

DIVING SAFETY AND PLANNING CHECKLIST

- I. Analyze the Mission for Safety:
 - * Ensure the mission objective is clearly defined.
 - * Determine that a non-diving approach is inadequate.
 - * Evaluate safety considerations.
 - * Coordinate emergency assistance.
 - * Consider location and environment.
 - * Review relevant laws & regulations.
 - * Review qualifications and select personnel.
 - * File dive plan with dive officer.

- II. Identify and Analyze Potential Hazards:
 - A. Natural Hazards
 1. Atmospheric:
 - exposure of personnel to extreme conditions
 - adverse exposure of equipment & supplies to elements
 - delays or disruption due to weather
 2. Surface:
 - sea sickness
 - water entry & exits
 - handling heavy equipment in rough seas
 - maintaining location in tide & current
 - flotsam, kelp, petroleum, present in the water
 - delays or disruption due to sea state
 3. Underwater & Bottom:
 - depth exceeding limits ascribed by dive plan
 - exposure to cold temperature
 - dangerous marine life
 - tides & currents
 - limited visibility
 - bottom obstructions
 - overhead environment
 - dangerous bottom conditions: mud, drop-off, etc.
 4. On-Site Hazards:
 - local marine traffic
 - conflicting commercial/recreational operations
 - high-powered, active sonar
 - radiation contamination & other pollution's
 - agency permits
 5. Mission Hazards:
 - decompression sickness
 - communications problems
 - drowning
 - other trauma
 6. Object Hazards:
 - entrapment & entanglement, snags
 - shifting or working of objects

III. Personnel, Equipment, & Emergency Procedures:

A. Diving Personnel:

- 1. assign qualified dive team
- 2. assign persons trained to task
- 3. verify training & qualifications for tasks
- 4. verify fitness:
 - general condition and/or evidence of fatigue
 - current medical exam
 - ears & sinuses
 - severe cold or flu
 - use of drugs, stimulants, intoxicants
- 5. observe diver emotional condition:
 - motivation & attitude
 - stability

B. Diving Equipment:

- 1. verify gear & technique authorized to task
- 2. verify equipment & technique fit to depth
 - personal gear(SCUBA) - mask, fins, snorkel, buoyancy compensator, suit (wet/dry), gloves, hood, knife, tools, tanks, timer, depth gauge, lights, whistle, compass, regulator, weight belt, SAS, helmet, full face mask, tether, hose, communications, bailout bottle
- 3. verify that life support gear is approved
- 4. verify that support equipment is available & safe
- 5. verify that all related equipment is functional
- 6. verify that all gear is maintained
- 7. verify that dive flag is displayed
- 8. verify that tanks are filled, current hydro & VIP
- 9. check Accuracy of depth gauge before dive

C. Provide for Emergency Equipment:

- 1. functional communications for outside help
- 2. verify first aid kit on hand & stocked
- 3. verify Oxygen equipment functional

D. Establish Emergency Procedures:

- 1. know how to access EMS
- 2. recompression chamber location & access
- 3. verify that emergency transportation is available
- 4. complete, review, and post Emergency Assistance Plan
- 5. verify current decompression tables
- 6. review signals (line, light, hand, sound)
- 7. review fire fighting preparations
- 8. pre-determine distress signals & call signs
- 9. remove potential breathing hazards
- 10. assign tasks for team members in the event of an emergency
- 11. drill all on emergency procedures w/cross training drills for:
 - fire
 - embolism
 - restore breathing
 - first aid
 - drowning
 - blowup (dry suit)
 - electric shock
 - rapid undressing
 - entrapment
 - rapid dressing

- E. Boat Preparation:
1. check engine, lights, trailer, anchor, lines
 2. check gas, oil, fresh water
 3. check CG safety gear (PFD, anchor, fire ext. horn)
 4. trail line
 5. check VHF radio, Loran, GPS
 6. check gear tie down
- F. Establish Safe Diving Operational Procedures:
1. Notify Proper Parties that Dive Operations Will Commence
 - dive officer
 - chief scientist
 - local authorities (USCG) (DNR ranger)
 - EMS (if appropriate)
 - boat captain (if appropriate)
 2. Complete Planning, Organization & Coordination of Activities:
 - ensure that alternatives to diving are considered
 - ensure that contingency planning was completed
 - mission goals, tasks clear, flexible operations (dive plan)
 - thoroughly brief team & support personnel
 - designate Master Diver and Dive Master
 - designate trained timekeeper/recorder
 - determine exact depth on dive site
 - verify adequate air supply plus reserves
 - ensure no unplanned activity unknown to dive supervisor
 - minimize/set bottom time by planning, briefing, training, organization & preparation, depth & diver condition (fatigue/cold)
 - plan dive by no-decompression tables
 - instruct all NOT to cut any lines without approval
 - ensure that dive platform is secure and safe
 - for surface-supplied boat dive, use two point mooring
 - where hazards exist insure quick mobilization of assistance team
 - prepare dive log - time/depth record
 - confirm legal permits
 3. Perform Dive Safety Procedure, Establish Safety Measure:
 - ensure divers AND tender/tech. check gear
 - designate standby diver, dressed as needed where required by dive plan
 - assign dive buddies
 - avoid line fouling overhead and with obstacles
 - brief divers on decompression or safety stop procedures, check emergency gas availability-hang bar, backup gas supply
 - verify display of signals, dive flags, lights as needed
 - ensure protection against harmful animals
 - check quality of diver air (test source)
 - brief support crew thoroughly
 4. Post Dive Check:
 - all divers accounted for, up, safety stop OK
 - diver activity limited, diver hydrated
 - flag down
 - gear stored out of way
 - clean gear & return if borrowed
 - complete dive log sheet - diver initial
 - cancel float plan upon returning to port/lock

