

CADC Magazine

Fall 2010

The official
magazine of
the Canadian
Association of
Diving Contractors

Inside:

Hiring the
Professional Diving
Contractor – The
Bottom Line

The Practical Aspects
of Cold Weather
Diving in Canada



Canadian Association of Diving Contractors



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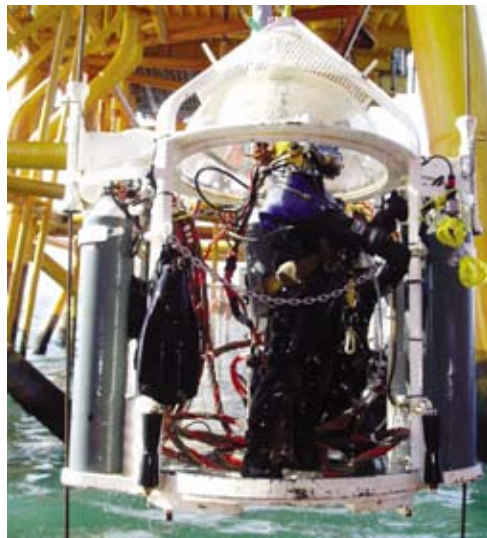
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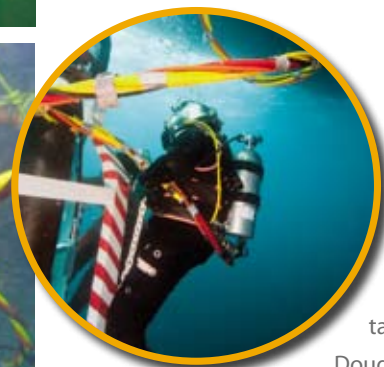
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On The Cover: Photo taken by

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C'est avec enthousiasme que nous vous présentons la première édition de la revue biannuelle de L'Association canadienne des entrepreneurs en plongée (CADC), rédigée avec la participation de Matrix Group Publishing Inc. Il est temps de démontrer que l'industrie canadienne de la plongée est performante et que les entreprises qui la composent sont des plus professionnelles et dynamiques.

“Nous souhaitons ardemment prioriser l'exploration des opportunités fournies par le secteur public, puisque pour innover, un secteur doit s'appuyer fondamentalement sur la R-D, être doté d'une main-d'œuvre hautement qualifiée et investir dans la technologie nouvelle.”

Notre compétitivité sur l'échiquier internationale est en croissance et ce type de publication servira à se connaître et à consolider le partenariat de la côte Est jusqu'à la côte Ouest en passant par le Centre. C'est d'ailleurs avec beaucoup de fierté que je suis devenu le premier président francophone de la CADC et j'interpelle mes confrères francophones à joindre nos efforts.

Nous souhaitons ardemment prioriser l'exploration des opportunités fournies par le secteur public, puisque pour innover, un secteur doit s'appuyer fondamentalement sur la R-D, être doté d'une main-d'œuvre hautement qualifiée et investir dans la technologie nouvelle. Le gouvernement est disposé à unir ses efforts à ceux du secteur afin de favoriser la création de produits et de procédés originaux et d'offrir la formation pertinente. Un certain nombre de programmes et services fédéraux soutiennent déjà l'innovation, et le gouvernement veut aider le secteur à y accéder.

Nous sommes heureux de vous retrouver parmi nous pour notre conférence 2010 à Toronto. Ces moments sont pour nous, une fois par an, l'occasion de nous rassembler et ils constituent des occasions propices

A vast territory, the strength of our partnerships, the success of our industry

It is with the outmost enthusiasm that we introduce the first edition of the biannual magazine of The Canadian Association of Diving Contractors (CADC), created in collaboration with Matrix Group Publishing Inc. The timing is right and the moment is now. We must demonstrate that the Canadian diving industry is growing successfully and that the companies in which it is composed of are the most professional and most dynamic.

“We wish to concentrate on exploring the opportunities supplied by the public sector. To innovate, a sector has to lean fundamentally on R-D, be endowed with a highly qualified workforce and invest in new technology.”

Our competitiveness on the international market is growing and this type of publication will serve to broaden our knowledge and to strengthen our partnership from the east coast to the west coast. Furthermore, it's with great pride that I became the first French-speaking president of the CADC and I call upon my French-speaking colleagues to join in our efforts.

We wish to concentrate on exploring the opportunities supplied by the public sector. To innovate, a sector has to lean fundamentally on R-D, be endowed with a highly qualified workforce and invest in new technology. The government is prepared to work with this industry to encourage the development of innovative products and processes and to provide appropriate training. A number of federal programs and services support innovation and the government is prepared to help the industry access these.

We are pleased to welcome you to our annual conference 2010 in Toronto. These moments are for us, once a year, the opportunity to gather and to establish productive opportunities and



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Continued on next page

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pour établir des partenariats fructueux. Veuillez consulter le site Internet (www.underwaterconference.ca) pour en savoir davantage et vous préparer à assister et à participer à nos différentes activités.

Cependant, comme dans la plupart des administrations performantes, nous souhaitons faire croître notre association. N'hésitez pas à parler des avantages et des services offerts par la CADC.

Le premier numéro de notre publication est l'étape finale d'un long parcours. L'accompagnement et le travail antérieur de M. Jim Wilson, ancien directeur exécutif, nous a conduits vers cet achèvement. Toutefois nous demeurons au point de départ d'une nouvelle exploration. Ainsi, je souhaite remercier et féliciter, le directeur exécutif actuel M. Doug Elsey qui, en ce sens, a accompli un travail colossal. Sans oublier tous les bénévoles de notre association ayant participé à la création de cet outil, qui permettra de renforcer notre industrie ainsi que tous les membres qui la composent.

Marc-Andre Desy

Le Président de l'CADC

fruitful partnerships. Please consult the web site (www.underwaterconference.ca) to learn more about us and get ready to attend and participate in our various activities. However, as in most successful administrations we wish to make our association grow, so do not hesitate to share this information with future members.

The first issue of our publication is the final stage of a long road. The accompaniment and the previous work of Mr. Jim Wilson, ex-executive director, led us towards this completion. However we must investigate new opportunities. Therefore, I wish to thank and congratulate Mr. Doug Elsey, the new executive director of the CADC whose commitment and hard work enables us to achieve our goals and raise the bar, your contribution is greatly appreciated. Special thanks to all the volunteers of our association having participated in the creation of this instrument that will elevate our industry to new levels.

Marc-Andre Desy

CADC President

Why You Should Be a Part of the CADC

“CADC is the glue that joins the diving community across Canada,” says Doug Elsey, Executive Director of the CADC.

Safety, according to Elsey, is one of the most important issues in an industry that can be both dangerous and physically demanding. The CADC acts as a unifying body, able to communicate effectively across Canada and beyond. The CADC acts a watchdog for the industry and keeps a constant eye on regulations. Because of their diligence in monitoring standards and regulations for commercial diving across Canada, the industry has become a much safer place.

As a member, you are adding to the voice that is CADC, effectively allowing the industry to be heard, especially when it comes to lowering insurance rates.

CADC was formed in 1982 because regulators and government legislators did not and do not want to talk to individuals—they want to talk to organized groups representing the industry. The safety standards that govern your operations today are a result of past CADC members doing their job in “getting it right” so that we have a safe and workable industry today.


Some of the benefits of CADC membership offers are:

- Constant communications on jobs coming up that you may be

interested in bidding. This is done weekly or biweekly as we send out tender information across Canada;

- Information website (www.CADC.ca) and the CADC sponsored website (www.UnderwaterINDUSTRY.com);
- The JOBS website (www.UnderwaterJOBS.com) where you can post jobs and look for qualified people;
- The members mail-list server that allows you to instantly contact ALL the members when you need advice, gear, personnel, etc.
- Diving insurances exclusively for CADC members—backed by Lloyds and folks who know the diving industry;
- Reduced rates on gear from our associate members; and
- This new magazine with articles on companies, jobs, safety, etc. to keep you informed.

