stringent owners.

Certified Propeller Technicians perform sophisticated shop quality underwater propeller repairs, which include, straightening large bends, precision cropping and design modifications worldwide. No matter whose propeller is installed on the yacht, the Subsea Solutions Alliance has the capability to repair this propeller without fail. Upon completion of extensive practical and formal training on-site and at major propeller manufacturing facilities, the technicians have become qualified to accurately assess propeller condition and determine the best-engineered repair solution to maximize propulsive efficiency. The solutions that can be provided are Classification society approved as permanent repairs. This was previously only possible in specialized propeller workshops after the propeller was removed and the yacht laid up for months on the beach. With the development of these specialized processes and tooling underwater propeller repair using the proprietary equipment and procedures of the Subsea Solutions Alliance are available to the Mega Yacht community.

Large bends can be straightened underwater in hours; dockside or at anchor. The underwater straightening process entails many cycles of cold static loading applied in sequence throughout the bend. During the process, subtle changes in geometry are measured and evaluated simultaneously by two technicians positioned at each end of the deflection. This process has been successful in Class Approved permanent restoration of deflections over 120 degrees.



Before the Repair Process



After the Repair Process



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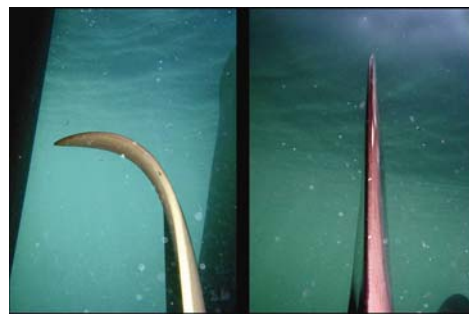
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Straightening systems include the “SUITCASE” cold straightening system for smaller bends, which is designed to be broken down into several components small enough and light enough to be flown on commercial aircraft as luggage. The full size systems for handling major deflections are designed and packaged for swift worldwide mobilization by air cargo.

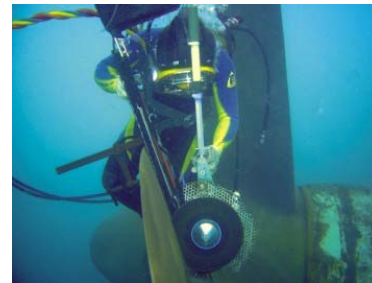
**Subsea Solutions Alliance Underwater Propeller Repair Services Include:**

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



**Design Modification Solutions:**

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



The Impossible is now Possible with the innovative techniques developed by the Subsea Solutions Alliance. With a global network of propeller technicians we are available to respond to emergencies on hours notice. Our equipment is always ready for dispatch. Their priority is to return your vessel back to services with any issues or fuss. As the global leader in underwater ship repair the Subsea Solutions Alliance has now made available extensive experience and equipment developed over the years for the Commercial shipping industry to today’s world class Mega Yacht market.

For more information please contact:

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