NONRESIDENT
TRAINING
COURSE

December 1994

# Mineman, Volume 1

## NAVEDTRA 14152

**Although the words "he," "him," and "his" are used sparingly in this course to enhance communication, they are not intended to be gender driven or to affront or discriminate against anyone.**

# PREFACE

By enrolling in this self-study course, you have demonstrated a desire to improve yourself and the Navy. Remember, however, this self-study course is only one part of the total Navy training program. Practical experience, schools, selected reading, and your desire to succeed are also necessary to successfully round out a fully meaningful training program.

**COURSE OVERVIEW**: In completing this nonresident training course, you will demonstrate a knowledge of the following areas by correctly answering questions on the broad topics of mine warfare, including history of mines, types of mines, mine actuation and planting methods, minefields, U.S. Navy organization as it relates to the mine force, quality and safety programs as they relate to mine warfare, mine production and processing, special incident reports, mine assembly training, and command inspections.

**THE COURSE**: This self-study course is organized into subject matter areas, each containing learning objectives to help you determine what you should learn along with text and illustrations to help you understand the information. The subject matter reflects day-to-day requirements and experiences of personnel in the rating or skill area. It also reflects guidance provided by Enlisted Community Managers (ECMs) and other senior personnel, technical references, instructions, etc., and either the occupational or naval standards, which are listed in the *Manual of Navy Enlisted Manpower Personnel Classifications and Occupational Standards*, NAVPERS 18068.

**THE QUESTIONS**: The questions that appear in this course are designed to help you understand the material in the text.

**VALUE**: In completing this course, you will improve your military and professional knowledge. Importantly, it can also help you study for the Navy-wide advancement in rate examination. If you are studying and discover a reference in the text to another publication for further information, look it up.

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*MNCM M.D. Femrite*

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## Sailor's Creed

**"**I am a United States Sailor.

I will support and defend the Constitution of the United States of America and I will obey the orders of those appointed over me.

I represent the fighting spirit of the Navy and those who have gone before me to defend freedom and democracy around the world.

I proudly serve my country's Navy combat team with honor, courage and commitment.

I am committed to excellence and the fair treatment of all."

# TABLE OF CONTENTS

# SUMMARY OF THE MINEMAN TRAINING SERIES

This series of training manuals was developed to replace the *Mineman 3 & 2* and *Mineman 1 & C* training manuals. The content is directed toward personnel working toward advancement in the Mineman rating.

The five volumes in this series are based on major topic areas with which the Mineman should be familiar. Their topics include the following areas:

Volume 1: Mine warfare, operations, and organization.

Volume 2: Mine shop administration and supply.

Volume 3: Mine maintenance and explosive materials.

Volume 4: Mines and mine components.

Volume 5: Exercise and training mines.

# INSTRUCTIONS FOR TAKING THE COURSE

## ASSIGNMENTS

The text pages that you are to study are listed at the beginning of each assignment. Study these pages carefully before attempting to answer the questions. Pay close attention to tables and illustrations and read the learning objectives. The learning objectives state what you should be able to do after studying the material. Answering the questions correctly helps you accomplish the objectives.

## SELECTING YOUR ANSWERS

Read each question carefully, then select the BEST answer. You may refer freely to the text. The answers must be the result of your own work and decisions. You are prohibited from referring to or copying the answers of others and from giving answers to anyone else taking the course.

## SUBMITTING YOUR ASSIGNMENTS

To have your assignments graded, you must be enrolled in the course with the Nonresident Training Course Administration Branch at the Naval Education and Training Professional Development and Technology Center (NETPDTC). Following enrollment, there are two ways of having your assignments graded: (1) use the Internet to submit your assignments as you complete them, or (2) send all the assignments at one time by mail to NETPDTC.

**Grading on the Internet:** Advantages to Internet grading are:

- you may submit your answers as soon as you complete an assignment, and
- you get your results faster; usually by the next working day (approximately 24 hours).

In addition to receiving grade results for each assignment, you will receive course completion confirmation once you have completed all the assignments. To submit your assignment answers via the Internet, go to:

**http://courses.cnet.navy.mil**

**Grading by Mail:** When you submit answer sheets by mail, send all of your assignments at one time. Do NOT submit individual answer sheets for grading. Mail all of your assignments in an envelope, which you either provide yourself or obtain from your nearest Educational Services Officer (ESO). Submit answer sheets to:

COMMANDING OFFICER
NETPDTC N331
6490 SAUFLEY FIELD ROAD
PENSACOLA FL 32559-5000

**Answer Sheets:** All courses include one "scannable" answer sheet for each assignment. These answer sheets are preprinted with your SSN, name, assignment number, and course number. Explanations for completing the answer sheets are on the answer sheet.

**Do not use answer sheet reproductions:** Use only the original answer sheets that we provide—reproductions will not work with our scanning equipment and cannot be processed.

Follow the instructions for marking your answers on the answer sheet. Be sure that blocks 1, 2, and 3 are filled in correctly. This information is necessary for your course to be properly processed and for you to receive credit for your work.

## COMPLETION TIME

Courses must be completed within 12 months from the date of enrollment. This includes time required to resubmit failed assignments.

## PASS/FAIL ASSIGNMENT PROCEDURES

If your overall course score is 3.2 or higher, you will pass the course and will not be required to resubmit assignments. Once your assignments have been graded you will receive course completion confirmation.

If you receive less than a 3.2 on any assignment and your overall course score is below 3.2, you will be given the opportunity to resubmit failed assignments. **You may resubmit failed assignments only once.** Internet students will receive notification when they have failed an assignment--they may then resubmit failed assignments on the web site. Internet students may view and print results for failed assignments from the web site. Students who submit by mail will receive a failing result letter and a new answer sheet for resubmission of each failed assignment.

## COMPLETION CONFIRMATION

After successfully completing this course, you will receive a letter of completion.

## ERRATA

Errata are used to correct minor errors or delete obsolete information in a course. Errata may also be used to provide instructions to the student. If a course has an errata, it will be included as the first page(s) after the front cover. Errata for all courses can be accessed and viewed/downloaded at:

**http://www.advancement.cnet.navy.mil**

## STUDENT FEEDBACK QUESTIONS

We value your suggestions, questions, and criticisms on our courses. If you would like to communicate with us regarding this course, we encourage you, if possible, to use e-mail. If you write or fax, please use a copy of the Student Comment form that follows this page.

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E-mail: n311.products@cnet.navy.mil
Phone: Comm: (850) 452-1548
DSN: 922-1548
FAX: (850) 452-1370
(Do not fax answer sheets.)
Address: COMMANDING OFFICER
NETPDTC N311
6490 SAUFLEY FIELD ROAD
PENSACOLA FL 32509-5237

**For enrollment, shipping, grading, or completion letter questions**

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## NAVAL RESERVE RETIREMENT CREDIT

If you are a member of the Naval Reserve, you may earn retirement points for successfully completing this course, if authorized under current directives governing retirement of Naval Reserve personnel. For Naval Reserve retirement, this course is evaluated at 3 points. (Refer to *Administrative Procedures for Naval Reservists on Inactive Duty*, BUPERSINST 1001.39, for more information about retirement points.)

# Student Comments

**Course Title:** *Mineman, Volume 1*

**NAVEDTRA:** 14152 **Date**: _____

**We need some information about you**:

Rate/Rank and Name: _____ SSN: _____ Command/Unit _____

Street Address: _____ City: _____ State/FPO: _____ Zip _____

**Your comments, suggestions, etc**.:

**Privacy Act Statement:** Under authority of Title 5, USC 301, information regarding your military status is requested in processing your comments and in preparing a reply. This information will not be divulged without written authorization to anyone other than those within DOD for official use in determining performance.

NETPDTC 1550/41 (Rev 4-00

# CHAPTER 1

# INTRODUCTION TO MINE WARFARE

**LEARNING OBJECTIVES**

Upon completing this chapter, you should be able to do the following:

1. Summarize the history of mines and their development.
2. Describe the types of mines and their categories.
3. Describe how mines are actuated.
4. Describe the methods of planting mines and the advantages and disadvantages of each method.
5. Describe the types and purposes of minefield.
6. Describe how the mine force fits within the larger structure of the U.S. Navy.
7. Describe how the mine force fits within the administrative organization of the Department of the Navy.
8. Describe how the mine force fits within the operational organization of the Department of the Navy.

A mine is specifically defined in the *Department of Defense Dictionary of Military and Associated Terms*, Joint Publication 1-02, as follows:

> In naval mine warfare, an explosive device laid in the water with the intention of damaging or sinking ships or of deterring shipping from entering an area. The term does not include devices attached to the bottoms of ships or to harbor installations by personnel operating underwater, nor does it include devices which explode immediately on expiration of a predetermined time after laying.

Mines fill an important role in naval warfare. The mines discussed in this training manual are sea mines. You, as a Mineman, should be thoroughly familiar with the different mines and their uses. Therefore, this chapter provides you with a brief history of mines and their development; information on mine types; the methods of planting and the advantages and disadvantages of each method; and the purposes of defensive, protective, and offensive minefield. This chapter also describes how the mine force fits within the larger structure of the U.S. Navy.

For additional information relating to the mine warfare program, consult the recommended reading list at the end of this chapter.

## MINE HISTORY

The Chinese were the first people to use explosives underwater. After they discovered that explosives perform in the same manner underwater as they do underground, they placed charges under enemy riverboats to destroy them. Thus, the idea of mining became associated with underwater explosions.

A forerunner of the naval mine was devised by a Belgian engineer named Geanibelli, who was tasked to destroy the Bridge of Parma. He loaded an old ship with gunpowder and equipped the ship with a

clockwork ignition device, thereby making the ship, in effect, a floating mine.

In 1776, the first known sea mine was invented by an American, David Bushnell. Bushnell's mine was a simple, watertight wooden keg, shown in figure 1-1. Loaded with gunpowder and fitted with a gunlock and hammer, it hung from a float and, at that time, was called a torpedo. The device exploded by impact when the keg floated against a ship.

Although numerous incidents proved their destructive force, mines were considered too tricky, dangerous, and hard to handle to win a place with most early navies. The mines often exploded unexpectedly and at the wrong times. American ingenuity, however, found ways to refine the naval mine. Consequently, much of our naval history involves mines.

## MINES BEFORE WORLD WAR II

Mines were first used in this country during the Civil War. After their successful use in that war, our country has used them in most subsequent conflicts.

### Mines in the Civil War

During the Civil War, Robert Fulton, who was best known for his invention of the steamship, devoted a good part of his life to the successful experimentation with underwater mines. In the Civil War, the Confederates defended Vicksburg by floating mines down the Mississippi River.

The first recorded successful use of a mine occurred in 1863 when the gunboat USS *Cairo* was struck by mines in the Yazoo River. A year later, a field of 80 mines, which for the first time had safety devices, was laid to defend the city of Mobile, Alabama. The monitor USS *Tecumseh,* which led the Union fleet in attacking the city, was struck by a mine.

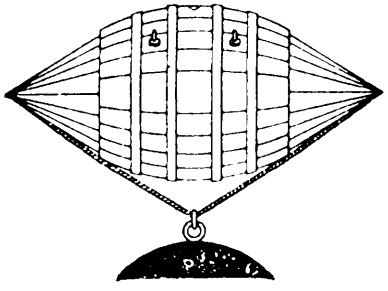


**Figure 1-1.—Bushnell's keg mine.**

This is the battle in which the victorious Admiral Farragut is famous for having said, "Damn the torpedoes [mines], Captain Drayton, go ahead! Jouett, full speed ahead!" History might have read somewhat differently but for the fact that, after the battle, the Federal forces discovered that the Confederate mines were inert due to immersion and wave action.

The Confederate mining efforts, on the whole, were remarkably successful. The record shows that of the ships sunk or damaged by mines during the Civil War, only one Confederate ship, the CSS *Albermarle,* was sunk by Union mines. Of the 35 ships sunk by Confederate mines, 3 were Confederate ships sunk by their own mines that had broken loose from their moorings.

Although mine developments up to that time were important, they had little practical significance. However, those developments provided the background for the first effective use of mines in warfare.

### Mines between the Civil War and World War I

Between the end of the Civil War and the beginning of World War I, very little happened in the United States to advance the development of mines. This country relied on buying obsolete mines from other countries.

Although the United States was not involved in the Russo-Japanese War of 1904, mines played a decisive role in that war. It was during that time that mines had their first use in a naval action at sea. The Japanese lured the Russian fleet through the Japanese minefield, resulting in the loss of the Russian battleship *Petropavlovsk.* Admiral Makaroff, who had refused to change course because he did not consider mines dangerous, lost his life in this minefield. The Russo-Japanese War, in which the Russians sank more Japanese ships by mines than by any other form of attack, proved that mines were formidable weapons.

### Mines in World War I

The United States had done very little to advance mine warfare. However, in 1917 when the United States entered World War I, many American inventors proposed various mine schemes. One such scheme noted that when a steel ship came in contact with a copper wire, it produced a galvanic current that could be used to fire a mine.

Much enthusiasm developed in the Bureau of Ordnance (BUORD) for the mine project. The Secretary of the Navy (SECNAV) authorized the bureau to procure 100,000 Mk 6 mines, shown in figure 1-2, to be used in the North Sea barrage. The mines were assembled at the rate of 6,000 a week. (The original number of mines required for this operation was 300,000. However, with the invention of the galvanic antenna firing mechanisms, the quantity was reduced to 100,000 mines.)

Through 30 October 1918, the United States had planted 56,611 American-made mines, and the British had planted 16,300 of their mines. This barrage, the greatest in history, was about 230 miles long and 15 to 25 miles wide. The barrage contributed to the mutiny of the German Navy in the last days of the war. When the Germans surrendered in November 1918, the United States and Great Britain were left with large stores of mines. See figure 1-3 for the depiction of a World War I mine and the barrage.

### Mines after World War I

In 1919, a building was set aside and an activity was created to improve mines. The BUORD was reluctant to designate this new organization as anything more than a building. However, 10 years later, a small experimental ammunition unit was included in the organization, which was called the Naval Ordnance Laboratory (NOL). For the first time, the functions of material design, reliability, and explosive safety were the responsibility of only one activity. The tasks of the laboratory were to (1) investigate the magnetic and acoustic influences of ships, (2) design a magnetic firing device, and (3) design a 21-inch cylindrical mine that could be laid by submarines with standard torpedo tubes.

