UNDERWATER

The Official Publication of the Association of Diving Contractors International

March • April 2017

ADC INTERNATIONAL

Aquanauts Meet Astronauts

UI-17 Underwater Intervention 2017

ADCI AUDIT KICKS OFF

UNDERWATER INTERVENTION 2017 RECAP

CHOOSE YOUR *performance*

SF350 OR 455

SUPERLITE® 27
SUPERFLOW 350

SUPERLITE® 27
455 BALANCED

KIRBY MORGAN®

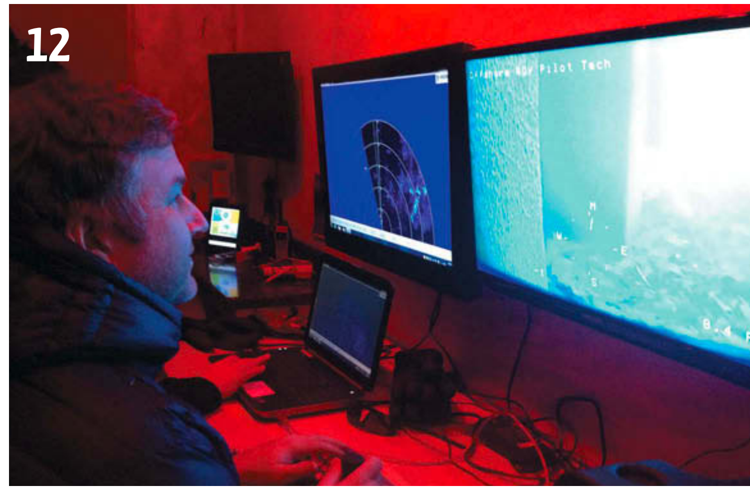
The 455 Balanced Regulator is now available complete & ready to dive on our
Kirby Morgan® 37, SuperLite® 27®, and BandMask® 18/28 models.

CE IMCA

INSIDE

The official publication of the Association of Diving Contractors International

FEATURES

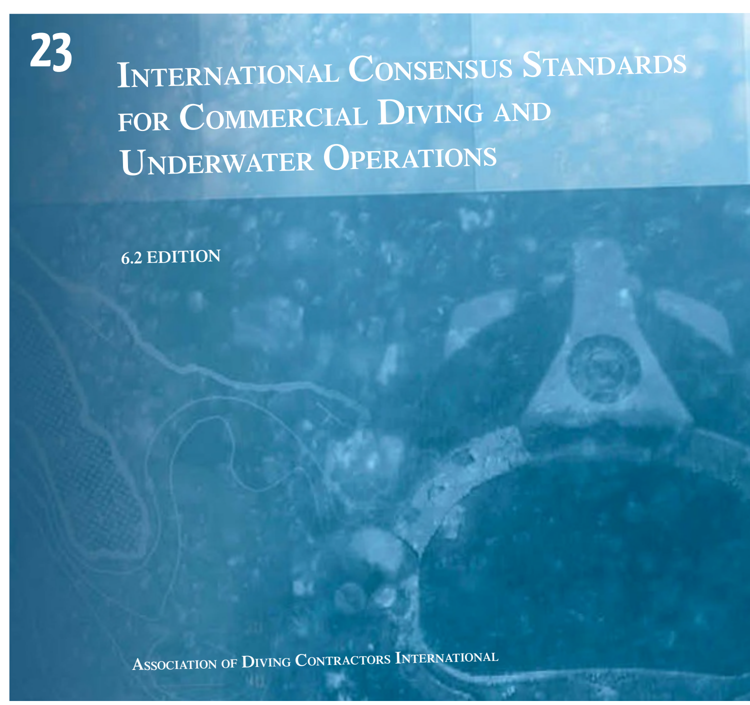

12


15

DEPARTMENTS

To contribute articles and photography to *UnderWater* magazine, please contact Steve Guglielmo at 352-333-2741 or sguglielmo@naylor.com

Subscribe to *UnderWater* magazine at www.underwatermagazine.com.



23

ADCI Online Buyers' Guide

When looking for trusted suppliers and services, our members turn to the official Association of Diving Contractors International ***Online Buyers' Guide***. Available 24 hours a day, 365 days a year, the newly redesigned ***Online Buyers' Guide*** allows members to find the products and services they need quickly and easily.

Visit our Online Buyers' Guide today at adci.officialbuyersguide.net.

UNDERWATER

The Official Publication of the Association of Diving Contractors International

March • April
VOLUME XXX, NUMBER II

Published for
ASSOCIATION OF DIVING CONTRACTORS INTERNATIONAL
5206 FM 1960 W. Suite 202
Houston, TX 77069
281-893-8388, Fax 281-893-5118
www.adc-int.org

Published by
NAYLOR ASSOCIATION SOLUTIONS
5950 NW 1st Place, Gainesville, FL 32607
800-369-6220, Fax: 352-331-3525
www.naylor.com

Publisher: Kathleen Gardner

Executive Editorial Committee:
Phil Newsum, pnewsum@adc-int.org

Managing Editor: Steve Guglielmo
sguglielmo@naylor.com

Advertising Sales Director: Jamie Williams

Marketing Associate: Kaydee Currie

Account Representatives: Angie Bevilacqua, Jeff Bunkin, Krys D'Antonio, Brian Donohoe, Shaun Greyling, Erik Henson, Shane Holt, Chris Zabel

Layout and Design:
BK Publication Design

UnderWater magazine (UPS 010-562) (ISSN 10726098) is published bi-monthly by **NAYLOR, LLC**, 5950 NW First Place, Gainesville, FL 32607, on behalf of the Association of Diving Contractors International, Inc. 5206 FM 1960 W., Suite 202, Houston, TX 77069. Periodical Postage paid at Gainesville, FL and at additional mailing offices.

Postmaster: Send address changes to
UnderWater magazine,
c/o Marie Redfern
1630 Ness Avenue, Suite 300, Winnipeg, MB Canada, R3J 3X1

Published March 2017
ADC-S0217/9268

www.underwatermagazine.com

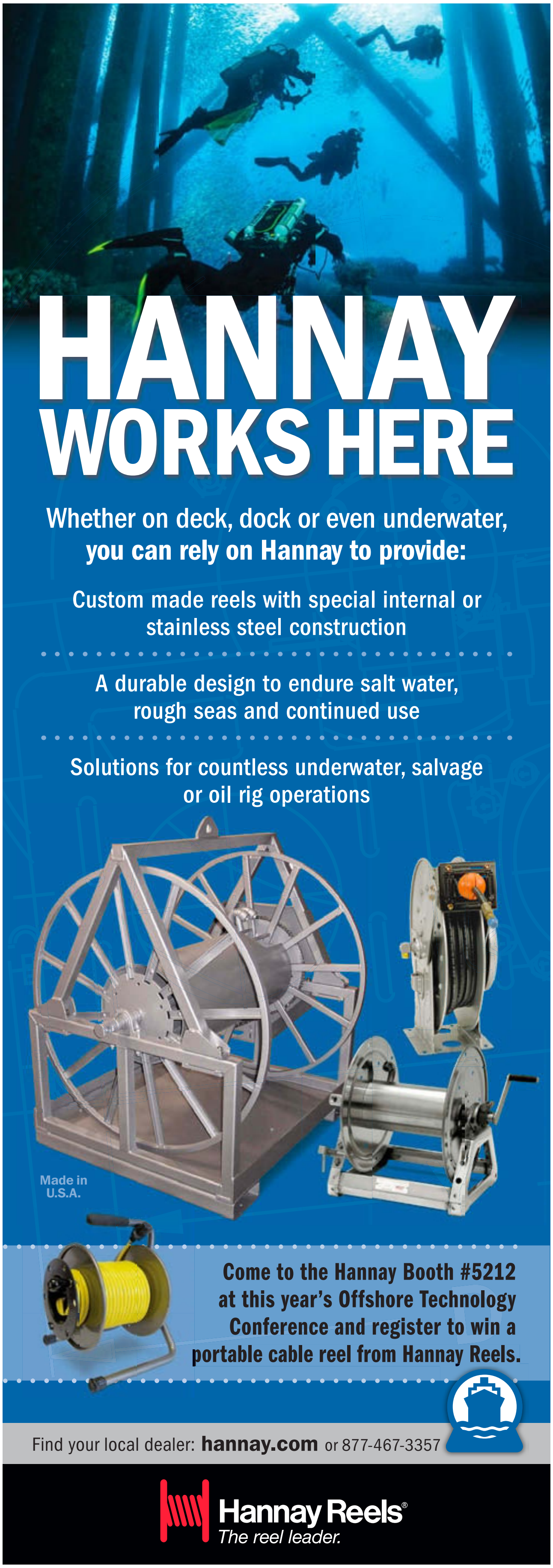
ADCI BOARD OF DIRECTORS

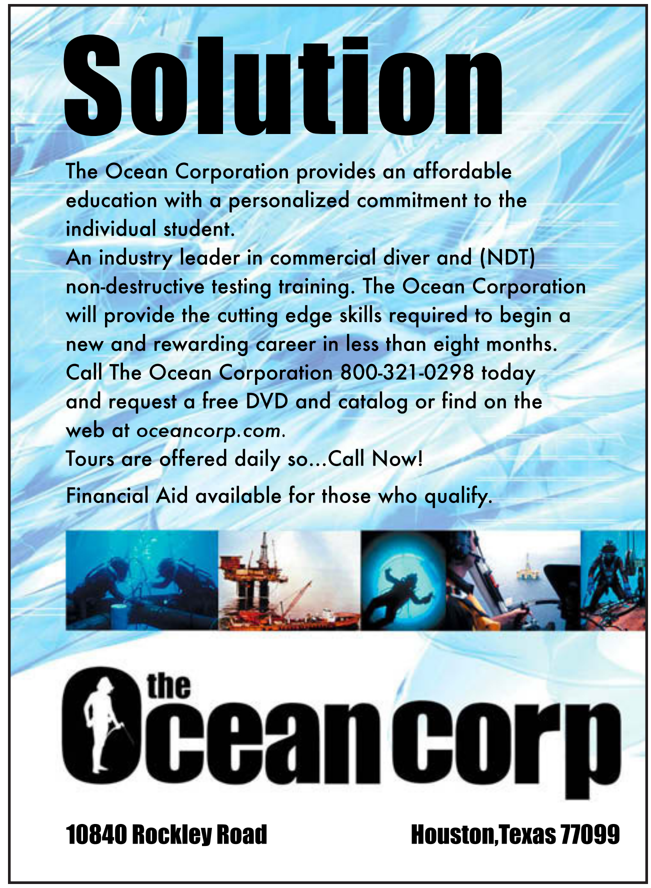
At Underwater Intervention 2017, elections were held to determine the Board of Directors and Executive Committee for the ADCI. **Bryan Nicholls** of U.S. Underwater Services was elected ADCI President for 2017, succeeding outgoing President **Craig Fortenbery**.

