

UNITED STATES MARINE CORPS
ENGINEER EQUIPMENT INSTRUCTION COMPANY
MARINE CORPS DETACHMENT
686 MINNESOTA AVE
FORT LEONARD WOOD, MISSOURI 65473-8963

LESSON PLAN

SHOP OPERATIONS

LESSON ID: BEE0-A01

BASIC ENGINEER EQUIPMENT OPERATOR COURSE

CID A1613F1

REVISED 10/26/2011

Approved By _____ Date _____

(ON SLIDE #1,2)

INTRODUCTION:

(15MIN)

1. **GAIN ATTENTION**. During this week of instruction you will be introduced to the items that an operator will come into contact with on a daily basis while completing his/her mission as a fleet Marine, heavy equipment operator.

(ON SLIDE #3)

2. **OVERVIEW**. This week will be discussing engineer ground equipment records and forms, tools, materials, and engineer equipment that pertain to being a 1345.

(ON SLIDE #4, 5, 6, 7, 8, 9)

3. **LEARNING OBJECTIVES**.

Instructor Note

Have the students read the Learning Objectives in their Student Outline.

a. **TERMINAL LEARNING OBJECTIVE**.

- (1) Provided references, facilities, forms, personnel, tools and engineer equipment, conduct shop operations to maintain unit readiness without injury to personnel or damage to equipment. (1345-ADMN-1002)

b. **ENABLING LEARNING OBJECTIVES**.

- (1) Given technical manual short titles, and without the aid of reference, identify the four elements of a short title per MCO P4790.2C. (1345-ADMN-1002a)
- (2) With the aid of reference, identify lubrication orders utilized in the maintenance and operation of engineer equipment per TM-09135C-OR/A. (1345-ADMN-1002b)
- (3) Without the aid of reference, identify the levels of maintenance per MCO P4790.2C. (1345-ADMN-1002c)
- (4) Without the aid of reference, identify petroleum, oils, and lubricants (POL) utilized in the

maintenance and operation of engineer equipment per the Student handout. (1345-ADMN-1002d)

- (5) Without the aid of reference, identify tools utilized in the maintenance and operation of engineer equipment per the SL-3-11825A. (1345-ADMN-1002e)
- (6) Without the aid of reference, select the correct records and forms per the TM 4700-15/1_. (1345-ADMN-1002f)
- (7) Without the aid of reference, identify the levels of operational risk management per the MCO 3500.27. (1345-ADMN-1002g)

(ON SLIDE #10,#11)

4. METHOD/MEDIA. This program of instruction will be taught by the informal lecture method, aided by a detailed outline, computer generated slides, you're student outline and applicable forms and training aids.

Instructor Note

Explain Instructional Rating Forms to the students.

(ON SLIDE #12)

5. EVALUATION. On the fifth training day there will be a 25 question written performance examination utilizing a lubrication order.

(ON SLIDE #13)

6. SAFETY/CEASE TRAINING (CT) BRIEF. In case of fire make your way out the closet exit and get in formation 200 feet from the building, get accountability and wait for further instruction. In case of inclement weather stay seated in the classroom and wait for further instruction.

TRANSITION: Now that you know what will be taught, how it will be taught and how you will be evaluated, are there any questions on what has been covered to this point? If not, let's move on to technical manuals.

BODY:

(34HRS 45 MIN)

(ON SLIDE #14,15)

1. TECHNICAL MANUALS. (2HRS)

(ON SLIDE #16)

a. Purpose.

- (1) Technical manuals are designed by the military and used to provide general knowledge of specifications, characteristics, capabilities, maintenance, emergency operations, operation, and safety practices.

Instructor Note

Have students take out their TM and follow along with the computer aided slides.

b. Cover Layout.

(ON SLIDE #17)

(1) Type of Publication.

- (a) TM's take many forms. An item of engineer equipment may have five or more manuals associated with it. Operator's manual, maintenance procedures, parts catalogs etc. Having the type printed on the cover will allow the individual Marine to narrow his/her search for the appropriate manual needed.

(ON SLIDE #18)

(2) Long Title.

- (a) The long title gives the equipment nomenclature or the title for a given manual.

(ON SLIDE #19)

(3) Model Designation.

- (a) When a new model of an existing item of engineer equipment is introduced a new TM may be issued in lieu of a change to the existing TM.

INTERIM TRANSITION: So far we have talked about types of publications, the Long Title and what a Model Designation is. Are there any questions? Everyone take a ten minute break.

(ON SLIDE #20)

(BREAK - 10 Min)

INTERIM TRANSITION: Did anyone think of any questions during the break? If not let's talk about the remainder of the Cover Layout.

(ON SLIDE #21)

(4) National Stock Number.

- (a) A National Stock Number is simply the official label applied to an item of supply that is repeatedly procured, stocked, stored, issued, and used throughout the federal supply system.

(ON SLIDE #22)

(5) Date.

- (a) Date the publication came into service.

(ON SLIDE #23)

(6) Short Title.

(ON SLIDE #24,25,26,27,28,29)

- (a) TM 09135B-24/2.

1. A short title can be broken into 5 parts.
 - a. Characters (1-2) abbreviate the type of manual. In the above example, TM indicates Technical Manual.
 - b. Characters (3-7) When discussing the Technical Manual of an item of engineer equipment indicate the equipment identification number(ID).

- c. Character (8) indicates the model pertaining to ID number (3-7).
- d. Characters (9-10) indicate the echelons of maintenance for which the TM has been written.
- e. Character (11) indicates the manual volume number.

TRANSITION: Thus far, we've discussed the characteristics of technical manuals. Are there any questions on what we've covered to this point? If not I have a question for you, **QUESTION:** What does a TM provide to the operator? **ANSWER:** General knowledge of specifications, characteristics, capabilities, maintenance, emergency operations, operation, and safety practices. Let's take a break and then we will move on and talk about the levels of maintenance.

(ON SLIDE #30)

(BREAK - 10 Min)

TRANSITION: Did anyone think of any questions during the break? If not let's talk about the levels of maintenance.

(ON SLIDE #31,32,33)

2. Levels of Maintenance. (1HR)

Instructor Note

Discuss previous classifications of maintenance as it refers to the echelons of maintenance. This is how maintenance was broken down in the past, first, second, third, fourth, and fifth echelons. Now it is levels of maintenance.

(ON SLIDE #34)

a. **Organizational.**

- (1) The Organizational level of maintenance is the maintenance performed by the trained operator/maintainer on the unit's assigned equipment. Generally this consist of limited action by the operator and maintainer to include

cleaning, inspecting, preserving, lubricating, adjusting, and testing, as well as replacing parts, minor assemblies and subassemblies as unit mission dictates and as defined by operator/maintainer or crew military occupational specialty (MOS) individual training standards(ITS).

(ON SLIDE #35)

b. Intermediate.

- (1) The Intermediate level of maintenance is maintenance actions performed by specialty trained personnel normally in support of using organizations. This level of maintenance usually consists of calibration, repair or replacement of unserviceable parts, components or assemblies and also may consist of the emergency manufacture of non-available parts. Intermediate maintenance activities provide technical assistance and contact team support to using organizations.

(ON SLIDE #36,37)

c. Depot.