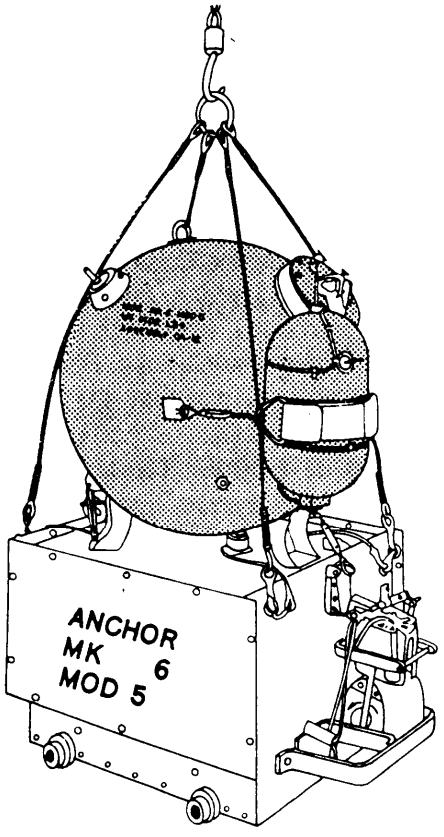



**Figure 1-2.—Mk 6 mine.**

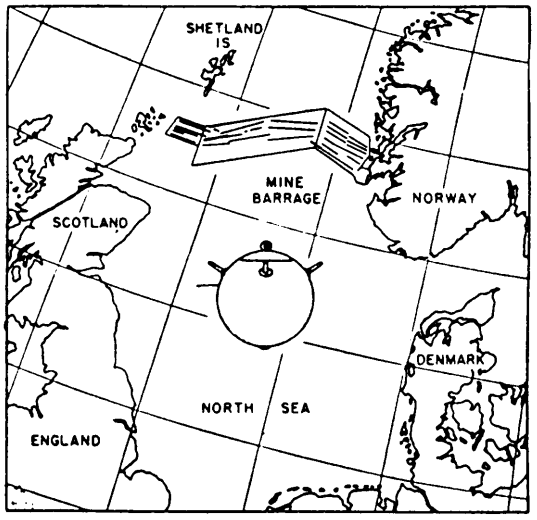



**Figure 1-3.—World War I mine and North Sea barrage.**

## MINES IN WORLD WAR II

In 1940, the NOL decided to copy the mechanism of a German magnetic mine received from the British. Since the mechanism required a nonmagnetic case, the United States manufactured replicas of the German magnetic mine mechanism and placed them in aluminum mine cases. These devices were used early in World War II as Mk 12 mines.

### Mines in the Pacific Theater

In October 1942, mines were laid in approaches to Bangkok, Thailand; Haiphong, (North) Vietnam; and the Hainan Strait, south of China. The mines, laid by submarines, immediately sank six ships and damaged six more. A total of 421 mines, planted by submarines in 21 areas, sank 27 ships and damaged another 27 ships.

About the same time that the Mk 12 mine was developed, the NOL initiated designs for several new mines that would respond to magnetic, acoustic, and/or pressure influences of ships. Other influences (such as gravitational, optical, cosmic ray, and electrical) were considered impractical and, therefore, were rejected. The mines were designed to be

launched from aircraft and to lie on the bottom after planting. Other features of these mines included (1) various sensitivity settings, (2) clock delay arming devices, (3) electrolytic sterilizers, and (4) ship counters.

The Mk 36 series mine contained 500 pounds of high explosives, while the Mk 25 series mine contained 1,000 pounds. Under the direction of the BUORD, the NOL started production of both mines in 1941. In 1944, the mines began to be delivered in quantities.

The Mk 25 and Mk 36 mines were used against the Japanese during Operation Starvation in the last 4 months of World War II. To carry out the operation, the Navy turned to the Army Air Force for the B-29 aircraft, which had the capability of carrying twelve 1,000-pound mines to destinations as far away as 1,500 miles (3,000 miles round trip).

On 22 December 1944, the Army Air Force issued orders for mining operations to begin on 1 April 1945. After the order was issued, the Navy moved a team of mine experts to Tinian Island in the Mariana Islands. One month later, the Navy had a mine assembly depot completed and in operation on the island.

The first minelaying in that operation occurred on 27 March 1945. The mines were planted in the Shimonoseki Strait, between the Japanese islands of Honshu and Kyushu. A total of 12,000 mines were planted in and around the Japanese main island of Honshu, and an additional 13,000 mines were planted in harbors and channels surrounding the newly extended Japanese Empire.

### Mines in the Atlantic Theater

The British and the Germans also used mines during World War II, with devastating results. The British vessels sunk by German mines included 280 combatant and 296 merchant ships. The German fleet lost 250 combatant and 800 merchant ships to British mines. German mines destroyed 22 percent of the landing craft lost by the United States and British navies in landing operations in 1944 and 1945.

The Germans even planted 266 mines in the Atlantic Ocean along the eastern seaboard of North America, including 36 mines off Charleston, South Carolina. Nine ships were either sunk or damaged as a result of these mines.

## MINES AFTER WORLD WAR II

After World War II, it was believed that the days of mine warfare were over, a conclusion that proved to be premature. Their usage again became apparent during both the Korean and Vietnam wars.

### Mines in the Korean War

The North Koreans mined Wonson Harbor. The minefield consisted of 3,000 Russian mines, which included new ground mines, as well as moored mines of 1904 vintage. As in the past, mines proved to be very effective weapons.

Mine warfare in the Korean War was a shock to the U.S. Navy. As a result of the lesson learned in Korea, the Navy followed a more balanced approach to mine warfare in the 1950s. The development of the Mk 50 series influence mines with modular features provided the Navy with the 1,000-pound Mk 52 and 2,000-pound Mk 55 aircraft-laid bottom mines. These mines were sensitive to three influences of six variations. In the early and middle 1960s, two magnetic-influence moored mines became operational: (1) the aircraft-laid Mk 56, made of stainless steel; and (2) the submarine-laid Mk 57, made of fiber glass.

### Mines in the Vietnam War

Mine warfare was next used in the war with North Vietnam, when the United States planted more mines than it did in all previous conflicts combined. Most of the mines used in Vietnam were modified versions of the low-drag aircraft bomb of the Mk 80 series. The modification was the result of the efforts of Gene Beach and Charles Rowsee at the White Oak Laboratory in Maryland, where the Mk 75 destructor adaption kit was developed. The kit permitted the conversion of the Mk 80 series bombs into magnetic mines known as destructors. The destructors could be used both on land and in the water. Ease in assembly permitted the use of over 250,000 of the destructors during the Vietnam War.

The destructors and other mines were used effectively in the mining of Haiphong Harbor and other North Vietnam ports. The mining operations were designed to prevent ships from leaving and entering the harbor and ports. Mining of Haiphong Harbor was accomplished with approximately 100 Mk 52 mines and 11,000 destructor mines. The

operation was successful and, once again, highlighted mine usage in warfare.

## MINES TODAY

Today's mines are designed for deployment against many types of ships to achieve a variety of results. However, to meet the challenges of the missions that they may be called upon to perform, mines are becoming increasingly complex. Moreover, the number of these missions is so large that no one mine can serve all purposes. Therefore, the Navy stockpiles many types of mines with the necessary built-in versatilities to provide the options needed for a wide array of missions.

As previously mentioned, all mines discussed in this training manual are sea mines; i.e., those mines that are placed in deep or shallow waters, coastal areas, harbor entrances, rivers, canals, and estuaries. Sea mines also include destructors, which are general-purpose bombs containing influence-firing mechanisms.

Some mines with small explosive charges are designed only for use against riverboats and wooden vessels of small displacement. Some mines with large charges can destroy or damage most capital ships. Still, other mines are intended primarily for use against submarines.

Although mines are becoming increasingly complex (largely because of the intelligence built into their firing systems), the same technology that has made mines more complex in some ways has made them simpler in others. For example, the newer mines have features which make assembly, testing, and stowing much easier and safer than was possible with the older, less-complex mines.

The advantages of mines over other weapons include the following characteristics:

- Mines lie in wait for the enemy without accepting a return threat.
- Mines can win battles passively by influencing the enemy to retire without attacking.
- Mines can be successful in confining ships to a certain area where they can be attacked by other means.
- Mines can cause ships to take longer alternate routes.
- Mines are a continuous menace to enemy morale.
- Mines can attack targets that human controllers cannot see or hear.
- Mine effectiveness is measurable in delays caused to enemy operations.
- Mines can cause the enemy to expend effort and material on countermeasures that otherwise are not productive and would not be necessary.
- Mines are cost-effective in that their targets are very valuable. The cost to the enemy when a target is destroyed is often far greater than the combined cost of the mines and the laying of those mines.

## MINE TYPES

When mines are classified according to the position they assume in the water, they fall into three categories: (1) bottom mines, (2) moored mines, and (3) drifting mines.

### BOTTOM MINES

Bottom mines are most effective in comparatively shallow waters. A large negative buoyancy brings the bottom mine to rest on the ocean floor and keeps it there. In very deep waters, surface vessels may pass over the mine without actuating its firing mechanisms or, in the event of an actuation, without suffering much damage. Bottom mines planted in deep water are still effective against submarines.

### MOORED MINES

Moored mines are used for deep-water planting and are effective against submarines and surface ships. The explosive charge and the firing mechanism in a moored mine are housed in a positive-buoyancy case; i.e., one that tends to float. A cable, attached to an anchor on the sea bottom, holds the case at a predetermined depth below the surface.

### DRIFTING MINES

Drifting mines float freely at or near the surface. They have no anchoring devices, and their buoyancy is approximately neutral. The use of drifting mines was limited by the Hague Convention of 1907 and are no longer in the U.S. Navy's stockpile of mines.

## MINE ACTUATION METHODS

Mines may also be described by their actuation, or detonation, methods. This description includes three types of mines: (1) contact mines, (2) controlled mines, and (3) influence mines. The U.S. Navy has no contact or controlled mines in service use. Therefore, the following paragraphs on contact and controlled mines are presented only for information.

### CONTACT MINES

Contact mines are actuated by the contact of the mine cases, or their attachments, with a target. They guard a narrower path than the influence mines and are generally more vulnerable to enemy countermeasures. Their principal advantage is logistic, as they can be produced more cheaply than influence mines. Although the U.S. Navy does not use contact mines, they are still used by some nations in situations where the disadvantages are acceptable, as in protective or unprotective minefield.

### CONTROLLED MINES

Controlled mines can be rendered safe, or they can be armed or fired at will from a central control station. Control mines, intended for protective use, have a limited operational utility. The U.S. Navy does not use controlled mines, but some nations, particularly those in close proximity to restricted international waterways, retain controlled mines because of the mine's unique advantage of permitting positive target selection.

### INFLUENCE MINES

Influence mines are actuated by the effects of targets on the physical environments of the mines. The major operational advantage of the influence mine is that the target need not contact the mine case, thus providing greater actuation range. The U.S. Navy has only influence mines in its arsenal.

## MINE PLANTING METHODS

When mines are classified according to the method by which they are delivered, they again fall into three categories: (1) aircraft-laid mines, (2) submarine-laid mines, and (3) surface-laid mines.

### AIRCRAFT-LAID MINES

Aircraft carry mines the same way they carry bombs or torpedoes, internally (inside the bomb bay) or externally (on wing stations). The following are some of the advantages of aircraft-laid mines:

- Aircraft can carry mines into enemy-held areas where minefield can be reseeded over a long period of time without danger to the aircraft from previously planted mines.
- Aircraft can plant mines in enemy-held shallow coastal waters where other planting methods cannot be used.
- Aircraft mine laying is an effective planting method for blockading enemy shipping lanes. However, a disadvantage is that this type of planting cannot be done in secrecy.

### SUBMARINE-LAID MINES

Planting mines by submarine has an advantage over surface craft and aircraft, as mining operations can be done in secrecy and at a great distance from the homeport. A disadvantage of using submarines is that they can carry only a limited quantity of mines. In addition, submarines must avoid the mined area for the armed life of the mines. Therefore, it would be unsafe for submarines to enter and reseed an established minefield.

### SURFACE-LAID MINES

The surface-craft method of laying mines is used where secrecy is not of primary importance. This form of minelaying is usually performed by high-speed minelayers. A surface minelayer can carry a large number of mines and can lay a large minefield in a relatively short time. At the time of this writing, the Navy has no surface minelayers in commission. However, the Navy does have several types of cargo ships that can be used to surface launch the Mk 60 mine.

## MINEFIELD TYPES

Fundamentally, mining should achieve its objective by making an area unsafe for passage of traffic. A minefield is an application of the capability of available mines and delivery vehicles to the problem at hand. Mines are not normally used just one at a time, but are used as a group to establish a minefield. Each minefield is planted for a defensive,

protective, or offensive purpose. The design of a minefield depends on the purpose of the field, including (1) the expected enemy traffic, (2) the type and number of mines available, (3) the field's geographic location, (4) the amount of enemy countermeasures to which it will be subjected, and (5) the laying agents to be used.

### DEFENSIVE MINEFIELDS

Defensive minefield are laid in extra-territorial or neutral waters, and are designed to hold back the opposition. We try to keep the enemy guessing at all times about our minefield, but in some cases, the defensive field is well advertised so that the enemy will know it is there. The field then becomes more effective, since the enemy may decide not to enter those waters because of the existing danger. We still use the mined waters for our own shipping, and we supply accurate charts to friendly ships that need them. Some of the reasons defensive minefield are used are to

- provide permanent defense of harbors and anchorages,
- protect coastal shipping lanes from seaward attack,
- protect assembly points for convoys,
- provide submarine traps, and
- protect against invasion.

### PROTECTIVE MINEFIELDS

Protective minefield are laid in friendly territorial waters to protect our own and friendly terminal areas, shores, and their approaches. Therefore, the fields differ in purpose as well as in the likely degree of enemy opposition.

### OFFENSIVE MINEFIELDS

Offensive minefield take the action to the enemy. They are planted in enemy-held or disputed waters to disrupt enemy shipping by destroying or damaging the enemy's ships or by making areas unusable because the threat of losses is too great. In contrast to defensive and protective mining, offensive mining poses the most direct threat to the enemy and, once completed, none to own forces. Whenever possible, offensive mining should commence early in the conflict with the most appropriate countermeasures-resistant mines available for two reasons: (1) to present an early danger, and (2) to lessen the need for hazardous early replenishment. The United States used an offensive minefield very effectively in Haiphong Harbor during the Vietnam War.

## U.S. NAVY AND MINE FORCE ORGANIZATIONS

The mine force plays a very important role within the Department of the Navy (DON). This section describes some of the major components of this department and shows how the mine force fits within this organization.

### U.S. NAVY ORGANIZATION

The following paragraphs discuss the three major organizational components of the U.S. Navy that relate to the mine force: (1) the Navy Department, (2) the naval shore establishment, and (3) the naval operating forces.

#### Navy Department

The Navy Department refers to the central executive offices of the Department of the Navy located at the seat of the government. It is organizationally comprised of the Office of the Secretary of the Navy and the Office of the Chief of Naval Operations. The DON is separately organized under the Secretary of the Navy (SECNAV). It operates under the authority, direction, and control of the Secretary of Defense (SECDEF).

#### Naval Shore Establishment

The naval shore establishment is comprised of shore activities. These activities have defined missions approved for establishment by the SECNAV.

#### Naval Operating Forces

The naval operating forces comprise the several fleets and seagoing forces. In addition, the President or the SECNAV may assign other forces and activities to the naval operating forces.

### MINE FORCE ORGANIZATION

The mine force organization has both administrative and operational chains of command. This section discusses those chains and describes the two major mine force commands.