Not everyone can join CADC. Those members who apply have to agree AND demonstrate that they operate in a safe working environment. One cannot join by simply filling in the form—you have to have a demonstrated level of safety and competence in operations.

For more information, please check out our website at www.cadc.ca or email: info@cadc.ca. We look forward to hearing from you! 

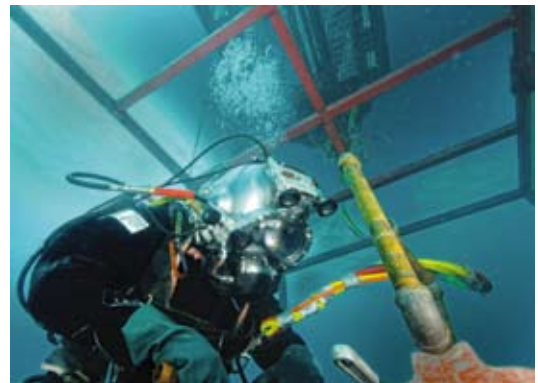
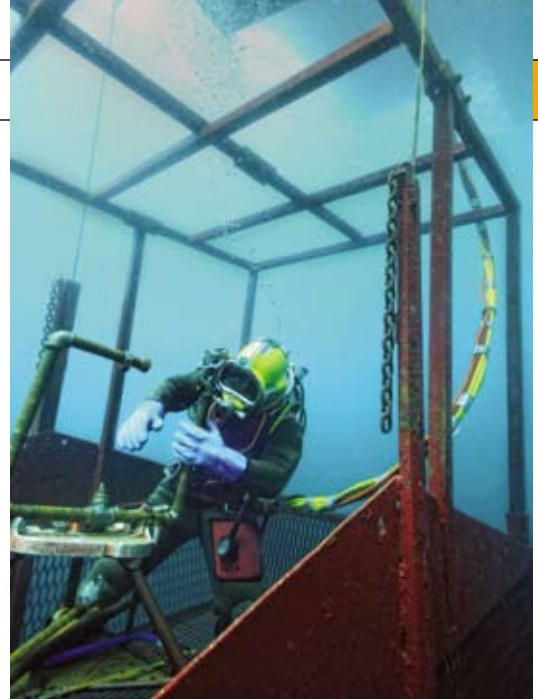


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Check out our members at www.CADC.CA/members!





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PAGE 1 OF 2 PAGES – BOTH PAGES MUST BE COMPLETED FOR APPLICATION OR RENEWAL



Canadian Association of Diving Contractors

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 Mississauga, Ontario L5N3V8
 Phone: (905) 542-7410 | Fax: (905) 567-6703
 Email: delsey@cadc.ca | Website: www.CADC.ca

Make check payable to: **Canadian Association of Diving Contractors**

Category	GROSS ANNUAL REVENUE OF COMPANY Sales derived from underwater operations only	DUES
<input type="checkbox"/> Contactor	Under \$1,000,000	\$500
<input type="checkbox"/> Major Contactor	Over \$1,000,000	\$850
<input type="checkbox"/> Associate Member		\$350
<input type="checkbox"/> Individual Member (non voting)		\$100
<input type="checkbox"/> Student Member (non-voting)		\$50

Please complete form and **provide a business card for all contacts** in your organization:

Application Information:

Company: _____ (a subsidiary of): _____

Mailing Address: _____

City: _____ Province/State: _____ Country: _____ Postal Code/Zip: _____

Area Code: _____ Phone: _____ Fax: _____ Website: _____

Company Contact 1: _____ Title: _____

Email Address: _____ Direct Line: _____

Company Contact 2: _____ Title: _____

Email Address: _____ Direct Line: _____

Business Founded: _____ CADC Member since: _____ # of Employees: _____

General Description of the Business: _____

Mission Statement: "The Canadian Association of Diving Contractors (CADC) will represent its members common interests with regards to safety and environmental standards, client satisfaction, and government intervention within our industry. The CADC will actively promote the use of its members and will supply its members with information and tools to ensure their competence, improve their performance and safety."

PROCESSING INFORMATION FOR APPLICATION (NEW OR RENEWALS)

We hereby apply for membership in the Canadian Association of Diving Contractors as a:

Contractor Major Contractor Associate Member Individual Member Student

We declare that revenues derived for the preceding 12 months fall into the category of _____

(See Membership Dues Structure on preceding page) and have therefore tendered our check for the sum of \$ _____

*Make check payable to: **Canadian Association of Diving Contractors***

If approved for membership in the Canadian Association of Diving Contractors, I pledge to foster safety in all in all areas of activity; to comply with all regulations as set out by the authority having jurisdiction or—in the absence of regulations—to observe minimum standards as identified in CSA Z275.2/ 04 Occupational Safety Code for Diving Operations + CSA Z275.4/ 05 Competency Standard for Diving Operations and Safety upgrades to the standards as approved by the Board of Directors, to maintain high standards with regard to business ethics, employee relations, the public image of the underwater industry and, further understand that the By-laws of CADC permit investigation of reported violations and, if necessary, termination of membership.

Company: _____

Signature of Company Officer: _____ Title: _____

For completion by the first-time applicants and applicants re-applying after a three year lapse. If applying for General Membership at least one of the following references should be from a current CADC General Member.

UNDERWATER INDUSTRY REFERENCES:

Company: _____ Person: _____ Phone or email: _____

Company: _____ Person: _____ Phone or email: _____

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Date Received : _____ Cheque : \$ _____

Application forwarded to: _____ Date: _____

References Contacted : _____

APPROVAL:

Executive Director: _____ Date: _____

Membership Committee: _____ Date: _____

Applicant Notified: _____ (date) Certificate Mailed / Transmitted: _____ (date)

Mission Statement: "The Canadian Association of Diving Contractors (CADC) will represent it's members common interests with regards to safety and environmental standards, client satisfaction, and government intervention within our industry. The CADC will actively promote the use of its members and will supply its members with information and tools to ensure their competence, improve their performance and safety."



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on the cover

Hiring the Professional Diving Contractor

The Bottom Line

Employing the right underwater contractor is a big decision that directly affects the bottom line of your business. Here's what you need to know.

By Doug Elsey, P.Eng.,
CADC Executive
Director and Past
President of CADC
John McFadzen, East
Dive Ltd..

To educate oneself on employing a commercial diving contractor, simply pick up the yellow pages or do an online search for commercial diving companies and you will immediately see that it is a very competitive business—there are dozens of companies that offer underwater services that range from simple underwater inspections or repairs to full blown deep diving in hundreds of meters of water.

Dams, bridges, wharves, oil rigs, municipal water and wastewater utilities are just a few of the places you may find divers working in Canada and around the world. The nature of the work they do is as varied as the locations. From inland construction work to offshore oil support, technology and innovation has enabled divers to go deeper, stay longer, and be more productive than ever before and, as a result, more work is being done underwater.

In the inshore diving market, some challenges beyond simple marine construction support include diving in contaminated water, diving inside potable water tanks high above ground elevation and penetrating pipes and conduits.



In the offshore oil industry, it can mean diving to depths far beyond a couple of hundred meters in depth and staying weeks at a time in surface mounted decompression chambers employing complex “saturation diving” techniques. As far as productive work is concerned, if it can be done above the water, chances are it can be done below.

Independent diving companies as well as members of the Canadian Association of Diving Contractors (CADC) are participating in these and other activities daily.

However, in the search for a qualified underwater services operator, are all created equal? Or more importantly, do they operate equally? Are there differences? In an occupation that some consider very dangerous and risky, are you—as an employer of such services—protected from a liability standpoint should something go wrong? How do you know?

