REGULATION 4.1 - STORAGE CONDITIONS FOR EXPLOSIVE ORDNANCE

General Overview

1.1 Explosive Ordnance (EO) should be stored in accommodation designated for that purpose to minimise the risk of injury to life and property in the event of an explosion or fire, and to prevent deterioration of the EO.

Requirements

1.2 All EO, under control of Defence, must be stored and handled in accordance with the following requirements of this regulation.

General Principles of Storage

1.3 Hazard Classification. All EO intended to be stored is to be classified in accordance with the requirements of Regulation 2.1.

1.4 Explosive Limits. All EO facilities are to be licensed in accordance with the requirements of Regulation 5.2. The Net Explosive Quantity (NEQ) of EO stored in any EO facility is to be strictly controlled in a manner which will ensure compliance with the explosive limits permitted by the Explosive Limit Licence. The explosive limits permitted on the licence must never be exceeded. For large quantity facilities, an Explosive Contents Board is required to record the NEQ stored in the facility at any given time.

1.5 Use of Explosive Ordnance Storehouses. EO Storehouses (EOSH) are to be used for the storage of EO, including explosive components, and should not be used for the storage of unrelated non-explosive stores. EO storehouses are not to be used for the processing or maintenance, including repacking, of EO.

1.6 Packaging. EO packages and containers are to be marked in accordance with Regulation 2.3. Packages are to be in good repair, be free from loose dirt, grit or other contamination before being stored. Any broken or damaged packages are to be repacked before being accepted into an EOSH, unless the damage is so slight and it does not adversely affect the protective qualities of the package.

1.7 Dispersal of stock. Stock of each nature are where possible, to be held in not less than two EO facilities in order to reduce the risk of the items being destroyed in event of a fire or explosion.

1.8 Storage by Lot Number. EO of the same Lot Number should be stored together in clearly identifiable stacks. Where multiple Lot Numbers of the same item of EO is stored, each Lot Number is to comprise of a separate stack. Oldest lot numbers are to be issued first. EO Stack Records are to be attached to each stack. Packages are to be stacked, as far as possible, so that identification markings can be seen without disturbing the stack. Fraction boxes are to be placed in a conspicuous position and clearly marked ‘FRACTION’.

1.9 Storage in Unit Loads. Stocks of EO, associated non-explosive dangerous goods and associated components are, as far as practicable, to be stored in unit loads.

1.10 Segregation in Storage. EO in any stack or building is to be arranged so that it can be readily identified by both store type (Name, NSN, Hazard Classification etc) and condition (Serviceable, Restricted-in-Use, Unserviceable etc). EO is to be stored separately according to its Condition Code and identified by an appropriate stack card.

1.11 Special Precautions. EO that requires special precautions during storage must be stored in accordance with those requirements. Special precautions may include, but are not limited to, temperature and humidity conditions, orientation with an EOSH, increased Quantity Distance (QD) due to artificial aging, etc.
1.12 **Inert and Instructional EO.** Inert and instructional EO is not to be stored in an EO storehouse with ‘live’ EO of similar types. Preferably, they are to be stored in a separate, dedicated, suitable non-explosive storehouse.

1.13 **Non-Explosive Components.** Non-explosive components may be stored in the same EO Storehouse as their associated explosive items.

1.14 **Access Aisles.** Access aisles are to be delineated by painted lines on the floor of the building. The lines are to be white in colour and at least 75 mm in width. The following access aisles are to be provided for:

   a. **Inspection Aisles.** Inspection aisles are to be maintained to allow ease of inspection of, and access to, storehouse walls and stacks of EO.
   
   b. **Working Aisles.** Working aisles are to be maintained to allow access by MHE or personnel to stacks.
   
   c. **Separation Aisles.** Separation aisles are to be maintained to allow separation between normal stock, stock which is earmarked for issue, and / or stock which is unusable.

1.15 **Safety Exits.** Safety exits in an EOSH are not to be blocked or obstructed. When work is being conducted, doors should not be fastened with other than approved quick-release devices which must be maintained in good working order. Where quick-release devices are not fitted, the doors must be unlatched or open. All doors should be outwards opening.

**Conditions of Storage**

1.16 **EO can be adversely affected by environmental conditions such as extremes of temperature, rain and electro-explosive hazards. Preferably, EO should be stored inside an EOSH, however this is not always possible. Some form of cover must be provided and the storage conditions monitored to ensure that the storage temperature limitations are not exceeded. When covered storage is limited, consideration is to be given to the factors that affect the priorities for allocating covered storage.**

1.17 **Open Storage.** When EO is stored in the open, such as field storage, the stacks of EO are to be provided, whenever possible, with covers or improvised shelters.

1.18 **Temperature.** Certain explosive substances, whether in bulk or in EO, are adversely affected either chemically or physically by extremes of temperature, and the most suitable storage accommodation available is to be used so that such EO is maintained in a serviceable condition. Stores that have additional special temperature restrictions are to comply with those restrictions. Temperature records may be required to be maintained.

1.19 **Restricted Humidity.** Restricted humidity conditions are those required in EO workshops where inspection or work is being performed involving the exposure of hygroscopic explosive substances and materials. Such conditions refer to the control of the Relative Humidity (RH) of the atmosphere which, for the purpose of these instruction and their related procedures, is based on a standard of 80 per cent RH at an air temperature of 16ºC.

1.20 **Ventilation.** Storage within a well ventilated environment may assist with the control of temperature. EOSH's with ineffective ventilation should be ventilated by opening doors and ventilators, if fitted, when atmospheric conditions are favourable. In some instances, EO workshops and storage buildings may require climate control to maintain an acceptable environment.

1.21 **Climate Control.** Where climate control plant or temperature control is installed, and set conditions of temperature and humidity can be established, the ventilation procedures are not required.

1.22 **Radio Frequency and Electrostatic Hazards.** Electrically initiated EO can be inadvertently initiated by radio frequency and electrostatic charges. Such items are, where possible, to be stored in...
a totally enclosed metallic container. Storage is to comply with the applicable safety distance to ensure protection from the emitters.

1.23 **Explosive Ordnance containing Phosphorus and Phosphides (Compatibility Group H).** On exposure to air, white phosphorus will inflame and could cause a spread of fire to adjacent EO. Compliance with the special storage requirements for this compatibility group is essential. See paragraphs 1.40 – 1.46 for the special storage requirements.

**Handling of Packaged Explosive Ordnance**

1.24 **General Handling Precautions.** All EO is to be handled with care at all times. When packages are moved they are to be lifted unless utilising a mechanical handling device such as a gravity conveyor roller. When utilising a roller, care is to be taken to ensure that the packages are not able to collide with each other. When stacking, packages are to be placed flat and not on one end, side or corner first.

1.25 **Handling Projectiles.** When handling projectiles, either packaged or unpackaged, the utmost care is to be exercised to ensure that driving bands and fuzes are not damaged or distorted etc. The forward end of one projectile should not be allowed to collide with the base of another.

1.26 **Damaged EO.** Any EO damaged during handling is to be segregated for priority examination by appropriately qualified inspection staff familiar with the nature of the EO in question.

1.27 **Mechanical Handling Equipment (MHE).** Only mechanically and electrically operated handling equipment which conforms to approved constructional specifications and limitations are permitted in EO areas.

1.28 **Pallet Handling.** Palletising may be adopted for EO of compatibility groups B, C, D, E, F, G, N, and S (may also be used with compatibility group H provided the specific limitations are met). Pallets may be of any suitable material however, only the approved pallet specified in the unit load specification is to be used as part of the unit load. Care is to be taken to ensure that packages and their contents are not damaged by over tensioning of the strapping. Packages may overhang provided they are stable in the unstrapped condition. Packages on a pallet are to be arranged, where possible to obtain a bonded stack. Stacking heights are not to exceed specified heights.

**Stacking of Packaged Explosive Ordnance**

1.29 **Method of Stacking.** Packaged EO is to be stacked in such a manner as to permit free circulation of air around each package so all stacks are ventilated. Packages are to be stacked on battens that allow free flow of air beneath the stacks. Battens need not be used where pallet stacking is being utilised. Battens material and dimensions are to be suitable for their intended use, however battens and other dunnage should not introduce additional grit or other contaminants into the storehouse.

1.30 **Space around Stacks.** Stacks should be positioned so that they are at least 1 metre from doorways to protect the stack from the elements. A minimum all round gap of 50 mm is to be maintained between each individual stack of pallets. Aisles are to be maintained in accordance with paragraph 1.14. Pallets are not to be stacked more than four deep from a working aisle. Where there is a working aisle on each side of a stack, pallets may be nine deep.

1.31 **Restacking.** Whenever restacking is necessary, the packages previously bearing the most weight should be repositioned on the top of the stack.

**Stack Heights**

1.32 **Separation between Ceiling and Top Package or Pallet.** The following minimum separation distances are to be upheld:

   a. **Regular storehouse.** A minimum separation distance of 300 mm is to be maintained between the top package or pallet and the ceiling of the building.
b. **Igloo designed buildings.** The stacking height is to provide a minimum of 600 mm clearance from the top of the stack to the roof.

c. **Traversed building.** The EO is to be stacked no higher than 600 mm from the top of the traverse.

1.33 **Unpalletised EO.** Unpalletised EO packages are to be stacked no more than two packages wide. Bulk stacking of EO is not permitted. The maximum permitted stacking heights for individual package types are as follows:

a. **Rectangular Packages.** Rectangular metal or wooden packages are to be stacked on their base to a height not exceeding 3.7 metres with the following exceptions:

   (1) Packages containing compatibility group B EO are not to exceed 1.5 metres.

   (2) Packages containing compatibility group H EO are to comply with the instruction for either Thick or Thin Skinned compatibility group H EO instruction, which ever is relevant to the store being stacked. See paragraph 1.44a and 1.45a for further details.

b. **Cylindrical Packages.** The maximum stack height is not to exceed 3.7 metres. Cylinders are to be stacked on their sides in tiers with any reinforcing bands coinciding throughout the stack. The following tier heights are not to be exceeded:

   (1) Cylinders under 25 kg in weight – 8 tiers, and

   (2) Cylinders 25 kg to 45 kg in weight – 5 tiers.

c. **Unboxed Shell.** Unboxed shells are to be stacked on their sides in tiers. The following tier heights are not to be exceeded:

   (1) Up to 140 mm – 15 tiers,

   (2) 140 mm to 175 mm – 11 tiers,

   (3) 175 mm to 300 mm – 8 tiers, and

   (4) Over 300 mm – 5 tiers.

1.34 **Stability of Stacks.** All stacks are to be stable. Stability of the stacks is to be achieved by either bonding of the packages, the use of battens or open stacking methods.

1.35 **Stability of Unboxed Shell.** Unboxed filled shell, except shell with either copper or steel based covers, are to be stored on their bases on wooden dunnage, except when racks are installed, or where local conditions render it necessary to store them on their sides.

1.36 **Palletised EO.** Stacking heights for loaded pallets are to be limited to:

a. 3.7 metres for pallets with battens on the underside which result in point loading of the contents of the lowest pallet, or

b. 5 metres for pallets with a flat underside which distributes the weight evenly across the contents of the lower pallet, or

c. The height permitted by the stability of the stack when the pallet is fitted with supporting posts which take the weight instead of imposing it on the contents of the pallets below, or

d. Stacking heights as detailed in paragraphs 1.44b and 1.45b for EO filled white phosphorus.
1.37 **Metal Box Pallets.** The maximum stack height of box pallets is not to exceed four pallets.

1.38 **Packaged Non-Explosives.** A maximum stack height of 5 metres is permitted for packaged non-explosives with the exception of cylindrical tail units. Cylindrical tails units, when stored vertically on their bases are not to exceed more than six tiers. When cradle stacked, cylindrical tail units are not to exceed four tiers.

1.39 **Guided Weapons.** For guided weapons, stacking heights and other handling criteria such as vehicle loading configurations, are usually identified in weapons specific manuals.

**Explosive Ordnance containing Phosphorus and Phosphides (Compatibility Group H)**

1.40 **General Storage Requirements.** Compatibility group H EO is to be stored separately (segregated) from other types of EO. EO containing phosphorus or phosphides is to be stored in as cool a place as possible and is not to be exposed to the sun. EO storehouses containing EO filled with Red Phosphorus are to be ventilated at least weekly.

1.41 **Leaking of Compatibility Group H EO.** Leakage of compatibility group H EO is readily detected by a strong odour of the toxic gas phosphine. In the event of a leakage, the leaking store is to be immersed in water. Therefore, a good supply of water is to be kept adjacent to, any building where compatibility group H EO is held as so the leaking round can be quickly immersed in water. The supply of water is to be housed in a container of suitable size to submerge the whole of the largest EO package.

1.42 **Inspection for Leaking Stores.** Regular external inspections of each pallet or loose package of compatibility group H EO is to be carried out at monthly intervals. Inspections are to be recorded.

1.43 **Tools to Cut Banding.** Suitable tools to cut the banding of pallets are to be readily available in a prominent position in storehouses used to store compatibility group H EO.

1.44 **Storage of Thick-Skinned Compatibility Group H EO.** Natures of thick-skinned compatibility group H EO is to be stored as follows:

   a. **Unpalletised.** Unpalletised packages are to be stacked to a height not exceeding 2 metres and with an ease of access to permit the prompt removal of any package which shows signs of phosphorus leak.

   b. **Palletised.** Palletised packages are to be stacked up to three pallets high, provided MHE is readily available. Each row of pallets is to be no more than two pallets wide from an inspection or working aisle. Ideally all pallets are to be directly accessible by MHE however, in worst case, the maximum number of pallets to be moved, in order to reach the least accessible pallet is not to exceed six.

1.45 **Storage of Thin-Skinned Compatibility Group H EO.** Natures of thin-skinned compatibility group H EO is to be stored as follows:

   a. **Unpalletised.** Unpalletised packages are to be stacked to a height not exceeding 1.5 metres and with an ease of access to permit the prompt removal of any package which shows signs of phosphorus leak.

   b. **Palletised.** Palletised packages are to be stacked not in excess of one pallet high. Each row of pallets is to be no more than two pallets wide from an inspection or working aisle and with an ease of access by either hand or MHE, to permit the prompt removal of any package which shows signs of phosphorus leak.

1.46 **Temperature Limitations.** EO filled with white phosphorus is to be stored oriented to the following positions if the ambient temperature is likely to exceed 44°C:

   a. Grenades – fuze end upper most; and
b. Separate, fixed and semi-fixed ammunition natures and free flight rockets – nose end upper most.

Stacking of Unpackaged Explosive Ordnance

1.47 Method of Storage – General. Unpackaged EO may be stored either vertically resting on transit bases, provided there is adequate stability or horizontally, cradle-stacked in tiers.

1.48 Unpackaged Projectiles. Normally unpackaged projectiles are to be stored in accordance with Topic -025 of the item publication. Should the need arise to stack projectiles unpackaged, the following method is to be employed:

a. The items are to be arranged in stacks so that no weight bears on driving bands.

b. The bottom tier is to be placed on wooden battens or pallets of sufficient thickness to prevent the driving bands coming in contact with the floor.

c. The end projectiles of each tier are to be secured by chocks fixed to the battens.

d. Battens are to be used between tiers.

1.49 Unboxed filled projectiles except projectiles with either copper or steel base covers, are to be stored on their bases on wooden dunnage.

1.50 Stacking Heights. Unpackaged EO and non-explosive dangerous goods may be stacked to a maximum height of three metres except as follows:

a. High Capacity store such as depth charges are normally to be stored in single tiers. Approval may be granted in some circumstance to stack to a maximum of 3 tiers.

b. Stacking height for loose projectiles is not to exceed 1 metre.

Inter-Service Storage of EO.

1.51 Storage facilities may be provided free of cost to other Services subject to the following requirements:

a. There is sufficient physical and explosives licence capacity at the proposed Holding Establishment.

b. The EO is stored at owner’s risk.

c. The Officer-in-Charge of the Holding Establishment is authorised to destroy any item which is considered to be in a dangerous condition and further storage could jeopardise the safety of personnel, stock or property.

d. Any direct charges specifically incurred by the Holding Service in providing storage, mechanical handling equipment or manpower to meet such requirements are recoverable and are agreed between the Owner Service and the Holding Service.

e. EO is to be listed on the statutory accounts register on the Computer Support for Armament (COMSARM) IT System to ensure explosives licensing and compatibility compliance, and that EO is not listed as surplus during mandatory Stocktake Programs. The Owner Service is to be entered on COMSARM. Where the Holding Establishment is not serviced by COMSARM, the EO holding is to be accounted for using the establishment’s normal accounting system.
Storage of EO at Defence Establishments for Non-Defence Organisations.

1.52 Storage facilities may be provided to Commonwealth or State Government departments, Foreign Military Forces or commercial organisations, subject to the following requirements:

a. There is sufficient physical and explosives licence capacity at the proposed Holding Establishment.

b. The EO can be safely stored in accordance with the requirements of this manual.

c. The EO is stored at owner’s risk.

d. The Officer-in-Charge of the Holding Establishment is authorised to destroy any item which is considered to be in a dangerous condition and further storage could jeopardise the safety of personnel, stock or property.

e. Charges specifically incurred by the Holding Establishment in providing resources to meet such requirements should be recovered. Storage services can be provided to a commercial profit making entity at normal market rates provided those services cannot be provided by another commercial entity. Such charges are to be agreed between the Owner Authority and Defence through the Administrative Headquarters for the Holding Establishment.

f. EO is to be listed on the statutory accounts register on the Computer Support for Armament (COMSARM) IT System to ensure explosives licensing and compatibility compliance, and that EO is not listed as surplus during mandatory Stocktake Programs. The Owner Authority is to be entered on COMSARM. Where the Holding Establishment is not serviced by COMSARM, the EO holding is to be accounted for using the establishment’s normal accounting system.

Responsibilities

1.53 Explosive Materiel Branch in the Capability, Acquisition and Sustainment Group (CASG) is responsible for the promulgation of all storage conditions and precautions for all in-service articles and substances, including items being introduced or trialled before being introduced.

1.54 EMB is responsible for the establishment of procedures for the preparation, testing, approval, amendment and control of unit load specifications.

1.55 The owner of the EO stored within an EO Storage area is to ensure compliance with this regulation and the associated procedures.

1.56 The establishment storing EO for its own use or on behalf of another service/organisation is to ensure compliance with this regulation and the associated procedures.

Procedures

1.57 Procedures to implement the requirements of this regulation are:

a. Procedure 1 – General Rules for Storage

b. Procedure 2 – Storage Conditions

c. Procedure 3 – Priority for Covered Storage

d. Procedure 4 – Limits of Temperature Reporting

e. Procedure 5 – Environmental Control

f. Procedure 6 – Restricted Humidity Conditions
g. Procedure 7 – Handling of Packaged Explosive Ordnance

h. Procedure 8 – Stacking of Packaged Explosive Ordnance

i. Procedure 9 – Stacking of Unpackaged Explosive Ordnance

j. Procedure 10 – Related Non-Explosives – Storage and Inspection

k. Procedure 11 – Inter-Service Storage of Explosive Ordnance

l. Procedure 12 – Storage of Explosive Ordnance at Defence Establishments for Non-Defence Organisations
PROcedure 1 - General Rules for Storage

General

1.1 The overriding principle in the storage of Explosive Ordnance (EO) is that EO is to be stored in special accommodation; where suitable storage facilities are not adequate or are not immediately available, temporary arrangements are to be made which will minimise the risk of injury to life and property in the event of an explosion or fire, and to prevent deterioration of the EO. Any temporary arrangements are to comply with principles prescribed in this manual.

1.2 The normal basis for the distribution of EO in storage is the United Nations Classification System for Dangerous Goods Class 1 (Explosives) - see Regulation 2.1 Procedure 1 for details. This classification separates Service conventional EO into 13 compatibility groups, each group containing all EO with similar characteristics. In the interests of safety, EO with dissimilar characteristics is to be kept apart in storage if the hazards attaching to one group are not to be aggravated by the presence and properties of certain others. For this reason, some groups are always to be stored alone; certain others with similar but not necessarily identical properties may, if necessary, be stored together.

1.3 Details of compatibility groups that may or may not be stored together are shown in Regulation 4.2 Procedure 1. The classifications shown are for EO in its approved packages or, if unpackaged, when fitted with its approved transit devices. A change in packaging or transit device(s), or removal from packages or of transit device(s) can affect these classifications.

Purpose

1.4 This procedure prescribes the general principles for the storage of Defence EO.

Dispersal of Stock

1.5 Stocks of each item are if possible, to be held in not less than two EO facilities in the same depot or in separate depots in order to reduce the risk of the total stocks of an item being destroyed in the event of a fire or explosion. Dispersal in this way is desirable in all establishments, but is essential at main storage depots where two-point dispersal is to be regarded as the absolute minimum acceptable and where wider dispersal should be the aim.

Storage by Lot Numbers

1.6 Subject to the provisions of paragraph 1.5, EO of the same lot number should be stored together in clearly identifiable stacks as far as practicable. Where multiple lot numbers of the same EO are held, each lot number is to comprise a separate stack, unless this is not possible due to the lack of storage space. Oldest lots should be most accessible, as these are to be issued first.

Explosives Limits

1.7 All EO facilities, whatever their purpose eg storage, workshop, EO loading areas on airfields etc, are to be licensed by the use of an Explosives Limit Licence (ELL) before being taken into use - see Regulation 5.1 Procedure 3 for details.

1.8 No EO facility, whether located at an EO storage depot or user establishment, is to be planned to contain more than 75,000 kg NEQ without the prior approval of the Licensing Authority in the Directorate of Explosive Ordnance Services.

1.9 The Net Explosives Quantity (NEQ) of EO stored in any type of EO facility is to be strictly controlled in a manner which will ensure that the explosives limits permitted by the ELL are never exceeded. To assist in this control appropriate storage planning and monitoring is to be undertaken. For large quantity facilities an Explosives Content Board is required to record the NEQ stored in the facility at any given time (See Regulation 4.4 Procedure 2).
Storage of Other Equipment or Material in Explosive Ordnance Storehouses

1.10 Storehouses used for the storage of EO are not to be used for the storage of other equipment or material.

Storage of Commercial Explosives and Ammunition

1.11 Commercial explosives and ammunition procured through normal service channels may be stored with Service EO provided those items form part of the Defence inventory and their Hazard Classification Codes have been confirmed by the Explosive Storage and Transport Committee of the Directorate of Ordnance Safety in accordance with Regulation 2.1 Procedure 1.

Storage in Unit Loads

1.12 Stocks of EO, non-explosive dangerous goods and associated components are, as far as practicable, to be stored in unit loads.

Storage in Transit Explosive Ordnance Storehouses

1.13 In buildings authorised as transit Explosive Ordnance Storehouse (EOSH), EO of different compatibility groups may be mixed in the same way as is permitted for the appropriate mode of transport. If it is necessary to open packages, for acceptance, receipt or issue or for identification, verification of quantity, repack or other process, this should be done in an adjacent building or separate compartment of the same building; only one nature should be present in this building or compartment at any one time. Remarking of the outer packages and sorting of packages may be carried out in the main transit building. Irrespective of the quantities of each Hazard Division (HD) present at any time the overall explosive limit applied to the building should be that for the HD which permits the least net explosives quantity for the available QD.

Segregation in Storage

1.14 EO in any stack or building is to be so arranged that it can be readily identified. The serious consequences of confusion, especially under active service conditions are obvious. To this end EO is to be stored separately according to its Condition Code, identified by a stack card and when required is to be appropriately marked, eg Red Card is to be displayed on the stock.

Special Precautions

1.15 Some EO and explosive substances require special precautions, additional to those applicable to EO in general. Examples of such stores and substances are given in Regulation 4.1 Procedure 4. The special precautions required for each item of EO and explosive substance can be obtained in the relevant item publication.

Suspect or Damaged Explosive Ordnance for Disposal

1.16 EO that is, or is suspected of being, other than serviceable or safe, is to be stored in accordance with the requirements of Regulation 4.2 Procedure 2 pending disposal.

Experimental Explosive Ordnance

1.17 EO that is in the experimental stage is to be stored in accordance with the requirements of Regulation 4.2 Procedure 3. Experimental stores are to be recorded in a separate register and, to ensure they retain their identity at all times, their packages and the contained items are to be marked with an identification symbol to enable each item to be associated with and, if unused, returned to its correct package.

Rocket Propelled Ammunition

1.18 Rocket propelled ammunition, which is potentially propulsive, is to be stored oriented within an EO storehouse so that the direction of propulsion faces away from the bulk of other EO within the storehouse, ie with heads facing away from other EO, preferably to traverses.
Inert and Instructional Explosive Ordnance

1.19 Inert EO such as inert filled, drill, dummy, servicing rounds, solid shot projectiles and empty items, and instructional EO is not to be stored in an EO storehouse with 'live' EO of similar types, eg inert filled, drill, servicing rounds etc of 20 mm cannon ammunition are not to be stored in the same storehouse as ammunition of 20 mm HE, Practice or any other variant. This is essential to prevent inadvertent mixing of filled and empty stores. Preferably, they are to be stored in a separate, dedicated, suitable non-explosives storehouse and afforded the same security and accounting requirements as live EO. Refer to Defence Security Principles Framework (DSPF) for the security and accounting requirements. Subject to security considerations this storehouse may be outside the EO area.

Empty Packages

1.20 Empty EO packages are not normally to be stored in EO storehouses containing EO. A separate dedicated site or building is to be allocated, ideally outside the EO area. Detailed instructions for the storage and transport of empty EO packages are at Regulation 2.3 Procedure 1.

Planning of Storage Space Layout

1.21 With the diversity of storehouses used for the storage of EO, it is not considered practicable to provide specific floor layouts. However, in planning storage layouts for each building the following factors should be taken into account to provide maximum space utilisation:

a. general stacking criteria as set out in Regulation 4.1 Procedure 8;
b. the position and heights of doors, windows and fire exits;
c. building headroom and lifting facilities;
d. access for personnel and Mechanical Handling Equipment (MHE);
e. height of traverses; and
f. maximum permissible stacking heights.

1.22 Once the floor layouts for each storehouse have been decided, floors should, where practicable, be clearly marked to show storage bays, access aisles, clearways etc. Storage bays should be identified by letters to aid in stock location.

1.23 Access Aisles. Access aisles need to be planned for and marked to allow efficient access for MHE and personnel throughout storehouses. The aisles are to be delineated by painted lines on the floor of the building. The lines are to be white in colour, and at least 75 mm in width. The following access aisles spaces are to be provided for:

a. Inspection Aisles. Inspection aisles are to be maintained to allow ease of inspection of, and access to, storehouse walls and stacks of EO. They are to be a minimum of 600 mm in width and are to be maintained between the wall of the storehouse and stacks of EO. Where items are the same Lot and Nature and the items can be readily identified, there is no requirement for a separation of 600 mm between stacks. Stacks are not to intrude into inspection aisles, nor is any obstruction, eg strapping equipment, desks, empty pallets etc, to be placed in the aisle.

b. Working Aisles. Working aisles are to be maintained to allow access by MHE or personnel to stacks. Working aisles for MHE are to be of sufficient width to allow for the safe and efficient use of laden MHE on site. Stacks are not to intrude into working aisles, nor is any obstruction, eg strapping equipment, desks, empty pallets etc, to be placed in the aisle.

c. Separation Aisles. Separation aisles are to be maintained to allow separation between normal stock, and stock which is earmarked for issue or which is unusable.
These aisles are to be a minimum of one metre in width. Stacks are not to intrude into separation aisles, nor is any obstruction, eg strapping equipment, desks, empty pallets etc, to be placed in the aisle.
PROCEDURE 2 - CONDITIONS OF STORAGE

Purpose

2.1 This instruction details the general precautions to be observed in regards to storage of Explosive Ordnance (EO), depending upon the type and nature of EO and/or the conditions of storage in question.

Covered Storage

2.2 All EO and associated non-explosive stores and non-explosive dangerous goods are preferably to be stored under cover. Some stores are more vulnerable to the elements, and where covered storage is limited, the provisions detailed in Regulation 4.1 Procedure 3 are to be applied.

Open Storage

2.3 When it is unavoidable to store EO in the open, the stacks of EO are to be provided, whenever possible, with covers or improvised shelters that should fulfil the following criteria:

a. they protect the EO against rain and sunlight,

b. protective sides should be provided unless the roof overlaps sufficiently to prevent driving rain or direct sunlight affecting the EO,

c. all covers must be supported in such a way as to allow a minimum air gap of 500 mm so that a current of air can circulate over and around the stacks, and

d. materials should be, as far as possible, non-flammable or fire retardant.

2.4 Normal means of protection are as follows:

a. Tarpaulin,

b. Locally improvised structures suitable for the theatre of operations, and

c. Galvanised iron shelters.

2.5 All stacks are to be supported off the ground by battens/dunnage unless palletised.

Temperature

2.6 EO can be adversely affected by extremes of temperature. These stores, and the temperature restrictions applicable to them, are listed in Regulation 4.1 Procedure 4.

Radio Frequency and Electrostatic Hazards

2.7 Electrically initiated EO can be affected by radio frequency radiation and electrostatic charges and therefore, to prevent inadvertent ignition from these sources, the following precautions are to be observed:

a. In storage such items are, where possible, to be totally enclosed in metallic containers. Such containers, if not fitted with soldered on lids, are to have tight fitting metallic lids to ensure good electrical contact between lid and container. When so treated, the Electro Explosive Device (EED) may be considered screened.

b. When not screened by the packaging provided or, if unpackaged, electro-magnetic pick-up may be reduced by any one or more of the following:

(1) fitting metal blanking caps to firing circuit connector plugs or socket,
(2) bonding with cartridge clips,

(3) isolating the firing circuits,

(4) screening certain electric leads to prevent them acting as pick-ups; and/or

(5) fitting RF filters.

c. In all circumstances, EED are subject to safety distances from emitters – see DEOP 115 – Defence Electro-Explosive Hazards Manual.

Explosive Ordnance Containing Phosphorus and Phosphides (Compatibility Group H)

2.8 All personnel working in a building containing EO filled with white phosphorus are to exercise extreme vigilance to detect the leakage of phosphorus. On exposure to air, white phosphorus will inflame and could cause a spread of fire to adjacent EO. Instructions for the storage and stacking of phosphorus filled EO are given in Regulation 4.1 Procedure 8.
PROCEDURE 3 - PRIORITY FOR COVERED STORAGE

Introduction

3.1 Explosive Ordnance (EO) can deteriorate rapidly when exposed to the weather, particularly direct sunlight or rain. Some form of cover must be provided whenever possible and storage conditions monitored to ensure that storage temperature limitations are not exceeded. When covered storage is limited, consideration is to be given to the factors that affect the priorities for allocating covered storage.

Purpose

3.2 This instruction outlines factors for consideration when allocating covered storage for EO and recommends priorities for allocating such storage by way of a list of EO by generic designations.