#### Mine Force Chains of Command

The chain of command is the succession of the commanding officer or the officer in charge, from a

**Table 1-1.—Designations and Locations of MOMAG Activities**

| ACTIVITY | LOCATION |
|---|---|
| Unit 1 | Seal Beach, California |
| Unit 3 | Colts Neck, New Jersey |
| Unit 5 | Sigonella, Sicily |
| Unit 8 | Guam, Mariana Islands |
| Detachment 10 | Kadena, Okinawa, Japan |
| Unit 11 | Charleston, South Carolina |
| Unit 12 | Misawa, Honshu, Japan |
| Unit 14 | Yorktown, Virginia |
| Unit 15 | Ingleside, Texas |

superior to a subordinate, through which command is exercised. There are two coexisting chains of command: (1) administrative, and (2) operational.

Before 1975, mine shops around the world were divisions of various naval magazines or ordnance facilities. This arrangement frequently put the magazine's priorities above those of the mine shop's, resulting in Minemen often being assigned to divisions outside their rating. On 1 July 1975, the reorganization of the mine force resulted in the establishment of both the Commander, Mine Warfare Command (COMINEWARCOM) and the Commander, Mobile Mine Assembly Group (COMOMAG). This reorganization established MOMAG detachments and units located around the world. Table 1-1 shows the designations and locations of these activities.

**ADMINISTRATIVE CHAIN OF COMMAND.—** The mine force's administrative chain of command, as with all of the Department of the Navy, begins with the President. Then it flows to the SECDEF; the SECNAV; the Chief of Naval Operations (CNO); the Commander-in-Chief, U.S. Atlantic Fleet (CINCLANTFLT); the COMINEWARCOM; and ends with the commanding officers or officers-in-charge of individual mobile mine assembly units or detachments. See figure 1-4.

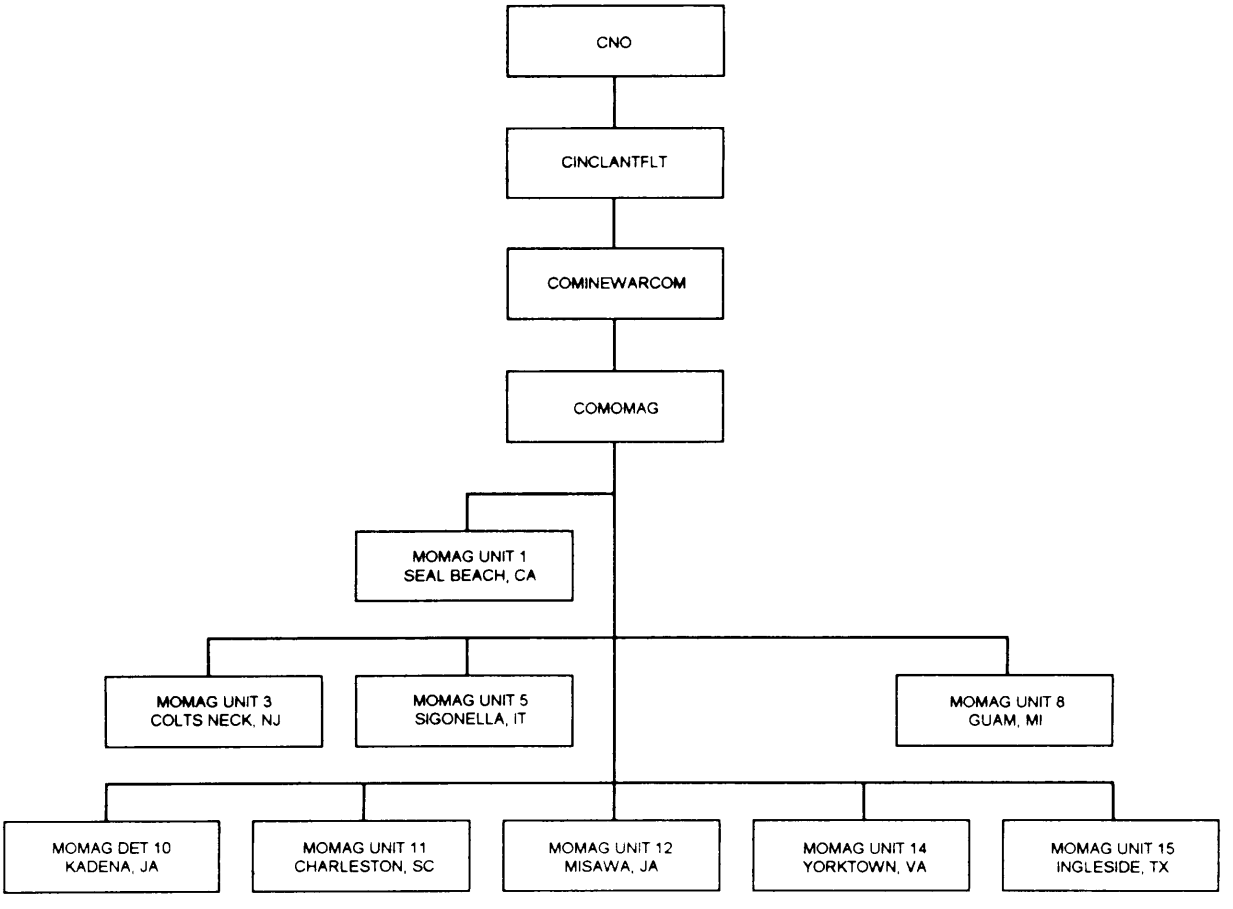



**Figure 1-4.-Mine force administrative chain of command.**

**OPERATIONAL CHAIN OF COMMAND.—** The operational chain of command, or task structure, comprises forces from one or more warfare types, which are organized to accomplish an assigned task or function of an operational nature. The operational chain of command for the mine force begins with the President and the SECDEF, as the National Command Authority (NCA), and continues through the CNO, the fleet commanders-in-chief (FLTCINCs), and ends with the commanding officers or officers-in-charge of the individual mobile mine assembly group units or detachments. See figure 1-5.

**Commander, Mine Warfare Command**

The Commander, Mine Warfare Command (COMINEWARCOM), under the direction of the CINCLANTFLT, acts in all matters that affect mine warfare readiness, training, tactics, and doctrine for active naval forces and corresponding Naval Reserve programs. The COMINEWARCOM is the technical advisor for mine warfare to the CINCLANTFLT, the Commander-in-Chief, U.S. Pacific (CINCPACFLT); and the Commander-in-Chief, U.S. Naval Forces, Europe (CINCUSNAVEUR).

**Commander, Mobile Mine Assembly Group**

The Commander, Mobile Mine Assembly Group (COMOMAG) is under the administrative and operational control of the COMINEWARCOM. MOMAG units and detachments are under the administrative control of the COMOMAG and are under the operational control of the CINCPACFLT, the CINCLANTFLT, or the CINCUSNAVEUR, as appropriate. The MOMAG mission is to maintain the material readiness of CINCPACFLT, CINCLANTFLT, and CINCUSNAVEUR pre-positioned war reserve material stock (PWRMS) service mines. In performance of this mission, the COMOMAG is required to provide a reservoir of trained personnel, organized in mobile units and capable of rapid deployment for final mine preparation, surface launch, and setting changes of pre-positioned mine stocks to support mining operations.

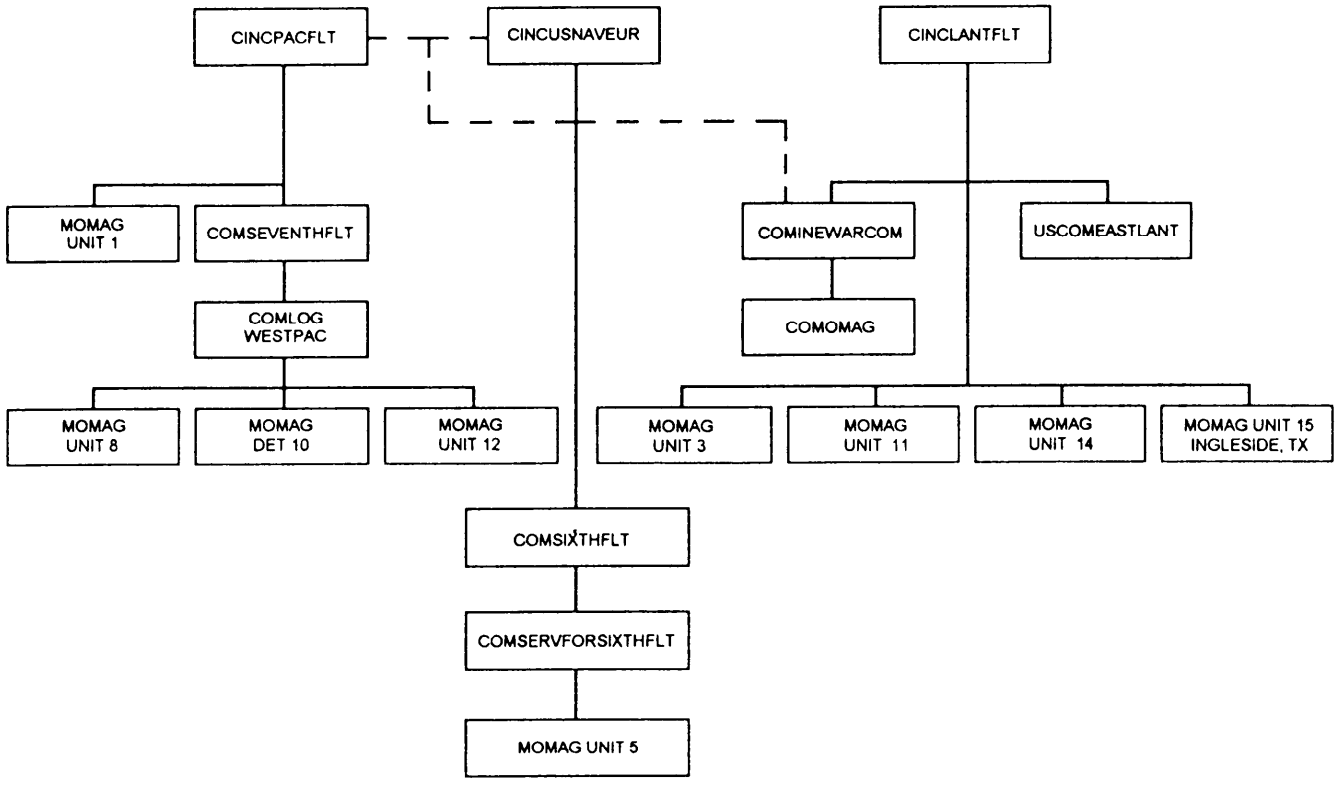



**Figure 1-5.—Mine force operational chain of command.**

## RECOMMENDED READING LIST

**Note:** Although the following references were current when this TRAMAN was published, their continued currency cannot be assured. Therefore, you need to be sure that you are studying the latest revision.


*Commander, Mobile Mine Assembly Group (COMOMAG) Mission and Functions and Statement of Operating Procedures and Employment of the Mobile Mine Assembly Group (MOMAG),* COMINEWARCOMINST 5450.2G, Commander, Mine Warfare Command, Charleston, S.C., 1992.

*Mining Operations,* NWP 27-4(A), Chief of Naval Operations, Washington, D.C., 1985.

*Standard Organization and Regulations of the U.S. Navy,* OPNAVINST 3120.32A, Chief of Naval Operations, Washington, D.C., 1979.

*United States Navy Regulations, 1990,* Secretary of the Navy, Washington, D.C., 1990.

# CHAPTER 2

# MINE WARFARE-RELATED PROGRAMS

**LEARNING OBJECTIVES**

Upon completing this chapter, you should be able to do the following:

1. Describe the Quality Assurance Program as it relates to Mineman responsibilities and tasks.
2. Describe the Navy Occupational Safety and Health Program.
3. Describe the Hazardous Material Safety Program.
4. Describe the Navy Explosives Safety Program.
5. Describe the Non-Nuclear Ordnance and Explosives-Handling Qualification and Certification Program.

There are several programs that support the daily operations of a Mobile Mine Assembly Group (MOMAG). This chapter discusses the Quality Assurance Program, the Navy Occupational Safety and Health Program, the Hazardous Material Safety Program, the Navy Explosives Safety Program, and the Non-Nuclear Ordnance and Explosives-Handling Qualification and Certification Program.

As a Mineman, you should be able to fully participate in these programs as they relate to your duties, as well as training your subordinates in these vital areas. For additional information on mine warfare-related programs, consult the recommended reading list at the end of this chapter.

## QUALITY ASSURANCE PROGRAM

It is the policy and goal of the Naval Sea Systems Command (NAVSEASYSCOM) to provide the fleet with safe ordnance material of the highest possible quality in a timely manner. The policies and procedures of the Quality Assurance Program for naval ordnance are set forth in *Naval Ordnance Quality Assurance Procedures for Fleet Activities,* NAVSEA QAP 100/NAVAIR QAP 100. These policies are reflected in the basic priorities of safety first, quality second, and quantity third. The QA Program implements this policy during both (1) the material acquisition from contractors; and (2) the receipt, production, maintenance, storage, and issue of ordnance material.

Established in *Quality Assurance Procedures,* COMOMAGINST 4855.1, the mine warfare's QA Program ensures quality, uniformity, and reliability in the total mine production effort. All aspects of ordnance materials are subject to inspection by both supervisors and QA inspectors. Inspections help to reduce human errors and help to ensure that all material used is of the proper type, quantity, and quality. QA inspections do not relieve supervisors of their responsibilities, but they do enhance the reliability of weapons and weapons systems.

QA requirements help to ensure the following procedures:

1. Incoming material is inspected to ensure that it
   a. conforms to the designated type, quantity, and quality;
   b. has not been damaged in shipment;
   c. is identified with the appropriate condition code status; and
   d. is packed, packaged, and preserved as necessary to permit further processing in a safe manner and to prevent material

damage or deterioration during storage, handling, and issue.

2. Ordnance material is segregated into compatible groups by explosive content and condition code for storage, further processing, or transshipment.

3. Ordnance material is controlled during handling and storage to prevent unsafe conditions or degradation of serviceable material.

4. Periodic maintenance is performed as required. Maintenance and renovation operations are controlled to assure that ordnance material completing these operations conforms to all applicable specification requirements.

5. Only safe, serviceable ordnance material is issued to operational units.

6. Ordnance material destined for outload is packed, packaged, and preserved as specified in applicable technical documents. After loading, it is securely blocked, braced, and dunnaged in the carrier to facilitate safe transport.

This section discusses the QA department, and planning, personnel training requirements, safety support, inventories and inspections, material condition tags and labels, inspection indication stamps, reject material, and discrepancy reports as they relate to QA.

## QUALITY ASSURANCE DEPARTMENT

Each MOMAG activity must plan, staff, and maintain a QA department proportionate with command workload. Since this department is responsible for performing all QA functions on the command's ordnance, it must have the independence necessary to achieve full implementation of QA policies and procedures. Although the commanding officer of a MOMAG activity (or the officer-in-charge of a MOMAG detachment) has the final responsibility for the quality of the mines at that activity, the QA department head is his representative and reports directly to him.