Employing an underwater contractor who has disregard or is ignorant to current safety standards and regulations can expose the employer to serious (and expensive) civil and criminal liability in case of an accident. Bill C-45 of the Criminal Code of Canada states that it is the legal duty of employers and those who direct work to take reasonable measures to protect employee and public safety. If this duty is carelessly disregarded and bodily harm or death results, an organization could be charged with criminal negligence.

It is generally recognized that the Canadian Standards Associations (CSA)

275 group of Diving Standards is as close to a common or national diving safety standard/regulation that exists in Canada. CSA standards are recognized as preferred industry practice by the Federal Government’s Human Resources & Development Canada, National Energy Board of Canada and by all 10 provincial labour regulators. Regulatory compliance for occupational safety is the responsibility of each province and territory in Canada. There are some jurisdictional overlaps such as Labour Canada having jurisdiction over federal government employees and the National Energy Board of Canada being responsible for the offshore.

Not all provinces enforce the same regulations. This can be a bit confusing, but if we keep in mind that those jurisdictions that do not call up the CSA standards for diving directly, emulate them in their own regulations. Although they may not be law in some provinces, many of the provinces who do not have diving regulations cite the various standards in their occupational health legislation. However, although the standard itself is not law, if a province, territory or the federal government refers to the standard in legislation, the standard then becomes law. It can and has been used in a court of law to prosecute clients, operators or supervisors if the standards are not met.

The CSA Diving standards have been formulated by consensus of various stakeholders in the Canadian underwater industry across Canada that included input from educators, regulators and especially industry users across Canada.

Table 1

Canadian Standards Association (CSA) Diving Standards	
CSA Z275.2 Refers to:	Occupational Safety Code for Diving Operations. <ul style="list-style-type: none"> Operational Requirements Minimum Crew Size Restrictions on Scuba Equipment Requirements Supervision Paperwork Etc.
CSA Z275.4 Refers to:	Diver and Dive Crew Competency <ul style="list-style-type: none"> The Competency required for all diving personnel
CSA Z275.1 Refers to:	Chamber Standards <ul style="list-style-type: none"> The requirements of Hyperbaric Facilities or Decompression Chambers
CSA Z180.1 Refers to:	Compressed Breathing Air Systems <ul style="list-style-type: none"> Minimum allowable limits of contaminants in breathing air Minimum compressor requirements

They are under continuous annual review and are updated every five years. (See Table 1).

To the employer, the most important or significant standards in this group of standards are the CSA 275.2 Occupational Safety Code for Diving Operations and the CSA 275.4 Standard on Diving Competency. These two standards form the basis on what a minimum acceptable operations safety standard consists of—and the minimum competency requirements of the individuals involved in underwater work required to operate safely in the underwater environment.

The CSA 275.2 Occupational Safety Code for Diving Operations concerns itself with the operational diving safety standards that include minimum crew sizes, restrictions on scuba operation, equipment requirements, supervision and medical requirements. It must be stressed that these are the minimum requirements to conduct safe diving operations and are not meant to be all inclusive. Meeting these standards as a minimum will vastly improve safety for the underwater worker.

The CSA 275.4 Standard on Diving Competency concerns itself with the competency of the underwater worker and support personnel. Again, this is a MINIMUM requirement for all personnel involved in a diving operation to ensure or enhance the safety of the operation. It provides designations for various levels

of competency in the occupational diving field. For instance, a diver working on a dam with underwater torches shall meet the designation of **Unrestricted Surface Supplied Diver**. The training to meet this designation involves approximately 1,000 hours of training. A large part of the underwater practical training must be done in open water and deep dives to 165 feet in real world conditions are mandatory.

We need to remind ourselves that each one of us has a responsibility to ensure the safety of others. **Safety is an attitude.**

There has been an increased awareness in recent years of the need to be diligent in our planning and execution of our objectives. For some, this could simply mean ensuring that onsite meetings are conducted. For others it will be far more involved. The responsibility, however, is not diminished by the perceived extent of apparent risk. There are few near misses in this business. When things go wrong in a dive, the consequences can be swift and severe. Making the right choices when employing diving services is the responsibility of the employer and may

require managers to reassess their current occupational health & safety programs to ensure compliance with regulatory requirements.

Who certifies to the CSA Standards?

Certification to the standards can be provided by the regulatory authority or an authorized representative of the authority.

In British Columbia, the Workers Compensation Board of B.C. provides certification to the CSA standards (These certifications are generally recognized only in B.C.).

Nationally, an example of an authorized representative is the Diver Certification Board of Canada (DCBC). The DCBC is a federally incorporated not-for-profit body. Originally set up to replace the diver certification regime of the National Energy Board of Canada and the offshore petroleum boards, the DCBC is at present the only national body that certifies offshore and inshore commercial divers throughout Canada.

The DCBC offers certification to commercial diving personnel who can demonstrate that they have sufficient training and experience to enable them to meet the competency requirements of the appropriate section of the Canadian Standards Association (CSA) Competency Standard for Diving Operations (CSA standard Z 275.4).

The Board also accredits commercial diver training organizations which train to the competency levels described in the CSA Standard Z275.4. Such accredited organizations can also assess the competency of commercial divers who have experience but little or no formal training. The assessing organization can provide training if and where necessary, and recommend the diver for certification. Seven provinces and two territories now cite the CSA Z 275.4 standard in their regulations respecting the safety of commercial diving operations. Those provinces also recognize DCBC certificates as reliable evidence that the holder is competent to the levels described in the standard.

Who are the educators?

Diving competence is performance-based and represents a consensus in the field of commercial diving about what

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constitutes quality professional education. National accreditation by the DCBC holds colleges and schools accountable to industry, to students and to the general public. The standards address five major areas: curriculum, quality of candidates, quality of instructors, facilities and educational policies. The accreditation process involves a self-study by the college, a lengthy written report and a site visit by Industry experts or consultants.

Graduating from a nationally accredited program adds value to a student's credentials and enhances his or her employment opportunities in Canada and throughout the world.

Who complies with the CSA Standards?

In many provinces, the CSA Diving Standards and its derivatives are law—plain and simple. Legally, failure to follow regulations and standards and to protect the underwater worker can result in civil and criminal charges.

When one considers the legal requirements for diving operations in Canada—as well as the intensive training and certification required by those involved in the industry—simply picking up the yellow pages and choosing a diving contractor at random is akin to playing

Russian Roulette with your business or organization at the end of the barrel.

Due diligence on the part of the owner (the employer of diving services) to make sure the diving contractor is in compliance and cognisant of the occupational health and safety laws and standards within the province, protects both the owner and the underwater worker.

Members of CADC are required—once accepted into the organizations membership by their industry's peers—to pledge and sign off on the

following mandatory CADC membership requirement:

“As a member, the company has pledged to foster safety in all areas of activity; to comply with all regulations as set out by the authority having jurisdiction or—in the absence of regulations—to observe minimum standards as identified in current CSA Z275.2 Occupational Safety Code for Diving Operations + CSA Z275.4 Competency Standard for Diving Operations and Safety upgrades to the standards and amendments as approved by the Board of

Table 2

RESPONSIBILITIES	
<p>Diving Contractor</p> <ul style="list-style-type: none"> • Ensure that risk assessments have been performed. • The area in which work is being carried out is safe and suit-able. • All personnel representing the diving contractor are appropriately qualified and certified. • All equipment used by the diving contractor is in good working order and, where applicable, is certified. • The actual work has been assessed and a suitable plan of action has been prepared (including lock-outs) for the work to be carried out safely, effectively and efficiently. • Any site specific safety and familiarization training is provided to all personnel on the dive crew. • Project records, including dive logs, hazard analysis, and all relevant details of the project are recorded properly. • Adequate arrangements exist for first aid and medical treatment of personnel. • All relevant regulations are complied with. 	<p>Client</p> <ul style="list-style-type: none"> • The scope of work has been clearly defined and agreed to by the diving contractor. • Agreement has been made to provide facilities and all reasonable support in the event of an emergency. • Consider all potential hazards that are under their control and inform the diving contractor of these. • Take steps to remove or reduce potential hazards as is feasible. • Ensure that sufficient time and facilities are made available to the diving contractor to carry out hazard analysis and lock out procedures where applicable.

