

CHAPTER 2

ORGANIZATION, ADMINISTRATION, INSPECTIONS, AND MAINTENANCE

LEARNING OBJECTIVES

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

1. Describe the combat systems/weapons department organization and its basic administrative requirements.
2. Describe the division watch, quarter, and station bill, including watch assignments.
3. Identify personnel manning requirements.
4. Describe the major reports and records originating in the combat systems/weapons division.
5. Explain the supervisor's safety responsibilities.
6. Describe the importance of information security.
7. Describe the types of inspections, maintenance periods, overhauls, and alterations.

INTRODUCTION

As a Fire Controlman (FC) supervisor, you will have duties and responsibilities that involve more than just repairing equipment. You will also assume the additional duties of a work-center supervisor.

This chapter discusses command organization, administration, inspections, and maintenance and material management responsibilities.

For additional information on general organization and administration, refer to *Military Requirements for Petty Officer Second Class*, NAVEDTRA 12045; *Military Requirements for Petty Officer First Class*, NAVEDTRA 12046; and *Military Requirements for Chief Petty Officer*, NAVEDTRA 12047.

ORGANIZATION

To manage your division effectively and efficiently, you must have a sound division organization. A sound division organization has a clear organizational structure and definite policies and procedures. It also has the necessary controls to ensure that the division is capable of completing its mission under all conditions. A functional organization eases the process of escalating from peacetime status to wartime status without major organizational changes.

The standard requirements for organization aboard each ship type and class are defined by the type commander (TYCOM) or higher authority. These requirements are intended to help commanding officers manage their units in the best possible manner.

The organization of the combat systems/weapons division is basically the same aboard all ships and shore commands. Variations in the organization within ships of the same type and class are usually caused by such factors as the number of experienced personnel, the differences in the employment or material condition of ships, and the methods that different division officers or senior petty officers use to organize and run their divisions. The basic administrative and functional organization in ships is prescribed by the *Standard Organization and Regulations of the U.S. Navy* (commonly called the SORM), OPNAVINST 3120.32.

Every level of command should have an organization bill. The organization bill for a particular level describes the duties and responsibilities of personnel assigned to that level. It also prescribes policy and procedures peculiar to that level.

SUPERVISOR RESPONSIBILITIES

As an FC1 or FCC, you may be either the leading FC or an equipment technician, depending on the size of your command. The leading FC assists the combat systems officer (CSO)/weapons officer and is responsible for directly supervising the preventive and corrective maintenance of all electronic equipment.

The leading FC also ensures that all records and publications are current and are available for reference, prepares required reports, and supervises the cleanliness and upkeep of the divisional spaces.

PERSONNEL RESPONSIBILITIES

The proper assignment of available personnel for the upkeep of equipment and for other necessary duties is essential. It is particularly critical if the division is short of personnel or if the available personnel are inexperienced. The leading petty officer must always be aware of the qualifications of the onboard technicians.

If the division is well-staffed, inexperienced people may be assigned to work with more-experienced crewmembers. In such cases, the leading petty officer

should ensure that the inexperienced personnel actually receive technical instruction, rather than merely act as toolbox carriers.

If the combat systems/weapons (fire-control) organization chart is organized into blocks according to the various types of equipment the division maintains, then the names of the technicians assigned to the different groups of equipment may be written under the appropriate blocks, with the top name being that of the supervisor in charge of that particular group.

In the final breakdown of duties, a certain number of equipment units may be assigned to one individual. An advantage of this arrangement is that the responsibility for the maintenance of certain equipment *is* placed on individual technicians. In smaller vessels, of course, the equipment to be maintained and the Fire Controlmen available are reduced proportionately.

ADMINISTRATION

Your involvement in administrative actions will become more of a requirement, directly or indirectly, as you advance to first class and chief. This section describes some of the duties and responsibilities associated with these requirements, including a knowledge of general quarters, watches, personnel manning, reports, safety, information security, and space upkeep and cleanliness.

GENERAL QUARTERS

Combat systems/weapons department personnel are each assigned a general quarters station by the division watch, quarter, and station bill. Assignments of personnel should be practical and functional, as determined by the CSO/weapons officer.

As an FC1 or FCC, you will be in a position to make recommendations to the CSO/weapons officer, and your experience and attitude will contribute much to the success of the department.

Specific instructions for general quarters should be outlined in the division's organization manual. Pro-

cedures and applications should be a major part of combat/weapons systems training.

WATCHES

As an FC supervisor, you may be in charge of the inport and underway watches. These watches are briefly discussed in the following paragraphs:

● **Inport Watches:** The leading FC of each watch section is designated as the duty Fire Controlman and is directly responsible for the handling of all equipment casualties that may occur outside normal working hours. All technicians who are aboard, even though they may rate liberty, are considered to be on duty and may be called on by the duty Fire Controlman at any time to assist in handling any equipment repair.

