

Offshore Structure Diving and Boating Recommendations

The following recommendations by the UCSB Diving Safety Program review some of the key points to consider when diving and/or boating around some types of offshore structures. Although these recommendations may include relevant procedural requirements, any specific diving or boating operation must be approved by the operator/owner of the offshore structure and the organization conducting the diving and/or boating.

OFFSHORE STRUCTURE DIVING: OVERVIEW

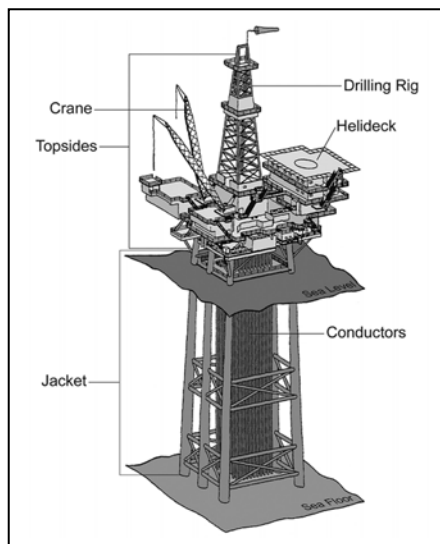


Image by Donna Schroeder



DIVER TRAINING / EXPERIENCE RECOMMENDATIONS

Diver skill level

- Scientific Diver Depth Certification: min. 60ft cert. for all offshore structure dives.
- Strong swimming ability: able to swim in currents, conduct independent rescue.
- Anxiety Level: first dive(s) for a diver should be led by an experience diver as an orientation dive only.

Lead Diver:

- Should have experience diving on offshore structure and is responsible to review the full dive plan and safety procedures with the divers and boat captain.

Safety Equipment for each diver:

- Audible and visual signaling device: Signaling tube & whistle
- Quick release equipment: Given the increased chance for entanglement, gear (game bags, slates sampling gear) gear, if attached, should be so it could be easily removed if needed.
- Dive knife/scissors for possible monofilament line.

Boat driver experience:

- Previous supervised captaining experience on offshore structures.

COMMUNICATION CONSIDERATION WITH STRUCTURE

Authorization:

- Homeland Security considerations: Security clearance may be required.
- Written authorization from the operator of the offshore structure is most likely required. Call to confirm the day before the boating/diving operations, once again when you arrive at the structure and before leaving the structure.

Radio: Confirm with offshore structure and support vessels (crewboats) the VHF channel to be continuously monitor while at the structure.

- Other Vessels:* Establish contact if any boat approaches the offshore structure if divers are in the water.
- Dive Flag:* Always have the dive flag up when divers are in the water and down when all divers are back in boat in case any boats approach the structure.
- Warning Signal:* Confirm with the operator of the offshore structure the type of warning signals since these vary. Some possible signals include fog, fire, oil spill and hydrogen sulfide signals.

