## CHAPTER IV - LOADING AND STORAGE ABOARD VESSELS

### Section 2 - HANDLING GEAR

421. Combination woven rope and wire slings are not permitted for use in handling explosives. An open hook shall not be used in hoisting or lowering a draft of ammunition or explosives.

422. Wire rope or wire rope assemblies including splices or fittings thereof, used in handling military explosives shall be kept bare to permit ready inspection of its safe working condition. Mechanical type endings may be used in lieu of hand splices provided such endings have a minimum breaking strength equal to the catalog strength of wire rope from which it is made.

423. When ammunition is being loaded or discharged from a ship, a save-all net should be rigged between the ship and dock or barge. The save-all net should be covered with a tarpaulin if the pieces being handled are small enough to pass through the mesh of the net.

Satisfy your lighting requirements in a safe manner.

This is a save-all net. Its purpose: to save all ammunition that may fall from draft.

424. Where needed, portable lights must be installed so as to prevent any part of the light or its cable coming in contact with the deck or the cargo. A hanging portable light shall not be suspended from its cord but shall be fitted with a gantline in a way that no strain is carried by the light cable. No portable light shall be taken into a hold or compartment in which the stowage of ammunition or explosives has been completed without prior approval of the Captain of the Port or his representative. A portable light that is permitted in a hold under these circumstances shall be guarded and protected so that neither the light nor the light cord will be bearing on any metal part of the vessel or on any ammunition or explosives or their containers. Spliced electrical cords should not be used.

## CHAPTER IV - LOADING AND STORAGE ABOARD VESSELS

### Section 3 - HANDLING AND STOWAGE OF AMMUNITION

431. Military explosives are not permitted to be loaded or unloaded in a hatch at the same time that other cargo is being worked in any of the holds serviced through this hatch.

432. Military explosives are not permitted to be loaded or unloaded from the same hatch from both sides of the ship simultaneously, unless the hatch is fitted with cargo handling gear located at both the forward and after ends of the hatch.

433. When military explosives are stowed in a hold below one in which any cargo is being worked, the tween-deck hatch dividing the two holds shall have all its covers in place.

434. Any deck loads over which military explosives must be passed shall be limited in height to that of the hatch coaming, bulwark, or three feet, whichever is greater.

435. Bulk explosives and ammunition in containers shall be so handled as to avoid rupture of the containers or the container seams and to prevent undue friction between the containers. If any container is found unsatisfactory, it shall be removed from the ship to a suitable location and its contents shifted to another container in good condition. The containers shall be relabeled as necessary.

436. Heat can have detrimental effects on ammunition and explosive stores. Explosives and ammunition shall not be unnecessarily exposed to the direct rays of the sun. When prolonged exposure is anticipated, protective covering shall be provided before starting handling operations. Matches or other flame-producing articles shall never be permitted in the vicinity of explosives and ammunition. Particular attention must be paid to avoid making sparks from the contact of steel on steel. Personnel working with such materials shall have no spark-producing devices or articles of a combustible nature about their person.

437. Ammunition and explosives and their containers should be protected at all times from water and dampness to prevent corrosion of metal parts. Water and dampness may also have adverse effects, possibly hazardous, on the properties of propellants and explosives. Loading and unloading operations should be stopped and all holds closed during electrical storms.

438. Explosives or hazardous materials, whether in containers, in bulk, or loaded into projectiles, cartridges, or ammunition components shall be handled carefully to prevent shock, undue pressure, or friction which may cause a fire or an explosion or damage the material.

439. All military explosives or chemical warfare agents in bulk must be handled carefully. Packages and other containers are not to be dropped, dragged, tumbled, walked, slid over each other or over the deck or otherwise subjected to shock except that heavy containers of military explosives equipped with pulling bar assemblies and skids may be positioned in the holds of vessels by using the assemblies to maneuver the containers for short distances slowly and carefully. Packages and other containers shall not be rolled unless rolling is specifically permitted.

4310. Rope net slings with pallet, skipboard, pieplate or similar base shall be so loaded that when lifted a minimum displacement of items shall occur and the cargo net shall completely encompass the load except on its topside. Not more than one third of the vertical dimension of any package shall extend above the sideboard of the tray. Drafts of explosives shall be hoisted and lowered carefully.

4311. Blasting caps, detonating fuzes, fulminate of mercury and other initiating or priming explosives shall be considered as constituting a distinct class of dangerous explosives and shall be handled with extreme care. A chute and mattress is not to be used when loading or discharging this class of explosives.

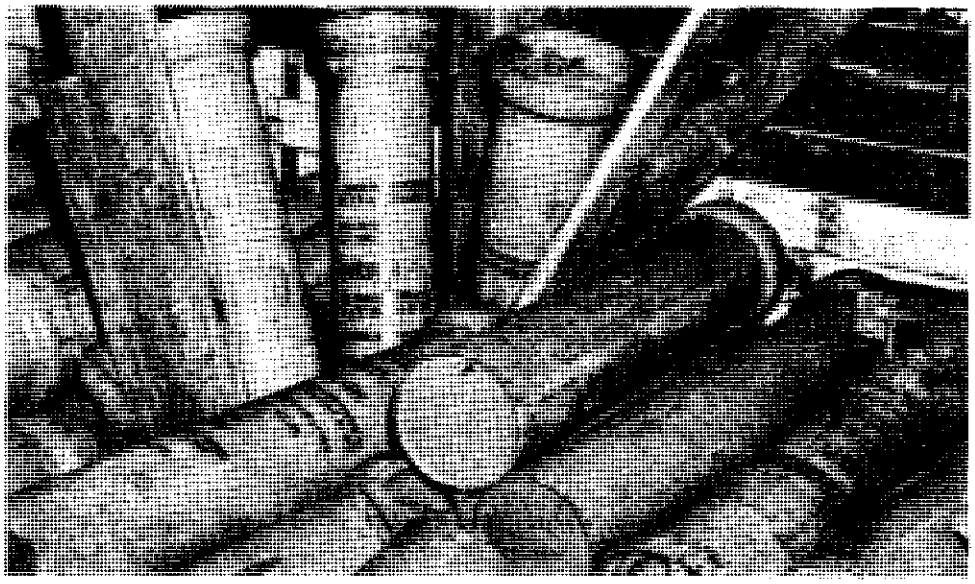
4312. "Cant" hooks shall not be used for raising or lowering a barrell, drum, or other container of explosives. Metal bale hooks shall not be used in handling packages of explosives.