- (1) The Depot level of maintenance is maintenance performed on material requiring major overhaul or complete rebuild of parts, subassemblies, assemblies or end items to include the manufacture of parts, modifications, testing and reclamation as required. Depot maintenance serves to support lower categories of maintenance by providing technical assistance and performing maintenance beyond their responsibility. Depot maintenance provides stocks of serviceable equipment by using more extensive facilities for repair than are available in lower level maintenance activities.

TRANSITION: Thus far, we've discussed the levels of maintenance. Are there any questions on what we've covered to this point? If not I have a question for you, **QUESTION:** What are the three levels of maintenance? **ANSWER:** Organizational, Intermediate, and Depot. **QUESTION:** What level of maintenance does an operator fall under? **ANSWER:** Organizational. Let's take a ten minute break and then we will talk about lubrication orders.

(ON SLIDE #38)

(BREAK - 10 Min)

TRANSITION: Did anyone think of any questions during the break?
If not let's talk about lubrication orders.

(ON SLIDE #39,40,41, 42)

3. **Lubrication Order.** (2HRS)

Instructor Note

Have students take out their LO and follow along with the computer aided slides. As you progress further into the Lubrication Order have the students locate certain items that are located on the LO. Have them tell you what interval they fall under, what type of service is required and how many service points pertain to that item. Also, ensure you have the student flip the LO over and explain to them the difference in types of viscosities used as it pertains to temperatures above and below 32 degrees F.

a. A Lubrication Order (LO) is used by the operator to complete all applicable organizational level equipment lubrication.

(ON SLIDE #43)

- (1) Interval. This is the frequency in which the item is maintained.
- (2) Item. This is the item on the equipment, which is to be maintained.
- (3) Maintenance points. This is the number of places where the listed item can be found.

INTERIM TRANSITION: So far we have talked about Intervals, Items and Maintenance Points. Are there any questions? Everyone take a ten minute break.

(ON SLIDE #44)

(BREAK - 10 Min)

INTERIM TRANSITION: Did anyone think of any questions during the break? If not let's move on and talk about what else the LO contains.

(ON SLIDE #45,46,47,48)

- (4) Description. This tells the operator the required maintenance action.
- (5) Material. This tells the operator what material, if any, is required for a particular item.
- (6) Recommended lubricants. This area tells the operator the lubricants required to complete Preventative Maintenance Checks and Services or PMCS on that particular piece of equipment.

TRANSITION: Thus far, we've discussed lubrication orders, as well as their utilization. Are there any questions on what we've covered to this point? If not, I have a question for you.

QUESTION: LO's give the operator what important information?

ANSWER: Interval, Item, Maintenance points, Description, Material, and Recommended lubricants. Let's take a ten minute break and then we will talk about the common POL's utilize in our equipment as well as who is responsible for them.

(ON SLIDE #49)

(BREAK - 10 Min)

TRANSITION: Did anyone think of any questions during the break? If not let's talk about POL.

(ON SLIDE #50,51,52,53,54)

4. PETROLEUM, OIL, AND LUBRICANTS (POL). (2HRS)

a. A substance, often a liquid, introduced between two moving surfaces to reduce the friction between them, improving efficiency and reducing wear. They may also have the function of dissolving or transporting foreign particles and distributing heat.

b. Lubricating oils have many differing measurable properties. The most common classification is based on viscosity. Viscosity can be perceived as a liquid's resistance to flow or its "Thickness". For example a fluid labeled 10w will

be "thinner" than a fluid labeled 70w. We also utilize multi viscosity oils such as 15W40. What this means is that the viscosity, or thickness of this oil is 15 but has an additive in it which causes the oil to thicken as it heats up. When the oil reaches operating temperature it will thicken to a viscosity of 40.

(ON SLIDE #55,56)

(1) Operator Responsibilities.

- (a) The Operator is ultimately responsible for the proper lubrication of his/her assigned item(s) of engineer equipment. The operator will be held fully accountable and responsible for any and all malfunctions or damage caused to an item of engineer equipment do to operator ignorance, neglect, negligence or improper PMCS.

(ON SLIDE #57,58,59,60,61,62)

(2) Oil, Engine (OE).

- (a) Lubricates internal moving parts, stops corrosion, dissolves contaminants, improves sealing, and removes engine heat. Without the proper amount of OE the motor will rapidly deteriorate and destroy itself.
- (b) OE 15w40 is the most commonly used crankcase lubricant for diesel engine driven engineer equipment. Depending on conditions other OE may be recommended by the original equipment manufacturer. Read and understand the organizational level technical manual, as well as the lubrication order before adding or refilling the engine crankcase with lubricant.
- (c) OE is packaged in containers varying between 1 quart and 55 gallons. The type and viscosity of the lubricant will be fixed to the container.

Instructor Note

Throughout the POI draw the students' attention to the labeling of each item of POL presented, in this case a 5 gallon container of OE 15w40 labeled **OE/HDO 15/40**.

(ON SLIDE #63,64)

(3) Hydraulic Oil (HDO).

- (a) Transfers engine power to operate the hydraulic cylinders and motors used in engineer equipment.
- (b) HDO 10w is the most commonly used hydraulic fluid in engineer equipment. Depending on conditions other HDO may be recommended by the original equipment manufacturer. Read and understand the organizational level technical manual, as well as the lubrication order before adding or refilling the hydraulic system with fluid.
- (c) HDO is packaged in containers varying between 5 and 55 gallons. The type and viscosity of the lubricant will be fixed to the container.

INTERIM TRANSITION: So far we have talked about OE and HDO. Are there any questions? Everyone take a ten minute break.

(ON SLIDE #65)

(BREAK - 10 Min)

INTERIM TRANSITION: Did anyone think of any questions during the break? If not let's talk about Transmission Fluid.

(ON SLIDE #66,67,68)

(4) Transmission Fluid.

- (a) A special hydraulic fluid sent under pressure by the transmission's internal oil pump through the valve body to control the clutches and the bands in order to control the planetary gear sets inside the transmission.

- (b) Transmission fluid is unique to the operational parameters and materials uses in construction of an automatic transmission. A transmission may require anything from light hydraulic oil to a specialized synthetic fluid such as Dextron V. Failure to utilize the appropriate fluid per manufacturer's guidance will cause increased wear and equipment failure.

Instructor Note

Inform the students not to confuse automatic transmission fluid with gear oil found in most manual transmissions.

- (c) Transmission fluid is packaged in a similar form to HDO/OE and is made available in 1 quart containers through 55 gallon drums.

(ON SLIDE #69,70,71,72,73)

(5) Gear Oil (GO).

- (a) Lubricating oil made specifically for manual transmissions, transfer cases, planetary gear hubs, and differentials. It is of a higher viscosity to better protect these assemblies. The high viscosity ensures transfer of lubricant throughout the gear train.
- (b) Common gear oils range in viscosity from 75w to 140w depending on application. The most commonly utilized gear oil in engineer equipment is GO 80w90. Inshore you Read and understand the organizational level technical manual before adding or refilling any gear case.

(ON SLIDE #74,75,76,77)

(6) Grease Artillery Automotive (GAA).

- (a) A thick viscous substance used to lubricate metal on metal contact reducing wear on components.

- (b) GAA is the primary grease used externally on equipment pivot points such as the pivot points found on the boom (arm) of an excavator. However GAA is not a suitable packing for wheel bearings or other high load applications.
- (c) GAA is packaged in pale form or individual tubes.

