

**Summary Report for Individual Task
551-88H-2520
Perform Cargo Planning Calculations
Status: Approved**

DISTRIBUTION RESTRICTION: Approved for public release; distribution is unlimited.

DESTRUCTION NOTICE: None

Condition: Assigned as a cargo checker in an operational environment at a terminal, an outport, or aboard a cargo vessel, during day or night, in normal weather conditions, given a completed risk assessment, an Operation Order/Operation Plan, safety briefing, safety equipment, cargo, fiber rope, wire rope, chain, sling, lumber, slide caliper, measuring tape, paper, pencil, daily tonnage report, DD Form 1387 (Military Shipping Label), FM 5-125, and TC 4-13.17. This task should not be trained in MOPP 4.

Standard: Perform cargo planning calculations, ensuring accuracy, without injury to personnel or damage to equipment.

Special Condition: None

Safety Level: Low

MOPP: Never

Task Statements

Cue: You are assigned as a Cargo Checker tasked with correctly performing calculations to determine the safe working capacity (SWC) of fiber ropes, and chains, and computing the tension of slings, board feet of lumber and the volume of cargo.

DANGER

Adhere to all DANGERS listed in the equipment technical operator's manual applicable to this procedure. Failure to comply may result in injury to personnel or damage to the equipment.

WARNING

Adhere to all WARNINGS listed in the equipment technical operator's manual applicable to this procedure. Failure to comply may result in injury to personnel or damage to the equipment.

CAUTION

Adhere to all CAUTIONS listed in the equipment technical operator's manual applicable to this procedure. Failure to comply may result in injury to personnel or damage to the equipment.

Remarks: None

Notes: None

Performance Steps

1. Determine the safe working capacity (SWC) of fiber rope.

a. Measure the diameter of fiber rope using a slide caliper.

b. Square the diameter (multiply it by itself) ($SWC = D^2$, where D = diameter). Example: $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$, $SWC = \frac{1}{4}$ ton (560 pounds).

Note: Tons in this step are represented as "long tons" in the conversion. One (1) LT = 2,240 pounds.

2. Compute the SWC of wire rope.

a. Measure the diameter or locate the tag indicating the diameter of the wire rope.

b. Use formula: $SWC = 8D^2$. Square the diameter (multiply it by itself). Example: $\frac{1}{2}$ inch diameter rope $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$.

c. Multiply the answer from step b by 8 (constant) and convert the fraction to a whole number. Your answer is the SWC in short tons. Example: $\frac{1}{4} \times 8 = 8/4 = 2$; $SWC = 2$ tons (4,000 pounds).

Note: Tons in this step are represented as "Short tons" in the conversion. One (1) STON = 2,000 pounds.

3. Compute the SWC of chains.

a. Measure the diameter of the chain.

b. Square the diameter (multiply it by itself).

c. Multiply the answer from step b by 6 (constant).

Note: Rounding down to tenths of a STON provides a greater margin of safety; for example, $3.43 = 3.4$; $3.47 = 3.4$.

Note 2: The formula for figuring the SWC of chains is as follows: $SWC = D^2 \times 6$ (SF) = STONs; $BS = 6(SF) \times 5 = 30$ STONs. Where: SWC = safe working capacity, D^2 = diameter squared, SF = safety factor, STON = short ton, BS = breaking strength.

4. Compute tension of slings.

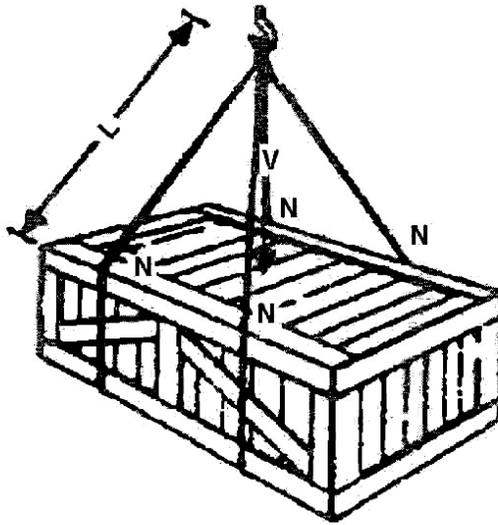
a. Multiply the weight of the load by the length of the slings (see Figure 3-139).