● **Underway Watches:** The leading FC makes up the underway watch list, which is then approved by the CSO/weapons officer and posted in the division spaces or combat systems spaces. All watches are stood according to this watch list and watch-standing instructions. A Fire Controlman on watch should not leave his assigned space except to handle a casualty, to supervise preventive maintenance, or to make inspections or tests. Note that the only reading materials authorized for use during underway watches are technical publications, manuals, and instruction books pertaining to some phase of combat systems.

PERSONNEL MANNING

Personnel manning is a prime concern of the CSO/weapons officer. However, you will more than likely be involved with personnel manning within your division. A division must have the correct manning levels to function properly and to fill the needs of equipment maintenance and other shipboard functions, such as general quarters watch stations.

Manpower requirements are normally accounted for by the Navy Manpower Requirements System (NMRS). The following subsections give a general background in Navy manning and the personnel tools with which to work, including the ship manning docu-

ment, the manpower authorization, and the enlisted distribution and verification report.

Ship Manning Document

The main function of the ship manning document (SMD) and the preliminary ship manning document (PSMD) is to document manpower requirements. To effectively manage personnel, the Navy needs an accurate identification of ship manning requirements. This is documented on the SMD and the PSMD in terms of the quantity and quality of personnel (skills, experience, specialized training) that are required to perform mission requirements as specified in the required operational capability (ROC), submarine required operational capability (SUBROC), and projected operational environment (POE) statements.

An ROC statement lists all required operational capabilities for a class of ships, a type of aircraft squadron, or other unit as assigned by the Chief of Naval Operations (CNO). Examples of ROC and SUBROC statements are shown in the following box:

ROC:	1. Engage submarines with antisubmarine armament. 2. Engage airborne threats using surface-to-air armament,
SUBROC:	1. Attack with torpedoes. 2. Engage airborne threats using installed antiair (AA) weapons.

A POE statement lists the most-demanding conditions (wartime or peacetime) of operation for which a unit must be manned, as shown in the following example:

At sea in wartime, capable of performing all offensive and defensive functions simultaneously while in Readiness Condition I; capable of performing other functions that are not required to be accomplished simultaneously.
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The SMD is developed in six phases: (1) data collection, (2) workload standards development or validation, (3) preliminary statement of required billets, (4) fleet review, (5) publication of final billets, and (6) implementation. The NMRS provides automated data-processing support for each of these phases.

If a ship is modernized during its service life (such as updating or adding equipment or systems), the SMD provides a means for determining manpower requirements for the modified systems or mission. The NMRS can generate an SMD to identify billets needed to operate and maintain new weapons, equipments, and systems far enough in advance of fleet introduction to provide trained personnel both when and where they are needed.

In addition, the shipboard managers—from the commanding officer to the leading petty officers—may use the SMD as an effective source document. Since it has detailed watch station requirements, the SMD can serve as the basis for establishing a battle organization and a watch bill for specific conditions of readiness. The SMD presents the basic manning requirements summary in seven sections. See table 2-1.

Manpower Authorization

Even though you will probably not be directly involved with manpower authorization (MPA) changes, you should have some knowledge of manpower authorization. The SMD is the basis for the Manpower Authorization (MPA) (OPNAV 1000/2).

The proper classification of authorized billets is extremely important in defining the Navy's overall manpower requirements. The numbers of billets throughout the Navy are summarized by the various classification categories. These figures provide the basis for recruiting, training, and promoting Navy personnel.

The Navy must produce the maximum combat readiness with the dollar resources available. For this reason, and because of the high cost of manpower, each billet requirement must be stated at the minimum skill and experience levels necessary for satisfactory performance of billet functions.

Billet reviews are conducted periodically at the CNO level. In those reviews, decisions are made based on the existing classification of each billet as indicated on the MPA. Improperly classified billets become the lowest priority billets in the category in which they are classified. Consequently, if the objective is to delete or redistribute billets, improperly classified billets are prime candidates for deletion or reprogramming.

The manpower requirements and manpower classifications within each Navy activity are specifically reviewed at the activity level annually to ensure the deletion of unnecessary billets or positions and the proper classification of each authorized billet or position.

If changes are required, a Manpower Authorization Change Request (MACR) (OPNAV 1000/4A) is submitted. If changes to the designator rating, grade, or number of billets and/or positions are requested, the requests must be justified in terms of changes in mission, function, and/or task, as contained in the ROC or shore required operational capability (SHO-ROC) statements. If a billet is currently classified improperly, the misclassification must be explained.

MACRs are normally submitted annually. More-frequent requests must be justified on the basis of changes in mission or functions beyond the control of the activity. Valid requirements for billet changes that will require the movement of personnel must be identified and requested as early as feasible to permit orderly personnel management. Normally, it requires 5 to 9 months after final billet approval before new or changed billets can be filled with personnel. MACRs that involve an activity reorganization are planned and submitted on the basis of the existing number of billets.

The Billets Authorized (BA) column on the MPA (block 32) indicates the billets authorized by the CNO. The quantity assigned to each billet authorized on the MPA is normally the same as the corresponding billet in the SMD. SMD billet requirements, which are not included in the BA column on the MPA, are entered on the MPA as Mobilization Billets (MBs), the majority of which will be reflected in the Selected Reserve (SR) column (block 39).

