OFFSHORE HELICOPTER SAFETY INQUIRY
November 23, 2009
Tara Place, Suite 213, 31 Peet Street
St. John's, NL

November 23, 2009

PRESENT:

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Anne Fagan.....Inquiry Counsel

Amy Crosbie. ..... Canada-Newfoundland and Labrador Offshore
..... Petroleum Board (C-NLOPB)

Ian Wallace/ ..... Hibernia Management and
Cecily Strickland..... Development Company (HMDC)

D. Blair Pritchett/ Denis Mahoney.....Suncor (Petro-Canada)

Alexander C. MacDonald, Q.C..... Husky Oil Operations Ltd.

Geoffrey Spencer..... Helly Hansen Canada Ltd.

Rolf Pritchard/
Laura Brown Laengle .....Government of Newfoundland and Labrador

Michael Cohen .....Cougar Helicopters Inc.

Jamie Martin.....Families of Deceased Passengers

Kate O'Brien.....Davis Estate (Pilot) and
..... agent on behalf of Douglas A. Latto for Lanouette Estate (Co-pilot)

V. Randell J. Earle, Q.C. .....Communications, Energy and Paperworkers Union
..... Local 2121

David F. Hurley, Q.C./
Karen Hollett..... Offshore Safety and Survival Centre, Marine Institute

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COMMISSIONER:
Q. Good morning, ladies and gentlemen. We're ready now to start the evidence from the--on the survival training from Memorial University and so are we ready, Ms. Fagan?
MS. FAGAN:
Q. Yes.
COMMISSIONER:
Q. Good morning, Mr. Rutherford.
MR. RUTHERFORD:
A. Good morning, Commissioner Wells.
COMMISSIONER:
Q. Okay then.
MS. FAGAN:
Q. This morning we're going to hear from the Offshore Safety Survival Centre, and as you may recall from the introduction quite some time ago now, the Centre offers a comprehensive range of courses in safety and emergency response training to a number of industries, and in particular, to the offshore petroleum industry and the Centre has a particular expertise in dealing with training for operations in cold and harsh environments and for this reason, it provides training to

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the workers in the offshore facilities off the coast of Newfoundland and Labrador.
The format over today will be--there will be a little bit of movement back and forth. We will initially hear from the director of the Offshore Safety and Survival Centre, and that is Mr. Robert Rutherford. Then the inquiry is going to hear as well from Greg Harvey, and Greg Harvey is one of the trainers. Greg will provide a demonstration on the use of the HUEBA, which is the helicopter underwater escape breathing apparatus. We heard an awful lot of information on that device last week, and Mr. Harvey is one of the trainers and he has brought in one of these devices and he will explain the use so that there may be a little more of a complete understanding as to some of the aspects and the complexity of bringing such a device into the training environment.
When Mr. Rutherford and Mr. Harvey are finished, we will have a panel, Mr. Rutherford, Mr. Harvey and as well another trainer, Mr. Patrick Dohey, is here. So the two trainers and the director will sit together, at which time we will then open up

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the questioning, because some of the questions may be more ideal for the trainer and other questions may be more ideal for the director. Mr. Rutherford will then direct the questions to the appropriate individual and as well during these presentations, there are three videos and we'll move to those at the right time.
So in order to help this run smoothly, we're going to have Mr. Rutherford sworn and Mr. Harvey sworn and Mr. Dohey sworn, so that when they're getting up and down, we don't have to go through that process. So I'll first ask Mr. Rutherford to provide his full name and to have the Registrar swear him in.
MR. ROBERT RUTHERFORD, SWORN
REGISTRAR:
Q. State your name please.
MR. RUTHERFORD:
A. My full name is Robert John Rutherford.
MS. FAGAN:
Q. I would ask Mr. Greg Harvey to come forward and be sworn and then we'll have Mr. Dohey come forward.
MR. GREGORY HARVEY, SWORN
REGISTRAR:

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Q. State your name please.
MR. HARVEY:
A. Donald Gregory Harvey.
REGISTRAR:
Q. Thank you.
MS. FAGAN:
Q. And Mr. Dohey.
MR. PATRICK DOHEY, SWORN
REGISTRAR:
Q. State your name please.
MR. DOHEY:
A. Patrick Dohey.
REGISTRAR:
Q. Thank you.
MR. ROBERT RUTHERFORD, EXAMINATION BY MS. ANNE FAGAN
MS. FAGAN:
Q. Mr. Rutherford, can you please provide a brief summary of your background? And I understand you're also going to give us a brief summary of Mr. Harvey's background and Mr. Dohey's background so that everybody has a context and perspective as to where the three of you are coming from and what information and experience you have.
MR. RUTHERFORD:
A. Okay, and I'd like to say good morning,

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Commissioner Wells, counsel and stakeholders and also to any viewers at home. I am very happy and pleased to be here to present the Marine Institute's offshore survival capability to this Helicopter Safety Inquiry. I've been Director of the Marine Institute's Offshore Safety and Survival Centre for ten years. My background is I'm a registered professional engineer, as well as a certificated first class marine engineer. After I completed my engineering training or engineering education in South Hampton, England, I went to sea for 12 years, sailed in a wide variety of vessels, vessel types with a number of different companies in all ranks, up to and including chief engineer.

I came ashore and in 1984, I joined German & Milne which at the time it was a marine engineering naval architectural consultants and specializing primary in icebreakers and icebreaker construction and modernization. I joined there as senior mechanical engineer and subsequently, I was technical manager there. With this company, I worked on and led a range of ship design, ship modernization projects. As well, I engaged in

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a wide range of consulting projects which included ship surveys, inspections, quality management systems and safety management systems.

In 1990, I accepted a position here in Newfoundland with the Newfoundland Dockyard Corporation. At the time, the dockyard was a ship repair yard. It was looking to position itself to bid on offshore fabrication contracts. I applied for the position of manager engineering, which was a new position at the Dockyard, and the responsibilities of that department were to set up an engineering group as well as quality management and safety management, develop a quality management and safety management systems for to bid offshore contracts.

When the shipyard changed ownership from the public sector to the private sector, I left there and moved to the Marine Institute, where I took over a position initially as a tanker instructor at the Offshore Safety and Survival Centre. I have a long background, from my childhood, I was a competitive open water swimmer as well as an open water lifeguard and a dinghy sailer. So I moved

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very quickly into doing other types of training at the Offshore Safety and Survival Centre. I also taught at the main campus of the Marine Institute in marine engineering and marine management subjects.

For the last five years, I have served as the secretary of the International Association of Safety and Survival Training and that's an organization that represents 140 training providers worldwide in 46 countries.

As the director of the Centre, I'm no longer involved in delivery of training, but I do have a responsibility to our clients to ensure that training is delivered efficiently, effectively and safely. As mentioned there before, I have two instructors with me today. Greg Harvey and Pat Dohey will be available for questions on specific details relating to training delivery, if required. Greg Harvey is a survival training specialist and Pat Dohey specializes in firefighting and other aspects of helicopter transportation. As noted previously, Greg Harvey will also provide demonstration of the details of helicopter underwater escape breathing apparatus.

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Just brief background. Greg Harvey is an instructor with the Offshore Safety and Survival Centre. He has more than 25 years experience in cold water marine survival training, including helicopter underwater escape training, qualified instructor trainer for both rebreather and compressed air helicopter ditching emergency breathing systems. In addition, he has extensive experience working as an occupational diver, dive supervisor and is the lead instructor for the Marine Institute's occupational dive program. Mr. Harvey is a member of: the Canadian Standards Association Occupational Safety Code for Diving Operations, Technical Subcommittee; the CSA Competency Standard for Diving Operations, Technical Subcommittee; the CSA Occupational Diver Training, Technical Subcommittee; and is a member of the Canadian Association of Underwater Science. He also sits on the Provincial Workplace Health Safety and Compensation Commission, Diving Technical Advisory Committee.

Mr. Dohey has a Bachelor of Education degree from Memorial University, a Masters of Science in Risk Crisis and Disaster Management

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from the University of Leicester in the United Kingdom, as well as certificates in major emergency management, helicopter landing officer, helicopter refuelling, helicopter firefighting and rescue, and helideck attendant, and studying offshore helideck safety emergency response at a number of training institutions in Canada, the United States and the United Kingdom. He possesses senior fire officer certifications, the International Fire Service Accreditation Congress, IFSAC, and is a visiting staff instructor at the Canadian Emergency Management College in Ottawa. He has been an instructor with the Offshore Safety and Survival Centre since 1995, was the primary delivery of helideck safety and emergency response training for the startup of Hibernia, Terra Nova and White Rose offshore projects. He continues to provide this training on an ongoing basis and also provides advice and guidance on safe offshore helideck operations to various operators on the Canadian east coast, as well as the Gulf of Mexico.

MS. FAGAN:

Q. Thank you, Mr. Rutherford. Mr. Rutherford is

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going to use a PowerPoint presentation and before we start to go through that presentation, there are a number of exhibits and I'd like to have those exhibits entered if there is no objection. The exhibits are numbered 11 through to 23 inclusive, number 66 and as well, numbers 93 to 99. So I'd like to have them marked and entered as an exhibit.

COMMISSIONER:

Q. Okay then, they're entered.

MS. FAGAN:

Q. Now Mr. Rutherford, I understand you have a PowerPoint presentation and the format is going to be that for the most part, you can run through your presentation and occasionally I may interject with the odd question and then towards the end, we may have some further questions. So if you'd like to begin with an overview and then take us through your presentation.

MR. RUTHERFORD:

A. Thank you, counsel. Just like to say that the training of employees is fundamental to safe operations and will form part of any operator's safety plan. I will do my best to provide a comprehensive and accurate account

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to the Inquiry of the Safety Survival Emergency Response training which is provided to offshore petroleum workers and I'll also touch briefly on a role we play and can play related to many aspects of offshore safety.

The presentation I'm going to give today is going to address a number of issues. I'm going to start off with background information on the Offshore Safety and Survival Centre and the Marine Institute as well, including information on the nature and volume of our training deliveries, some of our academic processes, facilities, equipment, faculty and staff and our quality assurance and safety management systems. I will provide an overview of the East Coast Canada offshore training requirements, basically this is the envelope that guides our training to the offshore, a brief summary of some training requirements and envelopes basically in other regulatory jurisdictions. We'll get into some more specific details related to helicopter escape training and certainly related to helicopter underwater escape breathing apparatus where Greg Harvey will provide a presentation. Also provide information on how

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we look to approach knowledge gaps and seek to improve offshore safety training, some current plans which are already in place and have been in place to enhance the Marine Institute, the OSSC capability to provide survival and emergency response training to the growing offshore petroleum industry and some concluding remarks, and after the presentation, I'll be more than happy to take questions. The presentation can be found at Exhibit 11.

Just we are part of the Fisheries and Marine Institute of Memorial University and Fisheries and Marine Institute, Memorial University is probably known to most in this room. It may not be known to all of the viewers at home, but it is North America's most comprehensive institute dedicated to education, training, applied research and industrial support in the oceans industries, and also, it is part of Memorial University. It is a technical institute within the University and provides a portal to the ocean for industry, educators, government and researchers. So we have a--we are the focus point for the ocean activities.

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Just going to get into a little bit on how the Marine Institute is currently structure. This slide which I've brought up here, I will discuss. You'll see there's three circles in that, in the slide there, which represent the three schools. They're the three basic academic units of the Institute. The School of Ocean Technology is the newest school. This was recently implemented or put in place only last year and it looks at programs, applied research and development associated with ocean technology and it's very much a growing sector in Newfoundland and Labrador. The School of Fisheries relates primarily, as it says, to the fishing industry, but it also has programs and it has aquaculture, seafood development and sustainable aquatic resources as two centres within the--you seen under the School of Fisheries, those are CASD and CSAR are two industrial response centres.

The School of Maritime Studies, which is what we are part of, as you can see, as programs which are primarily carried out at the main campus of the Marine Institute. The CMS, which is Centre of Marine Simulation,

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which is at the main campus of the Marine Institute, that's an industrial response centre which provides mainly simulating training which makes use of simulators, such as bridge simulator, engine simulator and ballast control simulators. Under there, you see the Offshore Safety and Survival Centre. That is our Centre. We provide, again, industrial response centre, and I'll get into that in a little bit more detail later, what that means, but we basically provide safety survival emergency response training to a wide range of industries and industry sectors, and under there, there's a SERT Centre. This is basically the SERT Centre, and again I'll get into that later, it's a satellite of the Offshore Safety and Survival Centre, which we spun out in 2003.

Around that, around the framework here, you'll see at the top across is a blue strip there, academic and student affairs. These, or the academic side of the Institute comes under an executive within the Institute. He oversees all of the activities relating to academia and the student affairs, as it states, and underneath, anything that's not

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related to the academic side is under the corporate services and external affairs, which looks after the operations, the basic operations of the Institute.

On the right-hand side, there's a number of offices. These offices report to the Executive Director. There's an office of research and development, which basically guides all our R & D activities. MI International, which looks after any activities that take place internationally. They also play a role with any of our graduate students that go overseas to study or to engage in activities, as well as they do a lot of developmental work overseas through CEDA and such other funding agencies.

The Canadian Centre for Fisheries Innovation is what it says, basically looks at innovations in the fisheries industry. One Ocean is basically a unit that was put together to try and bring together the concerns and issues relating to the offshore petroleum industry and the fishing industry as a communication and looking at ways that these two industries can coexist. We have the National Research Council, IRAP, which is a

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unit within the Institute which undertakes research, and CFNES St. John's, that's the Canadian Forces. We have a large contingent of Canadian Forces undergoing training at the Marine Institute, main campus. So that's got their own separate centre there. So that's basically an overview of the Institute.

This here just shows some pictures of the Offshore Safety and Survival Centre. This is our facility which is located in Foxtrap, just outside of St. John's. You'll see up in the top left-hand corner is our building there. On the bottom left is our firefighting training field. On the right-hand side, you'll see what is our survival tank, complete with some of the facilities there, including the helicopter underwater escape trainer.

MS. FAGAN:

Q. Just before you move on, the picture on the far right, the helicopter underwater escape trainer, we've heard the term "HUET" and I believe this may be one of the first times we've seen a photograph of the HUET. So that's the device that the trainees get in to be dunked and rolled in the training exercises?

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MR. RUTHERFORD:
A. That is indeed, yes.
MS. FAGAN:
Q. That's the HUET?
MR. RUTHERFORD:
A. Yeah.
MS. FAGAN:
Q. Okay, all right.
MR. RUTHERFORD:
A. I should, before I move on to the next slide, I'll just mention really, the Offshore Safety and Survival Centre was originally established to provide training to the marine transportation industry. That's why it fits within the School of Maritime Studies. As well as the fishing industry, they provided support to the School of Fisheries. Because of its location here in St. John's, we are located in convenient proximity to the extensive oil and gas deposits, Newfoundland and Labrador's Grand Banks and elsewhere. It has grown and become Canada's largest provider of safety survival and emergency response training to the offshore petroleum industry.

Just a little bit of our history there. Again, the facility, the OSSC has been in

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place for many years, providing support to the marine--to the School of Maritime Studies, but it's only been at its facility out in Foxtrap since 1986 and it was put there to deliver safety and emergency response training to the marine transportation industry, as noted before. In 1992, underwent a significant expansion, particularly relating to the fire field and fire field simulators, and this basically enhanced the facilities in preparation for delivering training to the offshore petroleum industry.

In 2003, in response to continued expansion of training volumes at the OSSC, as well as an anticipated increase in these volumes, a new expanded marine base was established in St. John's harbour, and we also span out the satellite training centre in Stephenville in Western Newfoundland. The Satellite Training Centre, SERT Centre, basically, currently focuses primarily on non-marine safety and emergency response training, but is also able to provide a range of marine emergency response training courses. The establishment of that centre allowed us to move some training courses out of the OSSC.

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In particular, what we moved out were long certificate courses in firefighting and the challenge we were facing is that these--because they were long courses, it reduced our flexibility to offer short courses because they were taking up facility space and we weren't able to respond as rapidly as we needed to to the offshore petroleum industry needs. So that gave us a lot more flexibility to schedule our short courses.

In terms of courses that we have, we have 80, around 80 standard short courses in the area of safety survival and emergency response. Around 25 percent of the courses we have are focused at the offshore petroleum industry and we're also able to, and we do, deliver--develop and deliver client courses or client required courses, custom courses to meet specific needs. All the courses at our Foxtrap campus are between half a day and ten days' duration, so they're all--it's all short course training. The majority of our courses involve practical exercises in some way or another, but everything that we deliver at the OSSC, as an industrial response centre, we operate on what's called a cost recovery

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basis, and this is basically our facilities are provided for us, and major equipment are provided for us either through Government or other funding arrangements, but the actual delivery of all courses, including all ongoing maintenance, service, support and all minor equipment activities all has to be funded out of our training revenue. So we have to essentially break even.

This next slide just gives a little bit of a snapshot of how the Centre has grown over the last few years. I think it's divided into--we got '95-96, '00, 2000 to 2001, 2005-2006 which are five-year blocks, and I think the last one is a three-year block. As you can see there, the Foxtrap, Southside, and the Southside is our marine base, which I mentioned before. You can see that the industrial response type training has gone from 60 to 1700 courses delivered to over 5,000. You'll see the technical certificate course there, '95/96-'00/01, we don't deliver that any more. That's now delivered in Stephenville. We also deliver training to the rural Newfoundland through--we take travelling courses out and deliver all round the

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communities of Newfoundland. What's missed there, I guess, is the two years '06/07 and '07/08 when we undertook a significant amount of training. There was a new regulation came in for the fishing industry and it required all people involved in fishing activities to have basic safety training. So the actual activity in those two years exceeded 7,000 people. We had--that was a very, very busy couple of years, and again this year is going to be similar because with the HUEBA, which was brought on, again we're exceeding the 7,000.

I think I should note there's an Exhibit 22 which--see if we can figure out how to shut this down. I think that's just--that just covers off the basic safety training, the basic safety training recurrent since '99. As you can see, the basic safety training, which I'll get into later, is our five-day course. It's relatively steady. These are--this is the course that's delivered to new entrants into the offshore petroleum industry, so that remains, except when we have new developments coming on stream, that remains relatively steady. The recurrents, which are the people

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actually in the industry, are just continuing to steadily grow with more and more people are engaged in this offshore petroleum industry off Newfoundland. That's shown in the slide there, the growth that's going on.

Just going to get a little bit into the academic structure of the Marine Institute. We are an educational institute and a public body, but all courses that we deliver at the Offshore Safety and Survival Centre are subject to the oversight of Academic Council of Fisheries and Marine Institute, and the role of the Academic Council is to approve, for recommendation to the University Senate, all degree regulations, courses and programs of study and to approve all non-degree regulations, courses, programs of study and candidates for diplomas and certificates. Approval of new courses and revisions to courses at the Offshore Safety and Survival Centre is undertaken by a standing committee of the Marine Institute's Academic Council, which is called the Non-Degree Program Committee. This committee is chaired by the Vice-Chair of Academic Council and includes the Marine Institute Registrar, three faculty

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members for each of the schools, one non-voting curriculum specialist and one student.

One of the key, I guess a key feature of our academic process is there is a separation of academic from operations, which means that our training quality is not sacrificed to expediency. If we need a change of course or something needs to be updated or changed, it has to go through a formal process, which can be, you know, when you're responding to industry, can sometimes be frustrating, but it tends to be--it's not--it's quite efficient and I think it serves a valuable function.

Our courses are subject to a regular review and updating and a schedule for review is prepared by Assistant Director of Programs, who reports to me, in consultation with a Program Chair. Our program chair there is a faculty member who is voted into that position for a duration of two years by other faculty members, and he has a role to play in developing of new programs and courses. Reviews may be undertaken because of the time since the last review, as a result of updating the regulations or other reason, as a result of comments received from students, clients or

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instructors, and the review of update is conducted by the faculty members who are teaching the course and under the oversight of program chair for some courses, not necessarily--if it's a course that's only delivered by one instructor, this may not be in that--it may not be--it may just be dealt with directly. Updated courses are signed off by management. We sign off to confirm that the courses are--we have the resources to deliver the courses and we have the--and that the courses do meet the requirements of our clients, and after that, they're submitted to the Non-Degrees Program Committee, which vets them for compliance with all academic processes.

The majority of our courses are regulatory required courses, so they're subject to external accreditation. They're required in some way by legislation. So the OSSC is recognized as a training provider by the Canadian Association of Petroleum Producers and its recognized by Transport Canada, the International Fire Service Accreditation Congress and others. For any courses that we deliver in accordance with

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external regulatory requirements, basically our review process involves us going to the regulator. If we update a course, we go first to the regulatory to confirm that the course meets their requirements. It then comes internal and goes through our own Non-Degree Programs Committee, just to confirm that it meets all requirements of the Institute.

Just on our employees, we're moving onto now. The current number of personnel full time and on call at the OSSC, including the SERT, the Safety and Emergency Response Training Centre in Stephenville, is 86. This is comprised of four managers. That's myself, I have an assistant director of operations and administration and I have an assistant director of programs, and I have a manager at the Safety and Emergency Response Training Centre in Stephenville. We have 70 faculty which are instructors and technical support personnel. This is comprised of both full-time and on-call people. We have around about 70 to 80 percent of those are full-time faculty at our Centre, but we have what are called a number of on-call personnel and these are people that work within industry generally

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and when they're off on duty--a lot of them work shift work, like in the marine industry or offshore industry. When they come in off duty, they will provide training at our Centre, and this provides two things for us. One, it allows us to be reasonably flexible in terms of capacity. We have a number of people we can call on. Two, it keeps what's going on--it maintains a currency with industry requirements, so that we don't become separated from our clients.

We have three of our faculty are currently undertaking work related to research and development in the marine and offshore industry. I've got eight administrative personnel who are involved in processing student files and receiving payments. That's between the two centres. There's two out in the SERT Centre and six in Offshore Safety and Survival Centre, and because we have a cafeteria at the Foxtrap campus, we have one catering employee.

Our instructors are selected through an open competitive hiring process. We're part of Memorial University. Everything has to be published, advertised and there is a formal

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process for any hiring of instructors or any other employee, but the instructor process takes account of qualifications, certifications, industrial emergency response experience, as well as teaching experience. New instructors when they come on to the Centre are provided with an orientation and training program before they're assigned to course deliveries, and I think I've got some exhibits there on our-- we might as well go, 19, 20 and 21. Let's have a look through that.

19, this is just--this would just be a typical advert for an instructor involved in safety and survival, which identifies what the duties are going to be. They will be delivering classroom instruction, but also assist in development of course materials in new and existing courses. Typically, our qualifications we're looking for, at least five years experience on offshore installation or commercial vessel, successfully completed three-year technology diploma or Transport Canada certification and we give preference to candidates with superior education previous to experience, industrial experience, members of

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emergency response organizations. We also look at some qualifications, if they're highly desirable, it's useful for us to have people who have SCUBA diving certification, fast rescue boat, life boat coxswains, emergency operations team safety of safety management, and we need to have people in good physical condition. So that's a typical advertisement.

We have in place, within our quality system, which I'm going to get into a little bit later, our instructor competency procedure, where we ensure people remain competent within for the delivery of courses and the Assistant Director of Programs and the Manager oversee this aspect of our operations, but to ensure that people, when they do come on board, have gone through the appropriate orientation, mentoring processes, ensuring that if there's external approval required by a regulatory authority for these people to teach courses that this has been obtained and you know, as noted here, we look at the hiring process and when we assign a new instructor at the Centre, we'll begin an orientation mentoring process, which is managed by the Assistant Director of Programs and we also

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undertake a course. During this process, there's a course we call STaRT, which is Successful Teaching and Resource Training. This is a specific effective teaching course that we utilize at the Offshore Safety and Survival Centre and SERT. Basically it covers off aspects of teaching in the classroom, as well as practical teaching requirements, and there's a requirement there to maintain competency. We have to have people engaged continuously in courses or we have to recertify them in the courses that they're teaching.

And I think if we look at 21 there, this is just--this would just be a table which indicates the required competencies. For any of our marine courses, which are delivered under Transport Canada, before we can assign any instructor to delivering a course, they have to be approved by Transport Canada and we have to submit to Transport Canada--every year, we have to submit updated lists of instructors and their training competencies and what they've been doing in teaching. So this is an updated list. We don't have that for the offshore petroleum industry, not at

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this time, any specific external requirement put in place for our competencies, but we do have in place our own internal requirements.

