

# EPA REGION 10 DIVING SAFETY PLAN

November 2002 Revision 1

## INTRODUCTION

This plan establishes general guidelines and procedures for safe and efficient SCUBA diving for the EPA Region 10 Dive Team. The intent is to provide guidance beyond that in the national Diving Safety Manual (DSM) and specifically address important safety issues. Both documents will be contained in our regional Divemaster's Folder and be available at the dive site.

This plan does not address surface-supplied diving operations. Safety protocol for surface-supplied diving operations will be addressed in an approved Dive Plan that will meet all industry and DSM requirements for such operations.

## DIVE OPERATIONS

1. Diving with **air** will be conducted in accordance with the U.S. Navy No-Decompression Limits and Repetitive Group Designation Table for No-Decompression Air Dives. Diving with **Nitrox** will be conducted in accordance with the NOAA Nitrox Tables for No-Decompression Limits and Repetitive Group Designation Table for Nitrox No-Decompression Dives.
2. During all diving, the dive tender will maintain continuous visual contact with the divers, or their bubbles after they descend. During "live boat" diving, the tender will also keep the boat operator informed of their position. The boat should always be positioned to provide immediate assistance to the divers.
3. The approved Dive Plan should provide that the deepest dive is scheduled first and be followed by shallower dives. If this is not possible, the divers must comply with Numbers 7 and 11, below.
4. While underwater, divers shall remain in contact with at least one other diver. This contact can be visual, auditory (including diver-to-diver wireless communication), tactile, or through communications from the dive tender. All divers must surface if contact or communication is lost. No one may dive unattended.
5. When diving in areas with entrapment or entanglement hazards or under other conditions when a standby diver is required, one or more of the following may be required at the discretion of the divemaster.
  - a. An extra open-circuit SCUBA regulator attached to a full SCUBA cylinder complete with a backpack will be at the dive site.
  - b. A fully equipped standby diver is ready to immediately don his or her gear and enter the water.

- c. A fully dressed standby diver is immediately ready (only needing to don a mask), or is located in the water at the surface where the dive team entered the hazardous area.
6. No dive shall exceed water depths greater than 130 ft without a working recompression chamber attended by trained personnel at the dive site.
7. As a general rule, all dives should terminate at least five minutes before the no-decompression limit.
8. Divers shall ascend from the bottom with sufficient gas to reach the surface with 500 psi (see 2000 National Dive Safety Manual (DSM) Appendix A). A diver must begin an ascent with at least 700 psi in his or her cylinder if they have to make a three minute safety stop at 15-20 ft.
9. When diving in extremely limited visibility and with overhead structures such as piers or floats, or in other situations with entrapment or entanglement hazards, all divers should begin their ascent when the cylinder pressure of any member of the team decreases to 1000 psi.
10. Divers should ascend at a rate of 30 ft/min ( $\pm 10$  ft/min). During repetitive diving at water depths greater than 50 ft, on ascent the diver should stop at 15-20 ft for a three minute safety decompression stop on the second and succeeding dives (See DSM, Appendix A). If a safety decompression stop is taken, the time spent at the stop has to be added to the bottom time for that dive.
11. Diving operations must be conducted in accordance with all appropriate EPA policies and standards (e.g., for Nitrox diving or flying after diving).
12. In an emergency, the divemaster may have to make field decisions that deviate from the requirements of this safety plan or the DSM to prevent or minimize a situation which will likely cause serious physical harm or death. If this occurs, a written report shall be submitted by the divemaster in accordance with the requirements of the National Diving Safety Manual (see DSM, Section III).

## **RESPONSIBILITIES OF DIVE PERSONNEL**

**Divemasters** shall be in complete charge of the diving operation, and ensure that: (1) All equipment is in safe operating condition; (2) A pre-dive safety briefing is given; (3) All divers are fit to dive; (4) All diving operations are conducted safely in accordance with prescribed EPA safety rules and regulations; (5) An accurate dive log is maintained including the bottom time, cylinder pressures, and maximum depth for each diver; and (6) A Dive Report is prepared upon completion of the diving activities.