(ON SLIDE#78,79,80,81,82,83)

(7) Antifreeze.

- (a) A substance containing ethylene glycol which is added to the water in a radiator to reduce the freezing point and raise the fluid's boiling point.
- (b) In most climates a 50/50 mix of antifreeze and water is recommended for use in engine equipment. The operator is responsible for mixing the antifreeze to the correct ratio before adding it to the item of equipment unless the antifreeze packaging indicates "Pre Mixed" or "ready to use".

(ON SLIDE #84,85)

- (c) Extended Life Coolants may be recommended by the equipment manufacturer. It provides improved heat transfer due to metal corrosion protection. ELC must not be contaminated with other coolants or fluids and not diluted with water. The chemical balance remains stable over a long life cycle.

Interim Transition: Thus far we have discussed what a lubricant is, and who is responsible for the proper application. Also we have touched on the most commonly utilized items of POL and their uses. Are there any questions on what we've covered to this point? Let's take a ten minute break.

(ON SLIDE #86)

(BREAK - 10 MIN)

Interim Transition: Did anyone think of any questions while on break? Let's start the demonstration.

Instructors Note

At this time take the class to the MHE phase POL shed for a demonstration.

(ON SLIDE #87)

DEMONSTRATION. The purpose of this demonstration is to give the students the understanding of the POL's contained in the POL shed, as well as the proper care, use, identification, clean-up and storage of POL's. This demonstration should take 2.5 hours. The student instructor ratio is, 12:2.

STUDENT ROLE: Observe the demonstration. Students need to be in a school circle around the POL shed in order to view the instructor's demonstration.

INSTRUCTOR ROLE: Demonstrate the proper identification, use, care, clean-up and storage of all POL's in the POL shed.

1. Safety Brief: There are no safety concerns during this demonstration.

2. Supervision and Guidance: The instructor is to demonstrate the proper identification of all lubricants contained in the POL shed, how to utilize proper containers (1 quart oil cans), (anti-freeze jug), hazardous material clean-up, returning lubrication containers to their proper place inside the POL shed. Answer any questions that may arise during the demonstration from the students.

3. Debrief: Allow students the opportunity to comment on what they observed. Provide overall feedback, guidance on any misconceptions, and review the learning points of the demonstration. Ask the students if there are any questions about the demonstration.

Instructor Note

At this time take the class back to the classroom.

(BREAK - 10 MIN)

Transition: We have just finished the demonstration of what a POL shed looks like and covered some of the POL's that we utilize in our engineer equipment. Are there any questions over anything that we just covered? If not I have a question for you, **QUESTION:** What can the fluid in a container marked OE/HDO-10 be utilized for? **ANSWER:** The fluid can be utilized in a crank case or hydraulic system if recommended by TM or OEM. **QUESTION:** What is the purpose of greasing engineer equipment?

ANSWER: Grease is used to reduce friction and prevent premature wear. **QUESTION:** What are the benefits of using ELC verses ordinary antifreeze? **ANSWER:** Long service life, reduced corrosion, and improved heat transfer. Let's move on and talk about some of the common tools that we utilize when conducting PMCS on our equipment.

(ON SLIDE #88,89)

5. TOOLS. (1HR)

Instructor Note

As you begin to explain the GMT and B.O.B make sure to explain that these are not the only tool kits that we utilize. Provide some insight as to where they will get the tools needed to conduct PMCS and emphasize the importance of whom is responsible for a certain tool or tool kit once they have signed for it. Also explain to them the importance of reporting when a tool has been broken and/or lost and what to do in the event that one of the two happens to them.

(ON SLIDE #90)

a. General Mechanic's Toolbox.

- (1) The general mechanic's toolbox is a set of tools utilized by a mechanic or operator to perform organizational level maintenance on items of engineer equipment.
- (2) The individual who signs for the tools is directly responsible for the accountability and serviceability of the loaned tools.

(ON SLIDE #91)

b. Basic Operator's Bag.

- (1) The basic operator's bag, or B.O.B, is a set of tools utilized by an operator to perform preventive maintenance on items of engineer equipment.
- (2) The individual who sign's for the bag is directly responsible for the accountability and

serviceability of the tools contained in the basic operator's bag.

Interim Transition: Thus far we have discussed the identification and utilization of the tools used to maintain engineer equipment. Are there any questions on what we've covered to this point? Let's take a ten minute break and then we will move on to the demonstration portion of the GMT and the B.O.B.

(ON SLIDE #92)

(10 min break)

Instructor Note

At this time gather the class around the GMTB and BOB.

(ON SLIDE #93,94,95,96)

DEMONSTRATION. The purpose of this demonstration is to give the students the understanding of how to properly identify and the proper use of tools within the GMTK and BOB. This demonstration should take 2.5 hours. The student instructor ratio is, 12:1.

STUDENT ROLE: Observe the demonstration. Students need to move to a school circle around the instructor in order to observe the demonstration. Allow students to handle items if they wish.

INSTRUCTOR ROLE: Demonstrate how to identify the type, and the primary function of the tools contained in the GMTK and BOB.

1. Safety Brief: Not applicable due to classroom demonstration.

2. Supervision and Guidance: The instructor is to demonstrate the proper identification and nomenclature of all tools contained in the GMTK and BOB. The instructor will demonstrate each tools purpose and demonstrate proper care of tools. Allow the students to handle the tools to better understand their characteristics. The instructor will answer any questions that may arise during the demonstration from the instructor.

3. Debrief: Allow students the opportunity to comment on what they observed. Provide overall feedback, guidance on any misconceptions, and review the learning points of the demonstration. Ask the students if there are any questions about the demonstration.

Transition: Now that we have finished our demonstration of some of the basic tools that are utilized by engineer equipment

operators when conducting PMCS on engineer equipment are there any questions before we move on? If not I have a question for you, **QUESTION:** True or false; General Mechanic's toolboxes are only issued to mechanics? **ANSWER:** False, operators require access IOT complete their assigned missions. **QUESTION:** Who is responsible for a given set of tools? **ANSWER:** The Marine that signed for them. Let's go ahead and take a ten minute break.

(ON SLIDE #97)

(BREAK - 10 MIN)

Transition: If there are no more questions concerning tools we will talk about the NAVMC 10523.

(ON SLIDE #98,99,100,101,102)

6. **NAVMC 10523, ENGINEER EQUIPMENT OPERATIONAL RECORD.** (4HRS)

(ON SLIDE #103 - 112)

a. **Purpose.**

- (1) The purpose of form NAVMC 10523 is to provide the operator of an item of equipment with the authority to operate it on an assigned mission. The NAVMC 10523 is utilized on daily missions not exceeding a 24 hour time period.
- (2) The NAVMC 10523 provides the operator with a checklist for conducting daily preventive maintenance checks and services (PMCS).
- (3) The NAVMC 10523 provides a means of recording mileage and hours for equipment operation so that PMCS may be scheduled. It also allows you to record the amount of petroleum, oil, and lubrications (POL's) that you used.
- (4) The NAVMC 10523 need not be prepared on equipment when an ERO/SRO has been submitted and equipment is operated from local equipment pool area to the maintenance shop.
 - (a) An ERO/SRO is a repair order that is submitted to your maintenance section in order to allow

the maintenance shop to perform scheduled PMCS or to repair your equipment.