General Considerations

3.3 Where there is insufficient covered storage accommodation available in storehouses, the following factors are to be taken into consideration when allocating such storage:

a. The inherent liability of particular kinds of EO to damage by exposure;
b. The design of the packages to resist exposure, and their condition;
c. The type of storage required by regulation, i.e., magazine or storehouse;
d. The availability of the EO in the theatre of operations and the prospects of reprovisioning;
e. The prevailing climate;
f. The available accommodation;
g. The need for the security of particular items, e.g., Small Arms Ammunition (SAA) and demolition explosives; and
h. The special risks from exposure if the condition of the EO is doubtful.

Recommended Priorities

3.4 When damage from exposure to the elements is the main consideration, the order of priority that should be followed when allocating covered storage for EO is as follows:

a. Water activated EO;
b. Guided weapons;
c. Anti-tank, ranging and spotting ammunition, phosphide filled stores;
d. Propelling charges and rocket motors;
e. Lachrymatory and pyrotechnics;
f. Fuzed projectiles and explosive heads;
g. Detonators, fuzes, and other initiating devices;
h. Demolition and bulk explosives;
i. Mine disposal weapon charges, prepared demolition charges and grenades;
j. Cluster (all types) and incendiary bombs;

k. Plugged High Explosive (HE) projectiles, bombs and similar stores;

l. Small arms ammunition;

m. Tail units; and

n. Other non-explosives and non-explosive dangerous goods.

Notwithstanding the priority as listed, the use of covered storage may vary depending on consideration of the factors at paragraph 3.3.
PROcedure 4 - Limits of Temperature and Temperature Reporting

Introduction

4.1 Certain explosive substances, whether in bulk or in Explosive Ordnance (EO), are adversely affected either chemically or physically by extremes of temperature, and the most suitable storage accommodation available is to be used so that such EO is maintained in a serviceable condition.

Purpose

4.2 This instruction prescribes the temperature limitations applicable, during storage, to certain types of EO.

Application of Temperature Restrictions

4.3 In general, the restrictions given in paragraphs 4.4 to 4.10 inclusive, are to be taken as those which are desirable rather than mandatory; their application is not to involve the major alteration of existing buildings, but they are to be considered when constructing new buildings. If particular items of EO require specific temperature limits of a mandatory nature, the EO Design Certificate (EODC) for the item is to specifically identify that requirement.

Limits of Temperature

4.4 Where any EO is mentioned in more than one class of temperature restrictions, it is to be regarded as being in the class with the maximum restriction.

Minimum Temperatures

4.5 To prevent the exudation of nitro-glycerine, double base and triple base propellants and EO containing these types of propellants are not to be stored in conditions where the temperature in any part is liable to remain for a continuous period of more than 30 days, at or below 10º C.

4.6 When such conditions are likely to exist, artificial heating is to be installed unless the temperature of the storehouse rises above 13º C for at least 60 days of the year.

Maximum Temperatures

4.7 The efficiency and safety of the following EO are affected by storage at high temperatures and they are, when possible, not to be stored in storehouses in which the temperature can be expected to rise above the limits shown for a period longer than seven days:

- **38º C:**
  1. Fuze safety and stores containing fuze safety;
  2. Stores containing phosphorus, 5 in WP, 4.5 in Smoke, 81 mm mortar;
  3. TNT based explosives, 5 in HE, Demolition HE, Mk11 Depth Charge;
  4. Non-TNT based HE filled projectiles; and
  5. Triple base propellant, 4.5 in.

- **32º C:**
  1. Single base propellant – 5 in, 76 mm, 40/60, 20 mm, SAA;

---

1 In due course temperature limits for specific items will also be specified in Topic -026 of the item publication.
(2) Double base propellant shotgun ammunition, 81 mm Mortar propelling charge;

(3) Fuzes and fuzed rounds;

(4) Detonators and stores containing detonators not filled with lead azide; and

(5) 70 mm (2.75") rockets.

Recording and Reporting of Guided Missile Temperatures

4.8 Storage Temperature Limits. The temperature extremes that should not be exceeded for guided missile motors are provided in each weapon’s handbook. If the stated temperature limits are likely to be exceeded, steps are to be taken to improve the temperature conditions.

4.9 Recording and Reporting of Excessive Temperatures. Missile storehouse temperatures are to be recorded daily when temperatures are likely to reach the prescribed limits. If these temperatures are reached or exceeded, a message report is to be made to the relevant Product Item Manager.

4.10 The provisions of paragraph 4.9 apply to all guided missiles and torpedoes.

Application of Data Loggers

4.11 Automatic Data Loggers (ADL) are used to record the climatic conditions under which EO has been stored as an aid to later determination of the need for testing and sentencing.

4.12 Product Item Managers should seek to have EO (or its transit packs) that is:

   a. Adversely affected either chemically or physically by extremes of temperature, and

   b. Likely to be employed in areas of extreme climatic conditions, fitted with ADL².

4.13 A decision to fit ADL to specific natures is not to be taken until:

   a. The methodology for utilising the data provided by ADL has been determined, and

   b. A cost benefit study for the particular nature establishes a financial advantage in utilising ADL.

4.14 The specific type of ADL for use in the explosives environment is to be authorised by the applicable Chief Engineer at the either Guided Weapons or Munitions Branch.

---

² Electronic environment monitoring equipment such as data loggers is acceptable within any Category of EO area or building provided it is compliant with the general and detailed requirements of the enclosure standard required by the facility in which they are to be installed. It must also be subjected to an Electromagnetic Compatibility assessment prior to being cleared for use. Environment monitoring equipment is normally designed to log data across the 'Manufacture to Target' sequence and will require occasional maintenance and 'download' of data. These processes may not be compatible with the benign storage environment and normally must be preformed within an EO process facility. The Director of Explosive Ordnance Services may authorise the 'downloading' of data in the storage environment if a comprehensive risk assessment deems the activity tolerably safe.
PROCEDURE 5 - ENVIRONMENTAL CONTROL OF EXPLOSIVE ORDNANCE FACILITIES

Introduction

5.1 Some Explosive Ordnance (EO) will readily absorb moisture from the atmosphere and some may deteriorate in extremes of temperature. Packages and the protective coating on the packages or on the stores themselves can be adversely affected also if constantly in direct contact with water or continuously exposed to a moist atmosphere. It is important, therefore, that the interior of EO buildings is kept as dry and as temperate as practicable. Ventilation assists in this environmental control, but, in some instances, EO workshops and storage buildings may require climate control to maintain an acceptable environment. Details regarding the limits of temperature for certain EO are given in Regulation 4.1 Procedure 4.

Purpose

5.2 This procedure prescribes the environmental control measures to be adopted within EO storehouses, magazines and workshops so as to safeguard and prolong the life of EO.

GENERAL CONSIDERATIONS

General

5.3 Despite the importance of ventilation the indiscriminate admission of air into certain EO buildings may do more harm than good. In general, the sealing and the protective coating of the stores themselves, or of the packages in which they are contained, does much to offset the effects of moisture-laden air.

5.4 In continuously hot and humid climates, additional precautions may be necessary and the rules for the ventilation of EO workshops, given in paragraph 5.9 below, may need to be applied to all buildings containing EO. In hot and dry climates, it may be necessary to ventilate the buildings during the hours of darkness in order to cool them.

5.5 The higher the temperature of air the more moisture it requires to become saturated, therefore, it must not be concluded that on a warm day the air is necessarily drier and better for ventilation than on a cold day; the reverse may be the fact. Thus, in climates where the relative humidity is generally high, buildings in which EO are exposed are not to be opened for ventilation without first ascertaining that the conditions are suitable (see paragraphs 5.10 to 5.13 inclusive).

5.6 The ventilation of a previously closed building in which the internal temperature is lower than that of the incoming air may result in condensation both on the walls of the building and the stores therein. With a free flow of air, this moisture normally evaporates during the period of ventilation, but when the air flow is restricted, as may occur when the building is surrounded by high traverses or situated in a deep hollow, the rate of evaporation may be slow and several ventilation periods may be necessary before the moisture finally disappears.

5.7 Water which enters buildings through structural defects is to be distinguished from that resulting from condensation and its presence is to be reported upon and attended to without delay.

5.8 When suitable storage or working temperatures cannot be established by any other means, it may be necessary to resort to artificial heating or cooling. Artificial drying of the air may also be necessary for EO workshops in climates where the relative humidity is extremely high.

Climate Control

5.9 Where climate control plant or temperature control is installed, set conditions of temperature and humidity can be established, and therefore ventilation procedures set out in this instruction are not required. Any climate and temperature control plant installed in EO facilities is to meet the appropriate electrical standards for the facilities concerned.
EXPLOSIVE ORDNANCE STOREHOUSES AND MAGAZINES

General

5.10 During wet weather, doors of aboveground buildings are to be opened as infrequently as possible and then only for as long as is really necessary.

5.11 Each building is to be visited not less than once every month and, in addition, as soon as possible after a spell of very wet weather. On these occasions, a thorough examination is to be made and all instances of dampness of the building or contents are to be recorded for remedial action in accordance with local procedures.

5.12 Where such dampness is due to structural defects repairs are to be effected as soon as possible.

5.13 In extreme instances where persistent dampness is liable to have a harmful effect on the stores, before repairs can be done, other suitable and appropriate accommodation on the establishment is to be used, otherwise action is to be taken to have the stores temporarily and correctly stored elsewhere.

5.14 Maximum and Minimum Thermometers. Generally there is no requirement to record daily temperatures in EO storage facilities at Defence establishments in continental Australia as most items of EO are able to withstand temperature variations from at least -10°C to +40°C without adverse effect. However, if the ambient temperature is outside the above range for more than 72 hours, the appropriate Product Line Manager at the Guided Weapons or Munitions Branch is to be advised of the temperature range, the time period the temperature was experienced and the natures of EO involved. Certain items of EO are susceptible to temperature extremes and are therefore, to be stored in a controlled environment. Regulation 4.1 Procedure 4 provides guidance on the special storage conditions required for susceptible items of EO. Where the environment is required to be controlled, each EO storehouse (or one of a group of storehouses), is to be provided with a maximum/minimum thermometer, the readings of which are to be recorded at a set hour each working day. The indices of the thermometer are to be reset after each reading.

5.15 Standardisation. Before a thermometer is taken into use, and once each twelve months thereafter, the thermometer is to be calibrated against a standard thermometer and any difference in the readings is to be recorded on a label. The label is to be attached to the thermometer and the correction is to be applied to every subsequent reading of the thermometer.

5.16 Thermographs or similar temperature recording equipment may be used instead of max/min thermometers. The graphs are to be retained by the building supervisor.

EXPLOSIVE ORDNANCE WORKSHOPS

General

5.17 The ventilation of EO workshops will depend to a great extent on the nature of the EO being worked upon and the type of operations being done. For some workshop operations, free ventilation, is permitted, while for others the ventilation is to be controlled to assist in maintaining the correct internal hygrometric conditions.

5.18 EO workshops operations are divided into the four classes detailed below. Inspection and maintenance instructions are to indicate the required class of EO workshop for each explosive store:

a. Class 1. Clean conditions with restricted humidity.

b. Class 2. Restricted humidity.

c. Class 3. Clean conditions.
d. Class 4. No special requirements, but see Regulation 4.4 Procedure 3.

Ventilation of Explosive Ordnance Workshops for Class 1 or Class 2 Operations.

5.19 Class 1 or Class 2 operations require an atmospheric condition which will not give rise to moisture pick-up by the EO involved, thus both the actual relative humidity or the air inside the building and its temperature are deciding factors in regard to the opening or closing of doors and windows. The method of determining whether or not the conditions are suitable for work to proceed is detailed in Regulation 4.1 Procedure 6, and a constant watch is to be kept on the hygrometers to ensure that the correct conditions prevail at all times. If the outside air contains more moisture than the air within the building, the opening of doors and windows may be detrimental, while on the other hand, the admission of dry air into a wet atmosphere is obviously advantageous.

Ventilation of Explosive Ordnance Workshops for Class 3 and Class 4 Operations

5.20 The requirement of paragraph 5.10 is applicable to workshops in which Class 3 or Class 4 operations are done provided wetting from the atmosphere is avoided, eg condensation brought about by bringing cold stores into a warm room. Should wetting from the atmosphere occur, work is not to proceed until the condensation disappears. In certain climates, or at certain times of the year, it may be desirable for stores to be kept overnight in the workshop so that they will reach the ambient temperature before work commences.
PROCEDURE 6 - RESTRICTED HUMIDITY CONDITIONS

Introduction

6.1 Restricted humidity conditions are those required in Explosive Ordnance (EO) workshops where inspection or work is being performed involving the exposure of hygroscopic explosive substances and materials. Such conditions refer to the control of the relative humidity (RH) of the atmosphere which, for the purpose of these instructions, is based on a standard of 80 per cent RH at an air temperature of 16°C.

Purpose

6.2 This procedure describes the equipment and details the procedure for determining relative humidity in EO facilities in which restricted humidity conditions are essential.

Relative Humidity

6.3 Relative humidity within the range of temperatures liable to be encountered in EO workshops may be defined as the ratio, expressed as a percentage, of the moisture that is present in air at a given temperature to the maximum amount that the air could hold at the same temperature without deposition occurring.

6.4 The moisture carrying capacity of air increases as its temperature rises, and conversely, decreases as the temperature falls. Should the air temperature fall without a corresponding decrease in the amount of water vapour present, the RH will rise until it reaches 100 per cent at the ‘Dew Point’. Further reduction in temperature will cause water to be deposited, eg air having an RH of 80 per cent at 27°C will, if its actual moisture content remains unchanged, have an RH of 100 per cent when its temperature is reduced to 23.3°C and will deposit water in increasing proportions as its temperature is further reduced. Water deposited under these conditions will form as condensation on any available surfaces.

6.5 The moisture present in the air may be absorbed by hygroscopic materials, the amount of water vapour available being greater, of course, at higher temperatures and relative humidity; therefore, in EO workshops where the control of humidity is required, it is essential to determine whether or not the conditions are favourable before work commences and throughout the working day. Specific requirements are detailed in relevant maintenance instructions.

Hygrometers

6.6 To determine whether working conditions are favourable, a Wet and Dry Hygrometer (eg Zeal or Brannan) is to be used. A Wet and Dry Hygrometer comprises two independent thermometers calibrated in degrees Celsius, the bulb of one of the thermometers being cooled by a wet muslin cylindrical wick, the lower portion of which is immersed in a reservoir of distilled water. The cooling of the wet bulb is dependent on the rate of evaporation of the water that increases as the temperature rises or the RH falls. The RH is determined by the temperature difference in conjunction with the dry bulb temperature. Annex A shows the variation of relative humidity with the dry bulb temperature and the wet bulb depression.

Use of Hygrometers

6.7 The hygrometer is to be installed away from direct sunlight, other radiation, draughts, upwards currents of air from radiators, etc, and in such a position in relation to the size and to the heating and ventilation arrangements of the building, that the humidity throughout will be correctly indicated. Ideally the hygrometer should be hung in a position where a steady flow of air around the bulbs is achieved.

6.8 The sequence of operations when using the hygrometer, ie when maintenance instructions require specific RH conditions, is:

   a. Fan both bulbs gently for a period of 30 seconds.
b. Note the reading of the dry bulb.

c. Note the reading of the wet bulb.

d. Deduct the reading of the wet bulb from the reading of the dry bulb and note the difference.

e. Work may only proceed when the difference is equal to, or greater than, that given below against the relevant temperature range, otherwise work is not to be permitted until the conditions are satisfactory:

<table>
<thead>
<tr>
<th>Temperature Range (Dry Bulb Reading)</th>
<th>Minimum Difference Between Wet and Dry Bulbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>ºC</td>
<td>ºC</td>
</tr>
<tr>
<td>0.0 – 7.0</td>
<td>1.5</td>
</tr>
<tr>
<td>7.5 – 15.0</td>
<td>2.0</td>
</tr>
<tr>
<td>15.5 – 23.0</td>
<td>2.5</td>
</tr>
<tr>
<td>23.5 – 32.0</td>
<td>3.0</td>
</tr>
<tr>
<td>32.5 – 40.0</td>
<td>3.5</td>
</tr>
</tbody>
</table>

NOTE

Due to the lack of an Australian Standard the above figures have been based on BS1339 and BS4833.

6.9 Instructions for the maintenance of hygrometers are given in Annex B.

Annexes:
A. Variation of Relative Humidity with the Dry Bulb Temperature and Wet Bulb Depression
B. Maintenance of Hygrometers
VARIATION OF RELATIVE HUMIDITY WITH THE DRY BULB TEMPERATURE AND WET BULB DEPRESSION
MAINTENANCE OF HYGROMETERS

1. To secure an accurate value of the temperature of evaporation, it is necessary to ensure that the accuracy of the reading is not affected by the presence of impurities in the water or by any reduction in the continuous supply of water to the moist fabric. In order to achieve this, the following maintenance instructions are to be complied with:

   a. **Testing.** The hygrometer is to be submitted to a qualified testing authority every six months (see Note) for maintenance and testing. This will include comparing the thermometers against a master thermometer complying with the accuracy requirements for ordinary meteorological thermometers (Specification AS2819-1985), replacing the wick and cleaning the water reservoir.

   NOTE

   The testing authority may vary the period of testing and maintenance based on local conditions and instrumental history.

   b. **Wick.** The muslin wick is to be free from grease, dirt or other contaminants and is to completely cover the bulb of the wet bulb thermometer. The wick is to be well immersed (about five centimetres) in the water reservoir and is always to be wet. Should the wick become visibly contaminated, the hygrometer is to be returned to the testing authority for maintenance.

   c. **Water Reservoir.** The reservoir is to be clean and free from contaminants and topped up daily (or more frequently in hot dry conditions) with distilled water to ensure it is kept well filled. Should the water or reservoir become visibly contaminated, the reservoir is to be emptied, cleaned and refilled using only distilled water. The hygrometer is not to be read for fifteen minutes after the reservoir has been cleaned and refilled.

   d. **Distilled Water.** Only distilled water is to be used in the reservoir. Containers of distilled water being used for daily top up of reservoirs are not to be used for any other purpose due to the possibility of contamination, eg possibility of electrolyte contamination if the container is used to top up lead acid car or forklift truck batteries.
PROCEDURE 7 - HANDLING OF PACKAGED EXPLOSIVE ORDNANCE

These procedures were formerly contained in DEOP 103, Part 3, Section 3, Chapter 3. In subsequent amendments to this publication this reference will be removed.

Purpose

7.1 This procedure prescribes the conditions applicable to, and the precautions to be observed when handling Explosive Ordnance (EO) either individually packaged or palletised.

General Precautions

7.2 All EO and EO packages are to be handled with care at all times. Rough handling may lead to damage to the package and contents, with subsequent reduction in safety, or the obliteration of markings, which may render the EO unserviceable. In particular:

   a. When packages are moved they are to be lifted, not slid, rolled or dropped.

   b. When one package is being stacked on another it is to be placed flat and not on one end, side or corner first.

   c. When packages are being moved along a gravity conveyor roller, they are not to be allowed to collide with each other, nor are they to be propelled carelessly or violently.

   d. When handling projectiles, either packaged or unpackaged, the utmost care is to be exercised to ensure that driving bands and fuzes are not damaged or distorted etc. The forward end of one projectile should not be allowed to collide with the base of another.

   e. Any EO damaged during handling is to be set aside in accordance with local instructions for priority examination by appropriately qualified inspection staff familiar with the nature of the EO in question.

7.3 It cannot be too strongly emphasised that all persons are to exercise the greatest possible care in the handling of all EO. This rule applies not only to personnel employed in EO areas, but also to those engaged in the transportation of EO (see Regulation 3.1 Procedure 1). In no instance should safety be sacrificed in the interest of speed.

7.4 Some articles and substances, such as exposed explosives and pyrotechnic substances, may have additional hazards associated with the item, such as toxic effects. Items of these types will require special handling precautions to be observed. The relevant item publication or Item Manager will be able to specify the specific requirements to be observed to protect personnel from the additional hazards.

7.5 EO is not to be stripped, made inert, sectionalised or otherwise altered or interfered with, unless authorised in accordance with Regulation 2.4 Procedure 1 or for the purpose of defect investigation or proof, and then only in accordance with authorised bench level instructions.

Mechanical Handling Equipment

7.6 Only mechanically and electrically operated materials handling equipments which conform to the constructional specifications and limitations prescribed in following Chapters are permitted in EO areas;

   a. Regulation 4.6 Procedure 2.

   b. Regulation 6.3 Procedure 1.

   c. Regulation 6.3 Procedure 3.
Pallet Handling

7.7 The following conditions are applicable when palletising and stacking palletised EO and EO packages:

a. Palletising may be adopted for EO of Compatibility Groups B, C, D, E, F, G, N and S (see paragraph 7.8 for Compatibility Group H).

b. Pallets may be of any material suitable for use with the above groups, except that where the pallet forms part of a unit load, only the pallet specified in the Unit Load Specification is to be used.

c. Care is to be taken to ensure that packages and their contents are not damaged by over tensioning of strapping during palletising operations.

d. Packages may overhang the pallet provided they are stable in the unstrapped condition – see Regulation 4.1 Procedure 10. Whenever possible packages on the pallet are to be arranged to obtain a bonded stack.

e. The stacking heights are not to exceed those specified in Regulation 4.1 Procedure 8.

7.8 Palletising of Compatibility Group H Explosive Ordnance. EO which is classified in Compatibility Group H may be palletised, subject to the limitations in Regulation 4.1 Procedure 8.

General

7.9 A list of Dos and Don’ts in relation to handling of EO is provided at Annex A.

Annex:
A. DOs and DON’Ts when Handling EO
DOS AND DON'TS WHEN HANDLING EO

General

1. Always remember that accidents can occur anywhere. It is a basic part of safety philosophy that ‘Accidents don’t just happen - they are caused’.

2. Personal injury may occur anywhere and at any time, but explosion of, or damage to stores, is most likely to occur during handling or movement. Therefore, you must exercise care at all times for your own and other people’s protection. Too much emphasis cannot be placed on the need for strict observance of the rules relating to the handling of stores by cranes, fork-lift trucks and the like.

3. To help remember some of the more important rules when handling EO they have been listed as a series of Dos and Don'ts. Make a point of reading through them to jog your memory.

DO

DO ensure explosives are ALWAYS carried, lifted and lowered with the utmost care.
DOB see that loads are lifted and lowered slowly and gently. Use padding where required to protect delicate items from landing shocks.
DOB learn the correct methods of slinging and handling.
DOB see that the working area is clear of obstacles and that personal protective equipment (safety helmets, gloves, goggles etc) is worn.
DOB see that someone who understands crane signals is in active control of all lifting operations and that personnel do not stand under loads.
DOB use commonsense when slinging packages, etc, use all the lifting rings provided and make sure each load is safe before lifting. See that lids of packages are uppermost.
DOB use only the authorised equipment for lifting loaded pallets and specialised containers.
DOB examine steel strapping for security before lifting pallet loads.
DOB check lifting gear before use for general condition and evidence of satisfactory testing.
DOB ensure that slings have an adequate safe working load for the weight involved. DO use slings of sufficient length to give the smallest possible angle between legs. DO obtain even load distribution by using all legs in a multi-legged sling.
DOB use slings with a much higher Safe Working Load (SWL) (at least twice the weight of the item being lifted) when handling items with an un-even weight distribution, ie the item is heavier at one end than the other.
DOB pad sharp edges of loads to prevent damage and/or cutting of slings.
DOB use steadying lines for long awkward loads.
DOB use safety latches or safety crane hooks to prevent slings jumping off.
DOB keep your back straight and take a good firm grip when lifting anything manually.
DOB lift manually only within your physical capacity.
DOB report immediately if any EO is dropped or involved in an accident. Request its examination by appropriately qualified personnel before further handling.
DOB be extra careful when handling DETONATORS; they are sensitive to shock or friction. Packages MUST be passed by hand.
DON'T

DON'T handle EO roughly or carelessly.

DON'T allow stores to be jolted, bumped or landed on a hard surface - they may be severely damaged.

DON'T take risks. If you are not sure of the correct method of lifting ask your supervisor for guidance.

DON'T risk accidents or injury through untidiness or failure to use personal protective equipment.

DON'T give any signals to the crane driver to lift or lower, unless it is your job, in which case make sure it is safe to do so.

DON'T sling stores in such a manner that they may break adrift in mid air.

DON'T strain lifting eyes by failing to use all of them.

DON'T sling packages by their handles.

DON'T improvise or use equipment other than that authorised, as this can lead to disaster.

DON'T lift pallets if you are in doubt about their safety and security - seek advice from your supervisor.

DON'T use lifting gear that is not in good condition or has not been tested as required by local instructions.

DON'T strain slings by exceeding the Safe Working Load.

DON'T use short slings that result in large angles between sling legs. (The larger the angle the greater the strain in each leg.)

DON'T strain individual legs by using them to take more than their share of the load, eg in a four legged sling with a Safe Working Load of 1 000 kg each leg can carry 250 kg.

DON'T risk an accident by using a limited number of sling legs to take the major share of the load.

DON'T take the chance of a sling breaking and allowing its load to fall.

DON'T allow loads to swing ‘wild’ - they may become uncontrollable.

DON'T risk severe back injury or damage to package or contents.

DON'T get hernia by straining - get help instead.

DON'T disturb items that have been dropped or involved in an accident unless it is essential for relieving or preventing further personnel injury, or to prevent further damage to stores or equipment.

DON'T lift packages of DETONATORS using slings.

DON'T JOLT or DROP DETONATORS.
PROCEDURE 8 - STACKING OF PACKAGED EXPLOSIVE ORDNANCE

Introduction

8.1 The principle of stacking is designed to achieve efficiency in storage, accounting and handling, and as an aid to implementing safety instructions.

Purpose

8.2 This procedure prescribes criteria for the stacking of packaged and palletised EO and associated non-explosives in storage.

General

8.3 Firm level surfaces with floor strength adequate for the proposed load are a fundamental necessity for the storage of packaged or palletised items. If there is doubt about the permitted loading of floors in EO facilities, specialist advice is to be sought. Where appropriate, floor loading limit notices are to be displayed.

Method of Stacking

8.4 Packaged EO is to be stacked in such a manner as to permit free circulation of air around each package. Packages are to be stacked on battens of sufficient height to allow free flow of air beneath the stacks and to clear any flooding which may occur under normal wet weather conditions; these battens are to be additional to those forming an integral part of packages. Battens need not be used where pallet stacking is utilised. Battens are to be of a size and of durable material suitable to their intended use. However battens and other dunnage of brick, concrete or any material which may give rise to grit or other contaminants are not to be used.

8.5 A space is to be left between stacks and walls of the buildings and between each stack, sufficient to permit ease of checking. See Regulation 4.1 Procedure 1, paragraph 1.22a for further details. Stacks should be at least 1 metre from doorways to provide protection from direct sunlight, rain, etc when doors are open.

8.6 An unobstructed aisle is to be left between each line of stacks. Aisles are to be wide enough to permit easy extraction of single packages, or pallets when these are in use. See Regulation 4.1 Procedure 1, paragraph 1.20 to 1.22 for further details.

8.7 A minimum all round gap of 50 mm is to be maintained between each individual stack of pallets to allow the removal of pallets without fouling and provide for ventilation. However, this requirement is negated if Mechanical Handling Equipment (MHE) that is fitted with side shift functionality to avoid fouling on the pallets is used. Additionally where a pallet configuration provides adequate ventilation with 50 mm between the items on pallet then a 50 mm separation between the actual pallets is not required.

8.8 Pallets are not to be stacked more than four deep from a working aisle. Where the same Nature and Lot are stacked together, they may be stacked six deep from a working aisle. Where there is a working aisle on either side of a stack, pallets may be stacked nine deep.

8.9 Segregation of Explosive Ordnance for Stacking. Ideally, EO is to be stored in separate stacks within a storehouse so as to:

a. Achieve economy of effort in the issue of stock;

b. Facilitate the issue of the oldest stock first;

c. Prevent incorrect issue of stock, eg issue of out-of-life or unserviceable items as serviceable stock;
d. Segregate different natures of the same type of EO, eg separate storage of ball and blank small arms ammunition; and

e. Facilitate easy identification of stock affected by special instructions such as EO Reclassification Messages, Lifting Data Variation Messages and Stock Management Instructions.

This can be achieved by segregating EO into stacks based on stock identification numbers, eg NSN and ASN, lot or batch number and Condition Codes.

8.10 The basis for stacking notwithstanding, the requirement for stock to be held in at least two places (see Regulation 4.1 Procedure 1 paragraph 1.5) is to be observed.

8.11 If EO bearing the same stock number but bearing different lot numbers is stacked together, each lot is to be segregated within the stack according to filler, mark and lot number, except where residual small quantities of lot numbers have been consolidated into a single package(s). EO without lot numbers is to be allocated a local lot number in accordance with Regulation 1.5 Procedure 1.

8.12 Packages are to be stacked, as far as possible, so that identification markings can be seen without disturbing the stack.

8.13 Fraction boxes are to be placed in a conspicuous position and clearly marked ‘FRACTION’.

**STACKING HEIGHTS**

**General**

8.14 Stacking heights may vary to suit local conditions providing stack stability is not compromised and stacks do not exceed the limits given in the following paragraphs. Notwithstanding the heights specified, when the building or stack in which EO is stored is traversed and when the EO is of a hazard division requiring traversing, the EO is to be stacked no higher than 600 mm from the top of the traverse (see Regulation 6.1 Procedure 2).

**Separation between Ceiling and Top Packages or Pallet**

8.15 A minimum separation distance of 300 mm is to be maintained between the top packages or pallet and the ceiling of a building to allow adequate ventilation and access to and removal of top packages or pallets; except where metal trusses are used in the buildings construction, then 500 mm minimum separation distance is to apply. Where a building structure has exposed trusses with a cavity between the trusses and the roof, the top of the pallets must not protrude higher than the trusses, i.e. into the truss space. As a general rule, the 300 mm distance should apply however; where this is not practicable the distance may be reduced but still allow safe removal of the topmost packages/pallets. For igloo designed buildings, the stacking height is to provide a minimum of 500 mm clearance from the top of the stack to the roof. Furthermore, the outer face of any explosives package and the inner face of any adjacent structural wall or metallic fittings must be separated by 500 mm.

