



tender operations

knowledge quest

A Complete Guide to Tender Operations
in a Public Safety Diving Role

KQ Review for ERDI Tender Operations

Directions

- Using the ERDI Tender Operations Manual as a reference, answer the questions on the following pages.
- Choose the most accurate answer for each question.
- Do not sign or date the student statement at the end of each chapter's statements until you have reviewed this material with your instructor, and your instructor tells you to do so.

Note: These assessments are designed for use in conjunction with the ERDI Tender Operations Manual.

v.1213

Student's Name _____ Date _____

Instructor's Name _____

Review Questions: Chapter 1

1. As more and more people began using the water for recreational purposes the numbers of _____ began increasing.

- A. Pleasure and relaxation
- B. Incidents and tragedies
- C. Comfort and recognition
- D. None of the above

2. Most dive teams were initially formed from law enforcement, fire and _____ departments.

- A. Public works
- B. Citizen action groups
- C. Emergency management
- D. Waste management

3. The three main types of diving operations include:

- A. Victim recovery
- B. Vehicle recovery
- C. Item recovery
- D. All of the above

4. The tender should be one of the most highly trained and knowledgeable individuals on the team.

True False

5. The tender must be able to know exactly what the diver is doing and be able to:

- A. Discuss mitigation strategies after the dive is complete.
- B. Correct any deficiency the diver may have.
- C. Report the deficiency to supervisors.
- D. Discipline the diver for failing to perform correctly.

I, _____, completely understand the answers to the questions that I missed as explained by my instructor.

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Review Questions: Chapter 2

1. Every organization has a _____ that it must follow in order to successfully perform and communicate amongst members.

- A. Hierarchy or Structure
- B. Schedule
- C. Outline
- D. Protocol

2. The operational functionality of the dive team falls upon the:

- A. Safety Diver
- B. Primary Tender
- C. Primary Diver
- D. Diving Supervisor

3. The DSO is responsible for _____ only.

- A. Recordkeeping
- B. Safety
- C. Media relations
- D. Equipment

4. The DSO can call a dive or cease diving activity at his discretion until safety measures and standards have been implemented to a satisfactory level.

True False

5. The _____ is responsible for any and all activities conducted underwater.

- A. Primary diver
- B. Back-up diver
- C. Primary tender
- D. Diving Supervisor

6. The back-up diver is commonly called a _____ diver due to his ability to rapidly respond to any in-water situation that may arise.

- A. 80% diver
- B. 99% diver
- C. Ready-to-go
- D. 90% diver

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Review Questions: Chapter 3

1. Witnesses at dive sites can supply information about what occurred, time of incident and:

- A. Activities of the parties concerned.
- B. Weather conditions.
- C. Names of other witnesses.
- D. Best way to perform dive.

2. When securing the dive scene, the general rule of thumb is to establish a perimeter of at least:

- A. 50m/50yds
- B. 100m/100 yds
- C. 75m/75 yds
- D. 200m/200 yds

3. _____ can be used to secure the scene.

- A. Barriers
- B. Tape
- C. Vehicles
- D. All of the Above

4. Team members should consider the following factors when performing site assessments: weather conditions, water conditions and current speed, visible hazards on the shore and in the water, and potential additional hazards that exist but are not readily known.

- True
- False

5. A knot is equivalent to?

- A. 1.6kmph/1.0 mph
- B. 2.4kmph/1.5 mph
- C. 1.85kph/1.15 mph
- D. 1.79kmph/1.115 mph

6. Photography provides a _____ visual record of the scene.

- A. Permanent
- B. Certifiable
- C. Illustrative
- D. Recordable

7. A minimum of _____ photographs need to be taken for each specific item of interest.

- A. Four
- B. Two
- C. Twenty
- D. Three

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Review Questions: Chapter 4

1. A tender's operations occur _____ the dive.

- A. Before
- B. During
- C. After
- D. All of the above

2. The tender has to be strong mentally and have _____ work skills.

- A. Adequate
- B. Capable
- C. Dependable
- D. Meticulous

3. Planning the dive dictates the _____ and mechanics the tender will have to address.

- A. Dive Mode
- B. Specific Equipment Needs
- C. Safety Issues
- D. Surface Requirements

4. Once the diver and tender have agreed on what equipment to use, the tender must perform:

- A. An initial safety inspection of every item.
- B. An initial assembly of the components.
- C. A written justification regarding the equipment selected.
- D. Documentation of the equipment selected.

