SUBSEA SOLUTIONS ALLIANCE

February / March 2010

SubSea Solutions Newsletter

"The Chronicles"

Rapid Cost-Effective Worldwide Underwater Repair Solutions

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Propeller Repairs

Steel Repairs

Stern Seal Replacement

Additional information may be found on our Web Site:

www.subseasolutions.com

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Spring has finally sprung upon us throughout most of the world. It has been a long and tough winter with record cold and snowfall being recorded throughout the world. This has not slowed down the diver / technicians from the **Subsea Solutions Alliance** one bit! Even in this challenging shipping market a substantial number of projects have been performed throughout the world. From Australia to Canada, the diver technicians have performed services on almost every continent in the past 2 months. From complex large underwater steel repairs to ship equipment upgrades, the member companies of the **Subsea Solutions Alliance** tapped into their vast in-house resources to engineer and perform these complex repairs without issue or delay.

The **Subsea Solutions Alliance** continues to invest in the development of its personnel and equipment. Just like we reported in our January newsletter, an additional 12 diver / technicians have gone through seal bonding and seal system training at **Blohm and Voss's Simplex seal academy in Hamburg Germany**. By maintaining our diver / technicians current with their bonding certifications we can assure a quality repair with a full OEM warranty when sealing system repairs are performed underwater. Certification to the Alliance Class "A" wet weld procedures continues with all major classification societies with additional diver / technicians being certified this past month. By maintaining our own work force of over 150 diver / technicians throughout the world we continue to remain the premier

underwater service provider for the global marine industry.

Construction of new facilities in Miami and Long Beach are scheduled to begin later this year. Upgrades to our facility in The Netherlands are being completed. So what's in store for 2010? Well, a continued focus on developing new, innovative and value added in-water solutions together with our OEM partners for deployment throughout the world.

The **Subsea Solutions Alliance** was very busy meeting the needs of the industry by performing multiple high value repairs in various ports around the world. The summary below illustrates just some of the major projects performed.

2 Tunnel Thrusters were exchanged in Europe
1 Tunnel Thruster was installed in Canada
4 stern seals were replaced- one in the Caribbean, Two in California USA, and one in Panama
1 permanent repair / overhaul to a sea chest was performed in the Caribbean
1 insert repair was performed in Panama
5 propeller repairs with Sectional reduction and straightening were performed in Europe, the Caribbean and North America

April already shows signs of continued significant work for the member companies. With confirmed projects in the Offshore, commercial shipping and cruise market segments, the **Subsea Solutions Alliance** remains focused on maintaining and keeping vessels and floating structures working and in their intended area of operation.

- Rick Shilling
Subsea Solutions Alliance

Ice flows everywhere- PROPELLERS BEWARE!

Underwater Propeller straightening and repair

BEFORE AFTER

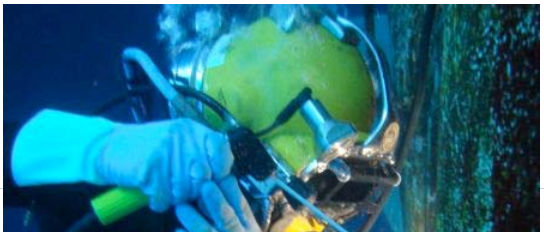
Just like our newsletter in January reported, the world's ports are

open after a hard cold winter rest. Ice continues to rein havoc to our colleagues sailing in these waters. Propellers have been repaired in Europe, North America and the Caribbean. With yet another significant number of propellers straightened and repaired using the proprietary techniques of the **Subsea Solutions Alliance**, vessels remained in service without delay. When high vibrations and unusual loading occurs on the propulsion engines, immediate emergency repairs are necessary to avoid damage to stern tube components and restore vessel performance. While the vessels were conducting cargo operations, the diver / propeller specialists from member companies in **The Netherlands, Miami Florida, Halifax Nova Scotia and Vancouver Canada** were busy below the surface restoring / repairing propellers with minimal or no hydrodynamic performance losses. Utilizing specialized equipment and highly trained propeller technicians, the teams allowed vessels to continue their cargo operations without any off hire and within hours of dispatching to the vessels site had the propellers repaired. Straightening large bends combined with sectional reduction methods are employed to restore propellers quickly underwater. Hydrodynamic and static balancing is then carried out in accordance with criteria established by the **Subsea Solutions Alliance** engineering department. By focusing on the hydrodynamic balance of the propeller, operational efficiency is maintained at the highest level without risking cracking or further damage to the propeller.