Table 2-1.-Ship Manning Document Description

Section	Title		Description
I	Officer Billet Summary		Consolidates the officer requirements into a single section.
II	Manpower Summary		Shows the number of officer, enlisted, and civilian manpower requirements at the department level.
III	Manpower Requirements		Displays the ship's manpower requirements by organizational component.
IV	Battle Bill		Shows the watch-station requirements for each condition of readiness prescribed in the ROC and POE statements.
V	Functional Workload		Provides a summary of all workloads, by category, that contributed to the billet requirements in each organizational component.
VI	Part 01	Summary of Officer Manpower Requirements	Provides a summary of officer billets by designator and paygrade along with totals for both. (This summary is shipwide and is not related to organizational components.)
	Part 02	Summary of Enlisted Manpower Requirements	Is similar to Part 01, but more detailed. Includes a summary for each rating group (i.e., DS, ET, FC, OS, RM) in alphabetical order, showing primary and secondary NECs and paygrades. The end of the section gives a summary for the entire activity, summarized by paygrade only. (This summary is shipwide and is not related to the organizational structure.)
	Part 02A	Summary of Enlisted Manpower Requirements by Division/Department	Summarizes the paygrades by each organizational component and shows the totals for each division/department. There is a single-line entry for each skill level (rating, paygrade, primary NEC, and secondary NEC) at the division level. Each department starts at the top of a new page.
VII	Summary of Organizational Manpower Requirements		Summarizes and displays the billet information contained in the previous sections.
	Part I		Shows the officer, chief petty officer (E-7, E-8, E-9), and other enlisted billets in the document.
	Part II		Shows the apportionment of enlisted skills by paygrade, including petty officers (E-4 and above), designated strikers (i.e., DSSN, ETSN, FCSN), and nonrated personnel (i.e., SN, FN).
	Part III		Shows the paygrade summary of all enlisted billet requirements on a shipwide basis. (This summary is identical to that shown at the end of Section VI [Part 02].)

What does all this mean to you? You, as a supervisor, play a very important part in the process. You must continually work with your personnel specialist to ensure that billet and personnel requirements for your division are accurately reflected in the SMDs. By keeping your division's manning requirements current, you help to keep your ship's manning requirements current.

Check the MPA to ensure that all the Navy enlisted classifications (NECs) listed in the MPA that

pertain to your division are current and correct. It is especially important to ensure that the NECs required to support new installations are requested and that old NECs no longer required are deleted.

When you work with the MPA, refer to the *Manual of Navy Total Force Manpower Policies and Procedures*, OPNAVINST 1000.16. It contains the information and procedures necessary to initiate a ship's force change request (SFCR).

Enlisted Distribution and Verification Report

An enlisted distribution and verification report (EDVR) is a statement of an activity's personnel account—the number of personnel assigned, their rates, their NECs, etc. The Enlisted Personnel Management Center (EPMAC) publishes an up-to-date EDVR monthly for every command.

As a supervisor, you should learn to use the EDVR. It contains valuable information that will assist you in providing proper manning for your ship. You will use the EDVR often, more so than the MPA or the SMD. As an FC1 or FCC, you will work closely with the division officer to determine NEC manning and personnel losses and gains, as well as to initiate any necessary changes to the EDVR.

The purpose of the EDVR is to provide

- a rate or NEC summary of the current and future manning status of the activity,
- a common reference point in any discussion of manning status between the manning or detailing control authorities and the activity,
- a statement of account for verification by the activity, and
- a permanent historical record at the Navy Military Personnel Command (NMPC) of an activity's personnel account for statistical uses and overall Navy manning.

The EDVR printout is divided into the following nine sections and as described in table 2-2:

- Sections 1 through 3 contain personnel information that has been extracted from the activity account and that requires special attention or action by the activity.
- Section 4 contains the total personnel account of the activity, including those members reflected in sections 1 through 3.
- Sections 5 through 8 contain only statistical and authorized billet information.
- Section 9 contains information on NEC management and lists names and up to five NECs that the service member may hold.

Table 2-2.-Enlisted Distribution and Verification Report Description

Section	Title	Description
1	Prospective Gains	Lists all members who are ordered to report to your activity within the next 7 months.
2	Prospective Losses	Lists all members who should have been detached or who are expected to be detached from the activity within the next 7 months. Career and noncareer EAOS (end of active obligated service) losses are also listed.
3	Personnel on Board for Temporary Duty or Assigned in a Deserter Status	Lists the personnel on board for temporary duty or assigned in a deserter status.
4	Total Personnel on Board and Rating NEC Summary	Lists all members in the activity's personnel account, regardless of their loss, gain, or duty status. When a member also appears in one of the three preceding sections, the section in which the member is listed is displayed in item AA of the EDVR.
5	Personnel Status Summary	Gives the numerical summary of the activity's personnel account, showing authorized billets, the Navy manning plan (NMP), and members on board the activity.
6	NEC Summary	Gives the summary of an activity's authorized NEC billets and the members on board or expected on board who possess those NECs.
7	CNO Billets Authorized Revision Number xxxx Dated Yr/Mo/Da	Is identical to the summary of organization billets in the activity's MPA.
8	NEC Billet/Personnel Inventory	Lists the NECs for which the activity has authorized billets and the members who hold those billets.
9	NEC Management Section	Lists the names of the activity's personnel who hold NECs and lists up to five NECs per individual.