5. The air cylinder should be positioned in a manner that assures the diver has freedom of head movement and:

- A. Does not restrict hose movement.
- B. Cannot strike his head on the first stage and valve assembly.
- C. Allows for correct redundant air system positioning.
- D. Doesn't strike the diver at the back of his knees.

6. Additional hoses need to be routed in their proper position and secured using:

- A. Clips
- B. Retractors
- C. Lashings
- D. All of the Above

7. Safety inspections should be performed throughout the initial inspection and:

- A. Assembly Duties
- B. Dressing Process
- C. Selection Phase
- D. Site Assessment

8. It is the tender's duty to be thoroughly familiar with each component of equipment, how it works and how it is used.

- True
- False

9. There are five main concerns when choosing personal protective equipment; they include: environmental protection, hand protection, foot protection, _____, and _____.

- A. Splash Protection
- B. Personal Safety
- C. A and B
- D. None of the Above

10. Waders allow the tender to:

- A. Assemble equipment.
- B. Photograph the scene.
- C. Protect his feet from potential falling objects.
- D. Escort the diver into and out of the water.

11. In addition to traditional work type gloves, the tender should wear _____ underneath his work gloves.

- A. Talcum Powder
- B. Hand Cream
- C. Latex or Nitrile Gloves
- D. Finger Cots

12. _____ ensure that fluids cannot penetrate the fabric and therefore mitigate the risk of exposure from splash hazards.

- A. Coveralls
- B. Bibs
- C. Blue Jeans
- D. Disposable Barrier Suits

13. The sun's damaging rays and its reflection off the water's surface can over a period of time:

- A. Cause the diver to suffer hypothermia.
- B. Tire the diver.
- C. Damage the eyes.
- D. Slow underwater reaction times.

14. Personal floatation devices must be worn by everyone at the surface working within _____ from the water's edge.

- A. 8 metres/25 feet
- B. 23 metres/75 feet
- C. 15 metres/50 feet
- D. 30 metres/100 feet

15. The tender should have an audible and a visual signaling device with him at all times.

- True
- False

16. The tender should start dressing the diver from:

- A. Undergarment to external dress.
- B. Feet to head.
- C. Head to feet.
- D. Back to front.

17. When dressing the diver in the dive system, the tender should stabilize the diver from:

- A. Falling.
- B. Losing balance.
- C. Potentially causing injury to himself or others.
- D. All of the above.

18. Having the diver place his hands on his air switching block, cutting devices and tether attachment aids in:

- A. Ensuring they are attached.
- B. Developing muscle memory.
- C. Locating possible entanglement points.
- D. None of the above.

19. There are three basic forms of communication during a dive, they include all except:

- A. Hand Signals
- B. Line Pulls
- C. Telegraphs.
- D. Electronic Communication

20. The tether should never be attached to a _____ or fabric loop for any reason.

- A. Stainless Steel “D” Ring
- B. Dive Harness
- C. Tenders harness
- D. Plastic “D” Ring

21. Harness clips should be designed so they cannot accidentally dislodge or open during the dive unless:

- A. The current speed exceeds safe diving limits.
- B. The tender needs to take a break.
- C. The diver requests to conduct a free search.
- D. The diver is physically attempting to detach his tether.

22. Once the diver is dressed and standing, the tender should:

- A. Allow the diver to walk to the water.
- B. Maintain hands on attitude with the diver.
- C. Begin recording the diver's vitals.
- D. Begin staging the decontamination area.

23. Equipment logs should include information on all of the following except:

- A. What was damaged.
- B. When serviced.
- C. Where serviced.
- D. Who delivered equipment for service.

24. Dive logs need to contain the following information: Location of the dive, date of the dive, weather conditions, name of primary diver and back up diver, _____, _____, time diver(s) entered the water, time diver(s) exited the water and activity requiring dive.

- A. Specialized Equipment Being Used
- B. Diver's Beginning air Pressure
- C. Mode of the Dive
- D. All of the Above

25. Air supplies should be divided in thirds. These thirds include: one-third of the diver's air supply for conducting the dive, one-third for decontamination and cleaning and the remaining third for:

- A. Safety and redundancy.
- B. Ascent and safety stops.
- C. Descents to the dive location.
- D. For residual cylinder pressure.