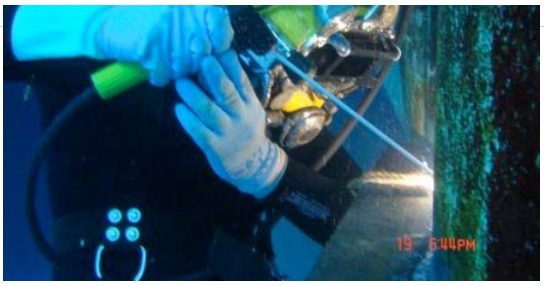
It is good to know that repair alternatives below the water line are available even in the newest facilities of the **Subsea Solutions Alliance**. This was demonstrated in early February when a fully loaded vessel entered **Nova Scotia** with a significantly bent propeller. Within hours a team was dispatched from the member company in **Halifax Nova Scotia**. With straightening equipment in tow, the propeller was restored to original geometry without delay completely below the waterline without the need for de-ballasting or other special requirements. The member companies remain available in most ports of call dispatched within hours of notification. Let us know what we can do for you.

Steel repairs happen at the most inconvenient times

Large, complex steel repair at an outer anchorage in Central America / Sea Chest overhaul



Prior to transiting the Panama Canal, grounding caused considerable damage



requiring immediate repair to the bow section of a vessel. Due to the location and significance of the damage a unique repair solution that could be completed efficiently and in a safe manner was required. Upon completion of an inspection dive, multiple tears and openings in the hull were found from the tip of the Bulbous bow all the way to frame 239 on BOTH the starboard and port sides of the vessel. The largest rupture was 12 meters long with an approximate width of 1 meter. Other ruptures included affected areas over 2.5 square meters in area. Both the Port AND Starboard sides of the vessel were affected over 30 affected frames with significant ruptures and tears.

As this vessel was anchored in a lightly sheltered outer anchorage, weather was considered when developing the unique, safe and class approved temporary repair. As the vessel was fully loaded, the draft and location of the damage required specialized dive equipment for deeper drafts. The repair of the damage required underwater as well as topside welding / preparation work. As the member companies of the **Subsea Solutions Alliance** already have approved class "A" wet weld procedures with a considerable work force of diver / technicians certified to these procedures the team could be immediately dispatched from **Long Beach, California, Miami Florida, Vancouver and Panama** to the vessel's location. Since the damage to the vessel was located near the fore peak tank and the vessel was in a lightly sheltered outer anchorage the repair could not utilize the conventional approach with cofferdams as the potential risk of "ripping off" the cofferdam in the heavy seas was present.

After the completion of a detailed inspection and a meeting with the attending class surveyors and underwriters, the engineering department of the **Subsea Solutions Alliance** developed a repair procedure that was subsequently accepted by all certifying bodies and performed without delay. Underwater welding was performed as described in the approve Class "A" wet weld procedure. Doubler plates matching the original hull steel quality and thickness were welded into place underwater. Frame and stiffener members matching to the original hull quality were then installed and welded underwater. Once all underwater welding was completed a 2 part underwater epoxy was installed over all weldments to assist in the protection and reduction of metal wastage in those areas immersed in salt water. Once the affected areas were closed off with the

doubler plates, the affected areas were dewatered, dried and cleaned.