G. Emergency Assistance Checklist

- 1. Recompression Chamber - Location & Phone number
- 2. Hospital -location & phone No. (if different)
- 3. Communications -
- 4. Land/Sea transportation - contact information
- 5. Air Transportation - Radio channel, phone number
- 6. Backup Diving units
- 7. Emergency consult (DAN) # (919) 684-8111
- 8. Dive Officer
- 9. Gas supply

SEA STATE CHART

Sea State	Description	Wind Force (Beaufort)	Wind Description	Wind Range (knots)	Wind Velocity (knots)	Average Wave Height (ft)
0	Sea like a mirror.	0	Calm	<1	0	0
	Ripples with the appearance of scales are formed, but without foam crests.	1	Light Air	1-3	2	0.05
1	Small wavelets, still short but more pronounced; crests have a glassy appearance but do not break.	2	Light Breeze	4-6	5	0.18
2	Large wavelets, crests begin to break. Foam of glassy appearance, perhaps scattered whitecaps.	3	Gentle Breeze	7-10	8.5 10	0.6 0.88
3	Small waves, becoming longer; fairly frequent whitecaps.	4	Moderate Breeze	11-16	12 13.5 14 16	1.4 1.8 2.0 2.9
4	Moderate waves, taking a more pronounced long form; many whitecaps are formed. Chance of some spray.	5	Fresh Breeze	17-21	18 19 20	3.8 4.3 5.0
5	Large waves begin to form; white foam crests are more extensive everywhere. Some spray.	6	Strong Breeze	22-27	22 24 24.5 26	6.4 7.9 8.2 9.6
6	Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of the wind. Spindrift begins.	7	Moderate Gale	28-33	28 30 30.5 32	11 14 14 16
7	Moderately high waves of greater length; edges of crests break into spindrift. The foam is blown in well marked streaks along the direction of the wind. Spray affects visibility.	8	Fresh Gale	34-40	34 36 37 38 40	19 21 23 25 28
8	High waves. Dense streaks of foam along the direction of the wind. Sea begins to roll. Visibility affected.	9	Strong Gale	41-47	42 44 46	31 36 40
9	Very high waves with long overhanging crests. Foam is in great patches and is blown in dense white streaks along the direction of the wind. The surface of the sea takes on a white appearance. The rolling of the sea becomes heavy and shock-like. Visibility is affected.	10	Whole Gale	48-55	48 50 51.5 52 54	44 49 52 54 59
	Exceptionally high waves. The sea is completely covered with long white patches of foam along the direction of the wind. Everywhere the edges of the wave crests are blown into froth. Visibility seriously affected.	11	Storm	56-63	56 59.5	64 73
	Air filled with foam and spray. Sea completely white with driving spray. Visibility very seriously affected.	12	Hurricane	64-71	>64	>80

Figure 4-4. Sea State Chart.

Bottom Conditions and Effects Chart

Type	Characteristics	Visibility	Diver Mobility On Bottom
Rock	Smooth or jagged, minimum sediment	Generally unrestricted by diver movement	Good, exercise care to prevent line snagging and falls from ledges.
Coral	Solid, sharp and jagged, found in tropical waters only	Generally unrestricted by diver movement	As above
Gravel	Relatively smooth, granular base	Generally unrestricted by diver movement	Good, occasional sloping bottoms of loose gravel impair walking and cause instability.
Shell	Composed principally of broken shells mixed with sand or mud	Shell-sand mix does not impair visibility when moving over bottom. Shell-mud mix does impair visibility. With higher mud concentrations, visibility is increasingly impaired.	Shell-sand mix provides good stability. High mud content can cause sinking and impaired movement.
Sand	Common type of bottom, packs hard	Generally unrestricted by diver movement	Good
Mud and Silt	Common type of bottom, composed of varying amounts of silt and clay, commonly encountered in river and harbor areas	Poor to zero. Work into the current to carry silt away from job site, minimize bottom disturbance. Increased hazard presented by unseen wreckage, pilings, and other obstacles.	Poor, can readily cause diver entrapment. Crawling may be required to prevent excessive penetration, fatiguing to diver.

Figure 4-8. Bottom Conditions and Effects Chart.

Predive Environmental Checklist (USNavy, 1988)

Surface

Atmosphere

Visibility _____
Sunrise/Set _____
Moonrise/Set _____
Temperature (air) _____
Humidity _____
Barometer _____
Precipitation _____
Cloud Description/Cover ____
Wind Direction/Force ____
Other: _____

Sea Surface

Sea State _____
Wave Action: _____
Height _____
Length _____
Direction _____
Current: _____
Direction _____
Velocity _____
Type _____
Visibility _____
Water Temperature ____
Local Characteristics ____

Subsurface

Underwater and Bottom

Depth _____
Water Temperature:
____ degrees at ____ depth
____ degrees at ____ depth
____ degrees at ____ depth
____ degrees at bottom

Thermoclines:
at _____ depth
at _____ depth

Current:
Direction _____
Source _____
Velocity _____
Pattern _____

Tides:
High Water ____ / ____ time
Low Water ____ / ____ time
Ebb Direction ____ Velocity ____
Flood Direction ____ Velocity ____

Visibility

Underwater:
____ feet at ____ depth
____ feet at ____ depth
____ feet at ____ depth
Bottom
____ feet at ____ depth

Bottom Type: _____

Obstructions: _____

Marine Life: _____

Other: _____