**Unpalletised Explosive Ordnance**

8.16 Unpalletised EO packages are to be stacked no more than two packages wide. Bulk stacking of EO is not permitted. There are no constraints on the length of the stacks within the physical confines of the storehouse, provided inspection aisles are maintained around each stack. The maximum permitted stacking heights for individual package types are as follows:

a. **Rectangular Packages.** Rectangular metal or wooden packages are to be stacked on their bases to a height not exceeding 3.7 metres with the following exceptions:

   (1) Packages containing Compatibility Group B (CG B) EO, eg detonators, are not to exceed 1.5 metres, and
(2) Packages containing Compatibility Group H (CG H) EO, eg EO filled white phosphorus – see paragraphs 8.34a. and 8.35a.

b. **Cylindrical Packages.** Cylinders are to be stacked on their sides in tiers with any reinforcing bands coinciding throughout the stack. The following tier heights are not to be exceeded:

1. Cylinders under 25 kg in weight – 8 tiers, and
2. Cylinders 25 kg to 45 kg in weight – 5 tiers.

In any case, the maximum stack height is not to exceed 3.7 metres.

c. **Unboxed Shell.** Unboxed shells are to be stacked on their sides in tiers. The following tier heights are not to be exceeded:

1. Up to 140 mm – 15 tiers,
2. 140 mm to 175 mm – 11 tiers,
3. 175 mm to 300 mm – 8 tiers, and
4. Over 300 mm – 5 tiers.

**8.17 Stability of Stacks.** All stacks are to be stable, particular attention being paid to corners. Stability of the stack is to be achieved by one of the following methods:

a. **Bonding of Packages.** Packages of which the length is greater than the width are to be bonded.

b. **Use of Battens.** Battens are to be used to achieve stability and are to be positioned as follows:

1. Metal packages – on the 3rd, 6th and 9th tiers.
2. Wooden packages – between the 8th and 9th tiers.
3. Cylindrical packages stacked vertically – between each tier.
4. Packages approaching a cubical shape cannot be satisfactorily bonded and are therefore to be interspersed, layer by layer, with long wooden battens of regular thickness.

c. **Open Stacking.** The stability of a stack can be achieved by carefully adjusted open stacking, ie honeycombing. This method requires small symmetrical open spaces to be left between packages.

**8.18 Stability of Unboxed Shell.** Unboxed filled shell, except shell with either copper or steel base covers, are to be stored on their bases on wooden dunnage, except when racks or conveyors are installed, or where local conditions render it necessary to store them on their sides. When this is necessary, shells are to be arranged as follows:

a. The bottom tier is to be placed on wooden dunnage of sufficient thickness to prevent driving bands from coming in contact with the floor.

b. Tiers are to be arranged head to base to prevent damage to driving bands, but when this is not possible, battens are to be placed between tiers.

c. End shell in the bottom tier are to be secured by wooden scotches fixed to the dunnage, and when necessary, wooden wedges should be placed against the shoulders of all projectiles in the bottom tier to prevent movement.
d. Shell of calibre 175 mm and above are to be stacked with battens between tiers in order to protect driving bands and to facilitate handling.

8.19 **Ventilation of Stacks.** All stacks of EO are to be ventilated. This can be achieved when dunnage, battens or open stacking is used, and by the provision of gangways.

8.20 **Restacking.** Whenever restacking is necessary, the packages previously bearing the most weight should be repositioned to the top of the stack.

**Palletised Explosive Ordnance**

8.21 With due regard to the strength of the floor, stacking heights for loaded pallets are to be limited to:

a. 3.7 metres for pallets with battens on the underside which result in point loading of the contents of the lowest pallet, or

b. 5 metres for pallets with a base that distributes the weight evenly across the contents of the lower pallet, or

c. The height permitted by the stability of the stack when the pallets are fitted with supporting posts which take the weight instead of imposing it on the contents of the pallets below, or

d. Stacking heights detailed in paragraphs 8.34b. and 8.35b. for EO filled white phosphorus.

**Metal Box Pallets (Cages)**

8.22 The maximum stack height of box pallets is not to exceed four pallets.

**Packaged Non-Explosives**

8.23 A maximum stacking height of 5 metres is permitted for packaged non-explosives except for cylindrical tail units which are to be stacked as follows:

a. When stored vertically on their bases - not more than six tiers, and

b. When cradle stacked - not more than four tiers.

**Use of Racks**

8.24 The stacking heights given in paragraph 8.16 may be increased by the use of racks, but due regard is to be given to the strength of the floor and the additional risk involved should a package be dropped from the top of the stack. In any case, approval to stack in excess of the heights given in paragraph 8.16 must first be sought from the Explosive Ordnance Packaging Team in the Munitions Branch.

**Self-Propulsive Missiles**

8.25 Additional information on the stacking of self-propulsive missiles is contained in Regulation 6.1 Procedure 1.

**Guided Weapons**

8.26 For guided weapons, ie missiles and torpedoes, stacking heights and other handling criteria such as vehicle loading configurations, are usually identified in weapon specific manuals. This information is to be applied in preference to the non EO-specific criteria prescribed above.
EXPLOSIVE ORDNANCE CONTAINING PHOSPHORUS AND PHOSPHIDES
(COMPARATIBILITY GROUP H)

WARNING

PHOSPHORUS EXISTS IN TWO FORMS ‘RED’ AND ‘WHITE’. THE RED FORM IS STABLE AND IS NOT SPONTANEOUSLY FLAMMABLE, BUT BURNT PARTICLES MAY TURN TO WHITE PHOSPHORUS AND LEAVE CRUSTED RESIDUE WHICH WILL SPONTANEOUSLY COMBUST WHEN DISTURBED. WHITE PHOSPHORUS (WHICH IS USED IN VARIOUS KINDS OF INCENDIARY AND SMOKE COMPOSITIONS) WHEN DRY, RAPIDLY OXIDISES IN AIR AND IGNITES SPONTANEOUSLY; IT FUMES WHILE OXIDISING. THE TENDENCY TO SPONTANEOUS IGNITION INCREASES WITH RISE IN TEMPERATURE. IT IS EASILY EXTINGUISHED BY WATER AND WHEN WET IS SAFE.

General Storage Requirements

8.27 EO containing phosphorus or phosphides, ie CG H EO, is to be stored in as cool a place as possible and is not to be exposed to the sun.

8.28 CG H EO is to be stored separately (segregated) from other types of EO.

8.29 Leakage of CG H EO is readily detected by a strong odour of the toxic gas phosphine. In the event of a leakage, the leaking store is to be immersed in water.

8.30 A good supply of water is to be kept available at or adjacent to, any building where CG H EO is held. Containers of water suitable for the immersion of the whole of the largest EO package are to be located inside each storehouse containing such stores to enable a ‘leaker’ to be immersed quickly if found.

NOTE

Ideally, the water container should be a wheeled plastic industrial waste bin. This allows for easy removal of the leaker from the EO storehouse.

EO storehouses containing EO filled with red phosphorus are to be ventilated at least weekly.

8.31 Tools to Cut Banding. Suitable tools to cut the banding of pallets are to be readily available in a prominent position in storehouses used to store CG H EO.

8.32 Inspection for Leaking Stores. Regular external inspection of each pallet or loose package of CG H EO is to be carried out at monthly intervals. Inspections are to be recorded.

Specific Storage and Stacking Requirements

8.33 Design and Construction of CG H EO. For storage purposes CG H EO is classified by its design and construction as thick or thin skinned\(^1\) and specific storage and stacking conditions apply accordingly.

8.34 Thick skinned CG H EO. Natures of CG H EO such as gun and mortar ammunition are assessed as thick skinned and are to be stored as follows:

a. Unpalletised. Unpalletised packages are to be stacked as follows:

   (1) To a height not exceeding 2 metres, and

\(^1\) Metal cased munitions are considered to be thin-skinned for the purpose of storage if their mean diameter to mean wall (excluding the base and/or fuze receptor wall) thickness ratio ($D/t$) is greater than 10 – see Glossary of Terms – Thin-skinned munitions.
(2) With ease of access to permit the prompt removal of any package showing signs of phosphorus leak.

b. **Palletised.** Palletised packages are to be stacked as follows:

   (1) Up to three pallets high provided Manual Handling Equipment (MHE) is readily available,

**NOTE**

‘MHE Readily Available’ is defined as having MHE dedicated to that EO storehouse, and parked adjacent to the storehouse when not being utilised elsewhere in the EO area. The storehouse is always to have a working telephone. If the MHE is removed for service or repair, it is to be replaced until it returns.

   (2) Each row of pallets to be no more than two pallets wide from an inspection or working aisle, and

   (3) Ideally all pallets to be directly accessible by MHE however, in the worst case, the maximum number of pallets to be moved, in order to reach the least accessible pallet is not to exceed six.

**8.35 Thin skinned CG H EO.** Natures of CG H EO such as M34 Grenade and Rockets 2.75in, are assessed as thin skinned and are to be stored as follows:

a. **Unpalletised.** Unpalletised packages are to be stacked as follows:

   (1) To a height not exceeding 1.5 metres, and

   (2) With ease of access to permit the prompt removal of any package showing signs of phosphorus leak.

b. **Palletised.** Palletised packages are to be stacked as follows:

   (1) Not in excess of one pallet high,

   (2) Each row of pallets not more than two pallets wide from an inspection or working aisle, and

   (3) With ease of access by either MHE or hand, to permit the prompt removal of any package showing signs of phosphorus leak.

**Temperature Limitations**

**8.36 White Phosphorus (WP) liquefies if exposed to temperatures in excess of 44° C.** To minimise hazards associated with the forming of cavities in WP filling (eg loss of ballistic performance, compression of filling on set back) EO filled WP is to be stored oriented to the following positions if the above temperature limitation is likely to be exceeded:

a. Grenades - fuze end upper most; and

b. Separate, fixed and semi-fixed ammunition natures and free flight rockets - nose end uppermost.
PROCEDURE 9 - STACKING OF UNPACKAGED EXPLOSIVE ORDNANCE

Purpose

9.1 This procedure prescribes criteria for, and precautions to be observed when, stacking unpackaged Explosive Ordnance (EO).

General

9.2 The procedures contained in Regulation 4.1 Procedure 8 paragraphs 8.4 to 8.12 are applicable also to unpackaged EO. Particular note is to be made of floor strength requirements.

Method of Storage - General

9.3 Providing the floor or ground is firm and reasonably level, unpackaged EO may be stored:

   a. Vertically resting on transit bases, provided that adequate stability to the store is afforded; or

   b. Horizontally, cradle-stacked in tiers, with the bottom tier secured with chocks and raised off the floor on suitable battens unless specific instructions are issued to the contrary.

Unpackaged Projectiles

9.4 If it is necessary to store projectiles loose and not in the approved packages as set out in Topic -025 of the item publication, the following method of stacking is to be employed:

   a. The items are to be so arranged in stacks that no weight bears on driving bands.

   b. The bottom tier is to be placed on wooden battens or pallets of sufficient thickness to prevent the driving bands coming in contact with the floor.

   c. The end projectiles of each tier are to be secured by chocks fixed to the battens.

   d. Battens are to be used between tiers to prevent damage to the driving bands.

9.5 Unboxed filled projectiles except projectiles with either copper or steel base covers, are to be stored on their bases on wooden dunnage, except where racks or conveyors are installed, or where local conditions render it necessary to store them on their sides.

Stacking Heights

9.6 Subject to the nature, strength and condition of the floor or the ground, and the stability of the stacks, unpackaged EO and non-explosive dangerous goods may be stacked to a maximum height of 3 metres except as follows:

   a. High Capacity stores such as depth charges are normally to be stored in single tiers. When necessary, up to three tiers may be permitted but prior authority is to be obtained from the Explosive Ordnance Packaging Team in Munitions Branch.

   b. Stacking height for loose projectiles is not to exceed 1 metre.
PROCEDURE 10 - RELATED NON-EXPLOSIVES - STORAGE AND INSPECTION

Introduction

10.1 There is a range of non-explosive items that are associated with Explosive Ordnance (EO). These items include drill, empty, instructional and inert filled EO, non-explosive components such as fuze adaptors, fuze covers, weapon arming components and consumable items such as paints, rubber, adhesives, felts etc.

10.2 Non-explosive Dangerous Goods (NEDG) are to be dealt with in accordance with Regulation 4.3 Procedure 1.

Purpose

10.3 This procedure prescribes the requirements for storage, inspection and transport of non-explosives associated with EO.

Terms and Definitions

10.4 For the purposes of this instruction non-explosives are grouped as follows:

a. **Inert Items.** Items which are in Service use and include inert filled, drill, dummy, servicing rounds, solid shot projectiles etc, and empty items that can be filled at a later date.

b. **Instructional Items.** Items which are used for training and display purposes, and include:
   
   (1) Items of EO and NEDG which have been converted to non-explosive instructional items;
   
   (2) Specifically manufactured items which have been made to represent an item of EO or NEDG;
   
   (3) Sectionalised stores; and
   
   (4) Inert items of EO and NEDG used for display purposes in museums or offices.

**NOTE**

An inert item may be referred to as an instructional item and vice versa, depending on the items current use, however the item will be marked ‘inert’ regardless of its use.

c. **Non-explosive Components.** Items such as projectile plugs, fuze adaptors and covers, tail units, fuzing wires and Guided Weapon (GW) components and sections that do not contain explosive substances.

d. **Consumable Items.** Items such as paints, sealants, adhesives, O-rings, felts, papers, nuts and bolts.

Storage

10.5 Inert and instructional items are not to be stored in an EO storehouse with ‘live’ EO of the same type. This is essential to prevent inadvertent mixing of filled and empty stores. Preferably, they are to be stored in a separate, dedicated, suitable non-explosives storehouse and afforded the same security and accounting requirements as live EO. Subject to security considerations this storehouse may be outside the EO area. Inert and instructional items on display are subject to security requirements of Annex C to Defence Security Manual (DSM) Part 2:67.
10.6 Whenever possible, inert items are to be stored under cover (see Regulation 4.1 Procedure 3).

10.7 Instructional items when in use are to be held under conditions which will prevent deterioration and so, prolong their useful life.

10.8 Non-explosive components may be stored in the same EO storehouse as their associated explosive items.

10.9 Normal general storage conditions apply to consumable items.

10.10 The packages containing inert, instructional items and non-explosive components are to be sealed in the manner prescribed for EO (see Regulation 2.3 Procedure 4).

Inspection

10.11 **Inert Items.** Inert items are to be submitted for inspection at intervals not exceeding five years. More frequent inspection may be necessary when directed or where storage conditions are unfavourable and deterioration is evident. Officers-in-Charge are responsible for submitting such items for inspection. EO storage depots are to include inert items in the depot's Routine Inspection program. Holdings of inert items at establishments/units are to be inspected by Regional Services staff.

10.12 Inert items that are boxed may be inspected in the storehouse in which they are held provided no EO is present, or in any suitable building which does not contain EO, or in a compartment of an EO workshop in which there is no EO present.

10.13 **Instructional Items.** When instructional items are initially purchased or manufactured they are to be certified free from dangerous substances by an authorised inspector, marked with its new identification details and brought to account as required at Regulation 2.4 Procedure 1.

10.14 All instructional items throughout Defence, including items held in offices and display cabinets, are to be submitted for inspection every five years. If there is any doubt on the condition of items, or there is any uncertainty as to the authenticity or date of their inert marking or certification, the holder is to immediately submit these items for inspection.

10.15 **Non-Explosive Components.** Non-explosive components are to be inspected as provided for inert items at paragraph 10.11, except that the inspection interval is to be triennial.

10.16 The provision of paragraph 10.15 does not apply to Guided Weapons (GW) components and sections for which separate policy will be detailed in appropriate GW documentation.

10.17 **Consumable Items.** Consumable items normally are not subject to inspection. When deterioration is evident, Officers-in-Charge are responsible for submitting such items for survey.
PROCEDURE 11 - INTER-SERVICE STORAGE OF EXPLOSIVE ORDNANCE

Introduction

11.1 From time to time there may be economic, operational or logistical reasons for having Explosive Ordnance (EO) of one Service stored in another Service's Establishment. Through this method of storage assistance more efficient use can be made of existing storage facilities and operational support can be better facilitated or any storage shortages that may exist can be alleviated.

Purpose

11.2 This instruction prescribes policy regarding the provision of storage of EO of one Service at another Service's Establishment.

11.3 Policy for the storage of EO at Defence Establishments for other Commonwealth Departments or State Government Departments, Foreign Services or commercial organisations, is defined in Regulation 4.1 Procedure 12.

Definition

11.4 The Service or Establishment that owns stocks held in storage by another Service will be described as the Owner Service or Establishment. The Service or Establishment storing EO on behalf of an Owner Service or Establishment will be described as the Holding Service or Establishment.

Policy

11.5 Storage facilities may be provided free of cost to other Services subject to the following requirements:

a. There is sufficient physical and explosives licence capacity at the proposed Holding Establishment.

b. The EO is stored at owner’s risk.

c. The Officer-in-Charge of the Holding Establishment is authorised to destroy any item which is considered to be in a dangerous condition and further storage could jeopardise the safety of personnel, stock or property.

d. Any direct charges specifically incurred by the Holding Service in providing storage, mechanical handling equipment or manpower to meet such requirements are recoverable and are agreed between the Owner Service and the Holding Service.

e. EO is to be listed on the statutory accounts register on the Computer Support for Armament (COMSARM) Information Technology System to ensure explosives licensing and compatibility compliance, and that EO is not listed as surplus during mandatory Stocktake Programs. The Owner Service is to be entered on COMSARM. Where the Holding Establishment is not serviced by COMSARM, the EO holding is to be accounted for using the establishment’s normal accounting system.

Application

11.6 All applications by one Service for storage assistance from another Service are initially to be negotiated locally between the Establishments concerned. A written application is then to be made by the requesting Establishment through its Command Headquarters to the Command Headquarters of the Establishment from which assistance is intended. Subsequent action is at the discretion of the Command Headquarters from which assistance has been requested however, the EO contracting authority within the Explosives Ordnance Branch is to be consulted early in the decision process.

11.7 All applications for assistance are to provide:
Details for each type of EO to be stored as follows:

1. NATO Stock Number and Ammunition Serial Number;
2. Service Item Name;
3. UN Serial Number and Proper Shipping Name (see Regulation 2.1 Procedure 1);
4. Hazard Classification Code;
5. Quantity – number of item(s) and number and dimensions of packages/pallets; and

The likely period of storage including anticipated turnover, i.e., whether or not stock will be static or if issues and returns are anticipated.

The authority for the Officer-in-Charge of the Holding Establishment to destroy any item which is considered to be in a dangerous condition and further storage could jeopardise the safety of personnel, stock or property.

Responsibilities of Owner Service or Establishment

11.8 The Owner Service will be responsible for the following:

a. Ensuring that the EO offered for storage is safe for storage, handling and transport, including movement under statutory requirements. This safety is to be vouched by a suitable certificate to be given to the Officer-in-Charge of the Holding Establishment by the Owner Service before the EO is handed over;

b. Advising the Officer-in-Charge of the Holding Establishment of any special characteristics or considerations affecting storage, handling and transport of the EO concerned, e.g., security classification, environmental control requirements and EO reclassification details;

c. Maintenance, inspection and stock control of its own stocks, unless by agreement, the Owner Service is prepared to delegate some or all these functions to the Holding Establishment. If any functions are delegated, a Memorandum of Agreement (MOA) is to be prepared locally to clearly define the division of responsibilities and channels of communication between Owner Establishment and Holding Establishment;

d. Issuing, annually, to the Officer-in-Charge of the Holding Establishment a suitable safety certificate to the effect that its stocks are safe for continued storage, handling and transport, when the Owner Establishment conducts maintenance and inspection of its own stocks; and

e. Providing competent personnel who may be attached to the Holding Establishment for discharging Owner Establishment responsibilities, as applicable.

Responsibilities of Holding Service or Establishment

11.9 The Holding Service will, in respect of Owner Service stocks, be responsible for the following:

a. Receiving, storing and issuing EO on behalf of the Owner Establishment;

b. Providing suitable storage, administration, non-technical labour, transport, access control and security arrangements;
c. Applying all safety instructions applicable to the Holding Establishment, together with any special requirements notified in accordance with paragraph 11.8b;

d. Undertaking such functions as are delegated by the Owner Establishment in accordance with the agreed MOA defining the divisions of responsibilities between Owner and Holding Establishments; and

e. Providing information to the Owner Establishment regarding his stocks through agreed channels of communication.

Memorandum of Agreement

11.10 Once approval to an application for assistance vide paragraph 11.6, has been given by the Command Headquarters of the Establishment concerned, any MOA deemed necessary under paragraph 11.8c should be drawn up, agreed, and published locally by the respective Services concerned, with information copies to each of the Command Headquarters.

11.11 If local agreement cannot be reached when drawing up the MOA, the circumstances are to be referred by both the Owner and Holding Establishments to the appropriate appointments in each of the Command Headquarters for advice and guidance.

11.12 Any alteration or modification to the division of responsibilities prescribed in paragraph 11.8 (except for paragraph 11.8c which is covered by action under paragraphs 11.10 and 11.11) and paragraph 11.9 required to meet local circumstances is to be recorded in a MOA. Details of any such alteration or modification are to be referred for approval to the appropriate appointments in each of the Command Headquarters concerned, before publication of the MOA.

Cost Recovery Arrangements

11.13 The Command Headquarters concerned are to ensure that if cost recovery pursuant to paragraph 11.5d is intended, the arrangements are agreed before approval is given to any application made in accordance with this instruction.
PROCEDURE 12 - STORAGE OF EXPLOSIVE ORDNANCE AT DEFENCE ESTABLISHMENTS FOR NON-DEFENCE ORGANISATIONS

Introduction

12.1 At times the Department of Defence may agree to store commercial and military type explosives (referred to as Explosive Ordnance (EO) in this instruction) belonging to other Commonwealth Government Departments, State Government Departments, Foreign Military Forces or commercial organisations.

Purpose

12.2 This instruction prescribes policy regarding the provision of storage of EO belonging to other Commonwealth Departments, State Government Departments, Foreign Military Forces or commercial organisations, in Defence facilities.

12.3 Policy for the storage of single Service owned EO at another single Service’s storage facility is detailed in Procedure 11.

Scope

12.4 The requirements of this instruction would apply, for example, to requests for assistance to store EO belonging to the following organisations:

   a. Commonwealth Departments such as Customs or CSIRO,
   b. Civil Police Forces,
   c. Visiting Foreign Military Forces such as the New Zealand Armed Forces,
   d. Non-Government Organisations, and
   e. Commercial companies such as Wesfarmers and Orica.

Definition

12.5 The authority that owns stock held on its behalf by a Defence Establishment, is to be known as the Owner Authority. The Defence facility storing on behalf of an Owner Authority, will be described as the Holding Establishment.

Policy

12.6 Storage facilities may be provided to Commonwealth or State Government departments, Foreign Military Forces or commercial organisations, subject to the following requirements:

   a. There is sufficient physical and explosives licence capacity at the proposed Holding Establishment.
   b. The EO can be safely stored in accordance with the requirements of this manual.
   c. The EO is stored at owner’s risk.
   d. The Officer-in-Charge of the Holding Establishment is authorised to destroy any item which is considered to be in a dangerous condition and further storage could jeopardise the safety of personnel, stock or property.
   e. Charges specifically incurred by the Holding Establishment in providing resources to meet such requirements should be recovered. Storage services can be provided to a
commercial profit making entity at normal market rates provided those services cannot be provided by another commercial entity. Such charges are to be agreed between the Owner Authority and Defence through the Administrative Headquarters for the Holding Establishment.

f. EO is to be listed on the statutory accounts register on the Computer Support for Armament (COMSARM) IT System to ensure explosives licensing and compatibility compliance, and that EO is not listed as surplus during mandatory Stocktake Programs. The Owner Authority is to be entered on COMSARM. Where the Holding Establishment is not serviced by COMSARM, the EO holding is to be accounted for using the establishment’s normal accounting system.

Requests for Assistance

12.7 Requests for storage assistance under the scope of this instruction are to be submitted in writing to the Administrative Headquarters of the establishment from which assistance is proposed. The Command Headquarters is to consult the EO Services Contract Authority at the Directorate of Explosive Ordnance Services (DEOS) before reaching a decision on the request.

12.8 All applications for assistance are to provide the following information, as a minimum:

a. Details for each type of EO to be stored, as follows:
   (1) Item name;
   (2) UN Serial Number and Proper Shipping Name;
   (3) NATO Stock Number (NSN), if one exists;
   (4) Hazard Classification Code;
   (5) Quantity – number of item(s) and number and dimensions of packages/pallets; and
   (6) Net Explosives Quantity.

b. The likely period of storage including anticipated turnover, ie whether or not stock will be static or if issues and returns are anticipated.

c. Whether or not transport or mechanical handling equipment owned by Defence or Defence EO Services Provider will be required.

d. The authority for the Officer-in-Charge of the Holding Establishment to destroy any item which is considered to be in a dangerous condition and further storage could jeopardise the safety of personnel, stock or property.

e. For other than Commonwealth Government departments or instrumentalities, a statement indemnifying the Commonwealth against loss or damage resulting from storage, handling and transport of the EO. Legal advice is then to be sought on the process for making the indemnity legally binding.

Responsibilities of Owner Authority

12.9 The Owner Authority will be responsible for the following:

a. Ensuring that the EO is safe for storage, handling and transport, including movement under statutory requirements. This safety is to be vouched by a suitable certificate to be given to the Officer-in-Charge of the Holding Establishment by the Owner Authority before the EO is handed over;
b. Advising the Officer-in-Charge of the Holding Establishment of any special characteristics or consideration affecting the storage, handling and transport of the EO concerned, eg security classification, environmental control requirements and safety or management related changes;

c. Maintenance, inspection and stock control of its stocks unless, by agreement, the Owner Authority is prepared to delegate some or all of these functions to Defence. A Memorandum of Agreement (MOA) or contract, or Implementing Arrangement for foreign government EO, as appropriate, is to be prepared to clearly define the division of responsibilities and channels of communication between the Owner Authority and Defence;

d. Provision of an annual safety certificate to the Officer-in-Charge of the Holding Establishment, advising that its stocks are safe for continued storage, handling and transport, when the Owner Authority conducts maintenance and inspection of its own stocks;

e. Providing competent personnel who may be attached to the Holding Establishment for discharging Owner Authority responsibilities as considered applicable; and

f. Providing the name and contact number of a competent person available on a 24 hour basis, in the case of an incident.

Responsibilities of Holding Establishment

12.10 The Holding Establishment will, in respect of owner stocks, be responsible for the following:

a. Receiving, storing and issuing EO on behalf of the Owner Authority;

b. Providing suitable storage, administration, non-technical labour, transport, access control and security arrangements;

c. Providing segregated storage for any explosives that are not listed in the Defence Explosive Ordnance Classification Listing;

d. Applying all safety requirements, together with any special requirements notified in paragraphs 12.8c and 12.9b;

e. Undertaking such functions as are requested by the Owner Authority in accordance with the agreed MOA or contract defining the divisions of responsibilities between the Owner Authority and Defence; and

f. Providing any information to the Owner Authority regarding the stocks through agreed channels of communication.

Memorandum of Agreement/Implementing Arrangement

12.11 Once approval to an application for assistance vide paragraph 12.7 has been given by the Administrative Headquarters, the MOA or contract required under paragraph 12.9c should be drawn up, agreed and endorsed by the Owner Authority and Defence.

12.12 For foreign government EO an Implementing Arrangement (IA) is to be drafted. Further guidance can be found in Defence Logistics Manual Part 2 Volume 8 Chapter 3 - International Logistics Agreements and Arrangements (DEFLOGMAN Part 2 Volume 8 Chapter 3).

Cost Recovery Arrangements

12.13 The Command Headquarters concerned is to ensure that cost recovery arrangements pursuant to paragraph 12.6e are agreed before approval is given to any application made in accordance with this instruction.
REGULATION 4.2 - MIXING RULES FOR STORAGE

General Overview

2.1 For practical needs in storage, it may be contemplated to mix Explosive Ordnance (EO) of different Hazard Divisions (HD) and different compatibility groups. The safety of EO would be ensured more easily if each kind was stored separately, but this ideal practice is not always practicable. A proper balance of the interest of safety against the other relevant factors must be observed.

2.2 These rules are based on the principles promulgated in AASTP-1 – Manual of NATO Safety Principles for the Storage of Military Ammunition and Explosives¹.

Requirements

2.3 All EO that is under control of Defence is to be stored in accordance with the following requirements of this regulation and its associated procedures.

Mixing Rules

2.4 Mixed Storage – Principles. EO of different HD and compatibility groups may be stored together if compatible. Additionally, EO may be mixed in storage as much as is necessary to promote operational efficiency. In particular:

   a. The number of items requiring separate storage should not unduly interfere with the technical organisation and functioning of a facility or establishment in an operational role of issuing EO expeditiously in time of emergency with the minimum of personnel, handling equipment and transportation; and

   b. The number of items requiring separate storage should be kept to a minimum in order to ensure that the area of land required and the costs of road and rail communications and of water supplies for firefighting will not be excessive.

2.5 Mixing Rules - Hazard Divisions. Mixed HD for above-ground storage are to be aggregated as given in Procedure 1.

2.6 Mixing Rules - Compatibility Groups. An overriding principle for the storage of EO is that different compatibility groups should be stored separately whenever possible. However, except at large depots and installations where there should normally be sufficient storage facilities/sites to provide separate storage, considerations of operational flexibility dictate a need for some degree of mixing of compatibility groups in storage. With the exception of substances in Compatibility Group A, which must not be mixed with other compatibility groups, the mixing of substances and articles is permitted as shown in Procedure 1.

2.7 Special Circumstances. Subject to technical advice and technical justification, the Director Ordnance Safety (DOS) may approve modification to the mixing rules for storage when considered appropriate in special circumstances. Such special circumstances are likely to occur when a small quantity of one HD is mixed with a large quantity of another HD, as follows:

   a. Very small quantity HD 1.1 and large quantity HD 1.2. It should be possible to arrange storage in such a manner that the mixture will behave as HD 1.2.

   b. High weight ratio HD 1.3 to HD 1.5. Generally, the fire risk will dominate, but under heavy confinement the risk of mass explosion dominates. Therefore, the greater Quantity Distance (QD) (HD 1.3 or HD 1.1) for the aggregate Net Explosives Quantity (NEQ) might be applied having taken into account the relative quantities of HD 1.3 and HD 1.5.

¹ The continued use of AASTP 1: 2010 is under review
c. **Low weight ratio HD 1.3 to HD 1.5.** The risk of mass explosion is minimal and therefore the HD 1.3 QD for the aggregate NEQ might be applied having taken into account the relative quantities of HD 1.3 and HD 1.5.

### 2.8 Suspect EO – Mixed Storage

Suspect EO must not be stored with any other EO.

### 2.9 Underground Storage

The following limitations apply to underground storage:

a. **Ammunition containing Flammable Liquids or Gels.** Ammunition containing flammable liquids is only permitted in underground storage sites if proper protection against fuel leakage is established. The possible energy release of a stoichiometric combustion should be considered as part of the total energy release. Multi-chamber sites should be arranged and/or sealed in such a way that fuel-fire or gas explosion should not increase the likelihood of reaction in neighbouring chambers more than established through interior distances to prevent detonation transfer.

b. **Ammunition containing Toxic Agents.** Because of difficulties of decontamination underground, ammunition containing toxic agents should only be stored under special provisions.

c. **Suspect Ammunition and Explosives.** Suspect ammunition and explosives should not be stored.

d. **Ammunition containing Pyrotechnics.** Ammunition containing pyrotechnics, such as illuminating, smoke and signal ammunition, could in some cases be more vulnerable to mishaps or self ignition, and thereby increase the likelihood of an accident. The decision to store ammunition that contains pyrotechnics underground must be made on a site-specific basis and provisions must be taken to mitigate the peculiar hazards of pyrotechnic materials.

e. **Ammunition containing Depleted Uranium.** Before ammunition containing depleted uranium is permitted in underground sites, the slight radioactivity and chemical toxicity that would result from an accidental fire or explosion should be assessed and accepted.