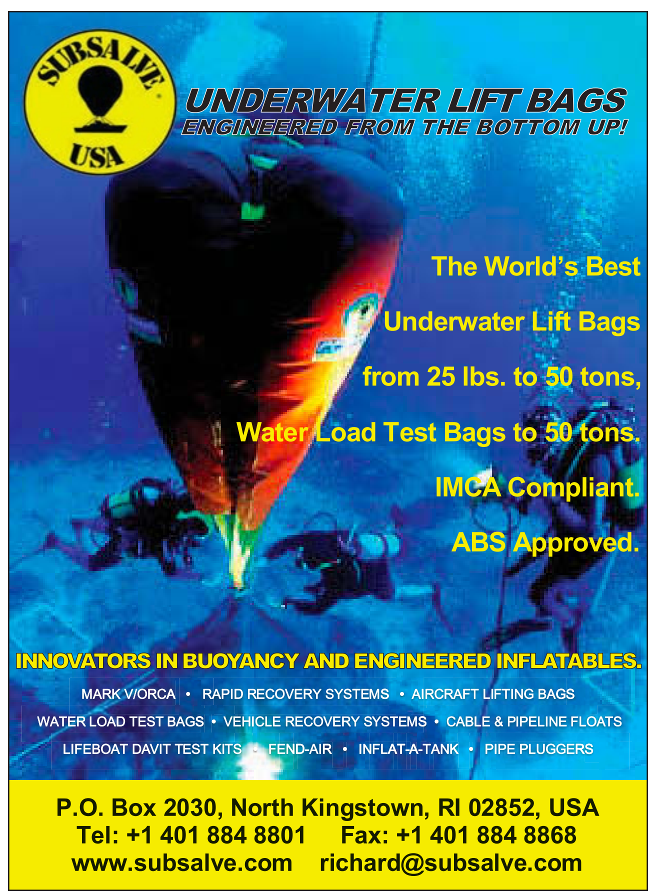
"Having served as 2nd Vice President for a number of years, I have no reservations in Bryan's ability to fully complement the leadership of the Presidents that preceded him," says ADCI Executive Director Phil Newsum. "Bryan was elected by a Board which is very discriminating and selective with respect to who should lead the Association. Rest assured that this Association is in very good hands. I personally look forward to working with Bryan in his new role as ADCI President."

"Craig Fortenbery assumed the reins of President of the ADCI, during his tenure as 1st Vice President," says Newsum. "Craig immediately made an impact, ensuring that the ADCI represented both the offshore and inland sectors equally. Craig's steady and detail-oriented approach to all challenges allowed us to streamline issues associated with membership review, budgetary policy, equipment testing and maintenance, as well as the development of the ADCI Auditing Initiative. When you sit back and take inventory of all the items tackled by the ADCI Board of Directors during his tenure as President, you realize the impressive leadership exhibited by Craig."

We thank Craig for his years of service as President and welcome Bryan in his new capacity as ADCI President. Thank you both for all that you do.


HANNAY
WORKS HERE
Whether on deck, dock or even underwater,
you can rely on Hannay to provide:
Custom made reels with special internal or stainless steel construction
A durable design to endure salt water, rough seas and continued use
Solutions for countless underwater, salvage or oil rig operations
Made in U.S.A.
Come to the Hannay Booth #5212 at this year's Offshore Technology Conference and register to win a portable cable reel from Hannay Reels.
Find your local dealer: hannay.com or 877-467-3357
Hannay Reels®
The reel leader.


Solution
The Ocean Corporation provides an affordable education with a personalized commitment to the individual student.
An industry leader in commercial diver and (NDT) non-destructive testing training. The Ocean Corporation will provide the cutting edge skills required to begin a new and rewarding career in less than eight months.
Call The Ocean Corporation 800-321-0298 today and request a free DVD and catalog or find on the web at oceancorp.com.
Tours are offered daily so...Call Now!
Financial Aid available for those who qualify.
the Oceancorp
10840 Rockley Road
Houston,Texas 77099


SUBSALVE USA
UNDERWATER LIFT BAGS
ENGINEERED FROM THE BOTTOM UP!
The World's Best
Underwater Lift Bags
from 25 lbs. to 50 tons,
Water Load Test Bags to 50 tons.
IMCA Compliant.
ABS Approved.
INNOVATORS IN BUOYANCY AND ENGINEERED INFLATABLES.
MARK V/ORCA • RAPID RECOVERY SYSTEMS • AIRCRAFT LIFTING BAGS
WATER LOAD TEST BAGS • VEHICLE RECOVERY SYSTEMS • CABLE & PIPELINE FLOATS
LIFEBOAT DAVIT TEST KITS • FEND-AIR • INFLAT-A-TANK • PIPE PLUGGERS
P.O. Box 2030, North Kingstown, RI 02852, USA
Tel: +1 401 884 8801 Fax: +1 401 884 8868
www.subsalve.com richard@subsalve.com

A MESSAGE FROM THE EXECUTIVE DIRECTOR | PHIL NEWSUM

I hope you enjoy this issue of *Underwater* magazine. There are several items that I think will capture readers' interest. The first feature covers the Diving Safety Work Group's (DSWG) meeting at the Neutral Buoyancy Laboratory (NBL). I attended this meeting and it was great for the commercial diving industry to familiarize itself with the mission of the NBL, and discuss possible future collaborations for utilization of the facility. Another article featured is an in-depth look at the new ADCI Certified ROV Pilot Technician Program at Northwestern Michigan College's Great Lakes Water Studies Institute. As mentioned in previous messages, this new program will be the first formal ROV training program endorsed by the ADCI, and the Association will issue ROV pilot certifications to its graduates. Rounding out the rest of the articles are features of the development of hyperbaric welding, the formal rollout of the ADCI Audit Initiative, and a look at U.I. 2017.

Underwater Intervention 2017 was very successful, and the heavy lifting performed by Naylor Events Solutions to pull together a major industry conference, which requires a year of preparation, in six and a half months validates the reason for why we selected them for show management. I want to personally thank Dave Petrillo and his team for all of their hard work and patience. These folks rank right up there with some of the most professional people I've ever worked with. I also want to thank Kathleen Gardner and her team with Naylor Association Solutions. To say that they make our Association better would be a gross understatement.

At Underwater Intervention, elections saw General Members, Crofton Diving and EPIC Divers and Marine retain their seats on the ADCI Board of Directors, and Broco has assumed the Associate Member seat previously held by Divers Supply Inc. I want to thank Robbie Mistretta (Divers Supply Inc.) for all of his hard work while serving as the Association's Treasurer for the past 10 years. Robbie also does extensive work to provide the Association with insights into equipment maintenance, inspection, and testing. This is especially valuable when we look to make revisions to the *International Consensus Standards for Commercial Diving and Underwater Operations*.

As for the Officers of the Board for 2017, Bryan Nicholls (U.S. Underwater Services, LLC) has been elected President, Jay Crofton (Crofton Diving Corporation) is 1st Vice President, Bo Ristic (Chet Morrison Contractors, LLC) is 2nd Vice President, and Bruce Trader (MADCON Corporation) will serve as Treasurer. Claudio Castro (Chilean Chapter Chairman, STS Chile) will serve as the International Executive Board Representative, and Craig Fortenbery (Mainstream Commercial Divers, Inc.) will serve on the Executive Board as Past President.

Lastly, the ADCI Audit Initiative formally kicked off on March 1st. The article featured in this edition of *Underwater* will spell out all of the relevant particulars, and stakeholders can direct any questions to the ADCI Office. Remember, there is no "pass/fail" with the audit. It isn't punitive, and any deficiencies uncovered during the audit will not jeopardize membership. The audit should be viewed as an educational experience, allowing members to confidentially assess their adherence to the International Consensus Standards for Commercial Diving and Underwater Operations. Don't wait until the last minute to schedule your company or school for the audit. We are encouraging members to schedule their audit in conjunction with others who are in close proximity, to help share the cost of travel for the assigned designated auditor.

There's so much more to report out from Underwater Intervention and what's in store for the industry in 2017, but for now just enjoy this edition of *Underwater*.

Aquanauts Meet

By Gary M. Kane

The Gulf of Mexico Diving Safety Work Group (DSWG) held their first meeting of 2017 at the Neutral Buoyancy Laboratory (NBL) located in the Johnson Space Center, Houston Texas. The NBL, also named the Sonny Carter Training Centre in honor of the late astronaut, is the training facility for astronauts heading to the International Space Station (ISS). The facility opened in 1998, and provides training for astronauts world-wide.

According to David Gilbert; DSWG Chairman, the DSWG meetings usually attract about 60 to 80 people in the commercial diving industry in the Gulf of Mexico. This meeting, at the NBL, attracted over 140 people. The NBL facility is presently operated by Raytheon, who graciously hosted the meeting, provided a delicious lunch and a guided tour of the facility to the DSWG attendees.