**All Divers** shall: (1) Dive only if they are physically and mentally fit and properly trained for the task to be performed; (2) Keep their diving equipment in safe operating condition; (3) Wear a compass, depth gauge, and a pressure gauge for the cylinder containing their breathing gas and a dive watch or a bottom timing device; (4) Decline to dive if diving conditions are unsafe or unfavorable, or if the diving operation violates EPA's safety policies or standards; (5) Maintain diving proficiency by diving at least once every two weeks (preferred) and not less than once every 3 months without requalification by the UDO or duly appointed divemaster (see DSM Section III and IV); (6) Not use EPA Region 10 equipment for off-duty diving purposes if their proficiency has lapsed until being requalified by the UDO or duly appointed divemaster; (7) Ensure that their field emergency form is kept up to date; (8) Maintain a dive log with all training, work, and personal (off-duty) dives entered (see DSM, Appendix A); (9) Maintain required certifications/ proficiency, including, at a minimum, CPR, 1<sup>st</sup> aid, and oxygen administration (see DSM Section IV); and (10) Maintain a level of fitness compatible with safe diving operations and be willing to retake the swim test at any time.

**Standby Divers**, when required at the discretion of the divemaster, shall: (1) Be fully equipped and ready to give immediate assistance at the dive site; (2) Receive the same briefing and instructions as the working divers; and (3) Monitor the progress of the diving operations.

**Tenders** shall: (1) Assist the divers with their equipment; (2) Track the divers' location during the dive; (3) Alert the divers, when necessary, on the status of their bottom time via the Diver Recall Unit; (4) Advise other vessels of diving operations and warn off boat traffic which may pose a hazard to the divers; and (5) Perform no other concurrent duty which interferes with these responsibilities.

## **CHECKLIST FOR PREDIVE BRIEFING**

1. Designate *dive team members* including the alternate divemaster,
2. Provide a *brief description* of the dive site,
3. Discuss the *objectives* of the diving operation,
4. Review the *operation of equipment* to be used,
5. Identify any potential *pollution sources*,
6. Discuss *environmental and any hazardous conditions*, and
7. Review *emergency and evacuation procedures*, including:
  - a. Establish evacuation routes and means of transportation,
  - b. Review methods of communication for emergency assistance, and
  - c. Review CPR and the use of medical oxygen, if necessary.

## NUMBER OF PERSONNEL PER DIVE TEAM

Except under emergency conditions, the minimum number of personnel required per dive team shall be as follows.

Water Depth/ Situation	Divers in Water	Standby Diver	Tender	Divemaster	Total
Under 15 ft/diver visible at all times	1	1 <sup>1/</sup>	1	<sup>2/</sup>	3
Under 60 ft/ without unusual conditions <sup>3/</sup>	2	-	1	<sup>2/</sup>	3
Any depth/ conditions require standby diver <sup>3/</sup>	2	1 <sup>1/</sup>	1	1	5
Over 60 ft but less than 130 ft/ all other conditions	2	-	1	1	4

Notes: <sup>1/</sup> The Standby Diver may remain at the surface, be fully equipped, and should monitor the progress of the diving operations.

<sup>2/</sup> The Tender will also be the Divemaster or Alternate Divemaster, if the Divemaster is diving.

<sup>3/</sup> Unusual conditions as determined by the divemaster considering weather, water currents, visibility in the water, potential entanglements, or any other factor that may compromise the safety of the diving operations.

## IN THE EVENT OF A DIVING ACCIDENT

1. Maintain heart and breathing functions,
2. Do NOT remove oxygen from patient, unless necessary,
3. Reconstruct dive profiles on the reverse side of the *EPA Field Emergency Form*,
4. Ensure a completed *EPA Field Emergency Form* accompanies the accident victim,
5. Complete the patient information section on the *USCG Dive Incident Check List*, if required,
6. Dive partner should accompany patient, or go to chamber ASAP, and
7. Retain all dive gear for examination; do not tamper with/ breakdown the equipment.

## EMERGENCY TELEPHONE NUMBERS

The following telephone numbers are appropriate for diving operations in the Puget Sound area. Emergency telephone numbers for diving operations in other areas will be listed on the Dive Plan prepared for that specific operation.

### Virginia Mason Hospital, Seattle, WA

Emergency Room	206-583-6433
Recompression Chamber	206-583-6543

### U.S. Naval Torpedo Station, Keyport, WA

<b>Recompression Chamber</b>	360-396-2522 or
	360-396-2563
After hours (ask for "Duty Desk Officer")	360-396-2244

### U.S. Coast Guard, Seattle, WA

Search and Rescue	206-220-7001
Seattle Harbor Patrol	206-684-4071
Cellular Telephone	*CG
VHF Radio	Channel 16

### Divers Alert Network

<b>Emergencies Only</b>	919-684-8111
Medical Inquiries & Other Business	919-684-2948