### Isolation of Explosive Ordnance

#### 2.10 EO storage establishments are to provide an isolation facility. The facility is to be licensed for the storage of demolition kits and EO known to be or suspected of being unsafe pending its ultimate disposal. The isolation facility is to be sited such that damage resulting from an accidental explosion or fire is acceptable.

#### 2.11 Packaging. All EO stored in an isolation facility is to be packed in approved containers/packages.

#### 2.12 Marking. EO which is considered unsafe is to be placed in isolation.

#### 2.13 Recovered EO. All EO recovered from EO disposal or incident tasking is to be clearly marked.

#### 2.14 Accounting Documentation. Accounting documentation is not to be located within the isolation facility.

#### 2.15 Mixing of Isolated EO. If the storage space is sufficient, EO requiring isolation should not be mixed in storage. However should storage space not be sufficient, isolated EO of different compatibility groups may be mixed under normal rules governing mixing.

### Segregation of Explosive Ordnance

#### 2.16 Marking of Segregated EO. All EO permitted to be segregated may be held in the same storehouse as serviceable stock provided each is held separately and positively identified.
2.17 **Mixing of Segregated EO.** The normal provisions for mixing compatibility groups and hazard divisions apply to EO requiring segregation (see paragraphs 2.5 – 2.6).

2.18 **Segregation of Ready-Use EO.** When EO is fuzed or otherwise ‘made live’ for use and is not required for immediate use, the EO or the packages in which it is contained are to be clearly marked to indicate its fuzed or ‘made live’ state. Such EO is to be segregated in ready-use storage.

**Responsibilities**

2.19 Each element of Defence involved in the storage and handling of EO is to ensure compliance with this regulation and the associated procedures.

**Procedures**

2.20 Procedures used to implement the requirements of this regulation are:

a. Procedure 1 – Mixing of Compatibility Groups and Hazard Divisions for Above-Ground Storage

b. Procedure 2 – Isolation of Explosive Ordnance

c. Procedure 3 – Segregation of Explosive Ordnance
PROCEDURE 1 - MIXING OF COMPATIBILITY GROUPS AND HAZARD DIVISIONS FOR ABOVE-GROUND STORAGE

Purpose

1.1 This instruction prescribes the authorised mixing in storage of Explosive Ordnance (EO) of different compatibility groups and hazard divisions, of aggregate quantities in excess of 50 kg NEQ. The authorised mixing of ‘small quantities’ of EO is detailed in Regulation 5.3 Procedure 1.

Mixing of Hazard Divisions

1.2 The permitted quantities of EO that may be stored in an EO building vary with the hazard division of the EO in relation to the available quantity distances. To enable best use to be made of an EO building, mixing of hazard divisions within the authorised mixing of compatibility groups is permitted.

1.3 Details for determining the hazard division of mixed storage for EO of more than one hazard division in a single site are given in Annex A.

1.4 Details for determining the required quantity distance for EO of more than one hazard division in a single site are given in Regulation 5.4 Procedure 1.

1.5 Details for determining the permissible quantities of EO of more than one hazard division in a single site are given in Regulation 5.4 Procedure 1.

Mixing of Compatibility Groups in Storage for Explosive Articles

1.6 EO of different compatibility groups should normally be stored in separate EO storehouses. This instruction is to be especially observed at main EO storage depots where large quantities of EO may be at risk. However, the storage together of certain compatibility groups is now accepted as normal practice and is advantageous in that it eases the problems of planning new storage and enables stocks of each item are held in at least two buildings. The authorised mixing of groups for explosive articles is given in Annex B, and summarised in the chart in the Annex. The term ‘building’ in this context means the total area under one roof, whether or not divided into rooms or compartments or a number of buildings licensed as a group, or an equivalent underground chamber or area.

Mixing of Groups within Compartmented Buildings at User Establishments

1.7 Even at user establishments, the over-riding principle is always that EO of different compatibility groups should be stored in separate storehouses if at all possible. If this is not feasible, then mixing as authorised in Annex B is allowable. At user establishments only, a further relaxation, which should be exercised only to meet unforeseen circumstances, is that EO may be mixed in each compartment or room of an EO storehouse in accordance with the provisions of Annex B. When such mixing takes place, EO is not to be positioned within 0.5 m of the inner walls of the compartments or rooms of the storehouse in which the EO is stored.

Mixing of Compatibility Groups in Storage for Explosive Substances

1.8 The compatibility of explosive substances in storage differs slightly from explosive articles. The authorised mixing of groups for explosive substances is given in Annex C, and summarised in the chart in the Annex.

Annexes:

A. Aboveground Storage - Mixing and Aggregation Rules for Hazard Divisions
B. Aboveground Storage - Authorised Mixing in Storage of Explosive Articles Compatibility Groups
C. Aboveground Storage - Authorised Mixing in Storage for Explosive Substances Compatibility Groups
ABOVE-GROUND STORAGE - MIXING AND AGGREGATION RULES FOR HAZARD DIVISIONS

1. To enable best use to be made of explosive ordnance storage facilities, mixing of Hazard Divisions (HD) within the authorised mixing of Compatibility Groups is permitted. The HD of mixed storage of EO is to be determined from table 1A-1.

<table>
<thead>
<tr>
<th>Hazard Division</th>
<th>1.1</th>
<th>1.2.1(2)</th>
<th>1.2.2(2)</th>
<th>1.3</th>
<th>1.4</th>
<th>1.5</th>
<th>1.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>1.1</td>
<td>1.1</td>
<td>1.1</td>
<td>1.1</td>
<td>1.1(3)</td>
<td>1.1</td>
<td>1.1</td>
</tr>
<tr>
<td>1.2.1(2)</td>
<td>1.1</td>
<td>1.2.1</td>
<td>1.2.1</td>
<td>1.1(4)</td>
<td>1.2.1(3)</td>
<td>1.1</td>
<td>1.1(5)</td>
</tr>
<tr>
<td>1.2.2(2)</td>
<td>1.1</td>
<td>1.2.1</td>
<td>1.2.2</td>
<td>1.1(4)</td>
<td>1.2.2(3)</td>
<td>1.1</td>
<td>1.1(5)</td>
</tr>
<tr>
<td>1.3</td>
<td>1.1</td>
<td>1.1(4)</td>
<td>1.1(4)</td>
<td>1.3</td>
<td>1.3(3)</td>
<td>1.1</td>
<td>1.1(5)</td>
</tr>
<tr>
<td>1.4</td>
<td>1.1(3)</td>
<td>1.2.1(3)</td>
<td>1.2.2(3)</td>
<td>1.3(3)</td>
<td>1.4</td>
<td>1.5(3)</td>
<td>1.6(3)</td>
</tr>
<tr>
<td>1.5</td>
<td>1.1</td>
<td>1.1</td>
<td>1.1</td>
<td>1.1</td>
<td>1.5(3)</td>
<td>1.5</td>
<td>1.1(5)</td>
</tr>
<tr>
<td>1.6</td>
<td>1.1</td>
<td>1.1(5)</td>
<td>1.1(5)</td>
<td>1.1(5)</td>
<td>1.6(3)</td>
<td>1.1(5)</td>
<td>1.1(5)</td>
</tr>
</tbody>
</table>

Table 1A–1: Aboveground Storage - Mixing and Aggregation Rules for Hazard Divisions

Notes

(1) When more than two HD are present in storage, any two of those HD are to be considered in determining a resultant HD, which is then to be considered with the next HD and so on until all HD present in storage have been considered.

(2) HD Subdivisions are used for storage purposes only and are not a recognised code under the UN System. Refer to Regulation 5.4 for further explanation of Subdivisions.

(3) 1.4 may be stored with any other HD without aggregation.

(4) Mixed 1.2.1/1.2.2 and 1.3 will usually behave as aggregated 1.2 or 1.3 (see Regulation 5.4 Procedure 1). However, there is a significant risk that, in certain circumstances, a mix of 1.2 and 1.3 will behave as an aggregated quantity of 1.1. If any of the following circumstances exists the mix must be aggregated as 1.1, unless relevant trials or analyses indicate otherwise:
   a. The presence of 1.2 shaped charges;
   b. The presence of high energy propellants, eg as used in some tank gun applications;
   c. The presence of 1.3 under conditions of heavy confinement; or
   d. The presence of 1.2 articles with an individual NEQ > 5 kg.

(5) 1.1 unless demonstrated by testing or analogy to be otherwise.
ABOVE-GROUND STORAGE - AUTHORISED MIXING IN STORAGE OF EXPLOSIVE ARTICLES COMPATIBILITY GROUPS

1. Subject to the observance of the provisions of paragraph 2, EO of various compatibility groups may be stored together as indicated in the Compatibility Group Mixing Chart and notes below. In all instances when mixing of Groups in the same building occurs, EO of different Groups is to be separated by the maximum distances possible.

2. The marking ‘X’ at an intersection of the chart indicates that those Groups may be combined in storage, that is:
   a. Groups C, D, and E may be stored together.
   b. Group S may be stored with any other Group except Groups A, K and L.

Other permitted combinations with certain restrictions are detailed in the Notes to the Mixing Chart, otherwise mixing is prohibited.

3. Special Circumstances. If special circumstances require mixing combinations other than those permitted by table 1B-1, subject to technical advice and technical justification, the Director Ordnance Safety (OS) may approve modification to mixing rules. For example, Compatibility Group F articles are normally to be segregated but they may be stored with other articles when the means are available to substantially reduce the risk of propagation from the Compatibility Group F articles. In considering such mixing the following points must be addressed:
   a. Does a particular item, or its level of protection provided by its packaging, increase the probability of serious accident when mixed with other like items or compatibility groups? If so, is the magnitude of increase in probability acceptable?
   b. What is the increase in the magnitude of the explosives effects if an accident occurs?
   c. If the mixing is not approved, does the explosives hazard increase because of some other influence?
   d. If approved, what action is to be taken to ensure the explosives hazard and its duration are minimised?
   e. Are alternative levels of inside QD protection appropriate to balance the perceived increase in probability of an accident?

4. Suspect Explosive Ordnance. Suspect EO must not be stored with any other EO.
Table 1B–1: Storage Compatibility Group Mixing Chart for Explosive Articles

Notes for the interpretation of compatibility group mixing chart

(X) Mixing Permitted.

(1) The following conditions are applicable to EO of Group B:

a. Detonators of Group B may be stored with EO of Groups C, D, E and F. The detonators, up to a total NEQ of 1.5 kg, must be stored in an approved package and must be segregated from the other Group(s) by a traverse of sufficient dimensions to screen all lines of sight (see Note 12), except that up to 0.2 kg NEQ of detonators may be stored in an approved package, without traversing, provided the detonators are stored at least 1m from any other EO.

b. EO of Group B (other than detonators) may be stored with EO of Groups C, D, E and F provided the EO of Group B is segregated from the other Groups by a traverse of sufficient dimensions to effectively screen all lines of sight to prevent instantaneous propagation. The total NEQ of Group B permitted for storage under these conditions can vary depending on the dimensions of the traverse (see Note 12 for details).

c. Fuzes of Group B may be stored with the articles to which they will be assembled, but the NEQ must be aggregated and the whole treated as Group F for further mixing purposes. See also Notes 10 and 11.

(2) EO of Group F may be stored with EO of Groups C, D, E and G provided the EO of Group F is segregated from the other Groups by a traverse of sufficient dimensions to effectively screen all lines of sight to prevent instantaneous propagation. The total NEQ of EO of Group F permitted for storage under these conditions can vary depending on the dimensions of the traverse (see Note 12 for details).

(3) The following conditions are applicable to EO of Group G:

a. EO of Group G that is not likely to give rise to loose powder may be stored with EO of Groups C, D, E and F.
b. Substances of Groups C, D and G which do not give rise to loose powder and which are less sensitive to mechanical stimuli than dry RDX may be mixed in storage.

Items packed in accordance with packaging authorised in Topic - 025 of the item publication, will not give rise to loose powder.

(4) EO of Groups G and H may be stored in the same site but must be segregated by a floor-to-ceiling 230mm brick wall (or a wall of equivalent fire rating).

(5) EO of Group K requires separate storage from all other Groups and may also require separate storage within the Group.

(6) EO of Group L requires separate storage from all other Groups and also requires separate storage within the Group. However, the Licensing Authority may approve mixing of specified types of Group L where assessment of the hazards of each type shows this to be reasonable. For example, different types of missiles using the same combination of fuel and oxidant may be stored in the same building.

(7) EO of Group N may be stored with EO of Groups C, D and E. When so stored, EO of Group N is to be considered as having the characteristics of EO of Group D for further mixing purposes.

(8) EO of HD 1.4 Compatibility Groups B, C, D, E, F and G may be mixed in storage with EO of Groups B, C, D, E, F or G in other HD.

(9) EO of Group S and empty, inert filled, drill and instructional items of EO may be stored with EO or substances from any Group except Groups A, K and L. Empty, inert filled, etc items may be kept in a building with filled items but not those of similar types (see Regulation 4.1 Procedure 11).

(10) Equal numbers of fuzes and other components of complete rounds of ammunition may be stored in the same site as the ammunition to which they belong. When so stored, the Compatibility Group is that of the assembled round for further mixing purposes.

(11) Items of EO that are complete or incomplete, with or without explosives may be stored with related complete items of EO provided they are compatible. For example, projectiles containing white phosphorus, but without bursting charges, may be stored with white phosphorus projectiles containing explosives.

(12) For a given NEQ of EO of Group B and Group F, a traverse may be constructed of brick, reinforced concrete, steel, hardwood, or suitable containers packed with sand/earth. If a combination of materials is used, the traverse thickness may be calculated on the basis of the effectiveness of materials in stopping high velocity fragments compared with hardwood or packed sand or earth. For brick, reinforced concrete, or steel (compared with hardwood or packed sand/earth) the effectiveness can be taken as 4, 6 and 24 times respectively. In every case, EO is not to be placed within 0.5 m of the traverse and the traverse is to exceed the height of the stored EO by at least 600 mm. Traverse dimensions and construction are to accord with the requirements of Table 1B-2.
ANNEX B

<table>
<thead>
<tr>
<th>NEQ of EO of Groups B or F</th>
<th>Thickness of Traverse of Brick/Reinforced Concrete at 3m centres, 0.2% tension reinforcement</th>
<th>Thickness of Traverse of hardwood or packed sand/earth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 5 kg</td>
<td>340 mm/225 mm</td>
<td>1350 mm</td>
</tr>
<tr>
<td>5 to 7 kg</td>
<td>450 mm/225 mm</td>
<td>1800 mm</td>
</tr>
<tr>
<td>7 to 12 kg</td>
<td>570 mm/225 mm</td>
<td>Not Permitted</td>
</tr>
<tr>
<td>12 to 18 kg</td>
<td>700 mm/300 mm</td>
<td>Not Permitted</td>
</tr>
</tbody>
</table>

Table 1B–2: Traverse Dimensions and Construction

This situation is intended only for the storage of small quantities of EO and for instances where it is uneconomical to provide a permanently compartmented building(s). For larger NEQ, where the building is, or may be internally traversed, see Regulation 6.1 Procedure 2.
ABOVEGROUND STORAGE - AUTHORISED MIXING IN STORAGE FOR EXPLOSIVE SUBSTANCES COMPATIBILITY GROUPS

1. With the exception of substances in Compatibility Group A, which must not be mixed with other compatibility groups, the mixing of substances is permitted as indicated in the Compatibility Group Mixing Chart and notes below. In all instances when mixing of Groups in the same building occurs, EO of different Groups is to be separated by the maximum distances possible.

2. The marking ‘X’ at an intersection of the chart indicates that those Groups may be combined in storage. Other permitted combinations with certain restrictions are detailed in the Notes to the Mixing Chart, otherwise mixing is prohibited.

3. **Special Circumstances.** If special circumstances require mixing combinations other than those permitted by table 1C-1, subject to technical advice and technical justification, the Director Ordnance Safety (DOS) may approve modification to mixing rules. For example, Compatibility Group F articles are normally to be segregated but they may be stored with other articles when the means are available to substantially reduce the risk of propagation from the Compatibility Group F articles. In considering such mixing the following points must be addressed:

   a. Does a particular item, or its level of protection provided by its packaging, increase the probability of serious accident when mixed with other like items or compatibility groups? If so, is the magnitude of increase in probability acceptable?

   b. What is the increase in the magnitude of the explosives effects if an accident occurs?

   c. If the mixing is not approved, does the explosives hazard increase because of some other influence?

   d. If approved, what action is to be taken to ensure the explosives hazard and its duration are minimised?

   e. Are alternative levels of inside QD protection appropriate to balance the perceived increase in probability of an accident?

4. **Suspect Explosive Ordnance.** Suspect EO must not be stored with any other EO.

<table>
<thead>
<tr>
<th>Compatibility Group</th>
<th>A</th>
<th>C</th>
<th>D</th>
<th>G</th>
<th>L(2)</th>
<th>S(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>X(1)</td>
<td>X(1)</td>
<td>(3)</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td>X(1)</td>
<td>X(1)</td>
<td>(3)</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>G</td>
<td></td>
<td>(3)</td>
<td>(3)</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>L(2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(2)</td>
</tr>
<tr>
<td>S(4)</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Table 1C–1: Storage Compatibility Group Mixing Chart for Explosive Substances

**Notes**

(X) Mixing Permitted.

(1) Mixing permitted provided substances have all passed United Nations (UN) Test Series 3. Mixed storage of substances of any Compatibility C, D or G which has failed UN Test Series 3 will require special consideration by the DOS.
(2) Compatibility Group L substances must always be stored separately from all substances of other compatibility groups as well as from all other substances of Compatibility Group L.

(3) The mixing of Compatibility Group G substances which do not give rise to loose powder and which are less sensitive to mechanical stimuli than dry cyclotrimethylenenitramine (RDX) may be mixed in storage with substances of Compatibility Groups C and D.

(4) Inert and substances of Compatibility Group S may be stored with substances of any compatibility groups except Compatibility Groups A and L.
PROCEDURE 2 - ISOLATION OFEXPLOSIVE ORDNANCE

Introduction

2.1 Explosive Ordnance (EO) storage establishments are to provide an ‘isolation’ facility. The facility is to be licensed for the storage of demolition kits and EO known to be or suspected of being unsafe pending its ultimate disposal. The isolation facility is to be sited such that damage resulting from an accidental explosion or fire is acceptable.

Purpose

2.2 This procedure prescribes the conditions whereby EO must be isolated (see definition in Glossary of Terms) from other EO in storage.

Explosive Ordnance to be Isolated

2.3 The following EO is always to be isolated:
   a. Repairable or unserviceable EO which has been certified unsafe by inspection;
   b. EO which the user or holder considers to have become unsafe;
   c. EO suspected of being unsafe following a Service report;
   d. Salvaged EO from an EOD task or after an accident, explosion, fire or trial;
   e. Misfired EO that has been certified as safe for recovery; and
   f. EO suspected of being tampered with or displaying damage.

2.4 EO earmarked for storage in isolation should be destroyed or otherwise disposed of as soon as practicable.

Packaging

2.5 All EO stored in an isolation facility is to be packed in an approved container/package.

Marking and Documentation

2.6 EO which is considered unsafe for normal storage is to be ‘Black Listed’ and placed in isolation pending urgent disposal action.

2.7 All EO recovered from EO disposal or an incident task is to be marked for identification. As a minimum, the Disposal or Incident Report Number is to be marked on each item.

2.8 Accounting documentation is not to be located within the isolation facility.

Mixing of Isolated Explosive Ordnance

2.9 If the storage space available is sufficient, EO requiring isolation should not be mixed in storage, ie individual items of EO or demolition kits, etc are to be separated by distance or a combination of distance and traversing, so as to reduce the probability of instantaneous propagation of an accidental explosion between items/kits. Otherwise EO of different compatibility groups may be mixed under the normal rules governing mixing.
PROCEDURE 3 - SEGREGATION OF EXPLOSIVE ORDNANCE

Purpose

3.1 This instruction prescribes the conditions whereby explosive Ordnance (EO) must be segregated (see definition in Glossary of Terms) from other EO during storage.

Explosive Ordnance to be segregated

3.2 The following EO is always to be segregated:

a. Returns or receipts which are damaged, or incorrectly packaged or sealed, but considered safe;

b. Returns from Ships;

c. Experimental EO; and

d. EO known to be or suspected of being other than serviceable but not unsafe.

Marking of Segregated Explosive Ordnance

3.3 All EO permitted to be segregated may be held in the same storehouse as serviceable stock provided each is held separately and positively identified.

Mixing of Segregated Explosive Ordnance

3.4 The normal provisions for mixing of groups and hazard divisions applies to EO requiring segregation.

Ready-Use Explosive Ordnance

3.5 When EO is fuzed or otherwise ‘made live’ for use in an emergency, or for practice purposes, or for any other reason, eg some types grenades or bombs/charges fitted with fuzes, and is not required for immediate use, the EO or the packages in which it is contained are to be clearly marked to indicate its fuzed or ‘made live’ state. Such EO is to be segregated in ready-use storage.
REGULATION 4.3 - STORAGE OF NON-EXPLOSIVE DANGEROUS GOODS

General Overview

3.1 Dangerous goods which are not of Class 1—Explosives should not be stored in an Explosive Ordnance (EO) storage area because of the additional hazards which may be introduced by their presence in the vicinity of EO. For example, an additional hazard may result from a volatile liquid leaking into the area drainage system, or the presence of the Non-Explosives Dangerous Goods (NEDG) may involve the right of access to the area for non-qualified personnel who would not normally be permitted in the area.

Requirements

3.2 All storage of NEDG in explosive storage areas must be conducted in accordance this regulation and its associated procedures.

3.3 In special circumstances where storage of NEDG in, or in the vicinity of, the area is essential, such storage must be specially authorised by the facility licensing authority.

3.4 Further advice may be sought from the Explosives Storage and Transport Committee (ESTC) which will consider such matters as the compatibility of the types of dangerous goods involved, the effects of the methods of packaging of the hazardous material(s) and, the need to restrict stacking to a single tier.

3.5 Weapons filled with NEDG. Where weapons or their components filled with NEDG are stored in an explosives storage area, the weapons or components are normally, but not always treated as Hazard Division 1.3 EO for Quantity Distance (QD) purposes, see Regulation 5.4 Procedure 1.

3.6 The Defence Explosive Ordnance Classification Listing (DEOCL) contains equivalent hazard classification codes for some NEDG.

3.7 Weapons or their components filled with NEDG goods are classified in accordance with the United Nations (UN) publication Recommendations on the Transport of Dangerous Goods—Model Regulations, ST/SG/AC.10/1 (as revised) (Orange Book).

3.8 Bulk Storage. When NEDG not related to weapons are stored in bulk, special separation distances will be laid down, based on the degree of structural protection afforded by the type of storage provided for the dangerous goods and related to the appropriate QDs for any EO contained in the area. With NEDG in surface storage sites, the special distance required is usually the inhabited building distances from sites containing EO. Where the structural protection of the NEDG warrants it, the licensing authority may determine a lesser distance subject to a minimum distance of 25 m. If underground storage sites are involved, the special distance is usually the inside QD from the site containing the EO with a minimum of 25 m.

3.9 Storage of Small Quantities. Small quantities of petroleum, oil and lubricants for operational purposes within a military installation require no specific separation distance from buildings or stacks containing EO. However, due regard must be taken of fire regulations.

Responsibilities

3.10 Each element of Defence involved in the storage of NEDG are to ensure compliance with this regulation and its associated procedure.

Procedures

3.11 The procedure for the implementation of this regulatory requirement is Procedure 1 – Non-Explosive Dangerous Goods – Storage and Inspection.
PROCEDURE 1 - NON-EXPLOSIVE DANGEROUS GOODS - STORAGE AND INSPECTION

Introduction

1.1 Explosive Ordnance (EO) storage areas are specifically designed for the storage of dangerous goods Class 1. Other classes of dangerous goods, especially when stored in bulk, normally should not be stored in those areas because of the additional hazards that may be introduced by their presence in the vicinity of EO. For example, an additional hazard may result from a volatile liquid leaking into the drainage system, or the presence of the dangerous goods may involve the right of access to the area for non-EO qualified personnel who would not normally be permitted in the area. Nonetheless, there are a number of stores or substances in the Defence inventory classified as dangerous goods in classes 2 to 9, that are related by function to EO and used for somewhat similar purposes as certain types of EO, or are components of weapon systems. These items or substances whether for convenience, security or other reasons are normally stored in EO storage areas. For the purpose of this manual these items and substances are referred to as Non-Explosive Dangerous Goods (NEDG).

1.2 NEDG are by their nature hazardous and whenever their storage within or in the vicinity of an EO storehouse is unavoidable, NEDG are to be managed as though they belong to Dangerous Goods Class 1. To this end, NEDG are assigned a pseudo Hazard Classification Code (HCC) for storage, handling and transportation purposes (see Annex A, Table 1A-1).

Purpose

1.3 This procedure prescribes the requirements for the storage, inspection and transportation of NEDG.

STORAGE

General

1.4 NEDG may be stored in an EO area at Quantity Distances (QD) appropriate to the assigned pseudo HCC.

1.5 NEDG normally are not to be stored in the same storehouse as EO. However, NEDG that are components of weapon systems may be stored in the same storehouse as the EO components of the parent weapon systems.

1.6 Other NEDG may be stored in the same storehouse provided they are held in a separate compartment of the storehouse and segregated in accordance with the requirements of the Hazardous Chemicals – Storage and Segregation Guide for Workplaces.

1.7 NEDG may be stored with EO for ready-use purposes in small quantity facilities located outside EO storage areas under the special conditions of storage addressed in Regulation 5.3 Procedure 1.

1.8 When dangerous goods are stored in bulk in the vicinity of EO, special separation distances are prescribed based on the degree of structural protection afforded by the type of storage provided for the dangerous goods and related to the QD for the EO in question. With such dangerous goods in surface storage sites, the separation distance required is usually the Inhabited Building Distance from sites containing EO. Where the structural protection of the dangerous goods warrants it, the Licensing Authority may determine a lesser distance subject to a minimum distance of 25 m. If underground storage sites are involved, the separation distance is usually the Inside Quantity Distance from the site containing the EO with a minimum of 25 m. A summary of treatments for storage of some dangerous goods liquids in bulk is given in Annex A.

To store in bulk means the storage of, or to store, dangerous goods in a receptacle other than a package.
Advice on the treatment of weapons or components of weapons filled with specified NEDG substances is given in Annex A. Further advice may be sought from the Explosives Storage and Transport Committee (ESTC) of the Directorate of Ordnance Safety (DOS). The ESTC will consider such matters as compatibility, methods of packaging and the need to restrict stacking heights.

Segregation

When NEDG of various dangerous goods classes are stored together in the same storehouse or compartment of a storehouse, they are to be separated from each other in accordance with the requirements of the Hazardous Chemicals – Storage and Segregation Guide for Workplaces.

Petrol Oils and Lubricants

The criteria in Annex A for the separation of Petrol, Oils and Lubricants (POL) storage sites from EO storage sites is further detailed in Regulation 5.4 Annex C.

Authorisation Requirements

Storehouses containing NEDG are to be authorised by the relevant Licensing Authority. The authorisation is to identify, as a minimum, the Dangerous Goods Classes and quantities that are permitted to be stored together with the conditions or limitations that apply to the particular site.

Application for Non – Explosive Dangerous Goods Facility Authorisation (Form EO 007)

The application process for new NEDG Authorisations is detailed in Regulation 5.2 Procedure 1.

Packaging and Marking Requirements

The authorised packages for NEDG are specified in the relevant Topic - 025 of the item publication. Packages of all NEDG are to be stencilled or labelled in accordance with the Defence standard DEF (AUST) 1000C. The pseudo HCC is not to be marked on packages for NEDG.

Packages containing NEDG that will give off spontaneously flammable gas when brought into contact with moisture are to carry an additional marking to show the substance the item contains - see specimen at Annex B.

Display of Fire Division Symbols and Supplementary Fire Symbols

Stores which contain EO and NEDG. Storehouses containing both EO and NEDG are to be signposted on each vehicular approach to the storehouse with the fire division symbol representing the most significant hazard for the EO stored, together with the applicable supplementary fire symbol(s) as provided for at paragraph 1.17.

NEDG Only Storehouses. Storehouses containing NEDG only are to be signposted on each vehicular approach to the storehouse with the EO fire division symbol signifying the greatest risk, together with the applicable supplementary fire symbol(s). Additionally, when NEDG are stored in compartments of a multi-compartmented storehouses the appropriate supplementary symbol(s) is to be displayed adjacent to the door of the relevant compartment, with the supplementary symbol(s) for the most significant hazard(s) displayed on the approaches to the storehouse. The supplementary symbol(s) is to be positioned so as not to be obscured when the door of the compartment is open. For additional information on supplementary symbols, refer to Regulation 4.7 Procedure 1 and its associated Annexes C and D.

INSPECTION

NEDG are to be subjected to inspection as for EO (see Regulation 1.5 Procedure 1).
1.19 Weapons or weapon components NEDG that are taken into an EO workshop for inspection or maintenance are to be handled as if they were EO of the HCC assigned to them for storage purposes.

Annexes:
A. Storage of Non-Explosive Dangerous Goods in Explosive Ordnance Storage Areas.
B. Non-Explosive Dangerous Goods - Special Markings
STORAGE OF NON-EXPLOSIVE DANGEROUS GOODS IN EXPLOSIVE ORDNANCE STORAGE AREAS

1. Articles or substances of dangerous goods other than class 1 dangerous goods, known as Non-Explosive Dangerous Goods (NEDG), ideally should be stored in separate facilities. However, in special circumstances, where the storage of NEDG of various classes has been deemed essential within an Explosive Ordnance (EO) storage area, such storage must be authorised by the Licensing Authority (LA).

2. Advice on the treatment of NEDG stored within EO storage areas is contained in the tables below. Pseudo Hazard Classification Codes (HCC) for each item will be assigned by the Explosives Storage and Transport Committee (ESTC) of the Directorate of Ordnance Safety (DOS) and are available for viewing in the Defence Explosive Ordnance Classification List (DEOCL). NEDG may be stored in an EO storage area at the prescribed Quantity Distances (QD) appropriate to the assigned pseudo HCC. Any further advice required can be obtained from the ESTC.

3. This annex does not contain information for the storage of NEDG outside an EO storage area. This information can be found in the Hazardous Chemical – Storage Segregation Guide for Workplaces.

Note:

The lists of articles and substances contained in the tables below are not exhaustive nor are they designed to be.

Articles of EO that contain NEDG

4. Table 1A-1 contains treatment information when stores within an EO storage area for weapons or weapon components filled with NEDG substances when stored within an EO Storage Area.