Instructor Note

Have the student get out their NAVMC 10523.

(ON SLIDE #113,114)

b. Dispatcher Responsibilities. The Dispatcher is any Marine from your shop assigned in writing by your OIC to perform the duties as the dispatcher. The dispatcher is responsible for tracking all missions and assigning operators and equipment to support missions that are requested. Other responsibilities of the dispatcher are to keep record jackets up to date and to schedule equipment PM's with your maintenance section.

(ON SLIDE #115)

- (1) In the "**DATE**" block, the dispatcher enters the date the equipment is dispatched.

(ON SLIDE #116)

- (2) In the "**EQUIPMENT**" block, the dispatcher enters the equipment's nomenclature or type of equipment that is to be used on your assigned mission.

(ON SLIDE #117)

- (3) In the "**USMC OR SERIAL NO**" block, the dispatcher enters the equipment's six digit USMC serial number.

(ON SLIDE #118)

- (4) In the "**ORGANIZATION**" block, the dispatcher enters the noun name of the unit that is responsible for the equipment.

(ON SLIDE #119)

- (5) In the "**1ST or 2ND OPERATOR**" block for the appropriate 1ST or 2ND operator, the dispatcher enters the operator's name as listed on the operator's license (OF-346).
 - (a) The OF-346 is you operator's license. This document lists all of the equipment that you

are licensed to operate. The OF-346 will be carried with you at all times while operating heavy equipment.

(ON SLIDE #120)

- (6) In the "**TIME OUT**" block for the appropriate 1ST or 2ND operator, the dispatcher enters the time that the equipment is dispatched.

(ON SLIDE #121)

- (7) In the "**DISPATCHER'S SIGNATURE**" block for the appropriate 1ST or 2ND operator, the dispatcher signs his/her name. The NAVMC 10523 is not valid without the dispatcher's signature.

(ON SLIDE #122)

- (8) In the "**REPORT TO**" block for the appropriate 1ST or 2ND operator, the dispatcher enters the location that the operator is to report.

(ON SLIDE #123)

- (9) In the "**OIL CHANGE HOUR/MILE DUE**" block, the dispatcher enters the hours/miles the next oil change is required. This block may be left blank when the equipment is enrolled in an oil analysis program. (Unit SOP will dictate).
- (10) In the "**OIL CHANGE HOUR/MILE COMPLETED**" block, the dispatcher enters the hours/miles the last oil change was completed. This block may be left blank when the equipment is enrolled in an oil analysis program. (Unit SOP will dictate).
- (11) In the "**LUBRICATION HOUR/MILE DUE**" block, the dispatcher enters the hours/miles the next lubrication is required.
- (12) In the "**LUBRICATION HOUR/MILE COMPLETED**" block, the dispatcher enters the hours/miles the last lubrication was completed.

- (13) In the "PM SERVICE TYPE PM DUE" block, the dispatcher enters the type of second echelon of maintenance or higher PMCS that is due.
- (14) In the "PM SERVICE HOUR/MILE DUE" block, the dispatcher enters the hours/miles a second echelon of maintenance or higher PMCS is due per the commodity section of TM 4700-15/1_.
- (15) In the "PM SERVICE HOUR/MILE COMPLETED" block, the dispatcher enters the hours/miles when the last second echelon of maintenance or higher PMCS was completed.
- (16) In the "OPERATION BEFORE" blocks, the dispatcher enters the legend as listed on the NAVMC 10524 indicating operator before-operation PMCS.
- (17) In the "OPERATION DURING" blocks, the dispatcher enters the legend as listed on the NAVMC 10524 indicating operator during-operation PMCS.
- (18) In the "OPERATION AFTER" blocks, the dispatcher enters the legend as listed on the NAVMC 10524 indicating operator after-operation PMCS.

INTERIM TRANSITION: So far we have talked about the purpose of the NAVMC 10523 and the Dispatchers responsibilities. Are there any questions? Everyone take a ten minute break.

(ON SLIDE #124)

(BREAK - 10 Min)

INTERIM TRANSITION: Did anyone think of any questions during the break? If not let's talk about the Operators Responsibilities.

(ON SLIDE #125,126)

c. Operator Responsibilities.

(ON SLIDE #127 -151)

- (1) Before Operations.
 - (a) In the "HOURS OR MILES START" block for the appropriate 1ST or 2ND operator, the operator enters the hours/miles indicated on the equipment's equipment operational time

indicator before leaving the equipment pool. Hours are recorded as shown on the hour meter in whole numbers. You do not round up or down when recording hours. Leave this block blank when the equipment does not have an equipment operational time indicator.

- (b) In each "ITEM" block for the "OPERATION BEFORE", the operator initials verifying that before-operation daily PMCS, as indicated in the Legend for Marking and in the appropriate TM, is completed before leaving the equipment pool with the equipment.

(ON SLIDE # 152-159)

(2) During Operations.

- (a) In each "ITEM" block for the "OPERATION DURING", the operator's initials verifying that during-operation daily PMCS, as indicated in the Legend for Marking and in the appropriate TM, is completed during equipment operation.

INTERIM TRANSITION: So far we have talked about the how we fill out our before and during operations columns. Are there any questions? Everyone take a ten minute break.

(ON SLIDE #160)

(BREAK - 10 Min)

INTERIM TRANSITION: Did anyone think of any questions during the break? If not let's talk about the after operations column.

(ON SLIDE #161)

(3) After Operations.

(ON SLIDE #162)

- (a) In the "RELEASED BY" block for the appropriate 1ST or 2ND operator, the operator obtains a signature from the person whom you reported to. This signature authorizes the operator to return to the equipment pool. When the

operator cannot obtain a "RELEASED BY" signature the Equipment Officer, Equipment Chief, or Lot Foreman may sign this block.

(ON SLIDE #163-167)

- (b) In each "ITEM" block for the "OPERATION AFTER", the operator initials verifying that after-operation daily PMCS, as indicated in the Legend for Marking and in the appropriate TM, is completed before returning the NAVMC 10523 to the dispatcher.

(ON SLIDE #168)

- (c) In the "TIME IN" block for the appropriate 1ST or 2ND operator, the operator enters the time the equipment returned to the equipment pool.

(ON SLIDE #169)

- (d) In the "TIME TOTAL" block for the appropriate 1ST or 2ND operator, the operator enters the total time the equipment was dispatched. This is the TIME IN block minus the TIME OUT block.

(ON SLIDE #170)

- (e) In the "HOURS OR MILES STOP" block for the appropriate 1ST or 2ND operator, the operator enters the hours/miles indicated on the equipment's operational time indicator or hour meter before returning NAVMC 10523 to the dispatcher. Leave this block blank when the equipment does not have an equipment operational time indicator.
- (f) In the "HOURS OR MILES TOTAL" block for the appropriate 1ST or 2ND operator, the operator enters the total hours/miles the equipment was operated. This is the HOURS OR MILES STOP block minus the HOURS OR MILES START block. When the equipment does not have an equipment operational time indicator this block will equal the TIME TOTAL block.

(ON SLIDE #171)

- (g) In the "WORK PERFORMED" 1ST or 2ND OPERATOR block for the appropriate 1ST or 2ND operator, the operator signs before returning the NAVMC 10523 to the dispatcher. This signature verifies that the work is completed.