ENVIRONMENTAL FACTORS AND POTENTIAL HAZARDS

- Forecast:* Check conditions the day prior, the morning of and periodically while at the structure.
- Fog:* Diving and boating operations should never be conducted in reduced visibility near offshore structures. If divers surface and cannot see the boat, they should stay in direct contact with the structure.
- Wind:* Windy/whitecapping conditions reduce both the visibility for spotting divers and basic control of the boat near a structure.
- Swell:* It is recommended to cancel the dive if the swell is >6ft.
- Surface/Subsurface Currents:* Cancel dive in strong currents > 1.5 knots, or when it is difficult for a diver to swim into the current:
- Some offshore structure may be prone to strong currents
 - Currents occur at multiple depths
 - Down current side of structure may have a weaker current.
- Underwater Visibility:* Can dramatically differ throughout the water column and dives should be canceled in low visibility.
- Compasses Do Not Work:* Ferrous (iron, steel) objects, magnets and any flowing electrical current will influence the reading of the compass. An error will result in the compass readout near many offshore structures.
- Entanglement:* Fishing line, nets and other monofilament line can be found on and around the offshore structures. All divers should have a cutting device and minimize all attached gear to a diver should be easily removed (bolt-snaps or a quick release device).
- Sharp objects:* Gloves should be worn to minimize cuts from sharp objects.
- Falling objects:* Before making the dive, scan the structure for any potential areas of activity (crane, etc) where objects (tools/materials) could fall into the water. Boats and divers should stay well away from these areas.
- Using Lift Bags:*
- Moderate and strong currents can prevent the safe use of lift bags.
 - Used by experienced offshore structure divers only and a secondary air source for lift the bag is recommended.
- Support Vessels:* A support vessel for the structure may arrive during the dive and this may create loud sounds underwater. If divers must surface while a boat is at the structure, they should surface under the structure, well away from the docking area.
- Other Boats:* Recreational boats may fish near offshore structures. Boat captains should contact any boat approaching to the offshore structure to notify them of divers in the water.
- Fumes:*
- Some offshore structures may be in areas of high amount of fumes in the air.
 - Should a gas alarm sound on the offshore structure:
 - Travel upwind away from structure.
 - Monitor radio
 - Use SCUBA units if necessary
- Flaring:* On occasions an offshore structure collecting oil/gas may burn off gases from the top of its platform. This “flaring” is very loud and can be startling, but is normal.
- Diffusers:* Diffusers pipes can be located under any offshore structures collecting oil/gas and may release gases creating a mass of bubbles in the water column. Divers should swim well around any area that has bubbles in the water column so not to become disorientated in the water column.
- Sub-surface saltwater intake pipes:* All divers must stay well clear of all sub-surface saltwater intake pipes located under the structure.

EMERGENCY PLANNING CONSIDERATIONS

- Helicopters may be able to land on offshore structure such as an oil platform.
- Personnel on the structure and its support vessels may be contacted.

LOST DIVER/BOAT PROCEDURES

Divers: If a diver should surface and cannot see the boat they should make physical contact to the structure until the boat makes visual contact with you. If divers surface away from structure and cannot return (current, etc) to the structure, use the signaling devices (signaling tube, whistle, dive slate), stay together and release weights if necessary.

Boat Captain:

1. Note current direction when diver was last seen. Drop a highly visible floating object with submerged portion attached to help note current direction and speed.
2. Recall other divers.
3. Note time: Start of dive & Present Time; Depth of water. Attempt to determine when air supply should be depleted. Account for & question dive partner noting anything unusual about the dive.
4. Briefly search for the diver and their bubbles within the dive area and down current while also looking towards the structure and/or any other area the diver may have sought refuge.
5. Call appropriate EMS - Coast Guard (Ch 16 VHF), 911 or other local EMS.
6. If unable to locate the missing diver return to last known position. Prepare dive teams at structure and await instructions from EMS.

DIVING ON AN OFFSHORE STRUCTURE

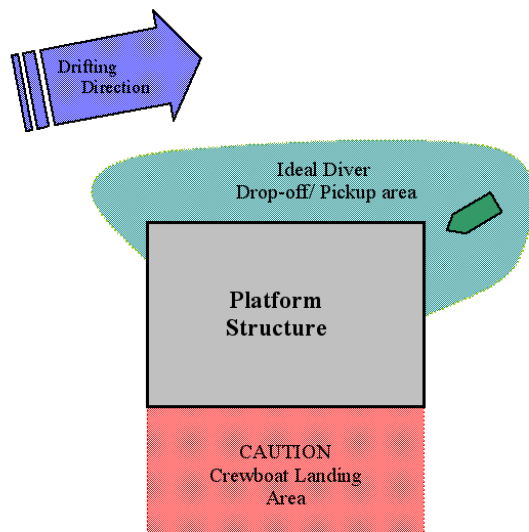
PRE-DIVE

1. Get approval from the operators/owners of the offshore structure
2. Determine key points for the structure: GPR coordinates, distance offshore, max depth, depth of any full or partial horizontal members to be dived on and potential hazards.
3. Complete Dive Plan as required.