## QUALITY ASSURANCE PLANNING

Efficient QA planning provides a systematic approach for

1. determining QA objectives and requirements for ordnance material;

2. identifying specific QA actions necessary to ensure that the objectives and requirements are met; and

3. providing resources necessary to perform required QA actions in a timely, effective, and efficient reamer.

Quality planning functions shall include the

1. identification of applicable technical documents and requirements;

2. determination of QA actions and the assignment of responsibilities for their performance;

3. review of weapons ordnance work instructions for adequacy; and

4. establishment of specific inspection points and the preparation of inspections, if not provided in the technical documentation.

QA and ordnance work planning must be done concurrently. In addition to ensuring that adequate work instructions are available and are used, it ensures that all necessary preparations for performing QA verification actions are completed in a timely manner. Close liaison and cooperation between personnel performing QA planning and personnel performing ordnance work planning are essential.

Quality planning functions consist of the planning required to provide QA verification personnel with the necessary tools required to ensure the quality of the work being verified. These tools consist of the following four points:

1. The point at which the inspection should be performed.

2. The drawing, equipment, and procedural instructions needed to perform the inspection.

3. The amount and severity of the inspections (i.e., 100 percent or sampling).

4. The method for recording or reporting the inspection results as specified by applicable ordnance technical documentation.

## PERSONNEL QUALITY ASSURANCE TRAINING REQUIREMENTS

All personnel whose work assignments may affect the quality of ordnance material must have the knowledges and skills necessary to perform safe and quality work. To achieve this, personnel assigned to ordnance-related work must be given general

indoctrination, as well as specific training, in the ordnance work to be performed. The indoctrination must include a segment on QA. This segment should stress the following objectives:

1. Motivation of all personnel to attain high-quality performance in ordnance work.

2. Development of an appreciation for the importance of, and the need for, an organized and effective QA program.

3. Familiarization of personnel with the ordnance QA procedures.

Personnel assigned duties as QA inspectors must be provided detailed training in the application of QA procedures and safety, quality, and technical requirements of the specific ordnance materials involved in their work assignments. This training is in addition to the activity training for weapons and ordnance personnel; it may be either on-the-job (OJT) or classroom training.

To provide increased range and depth to the capability of QA personnel, each QA supervisor shall provide OJT through rotational work assignments. The periods of OJT shall be of sufficient duration to ensure that the trainee is fully qualified to perform duties in that area of assignment. Records of all OJT and classroom training should be prepared and maintained on all QA personnel.

## QUALITY ASSURANCE SAFETY SUPPORT

QA inspectors should be familiar with all safety procedures and requirements of the job because they serve as safety observers at all times. They provide written reports of all safety violations or potentially hazardous conditions to the (1) shop supervisor, (2) command safety supervisor, and (3) QA department head. While in the working areas, QA inspectors should wear green hardhats or green ballcaps for easy visual identification.

Since QA supports the command's safety program, all QA personnel should receive basic safety instruction and OJT safety instruction specifically tailored to their areas of work. Before each evolution and during the quarterly safety standdown, QA inspectors will brief all command personnel on safety.

Supervisors and QA personnel must be constantly alert to the need for refresher training or other specific ordnance-related training, as evidenced by the quality of work performed. Supervisors are responsible for ensuring that necessary OJT or classroom training is provided before assigning personnel to new jobs related to the processing of ordnance material.

## QUALITY ASSURANCE INVENTORIES AND INSPECTIONS

Procedures for QA inventories and inspections are in pertinent technical publications and must be followed in the verification of the quality of mines and associated materials. Commitment to these procedures is essential to readiness. The following paragraphs discuss inventories; receipt inspections; preshipment inspections; and assembly, disassembly, and maintenance inspections.

### Inventories

Physical inventories are required for efficient inventory control. To fulfill this requirement, the stock balance and the location of an item must be in agreement with the stock record card for that item. Inventories will accomplish this requirement, as well as the following actions:

1. Determining and reconciling differences between physical count and stock record card balances.

2. Determining stock deficiencies that require corrective action.

3. Ensuring that material is correctly identified.

4. Ensuring that material is properly stored and packaged.

The primary inventory is the monthly 1/12th inventory, which allows a 100-percent inventory of on-hand stock each year. During this inventory process, the inspector verifies and tabulates the following data: (1) actual count and location (including all lots), (2) packaging and stenciling, (3) material condition tags and labels, (4) discrepant storage conditions, and (5) cure date data of preformed packings. In addition, an inventory is made of any item that is issued or received.

### Receipt Inspections

All incoming shipments of mine material must be inspected by QA personnel and personnel from the activity's supply division. Receipt inspections must be conducted in accordance with NAVSEA QAP 100/NAVAIR QAP 100 and COMOMAGINST 4855.1.

QA personnel need only to sample or monitor inspections performed by supply personnel. Sealed containers need not be opened unless (1) the condition of the container indicates possible damage or deterioration of the contents, or (2) technical documents dictate otherwise.

Receipt of field or fleet return materials is normally limited to a visual inspection for proper packaging and ensuring that no hazardous conditions exist. All material inspections must be tagged with an appropriate material condition tag or label.

### Preshipment Inspections

Before any mine material leaves an activity, it must be subjected to a preshipment inspection by QA personnel to ensure that the

1. preservation, packing, packaging, palletizing, and marking of the material is in compliance with applicable specifications;

2. material is properly tagged or labeled to indicate identity, count, and condition; and

3. shipping documentation is complete and corresponds with the material being shipped.

### Assembly, Disassembly, and Maintenance Inspections

QA personnel, with work center supervisors, are responsible for ensuring the quality of material undergoing tests, rework, assembly, disassembly, or maintenance. Many ordnance publications provide suitable travelers or processing documents (checklists, data sheets, etc.), while others may have to be developed locally. Travelers or processing documents must highlight each major operation to be performed, either by a brief description of the operation or by reference to paragraphs in the work instruction portion of the technical document. Some work instructions that are not excessively bulky may also be used as shop travelers. After the required maintenance or tests are completed, an appropriate condition tag or label, authenticated by QA personnel, must be affixed to each item, container, or unit.

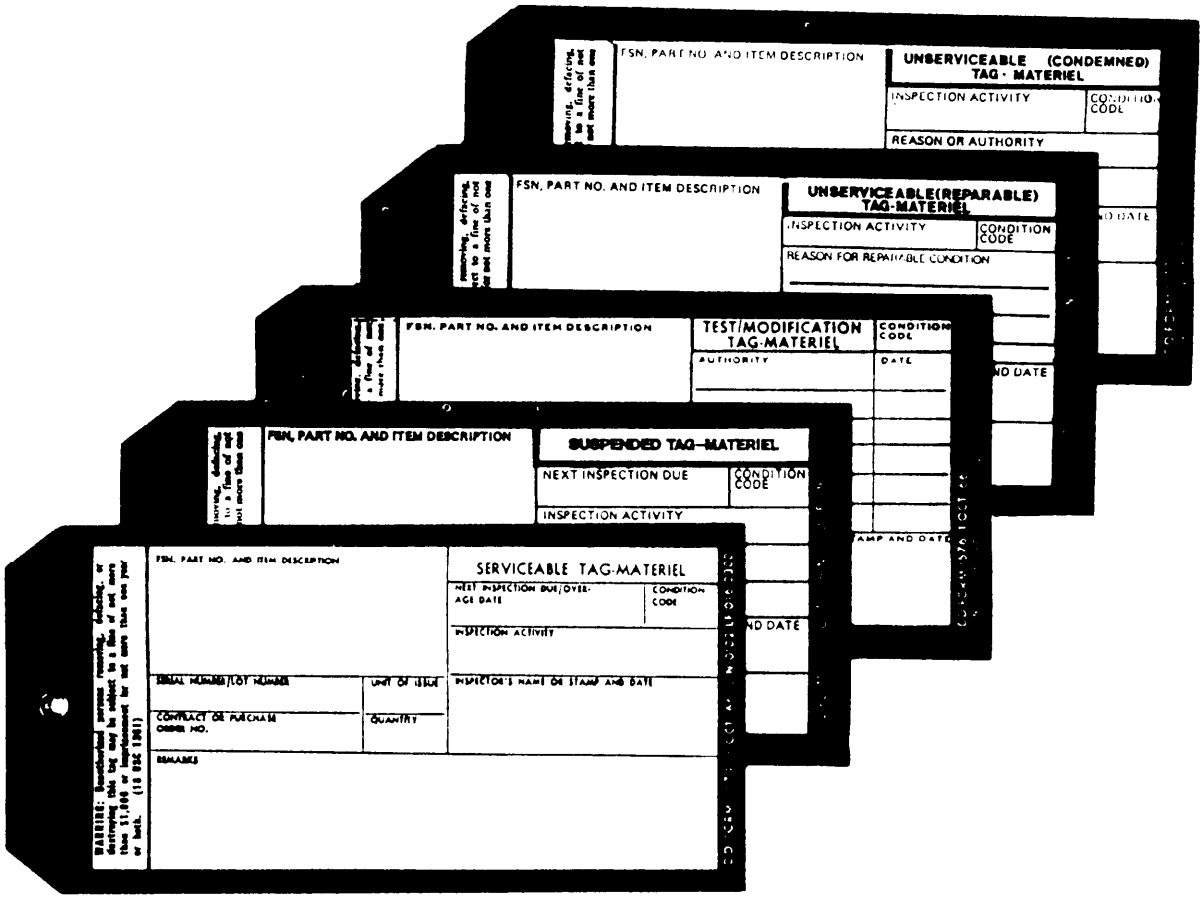



**Figure 2-1.—Materia1 condition tags.**

## MATERIAL CONDITION TAGS AND LABELS

Material condition tags, shown in figure 2-1, are used to indicate the inspection and condition status of ordnance material, except for that material in process that has accompanying material condition status documentation. Material condition tags and labels must be affixed to the material so that they permit easy identification of the material's condition. When it is impractical to tag each item (i.e., nuts, bolts, resistors, etc.), then the container, rack, bin, or drawer should be tagged or labeled.

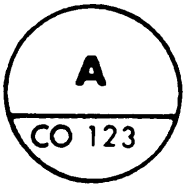
Material condition tags and labels are filled out by the person affixing the tag or label to the material. Periodically, QA personnel monitor that process. However, all tags and labels on material identified as serviceable are authenticated by a QA inspector, who applies a QA inspection stamp or a signature to the tags and labels. When the condition status of material changes, the material condition tags or labels are changed to show the new status. The older tags and labels are removed, the serviceable tags and labels are submitted to the QA department, and all other tags and labels are destroyed by the person removing them.

The five material condition tags and labels are identified and used as described in table 2-1.

**Table 2-1.—Material Condition Tags and Labels**

| TAG/LABEL | COLOR | USE |
|---|---|---|
| SERVICEABLE | Yellow border on the front. Tags also have a yellow stripe across the back. | Affix to material that is serviceable and ready for field or fleet issue. |
| SUSPENDED | Brown border on the front. Tags also have a brown stripe across the back. | Affix to material that is pending condition classification by an authorized group, activity, agency, or document. Do not issue for any purpose except emergency combat use. |
| TEST/MODIFICATION | Blue border on the front. Tags also have a blue stripe across the back. | Affix to material that will become serviceable upon completion of acceptable tests or modifications. Do not issue for any purpose other than for conducting the required tests and for applying the necessary modifications. |
| UNSERVICEABLE (REPARABLE) | Green border on the front. Tags also have a green stripe across the back. | Affix to material that is unserviceable because it is incomplete or it requires limited restoration. Do not issue for any purpose except to conduct the required restoration or to complete the assembly of material to the proper configuration. |
| UNSERVICEABLE (CONDEMNED) | Red border on the front. Tags also have a red stripe across the back. | Affix to material that does not meet certain specifications and cannot be repaired, restored, or otherwise rendered economically serviceable. Do NOT issue for use. Release ONLY for scrapping or for return to the continental United States. |

**Table 2-2.-Inspection Stamp**

| STAMP | EXPLANATION |
|---|---|
|  | Interim Acceptance Stamp<br><br>This stamp indicates acceptance of all inspections and processes at a given point or time; however, the material must undergo furthertier processing or inspection. Material so stamped is released only for further processing or inspection. It is NOT issued for use. |
|  | Final Acceptance Stamp<br><br>This stamp indicates that the material has met all the specified requirements. Material so stamped is ready for issue. |
|  | In-Process to a Deviation Stamp<br><br>This stamp indicates that the material has met all the specified requirements; however, at least one of the original requirements has been modified by an authorized deviation. Material so stamped is acceptable for use, but is not released for use unless the final acceptance stamp has been applied to the material or the documentation. |
|  | In-Process to a Waiver Stamp<br><br>This stamp indicates that the material meets most of the requirements, and that those requirements that were not satisfied were waived by an authorized board or agency. Material so stamped is acceptable for issue, but is not released for use unless the final acceptance stamp has been applied to the material or the documentation. |
|  | Rejection Stamp<br><br>This stamp indicates that the material does not meet the specified requirements. Material so stamped can NOT be issued for use. |

## INSPECTION INDICATION STAMPS

Inspection indication stamps are used to indicate QA authentication of the material condition status as either being accepted or rejected. In addition, these stamps identify the activity and the individual using the stamp.

The activity and user identification is provided by the use of an alphanumerical designation system incorporated into the stamp. A letter code designates the activity, followed by a number that identifies the person to whom the stamp is assigned. The size of the letters and digits are small enough to allow space for at least three additional digits after the activity and user codes.

Examples of the inspection stamps and a brief explanation of each are in table 2-2.

The QA supervisor issues the inspection stamps only to qualified personnel. Each inspector receives a set of stamps, with each stamp in the set having the same number.

A stamp assignment record is maintained by the QA supervisor to ensure accountability. This assignment record consists of having the person to whom the stamps are assigned apply each stamp issued to one of the blocks on the stamp record form; that person will then initial and date each stamped block.