While the facilities main function is to train astronauts they also welcome industry to utilize the facility for testing and training. They presently perform Helicopter Underwater Evacuation Training (HUET) and Water Survival training at the facility. The pool is approximate 202 feet long by 105 feet wide, 40 feet deep and contains over 6.8 million gallons of water. The filtration system turns over the pool water every 18 hours. In the pool is a mockup of the ISS where the astronauts practice tasks that will be done outside the space station. According to Kurt Otten, operations manager at the facility, they will train for a minimum of ten hours for every hour spent performing a task in space. During the training, everything possible is done to simulate space conditions. They even have the lights at the facility set to simulate a sunrise and sunset every 50 minutes just like in space.

During training the astronauts breathe a Nitrox mix so there is no decompression. The facility has the capabilities to mix all their own gases. In addition, there is a hyperbaric chamber rated to 165 FSW and a hypobaric chamber rated for 25,000 feet altitude. The facility has their own fabrication shop where they build all the mock ups. If there were ever a problem at the ISS which required an astronaut to exit the space station to make an un-planned repair, the NBL would immediately go into action, mobilizing their people to recreate the issue in the pool and then find a solution for the problem. Once that task is completed in the pool, mission control can talk the astronauts through the repair based on what they have learned in the pool.

Safety is certainly the number one priority at the facility. All mechanical and electrical systems at the facility have a least single if not double redundancy. While the astronauts are in the water there are safety divers and utility divers, on Scuba. One big difference in space compared to in the water is the astronaut's ability to move laterally or vertically. In space, it takes minimum effort to begin to

Astronauts

> One big difference in space compared to in the water is the astronaut's ability to move laterally or vertically. In space, it takes minimum effort to begin to move and a lot of effort to stop. In the water, it is the opposite.

move and a lot of effort to stop. In the water, it is the opposite. A lot of effort to start movement but minimal effort to stop movement. For this reason, when an Astronaut is ready to move the utility divers actually position them so they do not get used to the amount of effort it takes to move in the water and the minimal effort to stop moving in the water. There is a complete medical staff full time at the facility.

The suits the astronauts wear are suits that have been in space. Once they come back from space they are slightly modified for pool use. Every astronaut's suit is custom made. The suits have a heating and cooling system built into them to tolerate the wide range of temperatures experienced during a spacewalk. At the ISS the sun rises and sets every 50 minutes with temperatures during direct sunlight as high as +275° F and dipping down during darkness to - 275°. While all parts of the suit are critical the one area that gets the most attention are the gloves. Every astronaut is given two pair of gloves to take into space, and to fit an astronaut's glove there are over 90 measurements taken of their hands.

The US GOM DSWG would like to thank all the folks at the NBL for their hospitality. The organization hopes it can continue and grow the relationship with the facility. For those that have not seen the facility it is definitely worth the trip.

For more information on the NBL or to discuss the use of the facility for any commercial projects please contact Kurt Otten E: *kurt.otten-1@nasa.gov* P: 281-792-5914.

The GOM Diving Safety Workgroup is a US GOM focused, non-competitive and non-commercial group of oil and gas operators, transmission companies, commercial diving companies, supporting sub-contractors, organizations and industry stake holders. The group provides a unified voice to promote and improve diving safety. This is accomplished through the identification and sharing of best practices, identifying and seeking solutions to industry challenges and issues, by reviewing and commenting on existing and proposed standards and guidelines and by providing input regulators and industry associations. For more information or to join go to USGOMDSWG.com

ADCI Certified ROV Pilot Technician Training Program

Northwestern Michigan College – Great Lakes Water Studies Institute offers ROV Pilot Technician program.

By Aaron Lay

ROVs were first used for commercial diving operations was back in the mid 1970s. These initial contraptions where cumbersome to handle and extremely unreliable. Needless to say, the ROVs in use today are highly technical, multi-purpose marvels compared to their clunky ancestors. Lately, more and more operators, in both the offshore and inland sectors, are employing the latest ROV technologies on their jobsites.

Until recently, American divers had to rely primarily on field experience to learn how to "fly" ROVs in different environments, performing various tasks under the guidance of an experienced operator. As robust and comprehensive as American, accredited dive schools' curricula are, none have provided formal ROV training. Until now.

The Great Lakes Water Studies Institute (GLWSI) at Northwestern Michigan College (NMC) currently offers the only ADCI certified ROV training school in the world. Graduates of the program receive an ADCI Pilot Technician certification, and all the hands-on experience needed to be successful in our industry.

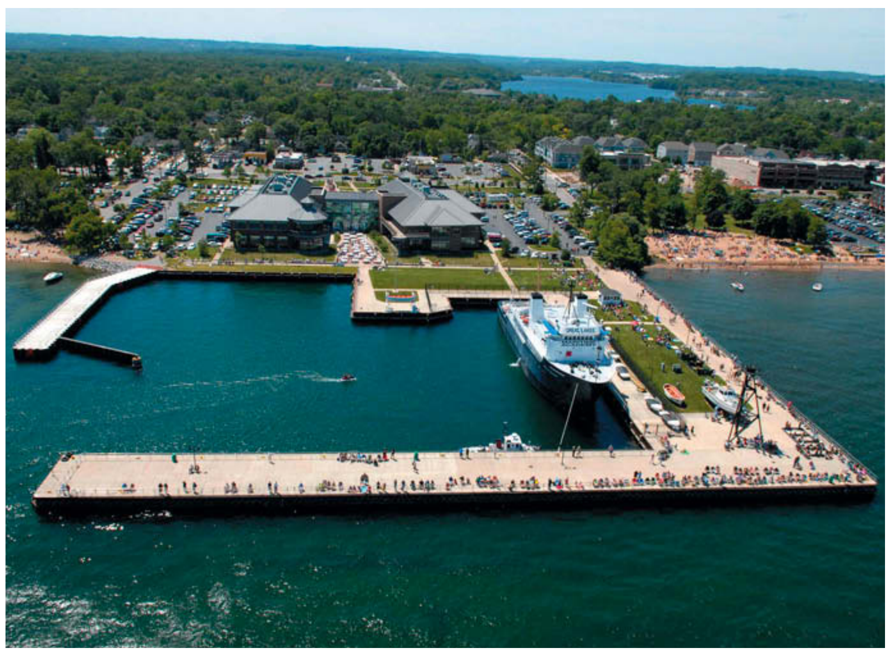
"There was a real gap in people finding a place where [prospective ROV operators] could get comprehensive training that would prepare them for work in multiple sectors of this industry," admits Hans W. Van Sumeren, Director of the Institute's ROV training program. He adds, "That's where NMC and our programming fits in really well. It starts with our ability to train in all aspects of ROV operations including multiple mission scenarios whether it be open water, deep water, rivers, under ice, around structures, in tunnels or storm sewers."

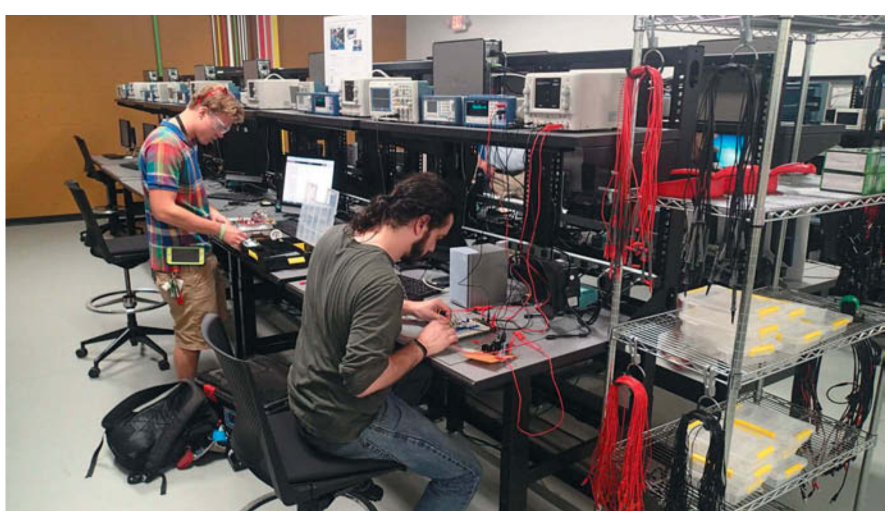
The program lasts 10 weeks and addresses every aspect of ROV operations related to both diving sectors, with training varying in terms of equipment used and depth / terrain ease or difficulty. The 10-week duration makes completion of the program an easily attainable goal for most. Van Sumeren notes that the institute's four and two-year degrees in marine technology are not for everybody. "Not everyone has either the time or the money to commit to programs of that length. So this 10-week program takes some components of the two-year and four-year programs and condenses it down to where the students are going through intensive, basic to intermediate electronics and electrical components. [Student also learn] data telemetry, hydraulics, pumping systems, fiber optic diagnosis, termination and repair of cables and tethers and umbilicals, essential ROV operations, ballasting and troubleshooting, mobilization for various types of deployments and deployment scenarios and applied operations."

Any craft or discipline enabled by advancements in technology must ensure it remains at the absolute forefront of innovation. GLWSI uses the latest equipment so that students are training with current, industry standard tools. "Our labs, electronics and hydraulics are state of the art. We just redid these [labs] less than a year and a half ago and invested roughly 2 million dollars into our technology area. So our diagnostic equipment and electronics are state of the art – the latest in all of the features you are going to see in any sort of diagnostic kit to repair or reassemble or modify a vehicle, and the same thing in hydraulics," Van Sumeren acknowledges.

He adds, "We provide the breadth of the tooling that any one company may have, [so graduates] are totally prepared. Looking at some of the newer functions that are out there, we've got current sonar systems, not just USBL or positioning, but scanning sonar, side-scan sonar and multi-beam sonars. We have integrated automation systems that are really making ROVs somewhat autonomous. And that's really our value-add - we bring in all the auxiliary or ancillary types of training that is also used in most ROV operations."

In past UNDERWATER features covering commercial diving schools we've addressed the notion of location informing the overall training experience for the student. And GLWSI's location couldn't be more of an ideal locale to learn how to fly ROVs and develop skills applicable to both offshore and inshore environments. First of all, Grand Traverse Bay features varying depths. "Our harbor is





about a one-acre harbor that is approximately five to six meters deep, and it empties out into a bay with depths up to about 190 meters."