(ON SLIDE #172)

- (h) In the "FUELS DIESEL" block, the operator enters the number of gallons of diesel fuel used or added. **Leave this field blank when diesel fuel is not used or added.**

(ON SLIDE #173)

- (i) In the "FUELS GAS" block, the operator enters the number of gallons of gas used or added. **Leave this field blank when gas is not used or added.**

(ON SLIDE #174)

- (j) In the "LUBES OE" block, the operator enters the number of quarts of engine oil used or added. **Leave this field blank when engine oil is not used or added.**

(ON SLIDE #175)

- (k) In the "LUBES GO" block, the operator enters the number of quarts of gear oil used or added. **Leave this field blank when gear oil is not used or added.**

(ON SLIDE #176)

- (l) In the "LUBES GRS" block, the operator enters the number of pounds of grease used or added. **Leave this field blank when grease is not used or added.**
- (m) In the "REMARKS" block front or back, the operator enters any amplifying comments about the equipment. This block will include any corrective maintenance that requires second echelon of maintenance or higher.

(ON SLIDE #177,178,179)

- (n) In the "1ST or 2ND OPERATOR'S SIGNATURE" block for the appropriate 1ST or 2ND operator, the operator signs. This signature verifies that all daily PMCS was completed.
- (o) The Equipment Officer, Chief, or Foreman signs the "EQUIPMENT FOREMAN'S SIGNATURE" block. This signature verifies that the equipment was properly used and that the NAVMC 10523 is completed properly.

Interim Transition: Thus far we have discussed the NAVMC 10523, trip ticket, its function, and how to properly fill this record out. Are there any questions on what we've covered to this point? Let's take a ten minute break and then we will do the practical application.

(ON SLIDE #180)

(BREAK - 10 MIN)

Instructor Note

At this time have the students go to the back of the student handout for practical application of the NAVMC 10523.

(ON SLIDE #181-187)

Practical Application. This practical application is designed to test the students' comprehension to ensure a thorough understanding of properly filling out of the NAVMC 10523, trip ticket. This PA should take about 2 hours to complete. The student instructor ratio is, 12:1.

Practice: The student's will read scenarios given in the student handout for the NAVMC 10523. Once the scenario is read the student will properly fill out the NAVMC 10523 templates that coincide with the scenario read per instructions.

Provide Help: The instructor will monitor the students to ensure all scenarios are completed. The instructor will assist students during the practical application in order to answer any questions and provide guidance.

1. Safety Brief: Not applicable due to classroom practical application.

2. Supervision and Guidance: Ensure students use their student handout and the provided references in completing this practical application. Answer any questions that may arise during the practical application. Assist any students that are struggling with the proper completion of the practical application.

3. Debrief: Once all students have completed all scenarios provided show the correctly completed records. Provide overall feedback, guidance on any misconceptions, and review the learning points of the practical application. Ask the students if there are any questions about the practical application.

Transition: We just finished our Practical Application on properly filling out the NAVMC 10523, are there any questions over what we just covered? If not I have a question for you,

QUESTION: What does the signature in the Work Performed block,

signify? **ANSWER:** It verifies that the work was completed or the mission was accomplished. **QUESTION:** Who can sign the

"RELEASED BY" block when the operator cannot obtain the signature from the jobsite supervisor? **ANSWER:** When the operator cannot obtain a released by signature the equipment officer, equipment chief, or lot foreman may sign this block.

(ON SLIDE #188)

(BREAK - 10 MIN)

Transition: If there are no more questions concerning the NAVMC 10523 we will talk about the NAVMC 10524.

(ON SLIDE #189,190)

7. NAVMC 10524, CONSOLIDATED ENGINEER EQUIPMENT OPERATIONAL LOG AND SERVICE RECORD. (3HRS)

(ON SLIDE #191,192,193,194)

a. **Purpose.**

- (1) The NAVMC 10524 provides the authority for an operator to operate engineer equipment on an assigned mission. A duplicate NAVMC 10524 may be prepared and issued to the operator instead of a daily NAVMC 10523 (Engineer Equipment Operational

Record) when equipment is operated at a project site for an extended period of time.

- (2) The NAVMC 10524 provides the operator with a checklist for conducting BEFORE, DURING, and AFTER preventive maintenance checks and services (PMCS).
- (3) The NAVMC 10524 provides a means for recording mileage and hours of equipment operation so that PMCS may be scheduled and petroleum, oil, and lubricants (POL) consumption can be tracked.
- (4) The NAVMC 10524 provides a template for indicating required operator daily PMCS listed on the NAVMC 10523.
- (5) The NAVMC 10524 need not be prepared on equipment when an ERO/SRO has been submitted and equipment is operated from local equipment pool area to the maintenance shop.

(ON SLIDE #195,196)

b. Operator Responsibilities.

(ON SLIDE #197)

- (1) Before Operation.

(ON SLIDE #198)

- (a) In the "DATE" column, enter the date the equipment is operated.

(ON SLIDE #199)

- (b) In the "SPEEDOMETER OR HOURMETER STARTED" column, enter the reading from the equipment's operational time indicator or hour meter. Enter N/A when the equipment does not have an equipment operational time indicator.

(ON SLIDE #200)

- (c) In each "ITEM" block for the "OPERATION BEFORE", the operator performs before-operation daily PMCS, as indicated in the Legend for Marking

and in the appropriate TM, before leaving the equipment pool with the equipment.

(ON SLIDE #201)

(2) During Operation.

(ON SLIDE #202)

- (a) In each "ITEM" block for the "OPERATION DURING", the operator performs during-operation daily PMCS, as indicated in the Legend for Marking and in the appropriate TM, during equipment operation.

INTERIM TRANSITION: So far we have talked about the how we fill out our before and during operations columns. Are there any questions? Everyone take a ten minute break.

(ON SLIDE #203)

(BREAK - 10 Min)

INTERIM TRANSITION: Did anyone think of any questions during the break? If not let's talk about the after operations column.

(ON SLIDE #204)

(3) After Operation

(ON SLIDE #205)

- (a) In each "ITEM" block for the "OPERATION AFTER", the operator performs after-operation daily PMCS, as indicated in the Legend for Marking and in the appropriate TM, before returning the NAVMC 10524 to the dispatcher.

(ON SLIDE #206)

- (b) In the "SPEEDOMETER OR HOURMETER STOPED" column, enter the reading from the equipment's operational time indicator or hour meter. Enter N/A when the equipment does not have an equipment operational time indicator.

(ON SLIDE #207)

- (c) In the "TOTAL HR/MI. OPER" column, enter the total hours or miles operated. This is the

SPEEDOMETER OR HOURMETER STOPPED minus the SPEEDOMETER OR HOURMETER START. When the equipment does not have an equipment operational time indicator enter the total hours recorded on the NAVMC 10523.

(ON SLIDE #208,209,210,211,212)

- (d) In the "POL CONSUMPTION" column, enter all POL's used.

(ON SLIDE #213)

- (e) In the "AIR FILTER CLEANED/CHANGED" column, TM-4700-15/1_ does not state what is required in this field. It has been known that entry of "CL" signifies that the air filter has been Cleaned, and "CH" signifies that the air filter has been Changed.