MS. FAGAN:

Q. So can I just stop you there? In the marine industry, if you are putting off a course that's required or certificate that somebody's seeking in the marine industry, the trainer's qualifications is regulated by Transport Canada? So there's a regulation process for the -

MR. RUTHERFORD:

A. There's a regulation process.

MS. FAGAN:

Q. - for the trainers if it's a marine environment?

MR. RUTHERFORD:

A. Yeah.

MS. FAGAN:

Q. But in the offshore petroleum industry, are you saying that there is no regulation of the trainers? It's a -

MR. RUTHERFORD:

A. Well, the current -

MS. FAGAN:

Q. You have your own processes.

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MR. RUTHERFORD:

A. We have our own.

MS. FAGAN:

Q. But as far as an outside regulator.

MR. RUTHERFORD:

A. Yeah, in the current process under CAPP, the way they have approached it, because it is a fairly new industry and what they did when they started up basically is instead of--they haven't got into the detail of the requirements of instructors, but what they did was approve or accredit various institutions or training providers. So they looked at the certain capabilities of the providers and have accepted that their own internal processes. So at the present time, there is no set standard that's external to ourselves.

MS. FAGAN:

Q. Are there any industries, any petroleum industries that do have an external standard?

MR. RUTHERFORD:

A. Yeah, the UK has specific requirements under OPITO and I'll get into that a little bit later.

MS. FAGAN:

Q. And you're going to deal with OPITO and the

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UK?

MR. RUTHERFORD:

A. I'll deal with that a little bit later, yeah.

MS. FAGAN:

Q. You're going to do a comparison of the other petroleum industries and the Canadian industry?

MR. RUTHERFORD:

A. Yeah.

MS. FAGAN:

Q. In a few slides?

MR. RUTHERFORD:

A. Yeah.

MS. FAGAN:

Q. Well, I'll let you deal with that at that time.

MR. RUTHERFORD:

A. The next slide is just a little bit on the facilities and equipment. We have quite an extensive array of facilities and equipment to support training activities at the Offshore Safety and Survival Centre. It includes the large survival tank, which is complete with our helicopter underwater escape trainer, which we saw, various marine and offshore evacuation devices. There is an

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environmentally contained fire training ground outfitted with marine offshore petroleum helicopter fire simulators. Our marine base is outfitted with a variety of life boat, fast rescue craft launching devices, as well as we have a variety of different life boats and fast rescue craft. We have access to a seagoing marine vessel which is operated by the Marine Institute and which we make use of, and we have a large inventory of specialized training equipment that includes such things as our immersion suits, our helicopter passenger transportation suits, bunker gear, et cetera, et cetera, et cetera. It's considerable.

The next--oh, just before we get onto that, before I start that, I'm going to just show the next part of the--the first part of a three-part video, which is a video that we show to all the people that come through to the Centre. It's basically an--provides an overview of the Centre and provides an overview of some of our safety management practices. I'm just going to show the first part at the moment and the reason I think this provides -- particularly those that are not

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familiar with our Centre, it does provide a little bit of--you know, it's probably the best way to look and figure out what it is we do and how we go about it. So I will start this video. Hopefully it will start.

(VIDEO PLAYING)

Sometimes there are moments in life where the unthinkable happens. In those moments, life can depend on decisions made in seconds. At the Offshore Safety and Survival Centre, or OSSC, we help you put in the hours of preparation necessary so that you and everyone around you survives those crucial moments, so you'll be ready for the challenge. It's here that you'll learn how to think safe, act safe and be safe.

The Offshore Safety and Survival Centre is an industrial training and research centre of the Fisheries and Marine Institute of Memorial University, the most comprehensive institute of its kind in North America, and a globally recognized leader in its field.

The OSSC delivers the highest quality of safety, survival and emergency response training available to over 7,000 clients every year, clients from all over the world. The

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OSSC contributes to safety in a wide variety of industries, including marine transportation, offshore petroleum, fishing and other industrial sectors.

It is important to understand to follow the safety management systems employed by these sectors. Before getting into the do's and don'ts of emergency response, at the Offshore Safety and Survival Centre, we understand that safety begins as a mind set. The OSSC recognizes that the safety culture upheld by many of our client organizations is second to none. We have built our success on promoting the best safe working practices and we encourage you to share your best safety practices with us. In order to act safe, it's important to first think safe. To achieve a safe work environment, standards must be met at the highest level. At the OSSC, we aim to meet those very high standards by going beyond what is required by current legislation.

Our ISO 9001 accredited educational institute offers courses approved by authorities such as the Canada Newfoundland and Labrador Offshore Petroleum Board, Canada Nova Scotia Offshore Petroleum Board,

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Transport Canada and the International Maritime Organization. Part of what sets our courses apart is the ability to simulate a crisis in a way that is challenging to the trainee, but executed within a carefully controlled risk managed environment.

Our highly qualified and certified instructional team will take you out of the classroom and work safely in real-life simulated emergencies. In this way, we prepare our students to be ready for the challenge.

The Offshore Safety and Survival Centre is committed to providing a safe and healthy work and training environment. The OSSC adheres to all legislation, policies and procedures of the Occupational Health and Safety Act, Memorial University and our own specific safety and risk management practices. We employ specific exercise risk management procedures to mitigate the risk of an incident or accident. This includes procedures to identify and control workplace hazards, an active and involved occupational health and safety committee, as well as providing appropriate equipment and training to

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employees concerning workplace health and safety. Every manager, every member of the faculty and every staff member is familiar with their practical working conditions and they are required to report any hazards or violations to their immediate supervisor.

At the OSSC, our approach to safety management incorporates risk assessments, safety critical activities, and reducing the potential for the unexpected.

Before the course begins, clients are subject to medical and fitness requirements and should meet all course prerequisites. The course begins to be taught by an instructional team who will have the highest level of training and qualifications related to the particular field of study. Our instructor student ratios are kept low to allow for closer interaction and the frontline personnel are capable and authorized to deal with any situation.

Finally, a full safety orientation for all students is a critical requirement that takes place prior to participating in any practical exercise. Students must know exactly what is expected of them, so that they

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can think and act accordingly. Only then will everyone truly be safe.

I hope that provided a little bit of an overview. That particular video was shot partly at our Foxtrap Campus and partly in our Southside Campus. I will show a little bit of Part 2 and Part 3 of the video a little bit later on which has a little bit more detail about the activities that take place on those campuses. As noted in that video, the OSSC is part of the Marine Institute, and the Marine Institute is an ISO 9001 accredited educational institute, and as such, it's subject to regular internal and external audit. I'm going to bring up Safety Exhibit 99. This is our Certificate of Registration. We have had this ISO 9001 system in place for six years, so I think it's gone through a couple of re-registrations, but we basically have a system which complies with the requirements, the design and development provision of education and training, industrial and applied research, industrial assistance to fishers and marine related industries, both provincially, nationally, and internationally, and if we go down to the next

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page here -- because our institute is located at a number of different geographical locations, we have -- each location has to be separately certified, separately registered, and subject to its own audit. So we've got the Fisheries Marine Institute, the main campus which is at Ridge Road. You'll see the Foxtrap Campus, Little Soldiers Pond, which is the Offshore Safety and Survival Centre. We have the Pier 25 which is our marine base on the south side of the harbour, and we also have Stephenville Campus out on the west coast of Newfoundland. So I'm probably the most audited person in the universe, I think. So within that, we have a safety management system. Because OSSC specifically undertakes exercises and practical exercise which involve risk and possible harm to our students, we have a safety management system which is quite extensive, but this was in place for many years, but when we put the ISO 9001 system in place at the Marine Institute, we rolled our system into the ISO 9001 system, so that it becomes an integrated -- completely integrated management system. The situation, I guess, this means that all our safety systems are

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subject now to internal and external audits. We have an orientation video. Part 2 and Part 3 of the video I'd like to just show now. They're not too long. I think it's about ten minutes total. These show a little bit more of the activities that take place, the safety management systems that are in place at Southside and for the Foxtrap Campus.

MS. FAGAN:

Q. Before you start the video, because you did mention audits. You had mentioned in here that you're audited internationally. Have you been audited by any other regulators or any other authorities beyond the ISO auditing process?

MR. RUTHERFORD:

A. We're audited by ISO, which basically audits for policies, procedures, and our management structure and what we do, but we're also audited by -- we can be audited by regulatory bodies, so we are subject to audit -- regular audit by Transport Canada who we deliver courses to. We have been audited by the C-NLOPB. We recently undertook, which I think we'll be talking about a little bit later, there was course review undertaken by CAPP

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which was a form of audit. We're also audited by suppliers. We've had audits by Husky Energy and Petro Canada. So we're subject to frequent audits. People come to see -- you know, for good reason because we do put people into situations that are -- you know, do subject people to risk, so I think we are audited and people watch us very carefully.

MS. FAGAN:

Q. Thank you.

MR. RUTHERFORD:

A. We'll just play this. Here at the Offshore Safety and Survival Centre, Foxtrap Campus, we provide training in a range of areas, including sea survival, fire fighting, confined space, and helicopter emergency procedures. Fire fighting training takes place at our especially equipped fire field, which sea survival training takes place in our survival tank, which includes a helicopter underwater escape trainer, or HUET. For the safety of everyone on the campus there's a dedicated emergency response plan to deal with a variety of emergencies. Please take note of the marked escape routes and emergency procedures posted throughout the building.

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In the event of a real emergency, you will hear one continuous alarm bell to evacuate the building. Students must immediately gather at a clearly identified muster station. Your instructor will conduct a roll call to ensure everyone is accounted for. If a medical emergency arise, the technical personnel assigned to your practical exercise will immediately respond to the situation. They are trained as medical first responders and are re-certified to current medical protocols and standards on a regular basis. If the response required is other than minor in nature, we will activate the OSCC medical emergency response plan. A team of trained technical personnel, including paramedics will respond. The Offshore Safety and Survival Centre is extensively equipped with first aid equipment, including portable trauma kits and automated external defibrillators. These kits are readily available to medical response personnel.

Accident and incident reporting are important aspects of an effective safety management system. If you see an incident, accident, or unsafe practice, advise your

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instructional team immediately. Part of our safety culture is to prevent accidents before they happen. At the OSCC, we want to ensure that everyone involved is safe.

Any practical session on the fire field is first preceded by classroom instruction and a minimum of two instructors are present for all major fire fighting exercises. Technical personnel are also assigned to each course. They prepare the fire field and required equipment prior to the exercise, with your safety in mind. For each exercise, you will be issued personal protective equipment that you are required to wear at all times. Your instructors are also equipped with personal radios and a thermal imaging camera that will assist in ensuring your safety. Prevailing weather conditions are always taken into account when preparing for fire field exercises. During any fire field exercise, the following safety procedures must be followed. Your instructor is in charge at all times, listen and following instructions carefully. Report any medical conditions or concerns. Appropriate personal protective equipment must be worn at all times. Smoking

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is absolutely prohibited. Neither chewing gum nor facial hair are permitted while wearing a breathing apparatus. No lighters, jewellery, or cell phones are permitted. Report accidents, incidents, or unsafe practices immediately.

Your instructors will ensure that every student is accounted for before and after an exercise, and, of course, your instructors are also responsible for ensuring your safety at all times.

At our survival tank, our well trained instructors are responsible for ensuring safe conduct during all practical exercises. So we'll do that right now. We can do an head count. One, two, three, four. At least one instructor is on the pool deck at all times while an exercise is in progress. During in water exercises, a certified life guard is on deck as well. Technical personnel are on hand to ensure that all equipment is properly maintained and ready for use. Prior to entering the water, your instructor will show you proper procedures for that exercise, and as required, they remain in the water during practical sessions. Where required, equipment

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used during practical exercises is fully serviced, inspected, and cleaned by a licensed servicing company to ensure your personal safety and hygiene. During any survival tank exercise the following safety procedures must be observed. Your instructor is in charge at all times. Listen and follow instructions carefully. Report any medical conditions or concerns. Appropriate personal protective equipment must be worn at all times. You are encouraged to wear long loose fitting clothing for these exercises. No gum is permitted, no diving is permitted, no running on the pool deck. Report accidents, incidents, or unsafe practices immediately.

Here at the survival tank, your course may include training in this unit, the helicopter underwater escape trainer, or HUET. Because of the inherent risk in this type of training, we follow strict risk management procedures in all HUET exercises. Technical personnel are responsible for conducting an inspection of the helicopter underwater escape trainer prior to each exercises. The following personnel are assigned to a HUET exercise to ensure everyone's safety; two

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instructors who will be in the water with you at all times, a certified life guard, a crane operator, two in-water safety swimmers equipped with scuba, and a safety swimmer supervisor, also equipped with scuba on deck. You will wear personal protective equipment in a size appropriate for you. This equipment is serviced, inspected, and cleaned after each use by a licensed servicing company to ensure your personal safety and hygiene. Please be sure to follow all survival tank safety procedures while participating in helicopter underwater escape training.

Thank you very much for your attention. We have demonstrated to you the importance of safety in all our courses at the Offshore Safety and Survival Centre. While it's important to follow the rules, remember safety begins as a mindset, recognizing that we are all responsible for ourselves and each other. We then ensure that we are working within a true safety culture. So remember if you first think safe, then act safe, everyone will be safe.

Here at the Offshore Safety and Survival Centre's southside marine base, we provide

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training in open water sea survival, fast rescue craft handling, life boat operations, and oil tanker safety. This facility features a variety of marine and offshore life boat launching systems, rescue boats, and an ocean going training vessel. For the safety of everyone on the campus there's a dedicated emergency response plan to deal with a variety of emergencies. Please take note of the marked escape routes and emergency procedures posted throughout the building.

In the event of a real emergency, you will hear one continuous alarm bell to evacuate the building. Students must immediately gather at a clearly identified muster station. Your instructor will conduct a roll call to ensure everyone is accounted for. Should a medical emergency arise, the technical personnel assigned to your practical exercise will immediately respond to the situation. They are trained as medical first responders and are re-certified to current medical protocols and standards on a regular basis. If the response required is other than minor in nature, we will activate the OSCC medical emergency response plan. A team of

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trained technical personnel will respond. Portable trauma kits, including automated external defibrillators are readily available to medical response personnel. Accident and incident reporting are important aspects of an effective safety management system. If you see an incident, accident, or unsafe practice, advise your instructional team immediately. Part of our safety culture is to prevent accidents before they happen and we want to ensure that everyone involved is safe at the OSSC.

Your instructors are responsible for ensuring your safety during small boat operations and open water sea survival exercises. Any practical session in small boat operations is first preceded by classroom instruction. Technical personnel are assigned to all small boat training courses. We prepare life boats, rescue boats, and required equipment prior to the exercise with your safety in mind. For each exercise, you will be issued personal protective equipment that you are required to wear at all times. Your instructors are also equipped with personal radios and location devices to assist in

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ensuring your safety. Prevailing weather conditions are always taken into account when preparing for both small boat operations and open water sea survival exercises. During any small boat operations or open water sea survival exercises, the following safety procedures must be followed. Your instructor is in charge at all times, listen and follow instructions carefully. Report any medical conditions or concerns. Appropriate personal protective equipment must be worn at all times. Smoking is prohibited. Jewellery lights or cell phones are permitted. No gum is permitted while participating in an open water exercise. Report accidents, incidents, or unsafe practices immediately. Before and after an exercise, your instructors will ensure that every student is accounted for. One, two, three, four, five, six, seven, eight, nine -- and, of course, instructors will monitor you closely throughout the exercises.

Open water sea survival training is one of the exercises you may participate in while at the southside marine base. For the safety of everyone, we have extensive safety

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practices in place due to the inherent risk of this type of training. Training in a survival tank is mandatory prior to any open water sea survival exercise. The following personnel are assigned to open water sea survival exercises to ensure everyone's safety; the instructor on the deck, instructor in the water, fast rescue boat crew, including technical personnel with medical first responder trainer, training vessel crew, and two in-water safety swimmers. Before an exercise takes place, your instructional team and the master of the training vessel will review the weather conditions in order to decide a suitable location and if the exercise is a go or a no go. Before beginning any sea survival exercises, students receive a briefing on board the training vessel, outlining shipboard polices and procedures, including emergency procedures and muster points for real emergencies, location of emergency equipment, lounge area, and smoking policy. You'll also be briefed on potential hazards, including vessel motion, overboard discharges, and rubbing strake, ascending and descending ladders and scramble nets, and bow and stern

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areas. You will wear personal protective equipment in a size appropriate for you. This equipment is serviced, inspected, and cleaned after each use by a licensed servicing company to ensure your personal safety and hygiene. Students are responsible to make sure they fully understand what is expected of them and to listen and follow any instructions. Safety swimmers and the instructor in the water will monitor and assist you at all times. The fast rescue craft is also standing by. Trauma kits and hypothermia response equipment are kept and maintained on board the training vessel. If for any reason the master or instructional team feels that conditions are not ideal, the exercise will be terminated.

Thank you very much for your attention. While we have demonstrated to you the importance of safety within the delivery of all courses at the Offshore Safety and Survival Centre, and while it's important to follow the rules, remember safety begins as a mindset. Recognizing that we are all responsible for ourselves and one another, we then ensure that we are working within a true safety culture. So remember if you first

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think safe, then act safe, everyone will be safe.

Sorry for the duplication there. I think, basically there was a little bit between the Foxtrap Campus and the Southside Campus, but I think it does give -- those videos do give people a better understanding for those who are not familiar with our Centre of the activities that take place at our Centre and how we manage those activities. That video can be found at Exhibit 23 if anybody is interested. I'm going to move on now from the Centre to look at the basic framework that provides the oversight of training for the offshore petroleum industry in the Canadian east coast.

MS. FAGAN:

Q. Mr. Rutherford, before you do that, just for the viewers at home, if they go to Exhibit 23, what they'll likely see is a link to a website and that's a much more efficient way of pulling down the video, so that if somebody wants to look at that video again. Most of the parties already have the list and they see that on the list, it's a direction to a link, and the link will not likely cause as much

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trouble for your computer as trying to download the actual video. So that's why that's done. So for those that are trying to review this later on, go to the link. Now I don't like to interrupt your flow, but I have, so I'll let you go back to the training because I understand now you're going to drill down a little bit and get into some of the actual courses that pertain to the helicopter transportation.

MR. RUTHERFORD:

A. Absolutely, yeah.

MS. FAGAN:

Q. Because you've said you offer 80 courses. We're only going to focus on the few that are relevant to the transportation of the offshore workers.

MR. RUTHERFORD:

A. Thank you, counsel. So basically the training for the offshore petroleum industry here in Eastern Canada, information was provided by CAPP last week, but I'm going to go into it just a little bit and touch on the bits that actually affect our operations. Basically, the majority of the courses that we deliver, as mentioned before, are delivered in

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accordance with the Canadian Association of Petroleum Producers, and in accordance with Atlantic Canada Offshore Petroleum Industry Standard Practice for training and qualifications of personnel, as ratified by the Petroleum Board, and the current version of that was issued in April, 2008. The CAPP Industry Standard Practice Document is subdivided into eight chapters and they're shown here on the slide. We have drilling installations, personnel qualifications and training, production installations, personnel qualifications and training. These two sectors just identify what training is required for those two types of operations. Section 3 is mandatory safety training for all petroleum installations. Under Section 4, we've got a section on mobile offshore drilling units and the marine certifications required for mobile offshore drilling units. Section 5 covers standby, supply support vessel, personal qualifications and training. Section 6 is emergency preparedness and response for all petroleum installations, and Section 7 are exemption and equivalency procedures. Section 8 is recognition of

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certificates. I think information on these can be found in the CAPP exhibits last week, but also we'll get into Exhibit 12, I think. At the Offshore Safety and Survival Centre, we primarily focus on Section 3 of this document and that's what we're going to be talking about today. We do provide courses for -- marine courses for the standby vessels, but I'm going to focus primarily here on what we do for the offshore petroleum production and drilling installations. So Section 3.1 covers aspects of the personal safety training, and this is the safety training that's required. Everybody that goes offshore to drilling platforms or operations has to undergo certain levels of personal safety training. There is offshore survival introduction, which we'll get into. We'll get into these in more detail later, so I'll just list them out at the moment; basic survival training, basic survival training recurrent, hydrogen sulphide training, workplace hazardous materials information systems, transportation of dangerous goods, basic first aid, advanced first aid, and cardiopulmonary resuscitation, CPR Level C. Section 3.3 training in the

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offshore petroleum industry, many of the emergency duties are undertaken by specialized teams of emergency responders. So we undertake a fair amount of training for these teams and the type of training that we cover off here is offshore fire team, offshore fire team recurrent which is a continuing proficiency, helicopter landing officer, rescue craft team, survival craft coxswain. A note at the bottom there, Section 3.2, which you may think we missed out, basically that refers to technical training, such as crane operators, we don't deliver that at the Offshore Safety and Survival Centre, most of that is delivered by other private industry suppliers or by the College of the North Atlantic. So we don't touch on those.

MS. FAGAN:

Q. So before you move to this slide, as I understand it, CAPP last week provided information on the courses and what you've included in your exhibits in 12 and 13 are, I believe, the index, and then the outline of the courses. So you've taken the segments that apply to these particular courses and included those in your exhibits. So that if

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somebody is looking at the exhibits, what they'll understand is what's contained are portions of the entire program that are relevant. So we have the index and then we have our --

MR. RUTHERFORD:

A. There's the index there.

MS. FAGAN:

Q. But not all of the index has been included?

MR. RUTHERFORD:

A. No, it's only the parts -- we've only included the parts that are relevant. if you want to go for the full information, go to the exhibits that were provided by the Canadian Association of Petroleum Producers.

MS. FAGAN:

Q. So Exhibit 13, as you can see, is only the section that deals with the programs that we're going to focus on because we're interested in helicopter transportation and what's relevant to that. So many of the other courses that's offered, Mr. Rutherford won't be dealing with them.

MR. RUTHERFORD:

A. Just to touch base here on the Training and Qualifications Committee, again this was --

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this was provided. Paul Barnes of CAPP did provide information to the hearing on this, but just basically to refresh everyone's memory and just to provide the oversight for what we do, there is a Training and Qualifications Committee, and this Training and Qualifications Committee is a multi stakeholder committee which reviews and updates the Canadian East Coast Offshore Petroleum Industry Standard Practice for the training and qualifications of personnel. The Training and Qualifications Committee does consist of one representative from each of the Boards, the Canada Newfoundland Offshore Petroleum Board and the Canada Nova Scotia Offshore Petroleum Board. There are two representatives from the Canadian Association of Oil Well Drilling Contractors, the CAODC; three representatives from the Canadian Association of Petroleum Producers. That's as it stands at the moment within the Terms of Reference of the Committee in their current document. Representatives of the Marine Institute and Survival Systems do attend these meetings by invitation, and that's been since early 2005. Prior to that, we weren't part of

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this committee. Previously before 2005, if there were issues brought to our attention by the committee, it would just be communicated to us by the committee, but we do have an invite to sit on the committee now, although we're not actual voting members of the committee. We'll touch base on the Training and Qualifications Committee. They review the standard practice of training and qualifications every year. I noted that the current version is April, 2008. It has been delayed. I think it's due for -- I think they're going to try and get it out next month, but it has been delayed a little bit for some reason. Recommendations for any changes to training standards are managed through a change request form which is submitted to this committee. A change request form can be submitted by anybody. It can be committee members, or we can submit a change request form. That change request form will then go to the committee members and they will then review the change and at the committee meetings they would determine whether we approve the change, modify it, or send it back. If there is a need to update any course

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requirements between issues of the training standards, for instance, if we have a situation we had with the HUEBA course, which was introduced, between issues of the standard, those changes are communicated to stakeholders generally by letter or e-mail so that the information will come out to us and we're aware of it, but it will then roll into the next issue of the standards. There's three courses that are contained within the standard practice which relate to safety and survival training, or basic safety and survival training. This is training which is undertaken by people going offshore, prepares them for aspects of emergency response, provides awareness of the various hazards offshore, and also undertakes a practical training related to sea survival. So the three courses we have are basic survival training course -- this is a course that must be completed by anyone new coming into the industry prior to their first tour of duty offshore. The basic is a five day course and it's valid for three years. The basic survival training refresher course provides for continuing proficiency so that people who

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have been offshore, every three years they have to come back and to the refresher course. This particular course just provides for continued proficiency, and it's a little bit more practical orientated than the five day course, it really focuses on elements of practical training. We have a course called the survival introduction course. This is a course that's put in place for visitors, people who are not working offshore generally, they are people who are only going to be offshore for a short term, for a short period of time. I believe Commissioner Wells indeed took this course before he went offshore as part of this Inquiry. It's completed basically for people who haven't got a BST or a BST-R. It provides -- it's a one day course valid for three years. Generally people who are going offshore have done this course will be under the supervision of somebody offshore, so they're not -- they don't go through the full range of training because somebody will be keeping an eye on them while they're offshore.

