

ARMY, MARINE CORPS, NAVY, AIR FORCE, COAST GUARD



MDO

MULTI-SERVICE TACTICS, TECHNIQUES, AND PROCEDURES FOR MILITARY DIVING OPERATIONS

ATP 3-34.84
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MULTI-SERVICE TACTICS, TECHNIQUES, AND PROCEDURES

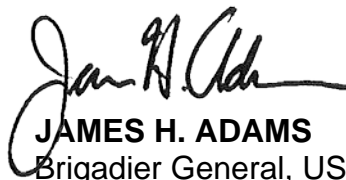
FOREWORD

This multi-Service tactics, techniques, and procedures (MTTP) publication is a project of the Air Land Sea Application (ALSA) Center in accordance with the memorandum of agreement between the Headquarters of the Army, Marine Corps, Navy, Air Force, and Coast Guard doctrine commanders directing ALSA to develop MTTP publications to meet the immediate needs of the warfighter.

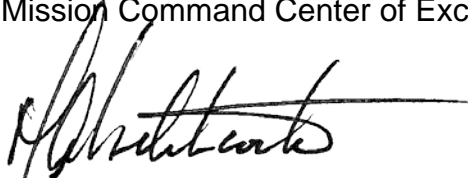
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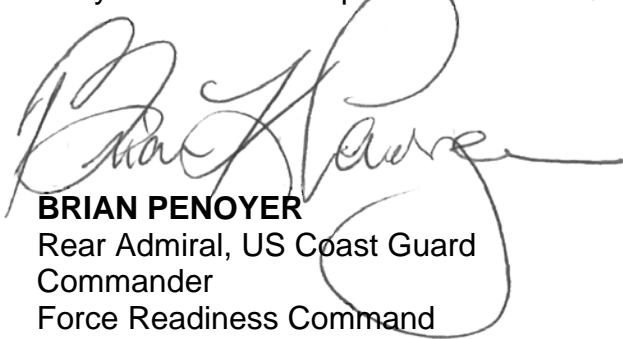
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PREFACE

1. Purpose

This multi-Service tactics, techniques, and procedures (MTTP) publication for *Military Diving Operations (MDO)* serves as a reference to ensure effective planning and integration for diving operations.

Note: For the Army, the term “command and control” was replaced with “mission command.” Mission command now encompasses the Army’s philosophy of command (still known as mission command) as well as the exercise of authority and direction to accomplish missions (formerly known as command and control).

2. Scope

This MTTP describes United States (US) military dive mission areas, force structure, equipment, and primary missions each Service could provide, in support of joint operations, to assist commanders and staffs at all levels.

3. Applicability

This MTTP publication applies to all commanders and their staffs that participate in diving operations across the Services.

4. Implementation Plan

Participating Service command offices of primary responsibility will review this publication; validate the information; and, where appropriate, reference and incorporate it in Service manuals, regulations, and curricula as follows:

Army. Upon approval and authentication, this publication incorporates the tactics, techniques, and procedures contained herein into the US Army Doctrine and Training Literature Program as directed by the Commander, US Army Training and Doctrine Command (TRADOC). Distribution is in accordance with applicable directives listed on the authentication page.

Marine Corps.¹ The Marine Corps will incorporate the procedures in this publication in US Marine Corps doctrine publications as directed by the Deputy Commandant, Combat Development and Integration (DC, CD&I). Distribution is in accordance with the Marine Corps Publication Distribution System.

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5. User Information

- a. US Army Combined Arms Center; Headquarters Marine Corps (HQMC), DC, CD&I; NWDC; Curtis E. LeMay Center for Doctrine Development and Education (LeMay Center); and Air Land Sea Application (ALSA) Center developed this publication with the joint participation of the approving Service commands. ALSA will review and update this publication as necessary.
- b. This publication reflects current joint and Service doctrine, command and control organizations, facilities, personnel, responsibilities, and procedures. Changes in Service protocol, appropriately reflected in joint and Service publications, will be incorporated in revisions to this document.
- c. We encourage recommended changes for improving this publication. Key your comments to the specific page and paragraph and provide a rationale for each recommendation. Send comments and recommendations directly to:

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SUMMARY OF CHANGES

ATP 3-34.84/MCRP 3-10.2/NTTP 3-07.7/AFTTP 3-2.75/CGTTP 3-95.17, *Multi-Service Tactics, Techniques, and Procedures for Military Diving Operations*.

This revision:

Updates:

- Navy explosive ordnance disposal missions.
- Army engineer dive unit capabilities and organization charts.
- Air Force special operations organization chart.
- Coast Guard capabilities and mission charts.
- United States Special Operations Command capabilities and organization charts.

Removes:

- Operation IRAQI FREEDOM diver recovery mission vignette from chapter I.
- Deep submergence unit as a classifier in the dive mission area unit capability chart, renamed Navy Underwater Rescue Command.

Adds:

- Underwater construction and maritime disablement operations as dive mission areas and their definitions.
- Contaminated water chart listing capabilities across the Services.
- Vignettes showcasing military diving operations across various activities in joint operations.
- Additional Marine Corps dive points of contact.
- The following references:
 - Army Technical Manual 3-34.83, *Engineer Diving Operations*.
 - Marine Corps Order 3150.4, *Marine Corps Diving Policy and Program Administration*.
 - *US Navy Diving Manual*, Revision 7.
 - Air Force Instruction 10-3501, *Air Force Diving Program*.
 - USSOCOM 350-4V1, *Maritime Training and Operations Manual VOL1--Combat*.

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2 January 2019

MDO

**MULTI-SERVICE TACTICS, TECHNIQUES, AND PROCEDURES FOR
MILITARY DIVING OPERATIONS**

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EXECUTIVE SUMMARY

MDO

Throughout the history of diving, each of the Services has evolved its diving capabilities to meet the demands of Service-specific mission requirements. The divers have specialized training, equipment, and capabilities based on Service-specific missions.

This *Military Diving Operations* multi-Service tactics, techniques, and procedures publication is designed to assist commanders and planning staffs who require divers. It is a reference which details Service and unit dive capability. Additionally, this publication highlights the advantages of using diving in joint operations and provides some decision aids for commanders and staff planners. This publication also provides an overview of major types of operations which can incorporate joint diving and provides subcategory descriptions of the 15 dive mission areas performed in these operations. Finally, it highlights some planning considerations for operations requiring dive capabilities, including immediate response situations.

Chapter I Dive Capabilities in Joint Operations

Chapter I introduces diving operations by explaining their relevancy in joint operations and showcases how diving can be used across the various activities in the joint spectrum.

Chapter II Dive Mission Areas

Chapter II describes the 15 dive mission areas and their subcategories that may be performed by military divers.

Chapter III Planning Considerations

Chapter III outlines planning considerations for coordinating dive operations.

Appendix A Dive Mission Area Unit Capability Chart

Appendix A provides a quick-reference chart listing dive unit capabilities by Service to accomplish each of the dive mission areas and subcategories.

Appendix B United States Army (USA) Diving

Appendix B provides USA dive missions, capabilities, task organization and employment information.

Appendix C United States Marine Corps (USMC) Combatant Diving

Appendix C provides USMC dive missions, capabilities, task organization and employment information.

Appendix D United States Navy (USN) Diving

Appendix D provides USN dive missions, capabilities, task organization and employment information, specific to operational commands in the Navy.

Appendix E United States Air Force (USAF) Diving

Appendix E provides USAF dive missions, capabilities, and task organization.

Appendix F Special Operations Forces (SOF) Diving

Appendix F provides SOF dive missions and capabilities in the various Services.

Appendix G United States Coast Guard Diving

Appendix G provides a summary on the United States Coast Guard diving missions.

Appendix H Dive Point of Contact List

Appendix H provides a comprehensive list of dive program points of contact, including Service program managers and major units.

Appendix I Common Equipment

Appendix I provides a list of common equipment to divers from all Services.

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Chapter I

DIVE CAPABILITIES IN JOINT OPERATIONS

1. Diving in Joint Operations

In the United States (US) military, dive capabilities are maintained as skill sets to facilitate accomplishing a unit's assigned missions. Diving does not have to be a stand-alone mission, rather it can be incorporated in joint activities across the spectrum to enhance military success. Additionally, integrating diving operations into the three major types of operations, offensive, defensive, and stability, can enable or enhance tactical success. While, historically, diving may not have been a first consideration as a force multiplier in the three major types of operations, the following examples show how diving can be integrated.

- a. **Offensive.** These operations are conducted to defeat and destroy enemy forces and seize terrain, resources, and population centers. Divers can be employed to infiltrate enemy areas, install devices on land that will disable enemy key infrastructure, and aid follow-on forces.
- b. **Defensive.** These operations are conducted to defeat an enemy attack, gain time, economize forces, and develop conditions favorable for offensive and stability tasks. Divers can be rapidly deployed in response to national security concerns and assist in placing and maintaining physical security systems in critical areas, such as ports, bridges, and dams.
- c. **Stability.** Diving operations can include salvage (for repair), logistical support, and search and recovery. Salvage (for repair) is conducted to recover or restore assets or equipment which has been submerged in depths of water. Diving provides logistical support for global force or civilian infrastructure sustainment, especially after a disaster. Also, search and recovery diving is conducted to recover personnel to the joint force component commanders.

2. Dive Missions in Support of Joint Activities

The use of diving in support of joint activities has steadily increased since the inception of military divers; however, the benefit of using diving assets is not generally understood at the tactical level. To help showcase diving across joint activities (which range from shaping to enabling in Joint Publication (JP) 3-0 *Joint Operations*), some diving vignettes are highlighted on subsequent pages. To best understand how diving is related to each joint activity, a brief explanation precedes each vignette and figure 1 explains a notional joint combat operation model from JP 3-0.

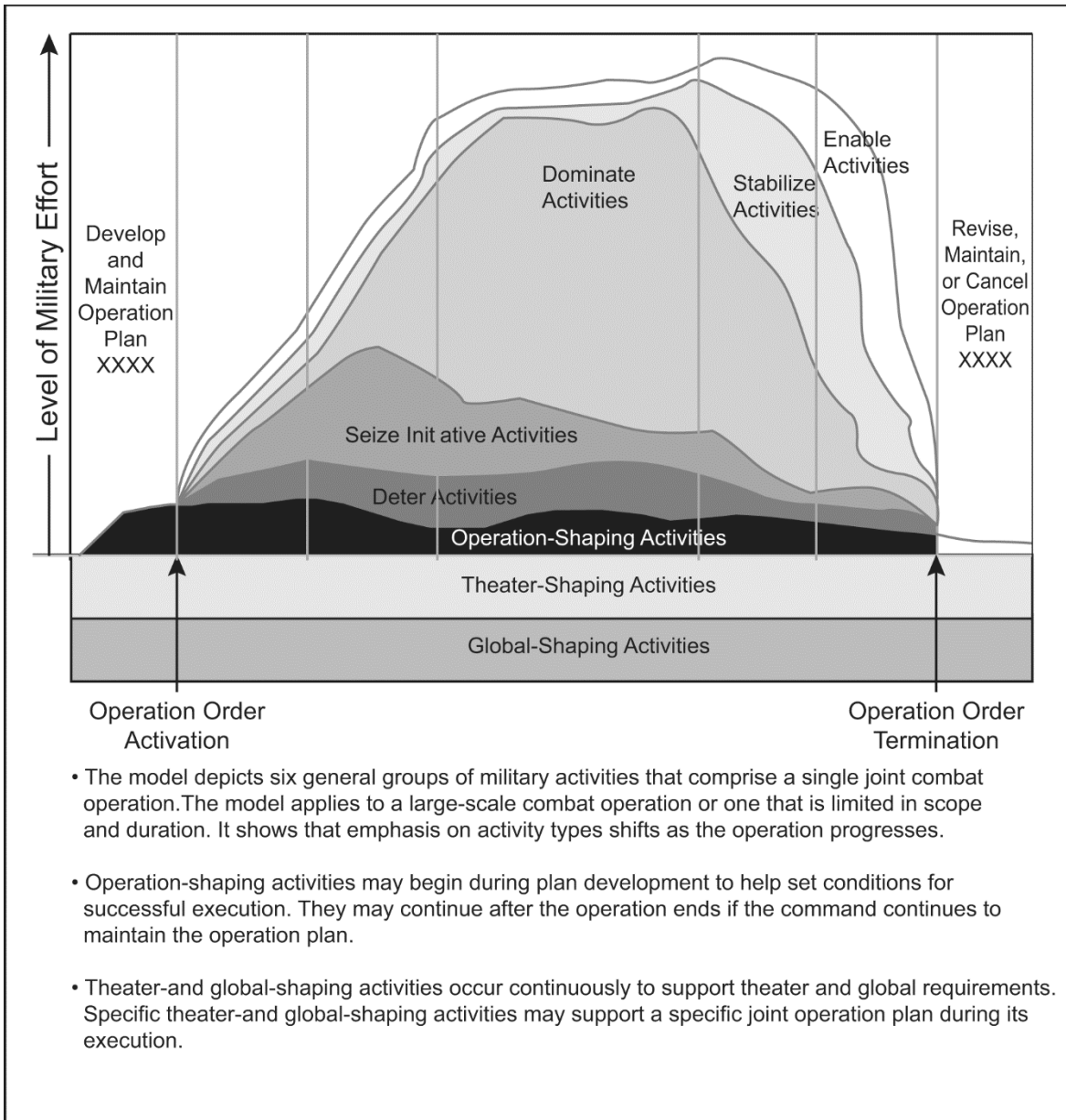


Figure 1. A Notional Joint Combat Operation Model

a. Shaping Activities. Shaping activities include long-term persistent and preventive military engagement, security cooperation, and deterrence actions to assure friends, build partner capacity and capability, and promote regional stability. One example of using diving assets for this purpose is exemplified in the following vignette, when the United States (US) Navy assisted the Philippine Navy in 2001.

**COOPERATION AFLOAT READINESS AND TRAINING 2001,
SHAPING ACTIVITIES**

While deployed on a combined readiness and training exercise in 2001, United States (US) military divers trained the Philippine diving and explosives ordnance disposal (EOD) forces on basic salvage and demolition core skills. The Philippine Navy requested help in identification and disposal of ordnance found on WWII sunken US ships in Subic Bay, Philippines. Additionally, the Philippine Navy requested assistance in salvage and disposal of the same ships. US Navy EOD divers identified and provided training and guidance for safe ordnance disposal while multi-Service divers, simultaneously, trained and assisted in salvage of the same sunk US ships. This greatly enabled the Philippine Navy in clearing these harbor obstructions and provided a safer environment for the host country, as well as building partnership capability and honing strategic and regional relationships.

SOURCE: United States Pacific Command, 21-26 July 2001

b. Deterrence Activities. Diving operations can provide options to deter enemy forces. According to JP 3-0, once a crisis is defined, deterrence actions may include mobilization, tailoring forces, and other predeployment activities. Predeployment activities may include initial deployment into a theater; employing intelligence collection assets; and developing mission-tailored command and control, intelligence, force protection, and logistic requirements to support contingency operations. The vignette showcases using diving assets to emplace underwater counter-mobility measures, such as emplacing obstacles and mines.

WORLD WAR II, DETERRENCE

In March of 1945, Navy Underwater Demolition Teams 7, 11, 12,13,14, 16, and 17 conducted a series of military dive operations in Okinawa [Japan] to clear potential beach landing sites for Marine assault forces, as well as conduct feints to create the illusion of landing sites in other locations. This was the largest single diving operation of World War II. These operations consisted of mobility and counter mobility dive missions that emplaced obstacles in areas assumed to be used as avenues of approach by Japanese forces, and reduced and removed obstacles in sites chosen for Marine beach landing sites. These missions were conducted to deter Japanese forces from focusing their attention and forces on the actual beach landing sites used by Marine landing forces. These dive missions facilitated Marine forces landing and ensured the successful invasion and seizure of the island of Okinawa. Furthermore, this type of diving asset use can provide an option to use underwater security detection and monitoring devices, which not only enable a commander to gain insight for potential future plans, but also work as flexible deterrent options for enemy forces.

SOURCE: United States Marine Corps, March 1945

c. Seize Initiative Activities. Commanders seek to seize the initiative by using decisive joint force capabilities. In combat, this involves starting defensive and

offensive operations at the earliest possible time, forcing the enemy to culminate offensively and setting the conditions for decisive operations. Applying joint combat power rapidly may be required to delay, impede, or halt the enemy's initial aggression and deny the enemy's initial objectives. Operations to gain access to theater infrastructure and expand friendly freedom of action continue during this phase, while the commander seeks to degrade enemy capabilities with the intent of resolving the crisis at the earliest opportunity. Diving operations during this activity, often, are not immediately considered; however, divers can execute missions well and provide a commander with the tactical surprise to control the battlefield. The following vignette highlights these endeavors.

OPERATION LIGHTS OUT, SEIZING THE INITIATIVE

At approximately 0200, special operations forces divers conducted a clandestine infiltration and emplaced demolitions on strategic infrastructure and a key main supply route bridge to deny the enemy's ability to quickly reinforce and sustain themselves. Upon H-hour, the enemy's sudden and total loss of power, water, and communications, disrupted the ability to react and enabled the follow-on ground and air assaults by United States (US) Special Operations Command land forces. Near simultaneously, previously infiltrated elements led indigenous forces to capture and control strategic airfields and ports. Conventional ground forces deployed through these seized entry points and achieved their strategic objectives. The use of diving assets over conventional methods to accomplish these objectives greatly reduced visibility and the risk of US detection. This enabled tactical surprise and provided minimal collateral damage. This operation caused scalable damage to infrastructure, which allowed for ease of repair and minimized risk to follow-on, conventional ground and air forces.