Secondly, Grand Traverse Bay has plenty of shipwrecks for students to learn to navigate. The Great Lakes have been sailed upon since at least the 17th century, and there are so many shipwrecks that historians are unsure of even a ballpark number – but anywhere between 6,000 to 25,000 is typically agreed upon. "We have lots of shipwrecks - very complex ones that require very detailed flying. We also have what I'll call 'trainer' shipwrecks that are in relatively shallow water that are safer, and students can't get hung up on as easily. But if they do get hung up, we can have divers can come out and support the recovery," adds Van Sumeren.

Another great aspect of GLWSI's program is the pacing. The facility is equipped with an indoor tank to allow students to move from basic scenarios to more complex ones. "We can do all this without a simulator because we can do everything live. No matter what's going on outside, we can always train indoors in a very safe and controlled environment. When we are doing detailed ballasting or sensor alignment, we can do that in an environment where we can make it perfect. Then we can go out and test it in the real world."

Van Sumeren is quick to add that the actual process of leaving the shop to get on the water is all part of the students' real-world training. "We drive home the whole concept of 'You better have it working before you leave the shop. And you better make sure you loaded everything on the truck, because when you get to the site, if you were the one who signed off on the load, then you're the one who's gonna be in trouble when it's not there.' So those little things we get them thinking about early because it's so important."

When asked how training students for inland and offshore environments differ, Van Sumeren is quick to note that it all comes down to teaching them to expect the unexpected. "The big pieces that change [between sectors] is when you are dealing with types of situations where there are a lot of the unknowns. For example, no one's probably been in that tunnel you are inspecting. The type of vehicle is typically much smaller than would be in any offshore arena. The sensors that are onboard are going to be somewhat nimble in terms of how they are going to be positioned and how they are going to be used and how they might be interchanged. I think there is a lot more breadth in some of these inshore operations, meaning you might have to change or modify your mission plan."

He adds, "If you are on-site doing a tunnel and you need to modify the vehicle so it can swim up farther, there might not be a textbook answer on how to do that or a way that can be practiced until you actually get into the situation. So by introducing [students] to that in the training, they get a feel for what it's like to operate in those environments. They get a feel for what it's like to work with the companion equipment that may be helping position the ROV, or the ROV itself may be helping visualize what that piece of equipment is doing. And so, it is looking at it from a broader perspective, and I'll say more holistically in terms of the data you get out of it is also important. So having the students understand that all the sensors on the ROV really need to be producing solid information, otherwise why are you doing the task?"

Regardless of curriculum, a strong, experienced instructor is critical to the learning process. It's simply not enough to be knowledgeable of one's profession. The ability to successfully convey information and methods of action is paramount to being an effective instructor. NMC comes to the table with years of experience across multiple disciplines.

"Our instructors come from all sectors of industry and have worked for different sectors of industry. Our fluid power instructor spent many years running big programs in the industry developing and designing power transmission systems for oil and gas, power generation, mining and defense industries, amongst others. She's used to big projects, high value, intense operations, and brings that experience into the classroom. Our electronics person has been part of the automotive industry out of Detroit for a number of years and brings a global perspective from the development of sensor control systems for not only the big three US automakers, but also Honda, Toyota and Nissan. In sonar, our own people have been operating kits it for over a decade. We also bring in people who basically write the books for training on sonar or use ROV across multiple sectors," acknowledged Van Sumeren. He adds, "It's important for us to put someone with content knowledge in front of the students so that they can drive them with scenarios that are really important in the job market."

Van Sumeren concludes by reminding those who may be skeptical of training in a fresh water environment that this notion is unfounded. "I think that some of the companies, who may only work in the ocean environment, wonder why people would train up in the Great Lakes. They don't drill for oil up here. Well, you don't have to drill for oil to train people how to operate a system that works underwater. We have deep water, we have complex scenarios, we have the equipment, we have the instructors and we have the ability. We own our own research vessels, we own our own harbor and pier, so we have the ability to work year around without anyone telling us we have to wait our turn, or the vessels out for another operation. This is what we do all year long, and we're committed."

For more information on GLWSI's programs, visit them online at www.nmc.edu/resources/water-studies/ or call 1-800-FIND-NMC (346-3662).

The Development of Hyperbaric Pipeline Welding

An excerpt from The History of Oilfield Diving: An Industrial Adventure

By Chris Swann

It was said that when a pipeline went off the stern of a pipe laying barge nobody wanted to see it again for at least 25 years: a wish that storms, corrosion, pressure surges and ships' anchors all too often confounded. Making a repair was a cumbersome business. It took two or more crane barges to lift a pipeline to the surface, and when the repaired line was set back on the bottom it often had a bend in it, which induced stresses. Welding flanges onto the cut ends and having divers insert a spool piece avoided that problem; but flanges could leak. Clamps, installed over the damaged area by divers, were a temporary solution.

Welding a pipeline under water was out of the question. The quenching action of the water produced brittle welds that could not meet the American Petroleum Institute (API) Standard 1104, *Standards for Welding Pipelines and Related Facilities*.

But what if the welds were done under water in a dry chamber? What indeed?

In early 1966, Ocean Systems, collaborating with the Linde Division of Union Carbide, decided to find out. Preliminary investigation and testing revealed that the most suitable technique was tungsten inert gas welding (TIG), a procedure where the welder adds filler rod manually while maintaining an arc with a non-consumable tungsten electrode. Using TIG, the investigators made a series of pipe welds at atmospheric pressure, and at 110 feet in a chamber. Both sets of welds were x-rayed and cut into 'coupons', which were then machined and tested according to the requirements set out in API Standard 1104. In every case, the welds done under pressure were of comparable quality to those done at the surface, and all exceeded the API standard.

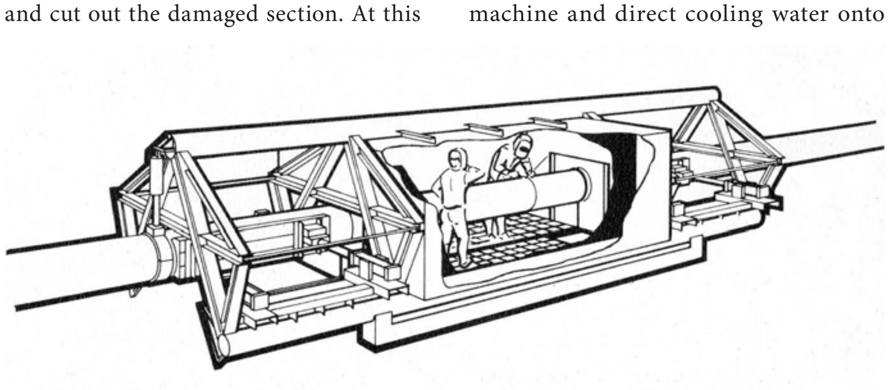
Having established the feasibility of welding at increased pressures, the Ocean Systems engineers designed a welding chamber, of which two examples were built. The Submerged Pipeline Repair System, as it was called, consisted of a central box section, which was open at the bottom and sealed around the pipe, contained within a strongback which aligned the pipe ends with large hydraulic clamping shoes. It had an overall length of 25 feet, a beam of 10 feet and a height of 8 feet. The dry weight was 29,600 pounds.

Since pipelines are usually buried, to make a repair divers had first to jet and air lift away the mud and excavate a hole for getting in and out of the chamber. Once the system was clamped to the pipeline, guided into place along down-lines, the surface operators blew the buoyancy tanks to reduce the weight. Divers then entered the flooded chamber, chipped off the cement weight coating and the composition coat and cut out the damaged section. At this

Ocean Systems divers monitoring the hydraulic pipe cutter (Christopher Swann)

point the doors were bolted around the pipe at either end and sealed, and the chamber was blown dry. To stop the chamber from exerting upward pressure on the line, the ballast tanks were then flooded.

The first pair of diver-welders, standing on gratings which were lowered down on either side of the chamber, set up the hydraulic cutter, a machine which inched its way around the pipe on a chain-strap arrangement, cutting and bevelling the ends to the required 37 ½ degree angle. Pairs of divers followed to monitor the machine and direct cooling water onto



The Ocean Systems welding chamber

the blade. Once one stub had been cut and bevelled, the cutter was transferred to the other stub. Workers on the barge then made up a replacement section of pipe, known as a ‘pup joint’.

During welding the chamber was purged with nitrogen to eliminate the possibility of fire and prevent contamination of the weld. The divers breathed through a mask.

In September 1967, Ocean Systems undertook the first hyperbaric welding contract, a ‘hot tap’ in the Gulf of Mexico: a process in which a new line is connected to an existing line without shutting it down. In this instance, a 6-inch line was connected to a 10-inch line. (The first company to do a mechanical as opposed to a welded hot tap was S & H Sub-Water Salvage. The entire process was done in the wet using a Hydrotech hot tap saddle and a T.D. Willamson hot tap tool.)

To make the connection, Ocean Systems used a simple igloo, cut out like the larger welding chamber at either end to sit astride the pipe. The depth was 110 feet. Divers working from the surface prepared the line and set the chamber; the welding was done in saturation. As soon as the welders completed their work, the chamber was removed. Divers then carried out the hot tap in the wet with a tapping tool. The customer, Humble Pipeline Company, reduced the pressure in the pipeline during welding but resumed full operation within three days.

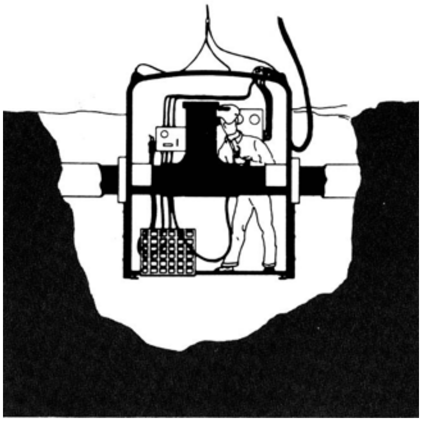
Between October 1967 and March 1970, Ocean Systems carried out seven further hyperbaric welding operations: a pipe fitting repair, a riser repair and three pipeline repairs in the Gulf of Mexico, a pipeline repair in the Raritan River in New Jersey, and the Halibut pipeline tie-in in the Bass Strait.