b. Multiply the number of sling legs by the vertical distance. The vertical distance is measured from the hook to the top of the load.

c. Divide the weight times the length by the number times the vertical distance. $T = W \times L / N \times V$; Where: T = tension on a single leg, W = weight of the load, N = number of slings, L = length of sling leg, V = vertical distance of sling.

Example: $1,800 \times 8 / 2 \times 6 = 14,400 / 12 = 1,200$ pounds; Where: $W = 1,899$ pounds, $N = 2$ legs, $L = 8$ feet, $V = 6$ feet.

d. Mark the sling with the SWC which (in this example) = 1,200 pounds.



L = LENGTH OF SLING LEG FROM HOOK TO TOP OF CRATE
V = VERTICAL DISTANCE FROM HOOK TO TOP OF CRATE
N = NUMBER OF SLING LEGS EXTENDING FROM HOOK

Figure 3-139
 Multiplying Weight of the Load by the Length of the Slings

5. Compute volume of cargo.

- Measure the length, width, and height of the cargo.
- Convert feet into inches (round off all measurements to the nearest whole inch).
- Multiply length by width by height in inches.

d. Divide 1,728 cubic inches (1,728 cubic inches = 1 cubic foot) into the number in Step 5c and round off the answer to the nearest tenth. This gives the volume of the cargo in cubic feet.

Example: For a container measuring 8 inches by 1 foot, 2 inches by 2 feet. $2 \text{ inches} - 8 \times 14 \times 26 / 1,728 = 2,912 / 1,728 = 1.685$ or 1.7 cubic feet.

- Enter data on DD Form 1387.

6. Compute board feet of lumber.

- Measure the length, width, and height of a piece of lumber.
- Round off all measurements to the nearest whole inch.
- Multiply length by width by height in inches.
- Divide the answer by 144 square inches.

e. Annotate board feet on the operations report.

Note: Round off the answer to the nearest tenth.

7. Convert tonnages.

- a. Convert LTs into STONs: Multiply the number of LTs by 1.12 STONs (example: 500 LTs x 1.12 STONs = 560 STONs).
- b. Convert STONs into LTs: Divide the number of STONs by 1.12 (example: 560 STONs divided by 1.12 = 500 LTs).
- c. Convert cubic feet into measurement tons (40 cubic feet = 1 measurement ton): Divide the number of cubic feet by 40.
- d. Record tonnages on the daily tonnage report.
 Note: The daily tonnage report should be legible with 100 percent accuracy.

(Asterisks indicates a leader performance step.)

Evaluation Guidance: Score the Soldier GO if all performance steps are passed (P). Score the Soldier NO-GO if any performance step is failed (F). If the Soldier fails any step, show what was done wrong and how to do it correctly.

Evaluation Preparation: Ensure that all materials required to perform the task are available. Tell the Soldier that he/she will be evaluated on performing cargo planning calculations.

PERFORMANCE MEASURES	GO	NO-GO	N/A
1. Determined the SWC of fiber rope.			
2. Computed the SWC of wire rope.			
3. Computed the SWC of chains.			
4. Computed tension of slings.			
5. Computed volume of cargo.			
6. Computed board feet of lumber.			
7. Converted tonnages.			