MS. FAGAN:

Q. I notice that we're about one minute to the

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break time and you're now going to provide a little bit more detail on each one of these course, so this would be a good time to break before we get into that detail.

COMMISSIONER:

Q. Okay, we'll take fifteen minutes.

MR. RUTHERFORD:

A. That'll be good. My throat is getting dry.

(RECESS)

MS. FAGAN:

Q. Okay, we're back from the break and Mr. Rutherford is now going to go through a couple of slides that will explain the basis survival training, and we're going to focus on the basic course and the recurrent course, and a little bit on the introduction course, and I'll let you take it away.

MR. RUTHERFORD:

A. Thank you, counsel. I must apologize, my voice was starting to run out of steam there just before the break. I got a little bit of a rasp in the throat, but counsel has very kindly given me a cough drop, so hopefully I'll be in much better form right now, at least for a little while, anyways. Moving into the basis survival training course, which

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as noted before, is the course that everybody is required to take before they go offshore in Eastern Canada, and anyone coming into the industry is required, and the objective of this course is basically to provide personnel with a basic understanding of the hazards associated with working in an offshore environment, the knowledge and skills necessary to react effectively to offshore emergencies, and the ability to care for themselves and others in an offshore -- in a survival situation. So it is -- keep in mind, it is a basic level course. These are people who have not been exposed to the industry before and it just provides the grounding. This is going to be a little bit dry because I'm just going to go through some of the issues in relation to course content. I think it's just important that we know what is covered in this course just for the record. So the BST course, we deal with hazards and emergencies associated with working offshore, deal with emergency preparedness and response, prevention detection and control of fire, sections on self-contained breathing apparatus and the use of these, personal flotation

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devices. There's a section on what to do in the event of installation abandonment, how to use inflatable life rafts, use of totally enclosed motor propelled survival craft, life boats. It also covers off issues such as the enemies of survival, which basically teaches people what they need to do to respond in a survival situation. Cover off some aspects of search and rescue. Undertake, as we saw in the video there, practical sea exercises offshore here, offshore St. John's. Helicopter safety and emergency procedures, and helicopter underwater escape training, HUET exercises, one day dedicated wholly to issue relating to helicopter aspects - aspects of helicopter safety. We also deal with such things as personnel transfer devices, such as Billy Pugh and Frogs. Demonstration of emergency personnel descent devices which we have a Skyscape device for in the event of emergency, people having to evacuate a platform of a rig. Demonstration of the use of smoke hoods, and as of May 5th this year, we have compressed air helicopter underwater escape breathing apparatus training. I say May 5th. I think actually the e-mail in the

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exhibit came to me on May 6th, but we'll deal with that later. The next course we have there is BST recurrent course and this is where we provide the continued proficiency and it's a shorter course because it doesn't focus so much on the classroom activities, it focuses primarily on all of the practical activities, and the objective of this course is to provide the continued proficiency in the use of safety, survival, rescue equipment techniques. It also is intended to update individuals. In three years, there can be changes that take place to survival and survival technologies, so it provides an update to people working offshore on any updates to procedures or equipment. So this course, much shorter, is discussion of offshore hazards, deal with personal life saving equipment, looks at installation abandonment, survival rescue equipment and techniques. Again we have a practical sea exercise in the course, we have safety and emergency procedures associated with helicopter transport, we have helicopter underwater escape trainer exercises, and again we have the compressed air, HUEBA, exercises

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introduced this year.

MS. FAGAN:

Q. And the last course is the one day course?

MR. RUTHERFORD:

A. Yeah, this last course is the one day course which I'm going to turn over to Commissioner Wells to tell us all about because he's just done it.

MS. FAGAN:

Q. What's the differences really between the one day course, and where is the focus on the one day course which is for visitors, such as the Commissioner?

MR. RUTHERFORD:

A. The focus of this course is basically to provide visitors to offshore installation awareness of hazards associated with marine environment, understanding their responsibilities during an offshore emergency and the ability to care for themselves and others in a survival situation. As I said before, if you go on as a visitor, you will be provided a fair degree of oversight by somebody who will be assigned to look after you at an offshore situation, so you won't be left to your own devices. So this course

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covers off many of the same aspects; offshore hazards, emergency response, installation abandonment, evacuation systems, life saving appliances, personal flotation devices. There are practical pool exercises that covers off survival theory, survival distress signals, covers off rescue and rescue equipment, helicopter safety and emergency procedures, helicopter underwater escape trainer exercises, and compressed air. So there's a fair bit of information there in the one day. This course doesn't cover off -- we don't get an opportunity in this course to do exercises in the open water because it's only a one day course.

MS. FAGAN:

Q. So the sea day which you would get in the other two, and we heard Mr. Decker talk about the sea day, isn't part of the one day course, but in all three courses, I understand, everybody will have to do the HUET training and everybody will end up having to do the underwater breathing apparatus. So those two components, as well as the other ones that you've described, that physical pool "get soaking wet" type aspect of the training.

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MR. RUTHERFORD:

A. Absolutely.

MS. FAGAN:

Q. Has to happen?

MR. RUTHERFORD:

A. Yeah. One thing I might just mention on the subject of sea day, since you raised it, obviously we've got a situation that is occasionally, because of our requirement to manage risk, there's times that we can't always deliver the sea day just because the weather is too rough. We have a system in place where if either the skipper of the vessel or the instructors consider that this is too risky to undertake an exercise, then we will have it postponed. We do around about 120/140 sea exercises a year and possibly 20 a year do get postponed in this way. What the procedure is in these instances, because it is not always easy to get back and do these exercises, is that we will have -- we are permitted by the Offshore Petroleum Board and by the helicopter operator to issue a letter.

A letter indicates that the participants have completed all parts of the course except for the sea exercise, and this will allow them to

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travel offshore for a limited period, 90 days. They have to come back and do their sea exercise, but just because of the sheer issues of logistics, we have a situation where if you can't get that sea day completed, that's what will happen. I believe that Robert Decker did mention that in his testimony, that he was exempted a sea day. You don't actually get exempted it, you get a deferment. So you're allowed a limited period to go offshore without the sea day exercise.

MS. FAGAN:

Q. So that reference to an exemption would likely have been one of those situations where the weather or some other factor, it was too rough, and you get a 90 day grace. You can continue to go off and you've got 90 days to get in and get your sea done?

MR. RUTHERFORD:

A. Absolutely. I think Robert Decker's instance is something that happens very, very rarely, that the weather was just absolutely too frigid. There was a concern that people could get hypothermic on that day. That's not something that happens to us very often. That's, generally speaking, the reason for a

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deferment would be the weather is just too rough.

MS. FAGAN:

Q. Now the next few slides, I understand, is going to deal with international standards, and you had indicated in your description, your bio, that you are involved in an international committee and that you're now going to go through some of the standards in the United Kingdom and in Norway, and why have you chosen those jurisdictions as a comparison, and I think that's what's in your next slide as to why you've gone to those?

MR. RUTHERFORD:

A. Just before I get into that, I should mention that the OSSC courses that correspond to the CAPP requirements, BST, BST-R, and OSI are Exhibits 14, 15, 24. There is an exhibit there also which is a student manual. This manual is actually in the process of being updated at this present time, but the other courses are up to date, the course outlines. So just getting into the training comparisons, offshore petroleum industry, unlike the marine industry which has international standards through the International Maritime

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Organization, which is a division of the United Nations, there's no one international standard for offshore petroleum jurisdictions. Generally speaking, each nation involved in offshore petroleum activities will have its own regulations and standards, although a number of nations will accept the standards that are developed by other authorities, particularly, and I'll get into later, OPITO, which is a United Kingdom standard, is adopted, I think, in about 30/35 different countries around the world. They have adopted that standard. The reason I've selected to look at the United Kingdom and Norway is because both of these jurisdictions which are widely involved in petroleum operations in cold water environment, they have very mature safety regimes which are similar to Canada. So I think that they provide a reasonable comparison. There are other regimes, particularly in the North Sea. We have the Netherlands and Denmark, but they're much smaller operations, and I don't think it would serve any great value to address them. There's also another, the International Association of Drilling Contractors, is

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looking at developing standards for drilling contractors worldwide. That is progressing, but it hasn't really been gelled, so I won't get into that, but I'll get into a little bit on the United Kingdom and Norway, and just -- I guess, just a caution, the information I'm presenting here is based on my knowledge as part of International Association of Safety and Survival Trainers, talking with a number of training institutions worldwide. If you want to have the -- you may want to, if this is of particular interest to you or value to you, maybe it's worth going back to the source references just to confirm that everything is accurate. I believe everything I have here is close to the truth, but just -- is the truth, but you might just want to check source documents. On the United Kingdom standards that we'll get into here, in 1982 an offshore petroleum board was set up, and this offshore petroleum board was under the oversight of what was the Department of Energy. Basically this offshore petroleum board was probably similar to CAPP in the Canadian jurisdiction. I don't know how many are aware in 1988 in the North Sea, there was a very severe incident,

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the Piper Alpha disaster which resulted in the loss of 167 lives in that instance. After that disaster, there was -- Lord Cullen was selected to put in place an Inquiry to look at offshore safety and improvements to offshore safety in the UK, and as an outcome of that Inquiry, they established OPITO, which was an independent non-profit organization with a mandate to market training courses outside the UK, but the marketing is sort of a separate, a sort of a lower level category. Basically, the idea here was that OPITO was independent basically of the direct control of the operators. OPITO reported to what was a health and safety executive. So it was kind of similar to our Department of Labour. It became -- safety training was taken away from the operator's direct control, although there was a lot of participation here. OPITO courses and standards are now the most widely adopted training standards worldwide. In 2007, and I don't know, this is a fairly recent edition, OPITO sort of developed a little bit further and they created what's called an "Oil and Gas Academy". What the purpose of this is is really -- it's gone a

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little bit further rather than just sitting standards, setting requirements for courses. It actually -- the Academy will work with institutions and training institutions to develop course content and to various aspects of improving offshore safety, and this, I think, has come about because OPITO is now adopted in many places in the world, and many places in the world that have -- don't really have a strong educational training safety culture, so they've gone a little bit where they help people develop these capabilities. So it was launched basically as an industry focal point, the skills, learning, workforce development. Just a little bit on the academy, it's a self-sustaining employer and trade union led organization committed to developing and sustaining a safe, skilled, and effective workforce now and in the future. To achieve this, it has a mandate to work in collaboration with industry, employers, learning and training providers, education academia, and partnership organizations. I should mention here that OPITO and the academy are basically funded through -- in every training delivery there is a certain

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percentage taken off of the delivery which goes back to fund this organization. The equivalent OPITO standards to what we have here in the BST and BST-R are the basic offshore safety induction and emergency training, which is the BOSIET Course, and there's a further offshore emergency training which is the FOET Course.

MS. FAGAN:

Q. Now before you give us some details on the equivalent courses in these jurisdictions, I just have a couple questions on the process because you've mentioned that the process is a little different there than it is here after the disaster. The reporting, and maybe I have this wrong, was moved from the Department of Energy -- the coordination of the training moved from the Department of Energy and the oil operators to the Department of Labour. Would that be a fair comment?

MR. RUTHERFORD:

A. The equivalent of the Department Labour, Health Safety Executive, yeah.

MS. FAGAN:

Q. Health Safety Executive?

MR. RUTHERFORD:

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A. Yeah.

MS. FAGAN:

Q. And from your knowledge, can you provide any comment, do you think that it would be something worth exploring, is there any benefits that we may take here from the approach, the OPITO approach, and I'm not saying, you know, that we should necessarily throw out the system we have, just from your experience, is there any value or good aspects of that process?

MR. RUTHERFORD:

A. Yeah, and as with most things in life, there's a balance, and there's good and bad aspects of it, I think. The good aspects of it are that because it is a funded independent organization, basically you have in place professional people, whose job it is to basically manage offshore training standards. So there's people that are dedicated to that. I think the situation we have a little bit here in Canada is it's always part of somebody else's job, so it's not entirely -- we don't have something set up specifically with an organization whose job it is, and clear job it is, to do that. The downside, I guess, and

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I'll get into a little bit when I talk about some of the OPITO training is that because it reports to the equivalent of the Department of Labour and Health Safety Executive, it has a tendency to be -- their much more cautious in terms of what they allow people to do during training. We will, in Canada, I think, push the envelope a little bit in terms of training risk -- that that we don't manage the risk, but it's because we have control of it, we can push that a little bit, and I think when it comes back to the Department of Labour, you tend to get a little bit -- they're very much more cautious.

MS. FAGAN:

Q. So --

MR. RUTHERFORD:

A. So there's good and bad.

MS. FAGAN:

Q. Good and bad. So we took the recent development, which is the HUEBA, the underwater breathing apparatus. We've heard evidence last week that that took a fairly long time.

MR. RUTHERFORD:

A. Uh-hm.

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MS. FAGAN:

Q. Almost nine years, and there were suggestions that, and I think it might have come from Mr. Earle or some other counsel, that perhaps if there was a leader or somebody was tasked or devoted to that particular project, it may have moved along a little quicker. At the same time, you're going to get into the details, and I understand this device is not being used in the North Sea. So can you comment on how their approach may have applied to that breathing device?

MR. RUTHERFORD:

A. It's a little bit hard to comment on that. What I can say, I guess, is that OPITO did adopt a breathing device, but what they have adopted is a rebreather device, which has much lower risk associated with training activity. I think for sure it would have moved quicker, but I'd be very surprised if they would have moved to adopt a compressed air breathing device which has significantly more challenges associated with it. I think the compressed air breathing device, you know I don't think there's any doubt is the best device, but there are a lot more challenges, and I don't

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think it's -- you know, in a risk adverse, in an organization that really doesn't like pushing that envelope, I don't think it would have necessarily been introduced. So on the other side, because they have -- they are independent, they can push forward through training requirements a little bit more quickly, and the operators will have to generally abide by them. So it's probably a little bit more -- it's a bit more of a streamlined approach, but it has -- as with everything, it comes with its own negative consequences too.

MS. FAGAN:

Q. So they may have dealt with it quicker, but the likely result is we wouldn't have gotten the device through?

MR. RUTHERFORD:

A. Yeah, so I would suspect, but that's --

MS. FAGAN:

Q. Now you're going to go through, just give us a brief description of what they do in these two jurisdictions and then you're going to do a comparison, is that correct?

MR. RUTHERFORD:

A. Yeah, well, I'm going to go through the BOSIET

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and the FOET courses first, and then I'll get into Norway.

MS. FAGAN:

Q. Okay.

MR. RUTHERFORD:

A. And then provide a comparison. So the BOSIET is initial offshore safety emergency response training and assessment for personnel new to the offshore oil and gas industry, like our BST course. You'll see there an optimal duration of 21 hours and five minutes. This is from the OPITO guidelines. That gives you the indication that they are very, very prescriptive about the time -- the type of exercises that takes place, how those exercises are going to be carried out, exactly what qualifications have to be required of instructors, et cetera, and exactly what sort of equipment has got to be used, right down to very detailed specifics of dimensions of equipment. So it's a very, very prescriptive organization, but they do give an optimal duration. They accept the fact that people -- you know, every training provider is going to be different, there may be different numbers of people in courses, but that just gives an

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indication of how prescriptive they are. Their certificate validity is four years as opposed to our three. What's covered off in the BOSIET course is safety induction, which is an industry overview and installation overview. They do offshore hazards, managing offshore safety, controlling offshore hazards, regulating offshore safety. We don't really get into the regulation too much in our course. Living and working offshore a little bit, we don't get into that too much. Helicopter safety escape, helicopter travel, helicopter emergencies, just like us they do HUET, helicopter underwater escape training exercises. As I mentioned before, they use a rebreather, and I'll get into that later. They do sea survival evacuation, evacuation escape, and emergency first aid, but they don't do that -- they don't do that in an open sea environment. Again I'll get into it a little bit later, but they are -- because of their approach to risk, they don't allow any trainee to go into water under 15 degrees centigrade, and they deal with fire fighting and self-rescue, which is fire fighting offshore and self-rescue. On the --

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MS. FAGAN:

Q. What's the -- do we have a temperature limit on our training, do our workers get the 15 --

MR. RUTHERFORD:

A. Two degrees or lower perhaps --

MS. FAGAN:

Q. Two degrees is the limit here, and 15 degrees would be the limit in OPITO?

MR. RUTHERFORD:

A. Fifteen in the UK, yeah. I mean, it's -- it's good grounds for putting it in. I think they had -- when they grew up in their early days, they did have a number of incidents, but what we've been able to do, I guess, because of experience with particular suits and the way we've set up our maintenance and service of all the immersion suits, and the way we select our immersion suits, we manage that risk through other ways. So it's something that you've got to -- you know, if we weren't careful about that aspect, if we weren't getting our suits -- every time somebody uses them, we send them back to a supplier, a certified supplier, for maintenance, you know, that's -- we wouldn't be able to manage that risk. That comes with -- there's a

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significant expense associated with that, obviously, of course. The FOET course, this one is the equivalent of our BST-R course.

MS. FAGAN:

Q. And where is this one?

MR. RUTHERFORD:

A. Eh?

MS. FAGAN:

Q. FOET?

MR. RUTHERFORD:

A. It's further offshore safety and emergency training, emergency response training, and this is, again like our BST-R, it's designed for personnel who have completed the earlier course or who are refreshing another FOET course. Optimal duration for this one is eight hours, it's a one day course for the certificate validity of four years, and there's not a whole lot in it. The course is helicopter escape and rescue, fire fighting, self-rescue, emergency first aid.

MS. FAGAN:

Q. So is this the HUET again?

MR. RUTHERFORD:

A. Yes.

MS. FAGAN:

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Q. So their refresher has the HUET type training?

MR. RUTHERFORD:

A. Yes, indeed.

MS. FAGAN:

Q. And their main course has the HUET training?

MR. RUTHERFORD:

A. Yes, that's seen as the major issue there to keep refreshing is the helicopter escape training.

MS. FAGAN:

Q. Okay.

MR. RUTHERFORD:

A. I'm just going to bring up here now -- this is not really directly related to the helicopter passenger transportation, but it was brought up, I think earlier in the Inquiry, the issue of occupational health and safety standards, and I think it's just worthwhile bringing up a course that's just been brought into the UK jurisdiction that came in in October, called MIST, and it's what's called a Minimum Industry Safety Training. This course is designed to introduce fundamentals of safety elements of the offshore oil and gas industry to people coming into the industry, and giving people the appreciation of potential hazards

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and controls that might be encountered by personnel offshore. This is -- expanding a little bit out from the BOSIET, I guess they realized they need a little bit more information on hazards and making people aware of what they're going to be facing. The expected duration of this one is ten hours and it's delivered entirely in a computer based format. It can be delivered by a training institution or delivered by the employer. What this course does, it requires people to go into it, they have to respond, and there's assessments that take place all the way through the course. So the employer is aware that the people coming into the industry are fully aware of the risks and hazards that they're likely to be encountering, and the sort of things that are covered in this course, introduction to hazard, offshore environment, working safely, including safety observation systems, understanding the risk assessment process, tasks offshore that require permits to work. There's personal responsibility in maintaining asset integrity, using manual techniques every day, there's controlling use of hazardous substances,

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knowledge and practice of working at height, and being aware of mechanical lifting activities, and the reason I bring this one up, I think, is this one will be a reasonably easy course to introduce, or something similar to introduce offshore here, and we might want to look at something in terms of helicopter passenger transportation, just making sure that people really truly do understand the risks there.

MS. FAGAN:

Q. So just let me stop you there. This is a new course that's been brought in in the UK?

MR. RUTHERFORD:

A. Yeah.

MS. FAGAN:

Q. But it's not a requirement here?

MR. RUTHERFORD:

A. It's not a requirement here, no, this is just a --

MS. FAGAN:

Q. But in your view, it's something that we could consider?

MR. RUTHERFORD:

A. It's something we might want to look at, yeah. I'm going to move into the Norwegian

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standards. The Norwegians are very much -- their regime is very similar to the one we have here in Canada where the offshore operators, there's a society called OLF, which is an association of offshore operators. They're a little bit different in as much as, I think, possibly due to the geography in Norway and the way that the industry is developed, they tend to have training suppliers or providers that one major company will have its preferred training providers, and another major company may have other providers. So there tends to be little bits of differences that take place in the actual training courses, depending on who they're working for. It tends to be a little bit more -- the training provider works more directly for a company, but the equivalent of OLF courses to the Canadian standards are basic safety and emergency courses, basis safety and emergency training refresher course. Again we'll just go through those. Basic safety and emergency course is designed to motivate the individuals to actively promote a better and safety working environment. Emphasis on these courses is very much placed on preventative

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measures that can forestall injuries or damage that environment. They take an approach where training people to think up front what's likely to happen to them, and it's very, very -- it looks at prevention very much. The course is designed for offshore personnel. Again there's a training basic safety course for the Norwegian offshore. This is an OH & S course as well. This one is required as a prerequisite for the basic safety emergency course. The OPITO are recommending this course takes place after the BOSIET. The basic safety is a five day duration and it's refreshed after four years. The course is comprised of these elements. There's an health safety environment culture, so again it's a little bit outside of what we do here. They deal very much with environmental issues as well as safety in the course. First aid is required for everybody. We in Canada, and in the UK, the first aid tends to be outside of the basic course. They look at joint evacuation, which is evacuation including search and rescue activities and various aspects of evacuation processes. Fire prevention. They do a sea rescue course, they

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do an open sea course in Norway, and they do do helicopter evacuation in Norway, which is reasonably recent. Again, I'm sorry, it's a little bit dry, but hopefully we'll get there. The basic safety and emergency training refresher course is again the one that's equivalent to our BST-R, and this is designed again for people to upgrade their knowledge and keep themselves refreshed on standards. The course is applicable to persons who have previously completed basic safety and emergency courses. The duration of this course is two days, similar to our BST-R, and the validity is four years, which is a little bit more than our course.

MS. FAGAN:

Q. Now before you get into the table, you had mentioned the first aid. Is the first aid taught or in some way provided to the workers offshore Newfoundland? You'd said something about it's not part of the BST, but do they get it in another course or somewhere else?

MR. RUTHERFORD:

A. They do get it in other courses. It depends on the -- offshore Canada, there's a number of people allocated as first aid and first aid

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responders and these people provide, but basically first aid training is required in accordance with legislation. For the number of people on board, a certain number of people have to have first aid training.

MS. FAGAN:

Q. Okay, so --

MR. RUTHERFORD:

A. In Norway, they basically provide as part of the course. There is -- everybody gets a little bit of first aid.

MS. FAGAN:

Q. I believe you have a table coming up soon.

MR. RUTHERFORD:

A. Yeah. This again is a table, something that's not -- this is just something I put together for the purpose of the Inquiry, and really just for the purposes of providing a snapshot which is reasonably easy to understand of some of the differences between the various training jurisdictions. You'll see at the top line there, there is CAPP, which is a Canadian standard, in the centre is the OPITO UK standard, and on the right is the OLF standard. If you look at our standard here in Canada, our basic safety, we have a duration

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of our course of five days. The OPITO UK has a basic safety requirement of 21 hours, which is basically three days. OLF Norway has five days. We should remember that OPITO has decided in this MIST requirement, which is another ten hours computer based training. Under the refresher training, we have two days in CAPP, we have eight hours in the UK, and we have two days in Norway. So Norway and Canada tend to be -- in terms of duration of courses are very, very similar. The validity in Canada is three years, so we have to come back and be refreshed after three years, whereas the other two jurisdictions, the UK and Norway, it's four years. When we look at aspects such as the open sea exercise, we require it here in our jurisdiction, and they require it in the Norwegian jurisdiction, but it's not permitted in the UK jurisdiction. Looking at the emergency breathing devices, Canada, as we will be talking about later, and we're all aware, we have the pressurized air breathing system. OPITO and Norway both use a rebreather. Now basically what they're using is a hybrid system where by they utilize -- it's a rebreather, but there is pressurized

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air in the event of an emergency situation, but they don't actually train on the pressurized air. The training actually only utilizes the rebreather part of it.

