Topic 1: HUEBA

1.8

CANADIAN ASSOCIATION OF PETROLEUM PRODUCERS

Helicopter Underwater Escape Breathing Systems Workshop Summary Report

March 1, 2006

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Summary of the CAPP Helicopter Underwater Escape Breathing Apparatus Workshop

The workshop was held in Halifax, Nova Scotia on January 30th and 31st 2006.

The objective of the workshop was to provide stakeholders with accurate medical, training, and operational EBS information that would allow CAPP members to make an informed decision on which type of device should be implemented in East Coast Canada.

The workshop commenced on January 30th at Survival Systems Ltd in Dartmouth with a presentation by Mr. [redacted] on the principles of emergency breathing systems for helicopter underwater escape (see attached slides). Following Mr. [redacted] presentation Survival Systems Ltd provided pool demonstrations of a hybrid re-breather and a compressed gas system in use.

The morning session on the 31st of January commenced with a presentation by Mr. Paul Barnes, Manager, Atlantic Canada, CAPP. The presentation provided an overview of the purpose of the workshop and the work conducted to date by the Helicopter Underwater Escape Breathing Apparatus (HUEBA) taskforce (see attached slides). This was followed by presentations by the international speakers.

The first presentation was given by Dr. [redacted], University of [redacted] United Kingdom. Dr. [redacted]s presentation outlined the Survival at Sea project, provided background on the development of the Shark air pocket (re-breather) and the performance of the air pocket in controlled trials. Dr. [redacted] also discussed, training requirements, the pros and cons of using a re-breather and a compressed air device, the use of compressed air by the UK Military and the risks associated with barotraumas. Dr. [redacted] presentation concluded that the air pocket increased breath hold time in cold water (see attached slides).

Other relevant points made during Dr. [redacted]s presentation include:

- Time required for successful, controlled escape 40-60 seconds;
- An EBS must be a part of an integrated immersion suit; and
- Exclusive "dry" training should not be considered.

The second presentation was given by Dr. [redacted] a UK Marine Safety and Survival Consultant and author of the UK Civil Aviation Authority report on the implementation and use of Emergency Breathing Systems. Dr. [redacted] presentation summarised the report she produced for the CAA on Emergency Breathing Systems and included current training practices among the UK offshore oil industry and military organisations. She also presented an overview of the EBS systems operated in the UK and provided data on water impact accidents including the numbers of fatalities that have occurred due to drowning following a helicopter crashes over water (see attached slides).

Other relevant points made during Dr.[redacted]s presentation include:
- EBS effects on buoyancy; Hybrid (additional lung full of air);
- U.K. knowledge gaps with the Air Pocket Plus;
  - Underwater deployment
  - Deployment in cold water
  - Buoyancy
  - Success/failure rates when deployed by naïve users and
- Case studies on risks associated with compressed air.

Dr.[redacted], Chief Medical Advisor, United Kingdom Offshore Operators Association (UKOOA) provided an overview of the factors that UKOOA considered when revising the basic offshore survival training to include re-breather training using a hybrid device. His presentation included a summary of the risk associated with using a hybrid re-breather in an emergency and in training (see attached slides). Note that the risk of barotraumas is calculated using diving statistics.

A facilitated panel discussion followed these presentations. The panel discussion provided an opportunity for workshop participants to ask presenters to clarify points raised during their presentation.

The afternoon session commenced with a presentation by Dr.[redacted] Dr.[redacted] presentation highlighted the need for a simple device and the physiology of barotraumas. He noted that likelihood of a fatal barotrauma occurring during training was remote as one the factor's that increases the impact of a barotraumas is the amount of dissolved gas in the brain. Diving at depth increases the amount of dissolved gas and since this would not be the case for offshore survival training the risk of a fatality would be very low (see attached slides).

Dr.[redacted] noted that the use of a compressed air system in training will rarely result in problems and with a compressed air system you can have adequate training at lesser depth. Dr. Sawatzky provided the following suggestion with regards to training; everyone would do the basic level of training with a compressed air system (this is with minimum risk) than the people that can go further in training does more advanced training (this would require a medical be performed).

Following Dr.[redacted]s presentation there was a facilitated panel discussion on the training and medical requirements of re-breather and compressed gas systems. The panel discussion included the Drs. [redacted], [redacted] [redacted], [redacted] and Dr.[redacted] of [redacted] This discussion resulted in a summary of the strengths and weaknesses of both re-breather and compressed gas systems as outlined in the table below.

Compressed air

Benefits	Issues
Operational performance ➢ Increases escape time[1] ➢ Easy to operate[2] ➢ Can be cleared under water ➢ Provides additional escape time (depends on breathing rate)	➢ Risk of using up all the air too quickly if the person hyperventilates ➢ Very small risk of barotraumas
Training requirements (under1 meter) ➢ Reduces the risk of barotraumas during training	➢ Need to revise training to include session using compressed air in less than 3 feet of water. ➢ Unable to used compressed air during HUET therefore training will not reflect real life situation ➢ Further research required on the frequency of training to maintain skills
Medical requirements (under 1 meter)	Under 1 meter of water, no revised medical is required
Training requirements (over 1 meter) ➢ Can be integrated into existing basic training ➢ Simple operation	➢ Risk of barotraumas[3] ➢ Need to clarify the legal liability if any associated with training and seek input from WCB ➢ Likely need to have medical personnel on standby and access to compression chambers ➢ Further research required on the frequency of training to maintain skills
Medical screening (training over 1 meter) ➢	➢ Requirement for revised medical, which is likely to include a chest X ray ➢ The revised medical is likely to exclude a proportion of the current workforce. This may present significant HR issues due to change in contractual requirements[4].

[1] Currently being used by the military
[2] Some participants argued that it was easier to use the compressed gas system that the re-breather
[3] It was argued that given the characteristics of the offshore workforce this risk may be higher than for military personnel. [redacted] disagreed with this point.
[4] It was suggested that those who fail the revised medical could undertake training without the compressed air and continue going offshore. This option was not supported by all participants.

Re-breather

Benefits	Issues
Operational performance ➢ Increases escape time ➢ Easy to operate ➢ Limits the negative impact of hyperventilation	➢ Unable to clear re-breather underwater[5] ➢ Limited depth of 4.5 meters ➢ Only operates if person takes a breath before entering water
Training requirements ➢ Can be integrated into existing basic training ➢ Simple operation	➢ Further research required on the frequency of training to maintain skills
Medical screening ➢ No additional medical screening required ➢ No risk of POA	

Additional issues identified

- There is a need to develop a technical standard for whatever system is selected.
- There is a need to consider the impact of the re-breather on the suit selection and usage.
- The introduction of compressed gas will require personnel from the UK to be trained on the compressed gas device.
- There is a need to clarify the medical screening requirements with AOMS for training with compressed gas.

[5] Dr [redacted] indicated that in a real emergency situation this is not much of an issue as you would not have time to perform this operation even if you could clear the re-breather.