The Bass Strait contract, for Esso Australia at a depth of 220 feet, was a major undertaking, with 45°F (7°C) water and a current that ran to 1 ½ knots. Two lay barges, one working from shore to the platform, the other from the platform to shore, handled the 24-inch pipeline.

The crew consisted of pipeline welders from the Gulf of Mexico and support divers from Santa Barbara under Whitey Stefens. Dan Wilson, convinced that it made more sense to train a welder to dive than a diver to weld, had some time before persuaded the Morgan City office to hire several skilled pipeline welders and turn them into divers. In fact, the only diving the welders had to do was to go from the surface, or from the bell, to the welding chamber. The support divers removed the weight coating, cut the pipe and set the chamber, and put on the epoxy coating after the welds were x-rayed. The five welders on the Esso Australia contract spent ten days in saturation, inclusive of decompression, completing the hook-up in less than the scheduled time.

Despite these successes, lack of a heavy construction connection meant that Ocean Systems, although it had pioneered hyperbaric welding, all but ceded the field once Taylor Diving entered the market.

Hyperbaric welding was right up Taylor’s alley. In 1961, Mark Banjavich and Jean Valz had worked on the laying of a pipeline from a tanker-loading terminal to a refinery at the Ilha d’Agua, just off Rio de Janeiro. After the lay barge left, a ship dropped an anchor on the line and put an eight-inch crack in the pipeline. With the barge gone, there was no way to pull the pipeline back to the surface; so Banjavich told the superintendent, who had stayed



The hot tap chamber

behind with some of the crew, that he would weld it under water. No one had ever welded a pipeline under water before.

Undaunted, Banjavich set about the repair. It took him close to a month. Day after day he descended the 60 feet to the soft mud bottom and dropped into the eight-foot deep trench to the pipeline. Visibility was virtually nil. Little by little he laid a pattern of overlapping beads over the damage, ground them smooth and ran another set of beads at right angles to the first, until the weld was three-quarters of an inch thick—the same as the wall thickness of the pipe. Finally, he welded one-inch by two-inch braces across the repair. When the company pressure tested the pipeline, the weld held.

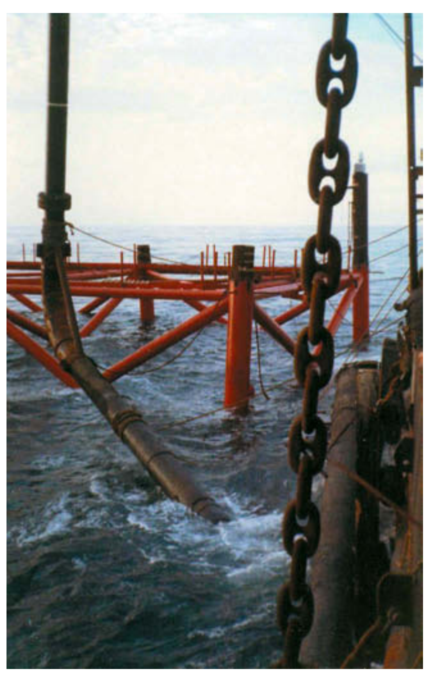
The repair in Brazil was the product of necessity, a performance that was unlikely to be repeated, but it set Banjavich thinking about the potential for welding pipelines underwater. Inevitably, as oil and gas companies laid ever more pipelines the chances of those lines being on the receiving end of an anchor were bound to increase. Here, surely, he told George Morrissey, was a promising business opportunity.

The company had to develop the ability to repair pipelines without pulling them to the surface. Beyond that, Banjavich saw an even more lucrative market. At greater depths, oil companies were bound to run into difficulties connecting newly laid pipelines to production platforms. The Gulf Coast method of lifting the line to the surface and cutting it to fit, then welding on an L-shaped riser and lowering it down again while trying to guide the riser into a set of clamps was not going to work. The connection would have to be made on the seabed.

The Taylor hyperbaric welding programme got under way in 1967 with the completion of the new chamber complex at Belle Chasse. The principal people involved in the development work were Morrissey and Taylor's chief engineer Anthony Gaudiano. The welders, young, skilled and willing to try something new, came from Brown & Root. All except two, the Stockstill brothers, returned to their original jobs once they had gone offshore and found out what it was like to live in a chamber and work on the bottom in a habitat. (Lyle Stockstill later became the president and CEO of Torch Offshore in Gretna, Louisiana. The company filed for bankruptcy in 2005.)

Taylor then recruited a second group of Brown & Root welders, while simultaneously training some of its divers in hyperbaric welding. From that experience, Taylor concluded—unlike Dan Wilson—that it was easier to train a diver to weld than train a welder to dive. A diver could be trained to weld in about four weeks and had no reservations about climbing out of a bell in black water. Ultimately 90% of the company's welders were divers.

Morrissey and Gaudiano began by experimenting with conventional arc welding. The results were not encouraging. Electrodes which performed well on the surface performed poorly under pressure. At 33 feet, the welders noticed a change; at 200 feet, it was rather like trying to stick



A typical platform riser (Photograph from Joe Schouest, OOGHP, 2002, a study funded by the U.S. Department of the Interior, Minerals Management Service)

The first Taylor Diving welding habitat (Collection of Drew Michel)

hot chewing gum onto ice: the bead simply fell off the work. Cellulosic electrodes, which are very porous, did not work at all. Gas samples revealed they released large amounts of hydrogen. Of the 37 electrodes Taylor tried, only the Atom Arc, a low-hydrogen rod for welding on special pipe, proved satisfactory. As with all low-hydrogen rods, the welder started at the bottom of the pipe and worked up, rather than the other way round as with conventional rods: a technique that took some getting used to. Even with the Atom Arc, however, the welders found they could not bridge the gap in the typical fit-up between two joints of pipe to put in the root pass, the critical first weld.

These considerations led Taylor to TIG (tungsten inert gas welding), the procedure that Ocean Systems was already using. TIG had the disadvantage that it was slow but it was the easiest method for obtaining a quality weld. Tests showed that it provided better control than with the standard arc process and it allowed for considerable errors in spacing. A skilled welder could cross a quarter-inch gap without difficulty; in fact, subsequent field experience showed it was possible to bridge an even wider gap. Like Ocean Systems, Taylor purged the chamber with nitrogen during the welding phase to eliminate the fire danger and prevent contamination of the weld. It also used argon, a very heavy gas, expelled from the torch, to shield the weld.

In the autumn of 1968, Taylor got an opportunity to put its welding technology to work. Brown & Root, supported by divers from Taylor, had pulled a bundle of small diameter pipelines across the St Lawrence River at Montreal. The lines were laid into a 30-by-30-foot trench blasted into the rock of the riverbed, then covered with ballast rock, after which inspectors from the city, the province and the Commonwealth each conducted an independent inspection. While the inspections were going on, a ship dropped one of its anchors at a point where the rock cover was inadequate. The anchor snagged two of the lines, one of which was to supply Montreal with heating oil, and pulled them up on the side of the trench. The anchor chain then broke.

By this time, the divers were back in New Orleans. Banjavich flew to Montreal, assessed the situation and told the pipeline owners that Taylor would cut out the damaged section of each line and weld in a large pup joint.

Taylor now had a group of welders certified for TIG to the API standard, but they did not have a welding habitat. Through the Brown & Root pipeline engineering department, Taylor obtained a copy of a patent for a method of welding a pipe in a flooded ditch. The drawings showed a Quonset Hut affair, with slots at either end, which sat over a pipe. Doors bolted onto the ends and sealed around the pipe with a gasket, in the manner of a packing gland. Unless the patent was amended, it had only two more years to run. The patent lawyer for Brown & Root advised that unless the inventor was aware of the potential for hyperbaric welding, the practical course would be to buy the patent for a nominal sum, or infringe it, since towards the end of a patent the holder rarely goes to the expense of defending it.

Acting on the advice, Taylor proceeded to build its first underwater welding habitat, UWH-1. Given its origins, UWH-1 was an undeniably more basic approach than that taken by Ocean Systems, lacking as it did a strongback with which to align the pipe ends. Construction, entrusted to Equitable Equipment, went on almost round the clock. The atmosphere was frantic. Everyone lent a hand, irrespective of their position in the company—Banjavich included. Such was the haste that Gaudiano was still squirting paint onto the habitat as it was loaded onto the truck for the journey to Canada.

When he arrived in Montreal Banjavich rented every big compressor he could find and rigged up two four-foot-diameter air lifts to suck the rock and overburden out of the trench. The bottom of the trench was no more than 60–65 feet below the surface; but

> In September 1967, Ocean Systems undertook the first hyperbaric welding contract, a 'hot tap' in the Gulf of Mexico: a process in which a new line is connected to an existing line without shutting it down.

the damage was near mid-channel where the current was strongest, and where heavy ship traffic limited work to daylight hours. Since the available barges, designed for the river, were much smaller than those Taylor generally used, they lashed three together. Cranes on the outboard barges held the pipe off the bottom, while the welding habitat was suspended from the middle barge. Because of the current, each diver was lowered into the trench on a large concrete block, his arms and legs locked tightly round the wire.