26. Incident reports should include: statement of the call for service, list of the responding dive team members, witness interviews, photographs and/or video of the scene, water quality reports and the dive log. Other items that may be included in the incident report include:

- A. Scene Sketches
- B. Evidence Receipts
- C. Individual Debriefing Statements
- D. All of the Above

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Review Questions: Chapter 5

1. Once the diver has entered the water, the tender has only one responsibility paramount to others:

- A. Ensuring the tender lines do not tangle.
- B. Ensuring the diver returns to the surface safely.
- C. Monitoring the divers air supply.
- D. Getting a tan.

2. Dive plans include all except:

- A. Air management strategies.
- B. Time limits allotted for dive times.
- C. Communication techniques.
- D. Designated break times.

3. Basic tethered search patterns include: spiral search, arc pattern, line pattern, walking line pattern and Tyrolean pattern.

- True
- False

4. One main complication with performing a circle or spiral pattern is:

- A. Redundancy in movement.
- B. Potential entanglement.
- C. Complication in establishing guidelines.
- D. Ineffective pattern.

5. Benefits of the arc pattern are its ease of use and:

- A. Speed of Deployment
- B. Versatility
- C. Both A & B
- D. None of the Above

6. When pivoting on a search line when using the line pattern, the tether should be let out approximately:

- A. 60 – 100 cm / 2 – 3 feet
- B. 100 – 150 cm / 3 – 5 feet
- C. 120 – 200 cm / 4 – 6 feet
- D. 30 – 100 cm / 1 – 3 feet

7. Some of the concerns the tender must address while the diver is submerged include:

- A. Slack Tender Line
- B. Floating Debris
- C. Boat Traffic
- D. All of the Above

8. When encountering floating debris, the tender should take every precaution to notify the diver of this hazard and direct him to a safe area or:

- A. Continue monitoring the debris.
- B. Remove the diver from the water until the hazard passes.
- C. Continue the dive.
- D. None of the above.

9. In navigable waterways, the dive team may have to get permission from which agency to secure a portion of that water for dive missions?

- A. US Navy
- B. US Marines
- C. River Watch
- D. US Coast Guard

10. Boating traffic creates two major hazards for underwater divers, they are:

- A. Overhead environments.
- B. Slip and fall hazards.
- C. Possible injury from jet intake / propeller.
- D. Both A and C

11. Most divers can only swim at a rate of _____ knot.

- A. 1/3
- B. 1/2
- C. 1/4
- D. 3/4

12. When encountering roller dams, tenders should?

- A. Continue the dive as normal.
- B. Stop the dive until highly specialized teams are notified to respond.
- C. Attach the tether to a vehicle to use for pulling the diver free.
- D. None of the above.

13. Log jams create a partial to full obstruction in the waterway. These anomalies are caused by:

- A. Animals building nests.
- B. Water way transportation.
- C. Floating debris including trees and limbs.
- D. All of the above.

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Review Questions: Chapter 6

1. Clear and effective communication is essential to help ensure:

- A. The dive objects are met.
- B. The equipment does not fail.
- C. The media is well informed.
- D. None of the above.

2. Surface communication devices each tender should use include:

- A. Radio or Cell Phone
- B. Lantern and Cell Phone
- C. Radio and Flashlight
- D. Semaphore Flags and Whistle

3. Dive teams should have the contact numbers for the nearest law enforcement agency or communications center, fire department, emergency medical services and:

- A. Clergy
- B. Hospital
- C. US Navy
- D. Environmental Protection Agency

4. Tenders must be familiar with their team's specific _____ and _____ and practice them often to ensure memory and proficiency with this type of signaling.

- A. Protocols and Signals
- B. Policies and Directives
- C. Plans and Protocols
- D. Signals and Plans

5. Tenders may have to employ a _____ to avoid being pulled off balance when performing line pulls.

- A. Weights
- B. Boots
- C. Harness
- D. Anchor

6. Two problems in regard to using line pulls for dive signals include:

- A. Fouling and unfamiliarity with the signals.
- B. Entanglement mitigation and thickness of line.
- C. Limited visibility and sediment.
- D. None of the above.

7. Electronic communications allow the diver and tender to speak directly to one another and avoid _____ due to fouled lines or current complications.