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Directors and to maintain high standards with regard to business ethics, employee relations, and the public image of the underwater industry."

Hiring a member company of the CADC does not guarantee safety or high performance as there are a multitude of variables in underwater work—each company has its own high standard in operations above the minimum requirement. However, it is up to the owner to make their own decisions as to who they should hire—and determine what the true price of hiring a low bidder or non-professional company is.

When considering who does the underwater work for the owner, considering the employment of a professional diving services company who has pledged in writing to observe safety standards and maintain high standards in business practices, is a good starting point .

Incidents and accidents cost money. Correctly choosing a professional contractor will translate into cost savings by the owner at the end of the day. The true bottom line in safety, performance and compliance to recognized industry practices and regulations is measured by the owner exercising due diligence in the selection of the contractor—by simply doing the homework. (See Table 2 on page 17).

Doug Elsey, P.Eng is the Executive Director of the CADC with over 40 years in the Underwater Industry. You can contact him at delsey@cadc.ca.

John McFadzen—with over 40 year as the president of East Dive Ltd. is a past president of CADC. You can contact him at eastdive@nbnet.nb.ca.

Additional information can be obtained from any member of the Canadian Association of Diving Contractors. A membership list is available at www.cadc.ca or contact any of the groups mentioned in this article at the following addresses:
Canadian Association of Diving Contractors:
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Offshore Commercial Diving on the East Coast

It is a job that requires strength, endurance and the ability to handle extreme conditions in hazardous environments. John Scott, a leader in the offshore industry, gives us some insight on how far the industry has come and where it is headed.

By Karen Kornelsen

In Dartmouth, Nova Scotia, Dominion Diving has climbed to the top of the commercial diving industry by being one of the largest diving, ROV and marine services companies in Canada. The company has more decompression chambers and more diving systems than anyone else on the east coast. That, combined with their 41-year history of serving the marine, scientific and offshore oil and gas industry makes Dominion Diving an expert on the world of offshore diving on the east coast of Canada.

Offshore commercial diving is not for the faint of heart. While former business development director for Dominion Diving, John Scott, casually answered “no” when asked if offshore diving commercial diving is considered an extreme job, any outsider would beg to differ.

“It may have been a lot more extreme 30 years ago,” says Scott. “Now it is very well-controlled and safety has come a long way. 30 years ago there were a lot of accidents in offshore diving because of divers not being properly qualified. In the old days, it was people who had just done basic scuba diving in a local swimming pool that were doing saturation dives a few weeks later.” Scott says now with industry regulations, advanced equipment and improved back-up systems, the job is fairly safe.

Simon Morris, Director, Professional Products for Bare Sportswear in Langley, B.C. has been outfitting the commercial diving industry with high quality suits for over 38 years in more than 54 countries. “The environment is very demanding for offshore commercial divers who have to conquer the elements to get the job done. If the

weather conditions aren’t looking good on a dive, they can’t just pack up and go home,” says Morris. “Commercial diving is often done on an emergent or mission critical basis, virtually regardless of conditions.”

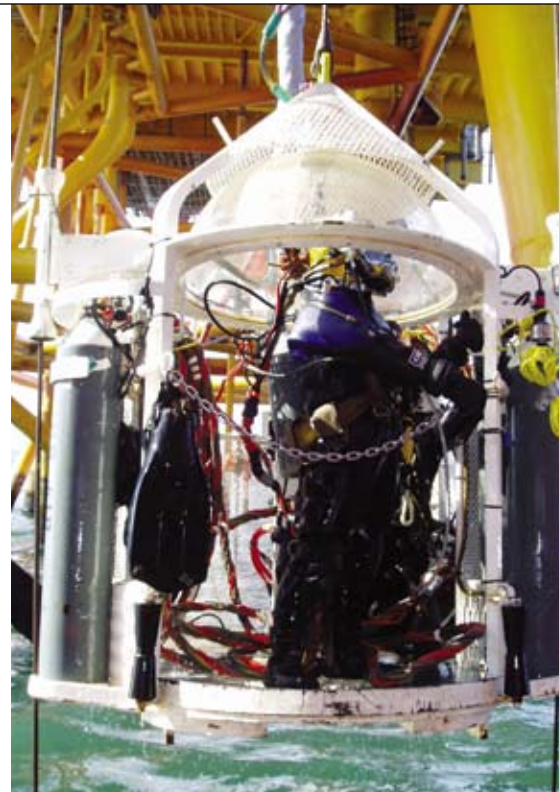
Offshore divers can dive for long periods of time in cold, low-visibility water. It can be difficult, hazardous and physically draining. Remotely operated vehicles (ROVs) have certainly eased some of the hardest work expected of an offshore diver and changed the industry.

“ROVs have changed the industry immensely,” says Scott. “It was in the early 80s that they came into play offshore. At one time, you used to have a need for a diving team on every drilling rig but divers are redundant now in certain areas.”

Oil rigs are being built bigger and extend deeper now and after a certain depth, a diver can’t be put in the water. If you look at the oil spill in the Gulf of Mexico, the rig is 5000 feet deep and it is ROVs that are repairing the damage. But ROVs are becoming more common now in shallower waters as well, according to Scott. They have replaced divers to a large extent which has a huge impact on the industry.

But this industry is still thriving. Because offshore commercial diving is mainly involved in oil rigs or oil production—installing pipe lines, flow lines, inspection, maintenance and repair—there is a lot of money to be made. Offshore divers tend to make triple or quadruple what inland divers are making, says Scott, depending on where you’re working or what you’re working on.

“The job can also tend to be more interesting. A lot of divers are fascinated by offshore technology and the types of jobs done on oil rigs,” says Scott. “You also get to




Wet bell being recovered after a dive offshore.

see parts of the world you would never have the chance to see doing inland diving. If you get qualified through the diving certification board of Canada, you can dive in Africa, New Zealand, Argentina and more.”

Scott says there is very little competition when it comes to offshore diving unlike inland diving where there are thousands of jobs a year that companies are competing for. But *just like* inland commercial diving, experience is an asset in an industry where knowledge paves the way.

“The average age of our offshore divers is in the mid-forties. We have some in the 50s and a few in their late 20s,” says Scott. “Experience is incredibly important. When you have the knowledge, you have the ability to solve a lot of problems that a client comes up with.”

Scott, who keeps his head out of the water these days, was an offshore commercial diver for 15 years. 

John Scott—formally with Dominion Diving Ltd.—is the new president of SubSea Consultants International Inc. located in Halifax, Nova Scotia. (john.scott@subseaconsultants.com)

To find out more about Dominion Diving, check out www.dominiondiving.com or BARE Sportswear Corp., www.baresports.com.

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Between Shores

A look at inland commercial diving in Canada



LEFT: A diver being hoisted into the water at Manitoba Hydro's Kelsey generating station in January 2010. (Photo Courtesy of Dominion Divers)

RIGHT: A diver leaving the surface through the ice at a northern community to repair the intake for the water supply. (Photo Courtesy of Dominion Divers)

Their work environment is ever-changing. They can be found in our rivers and lakes repairing bridges, salvaging the wreckage of an airplane from the water, fixing propellers on ships, and doing pipeline repair and welding underwater. Inland commercial divers in Canada take their job very seriously and have to deal with major challenges both on and off the job. Dominion Divers Ltd. in Winnipeg, Manitoba and ASI Group in Ontario are two diving companies that are making a mark in the industry and staying ahead of the competition.

Dominion Divers Ltd.