(ON SLIDE #214,215,216)

- (f) The operator completes the DAILY PREVENTIVE MAINTENANCE Section and initials the "HR/MI PMCS COMPLETED" column, verifying completion of daily PMCS.

Interim Transition: Thus far we have discussed the NAVMC 10524, "con-log", its function, and how to properly fill this record out. Are there any questions on what we've covered to this point? Take a ten minute break.

(ON SLIDE #217)

(BREAK - 10 MIN)

(ON SLIDE #218,219,220)

Instructor Note

At this time have the students go to the back of the student handout for practical application of the NAVMC 10524.

Practical Application. This practical application is designed to test the students' comprehension to ensure a thorough understanding of properly filling out of the NAVMC 10524, con-log. This PA should take about 1.5 hours to complete. The student instructor ratio is, 12:1.

Practice: The student's will read the scenario given in the student handout for the NAVMC 10524. Once the scenario is read the student will properly fill out the NAVMC 10524 template that coincides with the scenario read per instructions.

Provide Help: The instructor will monitor the students to ensure the scenario is completed. The instructor will assist students during the practical application in order to answer any questions and provide guidance.

1. Safety Brief: Not applicable due to classroom practical application.

2. Supervision and Guidance: Ensure students use their student handout and the provided references in completing this practical application. Answer any questions that may arise during the practical application. Assist any students that are struggling with the proper completion of the practical application.

3. Debrief: Once all students have completed the scenario provided show the correctly completed record. Provide overall feedback, guidance on any misconceptions, and review the learning points of the practical application. Ask the students if there are any questions about the practical application.

Transition: You have just completed the Practical Application of filling out the NAVMC 10524, are there any questions before we move on? If not I have a question for you, **QUESTION:** What is the purpose of section "B" of the NAVMC 10524? **ANSWER:** To provide a means of recording equipment mileage and hours, preventive maintenance scheduling, and POL consumption. It also provides the operator with the authority to operate an item of equipment on an assigned mission. **QUESTION:** Who maintains the NAVMC 10524? **ANSWER:** Dispatcher. Let's go ahead and take a ten minuet break.

(ON SLIDE #221)

(BREAK - 10 MIN)

Transition: If there are no more questions concerning the NAVMC 10524 we will talk about the SF 91, Motor Vehicle Accident Report.

(ON SLIDE #222,223,224)

8. MOTOR VEHICLE ACCIDENT FORMS. (3HRS)

(ON SLIDE #225,226)

a. SF 91, Motor Vehicle Accident Report.

(1) Purpose.

- (a) The purpose of SF 91, Motor Vehicle Accident Report is to provide a detailed report of any accident involving a motor vehicle.

(ON SLIDE #227,228,229)

(2) Responsibilities.

- (a) The operator of any vehicle, to include towed, involved in an accident is responsible for initiating a Motor Vehicle Accident Report, provided that individual is able to do so. A second party may initiate the SF 91 for the operator, using any available witnesses. The operator's supervisor (commodity officer) is responsible for completing the supervisor designated portions of the SF 91. The investigating officer is responsible for completing the accident investigator portions per the Manual of Judge Advocate General.

(ON SLIDE #230)

(3) Preparation Instructions.

- (a) The required entries contained on the SF 91 are self-explanatory. Upon completion of the SF 91, submit it to the commodity officer for review and appropriate action. Ensure that you provide accurate and truthful information as this report provides your chain of command with a written description of what occurred. Remember, you were at the accident scene and your chain of command was not. The more detailed you are the better understanding they will have.

(ON SLIDE #231-236)

(4) Filing.

- (a) The operator will carry 1 blank SF 91 in each vehicle at all times while operating.

(5) Disposition.

- (a) Retain the SF 91 with the accident investigation per the Manual of Judge Advocate General.

Interim Transition: Thus far we have discussed the SF 91, Motor Vehicle Accident Report, its function, and how to properly fill this form out. Are there any questions on what we've covered up to this point? Now we are going to conduct a Practical Application on the SF 91.

(ON SLIDE #237)

Instructor Note

At this time have the students go to the back of the student handout for practical application of the SF 91.

Practical Application. This practical application is designed to test the students' comprehension to ensure a thorough understanding of properly filling out the SF 91, Motor Vehicle Accident Report. This PA should take about 2 hours to complete. The student instructor ratio is, 12:1.

Practice: The student's will read the scenario given in the student handout for the SF 91. Once the scenario is read the student will properly fill out the SF 91 template that coincides with the scenario read per instructions.

Provide Help: The instructor will monitor the students to ensure the scenario is completed. The instructor will assist students during the practical application in order to answer any questions and provide guidance.

1. Safety Brief: Not applicable due to classroom practical application.

2. Supervision and Guidance: Ensure students use their student handout and the provided references in completing this practical application. Answer any questions that may arise during the practical application. Assist any students that are struggling with the proper completion of the practical application.

3. Debrief: Once all students have completed the scenario provided read over them to check for understanding. Provide overall feedback, guidance on any misconceptions, and review the learning points of the practical application. Ask the students if there are any questions about the practical application.

(ON SLIDE #238)

(BREAK - 10 MIN)

Interim Transition: We have just finished our scenario based practical application on the SF 91, are there any questions before we move on? Now let's talk about the other forms utilized when involved in an accident.

(ON SLIDE #239)

b. **SF 94, Statement of Witness.**

(ON SLIDE #240)

(1) Purpose.

- (a) The purpose of the SF 94 is to provide a detailed statement from an accident witness per section V of the SF 91.

(ON SLIDE #241)

(2) Responsibilities.

- (a) The individual that is responsible for completing a SF 91 will request that witnesses complete a SF 94. Use by the public is voluntary. Use by military and federal employees is mandatory (see the compliance statement on the back side).

(ON SLIDE #242,243,244,245)

(3) Preparation Instructions.

- (a) The required entries contained on the SF 94 are self-explanatory.

(4) Filing.

- (a) The operator will carry 2 blank SF 94's in each vehicle at all times while operating heavy equipment.

(5) Disposition.

- (a) Retain the SF 94 with the completed SF 91.

Interim Transition: We have just finished talking about the SF 94, its use and who is required to fill it out. Are there any questions before we move on?

(ON SLIDE #246)

c. **DD 518, Accident Identification Card.**

(ON SLIDE #247)

(1) Purpose.

- (a) The DD518 provides any person(s) involved in an accident all the information they require of the automotive equipment operator.

(ON SLIDE #248)

(2) Responsibilities.

- (a) The equipment operator will complete as many copies as required at the scene of the accident, provided the operator is able to do so. A second party may complete the card utilizing the information contained on the NAVMC 10523 or NAVMC 10524 in conjunction with the Operator's OF-346 or state driver's license.

(ON SLIDE #249,250,251,252)

(3) Preparation Instructions.

- (a) The required entries contained on the DD 518 are self-explanatory.

(4) Filing and Disposition.

- (a) Carry several copies of DD 518 in each vehicle. Give one completed copy to each interested party at the scene of the accident.