4313. Drafts shall not be raised or stopped in lowering by sudden application of power or brake. Drafts shall not be unloaded by tripping or freeing one side of the net, tray or pallet and tumbling the ammunition or explosive out of the gear. All drafts, beams, shackles, bridles, slings, hooks, etc., shall be hand freed before the winch takes control. Slings should not be disengaged by hand unhooking and then dragged from under the draft by means of the winch.

4314. The use of cargo-handling vehicles or equipment powered by internal combustion engines on docks, wharves or piers for the handling of military explosives may be permitted under certain conditions prescribed by local authority. Such type vehicles or equipment shall not be used within a hatch of a

vessel having military explosives in any hold within said hatch. Electric or battery powered vehicles or equipment of explosion-proof or spark-proof type, such as approved power-operated industrial trucks with recognized testing laboratory designations of "EE" and "EX" may be used to handle military explosives on docks, wharves, piers or in the holds of vessels under such conditions as the Captain of the Port may prescribe. All power-operated cargo-handling vehicles or equipment shall at all times be maintained in safe mechanical and electrical operating condition.

4315. Military explosives shall be so stowed and dunnaged as to prevent damage to the cargo or the vessel from shifting cargo caused by forces incident to the voyage of the vessel. Nothing within this paragraph shall be construed as requiring the entire interior of the cargo compartment to be covered with dunnage.



Improperly secured cargo can result in a very dangerous condition.

4316. Containers of military explosives marked, "This Side Up," or otherwise marked directing their stowage shall be so stowed.

4317. Kegs of black powder shall be stowed in an upright position, the bungs or other filling openings "up." Each tier shall be floored off. Metal containers or metal tanks or other containers of propellant charges having closure means which protrude beyond the chime or the surface of the container shall be so dunnaged as to prevent damage occurring to such closures.

4318. The uppermost tier of military explosives shall be so secured to the mutual satisfaction of the Captain of the Port and the Master of the vessel by tomming, bracing, strapping, top stowing with permissible cargo of sufficient unit weight and quantity or other effective means that no displacement can occur either upwardly or laterally. Appropriate diagrams and illustrations of correct blocking and bracing of ammunition are shown on pages 88 through 93 of CG 108.

4319. Military explosives shall be so stowed that they or their containers are not liable to be pierced by the dunnaging or crushed by superimposed weight.

4320. Containers of military explosives shall not be "cant" stowed. They shall be stowed in full bearing on dunnage or both end and center bearing on dunnage. Broken stowage may, at the turn of the bilge, be dunnaged out with cordwood or otherwise so cribbed as to provide maximum bearing attainable for the container to be stowed in the tier above. Broken stowage in other locations in the hold may be compensated for by cribbing out or by the insertion of sufficient dunnage to provide proper bearing for packages in the tier above.

4321. Fixed or semifixed ammunition in fiber containers, crated or uncrated, may be stowed on its base or on its side. Dunnaging shall be accomplished in such a manner as to bear only upon the metal part of the container. No dunnage or weight shall bear directly upon the fiber portion of the container. Separate-loading projectiles, boxed, crated, unboxed, or uncrated may be stowed on their bases or on their sides except for WP filled ammunition which shall be stowed as specified by appendix 146.29-100, Class II-D (under Stowage), of CG 108.

4322. Articles that are stowed "On Deck" shall be properly secured. Such security may be obtained by using the vessel's existing structures such as bulwarks, hatch coamings, shelter deck and poop bulkheads as part boundaries and effectively closing in the cargo by fitting angle bar closing means secured by bolting to clips or other parts of the ship's structure. Lashing of deck stowage is permitted, provided pad eyes are fitted to carry such lashings. Buard rails shall not be used to secure such lashings. Bulky articles may be secured by lashing with individual wire rope.

4323. Stowing of such bulky articles of cargo shall be in addition to the foregoing means of securing.

4324. Explosives stowed "on deck" shall be stowed as to provide safe access to the crew's quarters and to all parts of the deck required to be used in the navigation and necessary working of the vessel.

4325. Airing spaces for the crew shall be maintained free and clear of the stowed cargo.

4326. When runways for use of the crew are built over stowed cargo, they shall be so constructed and fitted with rails and life-lines as to afford complete protection to the crew.

4327. Explosives to be stowed "on deck" shall not be stowed on or under a bridge deck or within a distance, in a horizontal plane, of 25 feet of a gangway or lifeboat.

4328. On deck cargoes of explosives shall not be stowed nearer than 25 feet in a horizontal plane to the access means provided for crew quarters.