REPORTS

Periodic reports and maintaining personnel and equipment records will become a daily responsibility as you advance in rate. Train yourself to be both proficient and efficient. Preparing these reports and records in a proper and timely manner will allow you more time to complete your other duties. In other words, if you let the paperwork pile up, you will be pressured for time and will probably do the reports hurriedly. Keeping up with the paperwork daily will decrease your stress level and will yield a better management product for the Navy.

Even though the CSO/weapons officer is ultimately responsible for all division reports and records, he will depend on your knowledge and performance for inputs to that information. Some of the reports and records with which you should be familiar, de-

scribed in the following subsections, should be listed in your command's instruction on recurring reports.

Eight O'Clock Reports

Eight o'clock reports are daily equipment status reports given to the commanding officer by the executive officer each evening at 8:00 p.m. (2000). At sea, the CSO/weapons officer usually gives the combat/weapons systems eight o'clock reports to the executive officer. In port, these reports are given to the command duty officer (CDO) by the duty department officers. As the senior FC, you must ensure that the information is current and accurate for your area of responsibility.

Traditionally, the eight o'clock reports are verbal reports of equipment status. However, because of the

number of equipments on our ships today, there is usually a master sheet of equipments in multiple-copy form. Applicable comments are made adjacent to the listed equipments on a daily basis. One copy of the equipments list is kept for the divisional file. The original is turned in for the eight o'clock reports.

The following information is provided for each piece of equipment on the eight o'clock report:

- Status of the equipment, whether in an up status or a down status and with a statement of the nature of the problem if the equipment is in a down status.
- Parts information (parts on board, parts not on board, and supply requisition number).
- Estimated time of repair for a down item.
- Necessity of a casualty report (CASREP). (If an equipment or system CASREP has already been made, the report includes the CASREP serial number for the applicable equipment or system.)

Casualty Reports

As a combat systems supervisor, you will often be in a situation that requires you to draft casualty reports (CASREPs). These are message reports that support the CNO and the fleet commanders in the management of assigned forces. The effective use and support of Navy forces require an up-to-date, accurate operational status report for each unit. An important part of each operational status report is casualty information.

The CASREP system contains four types of reports: INITIAL, UPDATE, CORRECT, and CANCEL. CASREPs are not a substitute for maintenance and material management (3-M) data, but they are in addition to and complement that information. The reference publication for CASREP information and procedures is *Operational Reports*, NWP 10-1-10.

Equipment Status Reports

Equipment status reports vary from command to command. On most ships, the combat systems/weapons department is responsible for turning in an equipment status report before the ship gets under way. This report may be due any time from 72 hours to 24 hours before the ship gets under way, depending on the requirements set by the TYCOM and the command.

The equipment status report usually includes major equipment status, estimated time of repair (ETR), power out/minimum discernible signal (MDS) readings from radars, and power out/receiver sensitivity readings from communications equipment. This report is usually given on a locally generated report form (checklist type); however, it may be made on the same form as the eight o'clock report.

SAFETY

Most accidents are preventable. However, through ignorance or misunderstanding, there is a common belief that accidents are the inevitable result of unchangeable circumstances or fate. This belief fails to consider the basic law of cause and effect. In other words, accidents do not occur without a cause; most accidents are the direct result of some deviation from prescribed safe operating procedures.

A preventable accident may be traced to an ingrained belief or work habit of an individual. This belief or work habit may cause the individual to perform an unsafe act or permit a hazardous condition to exist. Then, when an accident occurs, the cause-and-effect sequence is completed.

One purpose of safety rules is to remind personnel of the dangers inherent in their work. Training in the observance of safety precautions can help prevent accidents and encourage the maintenance of an accident-free work environment. Operating procedures and work methods should stress hazard prevention

so that personnel do not expose themselves unnecessarily to injury or occupational health hazards. Most accidents can be prevented if personnel are alert to causes and take appropriate remedial action.

Electrical Safety Training

Any failure to follow electrical safety rules or procedures may result in mild to severe shocks. In some cases, death may even result. As a leading FC, you have safety-related responsibilities that may be grouped into the following three general areas:

1. Division Responsibilities: Division responsibilities include ensuring that all personnel in the division are aware of and observe all safety precautions, especially those precautions regarding electrical safety.

2. Nonelectrical Rating Responsibilities: Nonelectrical rating responsibilities are ever increasing, as more and more electronic equipment is used in the various jobs. As an FC1 or FCC, you will automatically be considered an expert on electrical safety precautions. Therefore, you have a responsibility to educate the personnel whose primary duties are non-electrical about these precautions.