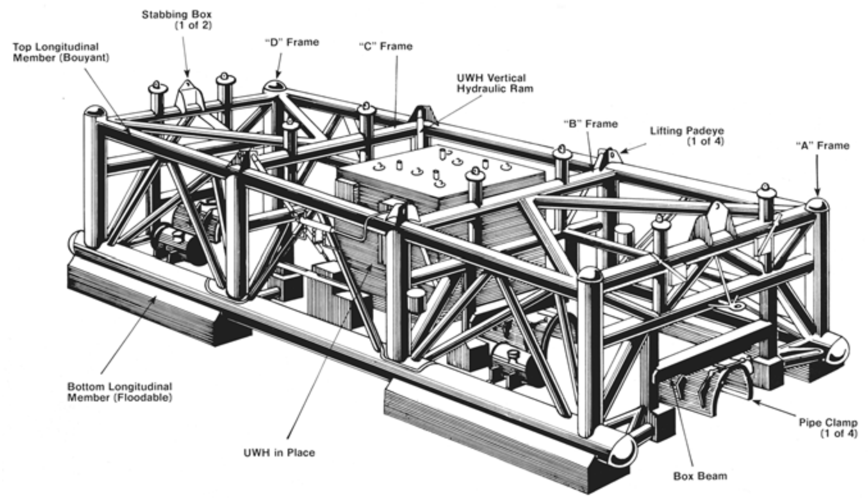
After cutting the first of the two damaged pipelines, the divers set the habitat over the line and closed the doors underneath it. Hydraulic cylinders then drew up the doors, clamping the pipe between the jaws that made up the top of the slots in the habitat and the corresponding jaws in the doors. Being small, the pipelines were flexible enough for the divers to pull the ends into alignment with chain-binders shackled to pad-eyes in the chamber.

Passing ships did not impede the work—but small boats created havoc. First one barge started rocking, then the second, then the third. If the welders were doing the root pass, the movement was enough to break the weld. They would then have to re-bevel the pipe ends and start again. Despite the difficulties, the welders ultimately produced excellent welds, which the Pittsburgh Testing Laboratory inspected by making gamma ray exposures with a Pipeliner camera.

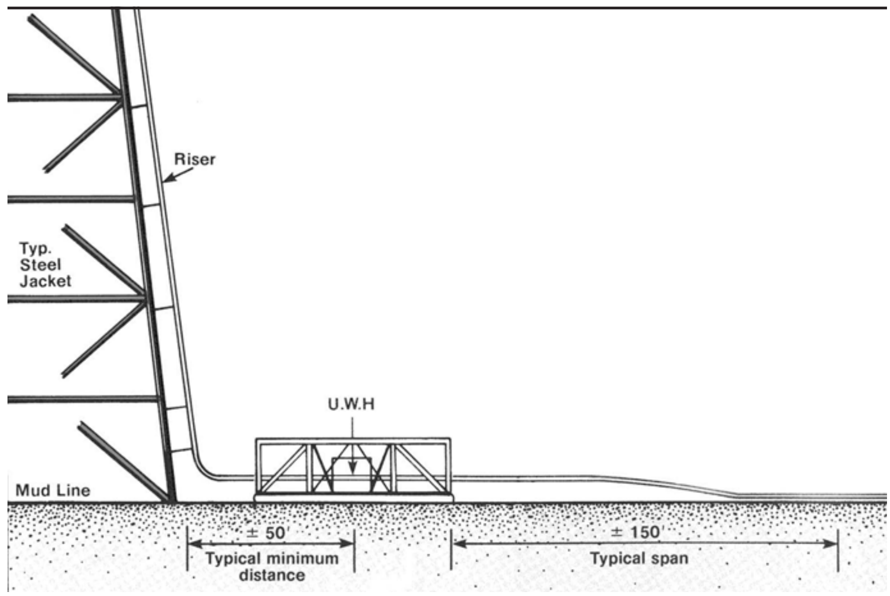
The actual welding took about two weeks; the preparation, mobilisation and demobilisation took about three months. Including development costs, Taylor had spent $3.5 million. Their money was certainly not wasted. By the time Banjavich left the company in 1972, Taylor dominated the hyperbaric welding business and was routinely completing welds in 72 hours, in much deeper water.

During the St Lawrence River operation, Banjavich decided that TIG was too slow and that Taylor should switch to metal inert gas welding (MIG). The MIG process differs from TIG mainly in that a wire electrode feeds into the weld automatically from a reel, by means of a ‘gun’. Banjavich instructed Gaudiano to fly back to New Orleans and look into the matter.

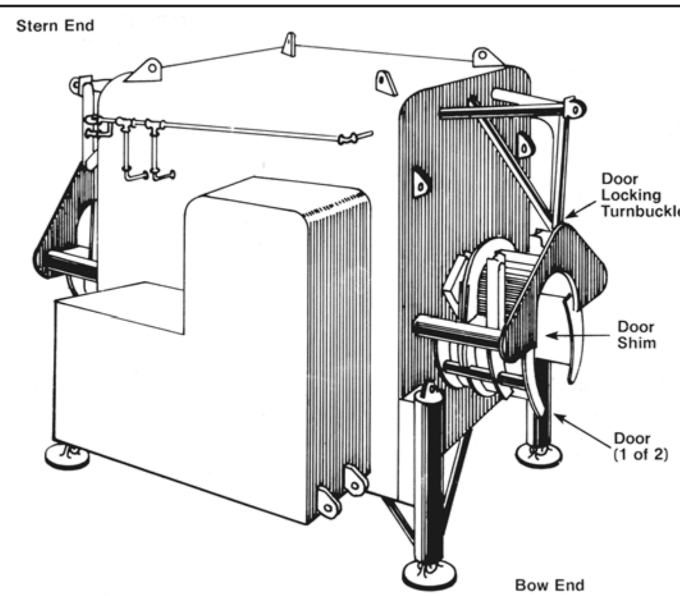
On the recommendation of a Taylor employee, Gaudiano obtained two Hobart



The Taylor Mod-1 pipe alignment frame (Collection of Drew Michel)



Making a pipeline connection at a platform (Collection of Drew Michel)



Welding habitat with jack-up legs, for use without an alignment frame (Collection of Drew Michel)

MIG machines. As it turned out, the fact that the machines did not have an independent current control made them unsuitable for hyperbaric welding, although no one discovered this until later. At any rate, by the time the trucks returned from Canada with the equipment Gaudiano and his team had done a considerable amount of experimenting in the small depth simulator.

The tests showed that MIG was unquestionably faster than TIG; but the welders could not get adequate penetration at depth. To increase the heat they tried various cover gases other than argon, including blends of helium. They also ran into difficulties with the wire hanging up in the continuous feed mechanism.

Eventually, after rebuilding the MIG machines with different parts, the Taylor technicians got the results they wanted. Nonetheless, laboratory tests continued to show that the TIG hand-weld wire method, while slow, produced the highest quality welds. For some years therefore, Taylor did the root pass and the following two or three passes with TIG and completed the weld with either MIG or the Atom Arc low-hydrogen rod—although, according to Ken Wallace, the low hydrogen rods had a tendency to leave gas bubbles in the weld, which showed up on the x-ray. The weld then had to be ground out for four to six inches on either side of the defect and a new root pass put in, followed by the fillet passes. This could happen three or four times on one weld. Each grind-out increased the chances of having to do another grind-out on top. Ultimately, Taylor did the entire weld with TIG. Once a welder became proficient, there were no grind-outs.

Towards the end of 1968, Taylor Diving used the welding habitat to repair a 20-inch line in the Gulf of Mexico belonging to the Tennessee Gas Pipeline Company. Again, the damage was caused by a ship's anchor. The operation was completed in four days, of which less than four hours were taken up with welding. With the success of the Tennessee Gas and St Lawrence River repairs to point to, Banjavich organised a luncheon meeting at the Petroleum Club in Houston, to which he invited the executives and chief engineers of Brown & Root and a number of major oil companies. The main topic of conversation was setting platform risers

Passing ships did not impede the work—but small boats created havoc. First one barge started rocking, then the second, then the third. If the welders were doing the root pass, the movement was enough to break the weld. They would then have to re-bevel the pipe ends and start again.

in deep water. The oil company engineers clearly thought it was something they could handle: Banjavich had to show them they were wrong. He got up from the table and invited them onto the balcony, 23 stories up.

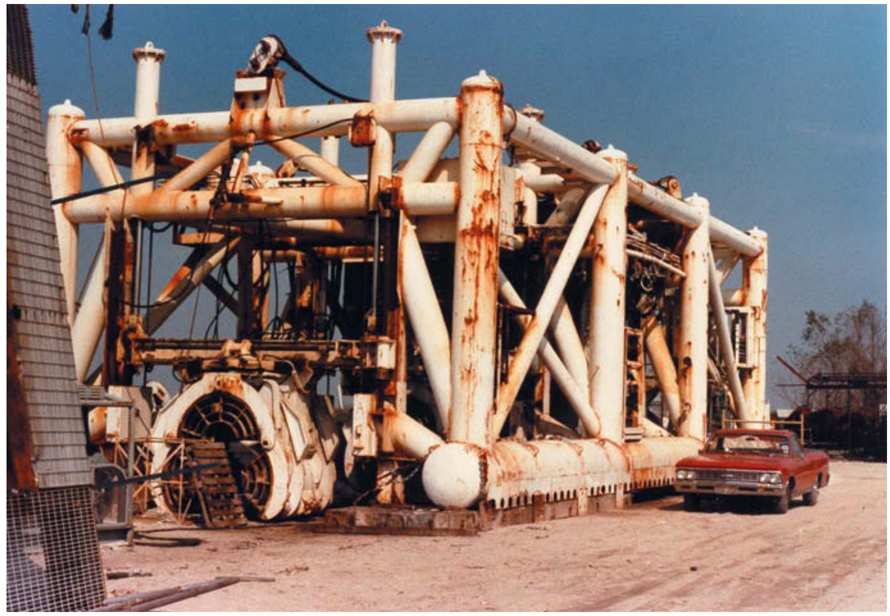
'I said, "One of you guys go down there and hold a teacup, and I'll give another of you a piece of piano wire. In this wind, you try to stick the wire in that teacup." That was all it took. I think it was the guy from either Esso or Texaco who said, "Okay, you made your point!"

'It was not pre-planned; I was sitting there thinking about the currents and the tides and the rough water, and the barge jumping up and down. I realised I needed a way to demonstrate the problem to them. There was not one dummy in that crowd; I had to convince them. I realised if I only half-convinced them it wouldn't fly.

'The point I was making was that if you want to go up to a structure in, say, 240 feet of water—of course we worked beyond that—and you hold a pipeline up near it, you can visualise the long catenary. You've got to suspend that pipe out a couple of thousand feet so you don't bend it, then set it down so it sits in the 20 saddles up along the diagonal jacket leg. It's an impossibility! So I told them, "What you do is set the riser in place when you set the structure. All we do is lay up to it, then go down and cut it and make an effective underwater weld"—which we did eventually.'

