



# **Emergency Response Diving International**

## **Standards and Procedures Manual**

### **Diver Standards**

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***Revision History***

Revision Number	Date	Sections Changed
2.0	03/16/2002	The manual has been restructured
3.0	08/01/2004	The manual has been completely rewritten
6.0	11/01/2005	Punctuation corrections made
7.0	10/27/2006	Language corrections made
8.0	11/13/2007	Minor editorial changes
11.0	01/01/2011	Major editorial changes. Version 9 and 10 bypassed to standardize all versions



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# **1. Disclaimer**

Emergency response diving generally is a hazardous activity requiring significant training, good physical fitness and a working knowledge of the inherent risk associated with these activities. This manual is not intended to and cannot replace a comprehensive training program conducted by a qualified instructor.

Neither the authors of this manual, Emergency Response Diving International (ERDI), Scuba Diving International (SDI), Technical Diving International (TDI), International Training (IT), nor any party associated with Emergency Response Diving International (ERDI), Scuba Diving International (SDI), Technical Diving International (TDI), International Training (IT) can nor will accept responsibility for accidents or injuries resulting from the use of the materials contained herein, the activity of scuba diving generally, or the activities associated with emergency response diving specifically.

## **1.1 ERDI Levels**

Many of the ERDI programs can be taught at several levels in accordance with National Fire Protection Association (NFPA) guidelines. The level of participation in the practical portion of the course will determine the final level of certification. The classification levels are: Awareness, Operations and Technician. All ERDI programs are available to public safety professionals regardless of their position within a department.

## **1.2 Awareness**

The Awareness level can be completed simply by doing the online academics for the ERDI course of interest. Upon completion of any of the online ERDI Academy courses, an individual will receive an awareness level certificate. For additional insight and understanding of the course, the individual can audit the practical session.

## **1.3 Operations**

The Operations level course requires the participant to complete the online academics and also participate in the non-diving segments of the Operations level course taught by an ERDI Instructor. Depending on the program and individual is completing, this portion of the training shows how to properly perform and/or supervise non-diving emergency response duties.

## **1.4 Technician**

The Technician level is the final step and requires the participant to complete the required number of practical training sessions under the supervision of an ERDI Instructor. Here the individual will apply what they have learned during the awareness and skill-development sessions, while learning practical lessons that can only be gained.



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## 2. Emergency Response Diver I

### 2.1 Introduction

This course will train successful candidates in the basic skills necessary for participation in limited open water public safety diving activities.

The ERD I Diver will be able to operate as a team member and support person within a dive team organization.

### 2.2 Student Prerequisites

#### ERD I

1. SDI Open Water Scuba Diver certification or equivalent
2. CPR1st or equivalent
3. CPROx or equivalent
4. Minimum age 18

**It is the ERDI Instructor's responsibility to evaluate a candidate's open water skills prior to starting any emergency response diving water skills.**

### 2.3 Qualifications of Graduates

#### ERD I

Upon successful completion of this course, ERD I Divers may engage in basic public safety diving activities without direct supervision. Graduates may also participate in limited application recovery/rescue operations, providing that:

1. The ERD I Diver operates under the supervision of a team supervisor
2. Operations are limited to 8 metres / 60 feet in depth
3. Operations are conducted in conditions consistent with his training
4. Dive profiles are kept within no decompression limits

**Upon successful completion of this course, graduates are qualified to enroll in:**

1. ERDI I Ops Components
2. ERD II Course

#### ERDI Tender

Upon successful completion of the tender portion of this course, graduates are qualified to:

1. Tend public safety divers in open water
2. Participate in the planning and execution of public safety diving operations

### 2.4 Who May Teach

An active ERDI Emergency Response Diver Instructor may teach this course



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## 2.5 Administrative Requirements

1. Have the students complete the:
  - a. ERDI Liability Release and Express Assumption of Risk Form
  - b. ERDI Medical Statement Form
2. Communicate the schedule of the course to the students
3. Ensure that the students have the required equipment

### Required Materials

1. *The ERD I Student Manual* is required for the ERD I course academics

### Certification

1. Upon successful completion of an ERDI course the instructor must issue the appropriate ERDI certification by submitting the ERDI Diver Registration form to ERDI Headquarters or registering the students online through member's area of the ERDI website.