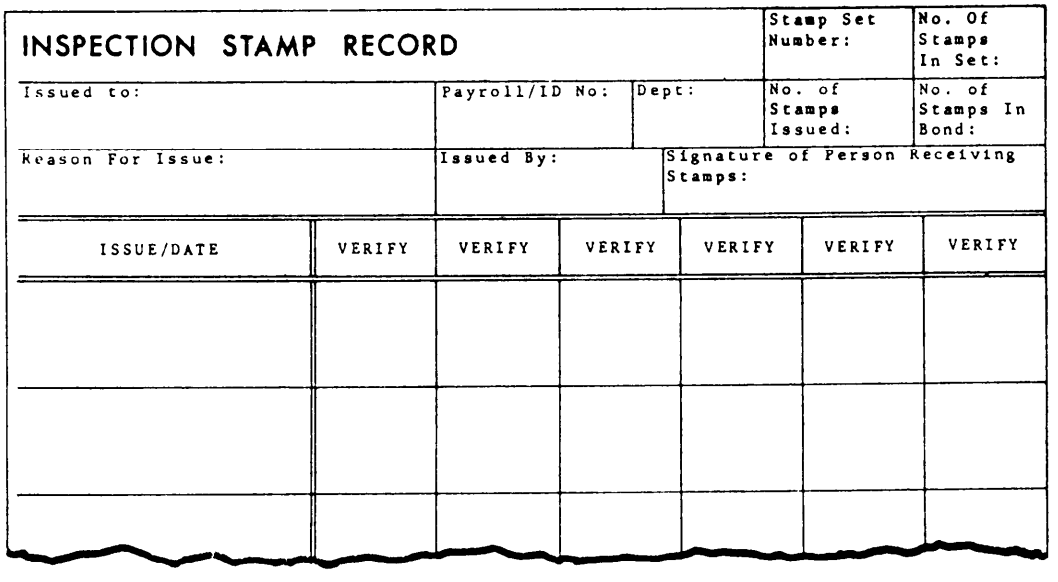
Surveys, following the same procedures used for assignment, should be conducted every 6 months. The survey will be for all stamps assigned. A sample stamp assignment record is shown in figure 2-2.

A current record of all stamps procured by number, indicating the number of stamps in each set, the type of stamps in the set, the status of the stamps (issued, unissued, damaged, lost, etc.), and the date of verification of the status will be maintained.

When a stamp is lost, the entire set of stamps is destroyed. All stamps turned in by QA personnel for any reason are held in bond, in a locked container, at least 6 months before reissue. The stamp assignment record will indicate which of the stamps are being held in bond. Stamps held in bond are verified against the new listing every 6 months.

## REJECT MATERIAL

When QA personnel discover nonconforming material, they are to immediately identify the material as nonconforming by filling in and attaching a SUSPENDED material condition tag or label. The material is to be separated and controlled to prevent unserviceable material from being mixed with serviceable material. Normally, the material is placed in an impound area, which has boundaries physically identified by walls, rails, ropes, chains, or conspicuous markings. QA personnel must authorize the removal of material from designated impound areas.



INSPECTION STAMP RECORD

| | | | | |
|---|---|---|---|---|
| | | | Stamp Set Number: | No. Of Stamps In Set: |
| Issued to: | Payroll/ID No: | Dept: | No. of Stamps Issued: | No. of Stamps In Bond: |
| Reason For Issue: | Issued By: | Signature of Person Receiving Stamps: | | |

| ISSUE/DATE | VERIFY | VERIFY | VERIFY | VERIFY | VERIFY | VERIFY |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Figure 2-2.—Inspection stamp record.**

## DISCREPANCY RECORDS

Discrepancies found in ordnance material that require corrective action are to be made on a discrepancy record, unless correction of the defect can be accomplished immediately by the operating personnel. Discrepancy records should also be generated for unauthorized or inadequate documentation. One example of a discrepancy record is shown in figure 2-3; other examples are in NAVSEA QAP 100/NAVAIR QAP 100.

## NAVY OCCUPATIONAL SAFETY AND HEALTH PROGRAM

The Navy Occupational Safety and Health (NAVOSH) Program embraces the total safety and occupational health effort within the naval establishment. The overall program is divided into primary program areas and specified support areas to help administer the total NAVOSH effort. The *Navy Safety and Occupational Safety and Health Program*, OPNAVINST 5100.8, outlines the purpose of this program. The *Navy Occupational Safety and Health (NAVOSH) Program Manual,* OPNAVINST 5100.23, gives the details required to carry out the specifics of the program.

The NAVOSH Program covers all safety areas. The major area you will be concerned with under this section is occupational safety and health, as it discusses NAVOSH program responsibilities and personal safety protective equipment. As the title implies, the NAVOSH Program specifically addresses the maintenance of safe and healthful conditions in the workplace or the *occupational* environment.

## NAVOSH PROGRAM RESPONSIBILITIES

By direction of OPNAVINST 5100.8, echelon-2 commanders are responsible for ensuring that their commanders, commanding officers, officers-in-charge, and their subordinate supervisors conduct an aggressive safety and mishap prevention program. This instruction also directs them to assign safety responsibilities to qualified personnel as a primary duty billet, where possible. If this cannot be done due to manning levels, it is to be assigned as a collateral duty. As a supervisor, you are responsible for following these directives and for ensuring that each individual under your supervision complies with safety and occupational health standards.

Programs in the primary areas are the responsibility of specific program sponsors. These sponsors maintain the technical expertise necessary to establish policy direction, organization, and procedures for their programs in each of the following major Navy elements: (1) submarine and diving, (2) surface, (3) shore, and (4) aviation.

As a Mineman, it is your responsibility to understand, comply with, and assist your command in all aspects of safety.

## PERSONAL SAFETY PROTECTIVE EQUIPMENT

As the supervisor, you are responsible for ensuring that all personnel have, use, and maintain personal safety protective equipment. This equipment is designed to prevent or reduce the severity of injury or illness.

It must be recognized that personal protective devices do nothing to reduce or eliminate the hazard itself. They merely establish a “last line of defense” to the hazard. Therefore, if the equipment is not used or maintained properly, it is of no value. For this reason, mandatory enforcement of equipment use is the key element in an effective personal protective equipment program.

The following six items must be taken into consideration for the issue of personal safety protective equipment:

1. **Eye and face protection:** Approved eye and face protection must be worn when there is a reasonable probability that an injury could be prevented by wearing such equipment. Injury can be caused by flying particles and chips; splashes from liquids (such as acids, caustics, and solvents); or operations that generate hot slag or molten metal, welding glare, etc. Personnel in the vicinity of such operations (including other workers, supervisors, or visitors) are required to wear eye protective equipment. It is the responsibility of the activity to provide the required approved protective equipment and to enforce its use.

2. **Respiratory protection:** Respiratory hazards may occur through exposure to harmful dust, fogs, fumes, mists, gases, smoke, sprays, and vapors. The best way to protect personnel is by using accepted engineering control measures, such as local exhaust ventilation. However, the use of engineering control measures may not always be technologically or

economically feasible, due to the nature and location of the activities. In these situations, the use of appropriate respiratory protection should be used to assure personnel protection.

3. **Head protection:** Helmets and hardhats must be worn when there is a possibility of impact from falling objects and at all times when operating materials-handling equipment (MHE).

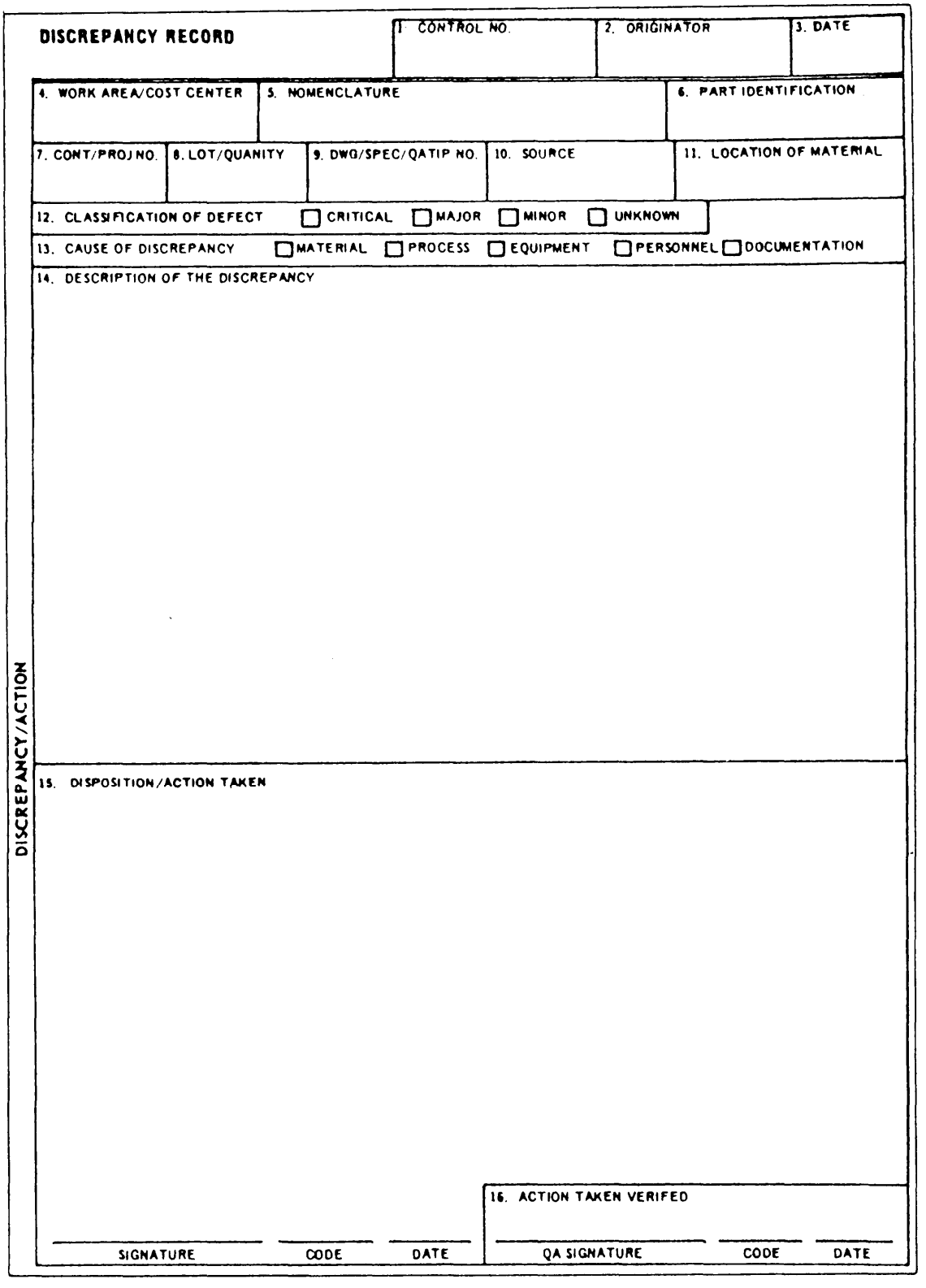



**Figure 2-3.—Discrepancy record.**

4. **Foot protection:** Foot protection must be worn when personnel are engaged in activities that involve danger from heavy falling objects. This can involve almost any job in a mine shop.

5. **Electrical protection:** Appropriate rubber protective equipment must be provided for personnel working on energized circuits.

6. **Hearing protection:** Hearing protective devices must be worn by all personnel when they enter or work in an area where the operations generate noise levels greater than 84-dB(A) sound levels or 140-dB peak-sound pressure levels or greater. The determination of which hearing protective device or combination of devices, suitable for use in each situation, is the responsibility of the industrial hygienist (or other competent personnel under the direction of an industrial hygienist).

All personal protective equipment must be of a safe design and construction for the work to be performed. Standards and specifications for the design and use of this equipment have been developed as a result of extensive research and testing. Only those items that have been recognized and approved shall be used.

This is not an all-inclusive list. It is your responsibility to ensure that your personnel have the proper protective equipment and that all instructions in the use of the equipment are followed. All the safety devices, equipments, and instructions will be of no use if they are not used as intended.

## HAZARDOUS MATERIAL SAFETY PROGRAM

The Hazardous Material Safety Program is a Navywide program designed to ensure the safe usage of hazardous materials. *Hazardous Material Control and Management (HMC&M),* OPNAVINST 4110.2, establishes the policies, guidance, requirements, and management of hazardous material used by the Navy.

Materials ordinarily considered to be safe maybe rendered hazardous under certain conditions by the uninformed user. Therefore, it is imperative that accident prevention actions designed to control and regulate the identification, transportation, storage, and use of hazardous materials be implemented to protect both the user and the general public.

Except as noted, hazardous material is any material that by virtue of its potentially dangerous nature requires controls to ensure adequate protection of life, health, and property. For the purpose of this program only, this definition excludes ammunition, explosives, propellants, pyrotechnics, chemical and biological warfare materials, medical and pharmaceutical supplies, and bulk fuels.

OPNAVINST 4110.2 gives guidelines for the reporting, management, and record keeping of hazardous materials. It also requires that activities ensure that all personnel coming into contact with hazardous materials be (1) indoctrinated and trained in the proper handling procedures of hazard materials, and (2) provided with and required to use personal protective equipment. It also contains information on host-tenant command relationships with regard to hazardous materials.

This section discusses material safety data sheets and hazardous-materials warning labels.

### MATERIAL SAFETY DATA SHEETS

To comply with the *Hazard Communication Standard,* 29 CFR 1910.1200, a Material Safety Data Sheet (MSDS) (OSHA Form 174) must be used by manufacturers of chemical products to communicate to users the chemical, physical, and hazardous properties of their product. (An equivalent form may be used if it contains the identical data elements.)

The completed form identifies key information on the product, such as the name, address, and emergency contact for the manufacturer; the identify of the hazardous ingredients; the physical and chemical characteristics; the fire and explosion hazard data; the reactivity data; the health hazard data; the precautions for safe handling and use; and the control measures. The use of the MSDS, or a narrative summary of the MSDS information, should be included as a part of hazardous-material training programs.

### HAZARDOUS-MATERIALS WARNING LABELS

Hazardous-materials warning labels are necessary to clearly show the hazardous nature of the contents of the packages at all stages of storage, handling, use, and disposal. When unit packages are removed from shipping containers, the continuity of the information must be maintained.

If you must relabel a hazardous-material container, use the labeling system for DOD hazardous-chemical warnings. As of September

1990, you can print labels directly from you HMIS CD-ROM computer disk on plain paper and put them on unlabeled containers. The label should identify the hazardous chemical contained and should provide the appropriate warnings.

The labeling of hazardous materials is governed by 29 CFR 1910.1200. The Department of Defense (DOD) adopted the regulations in *DOD Hazardous Materials Information System Procedures*, DODINST 6050.5. All hazardous materials procured by DOD must meet OSHA labeling requirements, and DOD activities are not required to relabel hazardous-material containers.

## NAVY EXPLOSIVES SAFETY PROGRAM

The Navy Explosives Safety Program is established in *U.S. Navy Explosives Safety Policies, Requirements, and Procedures (Department of the Navy Explosives Safety Policy Manual)*, OPNAVINST 8023.2. Explosives safety is the all-encompassing area of activity concerned with the prevention of the premature, unintentional, or unauthorized initiation of explosives and devices containing explosives. It also includes the

1. minimization of the effects of explosions, combustion, toxicity, and any other harmful effects;

2. mechanical, chemical, biological, and electrical hazards associated with explosives; hazards of electromagnetic radiation to explosive ordnance; and combinations of the foregoing; and

3. equipment or systems whose malfunctions would hazard the safe handling, maintenance, storage, release, delivery, or firing of explosives.

This section discusses safety program responsibilities, mishap causes, and mishap reports as related to explosives.