SOURCE: US Special Operations Command, March 2017

d. Dominate Activities. Diving operations can be used to break an enemy's will to resist. When used with other activities, diving can assist forces with the ability to dominate in a joint operation. A commander can employ diving assets for offensive operations (such as mobility, infiltration and exfiltration, and using explosives). Reducing obstacles increases mobility which will allow forces to dominate. Additional operations, which include counter mobility, physical protection and using explosives, capitalize on the friendly's momentum and initiative. Some of these activities include demolishing bridge structures, facilities, and infrastructure, which ultimately impede an enemy's ability to maneuver.

e. Stabilize and Enable Activities. During stabilizing and enabling activities of a joint operation, diving assets can be invaluable in reestablishing a safe and secure environment, providing essential government services, emergency infrastructure reconstruction, and humanitarian relief. Through diving support to the host government, the host nation's civil authority can regain its ability to administer the services and needs of the population. Diving assets were critical to accomplish this, as highlighted in the vignette discussing the US assistance after the Haiti earthquake in 2010. This operation also exemplifies one of the first successful US joint diving operations.

OPERATION UNIFIED RESPONSE, STABILIZING AND ENABLING

On 12 January 2010, a magnitude 7.0 earthquake struck Haiti. The 544th Engineer Dive Team was deployed on the United States Naval Ship Grasp (T-ARS-51) on a mission to train the Belizean Navy in diving techniques in support of United States (US) Southern Command. Immediately after the earthquake, the 544th was redirected from Belize to Haiti to participate in disaster relief efforts.

A US Air Force special tactics squadron was also deployed. Its mission was to secure the airfield and coordinate air traffic to facilitate inbound relief efforts and additional personnel. Pararescue teams provided emergency services and waterborne rescue capabilities to the commander, as needed.

Upon arrival in Port-au-Prince, Haiti, the 544th immediately began assessments of three different ports and waterfront facilities to determine feasibility for disaster relief usage. The hasty inspections determined that the port structures in Port-au-Prince were so severely damaged that they could not be used for cargo off-load, and posed a severe risk to all vessels currently moored to the pier.

US Navy Mobile Diving and Salvage Unit (MDSU) 2, and Underwater Construction Team (UCT) 1, were activated to assist the joint task force (JTF) commander with port-opening operations. The task force was commanded by a Navy O-6 and consisted of divers from the Army, Navy, and Air Force.

The dive team conducted a hasty underwater inspection (of the remaining pier) and hydrographic surveys to determine landing sites for Army shore landing vessels. (Within 48 hours of the Army's arrival, the Navy dive teams were on the ground, supporting the joint diving task force.)

The UCT 1 expertise was critical in establishing a plan of action to return the port to operational status. Under UCT 1 guidance, the MDSU 2 and 544th divers conducted a detailed underwater inspection of the existing port facilities. The inspection determined that 200 inches of pier could be repaired using underwater concrete emplacement techniques. The JTF immediately began pier repair operations.

Concurrently, salvage operations were underway within the port to clear channels of obstacles and obstructions. Under MDSU 2 guidance, the UCT 1 and 544th dive teams assisted in these efforts to clear a path for Army shore landing vessels. For larger ships, MDSU 2 employed a more accurate and automated bathymetric survey system.

The commander used other diving capabilities the dive teams provided for various activities. These included hyperbaric chamber operations, medical support, small boat support; and side-scan sonar, unmanned underwater vehicle, remotely operated vehicles, ship husbandry, and search and recovery capabilities.

The combination of expertise and capabilities used across the operation enabled 200 feet of pier to be repaired, the port deemed safe, operational, and handed over to Haitian civil authorities within three months. The port opening

allowed cargo ships to off-load aid, and was a key contribution to the overall disaster relief efforts.

SOURCE: Sergeant First Class Tracy Bower, Master Diver, US Army, Army Noncommissioned Officer in Charge during Operation UNIFIED RESPONSE, 12 January 2010

Chapter II DIVE MISSION AREAS

1. Introduction

Dive mission areas describe specific focus arenas in which military divers are trained to support operations. There are 15 dive mission areas, as listed in table 1. Many of the dive mission areas may include subcategories, which are detailed in this chapter. It is important to note, however, that not all dive units are capable of all dive mission areas. For example, a dive unit may only have self-contained underwater breathing apparatus (SCUBA) equipment and be limited to a subcategory of one or two dive mission areas. Refer to appendix A for an overview of which Services are capable of executing each dive mission area.

Table 1. Dive Mission Areas
Mobility
Counter mobility
Protection (physical security)
Explosive hazard and ordnance disposal
Infiltration and exfiltration
Maritime disablement operations
Underwater ship husbandry
Underwater construction
Port and harbor clearance operations
Joint logistics over-the-shore
Offshore petroleum discharge systems operation
Salvage operations
Search and rescue/recovery operations
Disaster response measures
Hyperbaric chamber operations

2. Dive Mission Area Descriptions

a. Mobility. Divers provide critical support for water obstacle crossing by supplying the information needed to determine crossing sites, bridging locations, and time estimates for reducing or removing obstacles. Divers gather this information by conducting hydrographic or bathymetric surveys and shore reconnaissance, which leads to obstacle reduction or removal.

(1) Structural, Bridge, and Fording Site Reconnaissance. Divers determine the type of construction used and condition of the structure, perform a battle damage assessment (BDA), and prepare repair estimates. Structural engineer augmentation may be required. Engineer divers can reconnoiter fording sites and their near- and far-shore approaches to provide data to higher echelons and help determine the best fording site.

(2) River Reconnaissance Operations (as a full river or sections of a river). Divers conduct reconnaissance of the near and far shores of a water obstacle to determine the ability of the site to support future wet gap-crossing operations. They identify the bottom composition and establish bank slopes, water depths and velocity, and possible staging areas and rally points on the near and far shores.

(3) Obstacle Reduction. After identifying obstacles to mobility, divers can remove or reduce the obstacles using mechanical or explosive methods.

(4) Installing Protective Barriers for Bridging Structures. Divers assist in installing impact booms, antimine booms, and antiswimmer nets upstream and downstream of crossing sites. Also, they can inspect these devices routinely for signs of tampering or damage and repair them, as required.

(5) Underwater Surveys. Dive units can create accurate charts of the waterway's bottom and note any obstacles to navigation. A few personnel and small watercraft (configured with various types of technology packages) can conduct the initial survey to provide a quick, and fairly accurate, description of the underwater terrain. If divers find obstructions or receive questionable readings, they can physically inspect the anomalies. The following are the three kinds of underwater surveys.

(a) High Resolution. A high-resolution survey involves post-survey data rendering and aerial photograph overlays and provides sub meter accuracy. Survey data can be provided in paper and digital form. High-resolution surveys take the most time compared to the other types of underwater surveys.

(b) Medium Resolution. A medium resolution survey provides a graphic representation of the bottom profile with sub meter accuracy. A digital copy is available within hours of the survey.

(c) Low Resolution. A low resolution survey provides 1 to 3 meter/approximately 3-9 foot accuracy with a verbal description of the site and basic markings.

(6) Very Shallow Water (VSW) Operations. Divers conduct advanced force and preassault mine countermeasures and reconnaissance operations in the VSW zone (from 3 to 12 meter/10 to 40 foot water depths) to locate and clear potential landing sites in support of joint littoral power-projection operations.

b. Counter mobility. Divers aid the counter-mobility mission by creating obstacles in and around potential crossing sites. They can emplace underwater minefields and other explosive and nonexplosive obstacles, and rigging bridges for command and time fused detonations.

(1) Obstacle Emplacement. Divers can build various types of obstacles designed to slow or impede the enemy's ability to conduct wet gap-crossing operations. These obstacles can be placed underwater with sub meter accuracy, creating interlocking barriers navigable by allied forces and an obstacle to enemy forces.

- (2) Bridge Structure Demolition. To impede an enemy's ability to cross bridges, dive units can demolish bridges to render them impassible. Some dive units have substantial training in precisely conducting demolitions. These teams, when augmented with structural engineers, can demolish a bridge in such a manner as to create an obstacle for the enemy.
- c. Protection (Physical Security). Divers can enhance protection in contingency operations, in response to national security concerns (including counterterrorism and counterdrug operations), and large-scale operations. Divers can rapidly deploy to secure, critical areas. Physical security of bridges, ports, locks, and dams may include active and passive systems to protect or provide early warning of impending breaches.
- (1) Passive or Active Detection Methods. Divers assist in placing and maintaining physical security systems in port areas, waterways, and on bridges, locks, or dams.
- (2) Security Inspections. Divers provide security and active early detection of explosive hazards by searching the underside of ships' hulls and the adjacent piers. Divers conduct these inspections before vessels enter a facility or while moored outside a secured perimeter.
- (3) Vulnerability Assessments. Divers perform inspections and surveys to facilitate assessment of vulnerabilities to threats.
- (4) Contraband Search. Divers conduct searches on the underside of ships' hulls to locate foreign devices and objects.
- d. Explosive Hazard and Ordnance Disposal.
- (1) Locate and Mark. Divers search for and record any identifying markings on foreign objects placed along ships' hulls, piers, port facilities, and other underwater structures.
- (2) Render Safe or Dispose of Underwater Ordnance and Explosive Hazards. Explosive ordnance divers render safe, remove, or mitigate effects of ordnance (e.g., sea mines, limpet mines, torpedoes) designed to be used underwater, and explosive hazards, such as unexploded ordnance and improvised explosive found underwater. This category also covers ordnance designed to function on land or in the air but is found underwater.
- (3) Marine Mammal System (MMS) Operations. MMS detachments use trained animals, including dolphins and sea lions, to provide an enhanced capability to detect, identify, mark, render safe, recover, and neutralize objects within a water column or on or below the seafloor.
- e. Infiltration and Exfiltration. These operations use diving as a means to circumvent enemy lines and defenses to facilitate follow-on missions, such as offense, defense, or stability.
- f. Maritime Disablement Operations. These operations use diving as a means to install or deploy devices to disable or reduce maritime vessels' ability to maneuver.

This operation can be conducted on static or moving vessels. The maritime disablement operations are nondestructive and temporary.

g. Underwater Ship Husbandry. Ship husbandry is in-water vessel inspection, maintenance, and repair. Vessel inspections are performed to assess the condition of the underwater hull and appendages. These inspections cover all parts of the vessel below the waterline and are part of a scheduled or emergent maintenance or damage assessment.

(1) Inspections.

(a) Hull inspections assess damage and identify buildup from marine growth on the hull, and the condition of antifouling paint surfaces.

(b) Propulsion and steering systems inspections check the condition of shafts, propellers, and rudders, and the serviceability of protective coatings, seals, and bearings.

(c) Vessel appendages inspections check the general condition and operational ability of the vessel.

(2) Maintenance. Underwater maintenance tasks include hull cleaning; replacing sacrificial anodes; maintaining cathodic protection systems; replacing worn or corroded nuts, bolts, and screws; maintaining fairing in hydrodynamic surfaces; and servicing any items that would fall into disrepair if they are not maintained. Maintenance procedures require hand tools, pneumatic or hydraulic tools, and other special equipment, such as hull-cleaning devices.

(3) Repair. Most underwater repairs are intended to be permanent. Tasks consist of removing and replacing hull appendages, sealing cracks or separated seams, and performing mechanical and metal repairs. Divers may accomplish repairs in a wet environment or a cofferdam (a watertight enclosure pumped dry to permit construction work below the waterline).

(4) BDA and Repair. BDA and repair provide immediate assistance to a vessel in distress. A remotely operated vehicle can be used to inspect and assess areas of damage and provide a real-time video feed to repair facilities via satellite. Repairs are temporary and are meant to keep the vessel afloat until permanent repairs are made. Divers conduct BDAs and repairs in a semi-permissive or permissive environment. BDA and repair capabilities are grouped into two categories. They are:

(a) Temporary Repair. Install small damage control plugs and design and emplace patches.

(b) Permanent Repair. Wet weld large patches and repair or replace underwater propulsion and steering systems.

h. Underwater Construction. Underwater construction is the construction, inspection, repair, and removal of in-water facilities in support of military operations. An in-water facility can be defined as a structure, system, device, or utility adjacent to, floating upon, or submerged in a freshwater or marine environment including in shore, rivers, and lakes. Pipelines, cables, sensor systems, and fixed or advanced

base structures are examples of in-water facilities. More information on ocean construction may be obtained from Naval Facilities Engineering Command (NAVFAC) Ocean Facilities Program managers. Underwater construction planning resources can be found in: Navy tactical reference publication (NTRP) 4-04.2.8, *Conventional Underwater Construction and Repair Techniques*; NTRP 4-04.2.9, *Expedient Underwater Construction and Repair Techniques*; and NAVFAC P-992, *UCT Arctic Operations Manual*.

i. Port and Harbor Clearance. Port and harbor clearance operations include facilities' opening, construction, clearance, and rehabilitation. Ports, harbors, and inland waterway facilities are fundamental to moving personnel and equipment for any military operation. Inspection, maintenance, and repair of these facilities can greatly contribute to the long term success of phased operations. Facilities can be improved for friendly forces and civil relief, or modified to deny use by the enemy.

(1) Planning and Inspection. Divers assist in planning port operations to help determine priorities of work or prepare work estimates. A completed inspection can provide the area commander with a report of existing conditions of underwater port facility structures.

(2) Hydrographic and Bathymetric Survey. Divers conduct surveys to depict water depths, bottom contours, and obstruction locations to determine the size of ship a port can support.

(3) Clearance. Divers undertake clearance operations to neutralize or reduce obstacles blocking shipping channels in ports, loading facilities, mooring sites, marine railways, dry dock facilities, lock and dam structures, and other navigable waterways.

(4) Repair. Repairing port facilities is more desirable than initial construction because it requires far less time and fewer resources. A repair may involve underwater and surface operations and will depend on closely integrating divers and general engineer assets. Inspecting and repairing structures may require specialized equipment and additional support personnel.

(5) Construction. Constructing new ports and facilities is a major undertaking, requiring an extensive use of divers. Divers provide valuable information during the initial site selection and survey. Divers conduct hydrographic surveys of the proposed area to determine water depths, sea bottom contours, shipping channels, and underwater obstacle locations. New port or facility construction would require additional support personnel working with diving assets.

j. Joint Logistics Over-the-shore (JLOTS). JLOTS operations occur when Navy and Army logistics over-the-shore (LOTS) forces conduct LOTS operations together under a joint force commander. LOTS is the process of loading and unloading ships without the benefit of deep-draft capable, fixed-port facilities; or as a means of moving forces closer to tactical assembly areas. Divers support JLOTS operations through the following tasks.

(1) Survey. Divers conduct a survey of the operation site, including an underwater bottom profile, to determine potential LOTS operation sites. Dive

units create sub meter accurate charts of the bottom and note any obstacles to navigation. The initial survey can be conducted by a few personnel with small watercraft (configured with various types of technology packages) which will provide a quick, and fairly accurate, description of the underwater terrain. If obstructions are found or there are questionable readings, divers can conduct a physical inspection of the anomalies.

(2) Obstacle Reduction. After identifying obstacles to LOTS sites, divers can remove or reduce obstacles using mechanical or explosive methods.

(3) Medium Salvage (Objects Weighing 10 to 75 Tons). In the event supplies are lost overboard, dive units can search the area to locate the submerged equipment. Depending on the size and depth of the submerged equipment, divers will attach lifting devices to the object for surface cranes to raise. If overhead lift support is not available, divers can attach inflatable bags and pontoons to the object, float it to the surface, and tow it into shore.

(4) Anchoring System Recovery and Repair. During LOTS operations, a ship's anchor and anchor chains may become entangled in underwater cables, caught on reef structures, or wrapped around sunken objects. Divers can unfoul an anchor and anchor chain so the surface vessel can get underway. Anchors may also become detached from their chains and cables. Divers can locate and reattach them.

(5) Anchoring Systems to Stabilize Causeway. Divers imbed anchoring systems into the seafloor to provide greater stability to a causeway during rough seas.

k. Offshore Petroleum Discharge System (OPDS). OPDSs are designed to facilitate the high-volume movement of bulk, liquid cargo from ship to shore and are used extensively during fuel transfer operations. Engineer port construction companies, divers, and transportation watercraft groups play important roles in preparing, installing, repairing, and operating OPDSs. Divers are required to support OPDSs by performing the following actions.

(1) Installing a single-anchor leg-mooring (SALM) system. The SALM system is emplaced as a mooring station and discharge manifold providing a semi-permanent installation for bulk fuel transfer directly from an offshore tanker to port storage.

(2) Conducting hydrographic surveys to determine beach gradient, underwater contour, and geotechnical information.

(3) Improving beach approaches.

(4) Clearing enemy emplaced or natural obstacles from beach approaches.

(5) Anchoring underwater pipelines to the seafloor.

(6) Inspecting pipelines and their components.

l. Salvage. Major salvage operations include clearing and removing submersed or sunken vessels, equipment, supplies, or other materials from port channels, berthing and docking facilities, mooring sites, lakes, lock and dam facilities, and other

navigable waterways. A diver's ability to salvage vessels or other equipment depends on the type, size, and location of the object and the time available for the salvage effort. Salvage methods range from simple to large-scale operations requiring complex integration of surface-support assets, including multiple vessels and lift assets. There are three categories of salvage operations: light, medium, and heavy.

- (1) Light salvage is done to clear berthing spaces. Objects weighing less than 10 tons are considered light salvage.
- (2) Medium salvage objects weigh 10 to 75 tons.
- (3) Heavy salvage is anything weighing more than 75 tons.

m. Search and Rescue/Recovery. Divers assist in search and rescue/recovery of personnel and equipment lost in or near water.

- (1) Physical searches. Divers use various techniques to locate personnel during combat, natural disasters, and other emergencies.
- (2) Recovery. Recovery operations are focused on recovering personnel, sensitive equipment, or material of forensic value.

(3) Dewatering. Divers provide dewatering capabilities for vessels impacted by flooding. Dewatering restores buoyancy to a sunken or partially sunken ship. It can be completed with pumps, compressed air, and water replacement. Additional techniques are detailed in the *US Navy Salvor's Handbook, Revision 1*, 1 January 2004.

(4) Submarine Disaster Rescue. Operations to recover personnel and equipment from distressed submarines.

n. Disaster Response Measures. Divers assist local, state, and federal authorities after a natural disaster.