4329. Fire plugs, sounding pipes, and access to same shall be maintained and clear of explosive cargo stowed on deck.

4330. Past experience has shown that there are some common violations of loading procedures that occur more readily than others. Masters should be alert and watch for the following transgressions against approved loading procedures.

a. Dropping loaded charges.

b. Dragging or sliding loaded charges.

c. Bumping loaded charges against each other or other subjects.

d. Jerking or tumbling loaded charges.

e. Raising or lowering loaded charges by other than controlled, steady, and slow movement.

f. Using inadequate or improperly maintained equipment.

g. Inadequate supervision and inspection of handling activities.

h. Disregard for authorized explosive limits.

i. Disregard for standard and authorized practices.

j. Transporting equipment over poor decks, or decks with protruding nails or other objects.

k. Manipulating munitions around sharp and protruding corners.

l. Transporting munitions over gang planks that do not have side rails.

## CHAPTER V - OCEAN TRANSPORT OF AMMUNITION

### Section 1 - PROCEDURES AT SEA

511. One of the major fears of mariners is having blocking carry away and cargo go adrift in rough seas. This is especially hazardous if the vessel is carrying explosives.

512. Ammunition is sensitive to friction, shock, sparks or heat. Immediate action must be taken to secure explosives, or cargo stored with explosives, that shifts or goes adrift while in transit. Weather and sea conditions may require the substitution of miscellaneous materials for standard blocking and bracing. The first and most important thing to do is to stop all movement of cargo within the holds as rapidly as possible. This can be accomplished by filling holes or voids that appear with any of the following materials in the order listed:

a. Wood of any type.

b. Tires or any rubber goods.

c. Bedding such as mattresses, blankets, sheets or pillows.

d. Pasteboard boxes containing solid materials other than dangerous or flammable items.

e. Flood the lower hold as a last resort if water-tight integrity can be maintained.

513. Most vessels transporting ammunition will have an adequate amount of dunnage aboard for replacing the above with a more permanent type of blocking when the weather and seas permit.

514. Frequent inspections of cargo and cargo spaces will usually reveal a situation of this type developing before it becomes an emergency endangering cargo, vessel, and crew. Therefore, frequent inspections of cargo holds, particularly in heavy seas, is one of the best ways of avoiding difficulties. Shore up those few loose items before they break loose and cause a major emergency.

515. Daily soundings of all cargo hold bilges shall be taken and all efforts shall be expended in order to keep the bilges dry.

516. In case of shipwreck, flooding of magazines, or other casualties whereby ammunition becomes wet or damaged, the damaged ammunition shall be forwarded to an ammunition depot as directed.

Care should be taken in handling to avoid further damage to containers.

517. In the event of a casualty to a vessel lifting explosives or other dangerous articles, the master is authorized to adopt such procedures as will, in his judgment, provide maximum safety to the vessel and crew under the existing circumstances. Should such a casualty result in damaged containers or the emergency use of unauthorized containers, such containers upon arrival at port will not be offered to any forwarding carrier for transportation. The vessel, owner, agent, charterer, master or other person in charge of the vessel will report immediately to the Captain of the Port or his authorized representative and request instructions as to disposition.

518. Explosives or other dangerous articles or substances found on periodic inspections to be in an unsafe condition may be disposed of by jettisoning, or may be continued in transportation to the nearest port, whichever course may, in the judgment of the master, provide maximum safety to the vessel and its crew. A report of such occurrence will be made to proper authorities, outling the circumstances and the Master's decision with an entry in the ship's log detailing the incident. If such substance is brought to port, delivery shall not be made to consignee or any forwarding carrier. Instead, a report shall immediately be made to the Captain of the Port or his authorized representative with a request for instructions as to disposition of the substance.

# CHAPTER VI - OFFLOADING CARGO VESSELS

## Section 1 - SAFE HANDLING

611. Ammunition and explosive containers shall not be tumbled, dragged, thrown, or dropped on each other, or on the floor or deck.

612. Projectiles should not be rolled but should be handled by trucks, tongs, and slings when possible. When such methods are not feasible, sufficient dunnage should be laid down and projectiles may be rolled by hand but not be allowed to bump into each other harming fuzes, damaging or loosening windshields, caps, tracers, fuzes, bourrelets or rotating bands, and identification markings.

613. Cargo nets alone shall not be used for transporting empty or filled tanks or other ammunition containers likely to be damaged. In hoisting and lowering ammunition containers with cargo nets, a rigid wooden platform or base shall be fixed in the net upon which the containers can be stood, stacked, or piled upon their stowage rings in such a manner as to prevent shifting and bumping into each other or exerting pressure upon their thin sides. Ammunition, explosive containers, and projectiles must be hoisted and lowered slowly in order to prevent damage, leaks, the loosening of windshields and caps on projectiles, etc. Ample time shall be allowed for proper removal after the landing of a hoist.

614. Barrels, drums or kegs containing explosives and ammunition containers shall never be rolled, but shall be carried by hand or transported with approved mechanical handling equipment.

615. Care shall be taken not to obliterate or deface markings, labels, and tags on containers of ammunition or explosives.

## CHAPTER VI - OFFLOADING CARGO VESSELS

### Section 2 - AIR FORCE EXPRESS

621. Conventionally, ammunition is loaded on a ship to be unloaded at one port of discharge or from the top down. Due to the number of Air Force installations being serviced in Southeast Asia, this is not possible. In an effort to accommodate the continuing requirements of these installations, shipments known as "Special Express" are being made.