MS. FAGAN:

Q. So now we've had the rebreather described as sort of like a bag, almost like a large ziploc baggie sort of idea with a hose that comes off. Is that the device that you're talking about when you say "a rebreather"?

MR. RUTHERFORD:

A. It is, and I think when Greg Harvey provides his presentation on the HUEBA, on the device we have here, he also has -- he has a rebreather, so he'll show that to the Inquiry. So just some comments on the bottom there. I think our training here generally focuses on practical elements of emergency response. We do try and push as far as we possibly can the practical, just to push people as close as we can to real life situations without putting them at harm in Canada. They tend -- OPITO and the UK, as I mentioned before, they're a little bit more cautious, high sensitive to training risks, so they tend to -- their training exercises tend to be a little bit

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less rigorous then they are in the Canadian jurisdiction. Again the Norwegians tend to be similar to Canada, but they do have a very strong focus within their training. It's very much on preventative activities, also have issues relating to environmental issues, regulations, and first aid. So we really -- I think in our courses, we probably push the envelope the most in terms of the actual practical exercises that we expose people to.

MS. FAGAN:

Q. Okay. Now we heard evidence from Mr. Decker that, I believe, his position was that consideration should be given to having training more often. I believe it was something to the point that every three years wasn't enough to keep you proficient, and we can see from this chart that in the other two jurisdictions it's actually extended out to four years between. Can you provide any comment or insight on the time period between the training and then each refresher course?

MR. RUTHERFORD:

A. Yeah, I think -- this is another one of those situations where you have to try and find a reasonable balance. The problem with any of

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this type of practical training, where you're training people for emergency situations and response to emergency situations, you know, the -- you try -- people don't have a lot of time to think in emergency situations, so you really need to be able to keep them refreshed in their skills and their knowledge, so that they don't lose that, but it's balanced out with the practicalities of -- you know, you're operating an operation offshore, so what's a reasonable amount of time for people to come back in terms of retraining. As you'll note there in the chart, we do take -- the frequency here in Canada is higher than it is in other jurisdictions. One of the things, I guess, that we can look at -- it's probably not practical to reduce that time just because we would not be able to operate, I don't think, offshore if we did that, but we could possibly look at a couple of options like computer based courses or something that people could do to at least refresh their knowledge, not necessarily their skills in between courses, but that's something that may come out of the Inquiry, I don't know.

MS. FAGAN:

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Q. Are there other jurisdictions -- you provide training to a number of other industries. Do other sectors provide the refresher? You had mentioned that the fishing industry had just gone through a lot of training in '07, I believe. Do they have these refresher segments?

MR. RUTHERFORD:

A. No, I think probably the best -- we'll compare it first to the marine transportation industry and I'll talk about the fishing industry. As I noted there before, the marine transportation industry is governed by the international maritime organization. They have what is called the standard for training certification of watchkeepers, and the training required for people going offshore or sailing internationally, they have basic survival training course, they have training in life boats, and they have training in fire fighting. They will basically take just over three weeks training coming into the industry, but there is no -- as it stands at the moment in Canada, and there is no requirement for refreshing this providing you continued to activity engage in your occupation at sea.

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Some jurisdictions in the world have gone out on a limb and said we do have to come in and do refresher training. This is currently before the International Maritime Organization at the moment, and I think it will happen that there will be a requirement for certain amount of practical refresher training, and things that you cannot do while you're on a ship, such as fire fighting, or some of the sea survival activities that can't take place, but that -- and the intent, I think, is to come up with a five year -- possibly a five year refresher, but it's not currently in place at the moment. In terms of our fishing industry and small boats in the local coastal, the basic training we've just introduced there or has just been introduced here in Canada, is a three day course. It provides skills in emergency response and sea survival, and various aspects there associated with that. This course doesn't -- again there's no requirement to refresh this course. So when somebody comes through and does that course, there's no -- that's it, basically, for the rest of their lives, as it stands at the moment. I would comment here on -- you know,

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the fishing industry is probably the most -- it is the most dangerous industry. We lose eight to nine people every year in the fishing industry, and I think it's worth noting that Iceland, which generally has zero losses, does have a refresher requirement into their training and they come in every five years to refresh. So there is, I think, a need to look at that, but it's outside of the scope of this Inquiry, but just as a comparison to what other training requirements are in other sort of --

MS. FAGAN:

Q. I thought it might be of interest to see if we can learn something from the other industries.

MR. RUTHERFORD:

A. Yeah.

MS. FAGAN:

Q. It appears that the offshore petroleum industry is training more right now as far as with the refreshers, and in Canada even more so than the other jurisdictions?

MR. RUTHERFORD:

A. Yeah, I mean, I've got to say from where I sit as a trainer provider, I mean, the offshore petroleum industry here in eastern Canada is

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extremely proactive with regard to training. I mean, it's -- I don't think -- we do get occasional complaints from people we do too much training, we'd like to reduce this, but generally speaking, I think the industry has been quite proactive in training activities.

MS. FAGAN:

Q. On the risk envelope, just before you move on, you had mentioned that the water temperature and the different breathers. Is there any difference in the HUET training in the other jurisdictions? For example, you know, the windows, or the sizes of the windows, or the lack of windows, do they all have windows that you have to punch out, or are they just holes? Is there any comparisons there?

MR. RUTHERFORD:

A. They all currently have windows, but in the UK jurisdiction a few years ago, they went through again one of these issues that there was a study done which indicated that trainees were being subject to too much stress going through this training, so there was a period in time where they weren't allowed to put windows into their HUET, helicopter underwater escape trainers. That got reversed just over

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a year ago. I think they realized, you know, the training really wasn't as effective as it should be without the windows in. So there was a change of heart there. There is guidance -- there still is guidance to OPITO relating to the size of the windows. I think there was a study done by Susan Coleshaw which went into OPITO, which basically identified a minimum size that windows were allowed to be for training, so again because of their concerns relating to stress of the people going through training.

MS. FAGAN:

Q. What about Norway, does Norway have windows or just holes?

MR. RUTHERFORD:

A. Norway has windows. Again Norway tends to be very similar to us in terms of how it approaches training.

MS. FAGAN:

Q. Okay. Now I understand you're going to give a little bit of information now on the escape trainer. Is that where we are?

MR. RUTHERFORD:

A. I'm just going to talk a little about the helicopter escape training part of the course

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in a little bit more detail. The outcome of any helicopter accident or incident will obviously have -- depend on the nature and causes of the incident. It'll also depend on the weather and sea conditions at the time, survival equipment worn, and the behaviour of the individuals involved. If we have a situation where we have an uncontrolled crash into the water, there's a very high likelihood that serious injury is going to result to the crew and passengers, whilst if a helicopter is able to land what's called a "controlled ditching", this is much less likely. However, we need to keep in mind that even if you do have a controlled ditching on the water, if you land into a rough sea or an inclement sea environment, you know, injuries could still result and you will still have the situation where people are not going to survive, but there was evidence from accident reports demonstrate -- this was from a Civil Aviation Authority paper generated in 2003 which looked at a number of helicopter incidents, and I won't go into this in any great detail because I think Greg is going to talk on this. Around about 60 percent of all water impacts, the

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helicopter inverted or sank immediately. So this is what helicopter escape training is all about, it's training for those times, you know, can we get off -- if it lands on the surface, what do we do, but if there's a good chance it's going to invert, this is what we're training for. So we provide an appreciation to our trainees of basically the disorientation that's going to result from an inversion of the helicopter, and we provide -- basically, it's intended to provide skills and knowledge of how people should react to that inversion. This is again a little bit dry, as is my throat. I'm just going to go through the learning objectives of the helicopter safety emergency procedures section of it, just so that we -- and I'll go through it fairly quickly. It is included, I think, in our evidence there under -- there's a presentation, an Exhibit 18, which goes through it, and I'll get to that a little bit later. The learning objectives, we look at issues such as flight preparations, discuss the personal preparations to be conducted prior to the heliport, describe heliport check in, helicopter pre-boarding procedures,

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examine characteristics of helicopter passenger transportation suit systems. We discuss pre-flight inspection procedures for the HUEBA, and we demonstrate correct pre and post checks of the flight suit, demonstrate pre-flight checks on the HUEBA, and performing the correct donning and doffing procedures for the flight suit and the flight preparations. Still continuing on flight preparations, we demonstrate donning the transit type survival suit which HUEBA equipment. Helicopter safety, we identify the danger zones for passengers approaching a helicopter. This should be a top level, actually. Explain the precautions to be taken when approaching a helicopter's danger zones, discuss the recommended personal conduct during a helicopter flight, list the safety equipment carried aboard helicopters, use a safety card to identify and locate emergency exists, discuss the purpose and proper use of helicopter safety equipment. So that's helicopter safety. Under implied emergencies, we look at the categorization of helicopter implied emergencies, analysing what types of emergencies can take place, and what are the

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possible outcomes. We look at the three phases of helicopter in-flight emergencies; pre-ditching, ditching, and post-ditching, identify escape routes from the helicopter.

Again, under the procedures, looking at the compressed air breathing apparatus, and again, Greg is going to get into this in a little bit more detail, but looking at the need for the HUEBA, identify time required to egress a capsized helicopter, examine factors affecting individual breath hold time, examine Boyle's Law and the relationship between pressure and volume, discuss direct effects of pressure on human body, describe the mechanism of lung over pressurization and Greg will touch on all of that. Identify cause, treatment and prevention of arterial gas embolism, describe the purpose of HUEBA, describe the two major types of HUEBA, identify the main components, describe the function of the main components. Identify limitations, describe operating principles, describe the procedure of deploying, describe the clearing procedures, identify importance of breathing normally, never holding your breath. Identify HUEBA malfunctions,

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including free flow and flooded, describe actions to take in the event of a malfunction, and practice carrying out breathing actions using this equipment, atmospheric pressure and dry conditions, demonstrate deployment, operation in shallow water. Demonstrate breathing actions in shallow water, including breath under water. Deploy and clear HUEBA while under water, breathe inverted under water, and deploy and clear while inverted.

What might be obvious from this, compared to other aspects of our training courses, which have generally tended to--that the guidance from CAPP has been very, very much top level. You know, we will cover this topic and it's left a little bit up to the training provider. Where this has come in, it's-- again, it's become very, very much more prescriptive. There's very, very detailed requirements that we have to go through in these courses, specifically because it is a risk associated with it.

The helicopter underwater escape training, the HUET, we will participate in introductory safety breathing, respond to alarm phases of simulated emergency, open

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emergency exits at appropriate time, use emergency exits at appropriate time, participate as a passenger in simulated in-flight emergencies. We'll do a number of HUET exercise where we exit on the surface of the water. We exit when partially submerged and upright and we exit the HUET when capsized, learn how to launch a helicopter life raft and we use the helicopter life raft in a simulated survival situation.

This next two slides are just a brief summary of the learning objectives of all the practical exercises that take place in the helicopter practical--in the helicopter passenger transportation training, and again, I'll go through it pretty quickly. It's helicopter safety emergency procedures, demonstrate pre and post checks of flight suit, demonstrate pre-flight checks HUEBA, perform donning doffing procedures, demonstrate donning of transit type survival suit. There's one here use the safety card to identify and locate the emergency exits, be aware of the safety card, practice carrying out breathing actions using the HUEBA equipment. Demonstrate deployment operation

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of HUEBA equipment in shallow water, less then one metre and Greg will get into that, again, the reason for that, and we're looking at breathing under water using HUEBA deploy and clear while under water. And continuing on that, participate in an introductory safety breathing, response to alarm phase of simulated emergency, open emergency exits, use emergency exits, participate as passengers in simulated in-flight emergencies, and the issue related to exits of the HUET.

So that really is, I guess it's just--just covers off all the--what we're trying to achieve in terms of the training and those are all the basic elements that we cover. So those are things that might want to be looked at to see if there's anything that needs to be added to that or changed in that area.

I'm going to get on to the facilities that we have for delivery of helicopter underwater escape training. Just before I get on to that, I think there's a transportation classroom presentation, Exhibit 18. I think we'll just go into that briefly, and show 18.

This is just a presentation that we would use in the classroom. You can take a look at

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it. I was advised by Greg actually just this morning that they've been working on an update to this one. So there is now a new update just as of the last couple of weeks, an updated presentation, but -

MS. FAGAN:

Q. I understand that the updated version may just--there's a few slides where some of the photographs have been changed to reflect the new suits.

MR. RUTHERFORD:

A. That's right.

MS. FAGAN:

Q. And we need not go through this entire presentation. I understand that you may--you're now about to describe the HUET and pages 23, 24 and 25 are still photographs of the HUET and I think they're still the same pictures as what's--it's the same HUET and you're going to describe the HUET and the features of the HUET, because there were some questions raised, and I'll ask you to address some issues on some of the training and the HUET itself. But so in this photograph, I understand that this is a picture of the trainer, the underwater escape trainer.

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MR. RUTHERFORD:

A. It is. It's the trainer that we have at the Offshore Safety and Survival Centre in Foxtrap, yes.

MS. FAGAN:

Q. And that this was obtained some years ago by the Institute?

MR. RUTHERFORD:

A. Yeah. I'll get into the detail. This is a McLean and Gibson helicopter underwater escape trainer. This is--basically, this was designed and developed in the 1980s in the United Kingdom. It was originally a concept that was thought of or put in place by the Robert Gordon Institute of Technology, which had a similar safety and survival training to ourselves and one of the very first organizations in the world really set up dedicated to providing training for offshore petroleum workers. The gentleman that was involved very much in the design or working on this is a Dr. Joe Cross, who was the head of that institution at the time, and he's still alive and he's still--he can't travel well, but he might be somebody--he has a wealth of information on helicopter transportation and

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helicopter transportation safety training and he may be somebody the Inquiry might want to talk with, but he is still around. But basically this was--when it was put in place, this particular helicopter underwater escape trainer was the gold standard really for trainers. At the time, there was some training going on but they tended to use shallow water egress chairs, which were just open chairs. This was the first attempt really to try and put in place something that better resembled a real helicopter situation.

I'll go back to the PowerPoint there now. Just as I noted, there was a number of those, that type of helicopter underwater escape trainer were installed worldwide. I think at the time, the market hadn't really developed to the state it has now and the company, after producing a number of these, went out of business because the market wasn't sufficiently mature. But they were a good unit. Just a couple of notes there on what changes we've made to this simulator since it was installed. We have put in push out windows on these windows. We have three window sizes, 480 by 380 millimetre, 480 by

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400 millimetre, and 650 by 470 millimetre. First, two of those sizes are fairly similar to what's on the S-92. They're a little bit smaller than what's on the Sikorsky, and the last one of those is similar to the emergency exit, but again, a little bit smaller than the ones on the emergency exit that's on the Sikorsky.

MS. FAGAN:

Q. Do you have the sizes?

MR. RUTHERFORD:

A. Yeah, I do here somewhere, in one of the--I will get into it.

MS. FAGAN:

Q. Okay.

MR. RUTHERFORD:

A. Yeah, I've got the windows in the Sikorsky are 508 millimetre by 422 millimetre and the emergency exit is 915 millimetre by 610 millimetre.

MS. FAGAN:

Q. So your medium window is 480 by 400?

MR. RUTHERFORD:

A. It is, yeah.

MS. FAGAN:

Q. And there's a small window, 480 by 380?

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MR. RUTHERFORD:

A. Yeah.

MS. FAGAN:

Q. So the windows in the trainer are a little bit smaller than what's in the S-92?

MR. RUTHERFORD:

A. Yeah, they are, and we find that, you know, this provides, you know, a reasonable challenge for people coming through training without exposing them to too much risk. We can manage this and most people can get through the smallest of these windows. I should note there, the report that was put in place for OPITO, they had indicated that the minimum size should be 480 by 430 millimetres, so we have two windows that are actually smaller than their recommended minimum sizes, but I can tell you, I've bene through that smallest window many, many times. So if I can get through it, I'm sure many people can.

MS. FAGAN:

Q. And they are smaller than what's on the S-92?

MR. RUTHERFORD:

A. They are, yeah.

MS. FAGAN:

Q. So if you can get through the trainer's, what

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you're saying the S-92's windows are larger?

MR. RUTHERFORD:

A. Yeah.

MS. FAGAN:

Q. Now with respect to the windows, I do understand that it's not only the size of the windows but sometimes the placement of the windows can be different, and are the windows in the HUET at the Centre, where are they from a placement point versus the S-92? Are they higher, lower, are they next to the seats?

MR. RUTHERFORD:

A. Our windows are actually lower than the ones on the S-92 and they're lower by a significant--it's 21, about 21 inches I think that they're lower. That, I think, to us is a little bit of a--we would like--I think the issue related to fidelity, which we'll probably get into on simulators, is it's important to a point. I think, when we talk about the physical fidelities of simulators there is differing viewpoints. In 1999, I think there were two papers or two people put together. One was looking at -- Susan Coleshaw basically recommended that physical fidelity wasn't that important. What's more

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important is your task analysis, what you're actually doing in terms of your helicopter training. But I think at the same time, there was another organization, another couple of researchers, Mills and Muir, who were doing some work for Shell Petroleum, who indicated that we should try, to the greatest extent possible, to try and get physical fidelity of the simulator. So the jury's out a little bit on it, but I think when we get to things like windows and window locations, I think it's certainly worth our while taking a look at this because whilst we do in our training, we do tell people part of the training is become aware of the specific helicopter you're flying on. Make sure you know the situation for the helicopter you're flying on. Make sure you know how you're going to be able to get out in the event of an emergency. That having been said, I think it might be worth our while just having a look at that aspect of our simulator to see if there's any way that it can be done to put these windows in a better position or a more--in a position that better represents the offshore here.

Keep in mind though that when we do put

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training--people through training in this simulator, they don't only work offshore in Canada. We do provide that this training is supposed to be basic training and it's supposed to position people really with skills and knowledge to fly in any helicopter in any jurisdiction. So those sort of things have to be looked at in terms of the balance there.

MS. FAGAN:

Q. Okay. Could you go to Exhibit 18? That's the presentation exhibit. Because I believe there is a photograph of the interior of the S-92 and then there is a photograph of the interior of the HUET and it demonstrates the difference in the location of the windows. I believe you'd be looking for about page 11 in the presentation and this is what the students see. So this page, there is a photo--is that the interior of the S-92?

MR. RUTHERFORD:

A. That is the interior of the S-92, yes.

MS. FAGAN:

Q. And that depicts the auxiliary fuel tank as well?

MR. RUTHERFORD:

A. No, the auxiliary fuel tank is not shown in

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this particular picture. I think we've got one here that does.

MS. FAGAN:

Q. I believe it is back on that page, page 11.

MR. RUTHERFORD:

A. Is it?

MS. FAGAN:

Q. Yeah, it's dark because it's all blue. Everything is blue. On the -

MR. RUTHERFORD:

A. Oh yeah, okay, there it is, yeah.

MS. FAGAN:

Q. Just it's the exact same colour as the seats.

MR. RUTHERFORD:

A. Yeah, it is.

MS. FAGAN:

Q. So it looks like a large box along the -

MR. RUTHERFORD:

A. Yeah, this is shown here on the port.

MS. FAGAN:

Q. On the port side.

MR. RUTHERFORD:

A. On the port side, that's the auxiliary fuel tank. My understanding is that this has been changed over. Now it's now on the starboard side, but that's fairly recent and I don't--

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Pat may be able to talk about that.

MS. FAGAN:

Q. Yeah, and I understand Mr. Dohey may have some exact measurements or Mr. Harvey, but for now, we are dealing with, right now, the issue of the location of the window versus the seat and so this picture would depict where the window is in relation to the seat, the height of the window, and if you could just move to page 20 of the presentation, then the group can see how the window is in relation to the seat in the trainer. I think it's 20 or 21.

MR. RUTHERFORD:

A. This one would show our trainer. This is an older picture, but it is our trainer, and shows the location. So you can see it is significantly lower in our training simulator.

MS. FAGAN:

Q. And can you move to the next page as well?

MR. RUTHERFORD:

A. Yeah, this is somebody just about to exit our window, yeah.

MS. FAGAN:

Q. And that would be another window.

MR. RUTHERFORD:

A. Indeed, yeah.

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MS. FAGAN:
Q. And this, just for the group, this would be a person seated in the trainer at the Centre?
MR. RUTHERFORD:
A. Absolutely, yeah.
MS. FAGAN:
Q. And the earlier photographs with the blue seats, they are the--that's the interior of the S-92, correct?
MR. RUTHERFORD:
A. That is true, yeah.
MS. FAGAN:
Q. Okay. There were other questions raised about the fidelity of the training, the number of people that are trained in the HUET. Do you have any comment with respect to that particular issue that was raised?
MR. RUTHERFORD:
A. Yeah, I can comment on it. I think we basically limit--during our role exercises, we limit the number of people in the HUET for a number of reasons. One of them is that the training really is--because it's important and people come into our training with very, very different levels of skills, capability, nervousness and everything else. We try to

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keep the instructor/student ratio very small so that the instructor can observe the student at all times. For the purpose of risk too, in the event that we--when we're inverting the helicopter, if anyone gets into trouble, we have a couple of divers in the water. But if we have too many people in the HUET during those exercises, then it becomes a little bit more difficult to manage the risk associated with those exercises. So we do monitor our students with safety divers and I mentioned our seatbelts, et cetera, in the HUET, we have emergency releases that the divers can pull in the event a student does get into difficulty. We do maintain an air gap above. But we do have people that get into challenging situations.

We used to do inboard/outboard training within the HUET so that people--you'll be inboard and somebody else trying to get out of the window. Again, we got into a situation where people were--it's very difficult in a training environment. You're putting people into quite an elevated level of risk when you can't get out your window until someone else has got out of it. We were finding that

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people were getting stressed doing this training. We did get situations where people were getting kicked in the face, et cetera. When you think about the new helicopter passenger transportation suit and the boots that are fitted to that, if we were into situations where people are getting kicked in the face, we're going to be into some significant injuries and concerns for us. So for the underwater escape exercises, we focus on the specific procedures that people are going to use, but we don't--we try to manage the risk at manageable levels.