3. Petty Officer Responsibilities: As a petty officer, you have the same responsibilities as all other petty officers in enforcing all safety precautions.

Electrical Shock Causes

Nearly all shipboard electrical shocks are caused in one or more of the following ways (all these failures may be summarized as neglecting applicable safety precautions):

- Unauthorized use of, or unauthorized modifications to, equipment.
- Failure to observe applicable safety precautions in the use of equipment or in working on or near energized equipment.
- Failure to repair equipment that is known to be defective and has previously given users a mild shock.

- Failure to test and inspect equipment for defects, or failure to remedy all defects found by tests and inspections.

Electrical Safety Education

Electrical safety education is a must. You cannot expect personnel to observe a safety precaution unless they are fully aware of the dangers involved. Therefore, one of your first duties is to ensure that all personnel in the combat systems/weapons division are aware of the dangers and the safety precautions necessary to combat those dangers.

Safety precautions depend to some extent on the type of ship involved. Some ships necessarily have particular precautions that must be strictly observed, but which are not applicable to other types of ships. Therefore, you should ensure that all personnel read and understand all safety precautions pertaining to the electrical and electronic equipments on your own ship.

Safety precautions for personnel in nonelectrical ratings should include information concerning electrical shock and precautions they must observe when using electrical equipment, either aboard ship or ashore.

Facts to be stressed to all personnel, both electrical and nonelectrical rating personnel, concerning electric shock should include the following cautions:

- Voltages as low as 30 volts can be fatal.
- The dangers from electric shock are much greater aboard ship than ashore.
- There is little middle ground between a slight tingle and a fatal shock.

Fundamentally, current, rather than voltage, is the criterion of shock intensity. The passage of even a very small current through a vital part of the human body may cause death. The voltage necessary to produce the fatal current depends on such factors as the body resistance, the contact condition, and the path the current takes through the body.

The probable effects of shock are shown in table 2-3.

Table 2-3.-Probable Effects of Electric Shock

AC 60 Hz (mA)	DC (mA)	Probable Effect
0-1	0-4	Perception
1-4	4-15	Surprise
4-21	15-80	Reflex action
21-40	80-160	Muscular inhibition
40-100	160-300	Respiratory block
Over 100	Over 300	Death

It is imperative to recognize that the resistance of the human body cannot be relied on to prevent a fatal shock from 115 volts or even lower voltages. Fatalities from as low as 30 volts have been recorded. Tests have shown that body resistance under unfavorable conditions may be as low as 300 ohms and possibly as low as 100 ohms from temple to temple if the skin is broken.

Volt for volt, dc potentials are normally not as dangerous as ac potentials. This is shown by the fact that reasonably safe "let-go currents" for 60-Hz ac are 9.0 mA for men and 6.0 mA for women, whereas the corresponding values for dc are 62.0 mA for men and 41.0 mA for women.

The instruction to personnel in nonelectrical ratings regarding the safety precautions they must observe when using electrical equipment should emphasize the following points:

- NEVER use any personal portable electrical equipment aboard ship unless it has been inspected and approved.
- NEVER use portable electrical equipment if there is reason to believe it might be defective. Have it tested by authorized personnel.

- NEVER make repairs yourself. All repairs must be made by authorized personnel only.
- ALWAYS visually inspect portable electrical equipment before you use it. Look for damaged plugs, frayed cords, broken or missing ground connections, etc.
- ALWAYS report any shock you receive from electrical equipment, regardless of how slight.

General Safety Promotion

Promoting safety within the electronics division or on the ship in general requires that you, as the FC1 or FCC, become safety conscious to the point that you automatically consider safety in every job or operation. Through the use of safety reminders and by your personal example, you pass safety consciousness on to other personnel.

You must be thoroughly familiar with section D5 of *Navy Safety Precautions for Forces Afloat*, OPNAVINST 5100.19. This is the primary source of general safety rules and regulations. Safety information is also given in the *Electronics Installation and Maintenance Book, General*, NAVSEA SE000-00-EIM-100.

INFORMATION SECURITY

The security of the United States, in general, and of naval operations, in particular, depends in part on successfully safeguarding classified information. All FCs must be security conscious to the point that they automatically exercise proper discretion in performing their duties and do not think of security of information as something separate from other matters. By doing so, security of classified information becomes a natural element of every task and not an additional burden.

You should be thoroughly familiar with the *Department of the Navy Information and Personnel Security Program Regulation*, OPNAVINST 5510.1. Following its guidance should be second nature to you.

SPACE UPKEEP AND CLEANLINESS

The upkeep and cleanliness of spaces in the electronics division is very important. The safety and operation of equipment depend on correct and routine upkeep. The upkeep of spaces should be a daily routine, regardless of priorities.