- (1) Assist in making plans and assessments of damage caused by natural disasters.
- (2) Remove obstacles to navigation in areas damaged or covered by floods, earthquakes, or other naturally occurring and man-made disasters.
- (3) Repair dams, levees, breakwaters, and other man-made retaining structures.
- (4) Validate hydrographic surveys by verifying existing charts are accurate and waterways were not affected by the disaster.
- (5) Provide dewatering capabilities for facilitates or areas impacted by flooding.

o. Hyperbaric Chamber Operations. Provide recompression therapy for pressure-related injuries resulting from flight or diving operations. Dive units may provide their own hyperbaric chambers. If not, available chambers may be located through the Naval Sea Systems Command (NAVSEA) worldwide web address (<http://www.navsea.navy.mil/Home/SUPSALV/00C3-Diving/>) or by contacting the Naval Experimental Dive Unit emergency number (850) 230-3100. These are not the

definitive sources for all recompression chambers worldwide, however, they can be used as planning resources.

Chapter III PLANNING CONSIDERATIONS

1. Requesting Dive Assets

a. Not every Service can perform every category within each dive mission area and some Services are not trained at all in some of the dive mission areas.

b. The timelines and scalable diving packages are specific to each Service and are detailed in appendices B–G. Once diving units are in theater, they will be likely task organized to the joint task force commander; however, this can change based on the duration of the diving mission and if follow-on requirements occur. There are two methods to use to request diving assets. Both methods require the requestor to ask for a capability, such as one of the dive mission areas, not a specific Service or unit to perform a mission.

(1) The first method is the standard process through the global force management, which flows through the combatant command and onward to the Secretary of Defense. The Secretary of Defense, upon approving the request, would task the Service chiefs who have the ability to complete the request. This method processes nonemergent, noncontingency diving requests.

(2) The second method is to request diving assets through Service Authority. This is the method of request used when there is an emergency or an unplanned mission needing diving assets. Tactical units can reach out to Service diving entities within their theater by requesting Service Authority assistance. An example would be if a High Mobility Multipurpose Wheeled Vehicle rolled over and personnel or sensitive equipment needed to be recovered immediately or within a strict timeline. Then, the unit needing diving assets could first determine which Service has diving assets closest to their location, using the diving contact list in appendix h, and contact that Service command to request Service Authority assistance. The Navy has two references for how to request diving assistance.

(a) The Office of the Chief of Naval Operations (OPNAV) has published step-by-step instructions on how to request Navy salvage and recovery assets based on the situation in OPNAV Instruction 4740.2G titled *Salvage and Recovery Program*, specifically section 7, Procedures.

(b) Pacific Fleet and Fleet Forces commands provide instructions on how to request Navy diving assets, see Commander Pacific Fleet/Commander US Fleet Forces Instructions 4740.1K, titled *Salvage, Recovery, Towing, and Offshore Oil Spill Response Operations*, which provide guidance such as in figure 2. The instructions also include a sample salvage situation report format.

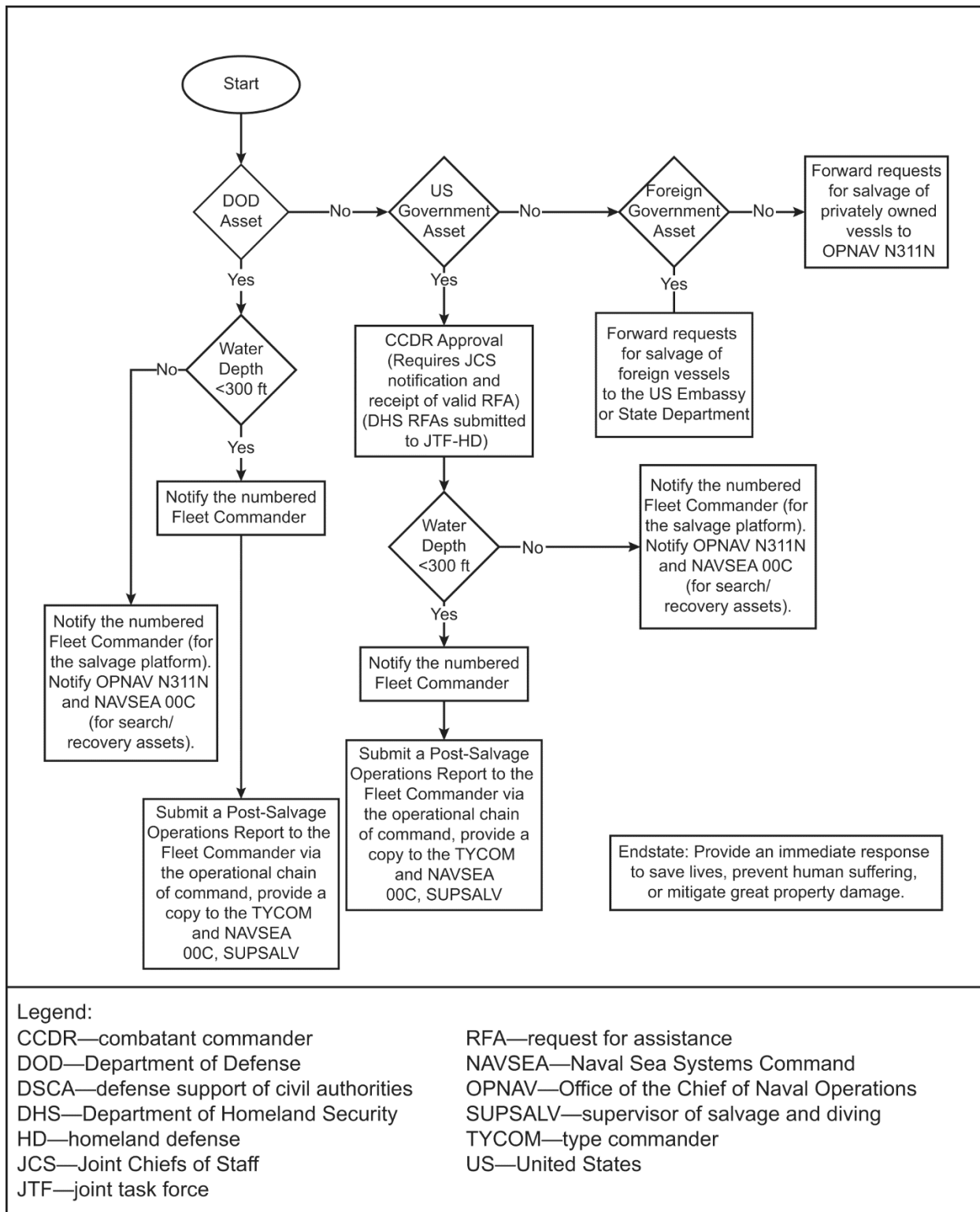


Figure 2. Salvage Response Process

c. When considering diving operations, it is imperative that planners understand the first 12–24 hours can make the difference between an accident (a ship grounding that can be refloated), and a disaster (a ship gets driven ashore or broken up by

seas creating an environmental and military crisis). If diving capabilities are required and diving assets are not already assigned to the command, Naval Sea Systems Command can provide immediate technical direction for initial triage and assist the unit with potential asset requests.

2. Considerations When Using Dive Assets

- a. Dive-Site Security. Most dive teams have a limited self-defense capability. Plan to provide site security at the support facilities and around the dive site.
- b. Logistic and Environmental Considerations. Dive operations have specific logistical and environmental considerations, which must be addressed during planning. These considerations will determine the manning, equipment, qualifications, and time required to accomplishment the mission. Planners requesting dive capabilities should provide as much information about the operating environment as possible. Table 2 provides a minimum checklist to assist in initial coordination.

Table 2. Dive Unit Initial Coordination	
This checklist is an example of what could be asked when a unit is requesting dive assets. These items are not all inclusive and could change based on which Service is in the theater and requires support. Timely dive unit notification, with as much of the basic information listed below as possible, will increase the degree of mission success. Use weather observers and forecasters, on-scene personnel, the Internet, and any other available sources to gather data.	
1. Determine the required capabilities.	a) Dive Mission Area(s): _____ b) Subcategories: _____
2. Determine requested location for dive or linkup location with dive units.	a) Grid coordinate or Lat/Long: _____
3. Point of contact for requesting unit.	a) Higher headquarters point of contact: _____ Contact #: _____ b) Dive unit point of contact: _____ _____ Contact #: _____
4. If known, provide the following information to assist the dive unit: <ul style="list-style-type: none"> ➤ Permissive or nonpermissive dive site. ➤ Water contamination. ➤ Air and water temperatures. ➤ Water depth. ➤ Current. ➤ Tide charts. ➤ Underwater visibility. 	5. If possible, and as necessary, be prepared to coordinate logistics for these prior to dive team arrival: <ul style="list-style-type: none"> ➤ Hazardous materials transportation. ➤ Compressed gas. ➤ Explosives. ➤ Generators and motors. ➤ Transportation requirements. ➤ Site security. ➤ Fuel (gas or diesel). ➤ Dive platform ➤ Other.

(1) Logistics.

(a) Transporting and Storing Compressed Air. Dive tanks (full of compressed air) are not allowed on aircraft without appropriate hazardous material declarations. If the dive team is transported by air, the tanks may have to be refilled at the destination. Logistics officers at the tactical units will be able to coordinate this for the dive units (through the base fire department or area civilian dive shops). If this is not possible, the dive units will bring compressors to refill their own tanks.

(b) Diver and Equipment Transportation Requirements. Requesting units may be tasked to provide transportation.

(c) Diving Platform. Divers operate from a wide variety of platforms, including piers, shores, barges, boats, and vessels of opportunity. The required platform depends on the mission. This will be coordinated once the diving mission is identified.

(d) Other Concerns. If there are additional considerations pertaining to the US classes of supply one through nine they will be detailed in the specific operations order for the diving mission.

(2) Environmental Conditions.

(a) Contaminated Water. Fuel, biological, or chemical contaminants may be damaging to dive equipment and hazardous to divers. Additional equipment or post-dive medical assistance may be required if these conditions exist. Tactical units requesting diving assistance should communicate any potential requests to medical personnel, if and as required. Table 3 provides an overview of which Services have the best equipment for diving in contaminated water. Of note, there are no Service divers authorized to dive in category 1. If divers are needed, NAVSEA can assist with contracting civilians to dive.

(b) Water Temperature. Cold water will reduce submerged times for divers who may require additional equipment or manning, such as the cold weather diving equipment or cold weather clothing. The tactical unit requesting the diving assets can provide this information, if known.

(c) Water Depth. Deep dive operations reduce submerged times for divers. Maximum operating depths depend, in part, on equipment.

(d) Currents. If currents are greater than one knot, the diving unit must be informed prior to its arrival.

(e) Tide Charts. Tidal phases may influence water depth and currents at the dive site. Tide charts are included in the initial briefing of the operating environment or can be requested through the weather officer.

(f) Underwater Visibility. Low visibility may increase the time required to accomplish a task. For example, if searching an area for a piece of equipment, low visibility may require a dense search pattern or alternate search technique.

(g) Unexploded Ordnance (UXO). The presence of UXO may require additional considerations for the type of dive being conducted, which would require the diving team to bring specialized underwater demolition tools.

Table 3. Contaminated Water

<p>Contaminated Water Categories (and Capacity Explanations)</p> <p>Full capability (F) means this dive mission area is a primary task this unit is trained and equipped to conduct. Limited capability (L) means this dive mission area is a task this unit may be able to perform based on skill sets inherent in primary tasks; however, the unit may be limited by equipment or that the unit has not trained to this task</p>	Army Engineer Diver	Army Special Forces	Marine Combatant Diver	Mobile Diving Salvage Unit	Navy Underwater Construction	Navy Regional Maintenance	Navy Explosive Ordnance Disposal Units	Navy Undersea Rescue Command	SEALs	Air Force Special Tactics	Air Force Guardian Angel	Coast Guard
<p>Category 1 a. Grossly contaminated. b. Extreme risk of injury or death. c. A fully-encapsulated diver requires surface exhaust (note 1).</p>												
<p>Category 2 a. Heavily contaminated. b. High risk of injury (note 2). c. A fully encapsulated diver with in-water exhaust (note 1).</p>	L											
<p>Category 3 a. Moderately contaminated. b. Some risk of injury, especially if ingested. c. Full face mask with skin covered, as necessary.</p>	F		L							L	L	
<p>Category 4 a. Baseline contamination. b. Low risk of injury (note 3). c. Standard diving dress.</p>	All Service units have full capability.											
<p>Notes:</p> <ol style="list-style-type: none"> 1. Fully encapsulated means a vulcanized rubbery dry suit with integrated boots, mated to dry gloves with a ring system. In addition, gloves must be taped or clamped to the suit. Divers must not use equalization tubes between their gloves and cuffs. 2. Injuries may be major and could include such things as skin irritation, rashes, and eye or sinus irritation. 3. Low risk refers only to risk from contaminants and does not relate to any other aspect of the dive. A full risk analysis is still required. <p>Legend: SEAL—A SEAL is a military member and a SEAL team is a team of SEALs.</p>												

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Appendix A

DIVE MISSION AREA UNIT CAPABILITY CHART

Dive teams consisting of personnel from different Services are possible but require additional coordination compared to those composed of a single Service. There have been instances where multiple Services are involved in a diving operation. For example, Army divers do not necessarily specialize in underwater ship repair; however, if the Army divers are the only dive team in an area, Naval Sea Systems Command or Navy Expeditionary Combat Command can provide an engineer or subject matter expert who can augment the Army dive team to provide the technical knowledge and authority to conduct repairs. It is important to understand that, as needed, divers can augment units already in theater to accomplish nearly any diving operation. Table 4 provides a breakdown of capability by dive unit type. The units are grouped with their Services and categorized by either full or limited capability.

Full capability means this dive mission area is a primary task this unit is trained and equipped to conduct. Limited capability means this dive mission area is a task this unit may be able to perform based on skill sets inherent in primary tasks; however, the unit may be limited by equipment or it has not trained to this task.

Table 4. Dive Mission Area Unit Capability Reference Chart												
Unit	Army Engineer Diver	Army Special Forces	Marine Combatant Diver (Note 1)	Mobile Diving Salvage Unit	Navy Underwater Construction Teams	Navy Regional Maintenance Centers	Navy Explosive Ordnance Disposal Units	Navy Undersea Rescue Command	SEALs	Air Force Special Tactics (Note 2)	Air Force Guardian Angel	Coast Guard
MOBILITY												
Structure, bridge, fording site reconnaissance	F	F	F	L	F		L		F	L	L	L
River reconnaissance	F	L	L	F	F		L		L	L	L	L
Obstacle reduction	F	L	L	F	F		L		L	L	L	L
Barrier installation(for structures)	F	L		L	L		L		L			
Underwater survey						L						
- High resolution	F			L	L	L	L					
- Medium resolution	F			F	F	L	F					L
- Low resolution	F		F	F	F	L	F		F			L
Very shallow water	L			L		L	F		F			L
COUNTERMOBILITY												
Obstacle emplacement	F	L			F				F			
Bridge demolition	F	F	L	L	F		L		F			
PROTECTION (PHYSICAL SECURITY)												
Passive or active detection methods	F	L	L	F	F	F			F	L	L	
Security swims	F	L	F	F	F	F	F		L	L	L	F
Physical security inspections	F	L	L	F	F	F	F		L	L	L	F
Vulnerability assessments	L	L		F	L	F	F		L			L
Contraband search	F	L	L	F	L	F	F		L	L	L	F
EXPLOSIVE HAZARD AND ORDNANCE DISPOSAL												
Locate and mark	F	L	L	F	F	F	F		F	L	L	L
Render safe and dispose (ordnance)							F					
Render safe and dispose (hazards)							F					
Marine mammal system operations							F					

Table 4. Dive Mission Area Unit Capability Reference Chart (Cont'd)												
Unit	Army Engineer Diver	Army Special Forces	Marine Combatant Diver (Note 1)	Mobile Diving Salvage Unit	Navy Underwater Construction Teams	Navy Regional Maintenance Centers	Navy Explosive Ordnance Disposal Units	Navy Undersea Rescue Command	SEALs	Air Force Special Tactics (Note 2)	Air Force Guardian Angel	Coast Guard
INFILTRATION AND EXFILTRATION												
Infiltration and Exfiltration		F	F				L		F	F	L	
MARITIME DISABLEMENT OPERATIONS												
Maritime disablement operations									L			
UNDERWATER SHIP HUSBANDRY												
Inspection	F			F	L	F	L					L
Maintenance	F			F	L	F	L					L
Repair	F			F	L	F	L					L
Battle damage assessment and repair	L			L		F						
- Temporary repair	F			F		F						L
- Permanent repair	L			L		F						
UNDERWATER CONSTRUCTION												
Underwater construction	F			L	F							
PORT AND HARBOR CLEARANCE OPERATIONS												
Planning and inspection	F			F	F	F	F	L				L
Hydrographic and bathymetric survey	F		L	F	F	L	F	L	F			L
Clearance	F		L	F	F	L	L		F			L
Repair	F				F	F		L				
Construction	F				F	L						
JOINT LOGISTICS OVER-THE-SHORE												
Survey	F			F	F			L				
Obstacle reduction	F			F	F	L		L				L
Medium salvage	F			F	L	L		L				
Anchoring system recovery and repair	F			F	F	L		L				

Table 4. Dive Mission Area Unit Capability Reference Chart (Cont'd)												
Unit	Army Engineer Diver	Army Special Forces	Marine Combatant Diver (Note 1)	Mobile Diving Salvage Unit	Navy Underwater Construction Teams	Navy Regional Maintenance Centers	Navy Explosive Ordnance Disposal Units	Navy Undersea Rescue Command	SEALs	Air Force Special Tactics (Note 2)	Air Force Guardian Angel	Coast Guard
Causeway anchor installation	F			L	F							
OFFSHORE PETROLEUM DISCHARGE SYSTEM												
single-anchor, leg-mooring system installation	L			L	F			L				
Hydrographic surveys	F			L	F			L				
Beach approach improvement				L	F							
Obstacle clearance	F			L	F							
Pipeline anchoring to the seafloor	F			L	F							
Pipeline inspection	F			L	F	L						
SALVAGE												
Light (less than 10 tons)	F			F	L	F		L				L
Medium (10 to 75 tons)	F			F	L	L		L				
Heavy (greater than 75 tons)	L			F		L						
SEARCH AND RESCUE/RECOVERY												
Physical searches	F		L	F	F	F	F	F	L	F	F	F
Recovery	F		L	F	F	F	L	F	L	F	F	L
Dewatering	F			F	F	L						
Submarine rescue				L				F				
CONDUCT DISASTER RESPONSE MEASURES												
Plans and assessments	F			F	F	F						L
Obstacle removal	F		L	F	F	L				L	L	L
Repair retaining structures	F				F							

Table 4. Dive Mission Area Unit Capability Reference Chart (Cont'd)

Unit	Army Engineer Diver	Army Special Forces	Marine Combatant Diver (Note 1)	Mobile Diving Salvage Unit	Navy Underwater Construction Teams	Navy Regional Maintenance Centers	Navy Explosive Ordnance Disposal Units	Navy Undersea Rescue Command	SEALs	Air Force Special Tactics (Note 2)	Air Force Guardian Angel	Coast Guard
Hydrographic survey validation	F		L	L	F	L						L
HYPERBARIC CHAMBER OPERATIONS												
Hyperbaric chamber	F	L	L	F	F	F		L	L			
<p>Notes:</p> <ol style="list-style-type: none"> 1. The US Marine Corps has a limited capability (under the hyperbaric chamber section) with the Expeditionary Hyperbaric Chamber and Transportable Recompression Chamber Systems. Not all Marine expeditionary units deploy with this capability so it is necessary to specify if diving capabilities are needed in mission requirements. See appendix C for amplification. 2. US Air Force special tactics units that have assigned pararescue jumpers have full search and rescue capabilities. Units without pararescue jumpers have limited search and rescue capabilities. See appendix E for amplification. <p>Legend: F—full capability L—limited capability SEAL—sea-air-land military member US—United States</p>												

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Appendix B UNITED STATES (US) ARMY DIVING

1. Overview

The US Army has two types of divers: engineer and special operations. The engineer divers specialize in conducting diving operations in support of combat, general, and geospatial engineering. Engineer dive detachments have a diverse range of capabilities and are able to conduct nearly every dive mission area, with only limited capability in the explosive hazard and ordnance disposal category. Special operations divers are members of a special forces (SF) team and will be discussed in detail in Appendix F, Special Operations Forces Diving.