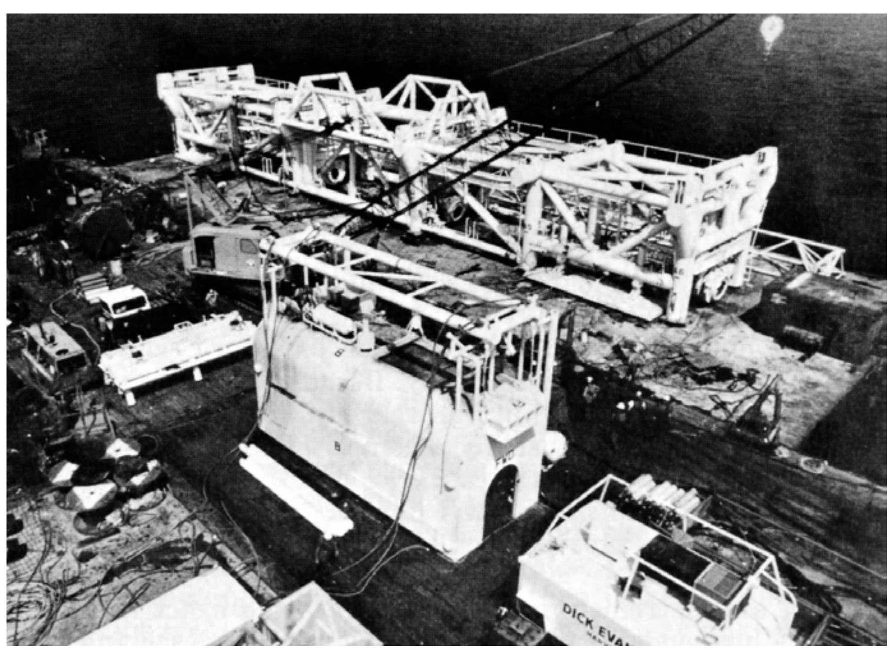
Banjavich already had an oral agreement with Brown & Root to give Taylor the money to build a pipe alignment frame; the pipeline division even set its engineers to designing it. The frame had to be able to move the pipe horizontally and vertically, and it had to be very strong. Banjavich and the Taylor engineers thought the ends of the pipe should sit in jaws which would move on a metal slab that would be left on the bottom.

The purists at Brown & Root did not want to leave the slab on the bottom; they designed a gigantic frame with 60-inch-deep beams that sat athwart the pipe. This was not at all what Banjavich had in mind, so he and his engineers designed an alignment frame of their own. However, instead of using tubular sections as Gaudiano advised, Banjavich opted for structural members, which made the frame too heavy. Consequently, on its first outing it sank into the mud: a shortcoming that was overcome by adding buoyancy tanks.



A pipe alignment frame at Taylor's yard in Belle Chasse, Louisiana (Don Barthelmess)

A Taylor welding spread and saturation system on a Brown & Root derrick barge (Collection of Drew Michel)



McDermott welding habitat and alignment frame (J. Ray McDermott & Co. Inc.)

In 1969, Taylor began welding risers intensively. In 1969–70 the company did the majority of the hyperbaric welds they were to make in the Gulf of Mexico, using a saturation system on a small barge. Most were done without the alignment frame because, contrary to what Banjavich had asked for, Brown & Root put a 15-foot stub on the 'L' of the riser, not a 30-foot stub. The shorter stub left insufficient room. To make the alignment without the frame, Taylor fitted the welding habitat with jack-up legs and added hydraulic cylinders at either end to move the pipe horizontally and vertically. With the pipe in the jaws and the habitat flooded to the top of the slots, two divers, one inside and one outside, could align the pipe ends with comparative ease.

Soon Taylor was completing riser connections in three days of work on the bottom: a very short time considering that it took Brown & Root three to four weeks with the conventional method.

'A considerable factor in our being able to do those jobs so fast was the co-operation of the people who put in the riser and laid the pipeline,' recalled Gaudiano. 'But in the beginning the co-operation wasn't too good. Those guys were a bunch of cowboys. We'd find that the riser would be in the clamps you could see, but on the bottom, it would only have been installed in half of them. As a result, we'd have to spend some time getting the riser in the clamps. Then they were supposed to lay the pipe alongside the horizontal leg of the riser and sometimes it would be a quarter of a mile away. Finally, after numerous meetings with Brown & Root, they got their superintendents together and told them, "Look, this is how you've got to do it, or else." So then everybody started working together.'

The other giant of the offshore construction business, J. Ray McDermott, got into hyperbaric welding when they buckled a large-diameter gas pipeline in 200 feet of water. Because the damage was done during laying, it was up to McDermott to splice in a new section at their own expense. After spending over $1 million trying to line up and connect the ends using flanges and various other methods, McDermott built a massive 165-foot long alignment frame, with a 20 foot by 10 foot welding chamber that lowered into place in the middle of the frame. The construction costs ran to approximately $2 million. This was the forerunner of even larger alignment frames built by both Taylor and McDermott, designed to grip the pipe over a sufficiently long span to eliminate any risk of bending or kinking.

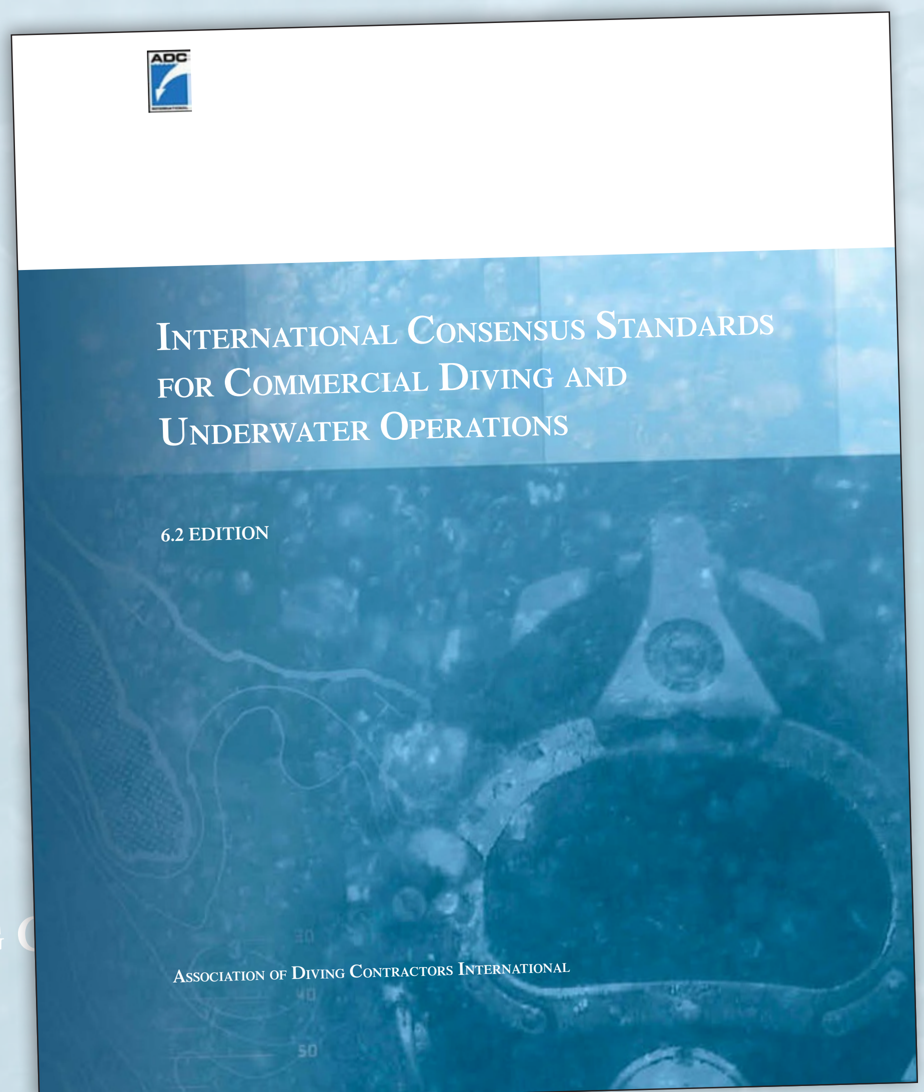
McDermott followed essentially the same procedure as Ocean Systems and Taylor. Dick Evans Inc. certified four welders—two divers trained to weld, two welders trained to dive—to the required API standard and completed the work in three or four days (having planned on two weeks). The system was subsequently used for several other repairs. Dick Evans recalled the operating cost being $20,000–30,000 a day, although even at that level it apparently paid for itself.

Despite their size and position in the industry, McDermott never mounted a serious challenge to Taylor Diving in the hyperbaric welding arena, either in the Gulf of Mexico or overseas. Until Comex exploited an opening through the French oil company Total, Taylor had the market virtually to themselves.

Christopher Swann is the author of "The History of Oilfield Diving: An Industrial Adventure"

The ADCI Audit Initiative Officially Kicks Off

By Phil Newsum, Executive Director, ADCI



The ADCI kicked off a thirty six (36) month audit initiative for General Members and Associate member Schools that have not previously submitted to formal audit, effective 1 March 2017. The purpose of the audit is for companies and schools to formally demonstrate adherence to the *International Consensus Standards for Commercial Diving and Underwater Operations.*

A certificate will be issued by the ADCI office upon successful completion of the audit and demonstrated satisfactory compliance to the ADCI *International Consensus Standards for Commercial Diving and Underwater Operations.*

Membership review audits will count towards meeting the audit initiative requirement. However, no certificate will be issued for membership review audits. Membership review audits are generated due to substantiated operational and/or equipment deficiencies, and are performed when a member is not in "good standing".