622. All loading under this concept uses a "grocery store" type or "open square of the hatch" storage plan.

623. This method of loading provides accessibility for offloading selective items depending on local requirements at each port of discharge.

624. Anything loaded in the "square of the hatch" must be discharged first.

625. After the hatch space is cleared, additional orders at later ports may be filled.

626. This type of ammunition offloading requires new blocking and bracing before continuing the voyage. Careful attention by the master of the vessel is required, to assure the hold is reblocked and rebraced to avoid any shifting of cargo. Discussion of magazine stowage using standard compartmentation is available in paragraphs 146.29-63 through 95, and illustrated at Appendix B of CG 108.

Personnel and cargo safety have very little impact upon native stevedore crews at foreign ports.

# CHAPTER VII - CHARACTERISTICS OF AMMUNITION AND EXPLOSIVES

## Section 1 - SCOPE

711. The compatibility or admixture charts included as Annex A have been reproduced from CG 108. They are concerned primarily with the various chemical components used in the manufacture of ammunition and explosives. They can be particularly useful in selection of spaces for stowage of materials which are to be returned or onloaded at ports where loading is not closely supervised and inspected.

712. There are certain items of explosives and ammunition which make up a large part of each load which may be shipped overseas for use. Following are brief descriptions of specific ammunition or explosive types which are furnished for ready reference:

a. Thermite.

b. White Phosphorous.

c. Smokeless Powder.

d. Bomb Ammunition.

e. Fuzes.

f. Firebombs.

g. Bullpup Guided Missiles.

h. Air-to-ground and Ground-to-ground Rockets.

i. Warfare Chemicals.

j. Pyrotechnics.

## CHAPTER VII - CHARACTERISTICS OF AMMUNITION AND EXPLOSIVES

### Section 2 - THERMITE

721. Thermite is an integrated mixture of iron oxide and finely powdered aluminum. It is in the form of a dark gray granular mass. Upon being ignited, it burns rapidly and reaches a temperature of about 4500°F. The iron oxide is reduced to boiling molten iron.

722. Thermite containers are marked incendiary - TH and painted for identification. The old color marking is one purple band on gray background. The new color marking is light red overall or red stripes on olive background.

723. The principle hazard of Thermite filled items is fire. The presence of a small explosive charge in Thermite items forms an additional fire hazard.

724. To extinguish a thermite fire, use large volumes of water, steam smothering, $CO^2$, sand, copper sulfate, dry chemicals, or any means of removing the oxygen. Do not use carbon dioxide or carbon tetrachloride extinguishers.

725. Thermite shall be bottom stowed and only in deep tanks. For stowing adjacent to or limited quantity shipments, check CG 108, 146.29-59 and 146.29-99(B), Note D.

## CHAPTER VII - CHARACTERISTICS OF AMMUNITION AND EXPLOSIVES

### Section 3 - WHITE PHOSPHOROUS

731. White phosphorus becomes liquid at 111°F.; therefore, it should be stowed in locations not subject to temperatures above 100°F. WP or PWP (plastic white phosphorus) filled items of ammunition shall be stowed in a nose-up position unless other requirements are specified. The primary hazard of white phosphorus is spontaneous ignition upon exposure to air. Leakage, which sometimes occurs, usually gives warning by the emission of white smoke.

732. Phosphorus fires should be immediately deluged with large quantities of water. The flow of water should continue until the fire is extinguished, and the phosphorus solidified. Wet sand or dirt may then be used as a cover prior to jettisoning.

## Section 4 - SMOKELESS POWDER

741. Protect powder from excessive temperatures and moisture; adverse conditions such as these hasten decomposition and spontaneous ignition may result from prolonged exposure. Smokeless powder must always be protected from the direct rays of the sun. If powder becomes wet or damp or there is any reason to suspect it has been, it shall be segregated from other powder until tests have proven its stability. If separation during voyage is impractical, item and details are to be entered in the ship's log.

742. Should powder be spilled, it shall be removed IMMEDIATELY since loose powder and powder dust are dangerous fire hazards. Dragging boxes over powder grains can cause serious fires. Care must be used to guard against powder dropping into cracks where it may remain for a long time without detection. Fires may result from this condition. Salvaged or deteriorated smokeless powder must be shipped under water.

## CHAPTER VII - CHARACTERISTICS OF AMMUNITION AND EXPLOSIVES

### Section 5 - BOMB AMMUNITION

751. Some bomb ammunition has comparatively thin walls. It is regarded as one of the most hazardous types of ammunition because of its tendency to detonate en masse if a fire occurs, or if a heated fragment is projected into the magazine or hold where stored. Bombs are shipped unfuzed thus lowering the sensitivity. Precautions should be taken to protect bomb-type ammunition from fire and shock. All the safety precautions for handling bomb-type ammunition must be observed.

## CHAPTER VII - CHARACTERISTICS OF AMMUNITION AND EXPLOSIVES

### Section 6 - FUZES

761. Fuzes are packed in sealed moistureproof containers. They should be protected against shock and high temperatures. Boxes containing fuzes should not be dropped, slid, rolled, "walked" on the corners, or struck, as in lining up a stack. They should be shaded from the direct rays of the sun and protected from other sources of high temperature or excess moisture.