2. Engineer Divers

Note: For a detailed description on Army engineer diver capabilities, see Technical Manual 3-34.83, *Engineer Diving Operations*.

a. Mission. Engineer divers provide support to assure mobility for the forward movement of troops and equipment. Divers provide support to disaster response, general engineering, and geospatial engineering operations in and around water. Divers enhance protection by conducting force protection swims and emplacing underwater obstacles and barriers. Divers also enable expeditionary logistics by providing accurate waterway datum, surveys, and repair of existing waterfront facilities.

(1) Engineer diving missions assist in infrastructure support and sustainment operations.

(2) Dive detachment capabilities can be tailored to the mission allowing the use of surface-supplied diving apparatus; self-contained underwater breathing apparatus (SCUBA); and remotely operated vehicles.

b. Capabilities. Engineer divers can rapidly deploy scalable assets to perform SCUBA diving and surface-supplied diving in nearly all environmental conditions: swift water; zero visibility; multiple levels of contamination; day or night; under-ice; and in rivers, harbors, or open ocean. The Army has tasked 13 of the 15 dive mission areas to its engineer divers. They are the following.

(1) Mobility.

(2) Counter mobility.

(3) Protection (physical security).

(4) Explosive hazard and ordnance disposal (limited capability, can only locating and marking).

(5) Underwater ship husbandry.

(6) Underwater construction.

(7) Port and harbor operations.

(8) Joint logistics over-the-shore.

- (9) Offshore petroleum discharge system (limited due to the inability to install a single-anchor, leg-mooring system).
- (10) Salvage (can only conduct light and medium).
- (11) Search and rescue/recovery.
- (12) Disaster response measures.
- (13) Hyperbaric chamber operations.

c. Task Organization. Engineer dive detachments are relatively small, specialized organizations assigned as theater assets and may be assigned or attached to supported units anywhere within an area of operations. Engineer dive detachments consist of 25 personnel and a full complement of diving equipment to support Army engineer dive capabilities. Each detachment can be split to conduct dive operations. Figure 3 depicts an engineer dive detachment organization.

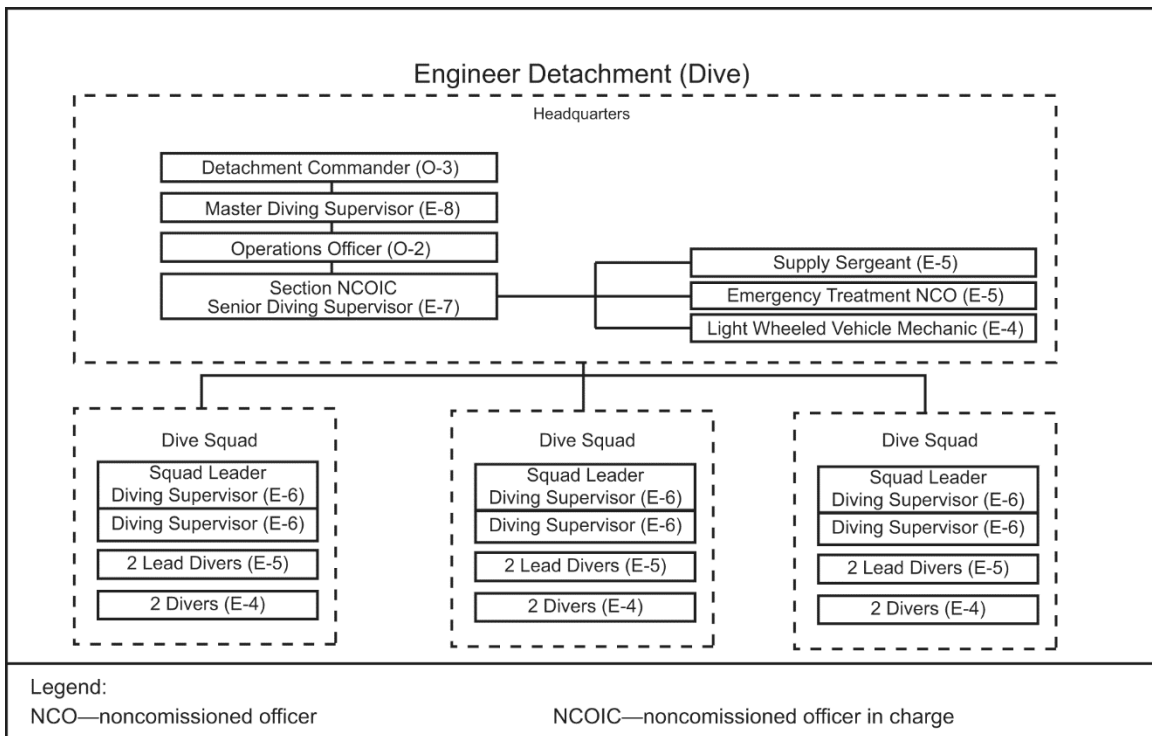


Figure 3. Engineer Dive Detachment Organization

d. Concept of Employment. The primary objective of engineer diving operations is to conduct underwater engineering and disaster response operations. Engineer divers are an integral part of a task organization that supports movement in or around any wet gap-crossing, including ports, harbors, inland waterways, beachfronts, and rivers. For short-term missions, diving assets are assigned, in direct support, to the supported commander. For long-term or complex missions, divers are attached to a company- or battalion-sized unit.

e. Tiered Rapid Deployment Capability. Engineer divers can rapidly deploy assets to respond to time-sensitive emergencies. The following are tier deployment capabilities and timelines.

(1) Tier one. Less than 48 hours from notification to departure from the current station. Requires a 4–7-Soldier dive squad capable of conducting:

- (a) Emergency response and a rapid assessment.
- (b) Search and recovery.
- (c) Engineer reconnaissance, inspections, and hydrographic surveys.
- (d) Antiterrorism or force protection swims.
- (e) Vessel inspections and maintenance.
- (f) Underwater demolition.

(2) Tier two. Fewer than 5 days from notification or tier one assessment. Requires an 8 to 14-Soldier dive element (can be two squads) capable of all tier one capabilities plus:

- (a) Light construction operations.
- (b) Minor ports, harbors, and inland waterway repair.
- (c) Light salvage operations.

(3) Tier three. Fewer than 7 days from notification or tier one and two assessments. Requires a 25-Soldier dive detachment capable of all tier one and two capabilities plus the 13 dive mission areas listed in paragraph 2.b. (in chapter two).

f. Employment Considerations and Limitations. Engineer divers do not possess organic transportation assets, so planners must make arrangements for support to meet tiered deployment timelines. Engineer divers will require a security detail. Engineer diving units have organic equipment to support diving operations to a 190 foot depth at sea level.

3. SF

SF maritime operations are some of the many options available to a commander to infiltrate and exfiltrate a detachment into or out of a designated area of operations to execute SF missions. Other missions for SF combat divers include tactical reconnaissance, demolition raids against bridges and other maritime structures, and underwater searches for security and recovery. SF divers are covered in more detail in appendix F.

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Appendix C

UNITED STATES MARINE CORPS (USMC) COMBATANT DIVING

1. Overview

The primary purpose of the Marine combatant diver is to provide a clandestine infiltration and exfiltration means for USMC ground reconnaissance elements, which facilitates the full range of amphibious reconnaissance and ground reconnaissance operations for Marine Corps special operations forces (MARSOF). (See appendix F for MARSOF dive mission capabilities.) The USMC underwater reconnaissance capability provides the supported unit commander with a capability to conduct clandestine subsurface operations in support of the force. Combatant diving is one of numerous specialized insertion and extraction methods used by Marine ground reconnaissance units to infiltrate and exfiltrate mission areas.

Note: For a detailed description of USMC diver program management, see Marine Corps Order 3150.4, *Marine Corps Diving Policy and Program Administration*, 22 October 2015; and Marine Corps reference publication (MCRP) 2-10A.6, *Ground Reconnaissance Operations*.

2. Marine Combatant Divers

- a. Mission. Marine combatant divers conduct underwater operations to facilitate amphibious reconnaissance, ground reconnaissance, surveillance, and operational environment shaping in support of the Marine expeditionary force (MEF), other Marine air-ground task forces, or the Marine component of a joint force.
- b. Capabilities. Task organized USMC ground reconnaissance elements plan, coordinate, and execute over the horizon, clandestine, subsurface dive operations via naval ships or aircraft to conduct full-spectrum amphibious and ground reconnaissance missions. USMC ground reconnaissance elements are manned, trained, and equipped for dive operations in the following mission areas. They:
 - (1) Conduct amphibious reconnaissance to collect and report information about the activities and resources of an enemy or information concerning the hydrographic characteristics of a particular area, well in advance of an amphibious landing force.
 - (2) Conduct subsurface hydrographic surveys in support of all United States Navy landing craft and amphibious assault vehicles.
 - (3) Conduct initial and confirmatory beach reconnaissance.
 - (4) Conduct initial terminal guidance of amphibious assault vehicles, tactical boats, amphibious ships, landing craft, and aircraft.
 - (5) Conduct subsurface insertion and extraction of combatant dive teams to clandestinely infiltrate and exfiltrate designated ground reconnaissance mission areas.

(6) Conduct subsurface infiltration and exfiltration in support of specialized reconnaissance of littoral and coastal areas and defenses; including ports, harbors, piers, and estuaries; and fords and bridges.

(7) Conduct subsurface, limited search and recovery of personnel or sensitive equipment.

(8) Conduct search operations for the amphibious ready group, expeditionary strike group, and maritime pre-positioning ship in fleet support of force protection to locate and mark limpet mines and improvised explosive devices. These operations include ship's hull, piers, harbors, ports, fords and bridges.

c. Task Organization.

(1) The USMC combatant dive capability resides within the active and reserve reconnaissance battalions and force reconnaissance companies. A complete list of USMC units with an organic dive capability and their geographic locations is provided in appendix H.

(2) USMC ground reconnaissance units are task organized to conduct the full range of ground reconnaissance missions, including combatant diving. The commander of deployed USMC ground reconnaissance elements and the supported unit will plan, direct, and coordinate the actions of USMC combatant dive teams. The general organization of the Marine combatant diver capability within task organized reconnaissance elements is as follows.

(a) Reconnaissance battalion: 12 dive teams each.

(b) Reconnaissance company: 4 dive teams each.

(c) Force reconnaissance company: 4 dive teams each.

d. Concept of Employment.

(1) A Marine ground reconnaissance unit employs six-person teams to conduct reconnaissance. The unit can be employed in general support of the MEF or in direct support or attached to a subordinate unit of the MEF or a joint force.

(2) Marine reconnaissance platoons are assigned to the ground combat element of each forward-deployed Marine expeditionary unit (MEU). If a company-sized element, the company headquarters will establish and maintain a reconnaissance operation center in support of the MEF or supported unit's combat operations center to conduct command and control functions of subordinate units conducting ground or amphibious reconnaissance missions.

(3) USMC reconnaissance platoons can be task organized and attached to subordinate units of the MEF or a joint force. Under such employment, the platoon headquarters will establish and maintain a reconnaissance operations center in support of the supported unit's combat operations center.

e. Employment Considerations. Marine combatant divers have unique considerations for their employment. The following must be considered when employing Marine combatant divers.

(1) MEUs possess the organic tactical boat assets to conduct over-the-horizon surface movement to a dive insertion point. Continental United States-based MEUs deploy with 11 meter, Naval Special Warfare, rigid hull inflatable boats for maritime interdiction operations. Another option of a USMC tactical boat asset is the combat rubber raiding craft, which has very limited applicability in this mission area.

(2) For planning purposes the average speed for surface and subsurface swimming for Marine combatant divers is one knot, unassisted. This translates into a maximum distance of one nautical mile, subsurface, under ideal conditions. Assisted by the diver propulsion device, the average motorized speed is 1.2 knots. Due to less expended energy, the diver propulsion device increases the distance a dive team is able to travel.

3. MARSOF Combatant Divers

A MARSOF maritime operation is one of the many options available to a commander to infiltrate and exfiltrate a detachment into or out of a designated area of operations to execute special operations forces missions. Other missions for MARSOF combatant divers include special reconnaissance, direct action raids against maritime structures, and underwater searches for security and recovery. MARSOF divers are covered in detail in appendix F.

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Appendix D UNITED STATES (US) NAVY DIVING

1. Overview

- a. The US Navy is the Service with most divers and there are divers in many commands within the Navy. However, this publication will focus on the diving missions of six operational commands, specifically those listed in appendix A. These commands have divers who can be requested to support diving missions for other Services or the Navy.
- b. The missions for the following will be covered in this appendix.
 - (1) Mobile diving salvage unit (MDSU).
 - (2) Navy underwater construction team (UCT).
 - (3) Navy regional maintenance centers.
 - (4) Navy explosive ordnance disposal (EOD).
 - (5) Navy undersea rescue command.
 - (6) The US Navy sea-air-land (team) (SEAL) will be detailed in Appendix F, Special Operations Forces Diving.
- c. Navy assets stationed on the East Coast of the US fall under Fleet Forces Command while the West Coast units fall under the Pacific Fleet command.

Note: For a detailed description of Navy diving capabilities, see SS521-AG-PRO-010, *US Navy Diving Manual Revision 7*, 1 December 2016. For Navy EOD diving capabilities and limitations see: OPNAV Instruction F3501.97H Ch-1, *OPNAV Required Operational Capabilities/Projected Operational Environment Instructions, Department of the Navy Issuances, EOD Required Operational Capabilities and Projected Operational Environment*, and Joint Publication (JP) 3-42, *Joint EOD Activities*. Navy Issuances include Navy instructions, notices, and change transmittals and are located on the Department of the Navy Issuances website, www.doni.documentservices.dla.mil

2. MDSUs

- a. Mission.
 - (1) Mobile diving and salvage companies and the area search platoons (PLTs) can execute the following dive mission areas.
 - (a) Mobility.
 - (b) Countermobility.
 - (c) Protection (physical security).
 - (d) A limited capability in explosive hazard and ordnance disposal.
 - (e) Underwater ship husbandry.
 - (f) Limited underwater construction.

- (g) Port and harbor clearance operations.
- (h) Joint logistics over-the-shore.
- (i) Offshore petroleum discharge system operation.
- (j) Salvage.
- (k) Search and rescue/recovery.
- (l) Disaster response measures.
- (m) Hyperbaric operations.

(2) They execute missions in support of Chief of Naval Operations (CNO) projects, fleet and Navy installation commander requirements, contingencies, and provide special operational support, as tasked. They can operate from opportune vessels, shorelines, and fixed waterfront facilities in varying maritime settings. The conditions can be open ocean, inland, riverine, coastal, or littoral and may include water temperatures ranging from polar to tropical/desert, swift water and contaminated water.

b. Mobile Diving and Salvage Companies Capabilities.

(1) Rescue, Salvage and Recovery. Mobile diving and salvage forces, primarily, conduct expeditionary salvage and diving operations. These operations encompass the entire spectrum of diving and salvage operations, from providing humanitarian assistance to supporting combat operations. They enable friendly forces increased access to, and freedom of movement throughout, the maritime and riverine operating environments. Mobile diving and salvage forces provide rescue, salvage, and recovery capabilities including:

- (a) Stabilization, retraction, refloating, dewatering, salvage of ships, aircraft and watercraft, items of national interest, and strategic assets.
- (b) Damage assessment.
- (c) Port recovery and harbor clearance.
- (d) Emergency underwater ship husbandry.
- (e) Shallow water search and recovery (<300 feet of salt water).
- (f) Submarine search and limited rescue.
- (g) High-value object recovery.
- (h) Rigging and crane related services.
- (i) Rigging for and augmented towing.
- (j) Explosives employment in underwater ship husbandry.
- (k) Manned and unmanned underwater inspection, search, location, and detection.
- (l) Hydrographic surveys.