As a senior petty officer, you should ensure that all workspaces are always in excellent shape, with tools properly stowed and equipment properly mounted and covered when not in use. While equipment repairs or other unforeseen events sometimes dictate maintenance, space upkeep and cleanliness should not be forgotten. Dangers of fire, damage control, personnel safety, and clogged equipment filters, as well as many other reasons, dictate that your spaces be kept up and clean at all times.

INSPECTIONS

Inspections of electronic equipment and digital data equipment systems are made at least once during each ship's training cycle and at other times when necessary. These inspections determine the state of equipment readiness and compare its condition with a previously established condition to detect any deterioration. They also help to determine the readiness of equipment after it has been installed, overhauled, repaired, or altered.

INSPECTION AND SURVEY INSPECTIONS

Inspection and survey (INSURV) inspections are conducted by the Board of Inspection and Survey to determine the material readiness of the ship's equipment and systems. Any discrepancies or deficiencies discovered by the INSURV inspection team are documented on Ship's Maintenance Action Form (OPNAV 4790/2K). These work requests are then used in planning an availability or an overhaul.

Material Inspection of Ships by the Board of Inspections and Surveys, OPNAVINST 4730.5, requires an INSURV inspection for active ships at least once every 3 years.

TYPE COMMANDER ADMINISTRATIVE INSPECTIONS

Type commander (TYCOM) administrative inspections are held at least once during each training cycle and are divided into a whole-ship category and a department category. Administrative methods are examined to determine if they are intelligent and efficient. They are also checked to determine if they are directed toward keeping the ship prepared for wartime mission performance.

MATERIAL READINESS INSPECTIONS

Material readiness inspections (MRIs) determine the material readiness of shipboard equipment and systems installations. They are conducted once during each ship's training cycle and are supervised by an officer who is qualified in the particular equipment or system. When practical, this officer is assisted by an engineer furnished by the systems command responsible for that equipment. In the interest of reducing costs and conserving manpower, these inspections are normally conducted concurrently with, or as part of, the INSURV inspection.

MRIs consist of three specific types of inspections: (1) performance inspections, (2) physical inspections, and (3) maintenance administration inspections.

Performance Inspections

Performance inspections include, but are not limited to, the following actions:

- Making the basic measurements listed on the maintenance requirement card (MRC) for the equipment and systems designated by the inspecting officer as essential to the primary mission and task of the ship being inspected.

- Conducting system tests on designated systems at a test and calibration facility. If any of these tests are not performed at the time or just before the inspection, they should be completed soon afterwards. In any event, additional measurements, as noted on system MRCs, should be taken at the time of the system test.

- Conducting interference tests to determine if operating the equipment causes problems with other installed electronic equipment or if it is hampered by interference from other electronic or nonelectronic equipment. The interference tests also identify the source and amplitude of interference emanating from nonelectronic equipment.

- Listing all approved modifications required but not made, as well as all unauthorized modifications.

Physical Inspections

Physical inspections include visually inspecting and determining the condition and adequacy of all equipment, cabling, repair parts, and tools.

Maintenance Administration Inspections

Maintenance administration inspections determine if there is an established procedure for submitting a Ship's Maintenance Action Form (OPNAV 4790/2K) and a Ship's Configuration Change Form (OPNAV 4790/2CK).

Checks are also made to ensure that there is a procedure for listing field changes on field change plates and updating electronics publications.

These inspections include, but are not limited to, checking to determine if the quantity and rates of electronics personnel on board meet the ship's allowance and if the electronics personnel assigned to the ship are capable of supporting the allowed equipment. They are also used to determine if there is an established program for on-the-job training (OJT), as well as a program for sending personnel to fleet and NMPC-controlled electronics schools.

PREOVERHAUL TESTS AND INSPECTIONS

Preoverhaul tests and inspections (POT&Is) are held approximately 10 to 12 months before an overhaul. These inspections cover work on combat system

items to be done during the upcoming overhaul. They provide information that is used to develop the plans for the ship's overhaul.

Personnel performing these inspections are normally from the ship's home yard. Personnel from the Naval Space and Warfare Command (NAVSPA-WARCOM) or the Naval Sea Systems Command (NAVSEASYSKOM) may also perform part of these inspections.

POSTOVERHAUL INSPECTIONS

Postoverhaul inspections furnish the commanding officer of the ship a report on the condition, capabilities, and limitations of the shipboard equipment and systems. These inspections include new installations of equipment and systems, as well as the equipment or systems that were included in the overhaul job orders.

MAINTENANCE AND MATERIAL MANAGEMENT RESPONSIBILITIES

By this point in your career, you probably have an extensive knowledge of the maintenance and material management (3-M) systems. You should follow those requirements automatically. However, as an FC1 or FCC, you should know the full use of the 3-M systems and must ensure that your personnel comply with the requirements.

Maintenance periods and overhauls are scheduled at various times according to the needs of the ship, the fleet, the type of ship, and the available funds. Regular overhauls are normally scheduled approximately every 60 months. Alterations are any changes made to improve the military or technical aspects of a ship.