We do engage in the surface evacuation, because for the surface evacuation, it's extremely important there that if you're on a helicopter that's landed on the surface of the water, the last thing you want to do is all move together and upset it. So it has to be a controlled team work environment. So for that particular training, we will put all of the trainees in at once and we will teach them how to evacuate the helicopter, but maintaining under the control of the person leading it, and ensure that they do it smoothly and safely. So there again, the issue is it's a

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balancing of training risk against benefit and that's the way we've--over time we found that that provides for us the best balance, but again, it's something we can look at in the Inquiry. We can certainly take a look at it.
MS. FAGAN:
Q. Just so that I understand the two different procedures, training procedures, there's one procedure where everybody is in the helicopter and they get out and get into a life raft or get out and get into the water, but the helicopter is not submerged and upside down?
MR. RUTHERFORD:
A. It's not submerged. It's not inverted, no.
MS. FAGAN:
Q. It's not inverted?
MR. RUTHERFORD:
A. No.
MS. FAGAN:
Q. And so there is an exercise where everybody is in the helicopter?
MR. RUTHERFORD:
A. Yeah.
MS. FAGAN:
Q. But the helicopter is not submerged?
MR. RUTHERFORD:

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A. Yeah.
MS. FAGAN:
Q. And the exercises where the helicopter is submerged is the one, is the second type of exercise where you have the risk of those boots kicking people in the face?
MR. RUTHERFORD:
A. Yeah. We focus on individuals and being very, very--you know, keeping the individual response to the training requirements is what we focus on in that situation.
MS. FAGAN:
Q. Just another couple of questions. You had mentioned the seatbelts. Can you describe the belt that's used in the HUET versus the belt that's--the seatbelt, the restraint--I understand from some of the earlier evidence that it's a four-point harness which would be a harness that goes over the shoulder and across the lap and is clasped in the centre. Is that the same as the restraint that's used in the trainer? And if not, why the difference?
MR. RUTHERFORD:
A. Well, no, it's not. The four-point harness is put in place now in the current generation of

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helicopters. When our helicopter escape trainer was built, it was more common to have a lap belt. That's what we have in place at the present time on our trainer. We are looking at the possibility of putting in a four-point harness and that's just we're working with the University to design a seat that will replace what we have there now. But I think one thing that needs to be, I guess, kept in mind, again it comes back to, you know, what's important in terms of fidelity. People coming into our training course, I think, without exception, I think, everybody has sat in a whole variety of seats. Everybody has used a whole variety of belts. What we basically do in our training is tell them, you know, become familiar with a particular belt and the particular seats, et cetera, that are in your helicopter. Make sure you know exactly where they are. So what we focus on really is the thing that nobody has done when they come in to do this type of training is they haven't been strapped into an upside down, dropped in the water and caused to, you know, force their way outside of a window. These are--and we don't have a whole

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lot of time in training, so that's really where we focus our efforts. That's not saying that it's not--you know, if physical fidelity can be achieved, then it's not a bad thing. It's never a bad thing, but it's not the central focus of the training. It's not something that's given us a great deal of concern. However, we are looking at seeing if we can improve on it.
MS. FAGAN:
Q. Thank you. I don't know if you're finished with the trainer and we're now going to move on to the suits, and we had lots of evidence last week on the suits. So can you just describe the suits that are presently being used and then I have a number of questions on that particular piece of equipment as well.
MR. RUTHERFORD:
A. Okay. The helicopter passenger transport, helicopter underwater escape training, all takes place utilizing a Helly Hansen helicopter passenger transportation suit. This was selected for use by the offshore petroleum industry. We received our first suits in November the 1st of 2007. It was selected in June the 12th, 2007, but they were

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delivered and we started our use of them in November the 1st of 2007.

The suits that we use for training purposes are identical to those which would be worn by the helicopter passengers, with a couple of provisos. We do mark them as training suits and the reason for this is more for Helly Hansen's purposes than ours. Because our suits are serviced by Helly Hansen, they go back to Helly Hansen's service department after every use. They didn't want to get a situation where our suits get mistaken for the suits in normal service, and the reason for this is that, you know, are suits are subject to continued use in a chlorinated environment. So they were specifically marked on the back as training suits. The training suits, we don't outfit them with personal locator beacons or lights because during training, we don't want these sort of things, things going off, so that's not included on the suit. I note there they're subject to the use, the more use in chlorinated water. We do lease from service by the manufacturer after each use, but it is possible over time that properties of seals

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change a little bit.

Notice there that suits are sized for best fit, not necessarily individually sized. For training purposes, you know, the role that we play there is providing people the information on how to use the suits and the features of the suits. We're not exposing people to cold water or cold water risk. So we don't have to necessarily precisely fit every suit to every individual. What we do is size for a best fit. Now we do maintain a large inventory of suits and generally we'll find something that's reasonably accommodating, but they're not actually sizing the suit for use. It's a little bit of a different category.

MS. FAGAN:

Q. Could you turn to Exhibit 98, which I understand is the lease between the Centre and Helly Hansen? I have a couple of questions on what needs to be done when the suits are serviced and why you need those things done in order to have effective training.

MR. RUTHERFORD:

A. We, at the Centre there, basically make use of the same suits that are used offshore. We

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have them leased through a sole source agreement with the helicopter passenger suit supplier and fundamentally after every use, the suits will go back. They will be cleaned, disinfected to ensure there's no hygiene issues, and they will be inspected. We have, within our standing offer agreements, I think we got two here, one is last year and one was this year, we have an indication there of how much it cost to service each suit. We have included in these service requirements the sort of things that happen in training. You know, people can tear off seals. They can break zippers. They can--face seals are in place. So they take pretty heavy use. So what has to happen, these go back and get serviced and are brought back to us. It's a pretty heavy commitment in terms of, you know, from the safety training provider because you see there it's $350,000 a year we spend just in servicing this particular suit. That's just our helicopter passenger transportation suits. We have another suit, which is an immersion suit, which is supplied by another supplier, and we have to pay that money too. So this is where--the reason why courses can

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be quite expensive.

MS. FAGAN:

Q. And I noticed here a cylinder replacement. Some of the aspects during training require you to use the different features of the suit. So what is the cylinder--I mean, we have the HUEBA, which is the breathing device, but is this the breathing device or is this a different -

MR. RUTHERFORD:

A. This is a cylinder which would inflate the--provide the inflatable collar that's included in the suit. So we will, during the training exercise, we will get the students to inflate that. So every time we do that, there's a charge associated with refilling that cylinder.

MS. FAGAN:

Q. So every time you blow up the floatation device on the suit, then that has to be folded back down and dealt with and replaced?

MR. RUTHERFORD:

A. Yeah.

MS. FAGAN:

Q. What about the gloves and the spray hood, the spray shield? Do you use those, and is that a

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requirement? Is that prescribed as a requirement or is that something you've chosen to do? Do you know?

MR. RUTHERFORD:

A. Well, we choose to do it. I mean, we teach people how to use all aspects of the suit. So as part of our training, we will have everybody utilize the gloves, have everybody utilize the face shield. Now those don't have to be replaced after every use. That cost there is only in the event it gets damaged. So if we damage any of those items, then they will be replaced. So we basically have a blanket order, which is, you know, the maximum amount of money we expect to spend during the course of the year. We'll draw down on that order. So it depends on how many repairs that happen during the course of the year.

These are expensive suits. They're more expensive than our immersion suits to maintain and service. We have our immersion suits, which were also discussed, I guess, in the Inquiry. There's been a number of comments made to the Fitzwright immersion suit. We have around 250 of those suits. They come in pretty well--again, we're talking about a

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universal suit. We have three sizes of that suit. We have a small, a universal, and the jumbo. The universal does fit most people, is used for most people, 150 pounds to 250 pounds, I guess. Above 250, we go into the jumbo and below that, we have the small. But we'll get into some features, I guess, of the suit. The fact that these are not precisely sized, they are very, very good suits in terms of keeping people warm and dry, because they've got certain features like continuous cuffs and continuous seals. We use them all the time in our sea exercises and we very rarely have any problems with them.

MS. FAGAN:

Q. So do the immersion suits require the same cost? You spend $350,000 a year on the transportation suits. Do the immersion suits, do you know approximately what kind of cost would it be to service those?

MR. RUTHERFORD:

A. We have more uses, but we're still less. It's probably about 250,000. As I say, it's a cheaper suit to service and maintain than this one is. This is an expensive suit.

MS. FAGAN:

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Q. Now before you move to this slide, I have one or two more questions. I don't want you to move into this device, because we're going to break for lunch, so I'll ask one or two questions on the suits and then if I'm not done, we'll start up again after the break.

MR. RUTHERFORD:

A. Okay.

MS. FAGAN:

Q. Were you--was the Centre involved in the selection process of the suits?

MR. RUTHERFORD:

A. No, we weren't.

MS. FAGAN:

Q. Okay. Do you think that the Centre could have added value to the selection process, and if so, why or did it not matter?

MR. RUTHERFORD:

A. I think we could add a lot of value to the selection. I think that what needs to be taken account of, I guess, is that not only do our instructors spend day in, day out, day in, day out in suits, they also see the number of people that come through in training. They know the sort of issues and the things that cause difficulties to people in training. So

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I think there's a lot of value that can be added by a training provider. I think probably these suits were looked at by our friends in Nova Scotia, because they were originally a Nova Scotian based company. We did get--prior to the implementation in November the 1st, we did get an opportunity, I think late October, a suit was provided to us to have a look at and we had a number of comments back to Helly Hansen on that, and Helly Hansen did actually come into our facility. A couple of their representatives came in to see us in February, I think February of 2008. We went through some of the issues that we were looking at in the suits, and there was a few things that I think the sort of reason why training providers can provide good knowledge is that there were some issues relating to, I guess, face seals which didn't have a lot of give. It's fine to have something tight but I think people come in all sorts of shapes and sizes, so generally speaking, if you're going to have immersion suits, helicopter passenger transportation suits, unless you're going to individually fit every suit, you really have to have suits

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designed so that the important parts of them have some flexibility, so that you can--so that, you know, you don't--because they don't fit everybody. Everybody has detail differences in their sizes. And it's also important, from our perspective as a training provider in as much as if seals, et cetera, are too tight, then we'll end up with a lot more damage to them when they're donned and doffed, which causes--it's quite expensive.

So those things, a couple of things there were raised. I think there were some issues with that suit in that respect, face seals, the wrist seals. The gloves were identified at that time as being a little bit clumsy. They could be easier. Issues also identified relating to how the breathing apparatus device was going to be attached to the suit, how it was--so that it wouldn't--there was a challenge, I guess, when you put this breathing device on a suit, you're trying to make something safer, but you could be in a situation where if you got something that's hanging loose, you're actually creating a hazard by doing that. So they really need to be tied in a little bit tighter. I think they

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also had some issues relating to the fit relating to legs and leg lengths because what was tending to happen in the underwater escape training is that people have different leg lengths and they weren't--tended to find that some of these heavy boots were getting dragged behind or coming loose. So there was another possibility of entrapment.

So I think Helly--Helly were actually very receptive. At that time, we told the issues there that were raised with them and my understanding is the new suits coming out has taken account of all of these factors. So it has--they have taken these comments away and looked at it. I haven't seen the new suit yet, but in discussions with them, they have indicated that they have incorporated comments from the training providers.

I would like to say, I mean, there's two ways that training providers can provide comments to suppliers. We can either-- you know, they can provide equipment to us and we'll just provide, you know, a report from an instructor. We're happy to do that with any type of safety equipment. We can also engage, if they wish us to, in a more formal research

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project where we can undertake specific tests on behalf and provide them with a technical report at the end of it. So we can do both ways and that will be sort of funded, but we're certainly happy to look at anything. Anything that's relating to safety training offshore, we're always happy to take it in and, you know, try it out basically.

MS. FAGAN:

Q. Well, I'll leave it there because we're at the break, and we'll come back at 2:00. Thank you.

(LUNCH BREAK)

MS. FAGAN:

Q. All right. When we broke for lunch, Mr. Rutherford, you were dealing with the suits and what value the Centre, as a trainer, could have in providing either some feedback or a study into the suits that are being worn. You also said that you had been asked for your comments and you did provide your comments. From a timing perspective, just so that we're clear, you said that the decision for the suits was June of 2007 and that you had the suits November 2007?

MR. RUTHERFORD:

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A. Yeah. We received a letter from Hibernia Management Development Corporation, I believe it was in June of 2007, indicating that they would be selecting a suit, a new suit, and that it would be implemented on November the 1st, which to the best of my recollection did happen.

MS. FAGAN:

Q. So when you were shown the suit in October, was that October of '07, a month or so before you received the suit?

MR. RUTHERFORD:

A. Yeah, we did get a suit a month or so before we received the final suit.

MS. FAGAN:

Q. And when were the comments provided with respect to the suit?

MR. RUTHERFORD:

A. I wasn't directly involved in this one. My assistant operations was in consultation with Helly Hansen. Helly Hansen did come to our training centre in February of 2008. So between that time, the comments went back to Helly Hansen and they came in to our Centre to have a look at some of the issues.

MS. FAGAN:

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Q. Okay. So the discussions between the Centre and Helly Hansen was after the suit had been selected?

MR. RUTHERFORD:

A. Yeah.

MS. FAGAN:

Q. Okay. When Mr. Decker testified, he indicated that there was escaping air in the suit and he discussed the procedure where you remove the trapped air from the immersion suit and he indicated that this was either not taught during the helicopter transportation suit or it was difficult. Can you explain the differences in the trapped air, I guess, event in the two different suits and what's your experience in the training?

MR. RUTHERFORD:

A. Yeah, indeed. In the immersion suit, we do provide training to our trainees basically to ensure that as much of the trapped air is out of the suit as possible before getting in or jumping into the water, basically for the reason of ensuring that they don't up end or, you know, basically they don't have air rushing pass their face as they drop in the water. The situation with the helicopter

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passenger transportation suit is because you're sitting inside a helicopter, there's no way that you could actually do any of these exercises aimed at burping your suit, as well as the fact that the helicopter passenger transportation suit comes under a different set of standards, which has a maximum and a minimum buoyancy. So there's got to be a means of making sure that we don't exceed what is a maximum buoyancy for the suit, so you don't get trapped inside the helicopter. For that reason, these particular suits, there's various devices that--these suits use what's called a Si-tec valve and a Si-tec valve is used in typical diver suits and it's a valve designed to release air from the suit but not allow water to come into the suit.

I know Robert Decker did indicate he had air that came up past his face. I don't know that's--it could have been maybe the face seal wasn't as tight as it should have been. It might be that the Si-tec valve was--it's capacity might have been exceeded or it might have been that the suit currently, in the current suit, version of the suit, that valve is actually adjustable. We do train not to

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touch it in the helicopter passenger transportation, but sometimes it's possible that got turned in, it would affect that. So that I guess would have to be looked at by TSB. But the new version of the suit, I know, that's coming out, those valves are no longer adjustable and not only do they only have one valve, they will have two valves on it. There's one on the hood and one on the shoulder. So there's two valves on that suit to release air. But basically, the air is released automatically on a passenger transportation suit.

MS. FAGAN:

Q. One other area that Mr. Decker covered was his core body temperature and when you train, what is the temperature in the pool?

MR. RUTHERFORD:

A. Our temperature in our pool tends to be around about the--it can be 14, 15, 16 degrees.

MS. FAGAN:

Q. And on the sea days, which are the days where they wear the immersion suits out in the ocean, I understand the temperature of your threshold limit can be as low as two degrees? Is that correct?

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MR. RUTHERFORD:

A. Two degrees, yeah.

MS. FAGAN:

Q. Mr. Decker was in the helicopter transportation suit when the incident occurred in March, and he indicated that at the time of rescue, his body core temperature was 28 degrees. Is this lower than you would have expected, given the time he was in the water?

MR. RUTHERFORD:

A. Yeah, it is. I think, if I remember rightly, the particular standard that those suits were designed to, we're looking at being able to maintain no more than a drop of two degrees core body temperature every six hours. So he obviously dropped more than that. Now the question is was it because the suit, there was problems with the suit, it wasn't put on right or there was other aspects relating to the suit. We do know he did indicate that he didn't get the gloves on and the gloves do form part of the seal of those suits. So there is obviously one area where he could take in water. So it does appear that he has taken in more water than would have been expected and he did lose more temperature than

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would have been expected.

MS. FAGAN:

Q. Okay.

MR. RUTHERFORD:

A. But having said that, we should also be very cautious that people are all so very different and when it comes to survival situations, people's response is so very different too.

MS. FAGAN:

Q. So these statistics or test parameters are just an indication or an average?

MR. RUTHERFORD:

A. They're an indication, but they're not--they're an indicator. They're not--you know, people are not machines. People have their own responses to situations.

MS. FAGAN:

Q. So you could get somebody who's larger or smaller react differently?

MR. RUTHERFORD:

A. Yeah. I mean, we know in this room, we got people here that's boiling hot. People here are freezing cold.

MS. FAGAN:

Q. I would now ask you to move to the helicopter underwater escape breathing apparatus, and I

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understand you're going to give a brief overview with respect to the implementation, because we heard a lot of evidence last week on the implementation. We'd like to know how the Centre fit within that nine-year implementation process, and then we're going to have Mr. Harvey do the demonstration. One of the reasons for having the demonstration is we hope that that will explain and demonstrate how complicated that particular device is with respect to all of the aspects, risk aspects and training aspects that have to be considered. So can you first go through the implementation? Then we'll get Mr. Harvey up.

MR. RUTHERFORD:

A. Yeah. I guess stepping back a little bit from the slide I've got up there, we first were made aware of that there will be an implementation of a breathing device, I guess, in 2002. CAPP sent us a letter indicating that they're considering implementing a breathing device, and it was a letter which included a number of other things, which are being looked at by CAPP. So we were aware of it. It wasn't--from our perspective, it wasn't considered much of a concern at the

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time. I guess our perception of it at the time would be that what would be implemented was something like a rebreather system, which had been introduced in the United Kingdom. We were familiar with that and it was reasonably easy to implement.

Understanding is that they started to-- CAPP and the operators were starting to look at other particular types of systems around and looking at different types of breathing devices and were looking very much at the pressurized air system as being really the optimal, the best solution to the evacuation situation people are likely to face. We became aware of that late 2004 that that had been selected by the operators and the Task Force for the CAPP implementation was put in place on early 2005, which we were invited to be part of. So we really got involved in the implementation of this device early in 2005.

The recommendations of that Task Force, I guess, 2008, the end of the Task Force, the Task Force recommended following implementing as soon as proper procedures were in place a compressed air unit as a chosen emergency breathing apparatus for offshore petroleum

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industry helicopter travel. Implementing this consistently across all petroleum industry operations in both Nova Scotia and Newfoundland and incorporate the compressed air unit as a component of the required safety training to include dry familiarization and in-pool training.

Between 2005 and 2008, a lot of things did happen. I mean, there was a lot of discussion going on about managing risk because I think we were getting medical advice indicating concerns relating to the management of risk. There was a number of issues relating to transportation of the unit on the helicopter. I think it wasn't until 2007 they got the approval from Transport Canada that they could actually transport this device on the helicopter. There was issues relating to integration with suits. So there was a lot of things went on between 2005-2008. I don't know whether I'm--in the process of all that, we were aware that the system was going to be put in place, so it still wasn't entirely sure which way things were going. We did arrange for training on rebreather devices for our instructors, just in case it went that way.

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We also, during 2007, we provided training to our instructors on this particular device. We also moved ahead on some of the aspects that we could move ahead on, such as the development of the--we had to put a shallow end in our pool to allow us to do the shallow water training. So no matter what device was going to be selected, that moved ahead in 2007, and we also ordered up -- just so that we would be ready to go, we did order up all the EBS units, although we didn't actually unpack them until we were sure which way the system was going.

MS. FAGAN:

Q. If you hadn't used the devices, why didn't you unpack them?

MR. RUTHERFORD:

A. If we haven't used them?

MS. FAGAN:

Q. Yeah, why didn't you unpack the -

MR. RUTHERFORD:

A. Well, there was--at the end of--it was still not quite sure which way it was going to go because they still hadn't managed to resolve some of the issues, how the training was going to be delivered and manage the risk associated

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with it. We ordered the devices up because they are--there's only one supplier of these devices. They tend to be long lead items and they're only built--they're only manufactured in batches. So you have to be able to get into a batch. So we ordered them and said, well, we're going to be ready. If there's a decision made to move ahead, we're going to be ready to move ahead. We didn't unpack them just in case the decision went the other way and we had to ship them back again, because this we can't afford. So that's basically what we did.

But so we had a number of issues that went in during that time. We had to--technical support personnel also had to be trained in servicing and hygiene. This was done by the supplier of the unit. So that all took place in around 2007. We had to design training courses, risk management procedures. This was going on. The CAPP committee was looking at these aspects, so we didn't get too much into this until such time until the CAPP report came out in 2008 saying we're going to go ahead.

Must say, the facility modifications we

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did, we had to put in place a HUEBA servicing room. We also designed and constructed a chair for doing shallow water breathing to do the shallow water training for the device and we procured the units.

MS. FAGAN:

Q. From a timing perspective, when was everything ready to go? Your shallow end of the room, of the pool. You had your servicing room. You had to build a chair and you bought a number of units. So at what point did the Centre have its facilities and equipment ready?

MR. RUTHERFORD:

A. We had our facilities and equipment ready by late 2007, but there was still some issues that had to be resolved as to how the training was going to be delivered, and I think there was a--at the end, I think it was at the end of 2007, there was still--I believe it was 2007 or 2008. 2008, I think there was still decisions being taken as to which--how this training was going to go about because the Task Force was sent by CAPP to look at various training providers, to look at other systems that were around there again. So we still hadn't been entirely settled. So at that

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time, we were--you know, we were reasonably ready to go, but until such time as we had the precise nature of the way that training was going to be delivered until such time as we understood exactly how we were going to manage the risk, we couldn't actually move ahead. So that basically, we were sort of sitting there waiting to see which way it was going to go.

MS. FAGAN:

Q. So you had the facilities and equipment ready, but the training, this risk component with respect to the training was still being sorted out by the Task Force?

MR. RUTHERFORD:

A. Yeah, it was still an issue to how it was going to be addressed, yeah.

MS. FAGAN:

Q. Okay. You have pulled up a slide now, 57. Can you just describe--there are six photographs. Can you just explain what's in each photograph?

MR. RUTHERFORD:

A. Yeah, on the top left-hand corner, you'll see somebody sitting in a HUET there actually wearing the breathing device. If you move down to the bottom left there, that is the

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training platform that we put in place. Obviously it was--we had a pool that was consistent depth, four metres right across it. It was prohibitively expensive for us to change and we couldn't take the pool out of service because of training activities to actually build a shallow end, so we designed basically a shallow platform which allowed us to undertake the training.

On the top middle there, you'll see the chair that was used in the end, which we utilized for delivering of this training. The issue in the end of the day, it was determined that the training, the best way of delivering the training was to provide an inversion. It was important to do this. However, we needed to carefully control the depth at which the trainee went under the water, just to avoid issues of embolism essentially which Greg will get into. So this was the chair that was designed.

On the bottom, you'll see the unit and again, Greg will show you a real model of that. On the top right, just shows how the unit was integrated into the suit at the time and down at the bottom right there, just a

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view of the chair.

So just the next slide here, we provided a demonstration of training course and training method to industry representatives March the 6th, 2009 and the reason we pulled industry in to go through this, because it was still--there was still some going--it still hadn't been firmed up exactly the best way to deliver the training. On the one side is managing the risk. There was a requirement to do only shallow water training. On the other side, to provide the most effective training, you really need to be able to put somebody in a situation where they're being turned upside down and breathing down and utilizing the unit in a semi-realistic environment. In the end, you know, we utilized that chair and pulled industry in and the Task Force just to show everybody who was looking at this unit, looking at the decisions, was fully familiar with what we consider would be the appropriate approach or the appropriate balanced approach to this training. So we had seven or eight people, I think, came in from industry and I think at the end of the day, you know, they were quite satisfied that this was probably

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the best way for us to move ahead, which we did.

The new training course received CAPP approval May the 5th or I think it was May the 6th, it was fully implemented. We were fully implemented by May the 11th. I think a copy--if you look at Exhibit--yeah, this was a--this is the notification we received from CAPP, the final approval of the CRF's. I talked about those earlier, the change request forms that went into CAPP, and these were--these forms had been circulated to all the committee members so they indicated that the course was approved. So once this was received by us as being approved, again it went through our own academic processes. We had to take this through our own process to get the course through what we call our Non-Degrees Programs Committee. So that took just a couple of days to get back to us during that week. Anyone that knows anything about academic processes knows that we were--that's very fast. We had people ready to go. They were just waiting for this to come through.

MS. FAGAN:

Q. So you received approval on the 6th and you

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got it through your academic approval process in five days?

MR. RUTHERFORD:

A. Less than five days. It was a couple of days. Then we had to schedule all our courses, and if you look at--I'll just open this up, because I think this is important to show people in terms of how we implement this and how we schedule our resources. The OSSC, we schedule all our resources on a weekly basis. What goes out to everybody is a weekly schedule. We have one going out to the OSSC in Foxtrap. We have another one goes out to SERT, the Emergency Response Training Centre on the west coast. The schedule basically has a number of aspects to it. We're looking at issues relating to facility equipment, information and equality safety notes, program information. This says, the following new courses and changes have been approved by MPC effective the May the 8th, it says there. These are the HUEBA courses that were approved then. So we received that. So final note there, thank you to all the faculty and staff dedicated their time, energy, et cetera, to implementation of the HUEBA, because a lot of

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people put a lot of time into this.