- (m) Debeaching. Debeaching includes operations between ships that work together to exercise their “beach gear” in order to conduct a salvage mission. An example of this operations is when ships lay a leg of “beach gear,” which consists of an anchor, a designated amount of anchor chain, and a designated amount of wire rope. A ship brings the wire rope over the bow rollers and connects it to hydraulic cable pullers, capable of pulling approximately 50 tons each. Once a ship is connected to its respective beach gear, the ships come stern to stern and pass tow wire between them. The ships then take turns pulling on the beach gear leg to exert a retracting force on the other ship.
 - (n) Aircraft recovery.
 - (o) Prisoner of war and missing in action underwater identification and support.
 - (p) Remotely operated vehicles (ROVs).
- (2) Enabling Area Access. This is a proactive means to ensure forces can freely enter and exit the theater of operations enabling increased access, and freedom of movement throughout the maritime and riverine operating environments. Subcapabilities to enable area access include:
- (a) Port, harbor, riverine, and waterways assessment and clearance.
 - (b) Manned and unmanned underwater inspection, search, location, and detection.
 - (c) Hydrographic surveys.
 - (d) Aids to navigation operations.
 - (e) Beach clearance and salvage.
 - (f) Stabilization, retraction, refloating, dewatering, and salvage of ships, air, space, and watercraft; items of national interest; and strategic assets.
 - (g) Search and recovery.
 - (h) Demolition.
- (3) Battle Damage Assessment (BDA) and Repair. BDA is the practice of assessing damage inflicted on a target. Mobile diving and salvage can provide BDA and repair for vessels in distress needing immediate assistance and located in remote, semipermissive or permissive environments. Additional capabilities include:
- (a) Emergency underwater ship husbandry.
 - (b) ROV and underwater scanning capabilities to conduct underwater ship husbandry.
 - (c) Manned underwater inspection, search, location, and detection.
 - (d) Damage assessment.
 - (e) Dewatering.

(4) Force Protection. Mobile diving and salvage has a limited self-defense capability. Mobile diving and salvage forces can conduct preventative actions to mitigate hostile actions against Department of Defense personnel, resources, facilities, and critical information. For MDSU, force protection does not include direct action against the enemy or protecting against accidents, weather, or disease. Subcapabilities of MDSU force protection include:

- (a) Manned underwater inspection, search, location, and detection.
- (b) Antiterrorism force protection dives.
- (c) Conventional self-defense.
- (d) Chemical, biological, radiological, and nuclear self-defense.
- (e) Emission control management and execution of operations security.

(5) Diving and Salvage used for defense support of civil authority (DSCA) and humanitarian assistance and disaster relief operations. Subcapabilities include:

- (a) Stabilization, retraction, refloating, dewatering, and salvage of ships, air, space, and watercraft; items of national interest; and strategic assets.
- (b) Damage assessment.
- (c) Dewatering.
- (d) Port recovery and harbor clearance.
- (e) Debeaching.
- (f) Emergency underwater ship husbandry.
- (g) Search and recovery.
- (h) High-value-object recovery.
- (i) Rigging and crane related services.
- (j) Rigging for and augmented towing.
- (k) Hydrographic surveys.
- (l) ROV.
- (m) Manned and unmanned underwater inspection, search, location, and detection.

(6) Fly away recompression chamber teams diagnose and treat decompression sickness and other diving and aviation related illnesses.

c. Task Organization. There are two MDSUs, with locations to cover east and west coasts of the US.

(1) MDSU 1 is stationed at Pearl Harbor, Hawaii and is tasked through Pacific Fleet. MDSU 1 has seven mobile diving and salvage companies. Figure 4 depicts an MDSU company organization.

(2) MDSU 2 is stationed at Little Creek, Virginia and is tasked through Fleet Forces. MDSU 2 has five companies. Each company is staffed with 17 divers, including one diving officer and one master diver. Within the MDSU, there is an area search platoon (listed in figure 4 as platoon 2), which consists of eight personnel, when it is fully manned.

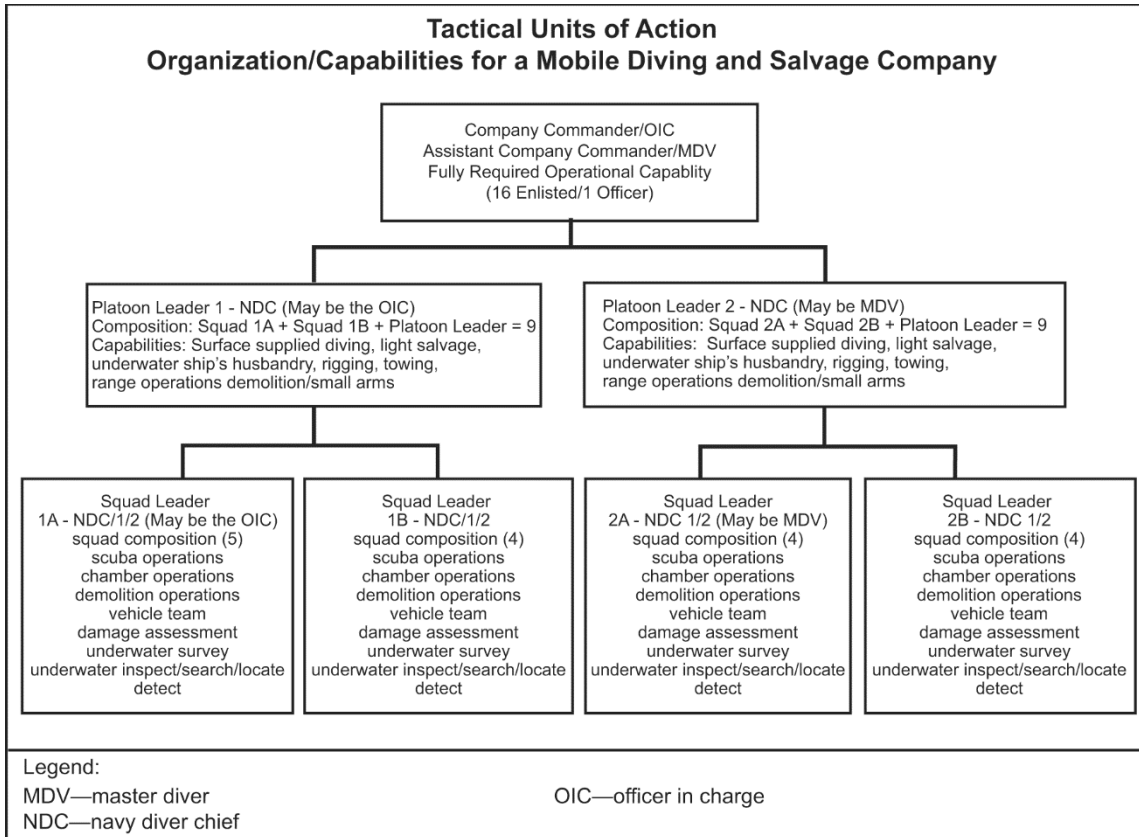


Figure 4. MDSU Company Organization

d. Concept of Employment. MDSU deploy MDS companies to support salvage operations. MDSUs can deploy multiple MDS companies, simultaneously, to support larger operations. In these cases, deploying units can be augmented with a deployable command and control cell to provide control and direction for a task group commander exercising control over larger expeditionary salvage operations.

(1) MDS companies are equipped with a diverse range of diving and salvage equipment deployable, scalable, and tailorable according to mission objectives; employ the full spectrum of surface supplied, open and closed circuit, self-contained, and recompression chamber diving.

(2) MDSU companies provide expeditionary salvage, clearance reconnaissance, BDA, underwater explosive demolition, site survey, lightweight towing, and aircraft recovery with a craft of opportunity. A MDSU company can exploit available retrograde or abandoned opposition-force craft and assets to augment a mission. An MDSU company has an organic capability of air dives to depths of 190 feet. Dives deeper than 150 feet of seawater are conducted using a helium-oxygen, MK 16, underwater breathing apparatus, and surface supplied diving

systems. Heavier salvage capability is represented in the emergency ship salvage materials equipment pool. This equipment is provided by the MDS parent command or through the in-theater emergency ship salvage materials pool. Due to their size, MDSU companies are limited in their ability to provide self-protection and may require nonorganic force protection when in a nonpermissive environment.

(a) Area search PLTs employ underwater scanning, remote operated vehicle and unmanned underwater vehicle (UUV) capabilities to search for, locate, identify, and mark designated targets in support of MDSU and EOD operations; and scan harbor bottoms and waterways to enable freedom to maneuver; and restore access to ports and facilities. UUVs are able to operate underwater without a human occupant to complete a number of specialized operations.

(b) The primary mission of the area search PLT is to provide a capability to detect and localize submerged objects in support of salvage operations. These units are equipped with side-scan sonar, ROVs with a variety of sensors, and expeditionary equipment to conduct area search operations via organic small craft. Due to their small size, area search PLTs are limited in their ability to provide force protection and require nonorganic, waterborne force protection when in a nonpermissive environment.

3. Navy UCTs

a. Mission. Seabee UCTs conduct inshore and deep-ocean facility underwater construction, inspection, repair, and maintenance operations in climates ranging from the arctic to desert and tropical regions. UCTs support amphibious landing operations and deploying the offshore petroleum discharge system in support of joint logistics over-the-shore operations. Other supported missions include: foreign humanitarian assistance (FHA), DSCA, and recovery operations. The UCTs conduct:

(1) Responsive underwater engineering and construction, inspection, repair, maintenance, and demolition of ocean and waterfront facilities. This is in support of Navy, Marine Corps, and combatant command operations in permissive and combat environments. When assigned by fleet commanders, UCTs accomplish additional underwater construction projects for other naval commands, laboratories, and offices.

(2) Diving operations to provide underwater construction in support of other naval construction force units, amphibious operations for naval beach groups, operating forces, sealift support facilities, and other fleet units, as directed.

(3) Installation, inspection, maintenance, and repair of undersea range facilities and in-shore cables for undersea surveillance systems.

(4) FHA, humanitarian mine action, humanitarian aid, disaster response, DSCA, and military civil action activities.

b. Capabilities. UCTs are capable of self-contained underwater breathing apparatus (SCUBA) and surface supplied diving operations in nearly all environmental

conditions. These include zero visibility, contamination, day or night operations, and ice diving in rivers, harbors, and open-ocean. UCT capabilities and functional tasks include the following.

(1) Underwater Engineering and Construction, Repair, and Maintenance. This includes shallow and deep-water structures, mooring systems, underwater instrumentation, light salvage, and precise demolition (using explosives).

(2) Inspection.

(a) The UCTs conduct hydrographic surveys using differential Global Positioning System and hydrographic survey systems to collect data within sub meter accuracy. Survey teams can be rapidly deployed to perform field data collection and postprocessing operations using a small boat deployable, mobile workstation or vessel of opportunity. Advanced underwater reconnaissance techniques include bathymetric surveys to sub meter accuracy, side-scan imagery, still photography, and full-motion video.

(b) The UCTs operate ROVs to a depth of 500 feet. They can deploy vertically or horizontally. Hydrographic survey data can be georectified and processed in the field by the UCT construction diving detachment and sent to headquarters (HQ) via organic high-frequency radio, ultrahigh frequency radio, or satellite communications.

(c) This information assists commanders in assessing battle damage; avoiding navigational hazards; locating debris in support of ports, harbors, and inland waterway recovery operations. It also assists in locating and recovering lost equipment and selecting locations for installing underwater facilities (such as pilings, moorings, and cable landings).

(3) Data Collection. The UCT collects water-crossing data for bridging operations.

(4) Blasting and Demolition. The UCT performs precision terrestrial and underwater blasting using military or commercial explosives.

c. Task Organization. The two UCTs are commanded by a civil engineer corps officer and are permanently structured units composed of personnel with the capability to plan, coordinate, and supervise general engineering and construction diving operations. The UCTs are organized into sea duty and shore duty components. Figure 5 depicts the UCT organization, with the shore and sea duty components.

(1) The shore duty component is comprised of support departments that consist of administration, engineering support, supply, equipment and material readiness, communications, medical, and training. These are the garrison staff elements, which only deploy in exceptional circumstances.

(2) The sea duty component consists of three independent, worldwide deployable construction diving detachments, comprised of 16 personnel capable of conducting marine and terrestrial construction operations worldwide. The

construction diving detachments can be task organized to support various mission or operation sets.

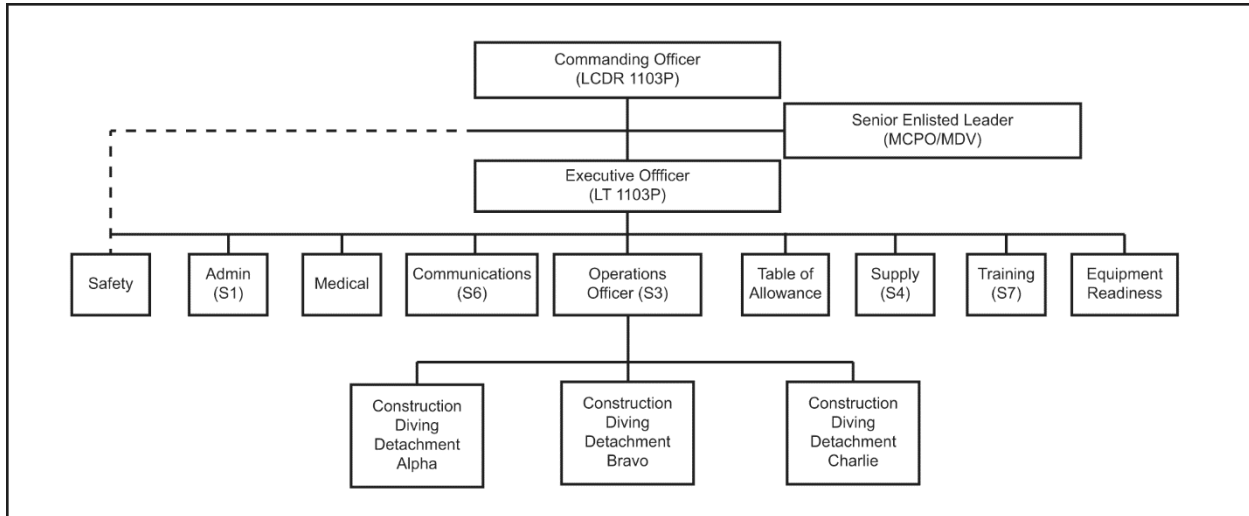


Figure 5. Seabee UCT Organization

d. Concept of Employment. Each UCT functions independently, as an integral unit of the Naval Construction Force. UCTs operate with decentralized control providing specialized underwater and general engineering services to the supported unit. UCTs are deployed as independent construction diving detachments equipped and trained for self-sufficiency in underwater construction to respond to emergency and contingency operations to support underwater construction and repair in any environment. The UCTs also provide:

- (1) Deployment of a task-organized construction diving detachment of 16 personnel and required equipment within 48 hours, a second construction diving detachment of 16 personnel within six days, and a third construction diving detachment of 16 personnel within 30 days.
- (2) Trained and equipped construction diving detachments to conduct defensive combat tactics. The UCTs receive can conduct force protection operations on open water and urban terrain. Due to the UCTs' small unit size, specialized equipment, and expertise, they employ these tactics in direct support of construction diving operations only. The UCTs require assistance from the supported unit with transportation, perimeter security, and waterfront security operations in nonpermissive environments.
- (3) Construction diving operations in permissive and nonpermissive environments in climates ranging from extreme cold weather to tropical or desert. The UCTs conduct operations in unsecured and isolated locations with prior coordination of the supported unit.

4. Regional Maintenance Center (RMC)

- a. Mission. RMC divers provide the theater maintenance coordinator with underwater ship husbandry; and battle and terrorist damage waterborne inspections, evaluations, and repairs to return the combatant to the fight.
- b. Capabilities. The following are RMC capabilities.
 - (1) Repairs.
 - (2) Security swims and antiterrorism or force protection hull searches to locate and mark limpet mines or improvised explosive devices (IEDs).
 - (3) Submarine countermeasure set, acoustic pod inspection, repair, and replacement.
 - (4) Submarine predeployment noise inspection and sound silencing.
 - (5) Special installations (sea-view, submarine).
 - (6) Main seawater or auxiliary seawater hydro blast and repair (submarine).
 - (7) Cathodic protection, inspection, cleaning, repair, and replacement.
 - (8) Bridal air and main ballast tank cofferdams (submarine high pressure air system).
 - (9) Towed array inspection preventive maintenance system and repair; component replacement (submarine).
 - (10) Range and special pinger installation and removal (submarine).
 - (11) Rudder inspection, sounding, repair, measuring, wrap, and replacement.
 - (12) All underwater inspections (manned and unmanned).
 - (13) Auxiliary power unit repair and replacement.
 - (14) Fixed pitch and control pitch blade replacement.
 - (15) Propeller repair and replacement.
 - (16) Secondary propulsion motor inspections, preventive maintenance system, repair, and replacement (submarine).
 - (17) All cofferdams, patches, plugs, and hull blanks and seals installation and removal.
 - (18) Sonar dome inspection (wet and dry) and repair.
 - (19) Shaft re-lamination and repair.
 - (20) Prairie air system inspection, cleaning, and repair.
 - (21) Stave bearing inspection, measurement, repair, and replacement.
 - (22) Shallow-water, antisubmarine warfare target installation and removal (submarine).
 - (23) Sound hull tile repairs (submarine).