## 2.6 Student to Instructor Ratio

### Academic

1. Unlimited, so long as adequate facility, supplies and time are provided to ensure comprehensive and complete training of subject matter

### Confined Water

1. A maximum of 10 students per ERDI Instructor
2. ERDI Instructors have the option of adding 2 more students with the assistance of an active ERDI Supervisor
3. The maximum number of students an ERDI Instructor may have in confined water is 14 with the assistance of active ERDI Supervisors

### Open Water

1. A maximum of 3 dive teams or 6 tethered divers per ERDI Instructor is allowed; it is the instructor's discretion to reduce this number as conditions dictate

## 2.7 Course Structure and Duration

### Open Water Execution

1. Student must complete 4 open water dives
2. The maximum depth must not exceed 18 metres / 60 feet on any dive
3. All dives must be completed during daylight hours
4. Upon successful completion of the dives, the student must complete his logbook and the ERDI Instructor must sign off on the completed dives

### Course Structure

1. ERDI allows instructors to structure courses according to the number of participants and their skill level.

### Duration



2. Classroom and briefing: Approximately 8 hours
3. Confined water: Approximately 6 hours
4. Open water dives (required): Four dives

## 2.8 Required Equipment

### ERD I Diver

**Instructor Note: It is important that the student understand the need for the proper equipment when performing the duties of an emergency response diver. The student should also understand the need for equipment standardization among team members.**

1. Mask and fins
2. Buoyancy compensator device (BCD)
  - i. A technical harness or similar BCD capable of emergency response diving tether requirements. The BCD must be capable of supporting a pony cylinder of at least 3litres / 21cubic feet in addition to the primary cylinder
  - b. The BCD must have adequate lift, 18 kilograms/40 pounds minimum recommended
  - c. If the student's BCD is not adequate for tether rigging but is otherwise acceptable, the student may use their BCD with an ERDI approved tether harness
3. Regulator
  - a. A primary regulator appropriate for the local diving environment \*
  - b. A secondary regulator for the pony cylinder appropriate for the local diving environment \*  
It should be noted that environmentally sealed regulators are recommended.
4. Cylinders
  - a. A primary cylinder of at least 11.1litres / 80 cubic feet when filled to its service pressure
  - b. A pony cylinder of at least 3 litres / 21cubic feet when filled to its service pressure
  - c. The pony cylinder must be rigged so that it is accessible and useable to the student. Additionally, the student must have the ability to pass the redundant air source to another diver without assistance in an emergency
  - d. Twin cylinders are not permitted at this level
5. Instrumentation; All students will be equipped with
  - a. Submersible pressure gauge (SPG) \*
  - b. Depth gauge \*
  - c. Underwater compass
  - d. Underwater timing device\*

\*Students may use a dive computer to meet these requirements
6. Exposure protection appropriate for the dive conditions
7. Cutting tool: 1 primary, 1 backup
8. Weight system
9. Surface signaling devices; 1 audible and 1 visual
10. Logbook
11. USCG approved personal floatation device (PFD)
12. Gloves: latex and work



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13. Dive tables

## **ERD Tender**

1. United States Coast Guard (USCG) approved personal floatation device (PFD)
2. Cutting tool: 1 primary and 1 backup
3. Rescue signals: 1 audible and 1 visual
4. Gloves: latex and work