## CHAPTER VII - CHARACTERISTICS OF AMMUNITION AND EXPLOSIVES

### Section 7 - FIREBOMBS

771. The firebomb presently is use by the Air Force (BLU-27 and BLU-32) is classed as Napalm. The filler is composed of 50 per cent polystyrene (a plastic similar to that used in the manufacture of children's toys), 25 per cent benzene (an aromatic hydrocarbon), and 25 per cent gasoline. The hazard is limited to fire which should be fought as any gasoline or oil fire by the use of fog to reduce the ambient temperature or steam smothering.

772. Solidification of the polystyrene will usually seal small leaks.

773. If a firebomb filler leaks or is spilled on deck, it may be removed with wooden scrapers (dunnage of any type) or non-spark (brass) shovels. An odor of acetone is not unusual or cause for alarm.

A large puncture can usually be sealed by wedging a piece of dunnage in the opening.

## Section 8 - BULLPUP GUIDED MISSILES

781. The engine of this weapon utilizes a liquid propellant combination of inhibited red fuming nitric acid (IRFNA) and a mixed amine fuel (MAF-1). Both liquids are factory-loaded and hermetically sealed within the engine propellant tanks with the initiating charge integral to the unit. Upon contact, IRFNA and MAF-1 react spontaneously and burn. Leakage of the liquid propellants is unlikely unless engines sustain severe battle damage or are accidentally dropped from an extreme height. In the event that either propellant tank is ruptured and propellant leakage results, both liquids can be neutralized with water. An engine that has developed an acid leak due to battle damage or mishandling may be packaged into a polyethylene bag in order to contain the fumes for safe transportation by personnel to a disposal area. Fires resulting from reaction between the propellants furnish their own oxygen and control only can be established by flushing and diluting with large amounts of water.

782. Skin contact with either liquid propellant should be avoided. Inhibited red fuming nitric acid (IRFNA) is a powerful oxidizing agent which will cause severe burns if accidentally spilled on the skin. Prolonged contact with mixed amine fuel (MAF-1) may result in skin rashes. Affected areas should be promptly flushed with water. Fumes from either liquid, particularly IRFNA, are toxic and should not be inhaled. Their presence is readily detectable by an acrid, foul odor and an emission of red fumes and can be easily avoided. Protective clothing is furnished and the ship's officers will be adequately instructed by the shipper in its use prior to loading. Leakers should be jettisoned.

Deck stows are provided with sufficient space for flushing underneath with water.

## CHAPTER VII - CHARACTERISTICS OF AMMUNITION AND EXPLOSIVES

### Section 9 - AIR-TO-GROUND AND GROUND-TO-GROUND ROCKETS

791. To decrease the hazards in handling, storage, and transportation, the rocket heads and motors are generally shipped and stored separately and are not assembled until required for use. If the motor on an assembled rocket is fired, the rocket will drive ahead with full force whether it be launched from a launcher or not. The seal at both ends of the motor are light and easily displaceable by pressure developed inside the tube and, should the igniter and grain ignite, these closures usually fail quickly and thus relieve the pressure. (NOTE: This is not so with the new 2.75" design.)

792. Because of the presence of the electric squib or igniter, rocket motors should not be located in the same compartment with or near operating radio apparatus or radio antenna leads. The storage regulations for ballistite are the same as those for regular smokeless powder.

793. Although there is little possibility of a motor firing as a result of falling or rough handling, such treatment is likely to result in fracturing the grain which will cause malfunctioning of the motor and should be carefully avoided. For this reason, rocket motors should be kept in their packing containers or ready boxes, and should not be handled more than is necessary.

794. It is preferable to stow motors in their original boxes. However, they may be stowed in racks if each motor is horizontally supported in at least two places, individually secured, and given protection equivalent to that supplied by the shipping containers.

795. Rocket heads are to be handled and stowed in the same manner as bombs and projectiles of similar sizes and characteristics.

## CHAPTER VII - CHARACTERISTICS OF AMMUNITION AND EXPLOSIVES

### Section 10 - WARFARE CHEMICALS

7101. Chemicals for service use are not always loaded into ammunition components. When transported in bulk they are considered to be poisons, flammable liquids or solids, and corrosive liquids or oxidizing materials.

7102. For the purpose of stowage and storage, chemical ammunition is separated according to the nature of their fillings so that in the event shells, bombs, or containers are ruptured in a fire, firefighting personnel will be able to control spilled liquids or burning chemicals with some degree of safety to personnel and materials. Personnel handling chemical material and those who have to combat chemical fires should be familiar with the action of blistering agents (mustard gas or lewsite), lethal gases, tear gas and screening smokes, spontaneously inflammable agents and readily flammable mixtures.

7103. Wherever and whenever chemical gases have been spilled or discharged, it is necessary to begin decontamination operations immediately in order to protect material, personnel and food supplies.

7104. Fire can be expected to either produce detonations or bursting of toxic gases and other chemical munitions, thus it is by far the greatest potential source of danger. Safety demands that all possible steps be taken to prevent fire and that fire precautions be strictly complied with.

7105. For fires involving chemical ammunition containing blistering agents, <u>all firefighters will be protected by masks and complete protective clothing</u>. These will be furnished by the shipper who will also arrange to give the ship's officers instruction in their use <u>before</u> loading starts. Such shipments are usually accompanied by trained shipper personnel who will assist the crew and advise the Master in emergencies. If practicable, such fires will be fought from the windward side. All unprotected personnel downwind will be evacuated and the civilian inhabitants warned. Fires involving toxic chemicals will be fought with similar precautions except that the danger area downwind is less. Firefighters will be protected with suitable masks such as the Navy Gas Mask, Army Gas Mask, or the Navy Oxygen-Breathing Apparatus or shipper provided protective clothing and apparatus.