- (24) Various radiological control services, including primary affluent tank hook-up and removal (submarine) and hull survey swipes (ships, carriers, and submarines).
- (25) Naval Sea Systems Command (NAVSEA) emergent underwater welding and nondestructive, ultrasonic, visual, and magnetic testing services.
- (26) Transducer and hydrophone repair and replacement, with associated cable.
- (27) Bow plane cofferdams.
- (28) Outboard transducer acoustic array assembly repair and replacement (submarine).
- (29) Torpedo tube and variable launch system repair and component replacement, with associated cable.
- (30) Anchor and associated handling equipment inspection, preventative maintenance services, repair, and component replacement (submarine).
- (31) Light and medium salvage.
- (32) Dry-docking (ship and submarine) and bearing block inspection.
- (33) Fin inspection, repair, and replacement.
- (34) Shaft seal and wrap (ship and submarine).
- (35) Pitsword and speedlog clean, repair, and replace (ship and submarine).
- (36) Rope guard line removal and repair or replacement (bolted or welded).
- (37) Underwater photography, video, and boroscope.
- (38) ROV inspection with broadband global area network and view cast satellite uplink.

c. Task Organization. RMCs and intermediate maintenance facilities (IMFs) are under the command of the NAVSEA Supervisor of Salvage and Diving/Director of Ocean Engineering (SUPSALV) 00C (www.supsalv.org). Table 5 lists maintenance facility locations and areas of responsibility.

5. EOD

a. Mission. EOD personnel detect, identify, render safe, recover, evaluate, and dispose of explosive ordnance which has been fired, dropped, launched, projected, or placed to constitute a hazard to operations, installations, personnel, or material. The mission extends to all explosive hazards and ordnance, particularly in those areas which are the responsibility of the Navy; or ordnance discovered within oceans, inlets, bays, and harbors.

b. Capabilities. Navy EOD units integrate into fleet battle groups to support special operations forces and conduct expeditionary mine countermeasures (MCM) operations.

- (1) Expeditionary MCM companies are dedicated capabilities that support the mine warfare (MIW) missions to search, classify, map, acquire, identify, re-

acquire, counter mine or neutralize, recover or exploit, and dispose or eliminate hazards. Some hazards include floating, bottom, volume, and buried sea mines and IEDs that impede freedom of navigation and are comprised of: one MCM PLT, one unmanned system (UMS) PLT, one postmission analysis cell, and one expeditionary MCM HQ.

Table 5. RMC/IMF and Area of Responsibility	
Area Regional Maintenance Center (RMC)/Intermediate Maintenance Facility (IMF)	Area of Responsibility (AOR)
Southwest RMC, San Diego, California	Supports ships, submarines (SSN class), aircraft carriers, and craft in port or operating off the west coast of the United States (US) from the San Francisco Bay to the southern point of South America. Support forward deployed repair teams in the US Fifth and Seventh Fleet AORs.
Puget Sound Naval Shipyard and IMF, Bremerton, Washington	Supports ships, SSNs, aircraft carriers, and craft in port or operating in the Pacific Northwest area from north of San Francisco to the Northern Pacific and Alaska areas, and all US Pacific Fleet ballistic-missile and guided-missile submarines (SSBN and SSGN classes).
Pearl Harbor Naval Shipyard and IMF, Pearl Harbor, Hawaii	Supports ships, submarines (excluding SSBN and SSGN classes), aircraft carriers, and craft in port or operating in the Mid-Pacific area.
Ship Repair Facility and Japan RMC, Yokosuka, Japan	Supports ships, aircraft carriers, and craft in port or operating in the US Seventh Fleet AOR.

Table 5 RMC/IMF and Area of Responsibility (Cont'd)	
Mid Atlantic RMC, Portsmouth, Virginia Mid Atlantic RMC Divers, Norfolk, Virginia	Supports ships, aircraft carriers, and craft in port or operating in the Atlantic Ocean from Charleston, South Carolina northward. Submarines in port and all non-SSGN class submarines operating in the Atlantic Ocean to the southern tip of South America, excluding those in port or operating in New London, Connecticut. Support forward-deployed RMC in the US Fifth and Sixth Fleet AORs.
Regional Support Group, New London, Connecticut	Supports submarines in port or operating in the New London, Groton, Connecticut regional waters.
TRIDENT Refit Facility, Kings Bay, Georgia	Supports all US Atlantic Fleet SSBN and SSGN class units.
Southeast RMC, Mayport, Florida	Supports ships, aircraft carriers, and craft in port or operating south of Charleston, South Carolina; in the Atlantic Ocean to the southern tip of South America (excluding mine warfare craft in port or operating along the Texas Gulf Coast).
USS Emory S. Land (AS-39) USS Frank Cable (AS-40)	Makes repairs to deployed submarines and deployed ships on an as-available basis in the Seventh Fleet AOR.

EOD MCM PLT. These types of PLTs are dedicated to supporting the MIW mission and are functionally organized to locate, identify, neutralize, recover, exploit, and dispose of underwater ordnance and explosive hazards impeding maneuver for friendly forces. MCM PLTs support other MIW platforms and units, but are capable of limited independent MCM operations.

(a) UMS PLT. These types of PLTs, primarily, provide mine exploration, reconnaissance, and hunting capabilities in support of MCM operations. In addition, they provide fleet support for the purpose of recovering objects, mapping other items of interest, and performing intelligence preparation of the operational environment. Their focus is on the search, classification, and mapping underwater mines and other hazards impeding friendly forces dominant maneuver. Each UMS PLT is task organized to support simultaneous operations in two disparate locations.

(b) Expeditionary MCM HQ. These HQs are functionally organized to provide command and control over normal manning for an expeditionary MCM HQ element.

(c) MCM PLTs. MCM PLTs provide diving and demolition support, intelligence collection, range clearance, and underwater clearance. They also provide shore detachment augmentation, riverine operations, CNO project support, contingency, and special operational support. MCM PLTs can be a force multiplier to support aircraft and ordnance recovery.

(d) Marine Mammal System (MMS) PLT. This type of PLT provides an enhanced, rapidly-deployable MCM capability in support of amphibious operations to conduct mine hunting and neutralization operations against

bottom, moored, and buried mines in the shallow water and very shallow water (VSW) zones.

(2) Area Search PLT. This type of PLT employs underwater scanning, remote operated vehicle and UUV capabilities to search for, locate, identify, and mark designated targets in support of mobile diving and salvage and EOD operations. An area search PLT scans harbor bottoms and waterways to enable freedom to maneuver and restore access to ports and facilities.

(3) The VSW Company. This is an agile and scalable unit of action functionally organized to provide command and control over four VSW dive PLTs, two combatant craft PLTs, and three UMS PLTs. The VSW company is dedicated to the MCM mission in support of amphibious operations to search, detect, classify, reacquire, and dispose or eliminate explosive hazards that impede dominant maneuver and enables access through the VSW zone. The VSW company consists of the following.

(a) VSW Dive PLTs. These PLTs provide a low-visibility dive capability to reacquire, identify, and dispose of underwater ordnance and explosive hazards located and marked by UMS or MMS PLTs in the VSW zone.

(b) VSW UMS PLTs. These PLTs provide low-visibility mine exploration, reconnaissance, and hunting capabilities in support of amphibious operations in the VSW zone.

(c) VSW Combatant Craft PLTs. These PLTs provide low-visibility insertion and extraction capabilities from over the horizon to the VSW zone.

c. Task Organization. The Navy organizes EOD forces to support combatant commanders. EOD officers within each numbered fleet, combatant commands, and theater special operations command provide staff planning support for operational EOD activities. (See a force structure flow chart in figure 6.) EOD warfare-qualified officers are the subject matter experts for maritime MCM and can direct MCM operations at the strategic, operational, and tactical levels.

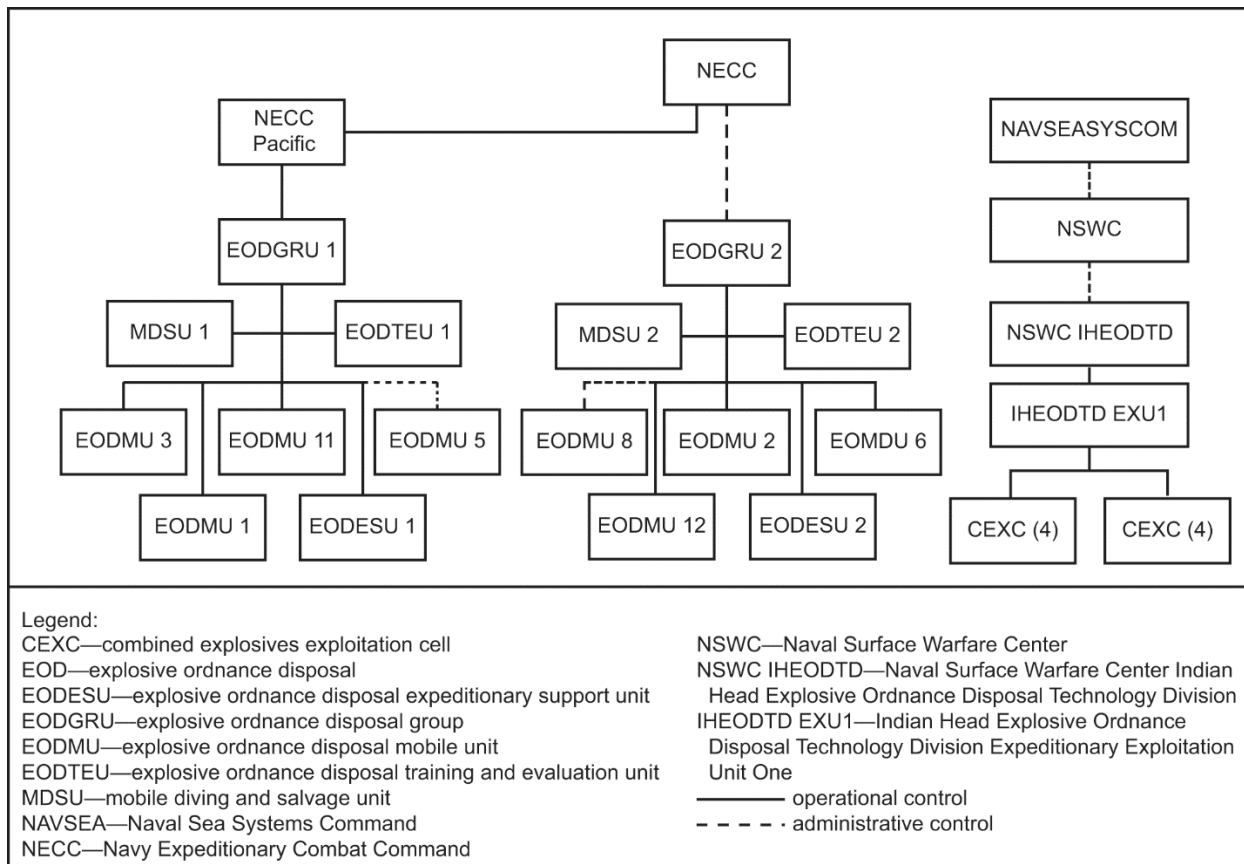


Figure 6. Navy EOD Force Structure

(1) Explosive Ordnance Disposal Groups (EODGRUs). Navy EOD operating forces are organized under two deployable echelon 4 EODGRUs (see figure 7). The EODGRUs are the O-6-led brigade/regimental equivalent HQ that provide centralized planning, coordination, and integration of subordinate EOD forces relating to movement, control (when exercising operational control), readiness and training, administration, and logistics. They are organized to deploy, when required, as a commander, task force controlling Navy EOD and expeditionary salvage forces or as the core of a joint EOD task force. Group staff EOD-qualified personnel may be selectively mobilized, individually, as liaison officers to support local, regional, littoral, or wartime EOD tasks. The EODGRU exercises Service authority over assigned EOD forces to provide EOD services to the operational commanders through explosive ordnance disposal mobile units, MDSUs, EOD expeditionary support units, and EOD training and evaluation units. For additional information on the EOD mission, task organization or planning considerations, see Joint Publication 3-42, *Joint Explosive Ordnance Disposal*, 9 September 2016.

6. Navy Undersea Rescue Command

- a. Mission. The mission of the Undersea Rescue Command is to rescue Sailors of all nations during a submarine crisis. The goal of the Underwater Rescue Command

is to reach a distressed submarine within 96 hours. Its mission is worldwide submarine assessment, intervention, and rescue.

b. Capabilities. The unit's capabilities include a ROV, submarine rescue chamber, the pressurized rescue module, and the two launch and recovery systems. The submarine rescue chamber can rescue up to six persons at a time and reach a bottomed submarine at depths of 850 feet.

c. Task Organization. The Undersea Rescue Command is homeported at Naval Air Station North Island, Coronado, San Diego, California. The unit is comprised of approximately 150 personnel. This includes active duty officer and enlisted Sailors, contractors, and reservists.

d. Concept of Employment. The explanation of the multiple components within this command follow.

(1) The Undersea Rescue Command uses a McCann rescue chamber operated by two crewmembers and lowered to the submarine in peril using a tether. Once the chamber reaches the submarine, it seals over the submarine's hatch, allowing Sailors to be safely transferred to the rescue chamber from the submarine. The submarine rescue chamber is the main component of the submarine rescue chamber flyaway system, which is capable of worldwide submarine rescue missions. Once launched, the submarine rescue chamber flyaway system can operate around the clock. The chamber consists of upper and lower compartments. The upper compartment is maintained at atmospheric pressure and contains operators, passengers, and controls. The lower compartment is flooded at ambient sea pressure and blown dry to transfer personnel after mating with a submarine. It contains a downhaul drum and spooling device. The ballast tanks are normally dry, but flooded during the mating process to add weight.

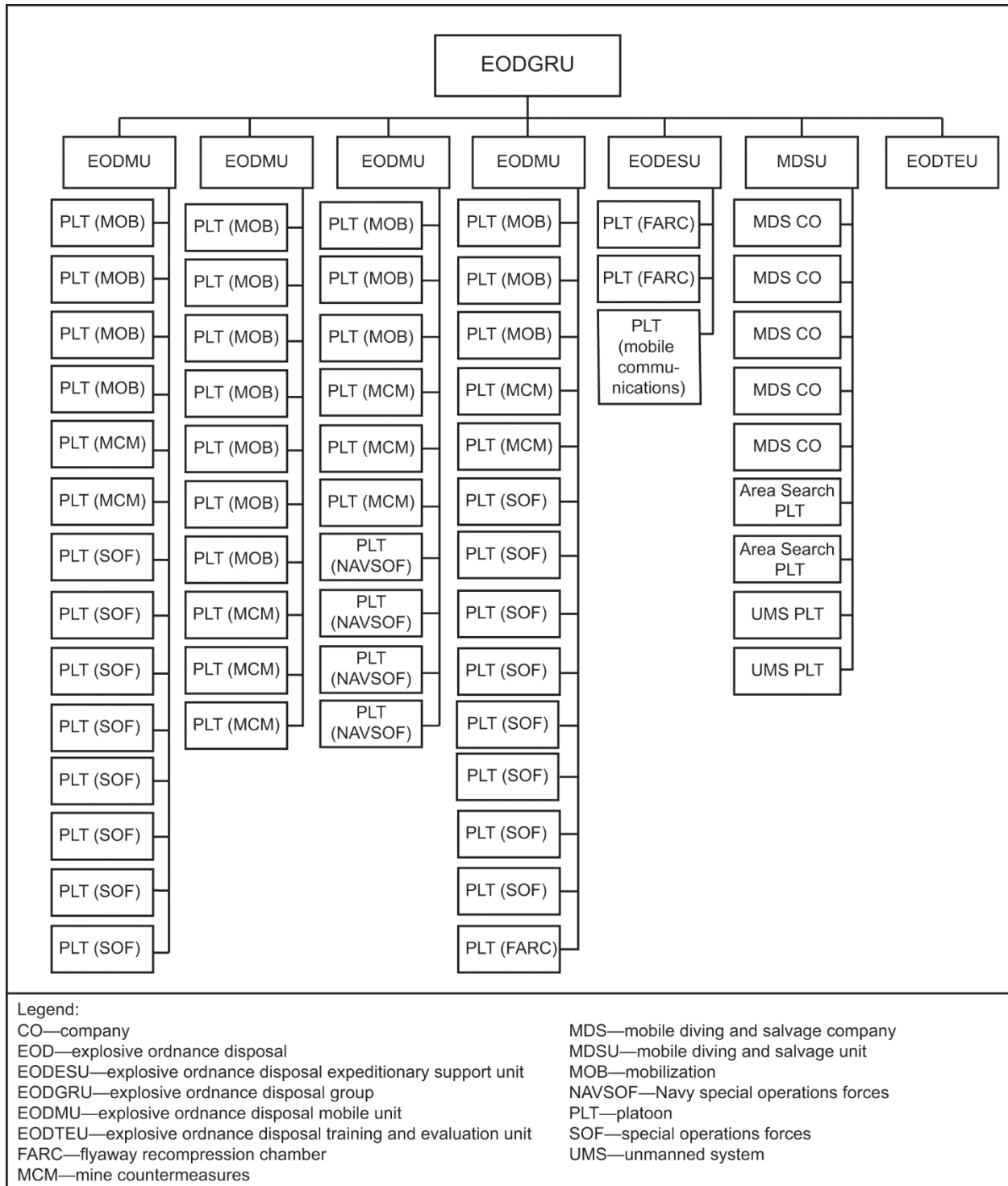


Figure 7. EOD Group Structure

(2) The pressurized rescue module, called Falcon, is a tethered, remotely operated submarine rescue vehicle. It can dive to depths up to 2,000 feet and mate with a disabled submarine trapped on the sea floor up to a 45-degree angle in pitch and roll. Two crewmembers operate the pressurized rescue module, which can rescue up to 16 people at a time. The module is the main component of the submarine rescue diving and recompression system, which can be flown anywhere in the world to rescue either US or partner nation submariners in distress. The submarine rescue diving and recompression system is designed for quick worldwide deployment in the event of a submarine accident and is transportable by truck, aircraft, or ship.