## **2.9 Academic Outline**

### **The Organization**

1. Recreational vs. Emergency Response Diving
  - a. Differences
  - b. Training specific
  - c. Why recreational is not adequate
2. Building the Team
  - a. Organizations; fire departments, police departments, rescue, volunteer, contract
  - b. Funding
  - c. Team structure
    - i. Primary diver
    - ii. Primary tender
    - iii. Backup diver
    - iv. Backup tender
    - v. Incident commander
    - vi. Incident commander aide
3. Attitudes
  - a. Professionalism
  - b. Responsible use of assets
  - c. Team cohesion
  - d. Physical fitness
4. Operations
  - a. National Fire Protection Association (NFPA) guidelines, Occupational Safety and Health Administration (OSHA) regulations
  - b. Standard operation procedures (SOP's), standard operating guidelines (SOG's) and protocols
  - c. Scene safety
  - d. Record keeping
5. Training
  - a. Increases safety
  - b. Increases abilities
  - c. May be required by law
  - d. Individual and team



- e. Interagency
- f. Keeping members stimulated
- g. Frequency
- 6. Public Safety Diving Accidents
  - a. Lack of training
  - b. Exceeding abilities and training
  - c. Learning from others
  - d. Avoid through education
  - e. Go/No Go decision

## **Equipment**

- 1. Recreational vs. Emergency Response Diving
- 2. Standardization
  - a. Benefits
- 3. Scuba Equipment
  - a. Mask
  - b. Fins
  - c. Regulators
  - d. Cylinder
  - e. Buoyancy compensator device (BCD)
  - f. Instrumentation
  - g. Pony cylinder
  - h. Exposure protection
  - i. Weight systems
  - j. Cutting tools
- 4. Specialized Equipment
  - a. HazMat
  - b. Diver propulsion vehicle (DPV)
  - c. Tow sleds
  - d. Metal detectors
  - e. Communications
  - f. Surfaced supplied air
  - g. Remote operated vehicle (ROV)
  - h. Range finders
- 5. Small Boats Ops
  - a. Types
  - b. Search patterns
  - c. Handling
  - d. Safety issues
- 6. Recording Keeping
  - a. Service records



- b. Lines
- c. Air fills
- d. Team logs
- e. Diver logs
- f. Training records
- g. Court documentation

### **Problem Solving**

- 1. Diver Problems
  - a. Stress
  - b. Panic
  - c. Illness
  - d. Fatigue
  - e. Psychological
  - f. Keeping focus
- 2. Air Loss
  - a. Causes
  - b. Solutions
- 3. Entanglement
  - a. Common points of entanglement
  - b. Cutting tools
  - c. Tether entanglement
- 4. Equipment Problems
  - a. Inappropriate equipment
  - b. New or unfamiliar equipment
  - c. Malfunctions

### **Tender Skills**

- 1. Value to Team
- 2. Back-up Tender
  - a. Responsibilities
- 3. Mapping and Documentation
- 4. Line Signals
  - a. Tender to Diver
    - i. Pull = OK
    - ii. 2 Pulls = Stop, Change Direction, Take Out More Line
    - iii. 3 Pulls = Surface
    - iv. 4 Pulls = Stop, Standby
  - b. Diver to Tender
    - i. 1 Pull = OK
    - ii. 2 Pulls = More Line



- iii. 3 Pulls = Object Found
- iv. 4 Pulls = Help, Trouble
- 5. Other Sets of Signals
  - a. Line
  - b. Hand signs
- 6. Search Patterns
- 7. De-con Procedures
- 8. Evidence Recovery
- 9. Required Equipment
  - a. Personal floatation device (PFD)
  - b. Appropriate/Inappropriate clothing, protective equipment

### **Responding to the Call**

- 1. Scene Evaluation: Rescue or Recovery; Go/No Go
  - a. Scene safety
  - b. Control of scene
  - c. Team standard operating procedure (SOP) / standard operation guideline (SOG)
  - d. Set up, gear up, deploy
- 2. Rescue
  - a. Risk vs. benefit
  - b. Witnesses
  - c. Timeline
  - d. Resuscitation/Cold water near-drowning
  - e. Rescue to recovery
- 3. Recovery
  - a. Crime scene recognition
    - i. Documentation
  - b. Body Recovery
    - i. Protecting evidence
    - ii. Bagging procedures
    - iii. Victim dignity
- 4. After the Call
  - a. Team de-briefing and critique
  - b. Counseling
  - c. Leaving the scene