Garth Hiebert, past-president of the CADC and co-owner of Dominion Divers, graduated from Seneca College in 1979 and has been in the commercial diving industry for 30 years. Working in a province that has over 100,000 lakes has ensured steady work for his staff of divers which in peak season

can be around 24 men and women. In 2004, Hiebert and co-owner Guy Dobson opened up a second office in Thunder Bay, Ontario and are now in the process of expanding into Yellowknife, Northwest Territories.

"We're well positioned to service a large geographical area," says Hiebert. "We work up North, in Ontario, Saskatchewan and a little bit in the northern states. With our offices in Winnipeg and Ontario, we are able to move divers around very easily and get jobs done."

Dominion is working on many projects right now including bridge repair for Manitoba highways, underwater repair work for CN Rail and CP Rail, hydroelectric dam work for Manitoba Hydro, Sask Power, OPG and Northwest Territories Power Corp. and a three-year contract in Ontario that includes a total of 1,200 bridge piles to repair.

The challenges inland divers face are unique. Imagine working in -40 degree temperatures, not being able to see your hand an inch from your face and, out of the

water, dealing with regulatory compliance, insurance costs and fierce competition.

Hiebert explains, "the divers that are good at their jobs are good at using all their senses, not just their sight. When you're in the Red River in Manitoba or doing work in Northwestern Ontario, you're lucky if you can see your fingers."

Sometimes it's hard to see clearly above the water as well—when it comes to regulating the profession. However, Hiebert says the industry has come a long way in the last 20 years, noting that in the past, the profession was largely populated by underwater cowboys and professional daredevils, some of whom viewed the rules as a hangman's noose. There's a lot of competition in this business, but stricter more comprehensive regulations, convictions and fines for infractions have helped to weed out the fringe operators and create a more level playing field, and opportunities for growth, for those willing to invest in the future.

"I believe that our Safety, Health and Environmental Program has been a major key to our success as a company," Hiebert says. "Having a credible safety record puts your client at ease." He adds their safety record combined with a team of experienced divers and ISO certification has helped them face all these challenges head on.

"Our divers take a lot of individual pride in the fact that they can get jobs done that very few people are capable of doing, and rightly so". They are part of a team but when it's their turn in the water and the bottom timer is ticking, it's up to them to get it done," says Hiebert.

ASI Group

Blake Goulet is the group manager of marine services for ASI Group (St. Catharines and Sarnia, ON), which is not just a diving contractor but a service company first and foremost. They offer two main services: marine services and engineering. Collectively, the company provides a plethora of services to industries within the great lakes basin, or tributaries that come off or into the great lakes in Ontario. The various marine services include commercial diving, operation of a fleet of remotely operated vehicles (ROVs) and marine geophysical surveys. Although the focus of commercial diving is within Ontario, many ROV and marine geophysical surveys are undertaken in the U.S., Central and South America and Europe.

Goulet knows that experience is important and he's proud of the fact that he can put out a five man dive crew that collectively has over 100 years experience. ASI has around 100 employees in total, 8 to 15 (depending on the season) of which are commercial divers.

The bottom line is experience is critical in an industry that used to be a breeding ground for scuba divers with no training or experience.

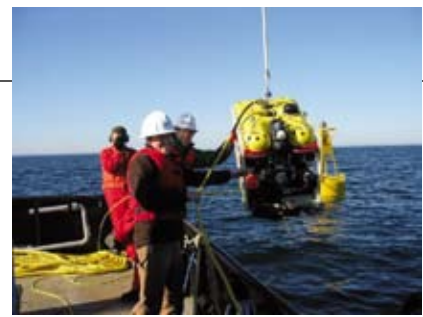
"This industry is competitive because there is no national standard in terms of regulation," says Goulet. "Or if there are provincial regulations in place, not all provinces will monitor or police those regulations the same from province to province."

Goulet says this is the main reason why some companies don't play by the rules. He adds that when clients recognize the value of the work being done by inland commercial divers, instead of just the cost involved, the industry will be able to take a step forward.

"The single biggest issue on actual job sites is making sure client representatives and engineers understand what's being attempted underwater," says Goulet. "They have to realize that elements underwater are far different than above water. Divers are dealing with little to no visibility, water currents and elements of a structure being old or broken down."

One way ASI Group is ensuring clients are satisfied is by training their own employees in their underwater welding program. If a client needs something repaired underwater to a given standard, ASI Group will train their divers to that standard or procedure in-house. The ability to provide new and seasoned divers with access to a training facility ensures their divers are constantly at the top of their game.

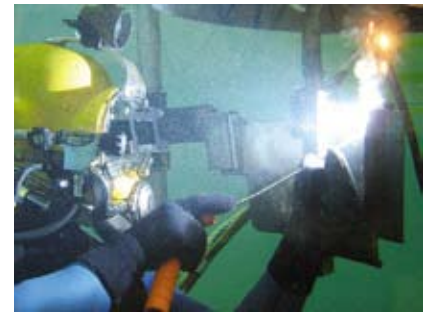
ASI Group maintains a corporate Quality Control Program, Project Management System, Health and Safety program and is also ISO certified. For many clients, the project management and administration




Deployment of ASI Falcon ROV for inspection of shipwrecks. (Photo Courtesy of ASI Group)



70-foot Dive Support Vessel, the ASI Clipper. (Photo Courtesy of ASI Group)



Underwater welding at ASI shop. (Photo Courtesy of ASI Group)

required for large projects is as important as the ability to do the work at the job site. Today's work environment requires sufficient corporate insurance policies, accident-free safety records and exceptional WSIB ratings. ASI has the ability to prepare site-specific operational plans, job safety analysis (JSA), inspection test plans (ITPs), along with the experienced personnel and equipment resources to complete underwater work. 

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Strength-Rated Umbilicals and Harnesses Is Bigger Really Better?

Photo Courtesy of Umbilicals International

By Jonathan Chapple

The subject of umbilicals and harnesses is a lively discussion point within the global diving industry. Numerous diving standards (safety codes) specify strength ratings and other criteria yet there is a wide—and puzzling—variation in requirements. These differences are particularly acute in Canada where a reality check has been long overdue. During 2008-2009, a CSA working group reviewed the relevant sections of the Canadian Z275.2 Occupational Safety Code for Diving Operations. This article draws on this work and presentations to various industry meetings.

Most people would agree that safety-to-life equipment should comply with a recognized standard but there are surprising variations. Table 1 lists the minimum strength ratings for umbilicals from various safety codes and illustrates a huge spread of requirements. (See Table 1)

Table 1: Minimum Strength Rating Requirements for Dive Umbilicals

The highest strength ratings are Canadian with Quebec and Ontario taking the top spots (a dubious distinction). The effect of applying over 4000 pounds of force to a diver would be catastrophic and,

if required, there are probably bigger problems to deal with. Irrespective of where these high figures originated, I believe that they confuse a number of issues and functions, namely a) diver's lifeline, b) diver recovery including lifting in air, and c) fall protection. However, a positive aspect is that the emerging mean (consensus) figure appears to be approx 2000 pounds and this is exactly where the CSA standard sits.

Umbilical function

Some safety codes appear to justify high strength ratings on the basis of lifting the diver but this highlights a common misunderstanding of the functions of a diver's umbilical. Umbilicals are neither designed for, nor are they rigged on the diver for, lifting. So, if the umbilical is not appropriate for lifting, why does an umbilical have to be strong enough for this? Alternatively, perhaps an umbilical has a high strength rating to pull a diver to the surface in an emergency. But very high strengths point more to body recovery than diver safety. Either way, excessive strength requirements make little or no practical sense. Put simply, bigger is not always better.