Bulk Liquids

5. Table 1A-2 contains information regarding the treatment of some NEDG bulk liquids when stored within an EO storage area.
<table>
<thead>
<tr>
<th>Type of NEDG</th>
<th>Class of Dangerous Goods</th>
<th>Examples</th>
<th>Type of storage for NEDG</th>
<th>Minimum distance between NEDG and any building containing explosive ordnance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetone</td>
<td>3.1</td>
<td>1090</td>
<td>Acetone ampoules, pistols bomb, aircraft or petrols delay</td>
<td>Surface Storage</td>
</tr>
<tr>
<td>Ammonium nitrate</td>
<td>5.1</td>
<td>1842</td>
<td>Prilled ammonium nitrate</td>
<td></td>
</tr>
<tr>
<td>Ammonium perchlorate (&gt;44 microns)</td>
<td>5.1</td>
<td>1442</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aniline and furfuryl alcohol</td>
<td>6.1</td>
<td>1547 2874</td>
<td>Aniline and furfuryl alcohol in drums</td>
<td></td>
</tr>
<tr>
<td>Calcium phosphate</td>
<td>4.3</td>
<td>1360</td>
<td>Candles white smoke (not Mk N6), lights indicating torpedo lifebuoy</td>
<td></td>
</tr>
<tr>
<td>Chlorosulphonic acid</td>
<td>8</td>
<td>1754</td>
<td>Bombs aircraft practice smoke filled CSAM</td>
<td></td>
</tr>
<tr>
<td>Dichlorodicyethyl sulphine</td>
<td>6.1</td>
<td>7027 (Provisional)</td>
<td>Bottles steel 1 L</td>
<td></td>
</tr>
<tr>
<td>Hexachlorobenzene</td>
<td>6.1</td>
<td>2729</td>
<td>Smoke composition</td>
<td></td>
</tr>
<tr>
<td>Hydrogen peroxide</td>
<td>5.1</td>
<td>2014 or 2015</td>
<td>Some torpedoes of United States design</td>
<td></td>
</tr>
<tr>
<td>Isopropyl nitrate and methanol</td>
<td>3.1</td>
<td>1222 1230</td>
<td>Generator gas chemical warfare Mk 1 and 2</td>
<td>Surface Storage</td>
</tr>
<tr>
<td>Magnesium/iron powder/lithium hydride</td>
<td>4.3</td>
<td>1418 1414</td>
<td>Submarine bubble decay Mk N2</td>
<td></td>
</tr>
<tr>
<td>Match composition</td>
<td>4.1</td>
<td>2254</td>
<td>Matches fuze safety, Matches fuze safety No 4, Matches safety flamer No 4, Matches waterproof safety Nos 4 and 5, Matches fuzee</td>
<td></td>
</tr>
<tr>
<td>Nitrocellulose</td>
<td>4.1</td>
<td>2555 2556 2557</td>
<td>Combustible cartridge cases, Caps and discs for same</td>
<td></td>
</tr>
<tr>
<td>Nitromethane</td>
<td>3</td>
<td>1261</td>
<td>Used for cratering, Store without heavy confinement. Standard drums stacked not more than two drums high</td>
<td></td>
</tr>
</tbody>
</table>
### Table 1A-1: Treatment of some NEDG in EO storage areas

<table>
<thead>
<tr>
<th>Type of NEDG</th>
<th>Class of Dangerous Goods</th>
<th>Examples</th>
<th>Type of storage for NEDG</th>
<th>Minimum distance between NEDG and any building containing explosive ordnance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Otto Fuel II</td>
<td>9</td>
<td>UN 3082</td>
<td>Mk 46 and Mk 48 torpedoes</td>
<td></td>
</tr>
<tr>
<td>Perchlorates (inorganic) not otherwise specified</td>
<td>5.1</td>
<td>1481</td>
<td>Rocket motors or plastic propellants</td>
<td></td>
</tr>
<tr>
<td>Petrol gel</td>
<td>3.1</td>
<td>1203</td>
<td>Bombs incendiary filled target practice, incendiary (without exploders)</td>
<td></td>
</tr>
<tr>
<td>Phosphorus red</td>
<td>4.1</td>
<td>1338</td>
<td>Containers smoke</td>
<td></td>
</tr>
<tr>
<td>Phosphorus white</td>
<td>4.2</td>
<td>1381</td>
<td>81 mm Mortars</td>
<td>Surface Storage</td>
</tr>
<tr>
<td>Potassium nitrate</td>
<td>5.1</td>
<td>1486</td>
<td>Slow match</td>
<td></td>
</tr>
<tr>
<td>Titanium tetrachloride</td>
<td>8</td>
<td>1838</td>
<td>Bombs aircraft practice smoke. Breakup 8 ½ lb filled FM. Bomb aircraft practice smoke 25 lb filled FM. Containers smoke Nos 1 and 2 FM. Drums Nos 2 and 4. Installation SC Type G filled FM.</td>
<td></td>
</tr>
</tbody>
</table>

Treat the NEDG as UN HD 1.3.
<table>
<thead>
<tr>
<th>Type of DG</th>
<th>Examples</th>
<th>EO Storage Area allowed</th>
<th>Underground Storage allowed</th>
<th>Type of Storage for DG</th>
<th>Minimum distance between DG and any building or stack containing EO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dangerous liquid substances other than Class 1 when stored in bulk</td>
<td>Aviation Spirit</td>
<td>NO</td>
<td>YES</td>
<td>1. Surface storage with a surrounding bund wall capable of holding the whole of the contents with a special provision for segregated drainage.</td>
<td>When Type 1 storage buildings are used, these storage places should be sited at least at the IBD from any EO building in the area. Where POL facilities are vital, a minimum distance of 450 m applies from sites containing HD 1.1 and/or 1.2 EO.</td>
</tr>
<tr>
<td></td>
<td>Gasoline/Petrol</td>
<td>NO</td>
<td>NO</td>
<td>OR</td>
<td>When Types 2 or 3 storage sites are used, such sites should be sited at least at twice the D4 distance from HD 1.1 EO with a minimum distance of 25 m.</td>
</tr>
<tr>
<td></td>
<td>High Test Peroxide (HTP)</td>
<td>NO</td>
<td>NO</td>
<td>2. Surface storage with a protective roof of 150 mm reinforced concrete and a surrounding bund wall capable of containing the whole of the contents and of sufficient strength to withstand blast loading and fragment attack with special provision for segregated drainage. The wall should be protected by earth heaped against it.</td>
<td>The separation distance from EO of HDs 1.2, 1.3 or 1.4 should be a minimum of 25 m.</td>
</tr>
<tr>
<td></td>
<td>Inhibited Red Fuming Nitric Acid (IRFNA)</td>
<td>NO</td>
<td>NO</td>
<td>OR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Isopropyl Nitrate (IPN)</td>
<td>NO</td>
<td>NO</td>
<td>3. Underground storage site covered by at least 100 mm of concrete or 600 mm of earth.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Methanol/Water</td>
<td>YES</td>
<td>YES</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mixed Amine Fuel (MAF)</td>
<td>YES</td>
<td>YES</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Otto Fuel</td>
<td>YES</td>
<td>YES</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Perchloric Acid Electrolyte</td>
<td>YES</td>
<td>YES</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Potassium Hydroxide Electrolyte</td>
<td>YES</td>
<td>YES</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diesel Fuel</td>
<td>YES</td>
<td>YES</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kerosene</td>
<td>YES</td>
<td>YES</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Paraffin</td>
<td>YES</td>
<td>YES</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lubricating Oils</td>
<td>YES</td>
<td>YES</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1A–2: Treatment of some Dangerous Goods Bulk Liquids in EO storage areas
NON-EXPLOSIVE DANGEROUS GOODS – SPECIAL MARKINGS

SODIUM PHOSPHIDE

DANGEROUS IF NOT KEPT DRY

THE CONTENTS OF THIS PACKAGE ARE LIABLE, IF BROUGHT INTO CONTACT WITH MOISTURE, TO GIVE OFF A SPONTANEOUSLY FLAMMABLE GAS.
<table>
<thead>
<tr>
<th>Type of NEDG</th>
<th>Class of Dangerous Goods</th>
<th>Examples</th>
<th>Type of storage for NEDG</th>
<th>Minimum distance between NEDG and any building containing explosive ordnance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weapons or components of weapons filled with one of the following substances:</td>
<td>Class</td>
<td>UN No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acetone</td>
<td>3.1</td>
<td>1090</td>
<td>Acetone ampoules. Pistols bomb aircraft or pistols delay</td>
<td>Surface Storage</td>
</tr>
<tr>
<td>Ammonium nitrate</td>
<td>5.1</td>
<td>1942</td>
<td>Prilled ammonium nitrate</td>
<td></td>
</tr>
<tr>
<td>Ammonium perchlorate (&gt;44 microns)</td>
<td>5.1</td>
<td>1442</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aniline and furfuryl alcohol</td>
<td>6.1</td>
<td>1547</td>
<td>Aniline and furfuryl alcohol in drums</td>
<td></td>
</tr>
<tr>
<td>Calcium phosphide</td>
<td>4.3</td>
<td>1360</td>
<td>Candles white smoke (not Mk N6). Lights indicating torpedo/ lifebuoy</td>
<td></td>
</tr>
<tr>
<td>Chlorosulphonic acid</td>
<td>8</td>
<td>1754</td>
<td>Bombs aircraft practice smoke filled CSAM</td>
<td></td>
</tr>
<tr>
<td>Dichlorodiethyl sulphine</td>
<td>6.1</td>
<td>7027</td>
<td>Bottles steel 1 L</td>
<td></td>
</tr>
<tr>
<td>(Provisional)</td>
<td></td>
<td>2874</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hexachlorobenzene</td>
<td>6.1</td>
<td>2729</td>
<td>Smoke composition</td>
<td></td>
</tr>
<tr>
<td>Hydrogen peroxide</td>
<td>5.1</td>
<td>2014 or 2015</td>
<td>Some torpedoes of United States design</td>
<td></td>
</tr>
<tr>
<td>Iso-propyl nitrate and methanol</td>
<td>3.1</td>
<td>1222</td>
<td>Generator gas chemical warfare Mks 1 and 2</td>
<td>Surface Storage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1230</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnesium/Iron powder/Lithium hydride</td>
<td>4.3</td>
<td>1418</td>
<td>Submarine bubble decoy Mk N2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1414</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitrocellulose</td>
<td>4.1</td>
<td>2555</td>
<td>Combustible cartridge cases. Caps and discs for same</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2556</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2557</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitromethane</td>
<td>3</td>
<td>1261</td>
<td>Used for cratering. Store without heavy confinement. Standard drums stacked not more than two drums high</td>
<td></td>
</tr>
<tr>
<td>Type of NEDG</td>
<td>Class of Dangerous Goods</td>
<td>Examples</td>
<td>Type of storage for NEDG</td>
<td>Minimum distance between NEDG and any building containing explosive ordnance</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>--------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>--------------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Weapons or components of weapons filled with one of the following substances:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Otto Fuel II</td>
<td>9</td>
<td>3082 Otto Fuel II 9 3082</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perchlorates (inorganic) not otherwise specified</td>
<td>5.1</td>
<td>1481 Perchlorates 5.1 1481</td>
<td>Rocket motors or plastic propellants</td>
<td></td>
</tr>
<tr>
<td>Petrol gel</td>
<td>3.1</td>
<td>1203 Petrol gel 3.1 1203</td>
<td>Bombs incendiary filled target practice, incendiary (without exploders)</td>
<td></td>
</tr>
<tr>
<td>Phosphorus red</td>
<td>4.1</td>
<td>1338 Phosphorus red 4.1 1338</td>
<td>Containers smoke</td>
<td></td>
</tr>
<tr>
<td>Phosphorus white</td>
<td>4.2</td>
<td>1381 Phosphorus white 4.2 1381</td>
<td>81 mm Mortars</td>
<td>Surface Storage</td>
</tr>
<tr>
<td>Potassium nitrate</td>
<td>5.1</td>
<td>1486 Potassium nitrate 5.1 1486</td>
<td>Slow match</td>
<td></td>
</tr>
<tr>
<td>Titanium tetrachloride</td>
<td>8</td>
<td>1838 Titanium tetrachloride 8 1838</td>
<td>Bombs aircraft practice smoke. Breakup 8 ½ lb filled FM. Bomb aircraft practice smoke 25 lb filled FM. Containers smoke Nos 1 and 2 FM. Drums Nos 2 and 4. Installation SC Type G filled FM.</td>
<td></td>
</tr>
<tr>
<td>Type of NEDG</td>
<td>Class of Dangerous Goods</td>
<td>Examples</td>
<td>Type of storage for NEDG</td>
<td>Minimum distance between NEDG and any building containing explosive ordnance</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------------</td>
<td>---------</td>
<td>--------------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Acetone</td>
<td>3.1</td>
<td>Acetone ammounites, pistols, bombs, aircraft or pistols, delay.</td>
<td>Surface Storage</td>
<td>Treat the NEDG as UN HD 1.3</td>
</tr>
<tr>
<td>Ammonium nitrate</td>
<td>5.1</td>
<td>Prilled ammonium nitrate.</td>
<td></td>
<td>Treat the NEDG as UN HD 1.1</td>
</tr>
<tr>
<td>Ammonium peroxide (&gt;44 microns)</td>
<td>5.1</td>
<td></td>
<td></td>
<td>Treat the NEDG as UN HD 1.3</td>
</tr>
<tr>
<td>Aniline and furfuryl alcohol</td>
<td>6.1</td>
<td>Aniline and furfuryl alcohol in drums.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium phosphate</td>
<td>4.3</td>
<td>Candies, white smoke (not MK N5). Light indicating torpedoes, blisters.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chlorosulfonic acid</td>
<td>8</td>
<td>Bombs aircraft practice smoke filled (CSAM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dichlorodieethyl sulphine</td>
<td>6.1</td>
<td>Bottles, steel L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hexachlorobenzene</td>
<td>6.1</td>
<td>Smoke composition.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrogen peroxide</td>
<td>5.1</td>
<td>Some torpedoes of United States design.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iso-propyl nitrate and methanol</td>
<td>5.1</td>
<td>Generator gas chemical warfare Mix 1 and 2.</td>
<td>Surface Storage</td>
<td></td>
</tr>
<tr>
<td>Magnesium/iron powder/lithium hydride</td>
<td>4.3</td>
<td>Submarine bubble decoy Mg N2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitrocellulose</td>
<td>4.1</td>
<td>Combustible cartridge cases. Caps and disks for same.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitromethane</td>
<td>3</td>
<td>Used for cratering. Store without heavy confinement. Standard drums stacked not more than two drums high.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Otto Fuel II</td>
<td>9</td>
<td>Mk 46 and Mk 48 torpedoes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Penthanitrate (organic) not otherwise specified</td>
<td>5.1</td>
<td>Rocket motors or prismatic propellants.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Petrol gel</td>
<td>5.1</td>
<td>Bombs, incendiary filled target practice, incendiary (without explosives).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phosphorus red</td>
<td>4.1</td>
<td>Containers smoke.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phosphorus white</td>
<td>4.2</td>
<td>81 mm Mortars.</td>
<td>Surface Storage</td>
<td></td>
</tr>
<tr>
<td>Potassium nitrate</td>
<td>5.1</td>
<td>Generator gas chemical warfare Mix 1 and 2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tetrabromomethane</td>
<td>8</td>
<td>Bombs, aircraft practice smoke. Breakup 8 ½ lb filled FM. Bombs aircraft practice smoke 25 lb filled FM. Containers smoke No. 1 and 2 FM. Drums Nos. 2 and 4. Installation SC Type G filled FM.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- UN No: United Nations Number
- HD: Hazardous Material
- Surface Storage: Storage at the surface of the ground or water.
REGULATION 4.4 - FACILITY OPERATIONS

General Overview

4.1 The purpose of this chapter is to provide guidance for authorities on the promotion of safe and efficient operations in Explosive Ordnance (EO) areas. It contains considerations which may serve as an aid to users in the preparation of instructions on the subject. Occupational health and safety issues of operations in explosive ordnance areas are to be conducted in accordance with the requirements of the Defence Safety Manual (SafetyMan).

Requirements

4.2 All EO facilities under the control of Defence must be operated in accordance with this regulation and the associated procedures.

SAFETY PRECAUTIONS

General

4.3 Posting of Warning Notices. Notices are to be posted in a prominent position at the entrance to EO areas and at each facility not situated within a compound having controlled access.

4.4 Industrial Safety. Personnel are to be made aware of explosives and industrial safety.

4.5 Compliance to regulations. Staff involved with the handling or use of EO are to comply with all regulations and procedures which may affect them in the course of their duties.

4.6 Patrolling and Guarding of EO Areas. Each entrance is to be guarded. When the entrance is not guarded they are to be closed and secured. Every EO area is to be patrolled in accordance with the requirements of the Defence Security Principles Framework (DSPF).

4.7 Control of Keys. The keys of all gates and doors to EO areas and facilities, when not in use, are to be deposited in a safe place authorised in accordance with the DSPF.

4.8 Thunderstorms. Work involving EO and in buildings containing EO is to cease during thunderstorms and personnel should be evacuated to a suitable location at the appropriate distance from Potential Explosion Sites (PES). When a thunderstorm is imminent, truck loads of EO should be moved undercover. Loads which must be left in the open should be covered.

4.9 Provisions for Medical Facilities. Provision is to be made for first-aid and medical attention at least to the standards issued by Worksafe Australia. Details of the arrangements are to be made known to all personnel.

4.10 Lighting of Fires. The lighting of fires is strictly prohibited unless specially authorised by the OIC of the establishment.

4.11 Locations for Work on EO. Work in EO areas is to be carried out in locations prepared and designated for the purpose.

4.12 Inspection of EO Facilities. All EO facilities are to be inspected periodically.

Personnel

4.13 Personnel employed in EO Areas. A person should not be employed in the EO area unless the CO/OC/director/superintendent is satisfied that the person is suitable for such employment.

4.14 Workplace Induction. Before commencing work in an EO area each person is to be formally inducted into the workplace by receiving instructions on the basic safety precautions required in the area.
4.15 **Admission to EO Areas.** No person must enter an EO area except by authorised entrances, and only then under authority of a pass issued by the CO/OC/director/superintendent or other officer-in-charge. Personnel are not to remain in the EO area after their authorised duties have ceased.

4.16 Any person showing the least signs of intoxication or impairment from drugs must not be admitted to EO areas.

4.17 All persons, including visitors, before entering an EO area or facility, are to search their pockets and are to deposit outside the entrance any prohibited article that they have with them. All persons may be challenged for prohibited articles. A proportion of employees should be challenged on a random basis.

4.18 **Employee Working Alone.** No one person should be permitted to work alone (or in a situation where another person cannot provide immediate assistance in case of an accident) in explosives workshop or laboratory operations which involve the assembly or breakdown of EO or the exposure of explosive fillings, or in any other operation which involves the opening of packages and the exposure of loose EO.

4.19 **Wearing of Rings and other Jewellery.** Good industrial safety practices discourage the wearing of rings and other jewellery by personnel employed in workshops. Rings and other jewellery should not be permitted in EO workshops.

**Controlled Activities**

4.20 **Prohibited and Restricted Articles.** No stores, other than EO which has been properly classified and authorised for storage therein, and such tools, appliances and materials as are authorised from time to time, are to be permitted into an EO area.

4.21 A list of specific items to be prohibited or strictly controlled is located in Regulation 4.4 Procedure 1, Annex B.

4.22 **Food and Drink.** When approved by the Licensing Authority tea rooms may be located within the EO area.

4.23 **Smoking.** Smoking inside EO areas is strictly forbidden except in authorised smoking areas.

4.24 Prominent signs are to be displayed at each exit from the smoking area with the wording:

‘**NO SMOKING BEYOND THIS POINT**’

A sign with the wording:

‘**WARNING NO LIVE AMMUNITION OR EXPLOSIVES ARE PERMITTED IN THIS AREA**’

should be placed at or near the entrance to the smoking area.

4.25 **Private Motor Vehicles.** Standing orders are to include regulations to cover local conditions for the certification, control and use of private vehicles in an EO area.

4.26 **Portable Hand Lights.** Portable hand lights may be used within the EO area if they are of a design that meets the electrical requirements for the particular building/area in which they are to be used.

4.27 **Battery Operated Devices.** Battery operated devices may be used in locations within the EO area at the discretion of the CO/OC/director/superintendent. Only ‘intrinsically safe’ devices should be approved for use in those areas where EED, explosive dust or other conditions which might give
rise to an explosion are present. To be ‘intrinsically safe’, the device should be incapable of producing sufficient energy to initiate an explosion.

4.28 **Photography.** Photographs taken within the EO area should be restricted to those required for official purposes. Where EO is exposed, Electro-Explosive Devices (EED) are involved or explosive dust or flammable gases may be present, the use of cameras with electrically operated equipment should be avoided unless specially approved for the purpose.

4.29 **Radioactive Materials.** As a general rule, radioactive material (except depleted uranium EO—see Regulation 5.4) should not be stored within an EO area. If it is necessary to keep such material inside an EO area, it must be kept in a separate building of robust construction. The building must be separated from the nearest PES by at least process building distance for the EO involved. If the radioactive material is stored underground, the separation distance must be as if the material belonged to Hazard Division (HD) 1.1. If a building not of robust construction is used, the separation distance must be at least the inhabited building distance from a PES.

**Operations in an explosive ordnance storehouse**

4.30 **Explosive Content Boards.** An Explosive Content Board is required to record the Net Explosive Quantity (NEQ) stored within the facility at any given time.

4.31 **Permitted Operations in a Storehouse.** Work on EO permitted in storehouse is limited to banding, stencilling, labelling and desiccant renewal where the container is not opened. For the purposes of Annual Ordnance Inspections, an authorised inspector may open ‘closed’ or ‘fraction’ containers to verify and validate the contents provided the individual package is removed to the exterior of the storehouse and the access door is closed prior to opening the container.

4.32 **Cleanliness of Buildings.** The cleanliness of all magazines and other buildings containing EO should be maintained at a high standard. The following precautions must be taken:

a. Dangerously combustible materials, such as paper, oily rags, cotton waste, paints, solvents, volatile liquids, and painting cloths required for use in an EOSH or workshop should be removed to a safe storage place when not actually in use;

b. Particular care should be exercised to avoid the presence of steel wool, sand, gravel, or any other abrasive substance upon the floors, tables, or other working places where EO is being handled;

c. Explosive dusts or vapours should not be allowed to accumulate inside or outside a building;

d. Electrical fixtures and motors should be kept free from dust; and

e. Special precautions to control personnel and EO (see paragraphs 4.39–4.43) should be observed when packages containing EO liable to initiation by spark or friction are stored and are not in dust tight containers.

4.33 **Authorised Stores and Equipment.** Only stores, tools and equipment authorised and required for use should be permitted in EOSH. A list of stores, tools and equipment approved for use should be displayed in the building. In particular, empty pallets and dunnage should not be allowed to accumulate in EOSH containing EO.

4.34 **Electrical Extensions.** When not specifically prohibited and when it is necessary to use extension lights during the handling, loading, or unloading of EO in magazines or other buildings or onboard vessels, lighters, railroad cars, trucks, or other vehicles, portable electric extension lights may be used provided they are in accordance with Regulation 6.3 Procedure 1.

4.35 **Handling Equipment.** Approved handling equipment should be used, maintained and inspected in accordance with the manufacturer’s instructions and recommended maintenance schedules.
4.36 Parking of Vehicles, Railcars and Barges. Vehicles, railcars and barges should be parked in the vicinity of magazines and EO workshops only for the period of time required for loading or unloading. At all other times, designated holding or marshalling areas should be used for parking purposes. When such vehicles/vessels are moving through EO areas, routes should be used which minimise the risk of an explosion and propagation between PES.

Operations in Workshops and Laboratories

4.37 The special requirements for the repair, modification, inspection and proof of EO in explosive ordnance workshops and laboratories are detailed in paragraphs 4.38 – 4.69. These activities should only be conducted in the locations designated. The NEQ of EO permitted in workshops or laboratories should be governed by the Quantity Distance (QD) in Regulation 5.4 of this manual.

4.38 Working Conditions. The following working conditions are to apply to EO workshops and laboratories:

a. Clean conditions (see paragraphs 4.46 – 4.48) should be observed when explosive contents are exposed;

b. Each work area should be thoroughly cleaned daily and each time work is changed from one nature of explosive to another;

c. Before any article is taken into an EO workshop operating under clean conditions, it must be examined externally and any grit or other substance likely to violate the clean conditions removed;

d. Work benches on which explosives are likely to be exposed should be so situated that nothing can accidentally fall on the explosives;

e. Work should be arranged so that explosives are never exposed to direct sunlight;

f. EO not being worked upon should be kept covered;

g. Oils, spirits, paint, flammable/volatile liquids and other hazardous chemicals should be stored in accordance with SafetyMan, in sound containers which, in turn, should be kept in a metal tray the size of which should be adequate to contain spilling. The quantity of such liquids should be kept to a minimum. During non-working hours or when not in use, they should be kept in a metal locker outside the building or in a special fireproof room/container consistent with Hazardous Chemicals Management Procedure 19 - Cabinets and Cages for Storage of Hazardous Chemicals. These lockers should be included in the daily security check. EO laboratories may store hazardous chemicals in accordance with Procedure 5 paragraph 5.28 and, providing the laboratory building has access control, daily security checks of DG containers are not required;

h. All doors in EO workshops not equipped with quick release hardware must be unlocked when work is in progress;

i. Protective shielding should be erected around assembly or disassembly apparatus to protect operators against flash and splinters in case of accident. Protective shields should be proof-tested prior to initial use and only used for the purposes for which they have been proof-tested;

j. When movement of unpackaged EO is necessary, care must be taken to ensure that it is securely held and is protected against damage and dislodgment;

k. EO containing exposed percussion caps or primers should have the caps protected from accidental striking by means of cartridge clips, or similar;
1. EO containing an EED should not be removed from its package for longer than is essential so as to minimise the time during which it may be susceptible to electromagnetic radiation. Whenever it is necessary to remove EO of this kind from its package, the safe distances from radio frequency sources should be observed;

m. Rooms for handling grenades, and other similar small stores, should be provided with a disposal chute, or equivalent facility;

n. Workshops or parts of workshops used for paint or rust removal should not be considered as clean areas while being so used. They should be thoroughly scrubbed and cleaned before being included in a clean area;

o. Paint or rust removal and painting operations should not be conducted in the same workshop room;

p. Any painting operations conducted in the adjacent bays of the workshop to explosives bays must be equipped with efficient fume removal systems or not operated when explosives operations are in progress (see also paragraph 4.54);

q. Ovens for drying non-explosive components should not be located in clean areas or EO workshops; and

r. Non-ferrous metal receptacles should be appropriately located at workplaces where there is a possibility of loose explosives or propellants being scattered on floors or work benches.

4.39 Personnel and Explosives Limits. To reduce the risk of injury to personnel and damage to property, the number of personnel employed, and the quantity of explosives within an EO workshop, should be kept to the minimum required to maintain the operation. Dividing the overall quantity into separate bays or rooms, with substantial internal walls or barricades, will reduce the risk of explosive propagation and probably reduce the effects of an explosives accident. The personnel and explosives limits vary with each operation and should be included in the Standard Operating Procedure (SOP).

4.40 A personnel limit is to be assessed for each building, room or area in accordance with the following principles:

a. The number of persons employed should be the minimum compatible with the highest standards of safety, quantity and an even flow of work;

b. The personnel limit should include all persons employed including those employed on the movement of the EO or on other tasks in the immediate vicinity;

c. The limit should include supervisors or inspectors if they are present for more than 1 hour per day; and

d. The limit should be related to the size of the building and the number of exits. Irrespective of other considerations, each person is to have ample working space and suitable evacuation routes.

4.41 A working explosives limit for each building, room or area should be assessed in accordance with the following principles:

a. It should not exceed the quantity permitted by available QD;

b. The limit should represent the minimum number of containers or rounds required to maintain an even and continuous flow of work;

c. The working limit should include all explosives held within the building and the immediate vicinity. It should also include EO that have been processed or waiting to be processed, whether on vehicles or on the ground; and
4.42 Signs should be conspicuously posted to provide the following information:
   a. The nature and type of the EO being processed;
   b. Details of the operation, eg re-boostering;
   c. The compatibility group, HD and fire class of the EO; and
   d. Personnel and explosives limits.

4.43 This information should be repeated as necessary for rooms or confined areas where special working conditions are prescribed. The explosives limits may be stated in terms of NEQ and/or number of rounds or containers.

4.44 **Standard Operating Procedures.** A standard operating procedure (SOP) should prescribe step-by-step procedures to control operations and the precautions to be taken in the course of workshop and laboratory operations. It should be available in the building for the operation in progress.

4.45 A SOP should be approved by the CO/OC/director/superintendent and include, as applicable:
   a. Drawings, specifications, gauge schedules, tools, apparatus, and restriction lists;
   b. Static electricity grounding (earthing) requirements;
   c. Maximum and/or minimum humidities;
   d. Clothing and footwear requirements;
   e. The maximum number of personnel to be in the workshop or laboratory at any one time;
   f. The maximum quantity of EO permitted in the building and/or to be worked on at any one time; and
   g. Additional safety precautions applicable to the EO being worked on.

4.46 **Clean Working Areas.** Clean conditions may be described as a set of precautions that are taken in EO laboratories, workshops, proof areas, and certain magazines, to prevent the introduction of, or the contact of explosives with, extraneous matter such as ferrous metals, aluminium or aluminium alloys or grit which might cause an explosion through friction or spark.

4.47 Working areas that are required to be maintained under clean conditions should be provided with a changing lobby. The lobby should be divided by a barrier to separate the clean area from the ‘dirty’ area.

4.48 **Clothing for Clean Conditions.** Clothing used in EO workshops or laboratories maintained under clean conditions should be specified by the licensing authority, and will normally include items such as spark-proof conductive footwear, flame-proofed smocks or coveralls and suitable hair covering.

4.49 **Static Electricity Precautions.** EO workshops should be provided with conductive or antistatic flooring. Conductive flooring is designed to provide a path of conductivity for the free movement of electrostatic charges, thereby preventing a charge accumulation, see Regulation 6.3 Procedure 2.
4.50 Antistatic flooring differs from conductive flooring in that it offers greater resistance to the passage of electrical current.

4.51 Grounding (earthing) points should be available for equipment, tools and EO in EO workshops, to prevent a difference of electrical potential between operators and the material that they must handle.

4.52 Conductive/antistatic flooring and grounding (earthing) systems should be tested for continuity in accordance with the manufacturer’s specifications, Australian Standards and any Defence regulations.

4.53 Personnel working in EO workshops should wear appropriate footwear and/or other antistatic devices when conductive/antistatic flooring is present. Such safety devices should be tested daily when in use.

4.54 **Painting Operations.** In accordance with standard good workshop practice:
   a. Painting and stencilling operations should only be conducted in well ventilated rooms or outdoors;
   b. Spray painting operations, when conducted indoors, should be done in spray painting booths, except for minor touch up or stencilling using low pressure spray markers or aerosol containers; and
   c. Operators and helpers should wear protective masks while spray painting is in progress, unless the spray booths are properly exhausted so as to preclude exposure of personnel to toxic atmosphere.