## EXPLOSIVES SAFETY PROGRAM RESPONSIBILITIES

Explosives safety, like all safety, is the responsibility of all commands and all personnel. However, the Commander, Naval Sea Systems Command and the Mobile Mine Assembly Group activities are assigned certain responsibilities for the overall program.

### Commander, Naval Sea Systems Command

Under the supervision of the Deputy Chief of Naval Operations for Logistics (DCNO/L), the Commander, Naval Sea Systems Command (COMNAVSEASYSCOM) is tasked with the following responsibilities regarding explosives safety:

1. Establishing and issuing technical standards and criteria.

2. Providing technical guidance and assistance to all components of the Department of the Navy (DON).

3. Providing technical advice and evaluations to the Chief of Naval Operations (CNO) in areas where operational requirements conflict with technical requirements.

4. Directing and coordinating the efforts of all technical offices and preparing all necessary data to analyze the program's effectiveness.

5. Providing the necessary technical advice and guidance for the development of explosives training programs to establish a level of competence to ensure success of this program.

6. Establishing, issuing, and implementing appropriate regulations, technical standards, instructions, and publications that relate to supervision over specific work performed by shore activities. This work includes the preparation, assembly, loading, testing, storing, handling, shipping, use, and maintenance of ammunition, explosives, and other dangerous materials.

### Mobile Mine Assembly Group Activities

All Mobile Mine Assembly Groups (MOMAGs) having custody of explosive materials must

1. comply with all applicable directives and guidance issued by proper authority,

2. ensure that explosive materials are handled only by qualified personnel, and

3. submit reports concerning explosive accidents and incidents.

## EXPLOSIVE MISHAP CAUSES

The improper handling, loading, processing, or testing of explosive devices has, in the past, caused

mishaps that resulted in injury, loss of life, or damage to property, as well as reduced operational effectiveness of both fleet and shore activities. Investigations have shown that a major cause of mishaps with explosive devices has been personnel error.

Analyses of mishaps clearly caused by personnel error show that the following seven reasons are most commonly encountered:

1. Lack of effective use of available training or lack of knowledge on the part of individuals and teams that handle explosive devices.

2. Lack of necessary and effective leadership and supervision by the supervisory personnel directly responsible for operations involving explosive devices.

3. High-tempo operations, during which maintenance of explosives safety tends to be degraded due to (a) fatigue; (b) short cuts to get the job done on time; or (c) complacency stemming from rapid, repeated, and often monotonous tasks.

4. Loss of continuity caused by the discharge, transfer, promotion, or retirement of experienced personnel.

5. Assignment to duty of personnel whose precise qualifications and experience are generally unknown.

6. Temporary assignment to perform ordnance-related tasks for which personnel are not specifically qualified.

7. Failure to follow, or to maintain current, standard operating procedures (SOPs) or standard job procedures (SJPs) that have been established for specific processes involving explosives or explosive devices.

## EXPLOSIVE MISHAP REPORTS

There is a high potential for catastrophe inherent to mishaps involving explosives. The requirements for reporting explosive mishaps, therefore, are more stringent than for any other type of mishap.

An explosive mishap is defined as an explosive incident or a dangerous defect involving an explosive system or a launch device which results in detonation, deflagration, burning, inadvertent jettisoning, or release of ordnance material resulting in damage or injury.

*Mishap Investigation and Reporting,* OPNAVINST 5102.1, establishes the requirements for reporting all mishaps involving non-nuclear explosive ordnance or explosive materials, chemical agents, and systems. It also defines procedures to be followed subsequent to these mishaps. In addition, *Underwater Mine Maintenance System,* NAVSEA SW550-FO-PMS-010, requires that a mine system class-B data report (supplement B sheet) be prepared when explosive items are damaged in storage or during handling.

## NON-NUCLEAR ORDNANCE AND EXPLOSIVES-HANDLING QUALIFICATION AND CERTIFICATION PROGRAM

In recognition of the need for reducing personnel-induced explosive mishaps, the Non-Nuclear Ordnance and Explosives-Handling Qualification and Certification Program was established. An integral part of the Navy Explosives Safety Program, this program requires that all personnel directly involved with ammunition or explosives be certified by the command or the organizational unit to which they are assigned as having satisfactorily demonstrated their qualifications to safely perform all functions, tasks, and evolutions involving explosive devices. In addition, this program requires that personnel be properly trained and qualified before they are certified to perform any task involving explosive devices, individually or as members of a team.

Program procedures and personnel qualification requirements are in *Ammunition and Explosives Ashore,* NAVOP 5; *U.S. Navy Explosives Safety Policies, Requirements, and Procedures (Department of the Navy Explosives Safety Policy Manual),* OPNAVINST 8023.2; and *Non-Nuclear Ordnance and Explosives-Handling Qualification and Certification Program,* NAVSEAINST 8020.9.

The basic qualifications under this program define the following four personnel requirements:

1. Be physically and mentally qualified and certified.

2. Receive a general indoctrination in the hazards of explosive materials and devices; general safety, fire, security, and health regulations; and emergency or hazardous conditions and reporting procedures.

3. Demonstrate competent knowledge and application of each evolution (such as assembly, disassembly, testing, etc.) with the specific explosive devices for which they are being qualified.

4. Be specifically qualified as individuals, team members, or team leaders (supervisors).

This section discusses certification for handling explosives and qualification and certification records.

## CERTIFICATION FOR HANDLING EXPLOSIVES

Upon being qualified and recommended for certification, each individual shall be issued final certification by the commanding officer or the officer-in-charge or by the command's certification board.

### Certification Boards

A certification board shall be appointed by the commanding officer or officer-in-charge of each unit or naval activity involved with explosives or explosive devices. This board shall include, as a minimum,

- the cognizant department head (or the comparable supervisory representative in those organizations without defined departments); and
- not less than one individual (E-6 or above) who is certified to perform the function, task, or evolution under consideration.

### Certification Duration

Certification, unless revoked for cause, shall be valid for a maximum of 12 months. A renewal of the certification, whether issued at the time of expiration or later, shall be granted only after the individual or team qualification has been validated by the certification board. Whenever possible, complete requalification should be accomplished before renewal of certification. In addition, individuals must be physically and mentally qualified and certified yearly before certification is renewed.

### Certification Revocation

Commanding officers or officers-in-charge are responsible for the revocation of individual or team certification whenever such action is deemed to be in the best interests of safety. However, revocation of certification for individuals or teams, including team leaders, is mandatory when an explosive mishap is caused by failure to follow authorized procedures. Flagrant disregard of safety precautions, reckless operation of equipment used to handle explosive devices, or other behavior indicating incompetence or unreliability is also cause for mandatory revocation of certification.

Personnel whose certification has been revoked shall be retrained until requalified and recertified, if the commanding officer considers such action appropriate. However, if the demonstrated behavior of an individual indicates that such retraining may be ineffective, that individual shall be assigned to other tasks not involving explosive devices.

Revocation of certification of military personnel for cause shall require an entry in the appropriate portion of the individual's service record stating the specific reason for revocation. See MILPERSMAN 5030420.3 concerning derogatory entries.

### Certification Transfer

When military personnel are transferred to another activity, the acceptance of certification related to an explosive device will be at the discretion of the commanding officer or officer-in-charge of the new activity.

## QUALIFICATION AND CERTIFICATION RECORDS

Each activity must maintain records indicating the personnel who have been qualified and certified to handle ammunition or explosive materials. These records will also include the levels, standards, and explosive families of such qualifications and certifications. *Explosive Material-Handling Qualification and Certification Program,* COMOMAGINST 8020.4, illustrates the appropriate form that should be used to record the qualifications and certifications of an individual. The original of this form is to be maintained by the command in the individual's training record.

## RECOMMENDED READING LIST

**Note:** Although the following references were current when this TRAMAN was published, their continued currency cannot be assured. Therefore, you need to be sure that you are studying the latest revision.

*DOD Hazardous Materials Information Procedures,* DODINST 6050.5, Department of Defense, Washington, D.C., 1990.

*Explosive Material-Handling Qualification and Certification Program,* COMOMAGINST 8020.4K, Mobile Mine Assembly Group, Charleston, S.C., 1992.

*Hazardous Material Control and Management (HMC&M),* OPNAVINST 4110.2, Chief of Naval Operations, Washington, D.C., 1989.

*Mishap Investigation and Reporting,* OPNAVINST 5102.1C, Chief of Naval Operations, Washington, D.C., 1989.

*Naval Ordnance Quality Assurance Procedures for Fleet Activities,* NAVSEA QAP 100/NAVAIR QAP 100, Naval Sea Systems Command, Washington, D.C., 1976.

*Navy Occupational Safety and Health (NAVOSH) Program Manual,* OPNAVINST 5100.23C, Chief of Naval Operations, Washington, D.C., 1992.

*Navy Safety and Occupational Safety and Health Program,* OPNAVINST 5100.8G, Chief of Naval Operations, Washington, D.C., 1986.

*Non-Nuclear Ordnance and Explosives-Handling Qualification and Certification Program,* NAVSEAINST 8020.9A, Naval Sea Systems Command, Washington, D.C., 1985.

*U.S. Navy Explosives Safety Policies, Requirements, and Procedures (Department of the Navy Explosives Safety Policy Manual),* OPNAVINST 8023.2C, Chief of Naval Operations, Washington, D.C., 1986.

*Underwater Mine Maintenance System,* NAVSEA SW550-FO-PMS-010, Naval Sea Systems Command, Washington, D.C., 1983.

# CHAPTER 3

# OPERATIONS AND READINESS

**LEARNING OBJECTIVES**

Upon completing this chapter, you should be able to do the following:

1. Describe mine production and processing.
2. Describe special reports on incidents that could affect the status of your command.
3. Describe the minimum training required for mine assembly.
4. Describe preparations for command inspections.

Mine readiness requires special emphasis on advance planning, personnel training, capability for fast deployment of personnel, development of new and better tactics for minelaying in hostile environments, pre-positioning of mines, continued collection of intelligence, and research and development of new or improved mines.

In addition, operational mines must be maintained in an assembly configuration that permits rapid upgrade and delivery to the laying vehicle. Mines must be ready for those areas in which potential mining requirements exist and for other contingencies that may arise.

This chapter presents only some of the procedures and requirements necessary for a Mobile Mine Assembly Group (MOMAG) activity to maintain an acceptable readiness status. These topics include mine production and processing, uniform mine warfare planning system, reports, mine assembly training, and naval command inspection programs.

For further information on these subjects, refer to the recommended reading list at the end of this chapter.

## MINE PRODUCTION AND PROCESSING

The most important aspect of a MOMAG activity is its capability to support mine assembly and production operations. Preplanned events must occur and be properly integrated to ensure a smooth and efficient flow of material.

This section discusses (1) work simplification and flow plans, and (2) work orders.

### WORK SIMPLIFICATION AND FLOW PLANS

The concept of work simplification has resulted in the development of vastly improved techniques in maintenance and mine assembly. These improvements have enabled MOMAG activities to accomplish the following:

- Improve basic procedures
- Reduce personnel errors and fatigue
- Decrease mine assembly time significantly
- Simplify documentation requirements and procedures
- Increase the quality and the type of the required subassembled components

Each MOMAG activity is required to develop and maintain a standard flow plan for the processing and production of mines and mine material. *Standard Production and Processing for Mines,* COMOMAG-INST 8550.12, provides basic guidance and examples

for developing a standard flow plan. In addition, it provides the standardized assembly, final preparation, and surface launch rates.

A flow plan concerning mine production and processing should include, as a minimum, the following items:

- Personnel assignments
- Administrative upgrade requirements
- Functional organization chart for upgrading weapons
- Material-handling equipment (MHE) and civil engineering support equipment (CESE) requirements

The development of flow plans will not ensure that an activity is capable of producing the mines required to support mine warfare operational plans (OPLANs). To examine a MOMAG activity's readiness and realistic response capability for possible mining requirements, each MOMAG activity must conduct a quarterly readiness assessment.

This assessment will use sufficient assets to sustain peak weapon assembly proficiency for all weapon types maintained on board and/or weapon types the unit or the detachment has the capability to assemble. Although two readiness assessments per year may be walk-through evolutions to examine and evaluate new ideas or changes in assembly flow-process plans, one readiness assessment each year must be of sufficient magnitude to exercise and verify assembly line resupply procedures.

Emphasis is placed on weapon reliability, with safety being paramount during all evolutions. Reliability is of primary importance during quarterly readiness assessments. A post analysis will be performed, with the results used by the commanding officer or officer-in-charge to evaluate and correct any assembly errors.

For the basic procedures to be followed during an upgrade exercise, refer to *Reporting of Mine Assembly Capability and Readiness Status,* COMOMAG/MOMAGINST 3501.1.

## WORK ORDERS

The establishment of a uniform procedure for assigning and monitoring scheduled and unscheduled workload requirements is essential to the successful coordination and management of MOMAG activities. Utilization of the work order system facilitates a coordinated production effort, based on workload scheduling, and greatly enhances the logistics management effort necessary to maintain accurate inventory control of mine material.

Each MOMAG activity is required to establish a quarterly work order system for use with the quarterly workload schedules. The basic procedures to be followed for initiating and processing work orders are contained in *Standard Procedures for Initiating and Processing Work Orders,* COMOMAGINST 4850.1. Responsibility for the final review and acceptance of completed work orders lies solely with the commanding officer or officer-in-charge.

## UNIFORM MINE WARFARE PLANNING SYSTEM

The planning of an operation involves a great deal more than just designing the end product. Planning for a minefield is even more involved. The designer's efforts are dwarfed by the actions of the overall planning and scheduling involved in the total aspect of a minefield; still, the minefield design is the core of the plan. If the design is not adequate, the whole operation may be a waste of time, money, and assets. It is also true that if the design is excessive, the operation will be too costly in assets and logistics. It is for these reasons that the Uniform Mine Warfare Planning System (UMWPS) was designed.

Under the UMWPS, the world has been subdivided into minefield planning folder areas. Each area has been assigned a numerical designation, as outlined in *Minefield Planning Folder,* MFPF 00. Several types of mine warfare publications have been developed by the Commander, Mine Warfare Command (COMINEWARCOM) to aid in mine warfare operations. One such publication is *Mine Setting Sheet Folder* (MSSF). MSSFs are issued for the Atlantic, Pacific, and European areas. Each MSSF, which is produced to aid mine assembly activities, contains computer-printed mine-setting sheets (MSSs) for specific geographical areas. The MSSs list the types of mines, the quantity of mines, and the operational settings for specific minefields within the geographical area.

In conjunction with MSSs, all mines consigned for combat use are assigned mine control numbers (MCNs), which are designators that comprise (1) a minefield number (four digits), (2) a minefield segment designator (an alpha character), and (3) a mine case number (one to four digits). Among other

things, MCNs reflect that all mines in a minefield are not identical. Generally, more than one type of mine (mark and mod) is specified. Also, operational settings, even among mines of like mark and mod, may have purposeful differences. The control numbers index such operational knowledge. The numbers are derived with reference to MFPFs, which locate the minefield and segment and list the mark and mod, the operational assembly (OA), the operational settings, and other operational mine data. During mine assembly procedures, the assigned MCN is stenciled on each mine case in accordance with applicable assembly publications.