ARRIVING AT THE STRUCTURE

1. Contact offshore structure crew when required.
2. Assess all aspects of the weather: winds, fog, currents, swell & forecast.
3. Assess work activity on the structure.
4. Dive entry/exit location:
 - a. Determine drifting direction of boat from the wind & current present
 - b. Support vessel activity
 - c. Sampling location reviewed on structure
5. Review dive plan with dive team and boat captain.

Determining the Diver Drop off/Pick up area:



*Pick-up/Drop-off location should be based on the boats general drifting direction from current/wind and the location of the crew boat landing area.

BOAT CAPTAIN: TENDING THE DIVERS

1. Dive Entry Location: Bow should be towards the structure. Divers should enter in a predetermined area close to the structure and where boat will not drift into or hit the structure. The boat captain should always have visual contact with each diver when they are at the surface.
2. Raise dive flag and note dive entry time.
3. Waiting for divers to surface
 - a. Remain near the structure continuously monitoring the area around and down current from the structure for surfacing divers.
4. Communicate with any vessel that approaches the structure and inform them about divers in the water.
5. Pick up the divers down current or so the boat will not drift into the structure while the divers enter the boat. Ensure that the engine is in neutral when divers are near the boat.
6. Lower Dive Flag.

DIVING ON AN OFFSHORE STRUCTURE:

1. Entering the water:
 - a. Have all gear ready; minimize time entering the water and at the surface.
2. Making the Descent
 - a. Use leg of structure as a vertical reference
 - b. Monitor your depth gauge continuously.
3. Time Management
 - a. Given the potential for deeper dives, continuously monitor your depth, air supply and decompression status and begin the ascent with more than enough air for the ascent, including all safety stops and 500psi remaining at the surface.
4. Ascending
 - a. Ascend close to a vertical leg of the structure and continuously scan for any overhead objects
 - b. Ascent Rate: no faster than 30ft per min
5. Safety Stops
 - a. 3-5 min stop at 15 - 20ft for all dives > 30ft
 - b. Dives > 60ft
 - i. 3-5 min stop at 20ft
 - ii. Mid-water stop for 1-2 min during ascent at half your max depth.
 - c. Swell: With a swell, make your safety stop closer to 20ft and stay well clear of any overhead objects
 - d. Current: Being directly down current of the structure's vertical leg may provide some shelter from the current during the safety stop
6. Surfacing
 - a. Begin your final ascent to the surface slightly inside the structure along a predetermined leg.
 - b. Continuously scan for any overhead objects (mussel mounds, overhang sections of the structure, approaching boats)
 - c. Surface slightly inside the structure with your regulator in your mouth, signal for the boat and scan the area.
 - d. Begin your surface swim away from the structure when the boat has made visual contact with you and is approaching the structure to pick you up.

LEAVING THE STRUCTURE

Contact the structure informing them all divers are out of the water and you are leaving the structure.

OFFSHORE STRUCTURE DIVING & BOATING CHECKLIST

LEAD DIVER

PRIOR TO DEPARTING

1. Contact structure: bring contact #'s
2. Assess weather conditions / forecast.
3. Check preparedness of each diver:
 - *Signaling device(s)*
 - *Well rested/hydrated*
 - *Proper certification/training for dive plan*
 - *General understanding of the dive plan*
4. Review plan with boat captain.

ARRIVING

1. Contact Structure.
 - *Inform structure personnel if possible of the dive plan and ask if they are expecting any structure activity: support vessel activity, alarm drills, if subsurface intake pipes will be used, etc.*
2. Assess Weather: winds, current, swell/surge.
 - *Determine the boats direction of drift / wind direction: diver entry/exit location, current direction for lost diver, wind direction for any sort of gas release.*
3. Assess work activity on the structure: potential falling objects.
4. Determine Diver Entry / Exit Location.
 - *Review Dive Plan*
 - *Review Dive Entry/Exit location*
 - *Tasks for each diver: AVOID TASK-LOADING*
 - *Dive depth, time and when (time/air supply) to begin surfacing*
 - *Safety stop procedures*
 - *Emergency procedures*
5. Don gear collectively so all divers are ready to enter the water at the same time.

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