Country / Organization	N	KG	LB	Comments (see Notes)	
EUR 30 Nations	3500	360	800	European Standard EN15333-1: 2008	
USA	US Coast Guard (offshore)	-	-	-	USCG cross-refers to ADCI standard
	OSHA (inshore/onshore)	-	-	-	OSHA cross-refers to ADCI standard
	ADCI Consensus Standards	4450	450	1000	Under review for Rev.6: 2000 lb proposed
AUS Federal	6000	610	1350	Australia & New Zealand	
CAN	CSA	8900	910	2000	Z275.2: Applies in 5 Provinces also
	Canada Labour Code	13730	1400	3085	
	Quebec Provincial Regs	20000	2040	4500	Re-affirmed in 2010
	Ontario Provincial Regs	24025	2450	5400	
Notes: 1. Figures are rounded for comparison. 2. Static breaking strengths with no factor of safety applied.					

Table 1: Minimum Strength Rating Requirements for Dive Umbilicals

Diver harnesses

Generally there are two distinct types of harness: diver recovery and diver equipment harness (e.g. bell harness). The primary purpose of the former is to recover an injured diver from the water (using a hoist) while the equipment harness holds the bailout, weights etc. In practice, these functions are often combined. Specific harnesses are not discussed here but all users should be aware that harnesses are manufactured to varying standards or, in some cases, no standard. Happily there is a move towards including harnesses within standards and codes. For example, IMCA

Information Note D 03/10 (issued February 2010) provides guidance for periodic examination of harnesses.

Global industry best practice, originating in the North Sea in the 1980s, is to wear an equipment harness over a strength-rated diver recovery harness. The use of two independent

harnesses is a common sense option. It allows dive equipment to be removed in an emergency while still retaining positive control of the diver (using the recovery harness). The critical path is to ensure that the complete rig remains practical: the higher the strength-rating the less diver-friendly it will probably be.

Table 2 shows the minimum strength ratings for harnesses and should be compared with Table 1. There are large gaps although some jurisdictions do match harness and umbilical strengths (i.e. as a total system). The interpretation of "strong enough to lift diver and equipment from water" raises concerns since, theoretically, it allows a harness rated to approx 350 pounds (large diver plus equipment) to be attached to an umbilical rated many times higher. Such inconsistencies undermine credibility. (See Table 2)

Table 2: Minimum Strength Rating Requirements for Diver Harnesses

Interestingly the European Standard separates the two essential harness functions: body harness with strength rating matched to the umbilical for underwater use, and lifting harness with higher strength rating for use in air. Logically, the latter

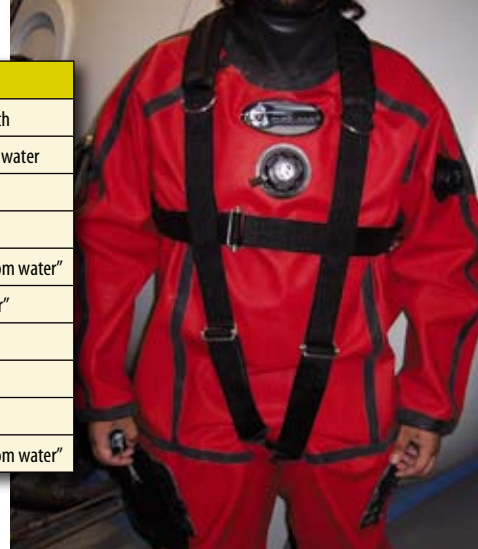
Country / Org.	N	KG	LB	Comments	
EUR	30 Nations	3500	360	800	Body Harness: Matched with umbilical strength
		9000	920	2025	Lifting Harness: To lift unconscious diver from water
USA	USCG	-	-	-	USCG cross-refers to ADCl standard
	OSHA	-	-	-	OSHA cross-refers to ADCl standard
	ADCl	-	-	-	"Strong enough to lift diver and equipment from water"
AUS	Federal	-	-	-	"Allow the diver to be removed from the water"
CAN	CSA	8900	910	2000	Matched with umbilical/lifeline strength
	CLC	-	-	-	
	Quebec	20000	2040	4500	Matched with umbilical/lifeline strength
	Ontario	-	-	-	"Strong enough to lift diver and equipment from water"

Table 2: Minimum Strength Rating Requirements for Diver Harnesses

provides a greater factor of safety. This is an advanced approach and may not be suitable for all safety codes. Again, the consensus starts to develop at approx 2000 pounds. The increasingly-accepted view is that, if single rating is required for all applications, under and above water, then around 2000 pounds for both harness and umbilical (i.e. complete system) is a good choice. The other advantages are that 2000 pounds is technically feasible in terms of design, provides an appropriate factor of safety and is still diver-friendly.

Total system approach

Both harness and umbilical are parts of the same lifeline system but when adopting a total system approach, it must be recognized that a diver lifeline system is NOT a fall protection system. Fall protection is for falling in air, an event which creates severe dynamic or shock loading. Falling underwater does not. Diver recovery involves lifting in air under very different physical conditions. Both sets of workers wear harnesses but that is a similarity not a commonality. So there is no logic in associating diving with fall protection. Unfortunately, some standards and codes confuse these applications. It is




Diver recovery harness

important that the diving industry develops a total system approach for its own unique workplace requirements.

The latest CSA Z275.2 safety code contains re-written sections on umbilicals and harnesses. These reflect a total system approach and provide an improved code that is simple, practical and understandable. In conclusion:

- Umbilical, harness and fittings are parts of the same diver safety system;
- Underwater and in-air functions must be understood;
- Strength ratings of all system components must be matched;
- Excessively high strength ratings are unnecessary;
- A suitable single strength rating for the total system is around 2000 pounds; and
- Diver recovery is not fall protection. 🇨🇦

Jonathan Chapple is a former UK Royal Navy Clearance Diving Officer. He is a member of the CSA Z275 Technical Committee on Occupational Diving and is also a director of DCBC. He joined Aqua-Lung Canada in 2005. He lives in Halifax, NS. The views and opinions expressed in this article are the author's own.



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The Practical Aspects of Cold Weather Diving in Canada

There are many challenges associated with diving in Canada's frigid waters. In this article, Gord Hay keeps you up-to-speed on the challenges with cold weather diving and how to overcome them.

By Gord Hay (Diver), Canadian Working Divers Institute

Diving in cold weather is a fact of life in Canada. With Canadian cold winter and Arctic diving operations commonplace in this country, there can easily be a tremendous differential between the water temperature and surface temperature—often spanning from Arctic salt-water temperatures of 31 F to surface temperatures of -70 F.

In this article, I will identify specific problems with cold weather diving such as: Second stage diaphragm freeze up before submersion (froze open or closed); Ice in pneumo causing loss of depth monitoring; Gas build-up causing loss of ice bearing strength, Filter packs, regulators and racks freezing; Side block freeze-ups and more.

Second stage diaphragm freeze up before submersion (froze open or closed)

$PV = nRT$

Reduce the pressure and temperature will be reduced

Reduce the Volume (diameter) and temperature will be reduced

Regulators produce cold, they reduce pressure and volume.

When moisture in the second stage is exposed to the frozen housing the diaphragm will often become sealed closed. This is most common before entering the water and I have never heard of this happening underwater. Go to free flow and wait on the ladder with the helmet submerged until the demand is working properly. Avoid using the purge button because this can tear the diaphragm.

Avoidance:

- Remove and dry the diaphragm at the end of each day;
- Change liners between dives with a warm dry one; and
- Enter water from a warm shelter.

If the second stage is free-flowing and cannot be stopped with adjustment of the dial-a-breath, the helmet should be removed and gas supplied stopped until the housing is heated. The flowing gas will only cool the diaphragm more.

Avoidance:

- Keep the helmet warm between dives and the diaphragm conditioned.

Exhaust valve freeze up before submersion (froze open or closed)

Due to the same reasons as above, the exhaust check valve will often freeze open before entering the water. Stay at the ladder after submerging the helmet until the exhaust is working properly.

Avoidance:

- Remove housing and dry the valve at the end of each day; and
- Change liners between dives with a warm dry one.

Always be prepared to remove the helmet after locking down if exhaust is frozen closed.

Remove the helmet and warm until exhaust is free.