The required heavy maintenance and overhauls that cannot be accomplished while the ship is under way usually takes from 2 to 6 months. During this time, many new electronics installations and equipment or system overhauls may be completed with the assistance of yard, tender, or civilian contract personnel.

To review the mechanics of the 3-M system, refer to “The Ships’ 3-M Systems” chapter of the *Military Requirements for Petty Officer Third Class*, NAVEDTRA 12044. Although that chapter provides an excellent description of the 3-M systems, the official reference for the 3-M systems is the *Ships’ Maintenance and Material Management (3-M) Manual*, OPNAV - INST 4790.4. You may also wish to read *Introduction to 3-M Systems*, NAVEDTRA 13092, which gives a short but very informative explanation of 3-M systems and procedures.

AVAILABILITY TYPES

An availability is an assignment of a ship to a repair facility for repairs beyond the capability of the ship’s force. Besides regular overhaul, several types of availabilities are assigned, according to the needs of the individual ship or the fleet. These are restricted, technical, and intermediate-level maintenance activity availabilities.

Restricted Availability

A restricted availability (RAV) is normally assigned for emergency repairs of prime systems that prevent the ship from fulfilling its mission. When emergency repairs to primary systems cannot be made by the ship’s force, the commanding officer may request the TYCOM to assign a restricted availability for the repair of a specific system. During an RAV, the ship is incapable of performing its mission.

Technical Availability

A technical availability (TAV) is assigned when repairs on noncritical systems or equipment must be made by a repair facility or yard. These repairs do not affect the ability of the ship to complete its mission. If necessary, the ship can get under way without the system or equipment being repaired.

Intermediate-Level Maintenance Activity Availability

An intermediate-level maintenance activity availability (IMAV) involves repairs made by either afloat repair activities (tenders and repair ships) or shore intermediate maintenance activities (SIMAs). Its purpose is to accomplish as much intermediate-level maintenance and repair work as possible within the workload limitations, the available funds, and the relative priority of the required work.

Although the primary emphasis of a SIMA effort is on repair work, authorized ship alterations and alterations equivalent to repair are undertaken as SIMA workloads permit.

UPKEEP PERIOD

The upkeep period is time in a port where the facilities of a yard or a tender are available for routine maintenance that cannot be completed while the ship is under way. Upkeep scheduled with the assistance of a tender or a repair ship is sometimes referred to as *tender availability*.

SHIPYARD OVERHAUL

Ships are assigned availabilities at shore-based repair activities as directed by the CNO. The first scheduled overhaul is normally granted to a ship after an initial operating period of approximately 2 years. Thereafter, scheduled overhauls depend on the ship type.

The amount of time in the shipyard for these overhauls varies. For example, if the shipyard works on a one-shift basis, the overhaul often requires 6 months or longer. The employment schedule, an operating directive furnished by the TYCOM, indicates when a ship is scheduled for overhaul.

Availability Work Package Development and Alteration

For an availability to be a success, the work to be done must be clearly defined in sufficient time to order material and to issue the necessary job orders or contract specifications. The definition of work required is obtained from the ship's database, as reflected in the current ship's maintenance project (CSMP), and from the results of the POT&Is.

The work package is developed through a sequence of events that starts with the ship's CSMP and results in an authorized work package control document and the ship alteration and repair package (SARP). The development process of the SARP is shown in table 2-4.

Preoverhaul

For the best use of the time and funds available for an overhaul, planning for the repairs to be made during the overhaul must be done in advance of the ship's arrival at the repair activity. Advanced planning is required of both the ship and the repair activity.

In preparing the combat systems work list for submission to the CSO/weapons officer, the leading FC must give all the information necessary to assist the shipyard in locating and rectifying the troubles. Most of this information is obtained from the CSMP.

The work list indicates all work that should be completed during the overhaul, the priority for each item, and the name of the ship's quality assurance (QA) inspectors. The work list is combined with the work lists submitted by the other divisions. Before the ship enters the repair yard, a complete ship's work list should be submitted.

Overhaul

During an overhaul, the combat systems/weapons department personnel continue to have responsibility

for their equipments, including repairs. This includes inspecting the work both during and on completion of the repairs.

Your responsibilities also include signing off jobs that are completed. To do this properly as a member of the ship's QA team, you must understand and apply the requirements of the *Quality Assurance Manual*, COMNAVSURFLANTINST 9090.1.

Remember, once you have signed off the work as being completed, you have "bought" the equipment, whether it works or not.

Postoverhaul

Completing an overhaul requires submitting a report on the completion status of all authorized repairs, canceling or rescheduling of uncompleted work, and preparing the ship for its initial voyage after the overhaul.

Except in unusual circumstances, job orders for uncompleted repair work are closed or canceled when the ship leaves the repair activity. Job orders for authorized alterations, however, are held open until the work is either completed later or canceled by the appropriate systems command.

If the ship leaves the repair facility with unfinished work to be completed by another activity, all outstanding job orders are transferred to the other activity, together with all pertinent information and whatever material was assembled for the work. If work is later desired on job orders that have been closed or canceled, new requests must be made.