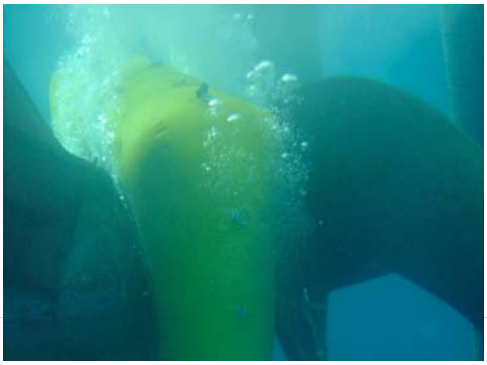
Watertight bulkheads between the tanks where damage occurred were dried, cropped away and subsequently replaced. The repair was done in accordance with class requirements to ensure the structural integrity of the affected area.

Braving the weather, heavy sea conditions and significant depths required to perform the repairs to this fully loaded vessel, the diver / technicians of the **Subsea Solutions Alliance** completed these repairs in a 2.5 week period. Yet again the member companies of the **Subsea Solutions Alliance** met the challenge of a unique and new repair process. Another satisfied customer sailed away into the sunset destined to offload it's cargo at its intended point.

In addition to this significant repair, another team of diver / technicians from the member companies of the **Subsea Solutions Alliance** from **Miami Florida** and **Curacao**, completely overhauled and performed a class approved permanent repair to the sea chests of a cruise vessel in operation. With a dry-docking schedule more than 2 years away and a vessel fully booked for many cruises to come, the **Subsea Solutions Alliance** was called in to provide service work to the vessels sea chests. Without causing any delays or deviations to the vessels itinerary, class approved repairs were completed to the complete satisfaction of the attending surveyors and customer's technical staff.

By maintaining a permanent work force of over 150 diver / technicians around the world, the member companies of the **Subsea Solutions Alliance** maintain a work force available and ready to tackle your vessel's toughest needs. With equipment designed for quick mobilization strategically located throughout the world, we remain ready to meet your emergency or maintenance needs.

Stern Seal repairs performed around the world



No one wants to hear the work leak on a ship. When it comes to Stern Seals this is particularly true. Over the past two months, the member companies of the **Subsea Solutions Alliance**were involved in

the exchange of 4 Stern Seals. Working on vessels in critical trades and sensitive environments, the repairs were completed safely and efficiently without any delays or issues with the vessel itineraries. Stern Seal replacements were performed on 2 different cruise vessels operating in 2 different parts of the world and one container ship operating in California, USA. The cruise vessels were operated in the Middle East, and in Panama. All vessels remained in service and the repairs were conducted during their normal itineraries. Working together with the vessel's operations department, the team executed the repairs over multiple port calls in accordance with the vessel itinerary to minimize delays and impacts to the vacationing passengers on board. Concerning the critical nature of the "cargo", expert support and detailed planning is required.

The **Subsea Solutions Alliance** performs underwater seal replacement on a global basis with the use of the TransHab flexible hyperbaric cofferdam system. The entire system is designed for easy transport throughout the world and can be utilized on a variety of ships in all types of trades. Being completely self sufficient, the team from the **Subsea Solutions Alliance** requires only electrical power from the ship in question to fully bond Aft Stern seal lip rings to full OEM and class requirements. By providing a fully authorized repair, the warranty provided by the **Subsea Solutions Alliance** remains the same as you would receive in the dry dock. We are the underwriters' company of choice for these tough repairs.

The Subsea Solutions Alliance (SSA) consists of underwater ship repair specialists including: All-Sea Enterprises Ltd, Miami Diver Inc, Parker Diving Inc and Trident BV. With a dedicated staff of over 150 divers globally, SSA has revolutionized the methods of repair for ship equipment underwater. Through a common shared system of dive equipment, specialty tools, and dive personnel the SSA is able to mobilize quickly anywhere throughout the world with diver / factory trained service technicians for most OEM equipment. From the replacement of aft propeller shaft seals to the exchange of thrusters to straightening large bends in propellers, SSA has become the OEM's choice for all types of complex repairs. With class approved techniques and a highly trained staff in both underwater ship repair and propulsion equipment maintenance, SSA is the clear choice for vessels operating in sensitive environments and on critical trade routes.

For Further information please feel free to contact:

Rick Shilling
Subsea Solutions Alliance
Sales and Marketing Manager
E-Mail:subseasolutionsinfo@gmail.com
phone: +1-914-826-0045

Forward email