Additional information concerning UMWPS and related publications is contained in *Mining Operations*, NWP 27-4.

## REPORTS

Situations will arise at times that require the submission of special reports on items of significance that could affect the status of your command. The reports discussed in this section are not meant to be all-inclusive, as certain occurrences, events, and situations are exempt from these requirements. Be sure that you check all current instructions for specific guidance concerning reports before you submit them.

A mishap involving a serious impact on a command's combat readiness posture or peacetime missions capability may require special reports with or in lieu of other reports. As a Mineman, you will be concerned with two special incident reports: OPREP-3 reports and situation reports. For further assistance in completing special incident reports, refer to Special Incident Reporting, OPNAVINST 3100.6. Two other reports with which you should be familiar are casualty reports and status of resources and training system reports. This section gives a brief overview of these reports.

Operational reports are the main channel of information from the operating forces to the Chief of Naval Operations (CNO). They provide for comprehensive reviews of the dynamic aspects of naval warfare. The following items are among the many uses for data produced by the system:

- Evaluation of the combat readiness of naval forces.

- Dissemination of evolutions and innovations in naval warfare.

- Detection of deficiency, excess, combat force imbalance, material, logistic support, and/or emphasis of effort.

- Factual basis for war, mobilization, and fiscal plans; national service morale; and proper allocation of the nation's manpower and productive facilities.

- Historical recognition of the U.S. Navy's contribution to the military efforts of this nation.

### OPREP-3 REPORTS

An OPREP-3 report is an incident report that should be submitted by the lowest level command that has knowledge of the event. There are two OPREP-3 reports with which you should be familiar: PINNACLE and NAVY BLUE.

An initial OPREP-3 (PINNACLE series) is normally the first indication to senior authority that an incident has occurred that is of national-level interest. National-level interest is presumed when it is conceivable that the National Command Authority (NCA) and/or the highest levels of government will desire timely knowledge of the incident.

An initial OPREP-3 (NAVY BLUE series) is normally the first indication to provide senior authority that an incident has occurred that is of high interest to the U.S. Navy, but not of interest to the NCA, and is of great concern to the Chief of Naval Operations (CNO) and other senior naval commands. These reports are used to provide immediate notification of incidents of military, political, or press interest that are of high Navy, vice national, interest. They are submitted to provide "as it happens" information on the following types of incidents:

- Instances of misconduct that may be reported by the local news media.

- Significant damage to civilian property resulting from actions of members of the Department of the Navy.

- Acts or attempts to willfully destroy property of the U.S. Navy.

- Bomb threats that are evaluated by the reporting officer as probably valid.

- Disorders or natural disasters of minor significance, if naval assistance is provided or requested.

- Fire, flooding, explosions, collisions, grounding, or other accidents to naval units.

## UNIT SITUATION REPORTS

A unit situation report (SITREP) is used by unit commanding officers, officers-in-charge, or other appropriate commanders to provide specific operational commanders and higher authority with timely notification of any incident not meeting OPREP-3 special reporting criteria. A unit SITREP must be submitted (1) when directed, (2) when considered appropriate by the reporting activity, or (3) when bomb threats have been evaluated as a hoax.

Unit SITREPs should contain the following information, when applicable:

- Status of the situation or the event not requiring OPREP-3 reports.
- Status of the progress of special operations or events.
- Information, as directed, concerning specific events tailored to unique operational requirements.
- Identification of the type of event being reported.
- Brief account of the event being reported. (Use concise statements to furnish specific information: What happened? Who was involved? Where did it happen? When did it happen? Why did it happen? What action is ongoing? What future action is planned?)

Care must be taken to avoid reporting sensitive personal information that might cause unwarranted invasion of the personal privacy of individuals involved in certain types of incidents. These incidents include reports of spouse or child abuse, assault, or rape of a service member or a dependent. In sensitive cases where disclosure of the personal identity of individuals involved might cause embarrassment or inconvenience, their personal identity should be withheld. Generic identification, such as "PO1" or "20-year-old female E-3" should suffice in lieu of names.

## CASUALTY REPORTS

Casualty reports (CASREPs) are used to report significant equipment casualties within the Navy. They support the CNO and the fleet commanders in the management of assigned forces.

A *casualty* is an equipment malfunction or deficiency that cannot be corrected within 48 hours and that has one or more of the following characteristics:

- It reduces the unit's ability to perform a primary mission.
- It reduces the unit's ability to perform a secondary mission.
- It reduces a training command's ability to perform its mission or a significant segment of its mission.

There are four types of CASREPs, which are submitted by using a combination of two or more messages, depending on the situation:

1. Initial CASREP. Identifies, to an appropriate level of detail, the status of the casualty and parts or assistance requirements.

2. Update CASREP. Contains information similar to that submitted in the initial CASREP and/or submits changes to previously submitted information.

3. Correct CASREP. Is submitted when equip ment which has been the subject of a previous CASREP is repaired and is back in operational condition.

4. Cancel CASREP. Is submitted upon commencement of an overhaul or other scheduled availability period when equipment which has been the subject of a previous CASREP is scheduled to be repaired.

Along with the four types of CASREPs, there are four categories associated with each report. The category reflects the urgency or priority of the casualty. Refer to *Operational Reports,* NWP 10-1-10, for guidance on message formats, types of reports, categories, text structure, and classification.

## STATUS OF RESOURCES AND TRAINING SYSTEM REPORTS

Status of resources and training system (SORTS) reports are the principal reports within the U.S. Navy. They provide identification and general status to the NCA, the Joint Chiefs of Staff (JCS), the CNO, the fleet commanders-in-chief (FLTCINCs), and other operational commanders.

SORTS reports are submitted as frequently as necessary for any of the following reasons:

- To maintain an accurate picture of unit status,
- To reflect any additions, changes, or deletions.

- To keep previously submitted status attainment dates from expiring.

- To comply with requests from the NCA, the JCS, the CNO, or the FLTCINCs.

SORTS reports must be submitted as soon as possible, but no later than 4 hours following any addition, change, or deletion to a unit's status. **DO NOT** collect and save data for a later transmission.

When submitting a SORTS report, you should ensure that it contains, as a minimum, the following information, with data labels:

1. Present geographic location (PRGEO)
2. Commanding officer (COMDR)
3. Current activity and employment (ACTIV)
4. Personnel strength (PERSN)

The only status-reporting instructions to be used by units for maintaining SORTS records in the Navy Status of Forces (NSOF) data base are contained in *Status of Resources and Training System,* NWP 10-1-11. Strict compliance is required to ensure accurate and timely updating of the NSOF data base. Additional instructions, limited to FLTCINCs and type commanders (TYCOMs), may amplify but must not be in conflict with or modify the guidance and the format provided in NWP 10-1-11.

## MINE ASSEMBLY TRAINING

From the time you completed your class-A school and reported to your first command, you experienced numerous evolutions involving mine upgrade training and inspections. There are very good reasons for this training.

At any time, you could be called upon to perform the tasks for which you have been trained; therefore, you must be ready to operate under all conditions, including wartime situations. To be able to work under strenuous and sustained operations, you must be capable of performing your duties well. From mine upgrade to movement of weapons to final preparation and deployment, it is everyone's responsibility, including yours, to ensure that the required training is received by all personnel, including your subordinates. This section discusses two aspects of mine assembly training: personnel qualification standards and on-the-job training.

### PERSONNEL QUALIFICATION STANDARDS

The personnel qualification standards (PQS) program is a qualification system for officer and enlisted personnel to perform certain duties. Although this program is not actually designed as a training program, it does provide many training objectives. The PQS for the Mineman rating is found in *Personnel Qualification Standards Underwater Mine Assembly Upgrade,* NAVEDTRA 43318. It is a collection of the minimum knowledge and skills required to qualify you for a specific watchstation, maintain specific equipments, or perform as a team member within a unit. The booklet is formatted in three sections, with the first two sections being used as steps to final qualification sign-off. The format is as follows:

1. 100—Fundamentals. This section identifies basic knowledge required to perform the job properly.

2. 200—Systems. This section covers the functional systems, such as components and subassemblies.

3. 300—Watchstations/Workstations. This section contains the required procedures for performing specific jobs.

You should be qualified as soon as possible to perform specific jobs. It is important that there be a means of keeping track of personnel who need certain PQSs signed off, who is and who is not progressing in the PQS sign-off; and who needs counseling or individual instruction to complete qualification. By using the PQS progress chart, you can easily keep track of each individual assigned within a department.

The PQS progress chart is maintained by individual supervisors and is reviewed weekly by the division officer. The chart should accurately reflect the PQS point system in tracking the trainee's progress and should contain the following information:

1. Command name, division, work center.
2. Trainee's name, rank, and rate.
3. Date the trainee completed command indoctrination.
4. Watchstation, by name and number.
5. Date the trainee commenced on a particular qualification.
6. Anticipated completion date.
7. Trainee's progress.

The PQS program cannot survive unless you plan effectively and maintain control. See figure 3-1 for an example of a PQS progress chart.

## ON-THE-JOB TRAINING

On-the-job training (OJT) is the most common training you will receive or provide for your personnel. OJT is informal training used for one-on-one instruction with your crew. It allows you to cross-train your personnel in all aspects of shop operations and in the various jobs involved in completing a mine upgrade.

Although OJT is informal training and documentation is not required, you should keep track of OJT in your own records so that you will be able to follow the progress of your personnel and be able to make good judgments when making job assignments.

## NAVAL COMMAND INSPECTION PROGRAM

All naval activities are inspected periodically to determine their state of proficiency. The objectives of the Naval Command Inspection Program (NCIP) is to ensure the readiness, effectiveness, and efficiency of commands and units and to assess the quantity, quality, and management of resources available to perform their assigned missions. The basic requirements and guidelines for command inspections applicable to all activities of the Navy's shore establishment, operating forces, and portions of the Navy Department commanded by the CNO are contained in *Naval Command Inspection Program*, OPNAVINST 5040.7. This instruction establishes the objectives and policies of the program and assigns respective responsibilities. It also provides procedures for the preparation, conduct, reporting, and follow-up of NCIP inspections.

The NCIP's basic concept is that inspections of subordinate commands and units are conducted periodically by the immediate superior in command (ISIC) or the immediate unit commander (IUC). When both administrative and operational commanders are involved, the inspection responsibility is that of the administrative ISIC or IUC.

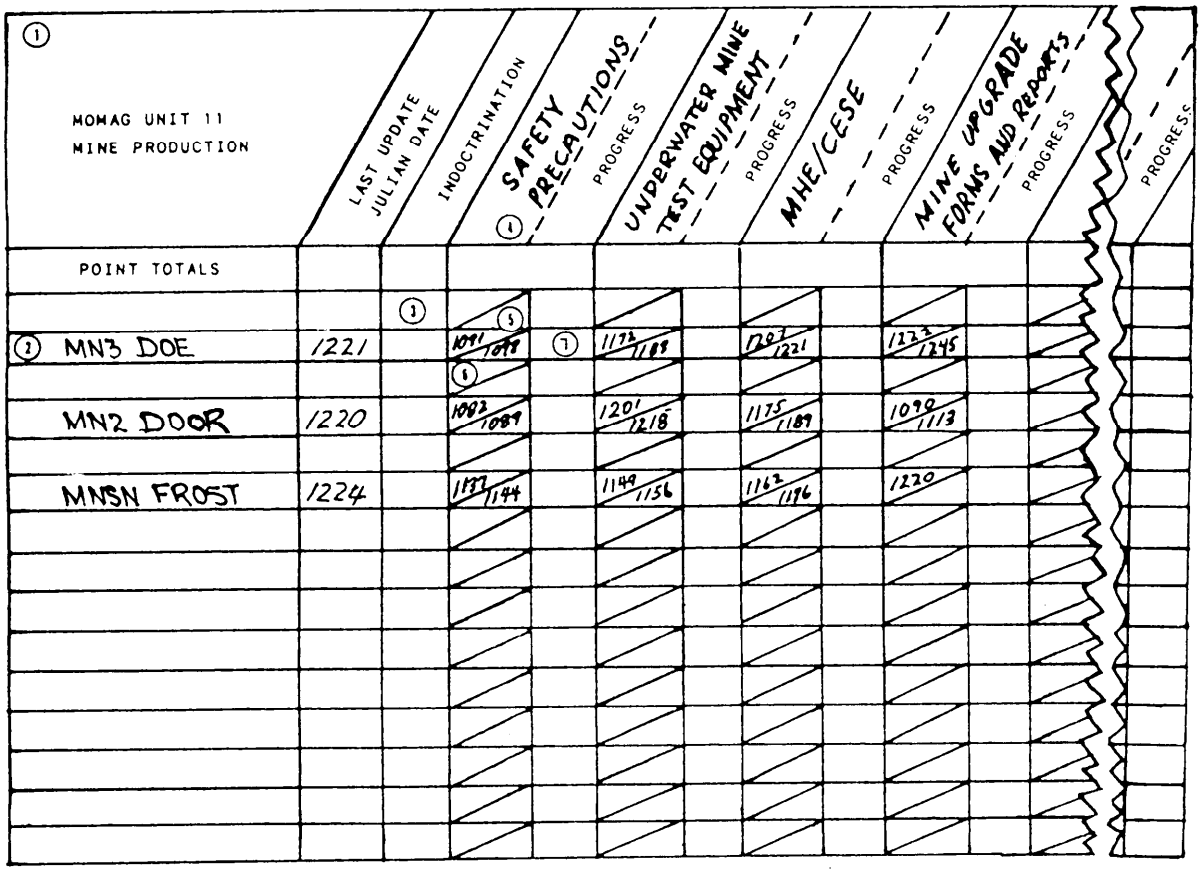



**Figure 3-1.-PQS progress chart.**

Inspections bring to light incorrect or improper practices or unsatisfactory conditions that cannot be minimized. They should not be considered as fault-finding operations, as they are conducted to point out existing discrepancies and to suggest methods for improving readiness, effectiveness, efficiency, responsiveness, and economy. Commendable conditions and praiseworthy accomplishments should be noted and discussed with appropriate personnel. Innovations of techniques, maintenance procedures, resource utilization, and administrative procedures should also be noted and discussed with appropriate personnel.

This section discusses inspection definitions, mine warfare inspections, and inspection preparations.

## INSPECTION DEFINITIONS

In its broadest sense, the term *inspection* includes not only command inspections but also the efforts of all inspection authorities within the Department of the Navy who periodically evaluate commands. Inspections are subject to general supervision, general guidance, and coordination by the Navy Inspector General (NAVINSGEN). In general, specific appraisal action terms concerning inspections are defined in the following paragraphs.

- Inspection. An inspection is a critical, official, and formal examination of a command's personnel and/or material to determine the personnel or material's condition or how effectively it can perform the assigned mission. The examination is imposed by higher authority and is conducted or sanctioned by the chain of command. The results of the examination are reported to higher authority, and a follow-up system is involved to ensure that problem areas have been resolved.