4.55 **Heat Sealing Equipment.** The use of heat sealing equipment for packaging of EO in polyethylene is permitted under the following conditions:
   a. The EO is suited to heat sealing;
   b. Only heat sealing apparatus approved in the SOP is used;
   c. The heat sealing equipment is used in accordance with the manufacturer’s instructions; and
   d. The heat sealing equipment is properly maintained and inspected for serviceability and cleanliness before initial use and at the beginning of each shift, and should be checked for cleanliness (absence of any spillage) before each operation.

4.56 The use of heat sealing equipment within a transit magazine or EO workshop should be restricted to use in a room or segregated area apart from other activities. However, heat sealing equipment must not be permitted in a room maintained under clean conditions.

4.57 Items to be heat sealed should be in serviceable condition and free of defects.

4.58 Detonators and heat sensitive items, such as propellant or explosive samples should be suitably packaged before heat sealing.

4.59 **Tools.** Only non-sparking tools should be used in direct contact with exposed explosives or in rooms maintained under clean conditions.

4.60 Special or locally designed tools and equipment should not be used in EO operations nor should modifications or alterations to approved tools or equipment be made without prior technical approval from the Service Headquarters / Defence Science and Technology Group (DSTG).

4.61 Tools and appliances designed and provided for particular EO operations should not be used for other purposes without approval of the Service Headquarters / DSTG.
Only those tools authorised for use by the applicable SOP for the operation being performed should be permitted in the room or area.

Disposal of EO Packaging and Scrap. All empty EO containers, packaging materials, empty cartridge cases, empty EO components, and the like, received from user units should be given a 100 per cent inspection and certified free from explosives in accordance with Regulation 28 of Explosives Transport Regulations 2002 Statutory Rules No. 92, 2002 (ETR), before being declared as scrap, Government provided material in aid to production, or otherwise disposed of.

Suitably trained and competent personnel are to be appointed by unit managers to perform this duty.

Constant supervision should be maintained by supervisory staff and all personnel should be safety conscious. Each operator should be fully acquainted with any hazards associated with the EO on which they are required to work. Before commencing an operation each operator should be familiarised with the particular task that will be performed.

In the event of an accident or incident involving EO, all operations must cease immediately and the situation must be reported to the CO/OC/director/superintendent. Nothing must be disturbed, except in the interest of safety or as may be necessary to give assistance to injured persons. Precautions must be taken to prevent unauthorised personnel from entering the area.

Accidents involving EO must be reported in accordance with these guidelines and other departmental regulations (see Regulation 1.3).

When an EO workshop is vacated, all electrical installations and powered equipment, other than essential services, should be switched off or disconnected. At the end of each working day the building should be secured.

EO remaining in the building should be subject to the following:

- During temporary breaks within the course of a working day, the EO may be left in position provided it is safely stowed, and the explosive composition is not exposed; and
- At the end of each working day EO may be left in the work area providing it is packaged, (except for EO which are not normally stored in packages) and placed on the floor. Items should be grounded (earthed) as appropriate.

The general requirements applying to EO areas and storage facilities, except that no inspection or maintenance operations are permitted within magazines.

Admittance within the barrier of a magazine is confined to those on duty therein. Before entering, all persons are to search their pockets to ensure the absence of prohibited articles.

All persons entering a magazine are to observe the rules governing the maintenance of ‘clean conditions’.

Cleanliness is of vital importance in magazines. Cleaning implements, which are to be made of non-ferrous metal, are to be kept to a minimum. The wheels and fittings of all trucks used in magazines are to be of copper or copper alloy. All floors and platforms are to be cleaned frequently. Fittings are to be kept free from dust or grit.

All explosive safety requirements for workshops prescribed within this regulation apply to preparation facilities.
Operations in a Guided Weapons Facility

4.75 All explosive safety requirements for workshops prescribed within this regulation apply to Guided Weapons Facilities. Additional operating requirements are as follows:

a. Roadways. Vehicles and personnel are not permitted to proceed beyond activated red lights on approach roads without permission from the appropriate weapons supervisor.

b. Explosive Testing. All testing of Guided Weapons with explosives or propellants present are to be conducted remotely within a test cell, except where deviation has been authorised by Directorate of Ordnance Safety. No personnel are permitted in the test cell or the surrounding area while the test is being conducted.

c. Weapons Assembly Room Loading Doors. The main loading door between the weapons assembly room and its loading bay is to remain closed during remote tests.

d. Loading Bays. Loading and packaging operations are not permitted at a loading bay when remote testing are being conducted in an adjacent test cell.

Operations in an Under-Precautions Facility

4.76 All explosive safety requirements for workshops prescribed within this regulation apply to under-precautions facilities.

Maintenance of Watercraft, Vehicle or Aircraft Components containing Explosives

4.77 All explosive safety requirements for workshops prescribed within this regulation apply to facilities or areas used to conduct the maintenance of Watercraft, Vehicle or Aircraft Components containing explosives.

Burning and Demolition Grounds

4.78 Authority for Disposal of Explosive Ordnance. EO is not to be destroyed with confirmation of sentence unless the EO is considered to be in a dangerous condition or it has been recovered from an EOD operation.

4.79 Record of Disposal. Detailed and accurate records of burning or demolition activities are to be maintained in a hardbound book with numbered pages.

4.80 Disposal Operating Hours and Conditions. The hours and operating conditions which destruction is permitted are to be specified.

4.81 Prohibited Articles. The articles which are prohibited or restricted in EO Areas are also to be controlled in burning and demolition grounds.

4.82 Communications. Communications are to be established between the demolition shelter or the firing point, the sentry posts and the establishment’s administration area.

4.83 Control of Access Personnel and Vehicles. Control of the burning or demolition ground, personnel and vehicles are to be established during operations.

4.84 Special Fire Precautions. Special fire precautions are to be undertaken prior to disposal activities being conducted.

4.85 Conduct of Operations. The following requirements are to be undertaken prior to the commencement of any disposal activity:

a. Notification to Civilian Authorities;
b. Warning to Establishment Staff;

c. Communications are to be established;

d. First Aid/Medical arrangements are to be made in advent of an emergency;

e. Inspection of Demolition Shelter;

f. Fire Prevention and Fire Fighting checks are to be conducted;

g. Escape Routes are to be planned in the event of an emergency;

h. Warning Flags and Sentries are to be posted. Sentries are to be briefed prior to placement;

i. Restricted Articles are to be controlled;

j. EO is to be secured at a identified storage location at the burning or demolition ground;

k. Personnel involved in the disposal task are to wear protective dress.

l. Operation is to be conducted via approved operating instructions, that include procedures for misfire; and

m. Post disposal activities are to be completed.

4.86 Packages and Produce. All packages and range produce is to be collected and processed in accordance with relevant instructions, eg empty packages inspected, processed and certified Free From Explosives.

4.87 All personnel, including sentries are to be warned by the Conducting Officer that the removal of range produce is forbidden and of the consequences of removing range produce from these areas.

4.88 Inspection of Burning and Demolition Grounds. Burning and Demolition Grounds are to be inspected for the following aspects at least every three months:

a. Cleanliness;

b. Serviceability of boundary fences;

c. Serviceability of fixed communications;

d. Signposting;

e. Serviceability of fire fighting equipment;

f. Fire breaks; and

g. Estate management.

4.89 Surrender of Burning or Demolition Grounds. When a burning or demolition ground is no longer required it is to be surrendered.

Use of Explosives for Displays and Demonstrations

4.90 Licensing. Display areas are to be licensed by the Licensing Authority.
4.91 Display Management. For each display a Safety Officer is to be appointed by the Officer in Charge (OIC) of the unit concerned with organising the display.

4.92 Operation of Displays. The operation of the display is to be in accordance with the provisions of AS 2187.4 – 1998.

4.93 Competency of Display Operators. Defence staff trained in the use of Defence EO are not to be assumed as competent firework Display Operators. Displays are not to be conducted by Defence personnel who are not trained in their use. The Display Operator is to be licensed under the relevant State legislation. If military EO or commercial explosives (not Fireworks) are to be used, the Safety Officer is to hold current Defence qualifications to initiate the items used.

4.94 Safety Assessment of Display. Displays are to be conducted within the requirements and the spirit of the explosive safety rules in AS 2187.4 – 1998 and this manual.

4.95 Significant Public Firework Display. When significant Defence assets are to be used in conjunction with a public firework display single Service safety authorities have prime responsibility for the safety of those assets and spectators, and are to ensure that appropriate risk assessments are conducted.

4.96 Use of Defence Explosives. Defence owned or controlled EO is not to be used for non-public funded displays.

4.97 Display Models and Props. Display models or props built to be destroyed, or which may be potentially destroyed by explosives are to be constructed from non-lethal fragment producing materials such as paper, cardboard, polythene, plastic ties and adhesive tape etc.

4.98 Post Display Actions. The Safety Officer is to conduct a clearance of the display site and a post display evaluation. The evaluation report is to be forwarded to the Explosive Ordnance Licensing Authority (EOLA) within the Explosive Ordnance Branch.

Principles for the Operation of Small Quantity Facility

4.99 SQF are to be in the charge of an appropriately qualified and responsible person who is to ensure the safe custody of the EO at all times. SQF are to be operated in accordance with the following principles. This list is in no way exhaustive and the instructions in Procedure 2 for the operation of EO storehouses in designated EO storage areas also apply where applicable:

a. Drill, dummy or instructional ammunition and weapons are not to be stored with live EO. The only exception to this is when an explosive or inert component is packaged separately from the parent item. Such components may be stored together, eg components of the Grenade Hand Practice F3.

b. Packaged kits, eg Ramset kits, and their components may be stored together.

c. Empty packages are not to be stored in SQF with live EO.

d. For security reasons, fired cartridge cases may be stored in SQF with live EO pending ‘free from explosives’ certification, and provided the cartridge cases are in a sealed container and clearly marked. Such storage is to be for the minimum time required.

e. Handling of EO is to be avoided during the approach or progress of an electrical storm.

f. Only those persons actually engaged in the handling of EO are to be in the immediate vicinity of such operations.

g. For EO of HD 1.1 and HD 1.2, the maximum use of unitisation to reduce external hazards is to be adopted. NEQ for each unitised quantity of EO is not to exceed 5 kg. Each unitised quantity is to be separated by at least 1 m from another.
h. Only properly packaged EO may be stored in SQF unless otherwise indicated on the licence.

i. Safes are not to be used as SQF except for storage of small quantities of smoke type stores and small arms ammunition (SAA). Safes so used are not to contain any other valuable and attractive items and are not to contain files and documents that would require the safe to remain unsecured for lengthy periods.

j. The storage of SAA in SQF is to be restricted to ammunition that is not of high explosive configuration and below a calibre of 19.1 mm.

k. Ball and blank SAA should be stored in separate SQF to reduce the possibility of contamination of blank ammunition with ball rounds.

l. Co-located SQF are to be separated by a minimum distance of 2.5 m otherwise the NEQ of each SQF are to be aggregated. However, relocatable magazines constructed in accordance with Australian Standard (AS) 2187 may be a minimum distance of 1 m from each other or to another SQF without aggregation.

m. EO from fraction containers, ie containers having fewer than the recognised full quantity, should always be used first.

n. Unpackaged EO, in particular SAA, is not to be stored in bags. EO that has been issued, and then returned unused, is to be packed into its authorised package before being placed in storage.

o. Packages containing EO that have been wetted are to be carefully wiped dry, especially around the lid, before being stored. Where the package is suspected or known to be not airtight, it is to be opened and the EO inside inspected and, if necessary, dried carefully item by item.

p. Packages are to be stored in SQF’s in such a way that air may be circulated freely around and under them.

q. Articles such as paints, oils, chemicals, other dangerous goods and cleaning rags etc are not to be stored in SQF.

r. The issue or receipt of EO, from or to, packages in SQF is permitted provided all packages are subsequently closed (see Regulation 2.3 Procedure 4 paragraph 4.30b).

Transfer Operations at Wharves and Anchorages

4.100 The transfer of EO whether onto a road vehicle, ship or aircraft, exposes it to a higher level of risk than most other operations. It is therefore important that appropriate procedures that take into account the local conditions be developed to ensure maximum safety and efficiency during these operations.

Responsibilities

4.101 All personnel, including contractors, who are employed in, or through conduct of their duties are required to enter an EO facility, are responsible to ensure compliance with this regulation and the associated procedures.

Responsibilities of Commanding Officers/Officers Commanding/Directors/Superintendents/Contractor Site Managers

4.102 The Commanding Officers (CO)/Officers Commanding (OC)/director/superintendent of an EO facility has primary responsibility for safe working and storage conditions within the facility. The following actions should normally be taken:
a. Establish and enforce personnel limits for EO facilities;

b. Establish and enforce explosives limits for all magazines, transit sheds/areas, outside stacks or hardstands, workshops, laboratories, proof areas and demolition and burning grounds;

c. Ensure that standard operating procedures are prepared, displayed in buildings and enforced for all examination, repair, renovation, modification, disassembly, assembly, proof and disposal (by breakdown, burning or demolition) of EO;

d. Establish and maintain appropriate explosives training for personnel, and review periodically working conditions within the EO area. Training is to include fire awareness instruction, fire prevention strategy, and practice in firefighting procedures;

e. Maintain blueprints, maps or drawings showing the locations of all buildings in the EO area, and the distances to public traffic routes, inhabited and uninhabited buildings on and off Defence property;

f. Maintain standing orders to take account of local conditions and to supplement regulations, other orders and instructions pertaining to the operation of the facility;

g. Implement an explosives safety program with a system of accident, incident, defect and malfunction reports and investigation complementary to these guidelines; and

h. Ensure that all facilities and equipment are maintained in a serviceable and safe condition.

Safety Responsibilities

4.103 To reduce the inherent hazards associated with their work, all personnel who, in the course of their duty, are required to handle EO must have a detailed knowledge of applicable orders or directives.

4.104 A high degree of care must be demanded of personnel who are in charge of, or are handling EO, where even a slight degree of negligence involves danger to life or damage to property.

4.105 It is the responsibility of all personnel to maintain vigilance to improve and develop safe practices, methods and attitudes.

Procedures

4.106 Procedures used to implement the requirements of this regulation are:

a. Procedure 1 – Facility Operations – General Instructions

b. Procedure 2 – Explosive Ordnance Storage Facilities

c. Procedure 3 – Underground Storage Areas

d. Procedure 4 – Magazines

e. Procedure 5 – Explosive Ordnance Workshops

f. Procedure 6 – Clean Conditions

g. Procedure 7 – Explosive Ordnance Preparation Facilities

h. Procedure 8 – Integrated Weapons Facilities and Guided Weapons Workshops

i. Procedure 9 – Under-precautions Facilities and Operations
j. Procedure 10 – Maintenance of Watercraft, Vehicle or Aircraft Components containing Explosives

k. Procedure 11 – Control and Operation of Burning and Demolition Grounds

l. Procedure 12 – Use of Explosives for Displays and Demonstrations

m. Procedure 13 – Principles for the Operation of Small Quantity Facilities

n. Procedure 14 – Transfer of Explosive Ordnance

o. Procedure 15 – Procedures for the Management of RADHAZ to Ordnance
PROCEDURE 1 - FACILITY OPERATIONS - GENERAL INSTRUCTIONS

INTRODUCTION

General

1.1 Operations with Explosive Ordnance (EO) involve hazards which are specific to the type of explosive being handled and the nature of the operation being carried out. In order to define the hazard involved in a particular operation it is necessary to know details of the explosives, quantity present, nature of operation, process conditions, etc. It is therefore difficult to provide detailed instructions that will cover every contingency, but the general instructions and principles outlined in this instruction are applicable in most situations.

1.2 It is a requirement not only to work in an orderly and prescribed manner, but to consider in advance, all the circumstances and consequences of any foreseeable event which could lead to fire or explosion and to minimise both the probability of such an event occurring and its potentially harmful effects.

Purpose

1.3 This procedure outlines the general requirements that experience has shown to be necessary for dealing safely with EO and potential explosives in EO areas and facilities.

1.4 The special procedures applicable to EO storehouses, magazines, workshops, preparation facilities, guided weapon workshops and integrated weapon facilities, and test, evaluation and proof facilities are given in later procedures in this section.

Necessity for Recognition of the Special Hazards

1.5 It is essential that all personnel, concerned with the administration of EO areas and facilities or who have occasion to enter such areas and facilities, should appreciate that such areas and facilities are places set apart for a special purpose. They have peculiar hazards that are not to be overlooked and which govern the actions of those responsible for the administration of such areas and facilities, and of those who work within them.

1.6 Because of the peculiar risks associated with EO areas, personnel are to spend no more time than is absolutely necessary in any facility in which EO is being stored, inspected or maintained.

GENERAL SAFETY AND SECURITY

1.7 The OIC is responsible for the safety and security of an establishment. The following procedures prescribe the minimum requirements against which regular inspections and audits are to be undertaken. OICs are to ensure that only personnel conversant with the general instructions prescribed in this procedure are authorised to work in EO areas or facilities.

Posting of Warning Notices

1.8 Notices are to be displayed in a prominent position at the entrance to EO areas and at each facility not situated within a compound having controlled access. The notice is to direct persons to the general instructions prescribed in this procedure governing the rules of entry to an EO area or facility. Typical Warning Signs must contain conditions of entry and controlled articles. An example is provided at Annex A.

1.9 Perimeter warning signs are also to be erected in accordance with the Defence Security Principles Framework (DSPF).
Emergency Controls and Safety Organisation

1.10 Arrangements are to be made within establishments to encourage awareness of explosives and industrial safety and to prevent accidents. Specific instructions covering fire and other emergencies are provided in Regulation 4.7 Procedure 1. Reliable, prompt communication between personnel working in explosives facilities and the establishment's emergency control centre is to be maintained.

1.11 All accidents are to be investigated immediately with a view to preventing their recurrence. See also Regulation 1.3.

1.12 Suggestions for improving safety are to be encouraged from all staff, followed up and the decision notified to the proposer.

Industrial Safety Measures

1.13 Personnel are to be made aware of explosives and industrial safety. The Work Health and Safety (WHS) Act imposes on Commonwealth employers and employees both a general duty of care and specific obligations in respect of workplace health and safety, and provides a framework within which employees may cooperate to address WHS issues. In addition, regulations governing precautions to be observed to guard against accident or injury to health are detailed in relevant industrial legislation. The following paragraphs amplify particular aspects.

1.14 Statutory Requirements. Supervisory personnel are to be fully acquainted with all industrial legislation relative to their sphere of responsibilities. In particular, supervisors at all levels from OIC downwards must appreciate that it is a management responsibility to ensure safe working conditions and a safe system of working. While unsafe practices by individual personnel are always to be actively discouraged, it is emphasised that one purpose of the relevant legislation is to protect personnel, as far as possible, from the consequence of their imprudence.

1.15 Protective Clothing. Issue of protective clothing is to be made in accordance with relevant industrial legislation awards and determinations or approved administrative arrangements. Supervisors must ensure that personnel use the clothing or equipment provided for their protection.

1.16 Guarding of Plant and Equipment. All dangerous parts of plant and equipment are required by law to be adequately guarded. Where there is a choice available between guarding a risk at source and providing personnel with protection against it, e.g. putting a window guard on a grinding wheel or supplying personnel with goggles, the first course should normally be followed. The reason for this choice is that safe working is then no longer dependent on the exercise of discretion by any particular work person.

1.17 Safety Training and Guidance to Employees. Safety training and guidance is to be given to all employees, with particular emphasis on young persons and new employees, to ensure that they can do their work safely and that they understand the dangers inherent in plant, equipment, etc.

Authorised Entrances and Exits

1.18 Entry to, or exit from, EO areas is to be only by way of places authorised by the Officer-in-Charge (OIC). These are to be as few as practicable for effective access control. Passage of personnel into and out of the area is to be controlled.

Authorised Entry to an Explosive Ordnance Area

1.19 No person is to be permitted to enter an EO area during normal working hours, unless he or she produces a current official pass applicable to the area in question authorised by, or on behalf of, the OIC, or is specifically authorised to do so by the OIC in person. Additionally, some visitors or contractors may need to be escorted throughout the EO area.
1.20 Authorisation to enter an EO area during normal working hours is not normally to apply to non-working hours. During non-working hours, no person is to be permitted to enter an EO area unless he or she is specifically authorised to do so by, or on behalf of, the OIC.

Use of Emergency Exits

1.21 Personnel employed in EO areas are to be aware of the position of both the normal and emergency exits of the EO facility in which they work. Emergency doors are to be clearly marked as such, both internally and externally. The approaches to and the exit routes from emergency exits are to be kept clear at all times.

1.22 Whenever a firefighting practice takes place, evacuation drills also are to be carried out, during which the emergency as well as the normal exits are to be used. The supervisor of the facility is to record the date of the practice and the time taken to clear the facility in the Emergency Control Room Incident Log Book. Comment is to be made on the adequacy or otherwise of the number of exits and the use made of them. Additional means of exit when considered necessary should also be recommended.

1.23 At such drills, workers in EO facilities are to be encouraged to make use of all available exits and to ignore the normal rules for entering and leaving such buildings. However, care must be taken to ensure that magazine clothing and shoes are free from extraneous matter before the workers are permitted to re-enter the building.

Egress of Personnel

1.24 Personnel are not to remain in the EO area after their authorised duties have ceased.

Control of Work Parties

1.25 Persons in charge of work parties are to know exactly how many people are under their control and where they are employed in order to facilitate rapid evacuation of personnel in an emergency.

Patrolling of Explosive Ordnance Areas

1.26 Every EO area is to be patrolled in accordance with the requirements of the DSPF and local security orders, as applicable.

Guarding of Entrances

1.27 Each entrance to an EO area, is to be guarded by sentries, Service Police, or security staff whose duty it is to prohibit entry by unauthorised persons and persons disqualified by these instructions; to scrutinise or search all persons before admitting them and to challenge them as to their freedom from prohibited articles, specifically mentioning matches, lighters, cigarettes, pipes, tobacco, and battery operated devices. When entrances are not guarded they are to be closed and secured.

Prohibited or Restricted Articles

1.28 Certain articles are not to be taken into an EO area without the authorisation of the OIC of the establishment. A list of some articles which are to be prohibited or strictly controlled is given in Annex B, however this list is not exhaustive. It should be noted that the articles prohibited in any particular situation will depend on the type of EO work being carried out. Notices showing lists of prohibited articles are to be posted at places where the effect is most telling, e.g. at the entrances to EO areas and the entrances to clean areas. Notices should be made up in accordance with the requirements of Australian Standard 1319-1994 (AS 1319-1994) Safety Signs for the Occupational Environment.

1.29 Depositing Prohibited Articles. Before entering an EO area, each person is to deposit prohibited articles in their possession at an appointed place until they leave the area. The appointed place is to be such that personal articles can be left with complete confidence as to their security.
Possession of a Prohibited Article. Any person who finds he/she is in possession of a prohibited article inside the EO area is to inform their supervisor immediately. Where a visitor is involved the escort is to be informed. In the interests of safety, anyone who declares that he/she has inadvertently taken prohibited articles inside the EO area, should not be penalised unless it is a repeated offence.

Search before Admission and Exit from Explosive Ordnance Areas

All persons, including visitors, before entering an EO area or facility, are to search their pockets and are to deposit outside the entrance any prohibited articles that they have with them. All persons employed in the EO area and visitors may be challenged for prohibited articles at the entrance before entering and when leaving. The challenge may be made by area guards or other persons authorised by the OIC of the establishment. A proportion of employees should be challenged on a random basis.

Persons under the Influence of Intoxicants or Drugs

Persons showing the least signs of being under the influence of intoxicants or drugs are not to be permitted to enter an EO area. No alcohol should be consumed during meal breaks. Anyone found in, or reasonably suspected of being in, such a condition within an EO area is to be removed and not allowed to re-enter without the permission of the OIC of the establishment, who may also take disciplinary action against the person concerned. This requirement is designed to exclude persons not fully and continuously responsible for their actions from working with explosives.

Firearms

With the following exceptions, firearms are prohibited within an EO area:

a. Signal pistols required in proof yards.
b. Small arms required on proof ranges.
c. Weapons in packs or pods, or for inclusion in packs or pods for approved ship, aircraft weapons systems, but only in authorised facilities.
d. Firearms carried by authorised personnel on defence or guard duties.
e. Firearms carried by authorised personnel for vermin eradication (see Regulation 4.5 Procedure 1).

Control of Keys

The keys of all gates and doors to EO areas and facilities are, when not in use, to be deposited in a safe place authorised for this purpose. Local arrangements for the custody of keys in accordance with DSPF are to be authorised by the OIC.

Storage of Authorised Explosive Ordnance and other Items

No EO, except as specified below is to be admitted into an EO area or facility other than the EO authorised for storage therein, nor tools, appliances, building material or any other items other than those authorised from time to time in accordance with these procedures. Exceptionally, if EO not recognised as an in-service item of EO is received, it may be stored by segregating or isolating it, as appropriate, under local restriction until its acceptability has been determined or arrangements made for its disposal.
Storage of Private Explosive Ordnance

1.36 Private EO lawfully in the possession of persons living in on military base accommodation may be stored with the permission of the OIC. The EO is to be clearly identified and segregated from all other Service EO.

Surrender of Explosive Ordnance Not Authorised for Retention

1.37 There are occasions when user units find EO that is not accounted for. For example, the unit store may locate some live rounds of small arms ammunition in a collection of empty fired brass from a range practice. There are also instances when personnel ‘acquire’, accidentally or otherwise, items of EO during training activities. The continued retention, storage and possible use of the EO obtained under the circumstances described above, will contravene Service regulations and EO handling practices.

Use of Cameras within Explosive Ordnance Buildings

1.38 Only digital cameras are to be used in EO Facilities. Cameras must meet the electrical requirements for the zone that they are being taken into, as promulgated in Regulation 6.3 Procedure 1.

Battery Powered Devices in Explosive Ordnance Areas

1.39 Commercial battery operated devices such as watches, calculators, pagers, transistor radios etc are not normally designed to meet the exacting requirements for explosives safety. No such device is to be taken into EO facilities unless it complies with the electrical requirements of Regulation 6.3 Procedure 1.

Use of Audio Players in Vehicles in Explosive Ordnance Areas

1.40 The requirements for the use of audio players in vehicles within EO areas are set out in Regulation 3.1 Procedure 1.

Use of Mobile RF Emitters and Cellular Mobile Telephones

1.41 Conditions covering the use of mobile RF emitters and cellular mobile telephones are set out in Regulation 4.4 Procedure 15.

Roads

1.42 Roads leading to and in EO areas are to be maintained in a good state of repair to lessen the risk of accident to vehicles. Speed limits are to be strictly adhered to (see Regulation 4.6 Procedure 2).

Works Services in Explosive Ordnance Areas

1.43 Works services in EO areas and facilities are permitted under the conditions prescribed in Regulation 4.5 Procedure 2.

Vehicles and Material Handling Equipment

1.44 Vehicles and Material Handling Equipment (MHE) are permitted in EO areas and facilities under the conditions prescribed in Regulation 4.6 Procedure 2. Vehicles not directly involved in loading/unloading operations outside facilities are to be parked well clear of all exits.
SAFETY AND WELFARE OF PERSONNEL

Provision of Medical Facilities

1.45 Provision is to be made for first-aid and medical attention at least to the standards laid down in the Defence Safety Manual (SafetyMan). Details of the arrangements are to be made known to all personnel.

Smoking and Carrying Smoking Materials

1.46 Smoking is strictly prohibited in an EO area or facility, except in places designated as smoking areas and authorised by the OIC of the establishment. The conditions are to include special arrangements for taking smoking materials through the EO area, similar to the requirements detailed in paragraph 1.48 for the taking of matches into an area.

Lighting of Fires

1.47 The lighting of fires is prohibited in the EO area unless specially authorised by the OIC of the establishment, e.g. for vegetation control (see Regulation 4.5 Procedure 1) or during a disposal activity.

1.48 When authority has been given for a fire to be lit, safety matches only are to be used for the purpose. The matches are to be taken into the area in locked boxes painted bright red, either by the OIC or another person authorised for this duty, who may be the person authorised to use them. When taken into the area by someone other than the user they are to be handed over, at the point where the fire is to be lit, to the person responsible for lighting the fire. The user is to keep the key in his possession and is to allow no other person to have access to the matches, and is to use them only for the purpose for which they have been authorised. Unused matches are not to be left in the area overnight and are to be brought out of the area only by the person who carried them into the area or other authorised person. The authorisation referred to above is to be given in writing, by the OIC of the EO area or other nominated officer, and is to state the purpose for which the matches are required.

1.49 Fires are not to be left unattended and are to be completely extinguished before the end of the working day.

Actions on Approach of a Thunderstorm

1.50 Whenever an electrical storm (thunderstorm) approaches the near vicinity of an EO area the OIC of the establishment is to direct whether or not to close down EO facilities and evacuate personnel from the area. OIC are to detail how and when shut down provisions are to be put into effect by the issue of comprehensive local instructions. As a minimum these local instructions are to address the aspects raised in paragraphs 1.51 to 1.53.

1.51 Thunderstorm Warning. Timely warning of the approach of a thunderstorm to an EO area may be obtained as follows:

a. Whenever possible, arrangements should be made with the nearest Meteorological Office to provide advance warning of approaching thunderstorm conditions.

b. An electrical storm may be considered in the ‘near vicinity’ when the time between the lightning flash and the thunder report is between 15-30 seconds. This will place the discharge approximately 5-10 kilometres from the observer.

c. There may be occasions when, although no thunderstorm activity has been seen or heard, the sky/cloud conditions (cumulonimbus clouds) in the area indicate that an electrical discharge is an imminent event. In these circumstances, the OIC may liaise with the nearest Meteorological Office before deciding whether or not to instigate shutdown procedures.
**Action on Receipt of Warning.** When a warning of thunderstorm conditions is received, all work in the EO area is to cease and evacuation of buildings or sites is to commence. Trucks containing EO are to be moved into shelter if practicable. Any open truck that cannot readily be moved should be covered. Where the supervisor of a specific building considers it unsafe or impracticable to suspend work or the process in hand, the OIC may authorise work in that specific site or building to continue with the minimum number of personnel necessary. However, work on EED and primary explosives must not be carried out when thunderstorms are close by.

**Procedure for Vacating Buildings.** When personnel are directed to vacate EO buildings the supervisor present is to ensure that:

1. All exposed explosives are covered;
2. Windows, shutters and ventilators are closed;
3. The building is vacated promptly;
4. Electricity is switched off at outside switches; and
5. Doors are shut and locked.

**Thunderstorm Conditions during Vessel/EO Operations.** Instructions addressing thunderstorm conditions during EO operations involving vessels are given in ABR 862 Volume 2 Chapter 5 Paragraphs 5.41 to 5.42.