Avoidance:

- Keep the helmet warm between dives and the diaphragm conditioned.

Ice in umbilical gas hose causing lose of surface supply

Compressed gas carries moisture, which freezes at steel fittings causing pellets. These can completely block the flow in the hose or get caught in the helmet check valve, block, bent tube assembly or second stage. If the diver identifies a loss of pressure or volume or ice pellets are felt coming through the oral nasal then the dive should be aborted. The secondary gas supply pressure should be maintained at 1.25 times the primary. If blockage occurs, switching to secondary can pass the blockage. Insure the bailout supply comes into the block down stream of the check valve. This will allow the diver to go on bailout and free-flow if the check valve and second stage are frozen.

Avoidance:

- Use water separates in the filter pack (a pressure container full of marbles with a drain cock before the filters in a heated environment works well);
- Use dry bottles, air kept warm;
- Avoid exposed fittings above water;
- Blow out hoses with bottled air at the start and end of each day (always point hose away from persons when blowing out, I've seen one lad with a ice pellet embedded in his hand);
- Use hoses that are rated for cold weather (i.e. Barfeld diving umbilicals are rated to -10F only; and
- Light weight hoses do not insulate as well as Gates HD (Working in -30F with a light weight hose, we had to side bloked freeze-ups, no gas even with bailout on. Switching back to Gates HD solved the problem).

Ice in pneumo causing loss of depth monitoring

Ice pellets can block the pneumo hose. Before each dive start a slow bleed on the pneumo keeping an eye on the gauge to avoid pinning. Stop bleed to check depth and then resume. A pressure relief valve at the gauge can avoid damage to the gauge.



Diving through the ice on Lake Simcoe to complete repairs to outfall diffuser nozzles.

Photo Courtesy of ASI Group

Avoidance:

- Blow out pneumo hoses with bottled air at the start and end of each day;
- Avoid fittings down stream of gauge; and
- Use 3/8 ID hose that is rated for freezing conditions.

Start-up of equipment

Try to keep the compressor and power plant warm after shut down. If not possible, remove the oil from engine and keep warm. Remove the belt from power plant, start and warm up engine. Shut down

and replace belt then start maintaining slow RPMs with outlet valve open until compressor is warm.

Avoidance:

- Use block heaters on power-plant and compressor; and
- If possible use electric power-plants.

Protection of surface crew from wind and cold

When surface temperatures are below freezing, a heated shelter such as a sea container, cube van or tent should be used to keep equipment and standby diver warm.

Getting and maintaining access to water

Use a chain saw with long bar and vegetable oil for chain oil to cut access. I prefer an equilateral triangle with minimum of one-meter sides. Cover the hole with SM Styrofoam and snow at the end of the day to keep open, or maintain a bubbler.

Moving ice

Moving ice can close the access hole or grab the umbilical. If the pack ice is moving the access hole should be shored up to prevent closing. Diving in a river with flowing ice should be considered too hazardous unless some type of diverter can be installed to eliminate ice flow from access to work site. Topside should always keep a lookout for hazardous moving ice conditions. Moon-pools can become clogged and anchors could drag if the vessel is in moving ice. Be prepared for moving ice when diving from a vessel.

Getting to dive site

If traveling on ice, thickness must be verified. Try to access the water as close to the diver's work site as possible. This could mean cutting several holes, say along a pipeline. In this case, you could use a shelter on skids or if ice conditions are good, a cube van. If ice conditions are poor, a shelter on a flat bottom steel boat that can be dragged over the ice will increase safety.

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Gas build-up causing loss of ice bearing strength

If ice thickness is two feet or less or you are diving in the same location for several days divers exhausted gas can build up under the ice weakening bearing strength. This can also act like a bubbler thinning the ice. If gas is seen coming up through a crack be aware and identify thinning conditions.

Pre-dive planning and job hazard analysis

This will be the greatest line of defense against accidents. Everything takes longer to do in freezing conditions and this is no exception. Besides typical pre-dive planning there are several other considerations:

- Divers thermal protection;
- Identification of hypothermia or even hyperthermia;
- Extra weight needed if diving dry;
- Locating work site;
- Monitoring of weather and ice conditions;
- Standby divers thermal protection; and
- Minimum four-man crew (confined access).

Emergency Contingency Plan

It will take longer to transport injured personnel to shore and keep them warm in cold weather conditions. Here are some extra considerations:

- Moving ice hindering access to shore;
- Freezing of access hole;
- Loss of divers gas supply;
- Compressor or equipment freeze-up;

- Hypothermia management; and
- Changing weather conditions.

Filter packs, regulators and racks freezing

If the filter packs are not located in a heated environment the moist elements will freeze and stop airflow or tear and send filter material into the rack. I have had a blockage at the helmet check valve due to filter debris. Moisture in the divers rack can freeze and block flow and HP regulators can freeze closed.

Avoidance:

- Keep the filter pack and divers rack in a warm environment;
- Keep secondary gas supply and regulators in a warm environment;
- Bleed filters regularly;
- Tee off of the bottle to two regulators for extra redundancy;
- Use glycerin or cold weather gauges; and
- Add a water separator before filters.

Power tools freezing

Always try to use hydraulics in freezing conditions. Besides the start up of hydraulic pump and running a tool to warm up hydraulic oil there is no other concerns.

If pneumatics are the only choice, be prepared for freeze-ups. Here are some modifications that I have found to help:

- Use an air heater down steam of the compressor;
- Use a mixture of half methalhydrate and half mineral oil for the inline oilers;
- Keep all pneumatic hoses above the water insulated; and

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- Run two tools to the job site, when one freezes use the other, when the second tool freezes the first should be thawed.

Battery life of electrical equipment reduced

Freezing temperatures greatly reduce the working life of batteries. Keep Batteries in a warm place and have spares handy.

In water decompression hazards

Always decompress using Sur-D- O₂ tables to minimize in-water times. Be sure to have heaters for the chamber and dry, warm blankets. Be aware of limitations with hot water suits.

Buffer 10 feet and 10 minutes due to off-gassing and larger buffer zone. Always blow down in the inner lock for extra heat. Ensure chamber has good structural bearing.

“Now, I always wear a Shorty under the hot water suit to give me some insulation. Hot water is awesome—there is less to no weight, good off-gassing and great mobility. You can apply more attention to the job.”

Loss of hot water for hot water suits

This is as cold as I’ve ever been. Three minutes from loss of hot water to leaving the 31F water. All was well below the rig in the Beauford Sea, two seconds later that all changed. The shock makes breathing difficult let alone talking. Top side told me to free flow because of my short rapid breathing while I was trying to scream, “Up on slack.” Now, I always wear a Shorty under the hot water suit to give me some insulation. Hot water is awesome—there is less to no weight, good off-gassing and great mobility. You can apply more attention to the job. Set up time is increased as well as E.C.P. and J.H.A. With decompression diving you need to have a heated reservoir with enough volume to complete the dive and water stops plus 25 per cent or have a second hot water unit. This often makes hot water suits impractical for decompression diving. Always add extra buffers and be prepared for omitted decompression.

Side block freeze-up.

This is when moisture in the gas supply starts to freeze and collects in the side block.

Once this has occurred you cannot free-flow the helmet or go on bailout.

Your only way out of there is to make it to the surface, get your kludge up under your neck dam or get the standby diver to get their kludge up under your neck dam.

This has happened to me twice while diving and twice while on the rack.

On all four occasions there were small pellets of ice felt coming through the oral nasal just before the freeze ups occurred. If this is felt by the diver, immediately abort the dive and call for “Gas to Pneumo”.

I have seen freeze-ups from -5C to -45C. It is not just the temperature that causes this but a combination of temperature, moisture content and due point.