7106. In fires involving Hexachlorethane smoke mixture, attempts should be made to remove and segregate the burning containers. When a relatively small amount of HC smoke mixture is involved in a fire, it can be "drowned" with water. Water will also serve to cool adjacent containers to prevent further spread.

## CHAPTER VII - CHARACTERISTICS OF AMMUNITION AND EXPLOSIVES

### Section 11 - PYROTECHNICS

7111. Pyrotechnics are more subject to deterioration than most other types of ammunition. Some pyrotechnics are susceptible to spontaneous ignition if exposed to moisture, high temperatures, or rough handling. Pyros as packaged by manufacturers are usually well protected against deterioration in storage.

7112. Water activated pyrotechnics require separate stowage. The stowage area should be suitably placarded to indicate that no water is to contact them. Non-water type fire extinguishers or other materials to combat fires involving water-activated pyrotechnics must be kept near such stowage and be conspicuously marked as to type.

7113. Most pyrotechnics furnish their own oxygen upon ignition and form a very hot fire.

7114. Large volumes of water should be used on those types not water activated.

7115. Firefighters should not enter ship's holds containing a high concentration of smoke unless adequately protected by oxygen masks and equipped with lifelines.

7116. When making inspections aboard ship where chemical warfare gases are stowed, the Navy Mk IV gas mask or Army service mask will give full protection against war gases in concentrations likely to be found on the ship. It will not protect against carbon monoxide, illuminating gas, ammonia or cyanide gas. It is therefore not suitable for use in case of industrial accidents or fires. The Navy Oxygen-Breathing Apparatus may be used in place of the service gas mask. For operations where blistering gases have been spilled, impregnated protective clothing furnished by the shipper should be worn.

7117. When possible, and when the amount of such ammunition or containers of these chemical substances warrant, the loading and stowage of chemical ammunition, chemical agents, or lethal gases will be supervised by a representative of the Army Chemical Warfare Service or U. S. Navy. (CG 108 - 146.29-100.)

## ANNEX A

## CHAPTER I - CG 108 - 146.29-99 EXPLOSIVES ADMIXTURE CHARTS

011. Chart A of this section indicates the compatibility of the various classes of ammunition described in paragraph 146.29-100. Chart B of this section indicates the compatibility within the class of items of Classes XI-C and XI-D.

012. A shaded block at an intersection of horizontal and vertical columns in Chart A indicates that the particular class of military explosives shown by the heading of the horizontal column to the left must NOT be stowed in the same hold or compartment with the particular class of military explosives indicated by the heading of the vertical column at the top of the chart. A shaded block at the intersection of horizontal and vertical columns in Chart B indicates that that particular item shown by the head of the horizontal column to the left must NOT be stowed "on deck" together unless separated by the superstructure, or in the same hold or compartment with the item indicated by the heading of the vertical column at the top of the chart. For specific provisions of stowage, and items included in each class, refer to paragraph 146.29-100.

013. In the charts the letters refer to the following notes:

a. NOTE A: Class II-F may be stowed in the same lower hold or tween-deck hold with Classes II-C, II-E, II-G, and III provided the Class II-F ammunition is bottom stowed and provided further that no other class of explosive or ammunition is stowed in the hold or tank below.

b. NOTE B: Class II-F may be stowed in the same deep tank, lower hold or tween-deck hold with Classes II-B, IV, V, VII: PROVIDED, That the Class II-F ammunition is bottom stowed: AND PROVIDED FURTHER, That no other class of explosives or ammunition is stowed in the hold or tank below.

c. NOTE C: Propellant charges Class II-A for separate loading artillery projectile filled with Class XI-A or XI-B chemical may be stowed together in the same hold or compartment: PROVIDED, That the propellant charges are "top stowed," the two items being separated by a type "A" dunnage floor. When so stowed the propellant charges shall not be overstowed with any other cargo.

d. NOTE D: Class II-J TH incendiary filled ammunition shall be stowed only in a deep tank or lower hold, and in all cases, bottom stowed, except that a limited quantity shipment not in excess of 500 lbs. net TH content may be stowed on deck in a special magazine constructed of material as set forth in paragraph 146.29-81(c) and provided such magazine has an insulation of sand at least one foot thick on the bottom. This magazine shall be so mounted that there is at least one foot void between its bottom and deck on which it is mounted, and its preferred location is aft. There shall be one charged fire hose in the immediate vicinity of this magazine when this class ammunition is stowed therein. There shall be only one such stowage per vessel and that stowage shall not be over living quarters or hatches in which military explosives, other dangerous articles, or ships' stores are stowed below.

e. NOTE E: Class V (unfuzed and no fuzes packed in container) and Class VII (unfuzed and no fuzes packed in container) may be stowed with Class X-A.

f. NOTE F: See Chart B for compatibility of items within this class.

g. NOTE G: May be stowed together if separate stowage is not available.