But then we go down into these are the instructor and instructor resources to everything we do, but I'll go down here a bit further and we look at--just to give some people an indication of when we put courses like this in, we're already sort of blocked full, so this has to be added in around other courses we've got. We got a basic oil spill response course which is going on all week. We have STCW, which is marine transportation courses going on all week. We have--there's a BST recurrent course which is going on there Monday and Tuesday. We have another BST-R course which is going on Tuesday and Wednesday. We have--and then we see the--then the BST-R courses would have included the HUEBA portion into those courses. We had a confined space entry course going on, H2S course, and then we see some, the HUEBA courses. These are the stand-alone courses that were added to ensure that we could meet the requirement of people that weren't coming up for BST recurrent courses. So as you can see, these were basically put on in the evening, 4:30 to 8:30 courses. 4:30 to 8:30,

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again 4:30 to 8:30. We had courses in on six there. 4:30 to 8:30, then we had courses going on in the weekend, Saturday and Sunday, and again, another one on Saturday, another one. So I think we put--on the first week operation, we had at least ten HUEBA courses going, which would be 120 people. So we were-- and we had no issues at all with any of those courses. We have marine basic first aid. Marine first aid and tanker familiarization, rescue boat, and most STCW courses. We have a lot of sea-day only course. That's one of your sea-day only that on a this course, and a WHMIS course. I think that's all for that week.

But I think it was challenging putting all this--I think when it came in, originally the intent was that this was going to be introduced into our BST, BST-R courses, but it was going to be voluntary for everybody else until such time as everybody had been trained. As a result of the incident on March the 12th, the decision was made by the offshore industry that they were going to train everybody as soon as possible on this device. So basically, that put a lot of pressure to move

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courses and move courses very, very quickly, and I think everybody sort of pulled their weight and did everything they could to make that happen.

MS. FAGAN:

Q. So are you saying that prior--obviously this has been talked about and discussed for a number of years. So it was clearly in the works prior to the March 12th incident, the implementation of this?

MR. RUTHERFORD:

A. Very much so, yeah.

MS. FAGAN:

Q. Very much so.

MR. RUTHERFORD:

A. Yeah.

MS. FAGAN:

Q. So are you saying that the plan, prior to March 12th, was that as workers, as recurrent time came up, as each worker filtered through and his three--he or her, three year time period elapsed and they were due to complete their BST recurrent, that's when they'd receive their HUEBA training. So you know, you would just--if you were out there and you were a year away from having to do your

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recurrent, once you went to do your recurrent, then you'd get your training. However, after March 12th, the decision was everybody is going to be trained immediately?

MR. RUTHERFORD:

A. Yeah, it was partly that.

MS. FAGAN:

Q. Is that what you mean by voluntary? Because you say it was voluntary.

MR. RUTHERFORD:

A. Well, or people could self select. Basically, people that were coming back to do their training course, their BST-R course, would do the HUEBA course. But people could choose and the companies could basically choose to send people in ahead of that time. We would have a number of stand-alone courses where we'd be starting to train. The intent, I think, the offshore industry wanted to get this in as fast as possible and make sure that everybody was trained as quickly as possible, but it wasn't--at that time, it wasn't considered they were going to make this mandatory for everybody offshore to have this training in place prior to a certain date. After March 12th, that was kind of--that was accelerated

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so it was pushed ahead to make sure that everybody that went offshore did have this training.

MS. FAGAN:

Q. And how many people have been trained on this breathing device since implementation? Your first course was the week of May 11th. How many have you trained since then?

MR. RUTHERFORD:

A. We had done--well, the end of October, we had done 1350. I think it's probably about just over 1500 now.

MS. FAGAN:

Q. Where did the--there must have been a budget or a cost associated with gearing up for this training and where would you get the funding for something like that? Because we heard from Mr. Barnes, the witness for CAPP, that an organization called PRAC provided some funding. So perhaps you could just explain that process?

MR. RUTHERFORD:

A. Yeah. One of the challenges for anyone that's involved in any way in any public institution is how do you find money to actually make things happen. We have to generally--we are a

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cost recovery unit. There's a limited budget in terms of what we can do, operational budget, which doesn't always provide us necessary funds to do capital acquisitions. We had a situation, I guess, with this particular training, implementation of this particular training was going to cost us a significant amount of money. It's 180--we had estimated somewhere between 170 and $200,000 to implement. Originally, there was talk that the offshore industry were actually going to provide us with the actual units and in the end, I think, for some reason, I don't--that was retracted. They decided that we would pay for this out of our delivery of courses and it would go onto the delivery of courses. It's a little bit challenging for us because, again, as a public institution, we have--our finances go year by year. So we have to--necessarily, it's not always easy to recover our money back into the previous year.

So what we looked at doing, I guess there's two approaches. One, when I went to our executive of the Marine Institute and indicated that this was coming in, it was an important training. It was required. It was

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going to be introduced to the offshore and it was extremely important that we introduce it, and basically said we would like, you know, to have permission to expend funds against this, and they did approve it, and I did say that what I would do is try and find ways to recover some of the money that was going to be expended. So what I did was applied to PRAC, which was--PRAC is Petroleum Research Atlantic Canada. They have money available for research activities, and because this was sort of a training developmental project with a slight--a certain amount of research activity associated with it, developing a risk management protocols, et cetera.

MS. FAGAN:

Q. Wait now. I know you're trying to find the exhibit. Just go over to TRIM. That's right, okay.

MR. RUTHERFORD:

A. Because of that, they did approve funding, a certain percentage of our funding. So that was--this was the final report we put in to PRAC.

MS. FAGAN:

Q. And I believe you're referring to Exhibit 94?

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MR. RUTHERFORD:

A. Exhibit 94, yeah.

MS. FAGAN:

Q. And 94 is the final report with respect to funding by PRAC?

MR. RUTHERFORD:

A. Yeah.

MS. FAGAN:

Q. What is PRAC?

MR. RUTHERFORD:

A. That's Petroleum Research Atlantic Canada, and it's a funding pool that's put in place by the offshore operators and it's a funding pool that we can access for certain research and development projects.

MS. FAGAN:

Q. So the money -

MR. RUTHERFORD:

A. So it is an offshore--the money does come from the offshore petroleum industry.

MS. FAGAN:

Q. So it comes from the industry, the operators for the most part?

MR. RUTHERFORD:

A. Yeah.

MS. FAGAN:

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Q. So the operators provide money to this research group called PRAC?

MR. RUTHERFORD:

A. Yeah.

MS. FAGAN:

Q. And that's where you received funding?

MR. RUTHERFORD:

A. Yeah.

MS. FAGAN:

Q. And this is the final report with respect to the funding that was provided?

MR. RUTHERFORD:

A. Yeah. We did originally intend completing all this by the 31st of August, 2008. As you see, it was delayed a little bit there while they were still looking at various types of systems, but so we had to ask for an extension on this proposal, but basically what we did here, just this gives an indication of what we did, what we had to do in terms of facilities, modifications. Because I got money from PRAC, we have to provide a report to them. So it provided us, you know, a report that does track some of the things that were going on, which I think is useful to people here. So it looks at the facilities modifications, our

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equipment acquisition, various--our training instructors, technical support personnel. The risk management, we looked at the risk management in conjunction--the HUEBA Task Force was looking at risk management. We were also looking at it internally to determine what was the best way of delivering the training. As well to that, we looked at this particular trainers. We thought that we could deliver the training, we could manage our risks effectively doing this, but we could provide an effective training capability. So we have to--this just gives an indication of what it cost us.

When we submitted the proposal, we were looking at MI providing $140,000 in cash, PRAC $50,000, and in kind, which is time for people who are fundamental--people who are full time at the Marine Institute, we just put our--it's not actual cash expenditure, but it's in-kind resources of our personnel. We'd estimated $176,000 at that time. When it came in, when we concluded this project, it was $167,000. We have actually expended a little bit more than that because we have now trained a few extra people up and we've trained--we've got

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another chair, but that's--at the end of the project, when we set up, this is what it cost us to do.

MS. FAGAN:

Q. So on about 170,000, 50,000 came from PRAC?

MR. RUTHERFORD:

A. Yeah.

MS. FAGAN:

Q. And about another 100 came from the Marine Institute?

MR. RUTHERFORD:

A. From the Marine Institute, yeah.

MS. FAGAN:

Q. And then there was about 20,000 in kind?

MR. RUTHERFORD:

A. Yeah.

MS. FAGAN:

Q. Which would have been existing resources devoted to this particular project or implementation?

MR. RUTHERFORD:

A. It would, yes, yeah, and I think here in the back here we've got--we had to submit the training courses into that. This is the HUEBA Task Force recommendation to CAPP that I included here, December 2008. That's included

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in the back here, and information on project expenditures. This tells you here exactly what the money was spent on. So the actual EBS system, the actual units, we expended close on $62,000 for those. The grates for the pool modifications, around $41,000, and then you see the outfit of the service room, construction of service room. So it provides a reasonable understanding there, I think, of what we were involved in.

MS. FAGAN:

Q. A good source document if somebody wants to see what went into the actual implementation of the device.

MR. RUTHERFORD:

A. Yeah.

MS. FAGAN:

Q. Now you had mentioned that you had some instructors trained in the rebreather and then you also had the instructors trained in using this device. Was there anything else required, any standards that had to be met or any certificates that had to be met in order to implement the training?

MR. RUTHERFORD:

A. Yeah, we had to have--our instructors require

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to have dive medicals. That was required by our Department of Labour because they were involved in compressed air breathing devices. We did have to have occupational--they're to be trained in occupational SCUBA diving. Greg will get into this a little bit more. He can tell a little bit more about that, what was required of his people there to deliver the training. I think--just thinking about what else there was. The other thing really related to the training of the technicians, because we had to have the manufacturer come in and provide training in servicing and hygiene aspects relating to the use and servicing of the device, because these are going to be utilized, you know, frequently in chlorinated water. We have to take them--after every use, they have to go through a servicing and cleaning.

MS. FAGAN:

Q. And the cylinders have to be refilled?

MR. RUTHERFORD:

A. Refilled, yeah.

MS. FAGAN:

Q. Now I don't know if that is all you have to add on this device, and if we're ready for Mr.

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Harvey to present or if there's anything else you'd like to add?

MR. RUTHERFORD:

A. I think my next slide says HUEBA presentation, Greg Harvey, instructor. So that probably is an indication that somebody is telling me -

MS. FAGAN:

Q. I think that's Mr. Harvey's -

MR. RUTHERFORD:

A. - they've had enough of me.

MS. FAGAN:

Q. - cue to take the stand and you will get a break. Just for the group, when Mr. Harvey is finished, Mr. Rutherford has a few comments, just a couple of slides on current standards and some opportunity for the future, and then we'll put the panel together for questions. So Mr. Rutherford, you get a break, if you would like to come down, and Mr. Harvey, you can step forward, if you would?

MR. GREGORY HARVEY, EXAMINATION BY MS. ANNE FAGAN

MS. FAGAN:

Q. And Mr. Harvey's presentation is at Exhibit 97, so I'd ask the Registrar to bring up Exhibit 97, if she would. Just perhaps go down to the bottom where it indicates TRIM

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contents and 97 is towards the top, third one from the top. I don't know if the system is exactly configured the same where they--the technicians have two PowerPoints and three videos all embedded.

MR. HARVEY:

A. Actually, yes, if we could go back to the presentation, it's linked through the presentation.

MS. FAGAN:

Q. Okay.

MR. HARVEY:

A. And there's a video clip in there that won't play unless it's actually linked through the presentation. I can do it from here?

REGISTRAR:

Q. Okay.

MS. FAGAN:

Q. Slide 59.

MR. HARVEY:

A. Here we go, okay. I guess I've been asked to brief everyone or to talk about the HUEBA unit. I guess there's been lots of talk about it since pretty well day one of the Inquiry. So I'm going to be--I'm going to go through the operation of it, the features of it, the

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benefits of it. While I'm doing that, I brought an additional unit here, so just maybe to get things going, to be passed around, and make sure I give you the one that doesn't have any air in it.

MS. FAGAN:

Q. I understand during the training, you pass around a cylinder that's not full until you get the students in the pool. Is that correct?

MR. HARVEY:

A. No, every student gets a full cylinder.

MS. FAGAN:

Q. But once they're -

MR. HARVEY:

A. In the classroom, it's a controlled setting, so they get it when--once they've seen the presentation and when I'm in control, so I know they're not going to do anything foolish with it.

MS. FAGAN:

Q. But this group is getting a cylinder that's not full.

MR. HARVEY:

A. It'll be a while before I get to it in the presentation, but just to get it going. So

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before I jump right into the HUEBA unit itself, I'm going to talk a little bit about the rationale behind implementing helicopter underwater emergency breathing apparatus. I think it's important that everybody understand where this is coming from and just how important it is probably to the survival of people who might find themselves trapped under water in a helicopter. So I'm going to go through that with you. I'll also review the equipment. I've also brought a rebreather unit here and there's been lots of mention about this being used in the North Sea. I'll do a little demo of this as well to show you how this would work and how it would compare to the compressed air systems.

Whenever you breathe compressed air under water, there's always a concern. There's hazards associated with it. So I'm going to review that with you as well and that'll probably explain or I hope it'll explain why we won't be using this unit in our HUET. So as Mr. Rutherford has already explained, all this training takes place on the shallow platform in our pool. At no point do students go over one metre in depth of water. So I'll

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explain that in that part of the presentation, as well as look at the limitations of it, and at the end of the presentation, I'll actually take you through our practical. So show you exactly what the students will be going through in the pool and what we expect of them.

Starting with the rationale. The International Association of Oil and Gas Producers, they publish a report annually on helicopter accidents around the world. They look at different types of operations. I've just picked out the offshore operations here. While it's a 2007 statistics, it's the most current report. In fact, it was only publicized probably within the last couple of months. So worldwide, as far as offshore helicopter operations go, and I guess I should add that most of these operations are within the Gulf of Mexico and the North Sea. There's over nine million passengers annually travelling offshore in helicopters and that means there's over 900,000 hours of flying time. In 2007, there was ten accidents. So when we talk about accidents, we're talking about either ditching, and when we talk about

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ditching, we usually think of a controlled descent or landing on the water, as opposed to a crash. In this case, an accident would be one or other. At some point, ten helicopters ended up in the water. Out of those ten accidents, there were five fatalities. So that's just a snapshot of what happened in 2007 worldwide as far as offshore helicopter operations go. For a five year average, looking back five years from 2007, we can see that the five year average of 16 accidents with 5.8 fatalities. So, I guess, what we're trying to point out here is the accident that happened this year, it wasn't an isolated event, helicopters do go down. In fact, I think if you look at a five year average, it's about 1.8 accidents per 100,000 hours of flying time, and about .6 fatalities per 100,000 hours of flying time. So helicopters go down. What happens to them when they land on the water. Well, I've chosen this report here because it's fairly current, 2006. It looked at 110 civil helicopter accidents as opposed to military over a five year period, and what the authors are showing us here is that 69 of the 110 accidents, 63 percent of

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them the helicopters capsized upon hitting the water. All the helicopters that fly offshore, they're designed to float, so they're either amphibious, so the shape and style and design of the helicopter will allow it to rest on the water and float, or in the case of the DS-32 that's flying off here, they have extra enough flotation bags that can be inflated prior to or upon landing on the water to keep the helicopter upright and afloat. I guess, that's the good news. The bad news is that helicopters are top heavy, so their gravity is high, the engines and rotors are up high on top of the helicopter itself, so even though they've landed, there's still a likelihood that they could roll over before people have an opportunity to get out. So 63 percent of the helicopters that land on the water capsize. Out of that 63 percent, 38 of them, and I think if my math is correct, that works out to about 58 percent of them actually sink. So if we just take the numbers for what they are, your helicopter has a greater likelihood of rolling over and sinking than it does staying afloat on the surface of the ocean. I will point out here, though, that these

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numbers don't tell us how long it took for the helicopter to roll over and sink. In some cases, it was immediately upon landing on the water; in other cases, the helicopter might have stayed afloat for up to twenty minutes before it actually rolled over and sank. If we take the numbers at face value, you're more than likely to have your helicopter roll over and sink. So they go down, they roll over and sink. It doesn't matter how you ended up in the water, whether it was a controlled ditching, a limited control, a fly in, or an uncontrolled event, our helicopter still stands a greater likelihood of capsizing than it does of staying upright. I guess, the next question that has to be asked now is why are people not getting out of survivable events, and I put the emphasis on survivable here because this particular study I'm referencing here by Cliffords, he looked at survivable events, so accidents where you wouldn't expect anyone to survive weren't included in the survey. He looked at UK military fatalities between 1971 and 1992, and what he found was that 83 percent of all the fatalities, again in survivable events, were as a result of

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drowning as opposed to impact injuries. So in other words, people were still alive when the helicopter rolled over and there was really no reason for them not -- there was no reason for them to die other than drowning. So just a quick review; helicopters go down, helicopters roll over, helicopters sink, and we know that in survivable events people are drowning in these helicopters. I guess, the next question is why are people drowning. I got four main causes up here. You know, there are more, but these are probably four of the big ones. People are drowning in survivable events as a result of incapacitation due to injuries. These aren't necessarily life threatening injuries, they're often what's referred to as flailing injuries. So on impact, your arms and your legs are free to fly around and now you've beaten up your hand, you've dislocated your shoulder, but you need that hand to release the seat belt, you have to be able to clear your exit, but you can't. That's the type of injuries we're referring to here under incapacitation due to injury. Disorientation; when we turn somebody upside down in our HUET under water, left becomes right, right becomes

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left, up becomes down, the bottom line is you don't know where to -- or where you're going. It's extremely disorienting. So we know people are not getting out again of survival events just because they don't know which way out is. When they're up on the surface, they know out is that way, but you turn them upside down, that doesn't mean anything any more. We know people are not getting out because their exit has been delayed. That could be from a jammed exit, so maybe they've had to make two or three attempts to try to clear their exit, it might be an issue with the seat belt, it might be the guy before them has to go out through the window or the emergency exit before they can go out. So there's something that delayed their exit. Those are three reasons why people are drowning in survivable events. Having said that, probably the single most cause for people drowning in these events is cold water shock, and I think it's been mentioned here a number of times at the Inquiry, certainly today, and what cold water shock is -- some of you have might even experienced this this morning. You might have been in the shower lathering up nice and warm, and all of a

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sudden somewhere in the house somebody turned on the hot water and all you got was a blast of cold water, and as soon as the cold water hits your skin, your first response is an involuntary gasp, and that's fine in the shower, but if you're about to roll upside down underwater in a helicopter, at the same time your face is going in the water, you're taking that gasp, and there's a very good likelihood that you're going to take in water and drown. The gasp reflex is followed usually immediately by loss of control of breathing. So it's a gasp, and you start hyperventilating, [witness demonstrates] you don't have control of your breath. Once again if your face is going in the water, that's not a good situation. You're at high risk of taking in water and drowning, and as we'll see in an upcoming overhead, not only can it lead to drowning, but cold water shock will significantly reduce your breath hold time. So if you're relying on your ability to hold your breath to get out of that helicopter, then that time could be as little as six seconds, but an average time of about 20 seconds. I'm getting ahead of myself. So up until May of

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this year, HUET training has dealt with all those issues. So if you came in and did HUET training prior to May, we would have talked about the importance of the brace position with you, we would have got you practising the brace position, locking your arms across your chest, holding onto the suit, locking your feet, your legs together, making sure your seat belt is nice and tight and secure prior to impact. By getting into proper brace position and securing your seat belt, you minimize or you reduce the risk of injuries or flailing injuries, as I mentioned. Disorientation. When you would have done our HUET training, we would have explained to you the importance of looking in the direction you always want to go. So if I'm sitting in the seat here and my emergency exit is right beside me here, a window, I'm going to focus on that emergency exit. When I'm hitting the water, if I can, I'm going to clear the exit; if I can't, I'll at least put my hand on it so I've oriented myself in the direction I want to go. So when I'm upside down under water, I don't have to guess left, right, I know which way I'm going, I've got something to direct

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me. So we would have dealt with this disorientation issue. Cold water shock, we deal with it in training. The importance of the flight suit and the importance of getting the flight suit done up. So every time we take a student through an exercise, we have them repeat this over and over and over again to the point where, I think, sometimes they just get sick of it. We get some pretty funny stares, because we just say take your hood down, relax your zipper, and as soon as they get it down, we say helicopter is going down, get watertight. We want it to be second nature to them that that hood is up, zipper is up, and they are watertight so they can insulate themselves from the cold water because when the cold water hits your skin, that's what triggers the cold water shock. So if we can insulate ourselves from that cold water, it'll minimize the effects, or even prevent cold water shock. There's one thing we haven't dealt with in training, though, up until May past, and that was the actual time it would take to actually escape from a submerged helicopter, and how long can people actually hold their breath because up until

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May, this was all breath hold, it all depended how can you hold your breath. There's a lot of studies out there, a number of studies, that have looked at how long it would actually take to get out of a capsized helicopter. I've got one here by Tipton that was done in 1997. There's one thing that most of the studies all agree on, and that is it will take significantly longer than people can actually hold their breath. So this particular study I got quoted here shows a time of between 40 and 60 seconds. That's to get everybody out of that capsized helicopter. So if it's taking 40 to 60 seconds to get out, how long can people actually hold their breath. So this study was done by Cheung in 2001, and he looked at offshore workers. So he took a sampling of offshore workers and there was a substantial population there. I'm going to go out on a limb and say I think there was 228 students going through a BST course, and what they did was they got them in the water, they were wearing a dry suit, a flight suit, got them in the water and timed how long they could actually hold their breath. So in cold temperature water in, let's say, a 25 degrees

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celsius, the average offshore worker can hold their breath for 37 seconds. Drop that water temperature down to something that's more reflective of what we have here in the summertime, our surface water goes up to 16/17 degrees celsius. Under those conditions, the same worker can only hold their breath 29 seconds. Drop it down to winter conditions, water temperature 1 degree celsius, you can see that breath hold ability now drops from 29 seconds down to 15.9. So it's almost half. So at this point, you should be starting to clue in here there's a problem; 40 to 60 seconds to get out of a helicopter, the average offshore worker can hold their breath for, well, in winter conditions, 15.9 seconds. We throw cold water shock on top of that, and that breath hold time can drop down to as little as six seconds, with the average time less than 20 seconds. So obviously there's a need to bridge that gap between actual breath hold time and the actual time it would take to escape from a helicopter. So there's two solutions out there, and I've brought both of them in here with me today, and the first one is the rebreather unit. It was introduced,

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or, I guess, not introduced, but Shell, this is over in the North Sea, started looking at the issues related to this breath hold and escape time as early as 1989, and what they wanted to do was to develop a system that extended the underwater breath hold time or underwater time of a passenger in a helicopter to get them to that -- to bridge the gap to get them to that 60 seconds. They wanted a system that didn't introduce additional dangers, whether that be in training, or actual use in the real world, and it had to be simple to use. The result was the rebreather, and I'll just do a quick demo of it here. So the way the rebreather would go on is it would go over your neck and it would be adjusted with the strap. It would secure either to the belt on the life jacket, as most operations I believe in the North Sea use a life jacket that goes on over the suit, and there's a little buckle here that would attach to the life jacket. It's positioned between the two lobes of the life jacket, and the way it would work is on impact with the water, the wearer would deploy it, and to deploy it, you just pull on the protective cover there and it

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opens up, and what we have inside here is we have what's referred to as a counter lung. It's basically a bag and the counter lung holds a volume of approximately nine litres of air. Coming off the counter lung is a hose that goes to a mouthpiece and the mouthpiece has a plunger on it. I don't know if you can hear that or not. The idea of the plunger is that you wouldn't actually start putting the air into the counter lung until you were just about to go under water. So the plunger allows you to put this into your mouth and breathe atmospheric air, so you're just breathing in air from the environment around you, and when you exhale, the exhaled breath is going back to the environment, as opposed to into the counter lung. Just prior to submersion, so just before your face goes in the water now, of course, the mouthpiece would be in, you'd hit the plunger, now when you exhale, your exhaled breath is going into this counter lung. Your exhaled breath contains -- we breathe in about 21 -- the atmosphere is made of 21 percent oxygen and about 78 percent nitrogen, with about 1 percent other gases. Our body metabolizes about 5 percent of that

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oxygen we breathe in. So we breathe in 21 percent oxygen, we exhale 16 percent oxygen. That's normally lost in the environment. The idea of the rebreather is it enables you to recapture that 16 percent oxygen and reuse it. The other thing that happens is when you exhale your breath, you're moving the air around in your lungs, there's dead space there where your body is not getting access to the air with the oxygen that we need. So by moving that air around and recapturing it, it extends our ability to stay under water. That's the rebreather in its simplest form. This was introduced in -- I'm going to say, 1996, and so they started using it both in training and offshore in the North Sea, but there was a problem with it, and the problem with it was it relies on the user to actually get a breath into the bag. If there's no breath in the bag, you've got nothing to rebreathe. So in 1999, they released what they called the hybrid system and the hybrid system had an air cylinder attached to it. There's just a plug here, but there would be a little air cylinder here and it holds about 3.5 litres of air, I think, is what's in that cylinder, and the

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idea is upon hitting the water, that cylinder would fire off automatically and it would put a breath in the bag for you. So in the worse case scenario, you hit the water, you didn't have that breath to put into the bag to begin with, there will be a breath in the bag waiting for you, and that was done in 1999. So that's the rebreather.