### **Search Patterns**

- 1. Tools
  - a. Lines
  - b. Tow systems
  - c. Metal detectors, magnetometers, side scan sonar, ROV



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2. Execution
    - a. Simplicity
    - b. Pre-determined start point, area of coverage, documented end point
    - c. Black water
    - d. Moving water
  3. Types
    - a. Sweeping arc
    - b. Expanding circle
    - c. Parallel pattern
    - d. V-Pattern
    - e. Jackstay
    - f. Tyrolean
  4. Determining Which Pattern
  5. Boat Based Search Patterns
    - a. Anchoring
    - b. Global positioning system (GPS)
    - c. Anchored circle
    - d. Tow sleds
  6. Marking Objects, Places

### **Crime Scene Recognition**

1. Securing Scene; Above and Below
2. Interview Skills
3. Scene Documentation
  - a. Photography
  - b. Videography
  - c. Accurate diagramming
  - d. Accurate description
4. Evidence Recovery
  - a. Proper handling
  - b. Evidence containers
  - c. Bagging procedures
  - d. Continuity of evidence/chain of custody

### **Environmental/HazMat**

1. Planning
2. Recognition
3. Equipment Issues
4. Types
  - a. Chemical
  - b. Biological



- i. Human
- 5. Decontamination Procedures
  - a. Personnel
  - b. Equipment
  - c. Patient/Victim
- 6. Water Sample
  - a. Proper container for laboratory analysis

## **2.10 Confined Water Outline**

**Students are required to successfully complete the following skills:**

1. Evaluation of scuba skills
  - a. Mask removal and replacement
  - b. BCD removal and replacement
  - c. Buoyancy skills
2. Line signals, performed with blacked out mask \*
3. Search patterns, at least 2 patterns performed with blacked out mask \*  
\* These skills may be conducted concurrently.
4. Diver to diver touch communications \*
  - a. Out of air = Hand to regulator
  - b. Go forward = Push
  - c. Go backward = Several pulls
  - d. Stop = Pull  
\* The primary diver will have a blacked out mask, the backup diver a normal mask.
5. Deploy 2 cutting devices and simulate use, one of which is without a mask
6. Simulated bailout consisting of blacked out mask, switching to redundant air supply, bailout of primary and surfacing
7. Diver to diver redundant air source with contact ascent
8. Victim bagging procedures

### **Tender Skills**

1. Line Signals \*
2. Search patterns, at least 2 \*  
\* These skills may be conducted concurrently.

**Students are to complete the following watermanship skills:**

1. 800 metre mask, snorkel and fins swim non-stop. Use of arms is not permitted; recommended completion time is 16 minutes.
2. 500 metre distance swim, nonstop, without the use of swim aids; recommended completion time is 16 minutes.
3. 100 metre buddy tow in full scuba equipment; recommended completion time is 4 minutes.



4. Survival float without aids, for 15 minutes; during the last 2 minutes the student will keep their hands above the waterline.

### **Tender Swimming Evaluation**

1. Students are to successfully complete the following water skills:
2. 200 metre swim without aids non-stop
3. 100 metre buddy tow in PFD non-stop
4. 10 minute survival-float

## **2.11 Open Water Performance Requirements**

The open water training consists of 4 dives. Each dive activity should be conducted as closely as possible to an actual incident response. The number of dives may be increased if, in the opinion of the instructor, it is necessary to meet a minimum training standard or proficiency level.

During all open water training there will be an ERDI Supervisor, Instructor or Instructor Trainer present and equipped to respond to an in-water emergency at all times. During any in-water training, NFPA 1006 and NFPA 1670 guidelines must be followed or for regions not governed by NFPA, any regulatory or legal requirements that apply to professional and/or volunteer public safety and emergency response divers.