Transition: We have just finished discussing the SF 91, SF 94 and DD 518, their functions, and how to properly fill these forms out. Are there any questions over what we covered? If not I have a question for you, **QUESTION:** What is the purpose of the SF 91? **ANSWER:** To provide a detailed report of an accident involving a motor vehicle. **QUESTION:** What is the purpose of the SF 94? **ANSWER:** To provide a detailed statement from an accident witness per section V of the SF-91. **QUESTION:** What is

the purpose of the DD 518? **ANSWER:** The DD518 provides any person(s) involved in an accident all the information they require of the equipment operator. Let's go ahead and take a 10 minute break.

(ON SLIDE #253)

(BREAK - 10 MIN)

(ON SLIDE #254,255,256)

9. **OPERATIONAL RISK MANAGEMENT**. (4HRS)

a. **Purpose**.

- (1) Operational Risk Management, commonly referred to as ORM, was established by OPNAV Instruction 3500.39 and adopted by the Marine Corps under Marine Corps Order 3500.27. It is a method for identifying hazards, assessing risks, and implementing controls to reduce the risk associated with any operation. By implementing controls, Marines can mitigate the severity of a hazard and/or reduce the probability of a mishap occurring.

(ON SLIDE #257-261)

b. **ORM Concept**.

- (1) Operational Risk Management is a decision making tool to be used by all people at all levels. It is used to increase operational effectiveness, anticipate hazards, and reduce the potential for loss, thereby increasing the probability of a successful mission.
- (2) When the ORM concept is applied, we increase our ability to make informed decisions. This is accomplished by providing the best baseline of knowledge and experience from those individuals associated with the mission or task that is being assessed.
- (3) We can also minimize risks to acceptable levels, based on mission accomplishment. You must remember that the risks associated with war are greater than

those associated with peacetime, but applying the ORM process is exactly the same.

- (a) Applying the ORM concept will also help reduce mishaps, lower costs, and provide more efficient use of resources.

(ON SLIDE #262)

c. Operational Risk Management Terms.

- (1) There are four terms that need to be understood when using operational risk management. They are:

(ON SLIDE #263)

- (a) HAZARD - This is any condition with the potential to cause personal injury, death, property damage, and/or mission degradation.
- (b) RISK - This is an expression of possible loss in terms of severity and probability.

(ON SLIDE #264)

- (c) RISK ASSESSMENT - This is a process of detecting hazards and assessing associated risks.

(ON SLIDE #265)

- (d) OPERATIONAL RISK MANAGEMENT - This is a process of dealing with risk associated with military operations, which includes risk assessment, risk decision making, and implementing effective risk controls.

INTERIM TRANSITION: We have just talked about the ORM Concept and defined the four terms that you need to know when using ORM. Let's take a ten minute break before we move on to talk about the ORM Process.

(ON SLIDE #266)

(BREAK - 10 MIN)

INTERIM TRANSITION: Did anyone think of any questions during the break? If not let's move on and talk about the ORM Process.

(ON SLIDE #267,268)

d. **OPERATIONAL RISK MANAGEMENT PROCESS**. The ORM process is a clear five-step system of minimizing those risks associated with any type of operation, mission, or daily routine. The five steps are: identifying hazards, assessing hazards, making risk decisions, implementing controls, and supervising. The process may seem laborious, but after continual use it should become a simple, fast, thorough process.

(ON SLIDE #269)

(1) Identifying hazards.

- (a) This is where the individual outlines or charts major steps in an operation; it is commonly referred to as the operational analysis. In this step, you will conduct a preliminary hazard analysis by listing all hazards associated with each step and listing all of the causes associated with that hazard.

(ON SLIDE #270)

(2) Assess hazards.

- (a) Once all hazards are identified, identify the associated risk of that hazard in terms of probability and severity.

(ON SLIDE # 271)

(3) Make Risk Decisions.

- (a) In this step, you develop risk control options. Start with the most serious risk first and select controls to reduce, minimize, or eliminate the risk. You must remember that, in some cases mission accomplishment will override some of the controls you may want to emplace. Once the controls are in place, it is time to make your decision.

1. Decide if the benefit of the operation outweighs the risk. If I does, then the operation should continue on.

2. If the risk outweighs the benefit then you must communicate that risk with higher authority in the chain of command.

(ON SLIDE #272)

(4) Implement Controls.

- (a) These are measures that can be implemented to eliminate hazards or reduce the degree of risks associated with the hazard. This can be accomplished by introducing engineering controls, administrative controls, or by using personal protective equipment.

(ON SLIDE #273)

1. Engineering Controls. These are engineering methods that are established to reduce risks. They can be implemented by changing the design or material selection. Material substitution can also be used as long as it is technically feasible, economical and conforms to established standards.

(ON SLIDE #274,275)

2. Administrative Controls. This method is used to reduce risks through specific administrative actions. This can be accomplished by:

a. Providing suitable warnings, markings, signs and notices.

b. Establishing written policies, programs, instructions and standard operating procedures.

c. Training personnel to recognize hazards and take appropriate precautionary measures.

d. Limiting the exposure to a hazard either by reducing the number of personnel/assets or the length of time they are exposed.

(ON SLIDE #276)

3. Personal Protective Equipment. Personal Protective equipment serves as a barrier between personnel and hazards and are used when other controls do not reduce the hazard to an acceptable level.

(ON SLIDE #277)

(5) Supervise.

- (a) In the final step of the ORM process leaders will conduct follow-up evaluations of the controls to ensure that they remain in place and have the desired effect. Continue to monitor for changes that may require further Operational Risk Management. Ensure that you take corrective action when necessary.

Interim Transition: Now that you have seen the five steps of ORM are there any questions? Let's take a ten minute break before we move on to talk about the three levels on which ORM exists.

(ON SLIDE #278)

(BREAK - 10 MIN)

Interim Transition: Did anyone think of any questions during the break? If not let's move on to talk about the three levels on which ORM exists.

(ON SLIDE #279,280,281)

e. **Three Levels Of Operation Risk Management.** ORM exists on three levels: Time-Critical, Deliberate and In-depth. The commander selects which level to operate in based upon the mission, time available, proficiency level of personnel and assets available. It is always preferable to perform a deliberate or in-depth risk management process for all evaluations, but time and resources are not always available. One of the objectives of ORM training is to develop sufficient proficiency in applying the process so that ORM becomes an automatic or intuitive part of our decision making methodology. In the operational environment leaders should be able to employ this time-critical process to make sound and timely decisions that generate tempo and facilitate decisive results.

(ON SLIDE #282,283)

- (1) Time Critical. This is an "on the run" mental or oral review of the situation using the five-step process without recording the information on paper. The time critical level is employed by experienced personnel to consider risks while making decisions in a time compressed situation.

- (a) This is the normal level of ORM used during the execution phase of training or operations, as well as in planning during crisis response scenarios.
- (b) It is particularly helpful in choosing the appropriate course of action when an unplanned event occurs during the execution of a planned operation or daily routine.

(ON SLIDE #284)

- (2) Deliberate. This is the complete application of the five-step process. It is used in planning an operation or evaluating procedures. Experience and brainstorming are primarily used to identify hazards and develop controls. This is most effective when conducted in a group. Examples of deliberate applications include planning of upcoming operations, review of standard operating, maintenance or training procedures and damage control/disaster response planning.