MS. FAGAN:

Q. And you said this rebreather, this hybrid rebreather that they're currently using in the North Sea?

MR. HARVEY:

A. The hybrid -- the hybrid unit is being used on the flights.

MS. FAGAN:

Q. Okay.

MR. HARVEY:

A. In training, because that compressed air cylinder is introducing a hazard or a risk to the trainees, it's not being used. So the model I have here is the training version, it doesn't have the high pressure cylinder on the side of it.

MS. FAGAN:

Q. So if you were doing the OPITO course, that's

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what you would be using and then when you went offshore, they'd have the cylinder attached?

MR. HARVEY:

A. Absolutely, yeah, to reduce the risk or to eliminate the risk, I guess, of a lung over expansion injury which is coming up in the presentation, they've just taken that cylinder off for training purposes.

MS. FAGAN:

Q. So you don't if it's everybody, is it generally used, or is it only in certain -- for certain companies or for certain --

MR. HARVEY:

A. In, I'm going to say again 2005, I believe it was, OPITO put it into their curriculum. So certainly in the UK sector, for example, everyone flying offshore has to meet the OPITO standard, so everybody would get the training in it, and I think in Mr. Rutherford's presentation he also noted that in the Norwegian sector they're also doing training on the rebreather.

MS. FAGAN:

Q. Thank you.

MR. HARVEY:

A. So that's one solution. The other solution is

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the compressed air system. I got a couple of slides in here coming up just to kind of give you the history of it. There seems to be a perception out there that this is something that just came into being as a result of the accident this spring, but I'm just going to show you that there is a history to this system, it is a well proven system, it's a well documented system, and over the years it has saved quite a few lives in actual use. I got up here military worldwide because they were the ones that really got the ball rolling on this. This is more just a reference slide here because the next slide I'm going to talk about all these different systems, and I just can't remember the acronyms, so I'm just going to name off the acronyms in the next one, and you can refer back to this slide, what's he talking about there, there they are there.

MS. FAGAN:

Q. And as I understand it, everybody has a different acronym or a different name for many of these devices. They're similar, but not exactly the same?

MR. HARVEY:

A. A lot -- yes, a lot of them are the

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manufacturer's acronyms they've put on them. In the case of HUEBA, the offshore operators here, it's my understanding, they wanted to distinguish their system, the system they're using here form all the others, so they put the name HUEBA on it. Collectively, they're referred to as EBS, emergency breathing systems. So starting as early as 1975, the first HEBE unit was developed. It was a low pressure system, it consisted of a cylinder that was stored under or behind the seat, and these are military operations now. I'm not sure -- it's unclear from the literature whether it was actually ever used, but it's certainly credited with getting the ball rolling. They had to start somewhere, this is where they started, it got things moving. As early as the 1980s, the US Navy, Canadian Forces, started using a spare air, and spare air, you can still buy them today and they're common in the recreational dive industry, sport divers use them. It basically consists of a high pressure cylinder, storage cylinder, and incorporated into the cylinder is a first and second stage, and basically you just put the cylinder with the mouthpiece in your mouth

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and it just hangs kind of suspended from your mouth, and it provides the air on demand. In 1986, the Canadian Forces switched to a HEED2, which was really an evolution of the spare air system. So the spare air was kind of just a generic system, and now they started looking and saying, well, we need something that's more tailored to our operations, so they started getting into the HEED2. In 1990, the US Navy switched to US Divers, or what's now referred to as Aqua-Lung. Their system, and I think it stands for Helicopter Air Crew Breathing Device, which was the first in the evolution of the SEA LV2, which is the system I'll be going through here. So this is where the SEA LV2 had its origins in 1990. By 1994, the Canadian Forces also switched to the same systems. By 1992, the Royal Navy started looking at a system they could use and what they went with was the STASS system. Again it's by a different manufacturer, but it looks very similar and behaves and has the same components as the system I'll be showing you here today. In 1993, the Royal Navy started looking at a P-STASS or one that passengers would be more -- it would be more suited to

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passengers as opposed to the flight crew and the military personnel. Of course, this brings us up to 2000 when CAPP starts looking into EBS emergency breathing systems. They didn't call it HUEBA at that time, it was just an EBS system. In 2004, as we've already seen through other's testimony here, they selected or they went with the US Divers, or what is now called Aqua-Lung, the SEA LV2. That's the unit I'm going to take you through here now. So just a little history on it, on the evolution of compressed air systems. The benefits of the HUEBA, you know, we talked about the issues and why people drown; well, hopefully if you provide the passengers with - you know, whether it's a compressed system or a rebreather system, something to allow them time to overcome any obstacle they might have encountered, and that might be their own panic, it might be that disorientation, they didn't get a chance to orient themselves on impact, and now they're upside down, it's going to take them time to figure out where they're to and where they have to go. There is an issue releasing that exit, they got to do it under water, considerably harder,

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instead of one bang, it's two or three bangs. They might have to go through alternate exits. Maybe that exit is blocked, maybe that exit is not available to them. The fuel cell, the S-92 carries an auxiliary fuel tank. It's probably going to take them a little extra time to get over that fuel tank to their exit, clear their exit and get out. There's a number of reasons here why people might have to use the air system. So to the system we're using, I've got it called Aqua-Lung EBS because that's how the company refers to their units. So on the screen there, you can see the first evolution of the helicopter air crew breathing device. That proceeded to the second generation, which is survival egress or the MK Unit, and that brings us up to -- and I'm not going to go through those systems with you here other than point out there is an evolution in this, and this is the third generation system.

MS. FAGAN:

Q. The generation one, so is that the one from 1990 with the US Navy, or approximately how long -- you have three generations, so --

MR. HARVEY:

A. 1990, yes.

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MS. FAGAN:

Q. Three pictures.

MR. HARVEY:

A. That was the start of it there, yes.

MS. FAGAN:

Q. Okay, so the first one is the 1990 version?

MR. HARVEY:

A. 1990 US Navy switched to.

MS. FAGAN:

Q. And the generation three is what we're using?

MR. HARVEY:

A. The generation three, yes, that's correct. Somehow I skipped a slide there. I'll just back up. So the system we're using, Aqua-Lung is the manufacturer. They refer to their system as the Survival Egress Air, and as we saw, there's the MK version and the LV2, and what that refers to is really the second stage and I'll get into that in a minute. It's just the different second stage on it, and I've referred to this one as the SEA LV2 Exxon, because when Exxon ordered these units or decided they were going with it, they asked for a couple of features that weren't necessarily standard off the shelf. So if you go to Aqua-Lung, for example, us at the OSSC,

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if we want to order a part or something, we have to reference the SEA LV2 Exxon version just to ensure we get the -- they know what we're talking about. So the system itself, and I'll stand up just to go through this just so everybody in the room can see me. So what we have here is we have a high pressure cylinder, and what I mean by high pressure it stores normal atmospheric air, which I've already mentioned, contains 21 percent oxygen and 78 percent nitrogen. It stores that air at 3000 psi when the cylinder is full. It holds 1.5 cubic feet of air in the cylinder. So what I mean by that is if we had a balloon and we let all the air out and we captured in a balloon, it would fill a space of 1.5 cubic feet. The air that's gone in the cylinder is filtered, so while it is just normal atmospheric air, it goes through a filtration process where contaminants are removed, as well as moisture. The moisture is taken out of the air before it goes in there. That air at 3000 psi is useless to us. If I stuck this hose in my mouth and turned it on, it would probably get very exciting in here, for me, anyway. So we have to be able to -- we have to

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be able to break that 3000 psi down to something that we can actually use. That's done by way of a first stage, and the first stage takes that 3000 psi or pounds of pressure of air and breaks it down or reduces it to what's referred to as an intermediate pressure, and in this particular case, the intermediate pressure is 135 psi. 135 is still no good to me, it's still way too much pressure for me to breathe from. That air is delivered through an LP hose, low pressure hose, to a second stage regulator, and that second stage regulator now takes that intermediate pressure and it breaks it down to an ambient or the surrounding pressure, and that's something I can actually use and breathe. That's the major components of the SEA LV2. Look closer now at each individual component. Just starting with the cylinder, there are markings on the cylinder around the neck of it, and I'll just quickly go through them just out of interest, I suppose. The first thing on the top there is DOT/3AL 3000. DOT is Department of Transportation in the States. So this cylinder is approved for use in the United States. 3AL refers to the

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material that it's made out of. It's an aluminum cylinder. 3000 refers to the pressure, the working pressure, of this cylinder, 3000 psi. The next numbering you see there on the overhead is AJ, and a bunch of zeros. That would be the serial number associated with this cylinder. The next line there is TC3ALM 207. So TC is Transport Canada, so it's approved for use in Canada. 3AL again is the material it's made out, aluminum, and in this case for the working pressure, we've got an "M" signifying metric, and 207 meaning it's 207 bars. So that's the working pressure of the cylinder. Cliff Div. there, that's the manufacturer, that's who made the cylinder, and then we've got the date of manufacture with the month and the year stamped. So that's the stamping around the neck of the cylinder. From the cylinder, we'll go to the hose -- sorry, from the cylinder, we go to the first stage. I've got a PowerPoint presentation. The first stage we told you is going to break the pressure down from 3000 to an intermediate pressure. The first stage also has some features that are important to the user of the system, and one

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of those is the on and off knob. So we can actually turn this system off whereby if I wanted to use it, I wouldn't get any air from it. Offshore -- when the passengers flying offshore are issued their flight suit with the HUEBA on it, it's turned on. It's ready for use or it's armed, if you will. So that people can visually check that very quickly, there's a slit that runs around the inside of the on/off knob, and you can see it clearly on the presentation there. If you can see red in through that slit, your system is off. If you don't see any red, it's on. So I've got this on my suit, I can quickly glance down and see my system is armed and ready for use, no questions asked. Just because it's on, unfortunately doesn't mean it's going to work for you. It has to be on and there has to be air in the cylinder. So they've put a pressure gauge on there for you, so you can look, and I told you it holds 3000 psi when it's full. So in this case here, it should be 3000 or in the green, if you will, and the pressure gauge calibrated in thousands of psi. You can appreciate it's a fairly small cylinder, so if it wasn't full, you wouldn't

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be getting every breath you're entitled to, so it's important that the wearers not only check that it's on, but a check that, in fact, there's air in it and it is full. Other features under first stage are the fill port. That's how we get the air in. There's basically a dust cap in there. That's of no significance to the wearers or the users. Hid away behind the swivel here is what's referred to as a burst disk. So if this cylinder gets exposed to high heat, the air inside will expand and rather than rupturing a cylinder and shrapnel going everywhere, this burst disk will rupture and the air will be released in a controlled fashion. That is the major features -- the features of the first stage.

MS. FAGAN:

Q. Now I don't know when we want to break. Do you want to break now or do you want to wait?

COMMISSIONER:

Q. Well, if you're getting into something else, we'll break, I guess.

MS. FAGAN:

Q. Well, he's going to go through -- there's a couple of more stages. I don't know if you want to break at 3:15 or if you want to break

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at 3:30.

COMMISSIONER:

Q. Yes, that's the usual time we break. We might as well before -- if you're going to go through two more stages, we'll break now.

MS. FAGAN:

Q. Okay, thank you.

(RECESS)

MS. FAGAN:

Q. Okay, Mr. Harvey, I understand you're going to go through some of the other components. Now, I know there are many components to this apparatus, but the focus for us will be some of the riskier components and the more complicated aspects.

MR. HARVEY:

A. Okay, keeping that in mind, I'll just touch on the high points of the few slides leading up to the hazards. So, we mentioned that we had a high pressure cylinder, first stage, that broke the high pressure air down to an intermediate which was delivered to a second stage which broke it down to intermediate pressure. The major features of the second stage--well, first of all, it's small and that becomes very important when we deploy under

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water because one of the things you have to do when you deploy the regulator under water is actually displace or clear the water out of it. The fact that it's small makes that very easy. So, from a training perspective where someone had to use it in a real work, it's very very easy to clear. It's an open circuit demand valve. And what we mean by demand, when you want air (witness demonstrating), you get air; when you don't want any air, you don't get any. It's air delivered on demand. And what we mean by open circuit, as opposed to the re-breather, we don't recapture our air, it's just lost to the environment through an exhaust on the second stage. The other feature I'm going to point out on the second stage is the purge button. It's just a depression on the front face of the regulator and when you push it in, you're opening the puffer (witness demonstrating) and you allow air to free-flow. That's one of the ways we can use to clear or displace the water out of the regulator should we have to deploy it under water. So, that's the major features of the second stage.

How does it work? Well, I've already

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demonstrated it. (Witness demonstrating). It's as simple as that. Put it in your mouth and breath. The issue comes in is if you have to deploy it under water. If you have to put it in your mouth under water, then, as I already mentioned, you're going to have to displace or clear the water out of the second stage. I'll just quickly demonstrate the two ways to do that. One is referred to as the blast method and it's as simple as (witness demonstrating) a little puff of air. I just displaced every bit of water in that second stage. I'm good to go to breath. You might not have that little puff in you; that's when you can use the purge button. (witness demonstrating) I just cleared every bit of water out of that second stage and I'm good to go to breath. That's how the unit works.

One of the beauties of this system here is that it fits right into what we've been teaching for the last twenty odd years in HUET training. It doesn't change a thing. The priorities are still to get water tight. The priorities are still to brace for impact. On impact, clear your exit and orient yourself towards that exit. It fits right into

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everything we've been doing. We instruct students to deploy it after impact, but before submersion, so the ideal situation would be you hit the water, water is coming up, and you need it, and it's set up on the left breast of your flight suit, it's only a matter of pulling it out of the dust cap, putting it in your mouth and you're good to go. In the situation where you find yourself under water, then obviously we pull out, put in, clear it, now you're good to go. So that's -- it's very simple, very clean system to use. It does have limitations, however. It's intended for one thing and one thing only and that's egress. You're in that helicopter, you're upside down under water, it's there to get you out, period. As far as the duration of the cylinder and how long it will last, that really depends on the individual. Everybody's different. It depends on your breathing rate, your work rate, how hard you're working. The water temperature, we've already seen the colder the water, the more you breathe, the more you breathe, the less time it'll work. The depth of water you're at, I'm going to come back and revisit that one in a minute.

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Do you have a face mask on, a dive mask. People tend to be a lot more comfortable with a dive mask on. It minimizes again the effects of cold water shock. If you're more relaxed, more comfortable, you're going to get more time out of the cylinder. Is the cylinder full? All these are factors to determine how long you'll actually get out of the system. Keep in mind, it's only intended for one thing, and that's that egress. If something has delayed your exit in getting out of that helicopter, you have time to deal with it. Malfunctions. Can anything happen to it? I don't know if anything can happen to it. This slide is taken from really the recreational dive industry; I've just come up from a dive, I've thrown all my gear down on the beach, I've got sand and dirt into the system, it's supposed to be maintained annually, I haven't bothered with that, I got my air fill from a not so reputable air station. You start seeing these issues come up. Because these systems, you know, they're not being used offshore, because they're being well maintained, the air is coming from a reputable fill station, I'm not sure if you'd actually

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see any of this, but here's the good news, if any of these things occur, so a freeze up, and what we mean by freeze up is in cold water, when you take a breath, the regulator can actually freeze open and just continue to flow air. So now instead of a demand regulator, it's a free flow regulator. You still have air. If the purge button gets depressed and stuck for some reason, you still have air, and that's all you're asking from the system is give me air. The second stage could flood on you. So in other words, remember when I said it was very easy to displace and get the water out of there, well, if the diaphragm on the front is torn or the exhaust valve isn't seating properly, or there's a problem with the mouthpiece, when you clear the water, more water can come back in; doesn't matter, you can still get air through that water, you can still breathe. At the end of the day, if something does happen, you're going to get the air you're looking for. You're going to have to live with the consequences of a little too much air, and maybe a little bit of water mixed in with your air, but you've got the air you need. That's the system, that's how it

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works, that's what it can do for you. Now I mentioned earlier that, and Mr. Rutherford mentioned it, all the training we do assumes it's done in the shallow end. In fact, we put a shallow end in our pool just to accommodate this system, and the reason is that when you breathe compressed air and the textbook says at a depth greater than one meter, you're at risk of a barotrauma injury or a lung overexpansion injury. I'm going to try to explain that to you now. Starting with Boyles Law, Mr. Boyle states that for any gas at a constant temperature, the volume of the gas will vary inversely with the pressure. So as pressure increases, volume decreases; as pressure decreases, volume increases. As an example, here in this room we're at one atmosphere of pressure, and one atmosphere is 14.7 psi, or 1 bar, if you prefer the metric side of things. Every 33 feet or 10 metres of water is equivalent to 1 atmospheres. So every foot of sea water exerts .445 psi of pressure. So we go down to -- sorry, we go down 10 metres. I just realized there's a problem with my slide there, I apologize. I got 0 feet, 10 metres, that should be 00, and 10

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metres should be down under 33 feet. So we go down to 33 feet, 10 metres, we've gone down an atmosphere. So now we've got the weight of the air over us, which is one atmosphere; we've got the weight of the water, which is another atmosphere. We've just doubled the pressure. So for the balloon that's in the picture there, if we had -- I got one there, that could be at 1 cubic foot, whatever you want to call it, we had 1 cubic foot of air in that balloon, we take it down to 33 feet or 10 metres, we've now just doubled the pressure. Because pressure and volume are inversely related, the volume of the balloon is now half, so now we only have half a cubic foot. This relates directly, as an example, to in a previous overhead where I said the amount of time you get out of the cylinder will depend on -- one of the factors is how deep you are. So, for example, just for argument sake, let's say in this room I got three minutes out of this system. So I put this in my mouth now and I breathe it down for three minutes, empty. I took this system now and I went down to 33 feet or 10 metres, I would only get half the time out of it, a minute and a half. If I

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went down another atmosphere, 66 feet, 20
metres, I'd only get a third of the time, I'd only get a minute out of it. So that's an example of Boyles Law and how it relates to using the system. That is an issue, but it's not as big an issue as if I was down at 33
feet and 10 metres and took a breath. So I'm down to 33 metres, I'm under water, I put this in my mouth and I fill my lungs up, nice big breath in the balloon there, so that one is one lung full of air, if you will, and now I stop breathing and I bolt to the surface. As I went down, pressure increased, volume decreases; as I come up, pressure decreases, volume increases. So when I come up from 33
feet or 10 metres back to the surface, pressure is half, but volume is doubled, and that's where the problem comes in. In fact, it only takes one metre of water for you to rupture your lungs. I'm going to explain that now in a second, just to try to relate this to something maybe everybody can relate to, or maybe has even experienced, and that is if you're flying, you know, while the plane is at altitude, the air outside in your outer ear is at an equilibrium with the air in your middle

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ear, so inside your ear drum there's a space there and the air pocket inside, so the pressure is equalized on both sides of the ear drum, but as the plane comes down, pressure increases and if you don't equalize that pressure in your middle ear, now all of a sudden you start to feel discomfort and pain. That's an example of Boyles Law. The problem with us and using this system is our lungs because our lungs are an air-filled space. So any air-filled space, whether it's your sinuses, your ears, the mass, the suit itself has air in it, so you go down, that suit gets what we refer to as suit squeeze; your lungs, the same thing will happen, except I'm breathing air. So every time I'm taking in a breath, it's delivered at ambient pressure, so the pressure of surrounding water. So my lungs are at equilibrium with my environment around me. I take a full breath at depth and I come up, that air expands, and as I said, I can experience a lung overexpansion injury. Lung overexpansion injuries are normally caused by two reasons. One is holding your breath, so you voluntarily hold your breath, bolt to the surface, boom, ruptured lung, you're in

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trouble, or there could be an underlying medical concern, there's a blockage, there's scar tissue, there's something there that's going to allow air pass, but not allow it to escape. So as you come up, that air gets trapped and expands and causes a lung overexpansion injury. As I've already stated, your textbook says that it takes as little as a metre of water for that to occur.

MS. FAGAN:

Q. Mr. Harvey, we had heard during, I believe it was CAPP's evidence, that when they were considering the training and they were considering using the -- whether they were going to do the training in the HUET or not, one of the considerations was would they have to change the medical, and the thing that was going to be added to the medical was a chest x-ray. Is the potential requirement for a chest x-ray related to these conditions, such as a chest cold, asthma, emphysema, bronchitis, I mean, is that what that chest x-ray was designed to do?

MR. HARVEY:

A. That would be part of the additional medical screening to screen out people that might have

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an underlying medical concern that could lead to the barotrauma or the lung expansion injury in the HUET, absolutely, yes.

MS. FAGAN:

Q. Okay, and then that was one of the reasons it ended up being decided that we would train with -- in less than a metre to minimize these potential problems?

MR. HARVEY:

A. Yes. I don't think it would be any small task to get everybody coming in through that screening process. Then, I guess, the question has to be asked, what do you do with the people who didn't pass the medical. So there's considerable issues there that had to be addressed, absolutely.

MS. FAGAN:

Q. Now you're going to explain how lung expansion can injure us and how it works.

MR. HARVEY:

A. Yes. So when we talk about lung expansion injuries, we're not talking about, you know, your chest exploding or anything, it's nothing near that dramatic. As we breathe in the air, it goes down through our windpipe, our trachea, into the lungs and through the

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different passages, your bronchial passages, until the air ends up in what we call the alveoli. You have literally hundreds and hundreds of millions of alveoli sacs in your lungs. This is how the oxygen gets into our body through the alveoli, this is how the byproduct of metabolism, CO2, gets flushed out of our body through these alveoli. They're only one to two cell thick, so they're very thin. This is what we actually refer -- this is what actually ruptures in a lung overexpansion injury. So that's why that one metre can actually rupture your lung. It's those alveoli that are rupturing. The alveoli are covered with capillaries and, of course, that's how the air gets in, the oxygen gets in, and the carbon dioxide gets flushed out, and you can see that in the overhead I got there. Now depending on if the -- sorry, when the alveoli ruptures, depending on where the air ends up will determine the type of injury you incur. So, for example, if the alveoli ruptures and the air escapes into the pleural lining around your lungs, then you could experience a collapsed lung or a pneumothorax. If the alveoli ruptures and that air gets

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trapped in around your heart, your major blood vessels, or it could travel up into your neck, your throat area, then that's referred to as a mediastinal emphysema. If the air ends up under the skin, it's usually in your shoulder area, it's referred to as subcutaneous emphysema. They're all serious medical issues, but the show stopper probably when it comes to doing the training in the HUET is arterial gas embolism, if your alveoli ruptures and the air actually gets into your circulatory system. So now you've got bubbles going around your circulatory system and they'll keep going until they can't travel any further. That could be in your heart or in your brain. So now if you got blood shut off to part of your heart, or part of your brain, this becomes a very serious medical concern, and, I guess, at the end of the day, that's probably the show stopper when it comes to putting people in the HUET. Obviously, millions and millions of people scuba dive, and it's not something you hear on the news, if at all, you know, people dying from lung overexpansion injuries. We can train people, you know, not to hold their breath. With

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medical screening, we can screen out those who are prone or have an underlying medical condition for that. Unfortunately, I think, in the time frame of the training that we have for the HUEBA and the complexity and the issues surrounding getting everybody in and medically screened, that's not possible. So we've limited the training to the shallow end of our pool. I think that leads me into the last part of my presentation, which is only a couple of slides here. I'll quickly take you through the training we actually do with the students in the pool. This comes right out of our course objectives here for the HUEBA course. We expect students to demonstrate a correct donning of flight suit with the HUEBA equipment on it. We expect them to go through a pre-flight check for that particular piece of equipment, deploy and operate the HUEBA equipment, and we're going to observe them breathing under water, as well as clearing the regulator under water. So everything they might need to do, should they actually have to use the unit, and it looks something like this. We'll put the HUEBA unit on the suits for the students. We expect them to do the

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pre-checks, and I already mentioned it's only a quick visual check, is the unit on, so you don't see any red; is it full, 3000 psi in there. You're good to go. We'll then take two students at a time into what we refer to as our pre-breather station. For all intents and purposes, unlimited air supply. So this is where the students can practice breathing under water, and all we're expecting from them is to establish a regular breathing routine. This can be very challenging for a lot of students. Some students are at this station for five or ten minutes. I've had students there for an hour. But the objective is to get them comfortable breathing under water, establishing a regular breathing routine. This is where we'll get them practising clearing the water out of the second stage. So they'll put their face in the water. They'll put the second stage in. They'll clear it using the blast method. They'll clear it using the purge button. They've done everything now and they're comfortable or reasonably comfortable with the operation of the system and now we'll move them -

MS. FAGAN:

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Q. Now, one minute. You had mentioned an unlimited air supply. So how do you go about giving them an unlimited air supply for this section, which is sort of the practice -

MR. HARVEY:

A. Yeah.

MS. FAGAN:

Q. - before--and you've said that the cylinders only have 300 psi. So how do you get the unlimited air supply? I mean, somebody's here for an hour, what are they using for the hour?