The dive team will consist of:

- ❖ Primary diver
- ❖ Primary tender
- ❖ Backup diver
- ❖ Backup tender
- ❖ Incident commander – may be filled by backup tender

Each student will need to rotate through each team position at least 3 times. ERDI recommends that a third diver be partially geared up to assume backup diver status if needed.

### **ERD Diver**

Students are to successfully complete the following skills:

1. Scene size-up
2. Team briefing
3. Deploying team
4. Correctly perform at least 3 search patterns
5. Locate and recover small evidence object and perform correct evidence handling procedures
6. Simulated recovery of victim performing correct handling procedures
7. Respond as backup diver to primary diver in trouble resolving situation
8. Communicate with tender using line signals
9. Bring simulated unconscious diver to surface and transport to shore/boat while performing rescue breathing and remove from water. The recommended distance is 50 metres.
10. Participate in proper decontamination procedures
11. Debrief and record each dive, team log and diver log
12. Post dive diver evaluation (medical and psychological)



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### **ERD Tender**

Students are to successfully complete the following skills:

1. Assist in dressing primary diver
2. Proper tether attachment
3. Correctly perform at least 2 search patterns
4. Communicate with primary diver through tether using line signals
5. Assist in proper evidence handling procedures
6. Assist in proper decontamination procedures

### **Recommended Sequence**

1. Dive 1:
  - a. Perform first of three search patterns;
  - b. Locate and recover small evidence object and perform correct evidence handling procedures
  - c. Participate in proper decontamination procedures
2. Dive 2:
  - a. Perform second of three search patterns
  - b. Simulated recovery of victim while performing correct bagging/handling procedures
3. Dive 3:
  - a. Perform third of three search patterns
  - b. Perform diver in trouble task as assigned by instructor
4. Dive 4:
  - a. While performing as backup diver, respond to diver in trouble resolving problem
  - b. Bring simulated unconscious diver to surface and transport to shore/boat while performing rescue breathing and remove from water

## **2.12 Certification Requirements**

1. Minimum score of 80 percent on the ERD I written test
2. Satisfactorily complete all academic, confined water and open water requirements
3. Satisfactorily complete swim evaluation requirements



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## 3. Emergency Response Diver II

### 3.1 Introduction

The ERD II program is designed to enable the student to develop detailed knowledge and advanced skills in emergency response diving. It also serves as a base to develop experience and as a prerequisite for ERD II level Ops Components and ERDI Supervisor. This course may be taught in conjunction with ERD I Diver at the discretion of the instructor.

### 3.2 Student Prerequisites

1. ERD I or equivalent\*
2. Minimum age 18
3. CPR 1st or equivalent
4. CPROx or equivalent
5. 10 or more logged public safety dives either training or operational dives beyond ERD I with a recognized public safety dive team \*

\*These prerequisites may be met by completing a combined ERD I and II course.

### 3.3 Qualifications of Graduates

Upon successful completion of this course, ERD II Divers may engage in rescue and recovery operations and activities under the direct authority of a sanctioned emergency response team provided that the activities, geography and environmental conditions do not exceed the level of training.

### 3.4 Who May Teach

Any active Emergency Response Diver Instructor (ERDI) with may teach this course.

### 3.5 Administrative Requirements

1. Have the students complete the:
  - a. *ERDI Liability Release and Express Assumption of Risk* Form
  - b. *ERDI Medical Statement* Form
2. Communicate the schedule of the course to the students
3. Ensure that the students have the required equipment

#### Required Materials

1. *The ERD Training Manual* is required for the ERD II course academics
2. Texts, other than ERDI manuals, used for ERD Ops Components must be approved by ERDI Headquarters

#### Certification



1. Upon successful completion of an ERDI course the instructor must issue the appropriate ERDI certification by submitting, the ERDI Diver Registration form to ERDI Headquarters or registering the students online through member's area of the ERDI website