- A. Entanglements
- B. Miscommunication
- C. Wet hands
- D. Slip hazards

8. A drawback to wireless communication systems is that they generally require _____ between the diver and the transducer.

- A. Extra Batteries
- B. Attached Communication Line
- C. Line of Sight
- D. Good Visibility

9. Some hardwired communications lines also serve as a(n):

- A. Search Line
- B. Guide Line
- C. Anchor Line
- D. Emergency Tether

10. VOX wireless systems can allow the tender to:

- A. Hear everything the diver is saying.
- B. Monitor how the diver is breathing.
- C. Assess stress or anxiety in the diver's speech.
- D. All of the above.

11. An advantage to electronic communication devices is that they can:

- A. Aid in comforting the diver underwater.
- B. Speed the time of the recovery.
- C. Make the team look more professional.
- D. None of the above

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Review Questions: Chapter 7

1. Boyles Law dictates that:

- A. As pressure increases volume decreases.
- B. As temperature increases volume increases.
- C. The concentration of gases is directly proportional at increased pressures.
- D. Gas concentrations decrease exponentially on decent.

2. When calculating a diver's initial depth consumption rate (DCR), assume a diver made a dive to 20 metres for 30 minutes and used 82 bar (66 feet for 30 minutes and used 1200 psi) his DCR would be?

- A. 2.55bar/min(37 psi/min)
- B. 2.62bar/min (38 psi/min)
- C. 1.93bar/min (28 psi/min)
- D. 2.73 bar/min (40 psi/min)

3. Utilizing DCR in question #2, the diver's surface air consumption (SAC) rate would be?

- A. .85bar/min (12.35 psi/min)
- B. .92bar/min (13.33 psi/min)
- C. .90bar/min (13 psi/min)
- D. .99bar/min (14.33 psi/min)

4. Utilizing the formula:

Metric

DCR = SAC rate x (Depth + 10msw)/10msw, calculate the DCR for a diver that is planning a dive to 14m and has a SAC rate of 1.19bar/min.

Imperial

DCR = SAC rate x (Depth + 33fsw)/33fsw, calculate the DCR for a diver that is planning a dive to 46 feet and has a SAC rate of 17.2 psi/min.

- A. 2.80bar/min(40.71 psi/min)
- B. 3.03bar/min(43.94 psi/min)
- C. 2.86bar/min(41.18 psi/min)
- D. 2.91bar/min(42.24 psi/min)

5. The diver's air supply is divided in thirds: one third designated for the dive, one third used for decontamination and the remaining third, used for:

- A. Undressing
- B. Redundancy
- C. Drying equipment
- D. None of the above

6. Most dive teams opt for _____ when calculating current flow rates.

- A. Time / Distance
- B. Distance / Speed
- C. Time / Speed
- D. Motion / Distance

7. Surface Current:

Metric

An object travels 22.86m in 30 seconds, what is the surface current speed in kph and kts?

Imperial

An object travels 75 feet in 30 seconds, what is the surface current speed in mph and kts?

- A. 2.74 kph (1.704 mph)/1.48 kts
- B. 2.95 kph (1.828 mph)/1.58 kts
- C. 2.73 kph (1.699 mph / 1.47 kts
- D. None of the above

8. Using a steel object weighing 1179kg/2600 lbs, calculate the water displacement, in freshwater, using steel's specific gravity of 8000kg/cubic metre (492 lbs / cubic ft.)

- A. 135 cubic metres/4.78 cubic feet
- B. 174 cubic metres/6.15 cubic feet
- C. 153 cubic metres/5.41 cubic feet
- D. 147 cubic metres/5.28 cubic feet

9. An object weighs 48kgs/106lbs negatively in saltwater. How much air must be used to raise the object to the surface from 22m/72ft?

- A. 120.5 litres/4.30 cubic feet
- B. 153.6 litres/5.31 cubic feet
- C. 98.6 litres/3.48 cubic feet
- D. 88 litres/3.12 cubic feet

10. An object weighs 16kgs/35lbs negatively in saltwater. How much air is needed to raise the object to the surface from 20m/66ft?

- A. 65 litres/2.3 cubic feet
- B. 35 litres/1.24 cubic feet
- C. 40 litres/1.41 cubic feet
- D. 48 litres/1.65 cubic feet

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