Avoidance:

- Dive HP bottles that are stored in a warm location for at least 12 hours;
- Have a dryer placed in line-up stream of the filter pack and keep them in a warm location;
- Use a hot water shroud. (*Note: I prefer to dive in a dry suit with a hot-water shroud, and I tee off to hoses running to my gloves, then to my diving hot-water suit.) Breathing the warm gas keeps you nice and warm, you still have buoyancy control and when you exit the water you are dry. You can comfortably dive for over four hours in -1C water; and
- Never dive without a pneumo, besides depth monitoring it is your second gas supply line.

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Almost all jurisdictions in Canada require commercial divers to be certified competent as described in the CSA Competency Standard for Diving Operations

The Diver Certification Board of Canada is the only national body that certifies commercial divers to Canada's national standard of diver competency CSA Z275.4



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Diving Health and Safety Standards and Legislation in Canada

By Bob Landry, Canadian Workplace Safety Inc.

The physical nature of the water environment is intolerant of mistakes. Any incident can become a fatal accident. In recent years fatal accidents in the working diver community have been considered good press and therefore, have received considerable public attention. Government regulatory agencies both provincially and federally in Canada and elsewhere have reacted to these fatalities and recommendations of the Coroner’s Jury by enacting standards regulating the conduct of occupational diving operations.

For occupational health and safety to work, internal responsibility by diving employers/owners is essential. Health and safety standards and legislation has been written to promote that general responsibility. The key is that the occupational diving community and government must be partners in diving health and safety.

Diving poses safety and health problems comparable only to those encountered in space. In a fixed industry, service or discipline with its established procedures and consistent work environment it is relatively straightforward to exercise total control over health and safety and extend such controls to diving operations. In underwater work such as marine construction which is very mobile and contracted to various employers, control cannot rest exclusively with the constructor but also depends on the client commissioning the work. Owners engage architects and/or professional engineers to draw up contracts. These documents do not however instruct contractors on how to execute the work, nor do they spell out the control and procedures required for workplace health and safety in general or specifically, diving. The owner and/or client may share direct responsibility for the diver’s health and safety. Health and safety cannot be contracted away. If in the case of a diver fatality, where negligence to health and safety can be proven, the result can be criminal prosecution under Federal Bill C- 45.

Thus, when government regulations do not exist or are poorly enforced, there is a grave danger that a low bid will be accepted from a contractor who may either fail to recognize or may decline to control the hazards unique to a specific job. In diving operations, the danger is understandably intensified by any deficiency in the technical expertise required. It may also be the owner’s and/or client’s responsibility to ensure all required safe work practices are followed.

This danger was minimized in the late 1970s with the development of C.S.A. Standard Z275.2 and Z275.4 in the 1980s. The Z275 group of standards define reasonable precautions to be undertaken to guard against the dangers found in occupational diving. These standards have influenced regulations for occupational diving in all provinces and territories.

As with other environmentally hazardous work places like space or the sea, only competent specialists can be expected to implement necessary enforcement and educational programs. However, this is NOT the practice in many Canadian jurisdictions. In occupational diving each dive is different and no dive is minor

Continued on next page

Summary of Canadian Diving Legislation

In Canada there are 14 jurisdictions enforcing OHS legislation with 13 citing a diving regulation or the CSA Diving Standard.

Jurisdiction	Legislation		Competency Cert.	
	Yes	No	Yes	No
Alberta Lan Yau - (780) 415-0595	CSA Z275.2		CSA Z275.4	
British Columbia Warren Fulton – (604) 207-1437	Internal OSH Reg. Sec. 24		CSA Z275.4	
Canadian Federal Janine Aussant (819) 953-4193	Internal Labour Code Part II S. XVIII		Internal S.18.5 of Code	
Manitoba Giselle Stuve – (204) 945-7802	CSA Z275.2		CSA Z275.4	
New Brunswick Richard Blais - (506) 632-2819	Internal OHS Reg. 91/191 Part XX S. 299		Must be Competent	
Newfoundland/Labrador Craig Allen - (709) 637-2997	CSA Z275.2		CSA Z275.4 modified	
Nova Scotia Sergio Gregualdo - (902) 424-1724	Internal OHS Act S. 82 Reg. 174/2005		CSA Z275.4	
Nunavut Judy Kainz - (867) 669-4417	CSA Z275.2 Under Review		CSA Z275.4	
N.W.T. Judy Kainz - (867) 669-4417	CSA Z275.2		CSA Z275.4	
Ontario John Mitchell - (613) 290-4320	Internal OHS Act Reg. 29/94 Reg 155/04		CSA Z275.4	
P.E.I Ian Rodd - (902) 368-5575	CSA Z275.2		CSA Z275.4	
Quebec Claude Rochon - (418) 266-4699	Internal - OHS Reg -Code for Construction Industry-XXVI.I		CSA Z275.4 Review	
Saskatchewan Ray Anthony - (306) 787-4502	Internal OHS Act Part 20 S. 283		Must be Competent	
Yukon Ossie Vanasse - (867) 334-2002	No Reg.	*	No Reg.	*
Z275.2 - CSA Standard “Occupational Safety Code for Diving Operations” Z275.4 - CSA Standard “Competency Standard for Diving Operations” Internal - In-house legislation Review – Regulation Under review – future amendment possible Must be Competent – Responsibility of employer Modified – Standard adopted with slight modification				

Photo Credit: Dave Geddes



or routine. A superficial approach to inspection and control by inexperienced inspectors will only aggravate the many diverse problems of occupational diving recognized universally as high risk work. Legislation cannot be expected to provide universal guidance or control. Through government and diving sector cooperation, serious health and safety consequences for divers, along with costly punitive and legal costs for employers, owners and supervisors can be prevented now and in the future.

Future diving health & safety articles will address the interpretation of specific clauses found in the various Canadian standards and regulations and discuss various past diving incidents. Please address any queries or questions to Bob Landry, Canadian Workplace Safety Inc, rwlandry@sympatico.ca

Bob Landry, who recently retired as MOL, Provincial Diving Coordinator, is the chairman of the Z275.2 Committee and is a partner in Canadian Workplace Safety Inc. along with Steve Duffy.

Quebec: Stretching Out a Buoy to Professional Divers

By Marc-Andre Desy

Since the month of June 2010, the province of Quebec has tightened its construction safety measures by adopting changes on the code of security for building work and the regulation on the health and the safety of the work (RSST). These changes require adjustments for all companies on dive sites and new vigilance when evaluating a job overall cost.

Research and statistics produced by the CSST established an alarming rate of mortality of the professional divers which is 20 times higher than that of the sector of the building and the public works.

Something had to be done!

A decade of hard work, during which a committee of experts regrouping the fields' best, analyzed, exchanged and made consensus on a section of 94 articles, which represent many prevention measures to insure the health and the safety of the diving teams. These finds brought the committee to interrogate on the statutory gaps susceptible to put in danger the lives of the divers. Among these, we find different changes concerning:

- Obligations for the employers and the divers;
- Dive modes;
- Responsibilities of diving team members;
- General safety standards; and
- Documents, equipment and material.

What's more, an emergency line is now in service (24 hours a day, seven days a week) in the medical care unit of the Quebec Diving Medical Service. You can contact them at 1-888-835-7121 or by visiting www.cmpq.org.

The task of reviewing 94 articles required determination and hard work. The committee needed to focus on the long term benefits and on the importance of the human factor. Such labour must be accompanied by the motivation that we can improve the safety on each construction site and that the security of our workers remains our top priority.

For further information contact the Canadian Association of Diving Contractors for a copy of the newly amended code of regulations in effect for the province of Quebec.

Marc-Andre Desy is the President of the CADC.

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An example of DR&T's underwater capabilities was recently highlighted on an episode of National Geographic's "World's Toughest Fixes". In this particular case, three 25 Ton air hoists were used to surface a 50 Ton rudder to the surface. For more on this particular story and how DR&T's equipment was utilized please see the following link - <http://channel.nationalgeographic.com/series/worlds-toughest-fixes/all/Overview> and choose the 50 ton rudder episode.



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