### **3.6 Student to Instructor Ratio**

#### **Academic**

1. Unlimited, so long as adequate facility, supplies and time are provided to ensure comprehensive and complete training of subject matter

#### **Confined Water**

1. A maximum of 6 students per ERDI Instructor
2. ERDI Instructors have the option of adding 2 more students with the assistance of an active ERDI Supervisor
3. The maximum number of students an ERDI Instructor may have in confined water is 12 with the assistance of active ERDI Supervisors

#### **Open Water**

1. A maximum of 3 dive teams or 6 tethered divers per ERDI Instructor is allowed; it is the instructor's discretion to reduce this number as conditions dictate

### **3.7 Course Structure and Duration**

#### **Open Water Execution**

1. Student must complete 6 open water dives
2. Training depth must not exceed 18 metres/ 60 feet in depth
3. All dives must be completed during daylight hours

#### **Course Structure**

1. ERDI allows instructors to structure courses according to the number of participants and their skill level.

#### **Duration**

1. Classroom and briefing: Approximately 8 hours
2. Confined water: Approximately 4 hours

ERD I Diver training may be combined with ERD II Diver training at the discretion of the instructor with the incorporation of an additional 10 open water training dives as either tender or diver (minimum 5 as diver) in the program, with the course duration adjusted appropriately.

### **3.8 Required Equipment**

1. Same equipment as required for an ERD I Diver
2. In addition to the basic equipment, ERD II students will need to have the following equipment
  - a. Dry suit with appropriate insulation suitable for emergency response diving
  - b. Full face mask with communication capabilities



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## 3.9 Academic Outline

### Victim's Death

#### Accidental

1. Misconceptions of Near Drowning
  - a. Immersion reflex
  - b. Secondary drowning
  - c. Chances of survival
2. Mechanics of Drowning
  - a. Dry
    - i. 10 - 15 percent of drownings
    - ii. Laryngospasm
    - iii. Possibility of resuscitation
    - iv. Infants vs. adults
  - b. Wet
    - i. Majority of drownings
    - ii. Agonal gasp
    - iii. Water aspirated into lungs
    - iv. Chemistry changes
    - v. Final moments

#### Intentional

1. Crime Scene
  - a. Identify
  - b. Evidence
    - i. Types of evidence
  - c. Skeletal remains
    - i. Human or other
    - ii. Handling of evidence
2. Physiological Changes in the Human Body
  - a. Rigor mortis
  - b. Livor mortis (lividity)
    - i. Absence
    - ii. Contact lividity
    - iii. Cadaveric spasm
    - iv. Decomposition
    - v. Putrification
    - vi. Anthropophagy
3. Removal of Crime Scene Evidence
  - a. Documentation/Recording of information, observations
    - i. Mapmaking



- ii. Photography/Videography
- iii. Topside documentation
- iv. Written report
- v. Accuracy
- 4. Vehicle removal/heavy lift
  - a. Preserving interior/evidence
    - i. Evidence recovery vs. salvage recovery
    - ii. Occupational Safety and Health Administration (OSHA)
  - b. Techniques
    - i. Utilizing non-public safety personnel
    - ii. Specific training required
  - c. Hazards
  - d. Vehicle/Accident analysis
  - e. Body Recovery
    - i. Surrounding area
  - f. Body Handling/Bagging
    - i. Still water vs. rapid water
    - ii. Rigor
    - iii. Water sample
    - iv. Diver safety/contamination

## **Encapsulation**

### **Environmental Issues**

- 1. Nuclear, Biological, Chemical
  - a. Medical concerns
    - i. Water sample
    - ii. Team health and safety
    - iii. Sources
- 2. Dangers to Diver, Scene, Team Members, Family
- 3. Suit Permeation
- 4. Protecting Potable Water Supply
- 5. Post Dive Observations
- 6. Decontamination Procedures