- Certification. A certification is an examination of personnel or material to officially endorse the personnel or material as being of the desired quality.

- Request Assist Visit. A request assist visit is a critical and official, but informal, examination of personnel or material to determine the condition of the unit and how effectively it can perform the assigned mission. This visit is made at the request of the commanding officer or officer-in-charge. It may be made by organizations inside or outside the chain of command. The results are reported only to the commanding officer or officer-in-charge for internal use. If a senior in the chain of command directs that an assist visit be made and requires a report of the results, the visit will be considered as an inspection and the authority to conduct the inspection will be requested from the FLTCINC or the ISIC.

- Audit. An audit is an examination of records or accounts. It may be part of an inspection or an inspection in itself for NCIP purposes. It should not be confused with an internal audit conducted by the Naval Audit Service.

- Follow-Up. A follow-up is the process of ensuring that a command is taking adequate action on an approved recommendation contained in an inspection or audit report.

## MINE WARFARE INSPECTIONS

There are many types of inspections with which you may become involved. They range (1) from personnel inspections to zone inspections conducted by your command, and (2) from administrative inspections to operational readiness inspections conducted by higher authority. Although each type of inspection concerns a command's effectiveness, this section discusses only some of the inspections conducted by the COMINEWARCOM and the Commander, Mobile Mine Assembly Groups (COMOMAG), especially mine readiness certification inspections and assist visits.

As outlined in *Inspection Guide for MOMAG Unit and Detachment Command Inspection*, COMOMAG/MOMAGINST 5040.1, COMOMAG command inspections examine a command's ability to accomplish its assigned mission in the following five areas:

1. General. Evaluates the mission and functions, tasks, and resources adequacy and management (including personnel, facilities, equipment, supplies, training, and funding); coordination with other commands; effectiveness of plans and current operations; contingence y operational plans; and known deficiencies or problem areas.

2. Administrative. Determines whether organizational and administrative methods and procedures established by higher authority are being followed. These inspections are directed toward maximum readiness.

3. Supply. Determines whether the supply department is effectively carrying out its assigned functions and tasks in accordance with directives established by higher authority.

4. Maintenance and Material. Determines the condition and adequacy of MHE, machinery, and facilities.

5. Items of Special Interest. Determines certain items that are of special interest to the Secretary of the Navy (SECNAV) and the CNO. These items are published as an OPNAVNOTE 5040 by the NAVINSGEN at the beginning of each fiscal year.

In addition to the above inspection areas, a COMOMAG command inspection may check for the following items:

- Adequacy and condition of personnel clothing and equipment.
- Appearance, bearing, and smartness of personnel.
- Assignment of personnel to work areas, watches, and special duties.
- Cleanliness, sanitation, smartness, and appearance of the command.
- Comfort and conveniences of living spaces.
- Dissemination of information within the command.
- General educational facilities for personnel.
- General knowledge of personnel in regard to the command's organization, regulations, orders, and administrative procedures.
- General military training (GMT) and OJT programs.
- Indoctrination of newly reported personnel.
- Proper maintenance of stockpiled weapons and associated equipment and upkeep of maintenance records.
- Proper posting of operating instructions and safety precautions.

### Mine Readiness Certification Inspections

Just as an operational readiness inspection (ORI) evaluates the readiness and capability of a ship to perform its assigned mission under wartime conditions, a mine readiness certification inspection (MRCI) evaluates the capability of a MOMAG activity to assemble mines under the same conditions. Therefore, the COMINEWARCOM is tasked by the CNO to assess and assure mine warfare (MIW) readiness throughout the Navy.

To accomplish this task, the Commander, Mine Warfare Inspection Group (COMINEWARINSGRU), under the direction of the COMINEWARCOM, conducts or assists in conducting MIW certification inspections of all commands or units assigned MIW missions. The inspections are conducted in accordance with the *Mine Warfare Readiness Certification Inspection (MRCI) Program,* OPNAVINST C5040.15. These certification inspections are scheduled and conducted in an operational environment, permitting realistic assessments and evaluations of a command's operational readiness with respect to its mine warfare techniques, procedures, tactics, doctrine, training, and resources management.

MIW inspections for certification are conducted at MOMAG activities at intervals considered appropriate by FLTCINCs, but not exceeding intervals of 24 months. When an inspection team arrives, a letter of instruction (LOI) is presented to the commanding officer or officer-in-charge to prepare specific mines assigned to that activity's stockpile. The activity is then evaluated with respect to its procedures involving the upgrade operations of the designated mines. Upon completion of the assembly aspect of the inspection, a post analysis is conducted on the mines to check the effectiveness of procedures and the operating efficiency.

In addition to evaluating a command's upgrading operations and capabilities, the inspection team also checks the following areas:

- Security
- Facilities
- Training programs
- Personnel, material, and supply management

### Assist Visits

Informal assist visits are conducted by members of COMINEWARINSGRU on an "as-requested" and "as-available" basis. An assist visit will not be scheduled within 60 days of a scheduled MRCI. They may be intraservice or interservice visits. An informal report will be provided to the commanding officer or officer-in-charge of the inspected activity and to the ISIC. Requests for assist visits should be made directly to the COMINEWARINSGRU.

## INSPECTION PREPARATIONS

An inspection should not take your command by surprise. The best preparation for an inspection is to perform daily work assignments and requirements without errors. Preparation for the next inspection actually begins the day the last inspection ends. You are

required to correct any discrepancies noted during an inspection as soon as possible. Some of these discrepancies may be corrected immediately, whereas others may take time because of administrative or logistics situations. In addition, you should review and take into consideration any recommendations submitted by the inspection team, regardless of whether the recommendations are official or unofficial.

When you are preparing for an inspection, check the results from the last inspection. The last inspection report is a logical place to start, not only because it will be checked by the inspecting officer, but also because it points out former weaknesses in the command. Make sure that your command has corrected or acted upon all listed discrepancies from the last report. If any discrepancies have not been corrected, make a note as to the reason why; the inspectors will ask about them.

Other sources of information for the preparation of inspections are the inspection checklists and guides. Although primarily intended for COMOMAG command inspections, COMOMAG/MOMAGINST 5040.1 provides a list of areas that may also be checked during an MIW certification inspection or assist visit. OPNAVINST C5040.15 provides a chart of general areas to be inspected during an MRCI.

As a Mineman, you are considered as the professional source concerning operations involving the assembly, handling, and maintenance of mines and their associated equipments. However, since the Mineman rating involves more than just working with mines, you should contact personnel from other ratings or areas for assistance in preparing for an inspection. For example, a Yeoman may suggest a more efficient way of performing administrative matters, or a Storekeeper may advise you if your basic supply procedures are within the requirements of the Naval Supply Systems Command (NAVSUP-SYSCOM). In addition, you can conduct your own preinspection within the command, as personnel from one division of the command can inspect another division, specific area, or operation.

Remember the following two important factors:

1. DO NOT wait until the last minute to prepare for an inspection. That is usually too late.

2. DO NOT rely on your own self-check in areas for which you are normally responsible. You may be doing a task or a procedure wrong in the first place.

Finally, remember that the most important task of a Mineman is to prepare mines in support of mine warfare operations.

## RECOMMENDED READING LIST

**Note:** Although the following references were current when this TRAMAN was published, their continued currency cannot be assured. Therefore, you need to be sure that you are studying the latest revision.


*Inspection Guide for MOMAG Unit and Detachment Command Inspection,* COMOMAG/MOMAG-INST 5040.1E, Commander, Mobile Mine Assembly Group, Charleston, S.C., 1992.

*Mine Warfare Readiness Certification Inspection (MRCI) Program,* OPNAVINST 5040.15C, Chief of Naval Operations, Washington, D.C., 1987.

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*Operational Reports,* NWP 10-1-10, Chief of Naval Operations, Washington, D.C., 1987.

*Personnel Qualifications Standards for Underwater Mine Assembly Upgrade,* NAVEDTRA 43318, Naval Education and Training Support Center, Pacific, San Diego, Calif., 1986.

*Reporting of Mine Assembly Capability and Readiness Status,* COMOMAGIMOMAGINST 3501.1D, Mobile Mine Assembly Group, Charleston, S.C., 1990.

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*Standard Procedures for Initiating and Processing Work Orders,* COMOMAGINST 4850.1A, Commander, Mobile Mine Assembly Group, Charleston, S.C., 1987.

*Standard Production and Processing for Mines,* COMOMAG/MOMAGINST 8550.12C, Commander, Mobile Mine Assembly Group, Charleston, S.C., 1992.

*Status of Resources and Training Systems (SORTS),* NWP 10-1-11(A), Chief of Naval Operations, Washington, D.C., 1987.

# APPENDIX I

# GLOSSARY

AVOIDANCE—In order to prevent damage, the deliberate act of a potential mine target maneuvering around a mine or a minefield after the mine or the minefield has been identified.

BOTTOM MINES—The nonbuoyant mines that lie on the bottom of the ocean awaiting actuation by a target. In NATO terms, this mine type is referred to as a ground mine.

CHANNELIZATION—In mine countermeasures, the term applied to the tactic of creating a passage through a minefield during a breakthrough operation.

CLEARING—The level of mine countermeasures effort required to sweep, hunt, or otherwise neutralize, to a high percentage, the mines in a field, whether of a certain type or totally.

COVERAGE—The percentage of an area that has received some level of specified sweep effort.

DELAY ARM—The feature on a mine that causes it to arm only after a specified period of time has elapsed.

DESTRUCTOR (DST)—The bottom mines that use 80-series bombs as the case and the explosive charge.

HARASSMENT MINES—The mines specifically set to target sweepers or to enhance the psychological danger of a minefield.

MINE NEUTRALIZATION—The action taken to render a mine harmless.

MINE SENSITIVITY—The characteristic of an influence mine or a circuit that describes its liability to actuation by an influence field.

MINE WATCHING—A method of countermeasures involving visual observation of the emplacement of mines during delivery.

MINEFIELD LENGTH—The dimension of a minefield that is parallel to the anticipated target track. The transit distance through the minefield.

MINEFIELD PERFORMANCE OBJECTIVE (MPO)—The purpose of planting a minefield is to sink, damage, interrupt, and/or delay enemy maritime traffic. An MPO expresses the qualitative goal of a minefield and describes the broad objective that the minefield is expected to accomplish (such as port closure, attrition, antipassage, blockage).

MINEFIELD WIDTH—The dimension of a minefield that is perpendicular to the anticipated target track.

MINESWEEPING—The use of mechanical or influence techniques to counter mines along a sweep track.

MOORED MINES—A mine that has a buoyant case maintained at a predetermined depth by means of a cable attached to an anchor.

PENETRATION—The act of entering a minefield, either to transit or to sweep that field or area.

PRIMARY TARGET—The class of target that has been identified as the principal concern and against which the minefield is planned.

PSYCHOLOGICAL THREAT—The unquantifiable effect a minefield has on the enemy, based on the enemy's perception of its danger.

REPLENISHMENT—The number of mines scheduled to be delivered to replace those mines expended in the minefield after the initial planting.

SHIP COUNT—A countermeasure on a mine that prevents firing the weapon until a specified number of actuations have been achieved.

THREAT—The probability that a minefield will inflict a specified level of damage on a target ship attempting to transit that minefield.

WATER DEPTH—The distance in feet, meters, or fathoms from the ocean floor or the river bottom to the surface of the water.

## APPENDIX II

# ABBREVIATIONS AND ACRONYMS

ACTIV—current activity and employment (report)

BUORD—Bureau of Ordnance

CASREP—casualty report

CESE—civil engineering support equipment

CFR—Code of Federal Regulations

CINCLANTFLT—Commander-in-Chief, U.S. Atlantic Fleet

CINCPACFLT—Commander-in-Chief, U.S. Pacific Fleet

CINCUSNAVEUR—Commander-in-Chief, U.S. Naval Forces, Europe

CNO—Chief of Naval Operations

COMDR—commanding officer (report)

COMINEWARCOM—Commander, Mine Warfare Command

COMINEWARINSGRU—Commander, Mine Warfare Inspection Group

COMNAVSEASYSCOM—Commander, Naval Sea Systems Command

COMONIAG—Commander, Mobile Mine Assembly Group

dB—decibel

DCNO/L—Deputy Chief of Naval Operations for Logistics

DOD—Department of Defense

DON—Department of the Navy

FLTCINC—fleet commander-in-chief

GMT—general military training

HMC&M—hazardous material control and management

HMIS—Hazardous Material Information System

ISIC—immediate superior in command

IUC—immediate unit commander

JCS—Joint Chiefs of Staff

LOI—letter of instruction

MCN—mine control number

MFPF—minefield planning folder

MHE—material-handling equipment

MIW—mine warfare

MOMAG—Mobile Mine Assembly Group

MRCI—mine readiness certification inspection

MSDS—material safety data sheet

MSS—mine-setting sheet

MSSF—mine-setting sheet folder

NAVEDTRACOM—Naval Education and Training Command

NAVINSGEN—Navy Inspector General

NAVOSH—Navy Occupational Safety and Health

NAVSEASYSCOM—Naval Sea Systems Command

NAVSUPSYSCOM—Naval Supply Systems Command

NCA—National Command Authority

NCIP—Naval Command Inspection Program

NOL—Naval Ordnance Laboratory

NSOF—Navy Status of Forces

NWP—naval warfare publication

OA—operational assembly

OJT—on-the-job training

OPLAN—operational plan

OPREP—operational report

ORI—operational readiness inspection

PERSN—personnel strength (report)

PQS—personnel qualification standards

PREGO—present geographic location (report)

PWRMS—pre-positioned war reserve material stock

QA—quality assurance

SECDEF—Secretary of Defense

SECNAV—Secretary of the Navy

SITREP—situation report

SJP—standard job procedure

SOP—standard operating procedure

SORTS—status of resources and training system

TYCOM—type commander

UMWPS—Uniform Mine Warfare Planning System

## APPENDIX III

# REFERENCES USED TO DEVELOP THIS TRAMAN


*Ammunition and Explosives Ashore,* NAVOP 5, Chief of Naval Operations, Washington, D.C., 1990.

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*Department of Defense Dictionary of Military and Associated Terms,* Joint Publication 1-02, Joint Chiefs of Staff, Washington, D.C., 1989.

*DOD Hazardous Materials Information Procedures,* DODINST 6050.5-M, Department of Defense, Washington, D.C., 1990.

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*Hazardous Material Control and Management (HMC&W),* OPNAVINST 4110.2, Chief of Naval Operations, Washington, D.C., 1989.

*Inspection Guide for MOMAG Unit and Detachment Command Inspection,* COMOMAG/MOMAGINST 5040.1E, Commander, Mobile Mine Assembly Group, Charleston, S.C., 1992.

*Mine Warfare Readiness Certification Inspection (MRCI) Program,* OPNAVINST C5040.15C, Chief of Naval Operations, Washington D.C., 1987.

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*Navy Safety and Occupational Safety and Health Program,* OPNAVINST 5100.8G, Chief of Naval Operations, Washington, D.C., 1986.

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