**Food and Drink in Explosive Ordnance Areas**

Intoxicating liquors are not to be taken into an EO area unless authorised by the OIC. Food and non-intoxicating drinks may be admitted into an EO area subject to the prior approval of the OIC, but only when it is difficult or inconvenient to arrange for personnel working there to leave the area for the purpose of taking refreshments. For reasons of hygiene, the consumption of food is not permitted in EO facilities which do not have 'tea room' facilities attached. Such tea rooms should not have direct access from rooms in which EO is handled.

It is important that personnel who handle EO wash before handling food.

**Personnel Limits**

All EO facilities are to have a Personnel Limit applied and a notice showing the limit is to be displayed. The limit is to be assessed on an individual site basis, and should reflect the minimum number of personnel necessary to allow EO operations to proceed smoothly and effectively in and around that site. This limit may be exclusive of transitory supervisory staff and authorised visitors but may need to include extra staff for stock relocation tasks, and personnel on estate management tasks or personnel from other units collecting EO. Personnel limits do not apply if an emergency situation is in existence, for the period of that situation. Specific guidance on the determination and display of personnel limits for EO storage and workshops facilities is provided at Regulation 4.4 Procedure 2 and Procedure 5 respectively.

**Employees Working Alone**

Normally, persons engaged in work with explosives are not to work alone but where it is deemed necessary and approved, in accordance with the DSPF, it is essential that arrangements be made so that aid is readily available in the event of a mishap. In addition, regular contact is to be arranged and maintained.

**Care in Dealing with Explosive Ordnance**

In handling EO, safety is to be the foremost consideration. All types of EO are to be handled with care, and the application of undue force prohibited. Cleanliness, method and care in all
explosives work are to be stressed and must take precedence over urgency; the attitude of pressing on without due regard for safety is unacceptable.

**Explosive Ordnance Rough Usage**

1.61 Where EO is deliberately and with proper authorisation subjected to dynamic testing at testing facilities appropriate protection must be provided.

**Locations for Work on Explosive Ordnance**

1.62 Unless otherwise authorised by the OIC, work in an EO area is to be carried out in locations prepared and designated for the purpose.

**Explosive Ordnance in a Non-Explosives Environment**

1.63 Where there is a temporary and unavoidable requirement to handle EO in non-explosives areas or buildings, prior approval of the Licensing Authority must be obtained. Precautions are to be taken to screen personnel from the effects of fire or explosion. It is particularly important to bear in mind that fragments arising from a container of explosives or metallic items touching or near explosives, may travel relatively long distances with lethal effects.

**Restriction on Experimental and Development Work**

1.64 Experimental and development work is not to be carried out in buildings where routine maintenance is proceeding. In compartmented buildings this work maybe carried out in one compartment while routine maintenance is proceeding in another compartment provided the OIC is satisfied that it is safe to do so.

**Segregation of Explosive Ordnance**

1.65 In areas where EO is being assembled, care is to be taken to keep apart different types of EO until they are brought together in an approved manner. For example, initiating devices are to be kept separate from secondary explosives.

**Issue of Written Instructions**

1.66 The special rules and operating instructions for processes involving EO must be prepared, approved and issued before work of any kind on EO or packages containing EO is undertaken (see Regulation 4.4 Procedure 5 and if applicable, Procedure 8).

**Unusual Occurrences**

1.67 All persons are immediately to report to higher authority anything unusual or apparently dangerous that they observe in the operation of the plant, machinery, tools or implements, in the appearance of the materials with which they are working or in the acts or conduct of other people. In experimental and development work and in trials it may become necessary to deal with shortcomings in equipment that have become apparent in the course of operations. In these circumstances independent competent assessment of the associated hazards may need to be sought. Ad-hoc procedures are to be discouraged and in their place a careful and considered approach to the problems must be fostered.

**Provision of Shielding for Explosive Ordnance Work**

1.68 Where it is practicable to do so, suitable shields or protective devices are to be provided, to protect personnel from the effects of an explosion.

1.69 **Shielding Specification.** The dimensions and strength of shields for use with EO is to be related to the magnitude of the explosion effects it may be called upon to withstand. Shields are to be type-tested where practicable. If it is not practicable to type-test a guard its design should be based on accepted safety criteria of a tested shield. It is important to ensure that all shields are adequately
secured so that in the event of an explosion they are not projected against the person they are intended to protect. The amount of EO allowed behind a type-tested shield is to be marked upon it together with a reference to the record of its design or type testing trial. Defence Explosive Ordnance Logistics Capability (DEOLC) Explosive Ordnance Licensing Authority (EOLA) is to be consulted in all cases of doubt as to the suitability of a shield, or where it has not been specifically type tested.

**Action in Emergency**

1.70 Personnel are to be made familiar with the action to be taken in an emergency such as explosion, fire or injury. Instructions to this effect are to be made known to personnel and steps taken to ensure that they understand them (see Regulation 4.7 Procedure 1 and Manual Fire Protection Engineering (MFPE)).

**Medical Approval**

1.71 Only personnel who have been medically approved for the work are to be allowed to work with substances carrying toxic risks. Precautions appropriate to the hazards of the task must be taken. Where necessary, suitable extraction plant is to be provided, as it is better to remove the hazard where this is practicable than to attempt to protect the individual (see also Regulation 4.6 Procedure 1).

**Protective Clothing for Explosives Ordnance Work**

1.72 When carrying out work with EO, special protective clothing, headwear and footwear, are to be worn as required. The area in which such protection is worn and by whom, is to be laid down by the OIC of the establishment who is also to define any limitations on private clothing or uniforms worn in conjunction with the special protective clothing and equipment (see also Regulation 4.6 Procedure 1). Suitable arrangements are to be made for the laundering of protective clothing used with EO.

**Restrictions on Movement of Personnel Between Facilities**

1.73 Toxic and other hazardous materials, including those liable to cause dermatitis, are to be limited to the area where they are handled. To do this it may be necessary to limit the movement of persons whose protective clothing may be contaminated. Suitable decontamination procedures are to be developed locally.

**Medical Aids and Appliances**

1.74 It is desirable to avoid the carrying or wearing of metal or other hard objects, or anything that may shed fragments and introduce a hazard to EO processes. Medical aids and appliances such as spectacles, trusses, etc should also be considered so that they do not introduce a hazard into the work being done. Hearing and other aids to body functions which are electrically operated are to be approved by DEOLC (EOLA).

**SAFE PROCESSING OF EXPLOSIVES AND EXPLOSIVE ORDNANCE**

**Cleanliness in Explosive Ordnance Buildings**

1.75 Arrangements are to be made to minimise the entry of mud, grit, etc into buildings used for EO. This may require personnel to enter a building or a section of a building through a facility where footwear is changed.

**Entry to Clean Areas**

1.76 Entry to areas where ‘clean conditions’ exist is to be across a barrier, appropriately marked and sited. Special footwear is to be provided for use on the clean side. Regulation 4.4 Procedure 6 details the special requirements for operating facilities under ‘clean conditions’.
Explosive Ordnance Storehouse Conditions

1.77 Where EO storehouse conditions apply, special footwear is not necessary as it is for magazines. Cleanliness, however, is still required and, where required, mats are to be placed outside EO storehouses and footwear wiped before entering such a building.

Cleanliness of Benches, Fittings and Floors

1.78 Floors, interior benches and fittings are to be maintained in a clean condition.

Care with Flammable Materials

1.79 Cotton rags, paints, solvents used for cleaning and other flammable materials are only taken into an EO building in minimum quantities for immediate use. All material remaining after use is to be removed to suitable flameproof metal cupboards outside the building or other authorised storage places. Where flameproof metal cupboards are used they are to be sited away from the wall of the building and well clear of the door and any opening windows.

Segregation of Waste Explosives

1.80 Care is to be taken to ensure that waste explosive is always kept separate from other waste material, and that separate containers appropriately marked are used for each type of explosive.

Explosives Contaminated Materials

1.81 Used cleaning materials and other articles of waste that may be contaminated with explosives, are to be treated as waste explosive and disposed of in accordance with instructions issued by the OIC of the establishment. They are to be kept separate from waste explosive material.

Disposal of Waste Material

1.82 All waste from EO buildings is to be appropriately identified and adequate arrangements are to be made for its safe collection and disposal.

Cotton Waste

1.83 Cotton waste presents a serious fire hazard because it is liable to spontaneous combustion. Its use in EO areas is to be avoided.

Tool Specification

1.84 Guidance on suitable materials for tools will be found in the appropriate Explosives Hazard Data Sheet (HDS). HDS provide chemical and physical characteristics of explosive substances and list the particular hazards and handling requirements. HDS are prepared by Weapons Systems Division in the Defence Science and Technology Organisation, for all explosive substances of Australian origin or for which insufficient data is available from the source country. HDS or equivalent documents, prepared by the appropriate National Authority, are usually available for explosives of overseas origin. Tools should be designed to give no more than the torque or force that is consistent with the requirement of the operation. Lengths of piping which could be used to increase the applied torque should be excluded from EO buildings or sites. Adjustable spanners are not normally to be allowed for EO work.

Building Explosives Limit

1.85 The explosives limit applicable to a particular building or area is to be displayed on the appropriate Explosives Limit Licence (ELL) (see Regulation 5.3 Procedure 1 for ELL requirements). In addition, for facilities storing small quantities the maximum amount and type of explosives, by name, actually permitted in an EO building may need to be posted in the building. This limit is to be fixed by OIC of the establishment and may be equal to or less than that approved by the Licensing Authority on
the ELL. The aim should always be to keep the quantity of EO in a building to minimum rather than the limit posted.

Covering of Explosives

1.86  It is good practice for any explosive not being worked upon, or in process, to be kept covered or in its container and as far away as practicable from material being processed.

Explosive Ordnance Life

1.87  The life of EO is to be managed in accordance with Topic - 024 of the item publication.

Reviewing Explosive Ordnance Stock for Disposal

1.88  EO stocks are to be reviewed for disposal when they become surplus to requirements. Explosives that have been ordered for trials that have been completed or have been cancelled are similarly to be considered for disposal.

Shielding Explosive Substances from Direct Sunlight

1.89  Explosive substances are not to be exposed to direct sunlight. EO should not be exposed to direct sunlight for prolonged periods.

Spillage of Explosive Substances

1.90  The procedure for dealing with spillage of liquid or solid explosives is to be laid down and followed. The method to be used in clearing up a spillage of explosives will depend to some extent upon the circumstances in which the spillage has occurred. When a spillage can be tackled there is to be available a procedure for doing this promptly and safely. Where the personnel present or the circumstances of the spill preclude immediate action, the requirement to call qualified assistance is to be well established. There is to be an approved desensitising agent for an explosive used in an establishment. Adequate quantities of the appropriate agent are to be conveniently available. Because of the potentially hazardous nature of many explosives it is most important to prevent operatives from taking unauthorised action in clearing up spillages. During clearance of spilled explosives, only the minimum number of people are to be present. Unless the explosive is highly sensitive it is advisable to pick it up either alone or with some diluent such as sawdust, if this is compatible, and take it to an approved place for reworking or preferably for disposal. There is always some hazard present in clearing up a spillage of explosives and in the case of very sensitive explosives it is often advisable to chemically destroy the bulk of the explosive where it has fallen and then clear up the reaction products.

Breaking Down of Explosive Ordnance and Non-Explosive Dangerous Goods

1.91  Work involving the breaking down of EO and Non-Explosive Dangerous Goods is potentially more hazardous than, and is to be segregated from, any other work. Additional precautions are therefore necessary, and EO is not to be broken down where no positive gain will result (see Regulation 2.4 Procedure 1).

Equipment Trials

1.92  EO establishments may be called upon to carry out or to assist in trials with new EO packaging, handling and movement techniques or to conduct trials on new breakdown, disposal, repair or proof processes. In such instances, the normal safety precautions detailed in this manual are to be observed unless any deviations are specifically authorised.

Estate Management Plan

1.93  A balanced plan of estate management is to be implemented to reduce the risk of fire and erosion. The fire hazard may be reduced by the installation of firebreaks and the control of vegetation, but care is required to ensure that the firebreaks do not cause soil degradation and erosion.
Vegetation may be controlled in a number of ways, one of which is grazing by introduced livestock. Traverses may need to be protected to avoid damage by the animals. The natural fauna (vermin) which is always present must also be controlled to avoid damage to buildings and installations. Regulation 4.5 Procedure 1 provides guidance on the creation of firebreaks and the control of vegetation, introduced livestock and vermin.

**INSPECTION REQUIREMENTS FOR EXPLOSIVE ORDNANCE FACILITIES**

**Inspection of Explosive Ordnance Areas and Facilities**

1.95 All EO areas and facilities are to be inspected periodically in accordance with Regulation 1.4.

**Annexes:**

A. Example of Explosive Ordnance Area/Facility Warning Notice
B. Articles Prohibited in an Explosive Ordnance Area
CONDITIONS OF ENTRY:

ENTRY TO A COMMONWEALTH EXPLOSIVES AREA OR EXPLOSIVES FACILITY IS SUBJECT TO THE APPROVAL OF THE OFFICER COMMANDING (OR COMMANDING OFFICER).

NO PERSON IS PERMITTED TO ENTER A COMMONWEALTH EXPLOSIVES AREA OR EXPLOSIVES FACILITY UNLESS AUTHORISED BY THE OFFICER COMMANDING (OR COMMANDING OFFICER) OR AN APPROVED DELEGATE.

ALL PERSONS EMPLOYED IN AN EXPLOSIVES AREA OR EXPLOSIVES FACILITY ARE TO BE CONVERSANT WITH THE GENERAL INSTRUCTIONS PRESCRIBED IN eDEOP 101 - DEPARTMENT OF DEFENCE EXPLOSIVE REGULATIONS REGULATION 4.4 PROCEDURE 1 AND THE FIRE WARNING SYMBOLS AND PRECAUTIONS DETAILED IN REGULATION 4.7 PROCEDURE 1.
ARTICLES PROHIBITED IN AN EXPLOSIVE ORDNANCE AREA

1. The following articles are to be prohibited from explosive ordnance areas or authorised and strictly controlled by the Officer-in-Charge of the establishment:

   a. Oil or gas filled lighting, heating or burning appliances and all flame, spark or fire producing appliances.
   b. Matches and other portable means of producing a spark or flame.
   c. Radio transmitters and receivers, including mobile phones and pagers.
   d. Cigarettes, tobacco in any form, and any article used for the purpose of smoking.
   e. Beers, wines and alcoholic liquor.
   f. Motor spirit, flammable oils and solvents not contained in the fuel tank of a vehicle or in a sealed container.
   g. Firearms.
   h. Drugs and medicines.
   i. Food and drink unless for sale or consumption in official canteens or refreshment areas.
   j. Battery operated equipment.
   k. Radioactive material.
   l. Cameras.

NOTE

This list is not comprehensive and may vary from site to site.
PROCEDURE 2 - EXPLOSIVE ORDNANCE STORAGE FACILITIES

Introduction

2.1 Explosive ordnance storage facilities comprise all buildings, open sites, lockers or other structures in which Explosive Ordnance (EO) may be stored, including Explosive Ordnance Storehouses (EOSH), magazines and underground storage areas.

Purpose

2.2 This instruction describes the administrative requirements for EO storage facilities, which are additional to the general requirements contained in Regulation 4.4 Procedure 1. Further special requirements for underground EO storage facilities and magazines are detailed in Regulation 4.4 Procedure 3 and 4 respectively, and for Small Quantity Facilities in Regulation 5.3.

Licensing

2.3 All EO storage facilities are to be licensed in accordance with the requirements of Regulation 5.2 Procedure 1. The requirements of Regulation 5.4 Annex A sub-paragraphs 143 (b) and (c) re period of operation in adjacent EOSH and non-permanent transfer facilities, are to be observed.

Explosives Content Board

2.4 An Explosives Content Board is required to record the Net Explosives Quantity (NEQ) stored in the storage facility at any given time. A typical layout of an Explosives Content Board (ECB) is given in Annex A. The board is to be located inside the facility, in the near vicinity of the doorway together with a copy of the Explosives Limit Licence. The Explosives Content Board is to be updated as movements of EO occur. The recording of explosives content is also available by electronic means, e.g. COMSARM, in many storage areas. However, since the update of the electronic data can significantly lag the real time storage situation and corporate governance requires that the explosive limits for EO buildings never be exceeded, the manual system provides facility management with real time assurance that the explosive limits are never breached. Accordingly, the requirement for Explosives Content Boards is mandatory for all EO storage facilities except for EO storage depots where alternative arrangements to achieve the intent of this requirement may be implemented, e.g. a print out of COMSARM screen WH07 – Explosive Quantity Enquiry, for each facility on the Depot, at the end of each day which is retained as part of the Depot Emergency Plan.

Personnel Limits

2.5 EO storage facilities are to have a Personnel Limit applied. The limit is to be displayed on the Explosives Content Board or on a suitable notice that is displayed adjacent to the Explosives Limit Licence (ELL) located in the facility. The limit is to be assessed on an individual site basis, and should reflect the minimum number of personnel necessary to allow EO operations to proceed smoothly and effectively in and around that site. The limit may be exclusive of transitory supervisory staff and authorised visitors but may need to include extra staff for stock relocation tasks, and personnel on estate management tasks or personnel from other units collecting EO.

Doors, Windows and Shutters

2.6 All doors, windows and shutters are to be kept closed and secured except when it is necessary to open them for work or ventilation.

2.7 Whenever work is undertaken in storage facility all doors are to be open to allow rapid evacuation in the event of an emergency. The only exception to this requirement is if pedestrian doors fitted with quick release push bars are located at the front and rear of the building. In this case, other doors need not be opened, provided that the quick release mechanism has been checked and found serviceable. When the doors are open, a responsible person is to be left in charge of the building.
2.8  When diesel powered Mechanical Handling Equipment (MHE) is in use inside an EO storage facility, doors and windows are to be open as required to prevent build up of a hazardous concentration of exhaust fumes.

Disconnection of Electricity Supplies

2.9  When an EO storage facility is vacated, the electricity supply is normally to be disconnected by switching off at the master switch. In buildings where a constant temperature and/or humidity is required, the power supply for the conditioning units and control systems may be left on, but the power supplies to all other services in the building are to be disconnected. Power required for security purposes must remain connected.

Unauthorised Explosive Ordnance and Tools

2.10  No person, without the special authority of the Officer–in–Charge (OIC) is to take any chemical, explosive substance or explosive store into an EO storage facility except as are authorised for use or storage therein (see also Regulation 4.4 Procedure 1, Annex B). Tools required for carrying out repairs to buildings are to be authorised by the OIC, in accordance with Regulation 4.5 Procedure 2.

2.11  Cleaning equipment, e.g. brooms/sweepers, doormats, dustpans and brushes and handling trolleys, required for day–to–day housekeeping of facilities, may be stored therein.

2.12  Tools and materials required for use during permitted operations (see paragraph 2.13–2.15) must be authorised in writing by the OIC before being taken into any EO storage facility. All approved tools are to be appropriately stored away when not in use. Tools and materials must be removed from the facility at the end of each day and/or on completion of the authorised tasks. Banding cutters may be kept in the storage facility to allow access to any suspect EO.

Permitted Operations in EOSH

2.13  Work permitted on EO in EOSH is limited to banding, stencilling, labelling, desiccant renewal and re-palletisation where the EO container is not opened. When it is necessary to carry out other work e.g. cleaning or scraping of containers, or opening the containers, they are to be removed to an EO workshop. These limitations do not apply to EO of Hazard Classification Code (HCC) 1.4S – see paragraph 2.15 for details. No other EO (other than unboxed shells, bombs and the like) is to be exposed in the storehouse.

2.14  For the purpose of conducting a monitoring audit, authorised inspectors may open ‘closed’ and ‘fraction’ containers to verify and validate contents as required by Regulation 1.4 Procedure 3, provided that the individual package is removed to the exterior of the EOSH and the access door is closed prior to opening the container. EO requiring periodic venting (to release built up gas pressure) must be removed to the exterior of the EOSH and the access door closed prior to unpacking, venting and repack operations.

2.15  Opening of Packages of HCC 1.4S. Packages containing EO of HCC 1.4S may be opened inside an EOSH under the following conditions:

a. Outer packages may be opened to remove sealed inner packs e.g. BAW F3 opened to remove BAM M19A1.

b. Provided a separate compartment or suitably traversed area is available within the EOSH for the task, and the EOSH is licensed for the storage of HCC 1.4S SAA only, monitoring audits, other EO inspections, EO accounting and EO repack operations may be conducted within the EOSH.

c. Any building utilised in accordance with paragraph 2.15 b can only be used if approved for such activity on the explosive limit licence and may be classified as a Group 2 exposed site to another potential explosion site.
2.16 Non-explosive dangerous goods may be visually inspected in a storehouse authorised for
dangerous goods storage only, but if for any reason they are taken into an EO workshop, they are to be
treated as Hazard Division 1.3 EO except when otherwise indicated.

Cleanliness

2.17 Before taking any EOSH into use it is to be thoroughly clean and while in use, is to be kept
clean. Where required, doormats are to be provided at each entrance; the floor and all platforms and
fittings are to be kept free from dust and grit. Oiled rags, waste and other articles liable to spontaneous
combustion are to be placed immediately after use, together with any other refuse, into metal bins
provided with lids, situated outside the building. These bins are to be cleared at regular intervals and on
no account are they to remain filled overnight. As soon as a building has been emptied, it is to be
thoroughly cleaned.

Examination of Packages and Unboxed EO

2.18 Before admission into an EO storage facility, every package and unboxed item of EO is to be
examined to ascertain that it is undamaged, correctly marked and sealed, properly closed or plugged
and externally clean. If the seal of a package is broken or missing, the inner packages/contents are to
be examined and, if found satisfactory, the package is to be correctly sealed before admission into the
storage facility. This examination of EO is to take place in an EO workshop or in accordance with
paragraph 2.15 b. Defective or incorrectly marked packages are to be repaired/replaced and correctly
marked before admission or segregated and placed under local restriction pending rectification.

Maintenance of Stocks

2.19 Stockholders and/or Custodians are responsible for ensuring that all stocks of EO in their
charge are correctly maintained and that the particulars of identification are not allowed to become
illegible, nor exposed metal parts allowed to corrode.

Storage of Empty Packages and Pallets

2.20 Unless specifically authorised in writing by the OIC of the establishment, empty packages are
not to be stored in EO storage facilities with EO. When necessary, they may be stored within the EO
area in a place set aside for the purpose (see Regulation 5.4 Annex A paragraph 86 and Regulation 2.3
Procedure 5). Pallets are to be removed as soon as they have been emptied.

Aprons and Hard-Stand Areas

2.21 Aprons of EO storage facilities, used for loading and unloading vehicles, are to be smooth and
level. They are to be maintained in a serviceable condition, any damage or subsidence being repaired
as a matter of urgency to avoid jeopardising the stability of MHE loading or unloading EO. Aprons are
to be swept regularly to avoid dirt or grit being tracked into the storage facility on tyres or shoes.

2.22 Hard-stand areas should be provided where necessary to allow off road parking for vehicles
waiting to load or unload and the hard-stand areas should be sealed and level.

Ready-For-Use Storage

2.23 When EO is fuzed and/or made ready for use and is not required for immediate use, e.g. prior
to ordnance loading operations for aircraft, the EO or the packages or dispensers in which it is contained
are to be clearly marked to indicate its physical status, e.g. ‘fuzed’. Such prepared/ready-for-use EO is
to be segregated in storage.

Annex:
A. Typical Layout of an Explosive Content Board
### EXPLOSIVE CONTENTS BOARD

**EXPLOSIVE ORDNANCE STOREHOUSE (BUILDING No. ________________)**

<table>
<thead>
<tr>
<th>HAZARD DIVISION</th>
<th>EXPLOSIVE LIMITS (per Explosive Limit Licence)</th>
<th>CURRENT NEQ (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.3.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.3.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MIXED HAZARD DIVISIONS CURRENTLY STORED AGGREGATED AS HD _________________**

**COMPATIBILITY GROUPS STORED**

**PERSONNEL LIMIT**
PROCEDURE 3 - UNDERGROUND STORAGE AREAS

General

3.1 Underground explosives storage facilities utilise special requirements for operation. These requirements are in addition to those requirements contained in Procedures 1 and 2 of Regulation 4.4.

Special Requirements

3.2 Special requirements for operations in an underground storage areas are contained in Part 3 of Allied Ammunition Storage and Transport Publication – 1 (AASTP-1 May 2010).
PROCEDURE 4 - EXPLOSIVE ORDNANCE MAGAZINES

Introduction

4.1 Magazines are Explosive Ordnance (EO) storage facilities in which ‘clean conditions’, described in Regulation 4.4 Procedure 6 are required to be maintained.

Purpose

4.2 This instruction prescribes the special requirements for magazines. The general requirements applying to EO areas and storage facilities contained in Regulation 4.4 Procedure 1 and 2 are also applicable to the administration of magazines, except that no inspection or maintenance operations are permitted within magazines.

Magazine Conditions

4.3 In addition to the requirements referred to in paragraph 4.2, the following rules (known as ‘Magazine Conditions’) are to be observed in the operation of magazines.

4.4 Admittance within the barrier of a magazine is confined to those on duty therein. Before entering, all persons are to search their pockets to ensure the absence of prohibited articles.

4.5 All persons entering a magazine are to observe the rules governing the maintenance of ‘clean conditions’ (see Regulation 4.4 Procedure 6).

4.6 All persons employed in magazines may be searched at the barrier by the person in charge, and visitors are to accept liability to be searched. All persons entering are to be challenged as to their freedom from prohibited articles by the person in charge of the magazine, who is to specify the prohibited articles.

4.7 Cleanliness is of vital importance in magazines. Cleaning implements, which are to be made of non-ferrous metal, are to be kept to a minimum. The wheels and fittings of all trucks used in magazines are to be of copper or copper alloy. All floors and platforms are to be cleaned frequently. Fittings are to be kept free from dust or grit.

Special Clothing

4.8 All persons entering a magazine are to put on the special clothing and shoes as prescribed in Regulation 4.4 Procedure 6.
PROCEDURE 5 - EXPLOSIVE ORDNANCE WORKSHOPS

Introduction

5.1 Any building or area in which the processing, (ie inspection, breakdown, modification, assembly, testing and maintenance) of Explosive Ordnance (EO) and Non-Explosive Dangerous Goods (NEDG) takes place, other than those operations which are permitted in EO storehouses is an EO workshop. This includes buildings or areas with equipment for specific EO tasks, eg painting, sealing, etc, and laboratories used for the development, research and/or testing of EO substances.

5.2 Facilities at user units used for the preparation of EO need not be administered as EO workshops, but as EO Preparation Facilities (see Regulation 4.4 Procedure 7).

Purpose

5.3 This procedure prescribes the administrative requirements for the management and safe operation of EO workshops, and is to be read in conjunction with Regulation 4.4 Procedure 1.

Integrated weapon facilities and guided weapon workshops

5.4 The special requirements applicable to Integrated Weapon Facilities and Guided Weapon Workshops are detailed in Regulation 4.4 Procedure 8 and are additional to the requirements of this instruction.

Types of explosive ordnance workshops

5.5 EO Workshops are graded in accordance with their construction and the facilities they provide. Broadly, these grades are:

   a. **Grade A.** A permanent workshop constructed as such and completely equipped to permit the inspection and maintenance of all natures of EO.

   b. **Grade B.** A workshop, either constructed as such or adapted, with less equipment than a Grade A workshop, in which most inspection and maintenance operations can be done.

   c. **Grade C.** A building or area without special equipment, taken into use for the inspection and maintenance of EO.

5.6 The constructional requirements for these various grades of workshops are contained in Regulation 6.1 Procedure 1.

Conditions for workshop operations

5.7 The conditions under which maintenance and inspection operations are to be done, vary with the type of the EO and the precise nature of the work. Four classes of conditions are prescribed, namely:

   a. **Class 1.** Clean conditions with restricted humidity.

   b. **Class 2.** Restricted humidity.

   c. **Class 3.** Clean conditions.

   d. **Class 4.** Normal conditions as specified in this procedure.

5.8 The requirements for clean conditions and restricted humidity conditions are fully described in Regulation 4.4 Procedure 6 and Regulation 4.1 Procedure 6 respectively.
5.9 The class of conditions required for each type of EO is to be indicated in relevant maintenance instructions (eg TIAD/DMPI/IRI).

Functional components of explosive ordnance workshops

5.10 EO workshops may be comprised of a number of workrooms, preparation-rooms and waiting/transit areas. The essential features of workrooms, preparation-rooms and waiting/transit areas are:

a. **Workrooms.** Workrooms in an EO workshop are compartments of the building separated from other compartments by walls of substantial construction, eg brick or reinforced concrete, not less than 230mm thick and which are without direct communicating doors between compartments. Workrooms may or may not be effectively traversed from other work or preparation rooms and waiting/transit areas. Workrooms are used for the inspection, maintenance and testing of EO.

b. **Preparation rooms.** Preparation rooms in a workshop are used for the receipt, unpacking, repacking and dispatch of EO. The necessary stencilling of stores or packages is permitted within preparation rooms.

c. **Waiting/transit areas.**
   
   (1) Waiting/transit areas associated with EO workshops are sites used for the temporary holding of EO which is to be processed through the particular workshop, or as an assembly point to accumulate EO before return to storage.

   (2) A waiting/transit area should normally be traversed. It may be sited within the traverse of the building/workroom it is intended to serve in which case it will share the approved explosives limit of the building/workroom, i.e. the combined Net Explosive Quantity (NEQ) of the explosives within the building/work-room and the waiting area must not exceed the licensed limit for the building/workroom as a whole.

   (3) Boundaries of waiting/transit areas must be marked out and EO in these waiting positions must always be within these bounds.

Licensing

5.11 EO Workshops are to be licensed in accordance with the requirements of Regulation 5.2 Procedure 1. Explosives limits must be assigned to the workshop as a whole and separate limits for each room and waiting position may be assigned depending upon the traversing arrangements between rooms and waiting positions.

5.12 In assessing the explosives limit for each room the following explosives quantities are to be taken into account:

a. Traversed rooms: all explosives within the traverse.

b. Untraversed rooms: all explosives in the building and waiting area in the near vicinity, unless the waiting area is separately traversed.

Instructions for explosive ordnance workshop operations

5.13 No work of any kind is to be undertaken in EO workshops unless details of the procedure for each operation and the tools authorised for the work are given in maintenance instructions or other authorised instructions. The only exceptions are as follows:

a. Explosives operations conducted in Guided Weapon Workshops and Integrated Weapon Facilities in which operations are detailed in locally prepared safety and
operating instructions and weapon processing instructions (See Regulation 4.4 Procedure 8).

b. Explosives operations conducted in EO Workshops or EO Preparation Facilities (see Regulation 4.4 Procedure 7) at user establishments where operations are to be done in accordance with relevant EO preparation procedures amplified by local instructions.

c. The proving of draft maintenance instructions by staff specifically authorised to undertake such operations.

5.14 Operatives and supervisors undertaking any explosives work are to ensure that they have maintenance instructions or weapon processing instructions and other safety instructions as appropriate, and any other data they may require, eg Materials Safety Data Sheets, available at the work site. The instructions are to be constantly referred to by the operatives and supervisors to ensure correct processing and the safety of themselves and that of other operatives nearby. At the start of any task and at the start of work each day all operatives are to be briefed by the workshop supervisor as to the risks associated with the task as a whole and the particular risks arising from their individual operations.