### **Dry Suit**

- 1. Types of Dry Suits and Materials
  - a. Shell style, Trilaminates
  - b. Crushed neoprene, compressed neoprene
  - c. Neoprene
  - d. Vulcanized rubber
- 2. Appropriate for Emergency Response Diving



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3. Types of Seals
    - a. Latex
    - b. Neoprene
  4. Dry Suit Features
    - a. Self donning
    - b. Rear entry
    - c. Front entry
    - d. Boot styles
    - e. Zipper guard
    - f. Relief zipper
    - g. Internal suspenders
  5. Dry Suit Insulation
    - a. Appropriate/Inappropriate
    - b. Compression resistant
    - c. Wicking action
    - d. Trapped air
    - e. Dive wear materials
  6. Dry Suit Valves
    - a. Inflator
      - i. Location
      - ii. Push to inflate
    - b. Exhaust
      - i. Location
      - ii. Automatic
      - iii. Adjustable
      - iv. Push to dump
      - v. Proper positioning
  7. Buoyancy Control
    - a. Proper weighting and location
      - i. Cylinder weights
      - ii. Weight integrated BCD
      - iii. Harness system
    - b. Controlling buoyancy underwater
    - c. BCD also required
  8. Maintenance and Care
    - a. Flush with fresh water
    - b. Drying
    - c. Avoiding heat, chemicals, oils
    - d. Zipper care
      - i. Cleaning



- ii. Appropriate/Inappropriate lubricants
- e. Seals
  - i. Appropriate/Inappropriate lubricants
  - ii. Repair/Replacement
  - iii. Minor repairs
  - iv. Leaks
  - v. Major repairs
  - vi. Zipper replacement
- 9. Dry Suit Emergencies
  - a. Excessive air in suit
  - b. Inflator valve stuck open
  - c. Exhaust valve stuck closed/open
  - d. Loss of weights
  - e. Excessive air in feet
  - f. Dry suit flood
- 10. Other Dry Suit Equipment
  - a. Helmet yokes
  - b. Dry glove systems
  - c. Inflation systems

### **Full Face Mask**

- 1. Purpose
  - a. Diver safety
  - b. Communications
- 2. Advantages
  - a. Increased diver safety
    - i. Contaminated water
    - ii. Winter diving
    - iii. Communications
    - iv. Corrective lenses
- 3. Disadvantages
  - a. Increased air consumption
  - b. Buoyancy
  - c. Bulky
- 4. Types
  - a. Appropriate/Inappropriate
  - b. Scuba Quick connect/disconnect
  - c. Surface supplied
- 5. Techniques/Procedures
  - a. Donning
    - i. In water vs. out of water



- ii. Strap adjustment
    - iii. Skirt seal
  - b. Diving with a full face mask
    - i. Equalization
    - ii. Buoyancy
    - iii. Removal and replacement underwater
    - iv. Alternate air source use
      - 1. Spare mask
    - v. Surface options
      - 1. Surface valve
    - vi. Decontamination procedures prior to doffing
- 6. Underwater Communications
  - a. Occupational Safety and Health Administration (OSHA)
  - b. Types of communication equipment
    - i. Push to talk (PTT)
    - ii. Voice activated (VOX)
    - iii. Hardwire/Tether
    - iv. Battery failure
- 7. User/Field Maintenance and Care
  - a. Authorized servicing/preventive maintenance
  - b. After use

## **Lifting Techniques**

- 1. When Emergency Response Diving Becomes Commercial Diving
  - a. Occupational Safety and Health Administration (OSHA)
  - b. Risk vs. benefit
- 2. Recovery Decision
  - a. Operating beyond training
  - b. Methods available
    - i. External buoyancy
    - ii. Dead lift
    - iii. Internal buoyancy
  - c. Scene safety
  - d. Preservation of evidence
- 3. Equipment
  - a. Markers
  - b. Lift bags
    - i. Types
      - 1. Open bottom
      - 2. Closed (Pillow)
    - ii. Safety features