When readying a ship for sea including its initial voyage after an overhaul, the electronics personnel must see that allowances of equipment, tools, and repair parts are on board and are properly stowed.

The reason is obvious, as negligence can make the ship a liability during action.

Table 2-4.-Ship Alteration and Repair Package Process

Step	Section	Purpose
1	CSMP Validation	The CSMP undergoes formal review to ensure its accuracy and completeness. This is the responsibility of the ship; however, external assistance is generally provided to enhance the effort. The CSMP provides the largest input into the development of the SARP.
2	Preoverhaul Tests and Inspections	These POT&Is identify work not previously covered in the CSMP. They also define more clearly the CSMP work requirements.
3	TYCOM Screening of the CSMP and Work Identified by POT&Is	The work may be assigned to off-ship activities or the ship's force, or it may be deferred until a later availability. Some categories of work will be authorized immediately to allow advanced planning (ordering of material and estimating of the work package).
4	Other POT&Is Designated by the TYCOM and the Concurrent Development of Estimates by the Naval Shipyard or the Supervisor of Shipbuilding	The ship must prioritize all work requirements that have been screened but are not yet authorized. This is completed in preparation for the work definition conference.
5	Maintenance Work Definition Review (Complex Overhaul/Selected Restricted Availability)	This meeting is scheduled by the TYCOM and is held aboard ship with the planning and estimating group. The POT&I information is used to make the work package fully defined within funding constraints and to prepare it for presentation to the work definition conference.

Alteration

In general, an alteration is any change. It can be major or minor and can affect almost anything about the ship. It may be any of several types: ship alteration (SHIPALT), boat alteration (BOATALT), machinery alteration (MACHALT), ordnance alteration (ORDALT), or alteration equivalent to repair (AER). An alteration, such as equipment calibration, can be performed during an availability.

Alterations are managed through the fleet modernization program and may be either military or technical improvements.

● **Military Alteration:** A military alteration results in a change of a ship's operational or military characteristics, qualities, or features. It also increases the ability of the ship to meet its ROC. The decision to incorporate a military alteration rests solely with the CNO.

● **Technical Alteration:** A technical alteration is a change that improves the safety of personnel and

equipment and provides increased reliability, maintainability, and efficiency of installed equipment.

Table 2-5 lists the alteration categories and their authorization sponsors.

Table 2-5.-Ship Alteration Categories

Title	Authorization Sponsor
K	Funded and authorized by the CNO
K/P	Funded and authorized by the CNO
D	Funded and authorized by the TYCOM
F	Funded and authorized by the TYCOM
TIA	No funding required; authorized by the TYCOM

Field Change

A field change (FC) is a modification to combat/weapons systems equipment. It should improve per-

formance, reliability, maintenance, operational characteristics, and/or safety.

The type designator indicates the completeness of the change package. Some packages contain all necessary instructions, parts, and tools, whereas other packages contain only instructions.

The four types of field changes are shown in table 2-6.

The three classes of field changes are described in table 2-7. The class designator indicates the activity responsible for the funding and installation of the field change.

Table 2-6.-Field Change Descriptions

Type	Description
I	Requires parts, all of which are included in the field change kit. Also included in the kit are publication package changes, materials, and special tools required to change one equipment and to revise existing equipment nameplates, publications, and charts.
II	May require parts, none of which are included with the field change. Usually affects only the publications package. If parts and tools are required, they are considered standard stock items and are available as bench spares (i.e., wire, lugs, soldering irons, etc.).
III	Requires parts, some, but not all, of which are included in the field change kit. The parts not included are considered standard stock items.
IV	Does not require parts or the use of any special tools. This type of field change is usually published in an <i>Electronics Information Bulletin</i> (EIB) and consists of only a publication change.

Table 2-7.-Field Change Classes

Class	Description
A	Modification may be made by forces afloat or station personnel. No installation funding is required. Approval of class A field changes to be made by forces afloat indicates only that the work content is within their technical capability. The class A designation does not require the modification, nor does it require forces afloat to make the modification. The decision of when and how to make the modification is considered to be a forces-afloat prerogative.
B	Modification requires fleet funding for and work by naval shipyards, tenders, etc., when authorized by the TYCOM. Except for class B field changes presently under way or in the fleet planning stage, this class of field change will no longer be issued.
C	Modification normally requires industrial assistance and the appropriate systems command installation funding.

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 ensure that you are studying the latest revision.

Department of the Navy Directives Issuance System Consolidated Subject Index, DPSINST 5215.1, Washington, DC, 1994.

Format and Procedures for Validation of Enlisted Distribution and Verification Report (EDVR), NAVMILPERS-COMINST 1080.1, Naval Military Personnel Command, Washington, DC, 1989.

Guide for User Maintenance of NAVSEA Technical Manuals, NAVSEA S005-AA-GYD-030/TMMP, Naval Sea Systems Command, Washington, DC, 1988.

Navy Stock List of Publications and Forms, NAVSUP 2002, Navy Publications and Forms Center, Philadelphia, PA, 1994.