ADCI DESIGNATED AUDITORS

The audit will be performed by an ADCI designated auditor, who has undergone training at an ADCI Diving Contractor and Diver Training Program Audit Workshop. Since the purpose of the audit initiative is to promote safety in the underwater industry, the primary motivation for auditor participation must be service oriented and not economically based. The role of the ADCI designated auditor is to enhance and protect organizational value by providing risk-based and objective assurance and insight.

Before an auditor can attend the ADCI Auditor Workshop, they must meet the minimum requirements of at least ten (10) years of recent industry experience in the mode of diving that they will be tasked to review (audit). All ADCI designated auditors must have verifiable documentation of the required years of experience. All designated auditors must have a working knowledge of the *International Consensus Standards for Commercial Diving and Underwater operations*, and cannot be under the direct employment of a General member or Associate Member School during the performance of the assigned audit.

Members can review all of the ADCI TV videos and UW magazine articles that discuss the benefits of submitting to the audit process, ways to prepare for the audit, and common discrepancies uncovered on contractor and school audits, to better prepare for their upcoming audit.

SCHEDULING

General Members and Associate Member Schools may request an audit at any time by contacting the ADCI office. It is not intended that the conduct of the formal audit will interfere with the normal business operations of the member, nor is it intended that the audit process require disclosure of confidential or proprietary information relating to the business activities of the member. In all cases, the audit process will be scheduled for a date mutually convenient and agreeable to the company/school and the ADCI designated auditor.

COST

Costs related to the audit will be minimized to cover only actual direct expenses and will be discussed and agreed upon in advance between the ADCI office, designated auditor, and the company/school.

STORAGE OF INFORMATION

All audit reports and findings are the property of ADCI and will be maintained in a confidential manner at the ADCI office. The contents of audit reports shall not be disclosed to any party, unless required in connection with a formal and confidential membership review process.

SUMMARY

The ADCI office will issue a formal letter, along with the ADCI Policy Memorandum 3000.8A, to notify the membership of the audit initiative. It is important to note that the audit process is strictly intended to develop a general appreciation for the ability of a member at the time of the audit to meet the requirements of the ADCI *International Consensus Standards for Commercial Diving and underwater operations*.

Members can review all of the ADCI TV videos and UW magazine articles that discuss the benefits of submitting to the audit process, ways to prepare for the audit, and common discrepancies uncovered on contractor and school audits, to better prepare for their upcoming audit. Familiarization with the requirements of the Consensus Standards and the performance of an internal audit using the audit reports in Section Ten of the Consensus Standards is the best approach to set your company or school up for success. ≋

Underwater Intervention 2017 a Home Run

UI17 was well-attended and well-reviewed

Though the downturn in the oil and gas industry has affected everybody in the commercial diving and ROV/AUV industries in some way, Underwater Intervention 2017 was still a resounding success. Attendees were captivated by the educational sessions and Special Events. The UI Think Tank was both informative and interactive, as attendees walked away from the event with key takeaways and best practices to take back to their businesses.

The Underwater Intervention Annual Awards Dinner took place on February 21st in the Hampton Inn and Suites Convention Center Hotel Ballroom. This annual tradition brought the industry together to celebrate both the future of the industry as well as its storied past, as both the MTS ROV Committee and ADCI recognized scholarship winners and award recipients for 2017 as well as the induction of the new class of the Commercial Diving Hall of Fame.

As always, the dinner of Louisiana-inspired cuisine left attendees completely satisfied. Then, underwater archaeologist **Ralph Wilbanks** gave the keynote address, discussing, among other things, his storied career searching for shipwrecks and artifacts in the United States, the Caribbean, Japan, the D-Day Beaches of France and the northern coast of England. Ralph has been diving since 1961, has been a PADI Master Instructor since 1974 and is on the Board of Directors for NUMA, a non-profit maritime archaeology organization sponsored by best-selling author Clive Cussler.

After the captivating keynote address, the MTS ROV Committee and the Association of Diving Contractors International issued awards and scholarships to the deserving recipients.

The awards-portion of the evening began with the MTS-ROV Awards & Scholarships. The ROV committee is committed to encouraging young people to study math and science and to explore and seek careers in the marine and undersea communities. That mission is accomplished in a variety of ways, including a partnership with the Marine Advanced Technology Education Center's MATE annual international ROV Competition. That program has now touched more than 7,000 students.

Rylee Knox of the Marine Maritime Academy was presented with the 2017 MTS ROV Committee 2017 Scholarship. Rylee is studying Marine Systems Engineering and is serving as President of the Student Government Association and President of the Student Mariners Society.

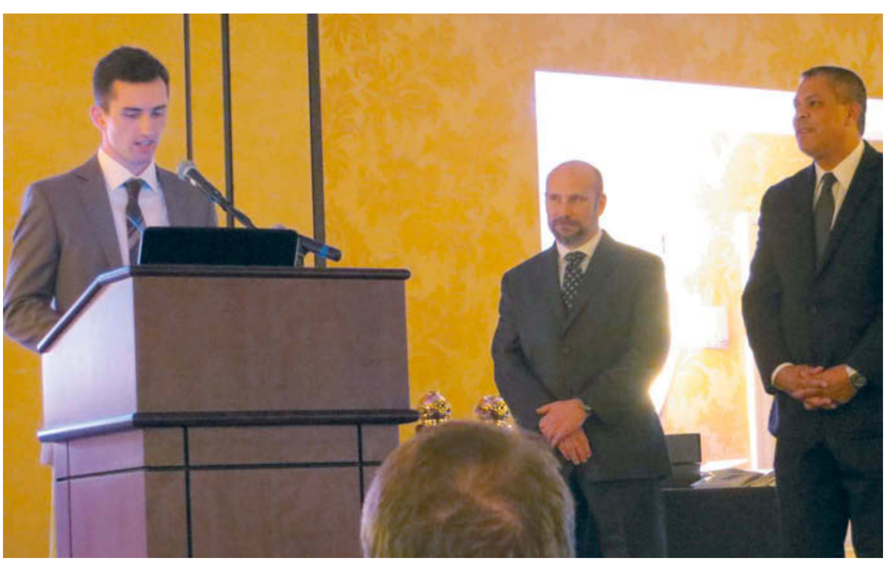
Matt Gardner from the MATE Center was recognized with the MTS ROV Committee's Academic Excellence Award. Matt started his journey into ROVs as the

Ralph Wilbanks, keynote speaker

Chuck Richards, MTS ROV Chairman

Doug Hernandez, BP, with MTS ROV Chairman Chuck Richards

Ryan Hoover, Briant Dozar, Morgan City Rentals, ADCI President Craig Fortenbery, and ADCI Executive Director Phil Newsum



Kelly Krumm, ADCI President Craig Fortenbery, and ADCI Executive Director Phil Newsum

captain of Monterey Peninsula College's ROV team. The team participated in MATE's 2003 and 2004 international competitions. Matt has served as the MATE Center's Competition's Technical Manager since 2005. He develops curriculum materials and is one of the instructors at MATE's annual Summer Institutes for Faculty Development.

The MTS ROV Committee also recognized **Doug Hernandez** from BP with its Distinguished Achievement Award. Doug has been involved with the design, construction, and operation of Remotely Operated Vehicles and their subsystems including manipulators and computer control systems for more than 38 years.

The Association of Diving Contractors International issued scholarships to Ryan Hoover and Kelly Krumm.

Ryan Hoover is graduating Berwick High School, in Berwick, LA, with a 3.7 GPA. Along with his many accomplishments in academics, student government, and athletics, Ryan has been actively involved in such community initiatives as Acts of Random Kindness Club, Key Club, and Future Farmers of America. Ryan has been accepted to Louisiana Tech University and intends to pursue a career in aviation. He is considering entrance into the military after graduating from Tech. In his essay, Ryan said, "From being an altar boy at church, to volunteering in different community projects through school, this town has given me many valuable life lessons that I will definitely use in my future endeavors."

Kelly Krumm is a junior, majoring in mechanical engineering, at Clemson University in South Carolina. After college, Kelly plans to do what he enjoys most about engineering. He wants to find a position where he can continue to design new tools for a company and be with the project from start to finish. Design or research and development department would suit him, as he wants hands-on involvement. He has spent considerable time participating in community service through his time with the Boy Scouts and served for three years as the youth representative for Feed the Hungry.

The Association of Diving Contractors International also inducted two new members into the Hall of Fame, Leslie Leaney and Owen Boyle.

Owen Boyle has worked as a commercial diver since his graduation from the

ADCI Executive Director Phil Newsum recognizes new Hall of Famer Owen Boyle

ADCI Executive Director Phil Newsum

New Hall of Famer Leslie Leaney with ADCI President Craig Fortenbery, and ADCI Executive Director Phil Newsum

ADCI President Craig Fortenbery

California School of Commercial Diving in 1960. He has worked on pipelines and platforms from California to the Cook Inlet in Alaska. His tenacity, knowledge and expertise have been invaluable to those that have worked by his side. He has been the focus of several articles regarding Cook Inlet divers and has written and published a book of his own: A History of Cook Inlet Diving; as well as his memoirs; Diving Blind into Danger. In his mid-seventies, Owen established a diving course to teach police and fire officials how to do body recovery work. His contribution to commercial diving in the Cook Inlet cannot be measured or accurately put into words.

Leslie Leaney learned to dive in Singapore in 1969. Throughout the 1970s he dove in New Zealand, Great Britain, Malaya, Oman, Australia and Saudi Arabia, where he worked with divers at ARAMCO. In 1980, Leslie relocated in Malibu, California. In 1983, he acquired an old diving helmet and started to search for information on its history. This was the beginning of what would become a path that would lead him to compile an extensive library and collection of historical antique equipment. In 1992, this interest in the history of commercial diving led Leslie to co-found the Historical Diving Society-USA, with Skip Dunham. Throughout his research, Leaney has written several dozen articles that have appeared in numerous international publications, including *Underwater* Magazine.

ADCI Executive Director Phil Newsum introduces Ralph Wilbanks

underwater exchange

INDEX TO ADVERTISERS

INDEX TO ADVERTISERS

Thanks to the advertisers that have helped make this publication possible.

THE COMMERCIAL DIVING INSURANCE SOURCE