- iii. Necessary features of lift devices
- c. Lift straps
- d. Lines
- 4. Lifting with External Buoyancy
  - a. Appropriate methods
  - b. Inappropriate methods/equipment
  - c. Calculating required lift
  - d. Overcoming ground effect
  - e. Rigging
  - f. Inflation methods/gas considerations
  - g. Hazards
    - i. Currents
    - ii. Loss of buoyancy
    - iii. Unsecured object
  - h. Securing object on surface
- 5. Lifting with Internal Buoyancy
  - a. When and if appropriate
  - b. Dangers
  - c. Generally not recommended
- 6. Dead Lift
  - a. Simple method
  - b. High degree of control
  - c. Rigging

### **3.10 Confined Water Outline**

**Students are required to successfully complete the following skills:**

#### **Scuba Skills**

1. Instructor evaluation of basic scuba skills including redundant air source use

#### **Dry Suit Skills**

1. Proper donning procedures
2. Proper weighting
3. Inflating and deflating dry suit
4. Simulated stuck inflator valve
5. Recover from inverted position
6. Buoyancy skills

#### **Full Face Mask Skills**

1. Equipment set up
2. Proper donning and adjustment



3. Entry techniques
4. Proper weighting
5. Equalization
6. Clearing partially flooded mask
7. Remove and replace mask underwater;
8. Remove mask and utilization of redundant air source

**Students are to complete the following waterman-ship skills:**

1. 800 metre mask, snorkel and fins swim non-stop. Use of arms is not permitted; recommended completion time is 16 minutes.
2. 500 metre distance swim, nonstop, without the use of swim aids; recommended completion time is 16 minutes
3. 100 metre buddy tow in full scuba equipment ; recommended completion time is 6 minutes
4. Survival float without aids, for 15 minutes. During the last 2 minutes the student will keep their hands above the waterline

### **3.11 Open Water Performance Requirements**

The open water training consists of 6 dives. Each dive activity should be conducted as closely as possible to an actual incident response. The number of dives may be increased if, in the opinion of the instructor, it is necessary to meet a minimum training standard or proficiency level.

During all open water training there will be an ERDI Supervisor, Instructor or Instructor Trainer present and equipped to respond to an in-water emergency at all times. During any in-water training, NFPA 1006 and NFPA 1670 guidelines must be followed or for regions not governed by NFPA, any regulatory or legal requirements that apply to professional and/or volunteer public safety and emergency response divers.

The dive team will consist of:

- ❖ Primary diver
- ❖ Primary tender
- ❖ Backup diver
- ❖ Backup tender
- ❖ Incident commander – may be filled by backup tender

ERDI recommends that a third diver be partially geared up to assume backup diver status if needed.

#### **Required Skills**

Students are to successfully complete the following skills:

1. Scene size-up
2. Team briefing
3. Deploying the team
4. Inflate/deflate dry suit
5. Disconnect/connect dry suit hose underwater
6. Recover from inverted position
7. Clear a partially flooded full face mask



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8. Remove and replace full face mask
  9. Remove full face mask and utilize redundant air source to ascend
  10. Locate, rig lift bag and lift to surface object\*, maintaining evidence continuity  
\* Object weight not to exceed 14 kilos/30 pounds
  11. Debrief and record each dive, team log and diver log
  12. Post dive diver evaluation (medical & psychological)

### **Recommended Sequence**

1. Dive 1: Dry suit skills and emergency response diving skills
2. Dive 2: Dry suit skills and emergency response diving skills.
3. Dive 3: Full face mask skills and emergency response diving skills
4. Dive 4: Full face mask skills and emergency response diving skills, decontamination procedures
5. Dive 5: Light lift skills
6. Dive 6: Light lift skills (instructor may substitute dead lift for bag lift, weight limit must be still observed)

## **3.12 Certification Requirements**

1. Score a minimum of 80 percent on the ERD II written test
2. Satisfactorily complete all academic, confined water, and open water requirements