MR. HARVEY:

A. For the people in the room, they can probably see it. I've gone back in the corner. Both sides of the picture there, you can see an 80-cubic foot SCUBA cylinder and that provides--you know, it's not obviously an unlimited supply, but certainly for the exercises we're doing and for the timeframe we're involved in, it is, for all intents and purposes, an unlimited air supply. The student can stay there as long as he wants and practice getting comfortable breathing under water.

MS. FAGAN:

Q. Okay, and then when they get comfortable, you move them to actually giving them the device?

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Is that correct?

MR. HARVEY:

A. We'll move them to the next station. We just call it the middle station, and this is where they'll do the same three exercises they did at the pre-breather station, which is put the regulator in their mouth, face in the water, breathe. We'll get them to put their face in the water, put the second stage in and clear it under water and we'll get them to do that using both the purge and the blast method. The only thing different in this station is they're actually using the unit itself, the HUEBA unit, and they actually have to deploy it. So pull it out of the dust cap and put it in their mouth before they could use it. So we're doing things in little small steps, give them a chance to adjust at each stage and get comfortable with the operation of the system.

So at this point here, and we'll go through a little exercise here. We'll yell out the words "ditching, ditching" and go through a little exercise of getting themselves watertight. We'll yell out the words "brace, brace" so they'll get comfortable getting in the brace position with

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the HUEBA there. We expect to see them landmark the HUEBA to second stage so they know where it's to, and then when we yell out "impact" they'll deploy it, put it in, breathe on the surface. We'll repeat the whole exercise, except the second time, they'll deploy it under water. So they'll lay down in the water, once they're face down, deploy it in and put it in.

At the end of that, we'll leave them and we'll give them an opportunity to actually breathe down the HUEBA unit itself. So they can get appreciation of how much time they would get out of it, with the emphasis here being in ideal perfect conditions. Obviously this would be the best case scenario for them.

So now they've done everything. They've actually used the unit. They've deployed it. They've cleared it. I'll back up. They've almost done everything, except actually use it upside down under water. So this is where the EBSIC chair comes in. We designed the chair so that we're in control of the students. Even though we're above a metre and we've--you know, we hope we've eliminated or we're confident we've eliminated that risk or

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barotrauma injury, we want to be controlling the situation so that if a student does get panicky or something, we can bring them up at a nice controlled rate. And what we'll get the students to do here is, right from the top, we'll get them suited down and we'll yell out "ditching, ditching." They'll get watertight. Again, they'll brace for impact. On impact, first exercise, they'll clear it, put it in on the surface and we'll roll them upside down, and the only thing we're watching for is a regular breathing routine, and by this time, the students are quite comfortable with the system. So we'll let them take four or five breaths, maybe six breaths under water and we'll bring them back up.

The second exercise and the last exercise, we'll get--do the same thing, except they'll actually deploy it upside down under water, clear it any way they want to. I got a little video clip here, just to show you how it works. Just before I play it though, I'll point out that this video was taken when we were still commissioning the system and playing with it and seeing how we were going to do it. So it goes a little quicker than we

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would with a student, but there you have it.

(VIDEO PLAYING) So they're upside down and he's got to deploy the HUEBA, put it in, clear it. In that case, the individual used a purge button. We'll just observe them take a couple of breaths so that they're comfortable and relaxed and then we can roll them up, ensuring that they're exhaling as they're coming up, so they're not at any risk at all of a lung over expansion injury. And then we have some students have so much fun with it, they ask to do it again and if they got air, off they go. (VIDEO STOPPED)

The last, this is the last slide here. I quoted a number of studies throughout my presentation, so I put the references here for anyone that wanted to go back and see where I got that information from. In some cases, there's a web link there for you to follow.

MS. FAGAN:

Q. Well, thank you, Mr. Harvey. That was very informative, and I think it gives a sense as to how much is involved in using this particular device, and what we're going to do now is Mr. Rutherford is going to come back up. He has a few closing slides and then

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we'll have the panel take their seats and we'll go through--I have some general questions and then we'll open it up to the group. I don't know if we'll get that far in the next half hour, but Mr. Harvey, if you could relax and step down, and Mr. Rutherford, you're back in the chair.

MR. ROBERT RUTHERFORD, RESUMES STAND, EXAMINATION BY MS. ANNE FAGAN (CONT'D)

MS. FAGAN:

Q. It's much more comfortable than that upside down thing.

MR. RUTHERFORD:

A. Oh, I think so. Thank you very much there, Greg. I guess you probably realize why Greg is an instructor and I push paper.

MS. FAGAN:

Q. Mr. Rutherford, you do have quite a volume of information to go through, so -

MR. RUTHERFORD:

A. I do indeed.

MS. FAGAN:

Q. And there's an awful lot to it. So I believe we should be at about slide 16.

MR. RUTHERFORD:

A. Yeah. I guess in concluding our presentation

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here today -- figure out where we're at -- there's a few things I just want to cover of a more general nature and issues where we're looking at some aspects really going forward, some aspects of how we, as an Institute, try to maintain our currency with what's going on both locally, nationally and internationally. So one of the ways we do this is to maintain associations with a number of industry and other types of association. Basically, three of these have particular relevance, I think, to offshore petroleum safety and to this Inquiry. One of them we've talked about a number of times, it's the Canadian Association of Petroleum Producers, Training and Qualifications Committee. We are there by invitation, but we religiously will sit at that committee. We think it's extremely important that training providers are represented at that committee.

We also participate--Transport Canada has similar types of committee, which are called the Canadian Marine Advisory Council and they have regional and national meetings. Again, these relate to updating of marine training standards and other aspects of the marine

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industry. Again, we will participate in these religiously because we think it's extremely important that, you know, we keep current with what is going on.

The next one here is a more interesting one, I think, in as much as the OSSC was a founder member of what's called the International Association for Safety and Survival Training, and we were one of--our training centre was one of six founding members and this was early, very early on in the '80s when, at the time, there was really widely varying standards worldwide and there still is, to an extent, but at the time, there was widely varying standards relating to safety survival training, what was being delivered in different jurisdictions. So this was six organizations. RGIT, we mentioned before, was one of those organizations. We had an organization from Norway, Denmark, from the Netherlands. It was basically European organizations, except for us in Canada, and--although there was one in the United States. Basically got together and the idea of this association was really it's an international networking association where we get together

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and basically share information and best practices that are going on worldwide. Ourselves are members of this and Survival Systems in Nova Scotia are also members of this association. But the objective of this association is to facilitate exchange of information on matters relating to safety in marine environment and to promote continuous improvement in safety and survival training internationally. I am the--actually an officer and secretary of the association since 2004. I've noted information on this association can be found at www.iasst.com.

One thing I want to mention here, I think, that the association does have meetings twice a year, a seminar twice a year associated with those meetings where we share training information, but we also have--every three years, we have a major international safety conference and the next conference is going to be here in St. John's in 2012 and we're going to be focusing on safety training associated with cold environments and Arctic environments. So if anybody is interested in that conference, the information on it, where we look as we've moving out into the Orphan

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Basin and possibly moving up north, we're going to be focusing on aspects of training at that conference. So I think it might be of interest to this Inquiry.

MS. FAGAN:

Q. I believe you have a slide there on opportunities for improvement and some of the plans that are being considered.

MR. RUTHERFORD:

A. I do indeed. One of the--I guess this Inquiry is basically focused on information gathering. Opportunities for improvement are going to be identified at a later stage, but I think what we really wanted to do here is just indicate to the Inquiry some of the things that are ongoing already which we might want to take account of during the course of the deliberations.

One of them relates to capacity and facility development. I think as we previously noted, the OSSC has sustained some, you know, continued growth in its capacity and I think given the continued and anticipated growth in the offshore petroleum industry, we need to consider where we're going to go to ensure that we do have capacity to respond to

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all training needs. It's no good coming up with ideas from the Inquiry if the capacity is not there to respond to these needs. So we did develop a concept document in 2008 which is currently being discussed with possible funding agents. This particular capacity here would not only increase our volume that we can deliver, but we're looking at a number of enhancements to facilities such as our survival training tank, providing additional environmental capability within the tank, looking at some possible enhancements to the helicopter underwater escape trainer, looking at enhancements to research and development capability within the unit. So I think the timing--as I say here, the timing of the Inquiry is fortuitous, I think, in some respects because if we are going to be looking at expanding and putting new facilities in place, then we will be in a good position to be able to take note of the findings of the Inquiry and incorporate such things into our facility.

MS. FAGAN:

Q. Did you have any capacity issues with respect to the implementation of the HUEBA, the

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breathing device that Mr. Harvey just demonstrated?

MR. RUTHERFORD:

A. Yeah, I mean, I think basically ever since the offshore petroleum industry has been in place off Newfoundland, we've had continued fighting of capacity issues. I note in the earlier slide, I mentioned that we--in 2003, we split off some training into the west coast. We created new facilities on the Southside. That really was as a result of Terra Nova coming on in 2002. We're always looking at issues of capacity. When the HUEBA came in, again I showed you the schedule. When it was introduced, we already had a full slate. One of the issues we have challenges with is that our pool is critical. It's our critical part and our pool is basically utilized 120-130 percent of the time. It's continually in action. So that causes us a little bit of problem in relation to when something like a HUEBA came in. You notice on the schedule that basically we had to schedule training outside of our normal work hours, which, you know, was not only stressful on our instructors, they were working very hard at

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this training, but it wasn't always convenient to our clients too, because our clients, they have people who go to work and don't necessarily want to be doing HUEBA training at 10:00 or 11:00 at night. They've got families too. So it did cause some concerns there. I think one of the--because of that issue, our friends in Nova Scotia came into Newfoundland and because it was so important, this training was delivered, they filled in a gap and we were able to meet the needs in the time available. So yes, we do have capacity issues and we do our best to respond.

MS. FAGAN:

Q. But the 2008 proposal is looking at trying to address some of those capacity issues, but I think what you're saying is if there's going to be recommendations come forward, consideration would have to be with respect to capacity as well?

MR. RUTHERFORD:

A. Yeah. I mean, the capacity issues, I think they're a given. You know, we're going to be looking at increasing capacity to deliver, but I think we're also, at the same time, you know, if we're going to do a major--a

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significant upgrade, then we will also be looking at any enhancements we can make to our facilities and equipment to better equip them to serve the community.

MS. FAGAN:

Q. There was information brought forward by Mr. Barnes of CAPP and they introduced an exhibit which basically was a review of the two training facilities and we need not go to that exhibit, just for the reference for the group, the exhibit is number 55, and it's Section 3.3, and in that exhibit at page 490, there is the review of the Survival Centre and in the same exhibit at page 505 is the review of the Survival Systems in Nova Scotia, and Mr. Barnes indicated during his evidence that he had asked the Centre for a response. He wrote in October 29th, 2009 and he asked for a response by November 13th, 2009, and I understand that the Centre did respond. Mr. Barnes actually undertook to provide that response, but his undertaking is now unnecessary because Exhibit 93, I understand, as provided by the Centre, is the response to CAPP. Is that correct?

MR. RUTHERFORD:

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A. That is the response to CAPP's request for an immediate response and the letter, yes, that is the same response. I should note that I did note in the response that I think because this was basically an audit of two training centres taking place by a small team, raised some very interesting, valuable comments, but I think the next step really would be discussion with the training qualifications committee and the training institutions to basically work out between them what is the appropriate best practice. It provided the-- it's a catalyst for us to go forward, but that's fundamentally--that was the response to that letter, yes.

MS. FAGAN:

Q. And can you describe the nature of that review? How many people were involved as the reviewers? Who were the reviewers and any other information about that review? When did it take place?

MR. RUTHERFORD:

A. The review took place in 2008, during June of 2008. It was--this is part of a series of reviews that CAPP, the training committee has decided to undertake. What they looked at is

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basically something we discussed there earlier, the fact that CAPP courses, we have guidelines--or within the training document, there are guidelines or top level guidelines that identify training providers, but they don't actually look at ensuring that everything--that there's no third party accreditation of the courses that takes place. They're relying on the internal processes of the training providers. So what they want to do is those courses that don't have any external accreditation processes in place, to create their own external accreditation. This was the first step in that process.

There's a consulting company called Strategic Directions was engaged to lead this up and associated with that was--because they're not content experts, they're just experts in processes and management, they're management consultants, they had alongside of that, would have a content expert and I think we had Mr. Clint Carey, who's sitting over there, was our content expert that came into our Centre.

MS. FAGAN:

Q. So what I understand you to say is that it's

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not a third party accredited type course, CAPP has approved the two training facilities or the two training providers -

MR. RUTHERFORD:

A. Yes.

MS. FAGAN:

Q. So are there any differences between the two training facilities or any aspects of that review that you'd care to comment on, because they're focusing on the trainers, not the course content itself.

MR. RUTHERFORD:

A. Well I think out of that review, I think both training providers were assessed to be meeting the training requirements as laid down in the training guidelines. There were a number of suggestions for improvements that were made for both of our organizations. Some of the suggestions of improvement for our organization was to look at the fidelity of our helicopter underwater escape trainer, which is, you know, is 1980s version, so that was one issue we'll certainly be looking at.

MS. FAGAN:

Q. And I'd just like you to explain, what do you mean by fidelity?

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MR. RUTHERFORD:

A. When it comes to dealing with training issues, I think we, fidelity, we can be looking at three different things. Number one is the physical fidelity of our equipment, does the piece of equipment we're using in training, does it exactly replicate the particular, the helicopter in this case that we're using in service, are there differences in the physical fidelity. This is--the other issue of fidelity can be related to the environmental fidelity. For instance, we can look at the issue of water temperature is, you know, 16 and 17 degrees, the helicopter could go down in 2 degrees. We have lights on; it could do down in darkness or rain, so, there's an environmental fidelity. We also look at the fidelity associated with the pedagogical sort of side of it, are we true to the learning objectives of the course, are we doing what is required in terms of training, actually representing what somebody is actually going to be expected to do in a real emergency situation. So there's three areas of fidelity. I think the issue of, the third one I don't think there's any issue with, with our

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training centre, we have very, very trite academic processes in terms of ensuring that we do meet the course requirements that are laid down. Relating to the second one, relating to the fidelity of, the environmental fidelity, this is one that we have to balance very carefully with the risks that we're exposing trainees to. I think the situation is that yes, we could put the pool at 2 degrees, we could, you know, we could make it dark or foggy, but I think in situation with people coming through already sufficient stressed in the training we do, we wouldn't be able to manage our risk if we did that, we wouldn't be able to ensure, so whilst we can certainly look at it, if they had the right tools in place to ensure us we could do that, but that's something we have to balance, it's a risk issue. The first one relates to how important this actual fidelity of the equipment to the training outcomes. The jury is a little bit open on this one, I think there have been studies that indicate that the physical fidelity is not as important as the actual costs that we're teaching, however, I think one should strive to attain full

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fidelity if at all possible. I think particularly in this instance now, we're looking at the differences between our particular helicopter simulator and Sikorsky, and one particular area, I think has been raised earlier today is the issue of the concern of the windows and the seats are much higher, it's quite a difference in terms of what we're training people to do and what we should be, I think, perhaps looking at, so those are three areas of fidelity, but I think they're all important that we try and find balances and try and find the right approach.

MS. FAGAN:

Q. Thank you. Your next slide has to do with a strategic plan and a vision. I believe you have a couple of slides now on some future prospects.

MR. RUTHERFORD:

A. I just wanted to, I guess, touch base, we are part of the Fisheries and Marine Institute. The Marine Institute has put in place an overall strategic plan which envisages the institute become a world oceans institute, having--it is already the largest training provider of a number of training and other

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services to the marine industry, but really creating something a little bit bigger and a little bit more international in scope, but one of the things that we're looking at in the plan is basically we're looking at--we provide training and various other services to various sectors and as you can see on the top there, we have a marine, recreation, science fisheries, aquaculture, energy--which is the offshore petroleum industry, defence and marine transportation, but what we're looking at doing is doing a number of undercutting or things that cut across all those sectors where we have training requirements which address all of the sectors. They just opened up a school of Oceans Technology last year, this cuts across every sector. We're looking at the moment at the safety security and emergency response and creating, I think, if you look at the next proposal, it's been initiated to develop a school of ocean safety. That might not be a big deal for changing from OSSC centre, as a centre to a school, if you will, to say, you know, big deal, what does that mean, but in terms of our organizational structure, it makes a very big deal in terms

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of at the present time we're just constrained within a school of maritime studies. Our main focus is providing training to the marine technology students is what we're in place primarily to do, but it's to open it up and say have a school that really does focus at various levels on the whole area of ocean safety and being a school, you can sort of start to raise the level of training available to providing certificates and post graduate courses, et cetera. So I think it's something that I think is important for the general development of the whole area of safety for our oceans. So it's just something that--it is in place and it's going through at the moment, I'm not really looking at for the moment, so it may be something to consider. This one, the (unintelligible) and Hollins capacity, will contain research centre and we'll get into advanced education degrees. Okay, just getting through the tools there now, one of the areas I guess of improvement, we're looking at safety related research and development and our centre has been supporting applied research and development by others for many years, but in 2003, we did establish our

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own research which is tied directly to the centre. And the focus of the unit is really the expansion and knowledge base related to emergence response, evacuation, surviving and rescue. As related to cold water, hostile environments, as well as development, underpinning, knowledge and techniques. We've conducted a number of research projects alone, but most of the projects we have undertaken with others. We work very closely with National Research Council, we work with Memorial University, Department of Human Kinetics. We also work with private researchers, BMT Fleet Technology, is one and we have international research projects ongoing. We currently have a researcher across in the UK at the moment working at the Maritime University in Greenwich on an international project. I think this is important to grow this capability and the role that we play is, you know, we're not prime researchers as in the university or NRC, but we have an interface I think with industry and with the fact that we're dealing with people day in and day out, I think we're in a very good position to see what is actually--we can

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trigger off lots of good research ideas because we see what is actually happening to people in close to emergency situations or in situations where they're put in stressful situations. So we can create the ideas, so we're looking at continuing to develop that research capability. Our current projects ongoing, we have, for many years now we've been doing work with PetroCanada and now Suncor and we're doing--and with Husky Energy, we actually work onboard, they give us access to their standby support vessels whereby we undertake drills utilizing their fast rescue craft, but in the course of doing those drills, we also at the same time try to look at various aspects of the activities to find out better ways to look at the recovery and how standby vessels can better support the offshore industry, so we do six drills a year for Husky Energy and six for PetroCanada, so it gives us a good access to boats and to people. And at the same time, we provide ongoing training to these people and what they're doing. We're also working as a local technology company, BMT I think was a big opportunity for simulators to be used in some

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of the training that we're doing. Where the Marine Institute is quite familiar with simulators, in terms of bridge simulators, engine simulators, but companies working on developing simulators, lifeboat operations, fast rescue boat operations, on such things which are all, I mean, we can possibly look at, you know, there may be some opportunity to look at additional types of simulators for helicopter passenger operations, so it's something that we do work closely with them. They lead it up and we assist them in doing the training associated with it. Getting close to the end now. Just for information, I've got two major proposals which have some relevance to this inquiry which are currently submitted. I'm not sure where they will necessarily go, but I'll raise them just because it identifies, I guess, some areas that we think there's room for improvement or movement and also areas where we think we have the capability to respond and assist in that improvement. There may be as many areas that can be looked at, but we have certain capabilities. One was looking at SmartER, this was a proposal which we put in place with BMT

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Fleet Technology, National Research Council and we're working with--we're supported by Suncor and Husky Energy. But it's looking really at the standby support, vessel capability and rescue capability offshore and this relates to helicopter passenger transportation in as, you know, part of the landing and taking off of helicopters offshore, if there's an incident out there, the first response is likely to be related to the standby vessels and the fast rescue boats, so this is software, looking at ensuring that capability is in the right place at the right time to do the right thing, it looks at various types of capability. So that is currently--we're looking for a little bit more funding out of the Federal government, I don't know if it will work or not, so we'll see. CARRC, is an interesting proposal that we put in PRAC. Off Aberdeen, BP spent a considerable amount of time and effort looking at ways they can better support their offshore petroleum activities up in remote areas off of the Hebrides. There were a number of units which are quite well dispersed and what they're originally looking was a system that

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utilized, you know, made sure we have helicopters there would respond to any incidences offshore, but in the end, they came up with a combination of helicopters and a very, very highly capable support vessel and what they had to do here, this particular vessel is designed to be able to recover people from the water, to be able to provide medical response, it's a medical response and it's well accepted by the health safety executive in the UK as being once they're onboard this boat, then they are in a place of safety. So we think there's an opportunity within the Canadian sector to something--for something similar, it wouldn't be exactly the same type of vessel, but I think it's worth exploring that we have to close some of the rescue, our rescue gaps as well and I think this is one proposal that we have been discussing with PRAC. There's a note there full details on past and ongoing safety related research can be provided on request. So this is a penultimate slide. I hope that this presentation has provided you with some information. I understand that the contribution, the OSSC and Marine Institute

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can and does make to the offshore petroleum industry and to the safety of workers in other industries. Our instructors and staff dedicate their lives to safety and the goal, everybody who goes to work should get home safely and I think this instance, such as the lost of 17 lives on March 12 has touched us all very deeply, so we are very happy to work with this inquiry to see if we can make training, make the offshore a safer place, regarded by--the Marine Institute has a motto "strive for excellence" and we have our own--we saw in the video, "think safe, act safe, be safe", so with that, I would say thank you very much for your attention.

COMMISSIONER:

Q. Okay, thank you, Mr. Rutherford. It's too late to begin questions now, it's twenty-five past, so -

MS. FAGAN:

Q. Excuse me, Commissioner, I have some questions for Mr. Rutherford and for the panel.

COMMISSIONER:

Q. Oh yes.

MS. FAGAN:

Q. So when we come back tomorrow, I think we'll

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start with the panel and then we'll do the questions then.

COMMISSIONER:

Q. So we'll adjourn now then to 9:30 tomorrow morning and then we'll carry on with the process.

(Adjourned)

CERTIFICATE

We, the undersigned, do hereby certify that the foregoing is a true and correct transcript of a hearing heard on the 23rd day of November, 2009 at Tara Place, 31 Peet Street, Suite 213, St. John's Newfoundland and Labrador and was transcribed by us to the best of our ability by means of a sound apparatus.

Dated at St. John's, NL this 23rd day of November, 2009

Cindy Sooley
Discoveries Unlimited Inc.

Judy Moss
Discoveries Unlimited Inc.

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