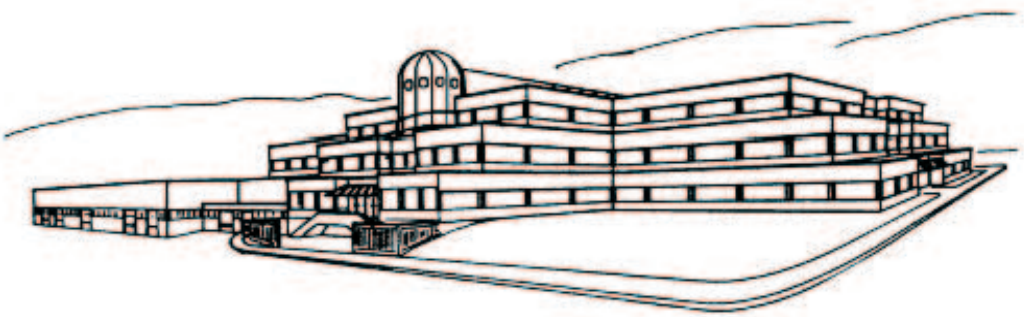
EXHIBIT/P-00017



MARINE INSTITUTE

School of Maritime Studies

Offshore Safety and Survival Centre

Compressed Air Helicopter Underwater Emergency Breathing Apparatus (HUEBA)

The Fisheries and Marine Institute
of
Memorial University of Newfoundland

School of Maritime Studies

Offshore Safety and Survival Centre

Compressed Air Helicopter Underwater Emergency Breathing Apparatus (HUEBA)

May 2009

P.O. Box 4920, St. John's, Newfoundland and Labrador
Canada, A1C 5R3

(709) 778 - 0200

Compressed Air Helicopter Underwater Emergency Breathing Apparatus (HUEBA)

CERTIFICATE TITLE: Compressed Air Helicopter Underwater Emergency Breathing Apparatus (HUEBA)

SCHOOL: School of Maritime Studies - OSSC

AMENDMENT OR NEW CERTIFICATE: New Certificate

EFFECTIVE DATE: Upon Approval

CERTIFICATE TYPE: Certificate of Achievement

OBJECTIVES: This course is designed to provide students with the theoretical knowledge and practical skills necessary to safely use compressed air Helicopter Underwater Emergency Breathing Apparatus (HUEBA).

PREREQUISITES: Valid Helicopter Passenger Transportation and Emergency Procedures certificate or valid HUET certificate or equivalent.
Marine Institute approved Medical Clearance.

DURATION:

Duration:	4.0 hours
Theory:	1.5 hours
Practical:	2.5 hours

MAJOR TOPICS:

1) Rationale for Helicopter Underwater Emergency Breathing Apparatus (HUEBA)

2) Hazards associated with using Helicopter Underwater Emergency Breathing Apparatus (HUEBA)

3) Helicopter Underwater Emergency Breathing Apparatus (HUEBA)

COURSE COMPUTER ID: Requested

RATIONALE FOR NEW COURSE: This course has been developed in response to an industry training requirement. Industry is introducing a compressed air HUEBA for personnel traveling offshore via helicopter. Training institutes offering safety training to the offshore industry can use a stand-alone HUEBA course to offer this training for individuals who require it but are not due to take a BST, BSTR or OSI course.

Compressed Air Helicopter Underwater Emergency Breathing Apparatus (HUEBA)

TYPE AND PURPOSE: This course is designed to provide students with the theoretical knowledge and practical skills necessary to safely use compressed air Helicopter Underwater Emergency Breathing Apparatus (HUEBA).

CALENDAR ENTRY: Rationale for compressed air Helicopter Underwater Emergency Breathing Apparatus (HUEBA), Hazards associated with using compressed air Helicopter Underwater Emergency Breathing Apparatus (HUEBA), compressed air Helicopter Underwater Emergency Breathing Apparatus (HUEBA).

CERTIFICATE AWARDED: Certificate of Achievement

PREREQUISITES: Valid Helicopter Passenger Transportation and Emergency Procedures certificate or valid HUET certificate or equivalent..
Marine Institute Approved Medical Clearance.