(3) The ROV, Sibitzky, consists of a 13.5 foot operations van, a 6.5 foot spares van, a winch with 3,000 feet of soft umbilical cord, a launch and recovery system, and the vehicle. The vehicle weighs 2,000 pounds, is variably buoyant and has a maximum depth of 2,000 feet. It consists of six thrusters for maneuvering, five high-definition cameras for intervention and salvage, two robust manipulators capable of lifting 100 pounds each, a front-looking sonar system, and an advanced navigation system that allows station keeping so the pilot can focus on the work at hand. The remotely operated vehicle is the main component of the assessment/underwater work system, which also includes a launch and recovery system, and flyaway sonar and associated support equipment. This is the first system mobilized in the event a submarine becomes disabled. The system will help confirm and mark the disabled submarine, assess surrounding conditions, clear debris from a submarine's hatch and provide emergency life support stores replenishment.

7. US Navy SEALs

Naval Special Warfare Command specializes in maritime special operations and oversees, trains, and equips SEALs. SEAL combat swimming and diving capabilities are covered in detail in appendix F.

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Appendix E UNITED STATES AIR FORCE (USAF) DIVING

1. Overview

The USAF employs combat divers to conduct three missions: personnel recovery, global access, and precision strike. The USAF divers are assigned to the Air Combat Command (ACC), which is called Guardian Angel; and to USAF Special Operations Command (AFSOC). Additionally, there are USAF divers in the Air Education and Training Command; however, they cannot be tasked to combat dive while in that unit. The USAF divers deploy as full units (squadrons) within ACC or through AFSOC. The USAF does not have scalable diving packages.

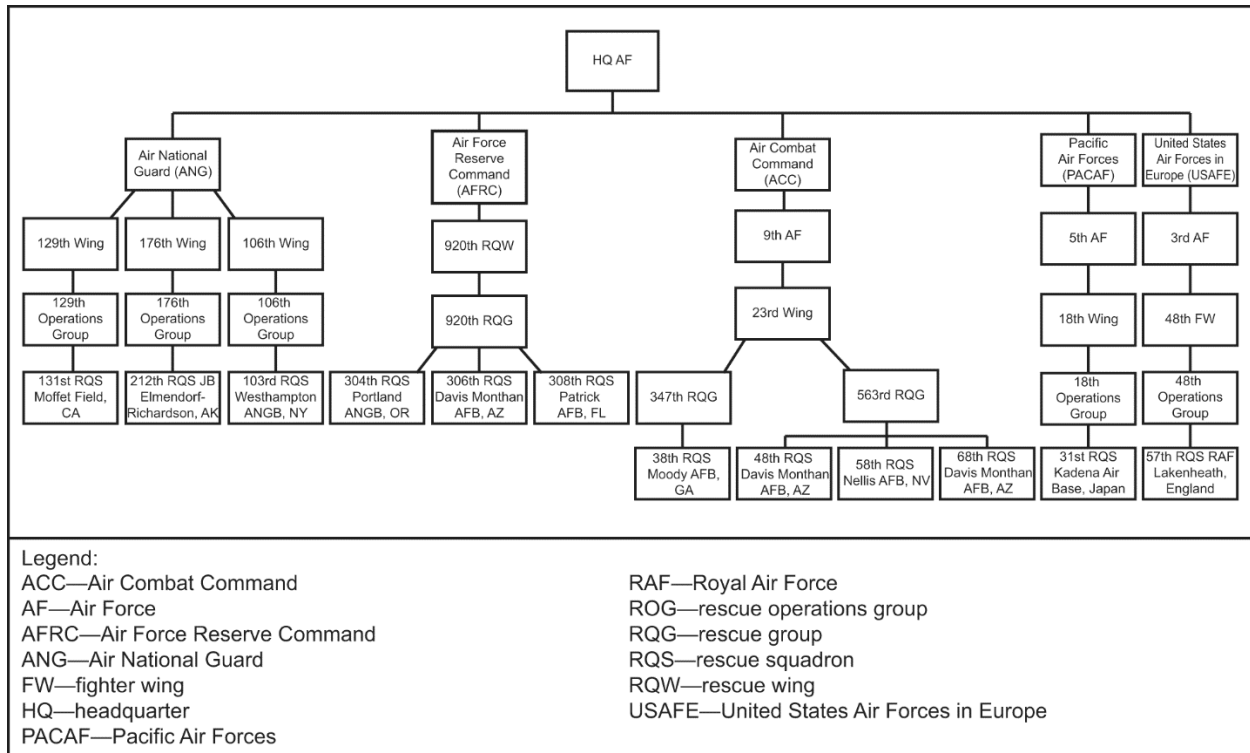
Note: For a detailed description of USAF diver program management, see Air Force Instruction 10-3501, *Air Force Diving Program*, 9 February 2009.

2. USAF ACC Guardian Angel Combat Divers

- a. Mission. USAF ACC Guardian Angel combat divers are pararescue jumpers and combat rescue officers. Their primary mission is to affect personnel recovery across the range of military operations providing capabilities to support a joint force commander's objectives and directly impact the theater security cooperation goals. Guardian Angel forces are prepare, plan, execute, and adapt personnel recovery operations. Executing personnel recovery operations includes the doctrinal execution tasks of report, locate, support, recover, and reintegrate. Personnel recovery pertains to the recovering personnel only; however, Guardian Angel forces perform other recovery operations, to include recovering sensitive technology.
- b. Collateral Missions. These include casualty evacuation, civil search and rescue, emergency aeromedical evacuation, and humanitarian assistance and disaster relief. Furthermore, they provide international aid, noncombatant evacuation operations, support for National Aeronautics and Space Administration flight operations, special operations missions, and support to the President of the United States.
- c. Capabilities. Guardian Angel is organized as an independent ground force with the ability to be augmented by enablers as a mission requirements dictate. Guardian Angel is deployed in proximity to specialized aviation assets that can provide rapid access across the area of operations. Guardian Angel's ground force capabilities are employed by conducting sea, land, and air warfare tasks to recover isolated personnel and sensitive equipment. In addition to being employed as ground forces, Guardian Angel personnel can act as individual augmentees to other joint and coalition forces.
- d. Task Organization.
 - (1) Guardian Angel dive capability resides within the USAF personnel recovery dive rescue and recovery in the active and reserve components' Guardian Angel rescue squadrons. Rescue squadrons deploy with individual and team dive equipment, watercraft, and aerial delivery equipment to provide commanders a

dive search and rescue capability. See figure 8 for an illustration of a Guardian Angel organization.

(2) The theater USAF Personnel Recovery (PR) dive rescue and recovery capabilities are embedded in expeditionary rescue squadrons and may be collocated with rescue-specialized fixed- and rotary-wing aircraft. These squadrons are task organized to provide full-spectrum PR missions, including recovery of personnel and sensitive equipment.



Legend:
 ACC—Air Combat Command
 AF—Air Force
 AFRC—Air Force Reserve Command
 ANG—Air National Guard
 FW—fighter wing
 HQ—headquarter
 PACAF—Pacific Air Forces
 RAF—Royal Air Force
 ROG—rescue operations group
 RQG—rescue group
 RQS—rescue squadron
 RQW—rescue wing
 USAFE—United States Air Forces in Europe

Figure 8. USAF ACC Guardian Angel Organization

e. Concept of Employment. The USAF employs combat divers as part of the combatant commander’s personnel recovery capability and provide a rapid response search and rescue/recovery capability. USAF personnel recovery forces are designed to penetrate hostile areas to rescue/recover isolated personnel or sensitive equipment. Personnel recovery divers are open circuit or closed circuit combat divers and skilled in shallow water search and rescue/recovery operations. They can conduct dives from shore or surface craft in bodies of water at elevations up to 10,000 feet mean sea level. They can conduct personnel recovery operations up to category 3, contaminated water. Once assigned to a combatant commander, personnel recovery divers are part of the joint force air component commander’s personnel recovery force. In this capacity, they maintain an on-call alert with USAF fixed- and rotary wing aircraft to provide a quick response, in-land personnel recovery capability for combatant commanders.

3. USAF AFSOC Special Tactics Combat Divers

USAF AFSOC special tactics combat divers employ dive teams as part of special tactic teams (STTs) supporting humanitarian assistance and disaster relief operations and

special operations forces missions for special operations component commanders. Once assigned to a combatant commander, STTs are part of the joint special operations component. This capability resides within the active and guard component special tactics squadrons. Special tactics combat dive mission, capabilities, task organization and concept of employment are covered in more detail in appendix F.

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Appendix F SPECIAL OPERATIONS FORCES (SOF) DIVING

1. Overview

SOF maritime operations are options available to a commander to infiltrate and exfiltrate a detachment into or out of a designated area of operations to execute SOF missions. Examples of missions for SOF divers include: tactical reconnaissance, demolition raids against bridges or other maritime structures, and underwater searches for security and recovery (of personnel or equipment). SOF combat divers are task organized in accordance with the assigned mission, and are aligned under a joint special operations task force.

2. US Army Special Forces (SF)

- a. Mission. SF use dive operations when required to execute any mission, including infiltrating and exfiltrating into or out of a designated area of operations. Other missions for SF combat divers include tactical reconnaissance, demolition raids against bridges and other maritime structures, and underwater searches for security and recovery.
- b. Capabilities. SF combat divers use closed circuit oxygen rebreathers to make low visibility, underwater approaches to land or maritime targets. These approaches are the last legs of longer infiltration routes that may use air, surface, submarine, or a combination of movement assets. Open circuit, self-contained underwater breathing apparatus (SCUBA) diving is used for nontactical search and recovery. The following six dive mission areas are identified for SF combat divers.

Note: For detailed descriptions, see Army Techniques Publication 3-18.12(C1), *Special Forces Waterborne Operations*, 14 July 2016; Including Change 1; 23 March 2017.

- (1) Mobility.
 - (2) Counter mobility.
 - (3) Protection (physical security).
 - (4) Infiltration and exfiltration.
 - (5) Search and rescue/recovery.
 - (6) Hyperbaric chamber operations.
- c. Task Organization. Each SF battalion is comprised of three SF companies. Each company has six SF operational detachments. One detachment per company is designated as a combat dive team. Therefore, each SF battalion has three combat diving teams.
 - d. Concept of Employment. The primary objective of SF diving operations is to conduct stealthy approaches to preselected beach landing sites where the assault force transitions environments to conduct missions ashore. This may be the most advantageous avenue of approach, and combined with other movement techniques, extends infiltration and exfiltration ranges.

3. United States Marine Corps Forces, Special Operations Command (MARFORSOC)

a. Mission. MARFORSOC recruits, organizes, trains, equips, and deploys task-organized, scalable, expeditionary Marine Corps Special Operations Forces (MARSOF) worldwide to accomplish special operations missions assigned by United States Special Operations Command (USSOCOM) or geographic combatant commanders via the theater special operations commands.

b. Capabilities. MARSOF combatant divers are capable of performing the following dive mission areas:

- (1) Mobility.
- (2) Infiltration and exfiltration.
- (3) Protection (physical security).
- (4) Search and rescue/recovery.

c. Task Organization. Headquarters MARFORSOC is located at Camp Lejeune, North Carolina. Subordinate commands within MARFORSOC, that maintain a combatant dive capability, are the Marine Raider Battalions. The 1st Marine Raider Battalion is located at Camp Pendleton, California. The 2nd and 3rd Marine Raider Battalions are located at Camp Lejeune, North Carolina. Each battalion has four Marine special operations companies. Each company has four Marine special operations teams (MSOTs) with qualified combatant divers.

d. Concept of Employment. MSOT dive teams employ SCUBA, MK 25, and the diver propulsion device for subsurface, clandestine entry into nonpermissive, uncertain, or hostile environments where MSOTs transition to conduct missions that may include direct action or special sensitive reconnaissance.

4. Navy Sea-Air-Land (Team) (SEALs)

a. Mission. Navy Special Warfare Command (NAVSPECWARCOM) is the USSOCOM lead component for special operations conducted in and around all maritime environments. NAVSPECWARCOM trains, equips, organizes, provides resources for, deploys, and sustains naval special warfare (NSW) forces. This is in support of the Commander, USSOCOM and other geographic combatant commander requirements, including maritime direct action, special reconnaissance, security force assistance, and foreign internal defense.

b. Capabilities. NSW forces are tasked with maritime missions that require sophisticated combat diving skills which facilitate the clandestine approach and assault on targets by swimmers beneath, at, and from the waterline. NSW-unique combat swimming operations include:

- (1) Combat swimmer ship attack.
- (2) Underwater demolition raids.
- (3) Harbor reconnaissance.
- (4) Submerged hydrographic reconnaissance.

(5) Underwater obstacle demolition.

(6) Maritime disablement operations.

c. Task Organization. The NAVSPECWARCOM headquarters is a USSOCOM echelon II command located in San Diego, California.

(1) NSW task groups are task organized into three NSW task units, comprised of up to three platoons each. Each NSW task unit can operate as a full task unit or three individual platoons. Moreover, when NSW task units deploy, they may also include elements of a special boat detachment, a cross-functional detachment of combat support personnel (like explosives ordnance disposal or interpreters), an unmanned aerial vehicle detachment, or a combat service support detachment. In any of these configurations, NSW task groups have great flexibility in the manner they can operate, either as a small contingent, or as an integrated cell within a larger amphibious or land-based force.

(2) The SEAL delivery vehicle team has a similar NSW task unit level capability and configuration. These SEAL delivery vehicle task units conduct direct action and special reconnaissance missions from various surface and subsurface platforms in support of national and geographic combatant command priorities.

d. Concept of Employment. SEAL combat swimmers specialize in clandestine, direct action, and special reconnaissance missions in permissive and nonpermissive environments. NAVSPECWARCOM employs an array of open-circuit, semi-closed circuit, and closed circuit underwater breathing apparatuses to meet force readiness objectives.

5. United States Air Force Special Operations Command (AFSOC) Special Tactics Combat Divers

a. Mission. Special tactics units provide the interface between sea, air, and land assets to synergize the capabilities of each. They produce precise sea, air, ground, and space power effects in the operational environment for special operations and conventional forces.

b. Capabilities. AFSOC special tactics combat divers employ dive teams as part of special tactics teams (STTs) supporting humanitarian assistance and disaster relief operations and for special operations component commanders. Once assigned to a combatant commander, STTs are part of the joint special operations component. In this capacity, special tactics combat divers may be attached to other components. All special tactics core capabilities can use combat dive as a means of infiltration and exfiltration.

(1) Precision Strike. This is the ability for joint forces to locate, survey, discern, and track objectives or targets; select, organize, and use the correct munitions; generate desired effects; assess results; and reengage with decisive speed and an overwhelming operational tempo, as required. These include:

(a) Terminal control operations.

(b) Joint terminal attack control.

(2) Global Access. Global access provides capabilities from air, ground, space, and cyberspace domains to affect an adversary's warfighting capacity and to set the conditions required by joint forces. Global access enables the strategic reach of long-range missiles and multipurpose combat aircraft for a variety of complementary missions across the range of military operations. These include the following.

- (a) An assault zone assessment or survey.
- (b) Terminal control operations in support of global access.
- (c) Specialized reconnaissance.
- (d) Weather operations and environmental reconnaissance.

(3) Personnel Recovery. Personnel recovery is the ability to report, locate and positively identify; support, extricate, recover, evaluate; provide triage for, stabilize, transport to definitive care; and reintegrate personnel and equipment during SOF and humanitarian operations. STT combat divers are combat control, special tactics officer, pararescue jumper, combat rescue officer and special operations weather team. They employ and operate by sea, air, and land in all environmental conditions and terrain.

c. Task Organization. AFSOC, Hurlburt Field, Florida.

(1) Special tactics combat dive capability resides within the active and reserve component special tactics squadrons. The commander of the expeditionary special tactics unit plans, directs, and coordinates the actions of dive teams as part of STTs. The 123rd and 125th Special Tactics Squadron (STS) Air National Guard units augment the 24th Special Operations Wing during humanitarian efforts and training.

(2) AFSOC Special Tactics units' general organization is shown in figure 9.

d. Concept of Employment. Air Force STS employ open- or closed-circuit dive teams as part of the special operations component commander's forces. In this capacity, special tactics divers may be attached to other components or conduct personnel recovery in support of the joint special operations component, and may be tasked to support one or more components of a joint force during the same campaign. When employed in a forward theater of operations, special tactics assets are assigned to an expeditionary STS reporting directly to the joint special operations air component commander.