CHART A—COMPATIBILITY CHART FOR VARIOUS CLASSES OF MILITARY EXPLOSIVES AND HAZARDOUS MUNITIONS

Legend: *Refers to different ICC classes: F.L., F.G., Cor. L., Oxy. M., etc. ◍ Shall NOT be stowed together. □ May be stowed together. A, B, C, D, E, F, and G—Check notes in § 146.29-99 for proper stowage.

| I.C.C. class | | Class | I | II-A | II-B | II-C | II-D | II-E | II-F | II-G | II-H | II-J | III | IV | V | VI | VII | VIII | IX-A | IX-B | IX-C | X-A | X-B | X-C | X-D | XI-A | XI-B | XI-C | XI-D | Class |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C | Small-arms ammunition w/o explosive bullets, mechanical time fuze and like items | I | □ | □ | □ | □ | □ | □ | □ | □ | ◍ | D | □ | □ | □ | □ | □ | □ | □ | □ | □ | ◍ | ◍ | ◍ | ◍ | □ | □ | ◍ | ◍ | I |
| B | Bulk propellants, such as ballistite, cordite, FNH, NH, and NC powder, "Made-up bag charges" in outside shipping containers | II-A | □ | □ | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | □ | □ | □ | □ | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | C | C | ◍ | ◍ | II-A |
| B | Fixed ammunition w/o explosive projectiles and like items | II-B | □ | □ | □ | ◍ | ◍ | □ | B | ◍ | ◍ | D | □ | □ | □ | □ | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | □ | □ | ◍ | ◍ | II-B |
| B or C | Pyrotechnics (fireworks) | II-C | □ | □ | □ | □ | □ | □ | A | ◍ | ◍ | D | ◍ | □ | □ | □ | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | □ | □ | ◍ | ◍ | II-C |
| *Var. | Chemical ammunition—WP or PWP filled (solid) | II-D | □ | ◍ | ◍ | ◍ | □ | □ | ◍ | ◍ | ◍ | ◍ | □ | ◍ | ◍ | □ | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | □ | □ | ◍ | ◍ | II-D |
| *Var. | Chemical ammunition—HC filled (solid) | II-E | □ | ◍ | ◍ | □ | □ | □ | A | □ | ◍ | ◍ | □ | ◍ | ◍ | □ | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | □ | □ | ◍ | ◍ | II-E |
| *Var. | Chemical ammunition—FS or FM filled smoke (liquid) | II-F | □ | ◍ | B | A | ◍ | A | □ | A | ◍ | ◍ | B | B | ◍ | ◍ | B | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | □ | □ | ◍ | ◍ | II-F |
| *Var. | Chemical ammunition—IM, NP, or PT filled, incendiary composition (oil gel) | II-G | □ | ◍ | ◍ | ◍ | ◍ | □ | A | □ | ◍ | D | ◍ | ◍ | ◍ | ◍ | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | □ | □ | ◍ | ◍ | II-G |
| None | Chemical ammunition—water activated | II-H | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | II-H |
| *Var. | Chemical ammunition—TH filled incendiary composition (solid) | II-J | D | ◍ | D | D | ◍ | ◍ | ◍ | ◍ | ◍ | □ | ◍ | D | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | II-J |
| B or C | Fuzes, PD w/o booster; fuzes AT mine (nonchemical) w/o booster; fuzes, bomb tail w/o booster; fuzes, tracer; primers; primer detonators, etc. | III | □ | ◍ | □ | ◍ | ◍ | □ | A | ◍ | ◍ | ◍ | □ | □ | □ | □ | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | □ | □ | ◍ | ◍ | III |
| A | Fixed and semifixed ammunition with explosive loaded projectile | IV | □ | □ | □ | ◍ | ◍ | ◍ | B | ◍ | ◍ | D | □ | □ | □ | □ | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | □ | □ | ◍ | ◍ | IV |
| A | Separate loading projectiles filled with explosive "D" | V | □ | □ | □ | ◍ | ◍ | ◍ | B | ◍ | ◍ | ◍ | □ | □ | □ | □ | □ | ◍ | ◍ | ◍ | ◍ | E | ◍ | ◍ | ◍ | □ | □ | ◍ | ◍ | V |
| A | BD fuzes; PD fuzes with booster; bomb fuzes with booster; rocket fuzes with booster; and like items | VI | □ | ◍ | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | □ | □ | □ | □ | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | VI |
| A | Separate loading proj. filled with HE other than explosive "D" | VII | □ | □ | □ | ◍ | ◍ | ◍ | B | ◍ | ◍ | ◍ | □ | □ | □ | □ | □ | ◍ | ◍ | ◍ | ◍ | E | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | VII |
| A or C | Blasting caps; detonators; AT mine fuzes (chemical); etc. | VIII | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | VIII |
| A or B | Explosives in bulk, such as black powder, propellant explosives for small arms, etc. | IX-A | □ | □ | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | IX-A |
| A | High explosives, such as dynamite, TNT, demolition blocks, etc. | IX-B | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | IX-B |
| A | Initiating and priming explosives in bulk | IX-C | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | IX-C |
| A | Explosive bombs, mines, torpedoes, etc. | X-A | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | F | ◍ | E | ◍ | ◍ | ◍ | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | X-A |
| A | Explosive bombs, mines, etc. packed with fuze in integral package | X-B | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | X-B |
| A | Guided missiles with solid propellant motors, w, w/o HE warhead | X-C | ◍ | ◍ | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | □ | ◍ | ◍ | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | □ | ◍ | ◍ | ◍ | ◍ | ◍ | X-C |
| A | Guided missiles with liquid petroleum fueled propellant motors, HE warhead | X-D | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | X-D |
| A or Pois. A | Chemical ammunition—lethal | XI-A | □ | C | ◍ | ◍ | ◍ | ◍ | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | □ | □ | ◍ | ◍ | XI-A |
| A or Pois. C | Chemical ammunition—nonlethal | XI-B | □ | C | □ | ◍ | ◍ | ◍ | □ | ◍ | ◍ | ◍ | ◍ | □ | ◍ | ◍ | □ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | □ | □ | ◍ | ◍ | XI-B |
| *Var. | Fuels in containers for missile and rocket engines | XI-C | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | F | ◍ | XI-C |
| *Var. | Oxidizers in containers for missile and rocket engines | XI-D | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | ◍ | F | XI-D |