(ON SLIDE #285)

- (3) In-depth. This is a deliberate process with a more thorough assessment (the first two of the five steps) involving research of available data, use of a diagram and analysis tools, formal testing or long term tracking of hazards associated with the operation to identify and access the hazards. It is used to more thoroughly study the hazards and their associated risks in a complex operation or system, or one in which the hazards are not well understood. Examples of the in-depth application are: long term planning of complex operations, introduction of new equipment, materials and missions, development of tactics and training curriculum and major system overhaul/repair.

(ON SLIDE #286)

e. The Four Principles Of Operation Risk Management. There are four overall guiding principles of ORM. They are:

(ON SLIDE #287,288)

- (1) Accept risk when the benefits outweigh the cost.
MCDP 1, War fighting, states, "Risk is inherent in

war and is involved in every mission. Risk is also related to gain; normally greater potential gain requires greater risk." Our naval tradition is built upon principles of seizing the initiative and taking decisive action. The goal of ORM is not to eliminate risk, but to manage the risk so that the mission can be accomplished with the minimum amount of loss.

(ON SLIDE #289)

- (2) Accept no unnecessary risk. MCDP 1 also states, "We should clearly understand that the acceptance of risk does not equate to the imprudent willingness to gamble..." Take only risks necessary to accomplish the mission.

(ON SLIDE #290)

- (3) Anticipate and manage risk by planning. Risks are more easily controlled when they are identified early in the planning process.

(ON SLIDE #291)

- (4) Make risk decisions at the right level. The leader directly responsible for the operation makes risk management decisions. Prudence, experience, judgment, intuition, and situational awareness of leaders directly involved in the planning and execution of the mission are the critical elements in making effective risk management decisions. When the leader responsible for executing the mission determines that the risk associated with that mission is too high or goes beyond the commander's stated intent, he should seek additional guidance.

Interim Transition: Now that we have talked about and have a better understanding of the four guiding principles of ORM let's move on and talk about developing a risk assessment matrix.

(ON SLIDE #292, 932)

f. Risk Assessment Matrix. A matrix can be used to accomplish the second step of the ORM process. Using a matrix to quantify and prioritize the risk(s) does not lessen the inherently subjective nature of risk assessment. A matrix does provide, however, a consistent framework for evaluating risk. Many different matrixes can be developed and used for various

applications; any risk assessment tool should include the elements of hazard severity and mishap probability. Once these two elements are framed into the matrix, a risk assessment code (RAC) can be assigned to the specific hazard.

(ON SLIDE #294)

- (1) Hazard severity. Hazard severity assesses the worst credible consequence that can occur as a result of a hazard. Severity is defined by the potential degree of injury, illness, property damage, loss of assets, (time, money, personnel) or effect on mission. Hazard severity categories are assigned as Roman numerals according to the following criteria.

(ON SLIDE #295)

- (a) Category I. The hazard may cause death, loss of facility/asset or result in grave damage to national interests.
- (b) Category II. The hazard may cause severe injury, illness, property damage, damage to national or service interest or degradation to efficient use of assets.

(ON SLIDE #296)

- (c) Category III. The hazard may cause minor injury, illness, property damage, damage to national, service or command interests or degradation to efficient use of assets.
- (d) Category IV. The hazard presents a minimal threat to personnel safety or health, property, national, or command interests or efficient use of assets.

(ON SLIDE #297,298)

- (2) Mishap probability. The probability that a hazard will result in a mishap or loss, based on an assessment of such affected populations, experience, or previously established statistical information. Mishap probability will be assigned an English letter according to the following criteria:
 - (a) Sub-category A. Likely to occur immediately or within a short period of time. This situation is expected to occur frequently to

an individual item or person or continuously to a fleet, inventory, or group.

- (b) Sub-category B. Probably will occur in time. This designation indicates that a mishap is expected to occur several times to an individual item or person, or frequently to a fleet inventory or group.
- (c) Sub-category C. May occur in time. The incident can reasonably be expected to occur sometime to an individual item or person, or several times to a fleet, inventory, or group.
- (d) Sub-category D. Unlikely to occur.

(ON SLIDE #299)

- (3) Risk Assessment Code (RAC). The RAC is an expression of risk which combines the elements of hazards, severity, and mishap probability. Using the matrix in Figure 1, the RAC is expressed as a single Arabic number, one through five, that can be used to help determine hazard abatement priorities.
 - (a) RAC 1. Critical
 - (b) RAC 2. Serious
 - (c) RAC 3. Moderate
 - (d) RAC 4. Minor
 - (e) RAC 5. Negligible

(ON SLIDE #300)

Risk Management Matrix		Probability			
		A Likely	B Probable	C May	D Unlikely
Severity	I Death, Loss of Asset	1	1	2	3
	II Severe Injury, Damage	1	2	3	4
	III Minor Injury, Damage	2	3	4	5
	IV Minimal Damage	3	4	5	5

Figure 1

(ON SLIDE #301, 302)

Instructor Note

At this time have the students go to the back of the student handout for practical application of ORM.

Practical Application. This practical application is designed to test the students' comprehension to ensure a thorough understanding of properly filling out an ORM worksheet. This PA should take about 2 hours to complete. The student instructor ratio is, 12:1.

Practice: The student's will develop and fill out the ORM worksheet based on an activity that they determine. Once they have decided on an activity the student should develop a list and write down the hazards that are associated with that risk. After they have determined the most severe risk they will input

those risks into the ORM worksheet, listing the most severe first and develop a plan to reduce those risks.

Provide Help: The instructor will monitor the students to ensure the worksheet is completed. The instructor will assist students during the practical application in order to answer any questions and provide guidance.

1. Safety Brief: Not applicable due to classroom practical application.

2. Supervision and Guidance: Ensure students use their student handout and the provided references in completing this practical application. Answer any questions that may arise during the practical application. Assist any students that are struggling with the proper completion of the practical application.

3. Debrief: Once all students have completed the scenario provided read over them to check for understanding. Provide overall feedback, guidance on any misconceptions, and review the learning points of the practical application. Ask the students if there are any questions about the practical application.

Transition: We have just completed the practical application on Operational Risk Management. Are there any questions over anything about ORM? If not I have a question for you, **QUESTION:** What are the five steps of the Operational Risk Management process? **ANSWER:** Identify hazards, Assess hazards, Make risk decisions, Implement controls, and supervise. **QUESTION:** What are the three levels of Operational Risk Management? **ANSWER:** Time-critical, deliberate, and in-depth.

(ON SLIDE #303)

SUMMARY:

(15MIN)

During this period of instruction we have covered: how to utilize a technical manual and the importance of references, how to utilize a lubrication order, identifying the levels of maintenance, identification and utilization of petroleum, oils, and lubricants, identification and utilization of tools and how to properly fill out and utilize engineer equipment records and forms. The information covered during this period of instruction is vital in the accomplishment of your mission as an engineer equipment operator. With the knowledge that you have gained during this week of instruction I am more than confident that you will be able to properly utilize the resources that are available to you and be able to accomplish your mission as a

basic engineer equipment operator. Those students with the instructor rating forms can now fill them out and turn them in.

REFERENCES:

MCO P4790.2C	MIMMS Field Procedures Manual
TM-09135C-OR/A	Forklift, Light Capability Rough Terrain (LCRTF)
SL-3-11825A	Basic Operators Bag
TM 4700-15/1H	Ground Equipment Record Procedures
MCO 3500.27	Operational Risk Management (ORM)