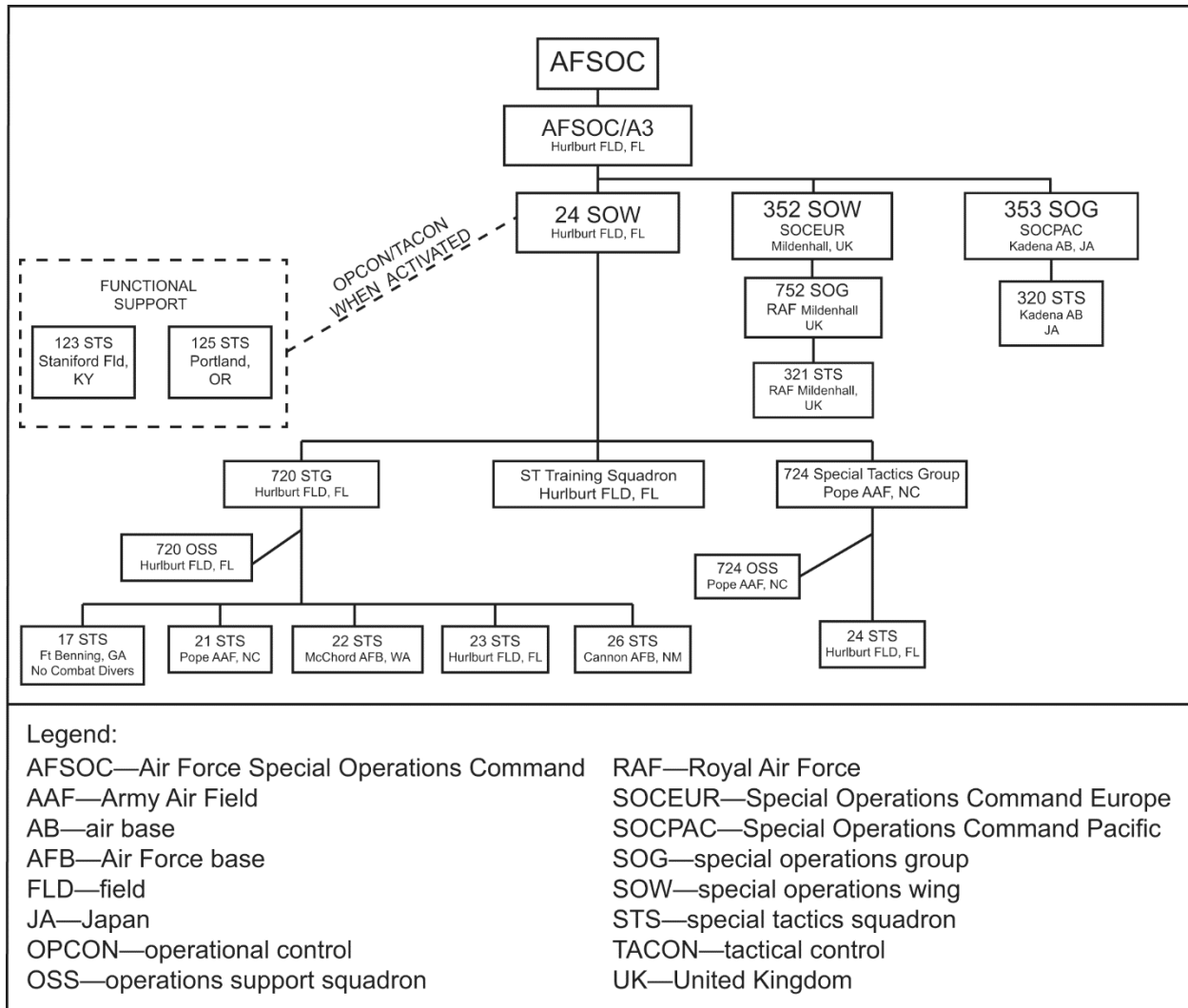


Figure 9. AFSOC Special Tactics Organization

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Appendix G

UNITED STATES COAST GUARD (USCG) DIVING

1. USCG Diver

- a. Overview. Although the UCSG is not a Department of Defense (DOD) entity, a few of its dive missions overlap with some of the DOD's dive mission areas. These include categories within mobility, protection (physical security) explosive hazard and ordnance disposal, and port and harbor clearance operations. The USCG diver is trained in self-contained underwater breathing apparatus (SCUBA), surface supplied, underwater tools, search and recovery, cold water and ice diving, and aids to navigation diving.
- b. Mission. The USCG dive mission is to provide diving capabilities and other subsurface equipment and technologies to support Service-specific requests.
- c. Capabilities. USCG divers are trained and equipped to perform the following missions.
 - (1) Ports, Waterways, and Coastal Security. USCG dive teams conduct subsurface inspections of piers, vessels, and adjacent shorelines to detect, identify, and mark underwater threats. These include mines, parasitic devices, improvised explosive devices, hazards to navigation, or other conditions that may hazard a vessel or critical infrastructure.
 - (2) Aids to Navigation. Divers provide the ability to conduct extensive, independent aid to navigation operations requiring minimal support. Divers can inspect moorings, change out buoys and chains, salvage sunken buoys, and lift buoy sinkers. Dive teams dive from small boats allowing them to work on aids to navigation in shallow water that are not accessible by buoy tenders. The ability to conduct fly-away aid-to-navigation missions in the aftermath of tropical storms affords an immediate response in the event a buoy tender cannot arrive on scene in sufficient time to reestablish commerce. This mission includes providing subsurface capabilities for aid-to-navigation units and waterways managers in support of the maritime transportation system.
 - (3) Drug Interdiction. The mission includes subsurface searches and inspections of piers, bridges, vessels, adjacent shorelines, and any other maritime infrastructure or structure to detect, identify, mark, and recover potential contraband.
 - (4) Defense Readiness. This mission includes operations, exercises, and joint training with other United States (US) military Services and allied and partner nations. This mission also includes underwater ship husbandry tasks in support of defense readiness for the underway fleet.
 - (5) Other Law Enforcement. This mission includes search and recovery of weapons, human remains, and other evidence in support of USCG law enforcement or other agencies. USCG divers provide diving subject matter expertise support for USCG investigations and case prosecution.

(6) Migrant Interdiction. This mission includes assisting in the enforcement of immigration laws at sea to interdict and process illegal and undocumented migrants as far from US shores as possible. USCG divers provide support to this mission set as requested by operational commanders.

(7) Marine Safety. This mission includes a variety of underwater tasks that support maritime safety. These include such as identification and removal of hazards to navigation, channel clearance for reestablishment of maritime transportation systems following natural or man-made disasters, and assistance in marine casualty investigations.

(8) Living Marine Resources. This mission includes environmental surveys and search/recovery of derelict fishing nets and other marine debris. It also includes oceanographic research and scientific sampling.

(9) Marine Environmental Protection. This mission includes oil spill response, hazardous materials response, other search and recovery, and investigation of hazards to the marine environment.

(10) Ice Operations. This mission includes hull maintenance, damage assessments, and repair of USCG ice breakers and other cutters operating in the high latitudes, and other mission areas requiring subsurface capabilities in the vicinity of floating ice environments. The US Navy-USCG Memorandum of Agreement on the Operation of Ice Breakers of 22 June 1965, commits the USCG to maintaining diving and salvage services in polar latitudes.

(11) Search and Rescue. This mission includes, but is not limited, underwater search, identification, and potential recovery of persons, vehicles, vessels, and aircraft.

2. Task Organization.

a. The USCG has three primary duty, regional dive lockers. Each dive locker consists of three teams of six divers plus a diving officer in charge of the locker (totaling 19 divers at each dive locker). The locations of regional dive lockers are:

- (1) Regional Dive Locker East, Portsmouth, Virginia.
- (2) Regional Dive Locker West, San Diego, California.
- (3) Regional Dive Locker Pacific, Honolulu, Hawaii.

b. Concept of Employment. USCG divers operate in teams from small-craft and pier-side applications. Divers deploy to major US ports, primarily, by commercial air, supported by prepositioned equipment trailers containing compressors, tanks, weights, and other support gear. USCG divers do not have scalable package dive teams and only deploy as necessary with their entire dive lockers. USCG divers can augment law enforcement, as needed, if the missions meet the USCG support the statutory missions.

c. Employment Considerations and Limitations.

- (1) USCG divers shall not be employed as combatants.

(2) USCG divers do not possess any explosives ordnance disposal (EOD) capabilities and are not trained or equipped to perform render-safe procedures on ordnance. If ordnance is found, EOD divers will be contacted for assistance.

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Appendix H DIVE POINT OF CONTACT LIST

When conducting planning for an operation, it is important to have knowledge of where all the diving assets are stationed across the Services. This is helpful if Services need to request diving assets across Services or would like diving assistance for an exercise or would like to request diving assets prior to a deployment. Table 6 provides a point of contact list.

Table 6. Dive Points of Contact List		
United States (US) Army		
Unit	Location	Contact Data
Chief diving supervisor; 20th Engineer brigade (BDE). It supports the US Army Training and Doctrine Command.	Fort Leonard Wood, Missouri	Commercial: 573-563-7611
74th, 86th, 511th, and 569th US Army Engineer Dive Detachments (these units fall under the 92nd Engineer Battalion, 20th Engineer BDE in Fort Leonard Wood, Missouri and support US Forces Command).	Joint Base Langley-Eustis, Virginia	Commercial: 74th: 757-878-8233 86th: 757-878-8338 511th: 757-878-8378 569th: 757-878-8333 Defense Switched Network (DSN) Prefix: 826
7th Engineer, 84th Engineer Battalion, 130th Engineer Brigade, 8th Theater Sustainment Command Dive Detachment. Supports US Pacific Command.	Joint Base Pearl Harbor-Hickam, Hawaii	Commercial: 808-448-2500/2501/2502; DSN Prefix: 315
Theater Dive Detachment (this rotation is out of Joint Base Langley-Eustis until they deploy). It supports US Central Command.	Kuwaiti Navy Base, Kuwait	Commercial: 9-011-965-975-8573/9-011-964-7128; DSN: 318-839-1066/1067
US Army Special Operations Command	Fort Bragg, North Carolina	Commercial: 910-432-2069
US Marine Corps		
I Marine Expeditionary Force (MEF), bases in California and Arizona (divers are only in Camp Pendleton, California)	Camp Pendleton, California	Commercial: 760-725-9690
II MEF Force	Camp Lejeune, North Carolina	Commercial: 910-440-7720/7725
III MEF: 3rd Reconnaissance Battalion	Okinawa, Japan	Commercial: 081-611-725-2527

Table 6. Dive Points of Contact List (Cont'd)		
US Marine Corps (Cont'd)		
3d Reconnaissance Battalion, III MEF Force Reconnaissance Company	Okinawa, Japan	Commercial: 081-611-725-5018
Marine Corps Forces, Special Operations Command (The US Marine Corps Raider Regiment only supports US Marine Corps Forces, Special Operations Command and includes 1st, 2d, and 3d Raider Battalions).	Camp Lejeune, North Carolina	Commercial: 910-451-3575
Headquarters Marine Corps, Ground Combat Element Branch for Plans, Policy, and Operations	Washington, District of Columbia	Commercial: 703-692-4306
US Navy		
Mobile Diving and Salvage Unit (MDSU) Unit 1	Pearl Harbor, Hawaii	Commercial: 808-471-9292
MDSU Unit 2	Joint Base Little Creek-Fort Story, Virginia	Commercial: 757-462-8801
Navy Seabee: Underwater Construction Team (UCT) 1	Virginia Beach, Virginia	Commercial: 757-462-3984
Navy Seabee: UCT 2	Port Hueneme, California	Commercial: 805-982-5948
Navy Regional Maintenance Center (RMC): Norfolk Naval Shipyard	Portsmouth, Virginia	Commercial: 757-443-3872
Norfolk Naval Shipyard divers	Norfolk, Virginia	Commercial: 757-444-9632
RMC and intermediate maintenance Facilities (IMFs): Southeast RMC	Mayport, Florida	Commercial: 904-270-5126, ext. 3179
RMC and IMF: Southwest RMC	San Diego, California	Commercial: 619-556-1501
RMC and IMF: Northwest RMC Puget Sound Naval Shipyard	Bremerton, Washington	Commercial: 202-781-0000
Navy RMC and IMF: Pearl Harbor Naval Shipyard and IMF	Pearl Harbor, Hawaii	Commercial: 808-368-0304
RMC and IMF: US Naval Ship Repair Facility and Japan-RMC	Yokosuka, Japan	Commercial: 011-81-46-816-4578/4579
Navy Explosive Ordnance Disposal: Explosive Ordnance Disposal Group (EODGRU) 1	San Diego, California	Commercial: 619-437-3700

Table 6. Dive Points of Contact List (Cont'd)		
US Navy (Cont'd)		
EODGRU 2	Virginia Beach, Virginia	Commercial: 757-462-8454
Navy Undersea Rescue Command	Naval Air Station, North Island, San Diego, California	Commercial: 619-545-9138
Naval Sea Systems Command (NAVSEA) Supervisor of Salvage and Diving/Director of Ocean Engineering	Washington Navy Yard, Washington, District of Columbia	Commercial: 202-781-1731/3453; Fax: 202-781-4588 Emergency NAVSEA duty officer : 202-781-3889
Naval Special Warfare Command	San Diego, California	Commercial: 619-522-2825;
Naval Special Warfare Group 3: Undersea Proponent	Pearl Harbor, Hawaii	Commercial: 808-472-0544;
US Air Force		
Headquarters Air Force, Special Operations and Personnel Recovery Division US Air Force Dive Program Manager	Pentagon, Washington, District of Columbia	Commercial: 703-695-4522; DSN 225-4522; Email: usaf.pentagon.af.a3.mbx.a3xx-workflow@mail.mil
Air Combat Command (Guardian Angels)	Joint Base Langley-Eustis, Virginia	Commercial: 757-225-8171; DSN 575-8171; email: ACC/A3J.Personnel.Recovery-02@us.af.mil
Air Force Special Operations Command dive program manager	Hurlburt Field, Florida	Commercial: 850-884-4868; DSN: 579-4868; email: AFSOC.A3V.BattlefieldAmnOrg@us.af.mil
US Coast Guard		
Coast Guard Diving Program: Commandant	Washington, District of Columbia	Commercial: 202-372-1294
Coast Guard Dive Force Management	Alameda, CA	Commercial: 510-437-3659

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Appendix I COMMON EQUIPMENT

1. Description of Common Equipment

Note: Dive units have multiple equipment packages based on the type of mission and term of deployment. Contact units for transportation considerations since most packages are scalable to meet mission requirements.

- a. **Rebreather.** Rebreathers are closed-circuit oxygen or mixed-gas underwater breathing apparatuses primarily used by the United States Special Operations Command community. This equipment combines the mobility of a free-swimming diver with the depth advantages of mixed gas. The term closed circuit refers to the recirculation of 100 percent of the mixed-gas breathing medium and results in bubble free operations. There are multiple rebreathers across the Services, these include the MK 25 and MK 16.
- b. **Self-Contained Underwater Breathing Apparatus (SCUBA).** SCUBA Divers do not need to be tethered. SCUBA divers are limited by the amount of air in their tanks and to currents up to one knot.
- c. **Surface Supplied Diving.** Divers are tethered by an umbilical which provides surface-stored air to the diver. Surface supplied equipment gives a diver relatively unlimited air and allows dives to depths of 190 feet of seawater (FSW) using air or 300 FSW using mixed gas (helium and oxygen). A diver using surface-supplied diving equipment can work in currents up to 2.5 knots without the aid of additional weight and equipment. Surface-supplied divers have limited mobility based on the length of their air supply hose, typically 300 to 600 feet.

2. Equipment Capabilities by Service

Table 7 provides an overview of which units use each piece of common equipment.

Table 7. Common Equipment			
Dive Unit	Diving Apparatus	Depth (FSW)	Minimum Manning (For use of equipment)
Army			
Engineer Diver	SCUBA	190	4
	Surface supplied	190	5
Special Forces	SCUBA	190	4
	MK 25	50	5
Marine Corps			
Combat Diver	SCUBA	190	4
	MK 25	50	6

Table 7. Common Equipment (Cont'd)			
Dive Unit	Diving Apparatus	Depth (FSW)	Minimum Manning (For use of equipment)
Navy			
Mobile Diving Salvage Units, Regional Maintenance Centers, Underwater Rescue Command	SCUBA	190	4
	MK 16	300	4
	Surface supplied	190 Air	5
		300 HeO2	12
Underwater Construction Team	SCUBA	190	4
	Surface supplied	190 Air	5
Explosive Ordnance Disposal	SCUBA	190	4
	MK 16	300	4
	Viper	50	4
Sea-Air-Land (Team)	SCUBA	190	4
	MK 16	300	5
	MK 25	50	5
	MODE	50	5
Air Force			
Special Tactics	SCUBA	190	4
	MK 25	50	5
	SCUBA	190	4
Coast Guard			
Diver	SCUBA	190	4
	Surface supplied	190	6
Operational Considerations:			
<ul style="list-style-type: none"> • A hyperbaric chamber may be required for any dive based on risk and planning considerations. • SCUBA dives deeper than 100 FSW require additional equipment and risk assessment mitigation. This diving is not common. 			
Notes:			
1. MK 25 and MK 16 are closed circuit, mixed gas, underwater breathing apparatuses.			
2. Viper is a closed circuit, mixed-gas rebreather model.			
Legend:			
FSW—feet of sea water			
HeO2—helium and oxygen			
MODE—modular oxygen diving equipment			
SCUBA— self-contained underwater breathing apparatus			

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GLOSSARY

ABBREVIATIONS AND ACRONYMS

A

ACC	Air Combat Command
AFSOC	Air Force Special Operations Command
AFTTP	Air Force tactics, techniques, and procedures
ALSA	Air Land Sea Application [Center]
ATP	Army techniques publication

B

BDA	battle damage assessment
BDE	brigade

C

CCDR	combatant commander
CCMD	combatant command
CNO	Chief of Naval Operations

D

DHS	Department of Homeland Security
DSCA	defense support of civil authorities
DOD	Department of Defense
DSN	Defense Switched Network

E

EOD	explosives ordnance disposal
EODGRU	explosive ordnance disposal group

F, G

FHA	foreign humanitarian assistance
FSW	feet of seawater

H

HQ	Headquarters
HQMC	Headquarters, Marine Corps

I

IED	improvised explosive device
IMF	intermediate maintenance facility

J, K

JCS	Joint Chiefs of Staff
JLOTS	joint logistics over-the-shore

JP	joint publication
JTF	joint task force
L	
LeMay Center	Curtis E. LeMay Center for Doctrine Development and Education
LOTS	logistics over-the-shore
M	
MARFORSOC	Marine Forces Special Operations Command
MARSOF	Marine Corps Special Operations Forces
MCM	mine countermeasures
MCRP	Marine Corps reference publication
MDSU	mobile diving and salvage unit
MEF	Marine expeditionary force
MEU	Marine expeditionary unit
MMS	marine mammal system
MSOT	Marine special operations team
MTTP	multi-Service tactics, techniques, and procedures
N	
NAVFAC	Naval Facilities Engineering Command
NAVSEA	Naval Sea Systems Command
NAVSPECWARCOM	Navy Special Warfare Command
NSW	Navy special warfare
NTRP	Navy tactical reference publication
NTTP	Navy tactics, techniques, and procedures
O	
OPDS	offshore petroleum discharge system
OPNAV	Office of the Chief of Naval Operations
P, Q	
PR	personnel recovery
PLT	platoon
R	
ROV	remotely operated vehicle
S	
SALM	single-anchor leg-mooring

SCUBA	self-contained underwater breathing apparatus
SF	special forces
SOF	special operations forces
STS	special tactics squadron
STT	special tactics team
	T
TYCOM	type commander
	U
UCT	underwater construction team
US	United States
UUV	unmanned underwater vehicle
UXO	unexploded ordnance
	V, W, X, Y, Z
VSW	very shallow water

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