CHART B—COMPATIBILITY CHART FOR VARIOUS ITEMS WITHIN CLASS XI-C AND CLASS XI-D

Legend: ◍◍ Shall NOT be stowed together □□ May be stowed together G Check note for proper stowage

| | Nomenclature | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o | p | q | r | s | t | u | v | w | x | y | z | aa | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a | Acids; i. e., nitric sulfuric; fuming red nitric; fuming white nitric; etc | □□ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | a |
| b | Liquid hydrogen | ◍◍ | □□ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | b |
| c | Liquid fluorine | ◍◍ | ◍◍ | □□ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | c |
| d | Liquid oxygen | ◍◍ | ◍◍ | ◍◍ | □□ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | d |
| e | Liquid nitrogen tetroxide | ◍◍ | ◍◍ | ◍◍ | ◍◍ | □□ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | e |
| f | Anhydrous ammonia | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | □□ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | □□ | □□ | □□ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | f |
| g | Diborane; pentaborane | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | □□ | □□ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | g |
| h | Aluminum borohydrides | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | □□ | □□ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | h |
| i | Diethylene glycol dinitrate, liquid | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | □□ | □□ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | i |
| j | Nitroglycerine, liquid | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | □□ | □□ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | j |
| k | Hydrogen peroxide | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | □□ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | k |
| l | Hydrazine; hydrazine hydrate | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | □□ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | □□ | □□ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | l |
| m | Dimethyl hydrazine, unsymmetrical | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | □□ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | □□ | □□ | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G | m |
| n | Alcohol-ethyl, methyl, furfuryl | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | □□ | G | □□ | G | G | G | G | G | G | G | G | G | G | G | G | G | n |
| o | Gasoline (AVGAS) | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | G | G | □□ | □□ | □□ | G | G | G | G | G | G | G | G | G | G | G | G | o |
| p | Heptane; kerosene; octane | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | G | □□ | □□ | □□ | □□ | G | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | p |
| q | Pentane | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | G | G | G | G | G | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | q |
| r | Aniline | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | G | G | G | G | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | r |
| s | Monoethylaniline | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | G | G | G | G | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | s |
| t | Nitromethane, tetranitromethane | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | t |
| u | Diethylene triamine | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | G | G | G | G | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | u |
| v | Acetonitrile (methyl cyanide) | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | G | G | G | G | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | □□ | v |
| w | Potassium cuprocyanide | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | □□ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | w |
| x | Sodium permanganate, solid | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | □□ | ◍◍ | ◍◍ | x |
| y | Calcium permanganate, solid | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | □□ | ◍◍ | ◍◍ | y |
| z | Lithium, metallic | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | □□ | ◍◍ | z |
| aa | Metals, powdered | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | ◍◍ | □□ | aa |

ANNEX B

CHAPTER I - DEFINITIONS

011. Ballistite - The powder grain or propellant used in rocket motors.

012. Bourrelet - Nonferrous bands around a projectile, machined to engage the lands of the bore of the weapon to impart rotation.

013. Cant hook - A hook used by commercial stevedores for handling of general cargo stored in drums, barrels, or cylinders. Prohibited for use with explosives.

014. Cant stored - Material stowed at an angle to the vertical centerline of the ship.

015. Captain of the Port - "Captain of the Port" means the officer of the Coast Guard, under the command of a District Commander, so designated by the Commandant for the purpose of giving immediate direction to Coast Guard law enforcement activities within the general proximity of the port in which he is situated. (33 CFR 6.01-3)

016. Dangerous articles - A term used as meaning explosives, flammable liquids, flammable solids, oxidizing materials, corrosive liquids, compressed gases, poisons, combustible liquids, hazardous articles and ships' stores and supplies of a dangerous nature as covered in 46 CFR 146-149.

017. Electrical Squib - The igniter or detonator of an explosive which is fired electrically.

018. Magazine - A compartment aboard ship or ashore fitted for the storage of ammunition.

019. Magazine Vessel - A ship which is designated for a period of time to stow and issue ammunition at a particular location.

0110. Master - Used in the nautical sense, the Captain of the ship.

0111. Port Captain - A director of shipping operation for a maritime shipping company.

0112. Port Commander - An officer who is responsible for and has authority over all activities of a port.

0113. Port Director - Officer who controls the water operations of a port; now called a Naval Port Control Officer.

0114. Preventer - Any line used for additional safety or security or to keep something from falling or running free. Used in addition to regular gear.

0115. Ready-service boxes - Are used usually for deck stowage of loose ammunition. This stowage must be kept to a minimum because ammunition stored in these containers is subject to quicker deterioration because of exposure to high temperatures.

0116. Satisfactory identification - A means of identification acceptable to a military command, such as a U.S. Coast Guard Port Security Card, validated Merchant Mariner's Document, or ID card.

0117. Shall, should, will, would - Are considered to be mandatory or required in terms of required action.

0118. Spark producing devices - Matches (paper, wood, safety), cigarette or pipe lighters of any kind, tinder boxes, etc.

## APPENDIX I - BIBLIOGRAPHY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0126. DISTRICT COMMAND INSTRUCTIONS APPLICABLE TO HAZARDOUS MUNITIONS HANDLING IN 8023 SERIES (THESE ARE USUALLY PROVIDED AT PRELOADING CONFERENCES).