Supporting Reference(s):

Step Number	Reference ID	Reference Name	Required	Primary
	DD FORM 1387	MILITARY SHIPPING LABEL (AVAILABLE ON DOD WEB SITE)	Yes	No
	TC 4-13.17	Cargo Specialist's Handbook	Yes	No
	TM 3-34.86	Rigging Techniques, Procedures, and Applications {MCRP 3-17.7j}	Yes	No

Environment: Environmental protection is not just the law but the right thing to do. It is a continual process and starts with deliberate planning. Always be alert to ways to protect our environment during training and missions. In doing so, you will contribute to the sustainment of our training resources while protecting people and the environment from harmful effects. Refer to FM 3-34.5 Environmental Considerations and GTA 05-08-002 ENVIRONMENTAL-RELATED RISK ASSESSMENT. AR 200-1 delineates TRADOC responsibilities to integrate environmental requirements across DOTMLPF and ensures all training procedures, training manuals, and training doctrine includes sound environmental practices and considerations. The Army's environmental vision is to be a national leader in environmental and natural resource stewardship for present and future generations as an integral part of all Army missions. Environmental protection is never completed. Continuously be alert to ways to protect our environment and reduce waste.

Leaders must ensure that their unit has an active and strong environmental program. They must understand the laws and know what actions to take. Leaders bring focus, direction, and commitment to environmental protection. Commanding officers should ensure the following environmental programs are in place and are being maintained:-Hazardous materials program.-Hazardous waste program.
 -Hazardous communications program.
 -Pollution prevention and hazardous waste minimization recycling program.
 -Spill prevention and response plan program.

Safety: In a training environment, leaders must perform a risk assessment in accordance with FM 5-19, Risk Management. Leaders will complete a DA Form 7566 COMPOSITE RISK MANAGEMENT WORKSHEET during the planning and completion of each task and sub-task by assessing mission, enemy, terrain and weather, troops and support available-time available and civil considerations, (METT-TC). Note: During MOPP training, leaders must ensure personnel are monitored for potential heat injury. Local policies and procedures must be followed during times of increased heat category in order to avoid heat related injury. Consider the MOPP work/rest cycles and water replacement guidelines IAW FM 3-11.4, Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical (NBC) Protection, FM 3-11.5, Multiservice Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Decontamination. All Soldiers and leaders must maintain a proactive posture towards safety in day-to-day operations. The need for total commitment to safety should be evident to commanders, senior Soldiers, and their subordinates. Safety awareness is most effective at three levels: command, leader, and individual. Observe all Warnings and Cautions and remain aware of the following:

- Hearing protection requirements.
- Wearing of safety clothing.

All operations will be performed to protect and preserve Army personnel and property against accidental loss. Procedures will provide for public safety incidental to Army operations and activities and safe and healthful workplaces, procedures, and equipment. Observe all safety and/or environment precautions regarding electricity, cable, and lines. Provide ventilation for exhaust fumes during equipment operation and use hearing protection when required IAW AR 385-10, the Clean Air Act (CAA) and the CAA amendments, and the OSHA Hazard Communication standard.

Accidents are an unacceptable impediment to Army missions, readiness, morale, and resources. Decision makers at every level will employ risk management approaches to effectively preclude unacceptable risk to the safety of personnel and property affiliated with this task.

- (a) Take personal responsibility.
- (b) Practice safe operations.
- (c) Recognize unsafe acts and conditions.
- (d) Take action to prevent accidents.
- (e) Report unsafe acts and conditions.
- (f) Work as a team.

Prerequisite Individual Tasks : None

Supporting Individual Tasks : None

Supported Individual Tasks :

Task Number	Title	Proponent	Status
551-88H-4508	Monitor Marine Terminal Operations	551 - Transportation (Individual)	Analysis
551-88H-4504	Review Pre-stowage Plan	551 - Transportation (Individual)	Analysis

Supported Collective Tasks :

Task Number	Title	Proponent	Status
55-2-1508	Conduct Vessel Operations	55 - Transportation (Collective)	Approved
55-2-1406	Conduct Cargo Operations to Discharge and Load Breakbulk Cargo	55 - Transportation (Collective)	Approved

ICTL Data :

ICTL Title	Personnel Type	MOS Data
MOS 88H - CARGO SPECIALIST SL2	Enlisted	MOS: 88H, Skill Level: SL2, Duty Pos: ABW