CLASS SIZE: Maximum 12

RENEWAL: Valid for three (3) years

SCHEDULE:

Duration:	4.0 Hours
Theory:	1.5 Hours
Practical:	2.5 Hours

COURSE AIMS:

1) To provide the student with the knowledge and skills to identify the hazards and limitations of compressed air Helicopter Underwater Emergency Breathing Apparatus.

2) To provide the student with the skills to perform pre-flight inspection of compressed air Helicopter Underwater Emergency Breathing Apparatus.

3) To provide the student with the skills to use compressed air Helicopter Underwater Emergency Breathing Apparatus.

EVALUATION: To achieve Pass status participants must:

¬ Have 100 % attendance.

¬ Demonstrate competency to complete exercises as identified in the practical evaluation checklists.

MAJOR TOPICS:

1.0 Rationale for compressed air Helicopter Underwater Emergency Breathing Apparatus (HUEBA)

2.0 Hazards associated with using compressed air Helicopter Underwater Emergency Breathing Apparatus (HUEBA)

3.0 Compressed air Helicopter Underwater Emergency Breathing Apparatus (HUEBA)

COURSE OUTLINE:

1.0 Rationale for Compressed Air Helicopter Underwater Emergency Breathing Apparatus (HUEBA)

- 1.1 Rationale
- 1.2 Egress Time

2.0 Hazards associated with using Compressed Air Helicopter Underwater Emergency Breathing Apparatus (HUEBA)

- 2.1 Basic Dive Physics
- 2.2 Medical Aspects

3.0 Compressed air Helicopter Underwater Emergency Breathing Apparatus (HUEBA)

- 3.1 Equipment
- 3.2 Operation
- 3.3 Breathing Routine
- 3.4 Malfunctions
- 3.5 Pre-flight Inspection
- 3.6 Practical

LEARNING OBJECTIVES

The expected learning outcome is that the student will be able to:

1.0 Rationale for Compressed Air Helicopter Underwater Emergency Breathing Apparatus (HUEBA)

1.1 Rationale

- Discuss the need for HUEBA.

1.2 Egress Time

- Identify time required to egress a capsized helicopter.
- Examine factors affecting individual breath-hold time.
- Discuss egress time versus breath-hold time.

2.0 Hazards associated with using Compressed Air Helicopter Underwater Emergency Breathing Apparatus (HUEBA)

2.1 Basic dive physics

- Examine Boyle's Law and the relationship between pressure and volume.

2.2 Medical aspects

- Discuss the direct effects of pressure on the human body.
- Describe the mechanism of lung over-pressurization.
- Identify the cause, treatment and prevention of arterial gas embolism, mediastinal emphysema, subcutaneous emphysema, pneumothorax.

3.0 Compressed air Helicopter Underwater Emergency Breathing Apparatus (HUEBA)

3.1 Equipment

- Describe the purpose of HUEBA.
- Identify the two major types of HUEBA.
- Identify the main components of HUEBA.
- Describe the function of the main components of HUEBA.
- Identify the limitations of HUEBA.

3.2 Operation

- Describe the operating principles of HUEBA.
- Describe the procedure for deploying HUEBA.

3.3 Breathing routine

- Describe HUEBA clearing procedures.
- Identify importance of breathing normally and never holding your breath.

3.4 Malfunctions

- Identify HUEBA malfunctions including free flow and flooded.
- Describe actions to take in the event of a malfunction.

3.5 Pre-flight inspection

- Discuss pre-flight inspection procedures.

3.6 Practical

- Practice carrying out breathing actions using HUEBA equipment at atmospheric pressure in dry conditions.
- Demonstrate pre-flight checks on HUEBA.
- Demonstrate donning a transit type survival suit with HUEBA equipment.

- Demonstrate deployment and operation of HUEBA equipment in a shallow waterenvironment (less than 1 meter).
- Demonstrate breathing actions in a shallow water environment (less than 1 meter) including the following; breathe underwater using HUEBA, deploy and clear HUEBA while underwater, breathe while inverted underwater using HUEBA, deploy and clear HUEBA while inverted underwater.