5.15 Workshop diary ammunition processing facility. A workshop diary is to be maintained and the supervisor is to record:

a. Work task activities along with staff briefings performed in the workshop on the day;

b. The names of individual’s working and visiting the workshop during the day; and

c. Details of any unusual incidents, including accidents, security breaches, emergencies/emergency drills, fires etc.

The diary is to be hard bound in year order and retained by the facility. Diaries are to be stored in a fire proof cabinet when not in use.

5.16 Display of work authorisation. An Explosives Work Authorisation Board is to be displayed in each EO workshop room. A typical design is shown in Annex A. As a minimum, the information to be displayed on the board is the building number, the name of the person in charge of the activity, the number of operatives approved for the activity, the name, NEQ and number of each EO item required for the activity and the total NEQ in the building, and the fire and supplementary fire symbols to be displayed. Any special safety instructions, including the required class of workshop operating conditions, are also to be displayed. The details called for on the board must be filled in by the senior maintainer or workshop supervisor at the commencement of each new job. Where convenient for effective management of explosive limits, it is permissible to use Form EO077 –Authorised Use and Explosives Content of An Explosives Facility (see Regulation 5.3 Procedure 1, Annex B) to record the actual NEQ in an EO workshop. When so used, the words ‘Small Quantity’ are to be erased from the EO077 title. Explosive Limit Licence details are to be taken from the EO workshop licence. The Form EO077 is to be displayed on the Explosives Work Authorisation Board during the work activity.

Articles in use

5.17 All approved tools, appliances and consumables required for each operation in an EO workshop are to be listed in the relevant Maintenance Instructions or other authorised instructions for that particular operation. Any items, including empty packages if not so listed, should be removed from the workroom in which the particular work will be undertaken.

5.18 Soldering irons. Soldering irons are to be used only in workshops in which Class 2 or Class 4 operations are being done, unless an entirely separate room is provided without direct access from the clean area. Electric soldering irons may not be used in Explosive Hazardous Areas. They are to be used only in accordance with the operating instructions or clearance rules of the facility. Since it is not practicable to restrict the surface temperature, the following conditions must be observed:
a. Solder is to be carried out only at a designated working position away from the bulk of the ammunition in the building and where no other work on explosives is being done;

b. The bench top must be of non-combustible material and a suitable fire-proof storage space is to be provided to accommodate the hot iron;

c. The size and rating of the iron must be as small as practicable and consistent with the task to be carried out; and

d. Each electric iron must be connected to a separate wall mounted double pole switched socket outlet which will ensure complete isolation and which is provided with pilot lamp indication.

5.19 Tools and apparatus. The special requirements applicable to the handling and use of tools and apparatus in EO workshops are detailed in Annex B.

Non-explosives in workshops

5.20 When a workshop contains EO, and whether it is being worked upon or not, the introduction of non-explosive items (other than essential tools, gauges, etc. authorised under paragraph 5.16 above) into the workshop, is prohibited. Exceptionally, non-explosive components which are integral parts of EO for storage purposes, eg the plug which replaces the fuze in a projectile, may be inspected simultaneously with the store itself, provided the inspection operations for the non-explosive items do not necessitate the use of tools or equipment which are not permitted in the workshop during the inspection of the EO concerned.

Floors

5.21 Floors of rooms in which an explosive substance is, or is likely to be, laid bare, normally are to be of concrete and surfaced with an approved gritless covering, or alternatively, are to be permanently covered with a well-fitted linoleum type covering. When handling Electro-Explosive Devices (EED) and certain explosive substances, precautions are to be taken against the development of static electricity. These explosives are listed in Regulation 6.3 Procedure 2 Annex A. Floors of other workshops may be of concrete, suitably rendered to make them dustless.

5.22 Floor coverings and other anti-static protection systems to be incorporated into facilities in which EED are to be inspected, tested or handled in any way, are to be in accordance with the requirements of Regulation 6.3 Procedure 2.

Work benches

5.23 Workbenches in all EO workshops are normally to be covered with linoleum or non–ferrous metal. At depots, to enable the inspection and testing of EED and inspection of explosive substances or stores which involve the exposure of explosive substances, at least one workshop is to be equipped with:

a. A metal bench with a non–ferrous metal top, or

b. A hardwood bench with a non–ferrous metal top, or

c. A hardwood bench with a conducting grade rubber top laid over an earthed surface.

These benches are to be bonded directly to the building earth. During maintenance operations all tools and gauges, when not in use, are to be placed in contact with the earthed surface of the bench. At those establishments where inspection is infrequent, temporary arrangements are to be made to meet these requirements.
Layout of work

5.24 Benches on which explosives will be exposed are to be sited so that nothing can fall accidentally onto the explosive items. Care must also be taken to ensure that explosive items cannot accidentally roll off work benches.

5.25 Work is to be arranged so that explosive substances are never exposed to the direct rays of the sun.

5.26 Explosives not under operation must always be kept covered, either in their packages or under suitable fireproofed covers.

Hazardous chemicals

5.27 Storage of chemicals in workshops. Oils, spirits, paints, etc. necessarily present in a room are to be in serviceable containers, kept in a metal tray with sides adequate to contain spillage, and located apart from work benches. The quantity present is to be kept to a minimum. In silent hours all these materials are to be kept in a locked metal flameproof locker outside the room.

5.28 Storage of chemicals in laboratories. Hazardous chemicals stored in laboratories are to be stored in accordance with the Defence Safety Manual (SafetyMan) and in accordance with the laboratory licence and any accompanying restrictions/instructions. When stored in a laboratory, and the chemicals are to be located as far as reasonably practicable from explosives. Out of business hours, DG3 (Flammable Liquids) and DG8 (Corrosive Substances) are to be kept in a locked metal cabinet or cage consistent with SafetyMan. The requirement for hazardous chemicals to be stowed in cabinets or lockers during non-working hours is not applicable to hazardous chemicals in use as part of an EO process for extended periods of time.

Earthing points

5.29 Earthing points are to be provided in those workshops which do not meet the full anti-static requirements to permit inspection of explosive substances or of stores which involves the exposure of explosive substances or which contain EED (see Regulation 6.3 Procedure 2). Each person in such workshops is to be instructed in their use.

Protective screens

5.30 Protective screens, eg brick partitions or rope mantelets, inside workshops, are to be so positioned that access to escape doors is not impeded.

Doors and windows

5.31 While work is in progress, doors are not to be locked and exits are to be kept clear at all times. Windows are to be blast resistant, and should be fitted with blinds or shutters so that the direct rays of the sun do not fall on any exposed explosive substance.

Cleanliness

5.32 Workshops are to be kept clean at all times. Any spillage of an explosive substance, or dust therefrom, is to be swept up at once and deposited in a receptacle containing water or oil. This receptacle is to be emptied and cleaned daily, and every time the workshop is vacated receptacles containing oiled rags and other waste are to be removed from the workshop during the period that the building is not occupied. Before commencing a new operation, the workshop is to be cleaned and all traces of the previous operation removed. This is to be done by washing; the use of floor polishes is prohibited, unless recommended by the manufacturer of the flooring material - see also Regulation 6.3 Procedure 2.

5.33 Work on dusty explosives. Work on dusty explosives necessitates particular attention to cleanliness (see Regulation 4.4 Procedure 6).
5.34 **Dusting of surfaces.** Any surfaces, including radiator and steam pipes, on which dust might lodge must be dusted thoroughly at frequent intervals.

**Employee working alone**

5.35 No person should be permitted to work alone in EO workshop operations that involve EO, where another person cannot provide immediate assistance in case of an accident.

**First aid apparatus and personal cleanliness**

5.36 Each workshop is to have access to adequate first-aid apparatus, appropriate for the work to be done. Advice on the types and quantities of such apparatus is to be obtained from the responsible medical authority. Personal cleanliness is essential, with frequent washing of the hands and face to avoid the toxic effects of contact with explosives; barrier creams, protective clothing etc, are to be used to restrict skin exposure to contaminants.

**Protective clothing**

5.37 Special protective clothing is to be worn in EO Workshops, see Regulation 4.4 Procedure 6 and Regulation 4.6 Procedure 1. Rules governing the wearing and maintenance of such clothing are specified in Regulation 4.4 Procedure 6.

**Protective measures**

5.38 When EED are being inspected and tested, the provisions of Regulation 4.4 Procedure 7 applying to work on EED are to be observed.

**Hygrometric conditions**

5.39 **Permissible limits of relative humidity.** Certain explosives are hygroscopic and the exposure of such substances is to occur only when the conditions are favourable, the normal working limit being based on a standard of 80 per cent relative humidity at 16° C (60°F). Any inspection operation which requires restricted humidity conditions is indicated in the relevant Maintenance Instructions. The method of determining the relative humidity is detailed in Regulation 4.1 Procedure 6.

5.40 **Precautions against condensation.** EO brought from cold environments is to be allowed to adjust to workshop temperature before explosives are exposed in order to avoid condensation on the filling. If condensation is visible on the store or package, work is not to proceed until the condensate has evaporated.

**Drying of items**

5.41 Non-explosive components for filling, assembly, and packing must be dried thoroughly in accordance with the appropriate Maintenance Instructions.

5.42 EO is not permitted in buildings in which drying ovens are fitted.

**Temperature limits**

5.43 Certain EO is not to be worked upon when the temperatures within a workshop are abnormally high or low. These temperature restrictions are detailed in Regulation 4.1 Procedure 4.

**Distribution of stores, benches, etc**

5.44 The stores within the workshop are, as far as possible, to be equally distributed throughout the work-rooms, and not more than half the floor area of these rooms is to be occupied by benches or stores which are to be so positioned that each person has free access to one or more of the exits provided. In the event of a runway system (eg gravity roller) masking an exit, the runway is to be hinged at this point and marked distinctively to denote that the exit is not permanently impeded. The
side of the length of runway concerned is to be painted bright red and marked in white ‘LIFT FROM THIS END’ indicating the unhinged end with an arrow also painted in white.

Entrance into a workshop

5.45 All persons, other than visitors, supervisory and managerial staff, employed in a workshop which is being operated under ‘clean conditions’ (see Regulation 4.4 Procedure 6) are, before entering, to exchange their outer garments for the special clothing provided, including conducting shoes where conducting or anti-static precautions are to be observed. This exchange of clothing is to be effected in the shifting lobby of the workshop in which instructions for entering and leaving clean areas are to be displayed. Supervisory, managerial staff and visitors are to enter the workshop in the manner detailed in Regulation 4.4 Procedure 6.

5.46 Persons employed in workshops not under ‘clean conditions’ are required to wear protective clothing as detailed in Regulation 4.6 Procedure 1.

Search on entering and leaving a workshop operated under ‘clean conditions’

5.47 Before entering the ‘clean’ area of a workshop, all persons are to search themselves to ensure that they are free from ferrous or other prohibited articles. Any prohibited article found is to be deposited on the ‘dirty’ side of the shifting lobby. All persons passing the barrier to the ‘Clean’ side are to be challenged as to their freedom from prohibited articles. Persons employed in the workshop are subject to challenge by the person in charge when entering or leaving, and at any time whilst in the workshop. Visitors and supervisors may be challenged if it is considered necessary by the person in charge. Additional requirements for clean areas given in Regulation 4.4 Procedure 6 are to be observed.

Daily operating routines

5.48 Handling. EO is to be handled and moved with care at all times and exposure to direct sunlight is to be avoided, particularly in the case of unpacked or exposed items. Movement is to be under control at all times. Action is to be taken to ensure that EO cannot fall from benches, trolleys, cradles, conveyor or handling systems. Benches on which explosives will be exposed are to be positioned so that nothing can fall accidentally onto the explosive items. Explosives not under operation must always be, either in their packages or under suitable covers.

5.49 Temporary work breaks. During temporary breaks in the working day, EO may be left in position provided that the following is observed:

a. Unpackaged EO is safely stowed, or
b. EO is packaged in its approved service pack, and
c. No bulk explosives or explosive filling is exposed.

5.50 End of day. EO in workshops at the end of a working day is to be dealt with as follows, subject to both overriding security requirements and the discretion of the workshop supervisor:

a. When the next day is a working day, EO may remain in the working or waiting area or approved storage providing it is packaged and earthed; or
b. When the next day is not a working day, or the first day of an extended break, EO may only be left in waiting areas correctly packaged and earthed.

5.51 Closing of workshops. At the close of work, or when otherwise instructed, eg at the approach of a thunderstorm, all exposed explosives are either to be covered or placed into receptacles which are to be closed, all doors and windows are to be shut and secured, the electric current is to be switched off and any other heating devices turned off. Where electricity is required to power air-conditioning or other equipment the power may be left on.
Australian standards applicable to explosive ordnance workshops

5.52 Australian Standards (which may be) applicable to operations in EO workshops are detailed in Annex C.

DETERMINATION OF PERSONNEL AND EXPLOSIVES LIMITS

Purpose of personnel and explosives limits

5.53 The purpose of Personnel and Explosives Limits is to regulate, within the maximum net quantity of explosives permitted in each building, the amount of explosive which may be held in each room in relation to its size, the number of persons employed therein and the nature of the work required to be carried out. In the interests of safety, the quantity of explosive and the number of personnel are to be limited to the minimum possible to ensure the economical and effective functioning of the workshop; however, economic considerations should not normally compromise safety requirements.

Basis for personnel and explosives limits

5.54 Personnel and Explosives Limits are to be based on the authorised maximum NEQ and the Hazard Classification Code (HCC) of the items in the workshop. Due recognition is to be given to the changes in Hazard Division (HD) risks which may result when EO is unpackaged. Some examples are:

a. Shell and mortar bombs filled with HE which belong to HD 1.2 when packaged, may present a HD1.1 type risk when unpacked.

b. EO belonging to HCC 1.4S when packaged, cannot remain in Compatibility Group S and may even give effects similar to HD 1.2 or HD 1.3 items, when unpackaged.

Maximum net explosives quantity

5.55 The guiding principle to be applied when assessing explosive limits is to limit the explosives quantity to the minimum compatible with efficiency, but the maximum net explosives quantity of a building in use as a workshop is not normally to exceed 1 200 kg NEQ. This limit may be increased at the discretion of the Licensing Authority to a maximum of 10 000 kg. A building for this purpose is the whole of the space under one roof or a defined area in the open, including waiting positions, loading and unloading platforms and sidings, or roads, immediately adjacent to the building. Filled wagons or road vehicles are not to be parked on other roads or railways within the Process Building Distance, except for the purpose of loading/unloading.

Working limits - quantity of items

5.56 Notwithstanding that the maximum net explosives quantity for each room in a workshop is controlled, the maximum quantity of items permitted to be under operation in a room, ie items removed from their approved package/unit load, is to be determined locally for each particular operation based on the minimum number of items consistent with efficient working.

5.57 The maximum quantity of items permitted to be under operation is to be displayed on the Explosives Work Authorisation Board or Form EO077 (see paragraph 5.15). The total explosives content of this allowed quantity of items, together with that of any components accumulated in the room, must not exceed the explosives limit for the room.

Mixing of compatibility groups and hazard divisions

5.58 Mixing of explosives of different Hazard Divisions and Compatibility Groups in EO workshop buildings/rooms and at waiting positions is frequently necessary for the work in hand. Refer to Regulation 4.2 for the mixing of Compatibility Groups and Hazard Divisions.
Combination of operations

5.59 It is important that EO operations are carried out strictly in the sequence laid down in maintenance instructions or other approved processing documents. Work in any workroom is to be restricted at any time to one type of item.

5.60 In the event of operations needing to be combined, eg examination and repair, unplugging and fuzing, repair and testing, these are to be specifically called for in the task authorisation documents.

5.61 Concurrent work on items of dissimilar nature in the same workroom is not normally to be permitted.

Personnel limit

5.62 The number of persons permitted to be engaged at one time in a room is to be kept to the minimum consistent with effective working. The personnel limit for a room need not include inspectors and supervisors as long as they are not present for more than 1 hour per normal working day.

5.63 Occasional visitors, over and above the authorised number of personnel, may have entry and remain while work is in progress; but on such occasions, the number of visitors at a time and the periods of stay are to be limited to the minimum necessary to achieve the purpose of the visit. Admission of visitors to an EO workshop is at the discretion of the foreman or supervisor of the workshop.

5.64 As a whole, the EO workshop building must normally be regarded as a mass risk. Hence, the number of staff permanently engaged in parts of the building other than the licensed work and preparation-rooms are to be kept as low as is practicable. This principle also applies to transport and handling personnel.

5.65 The authorised maximum number of personnel permitted in any room is to be displayed on the Explosives Work Authorisation Board in the room.

Annexes:
A. Typical Layout of an Explosive Work Authorisation Board
B. Tools and Apparatus for Use in Explosive Ordnance Workshops
C. Australian Standards Applicable to Explosive Ordnance Workshops
## TYPICAL LAYOUT OF AN EXPLOSIVE WORK AUTHORIZATION BOARD

<table>
<thead>
<tr>
<th>EXPLOSIVES WORK AUTHORIZATION BOARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUILDING No:</td>
</tr>
<tr>
<td>PERSON IN CHARGE:</td>
</tr>
<tr>
<td>OPERATIVES:</td>
</tr>
<tr>
<td>STORE:</td>
</tr>
<tr>
<td>OPERATION:</td>
</tr>
<tr>
<td>WORK REQ NO:</td>
</tr>
<tr>
<td>HCC:</td>
</tr>
<tr>
<td>NEQ OF EACH STORE:</td>
</tr>
<tr>
<td>MAX. QTY. OF ITEMS PERMITTED TO BE UNDER OPERATION:</td>
</tr>
</tbody>
</table>

### APPROVED LIMITS:

<table>
<thead>
<tr>
<th>Hazard Division</th>
<th>1.1</th>
<th>1.2.1</th>
<th>1.2.2</th>
<th>1.3.3</th>
<th>1.3.4</th>
<th>1.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel (No)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Licence (Kg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### ACTUAL NEQ IN BUILDINGS:

<table>
<thead>
<tr>
<th>Amount (Kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

### SPECIAL INSTRUCTIONS:

CLASS OF WORKSHOP OPERATING CONDITIONS:

---

**Figure 5A-1**  Typical Layout of an Explosive Work Authorisation Board
TOOLS AND APPARATUS FOR USE IN EXPLOSIVE ORDNANCE WORKSHOPS

Design and Approval

1. The chief engineers at the Explosive Materiel Branch (EMB) is to establish, in writing, an authorised process for the design, approval, repair, modification and control of tools and apparatus used in explosive ordnance workshops. Complete sets of drawings are to be maintained and kept up to date for all special tools and apparatus held.

Use of Correct Tools and Apparatus

2. Only tools and apparatus to approved designs and materials are to be used in work on Explosive Ordnance (EO), non-explosive dangerous goods and items suspected of containing explosives or dangerous fillings.

3. The tools required for each operation are specified in maintenance documents and the tools and apparatus provided for particular EO or operations are not to be used for any other purposes. Only tools authorised in relevant maintenance document may be taken into a workshop.

Ferrous and Aluminium Tools and Gauges

4. The use of steel or iron in the fabrication of tools is normally to be avoided, but they are not prohibited if the operation requires their use. The introduction of tools and gauges, etc, made of aluminium or aluminium alloy is prohibited.

Care and Maintenance

5. All tools and apparatus for use in EO workshops are to be kept serviceable. They are to be checked for serviceability on issue and periodically during use. Any defective tools are to be withdrawn from use immediately and replaced by serviceable items.

6. It is the responsibility of the custodian of gauges and other apparatus to ensure that items whose calibration life has expired are not issued for use.

Repair and Modification

7. If found necessary as a result of systematic inspection or other examination, repair and modification of tools or apparatus are to be carried out in accordance with approved drawings. If no approved drawings exist, prior approval is to be obtained from the authority nominated in the authorised process at paragraph 1 before repair or modification is undertaken.

8. After every repair or modification has been developed an officer, nominated in the authorised process at paragraph 1, is to check by examination and practical working that the equipment fulfils the purpose for which it was designed and that no interference with the working of any safety devices has resulted from the repair or modification.

Electric Leads and Connections

9. Electric leads and connections in electrical apparatus in EO workshops are to be kept in good condition and unauthorised connections are prohibited. See also Regulation 6.3 Procedure 1 for testing requirements.

Custody

10. Where not permanently installed or needed, equipment is to be drawn only when actually required and is to be cleaned and returned immediately on completion of work.
11. The person in charge of each room is to check the tools in the room before and after work each day and is to report discrepancies for immediate investigation.

Improper Use of Tools

12. Tools are only to be used as designed, eg unauthorised extension pieces must not be fitted to handles to obtain greater leverage. Abnormal force must not be applied to any tool.

13. Only light hand pressure is to be employed when gauging. This is most important both for reasons of safety and to prevent excessive gauge wear. Gauges are designed to accept correctly dimensioned items without the use of force.

Gauges

14. The gauges required for individual operations are listed in relevant maintenance instructions.

Management of Gauges


Maintenance of Gauges

16. Gauges are to be very carefully maintained and are to be protected against rust whilst not in use by lightly oiling or greasing. They are always to be handled carefully, since they are susceptible to damage. The working surfaces of a gauge are not to be cleaned with abrasive but should be rubbed clean with a cloth soaked with a solvent such as white spirit. If the working surfaces of a gauge become rusty, the gauge is not to be used but is to be transferred to the appropriate Gauge Management Authority for repair and re-calibration. Gauges are not to be adjusted or repaired locally.

17. Chamber gauges are to be turned daily when in use to equalise wear.

18. Ring and body gauges are to be stowed flat.

Checking of Gauges

19. It is the responsibility of the custodian of gauges to submit items for re-calibration when the calibration period expires, or when the accuracy of the gauge becomes suspect for any reason.

Weighing Appliances

20. Weighing appliances are to be maintained in good condition. They are to be checked periodically as laid down in paragraph 19.

21. The capacity of the scales selected is to be the nearest above the weight of the article to be weighed.

22. In order to eliminate the possibility of incorrect weighing, the procedure detailed in the relevant maintenance instruction is to be adhered to rigidly.

23. If any scales are found to be incorrect, the Officer-in-Charge of the establishment is to investigate and take appropriate follow-up action if the error may have affected the serviceability of any work carried out using the scales since they were last checked.

Checking of Electrical Test Apparatus

24. Policy for the design and repair, safety checking and calibration of electrical test equipment used in the processing of EO, are detailed in Regulation 6.3 Procedure 1.
Explosive Dust-Extraction Equipment

25. Approved explosive dust-extraction equipment is to be maintained to the manufacturer’s requirements. Such equipment is to be cleaned out regularly and the arising disposed of as explosive waste.
AUSTRALIAN STANDARDS APPLICABLE TO EXPLOSIVE ORDNANCE WORKSHOPS

1. An indicative, but not necessarily exhaustive, list of Australian Standards which may be applicable to operations in explosive ordnance workshops are:
   a. AS1324 - Air filters for Use in Air Conditioning and General Ventilation.
   c. AS1386.5 - Clean Rooms and Clean Work Stations – Clean Workstations.
   d. AS/NZS1680 - Codes of Practice for Interior Lighting and the Visual Environment.
   e. AS2013 - Clean Room Garments.
   f. AS2014 - Code of Practice for Clean Room Garments.
   g. AS2268 - Electrostatic Paint and Powder Spray Guns for Explosive Atmospheres.
PROCEDURE 6 - CLEAN CONDITIONS

Introduction

6.1 The term ‘Clean Conditions’ is used to denote the conditions required to minimise the special risks attached to the storage of those explosives which are to be stored in magazines, and to reduce the possibility of accidents in Explosive Ordnance (EO) workshops in which Class 1 or Class 3 operations are undertaken (see Regulation 4.4 Procedure 5).

Purpose

6.2 This procedure details the special requirements for operating EO facilities under clean conditions.

General

6.3 Clean conditions apply to the special requirements to be observed in the construction and furnishing of the building, its heating and lighting, the rigid control of cleanliness, entrance, exit, equipment, tools and operations, and the wearing of special clothing and footwear.

6.4 All explosives of Compatibility Group A, bulk explosives of Compatibility Group D and dusty explosives (see Notes), are to be held under clean conditions.

NOTES

Dusty explosives are those certain types of explosives which release fine dusts which are difficult to control. The only compounds and mixtures in service which fall into this category are gunpowder, Tetryl (CE) and exposed powdery pyrotechnic mixtures. When these explosives are exposed, Zone 21E electrical conditions may be required. All other explosives such as rocket motors and HE fillings may produce particles broken from the main charge, but, in general, the quantity is small and easily controlled. These explosives may require Zone 22E electrical conditions when they are exposed.

Items containing dusty explosives are normally adequately sealed and do not require clean conditions unless they are damaged or are to be broken down. Maintenance instructions governing work on this type of store are to specify whether clean conditions are required.

6.5 Particulars of the work to be done under clean conditions, and that the work must be done under clean conditions, must always be clearly specified in applicable maintenance instructions.

General Precautions

6.6 Before any EO or any package is taken into the clean area of a building, it is to be examined externally and any grit or objectionable substance is to be removed.

Tools and Equipment

6.7 Unless essential, the use of exposed iron or steel tools and equipment is to be avoided in buildings where clean conditions are to be observed. When this is unavoidable the relevant maintenance instructions are to state this requirement specifically.

Clothing and Footwear

6.8 The special clothing and footwear to be provided for persons employed in or visiting buildings under clean conditions, consists of:

a. Proban Coveralls, or shirts and trousers.
b. Dust Coat.

c. Conducting Shoes.

d. Overshoes and Legstats.

e. Plastic Disposable Gloves.

f. Proban Cap.

6.9 The items listed in paragraphs 6.8a, c and f are to be worn by persons employed in buildings operated under clean conditions.

6.10 The items listed in paragraphs 6.8b, c and f are to be worn by supervisory staff and visitors on entering a clean area. Alternatively, visitors may be provided with the items listed in paragraph 6.8d in lieu of those in paragraph 6.8c.

6.11 All personnel required to handle exposed explosive substances are also to wear the plastic gloves identified in paragraph 6.8e.

6.12 The special clothing and footwear identified at paragraph 6.8 is not to be worn outside the barrier of the shifting lobby (see paragraph 6.14), and if a person inadvertently steps from the ‘clean’ side, re-entrance is to be effected through the shifting lobby, ensuring that the shoes are properly cleaned before passing the barrier.

6.13 Clothing and footwear for use in clean areas is to be distinctively marked so as not to be confused with items worn outside clean areas, eg the toe caps of conducting shoes are to be painted red.

Shifting Lobby

6.14 A shifting lobby is an entrance room in a building operating under clean conditions. It is divided by a barrier into a ‘clean area’ and a ‘dirty area’, and the rules to be observed in this room are given in paragraphs 6.15 and 6.16. A typical layout of a shifting lobby is shown in Annex A, together with extracts from the rules. The shifting lobby is to be equipped as shown in Annex A.

Entrance and Exit

6.15 Entrance. Admittance to a ‘clean area’ is permissible only across the barrier, and is to be confined to those on duty. The following rules, as appropriate, are to be observed in addition to the general rules given in Regulation 4.4 Procedure 5:

a. Personnel Employed in the Clean Area. Before passing the barrier, personnel employed in the ‘clean area’ are to remove their outer clothing, ie coats, jackets, trousers and footwear, and after passing the barrier they are to put on the special clothing provided as listed in paragraphs 6.8a, c and f.

b. Supervisory Staff and Visitors. All supervisory staff and visitors are to:

   (1) search their pockets to ensure the absence of all prohibited articles, eg keys and knives;

   (2) turn down the ends of their trousers or overalls and brush off any mud or dust; and

   (3) either:

       (a) remove their boots or shoes;
(b) step over the barrier and put on red toe capped conducting shoes provided; and

c (c) put on the dustcoat and cap (paragraph 6.8b and f) provided; or

d (d) clean their boots or shoes of any loose dust or grit;

e (e) put on overshoes and legstats (paragraph 6.8d) as they pass the barrier; and

(f) put on the dustcoat and cap (paragraph 6.8b and f) provided.

6.16 Exit. On leaving the ‘clean area’, the order of the rules for entrance is to be reversed.

Additional Regulations Applicable

6.17 The special requirements of clean conditions not dealt with in the preceding paragraphs are referenced in Table 6-1.

<table>
<thead>
<tr>
<th>Requirements for:</th>
<th>Magazines</th>
<th>Workshops</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>Regulation 6.1 Procedure 1</td>
<td>Regulation 6.1 Procedure 1</td>
</tr>
<tr>
<td>Furnishings</td>
<td>Not Applicable</td>
<td>Regulation 4.4 Procedure 5</td>
</tr>
<tr>
<td>Lighting and Heating</td>
<td>Regulation 6.3 Procedure 1</td>
<td>Regulation 6.3 Procedure 1</td>
</tr>
<tr>
<td>Cleanliness</td>
<td>Regulation 4.4 Procedure 4</td>
<td>Regulation 4.4 Procedure 4</td>
</tr>
<tr>
<td>Tools and Equipment (additional to paragraph 6.7)</td>
<td>Regulation 4.4 Procedure 4</td>
<td>Regulation 4.4 Procedure 4</td>
</tr>
<tr>
<td>Operations</td>
<td>Regulation 4.4 Procedure 4</td>
<td>Regulation 4.4 Procedure 4</td>
</tr>
</tbody>
</table>

Table 6–1: Summary of additional applicable regulation

Annex:
A. Rules for Entering and Leaving a ‘Clean Area’
RULES FOR ENTERING AND LEAVING A 'CLEAN AREA'

INSTRUCTIONS

For Personnel Employed in the Clean Area

1. Wipe your boots or shoes on mat 'B' and take them off.
2. Take off your outer garments and hang them on pegs 'A'.
3. Pass the barrier in your socks and underclothes and then put on the special clothes, ie coveralls and cap 'C' and conducting shoes 'D'.

NOTE

On leaving the clean area the order of the above directions is to be reversed.

For Supervisory Staff and Visitors

4. Search your pockets to ensure absence of prohibited articles
5. Turn down ends of your trousers and brush them clean.
6. Either:
   a. Remove your boots or shoes;
b. Step over the barrier in your socks and put on the conducting shoes provided;
c. Put on a dustcoat and cap ‘C’; or
d. Clean your boots or shoes of any loose dust or grit;
e. Put on the overshoes and legstats ‘E’ as you pass the barrier;
f. Put on a dustcoat and cap ‘C’.

For All Personnel

7. Neither special clothes nor shoes must be taken outside the barrier, nor must outer garments, boots or shoes ever be bought inside it by personnel employed in the clean area.

8. If clean area shoes are allowed to collect grit they are just as dangerous and as likely to cause sparks as ordinary footwear.

NOTE

The instructions given above are to be displayed conspicuously at each entrance to every magazine and workshop operated under clean conditions.
PROCEDURE 7 - EXPLOSIVE ORDNANCE PREPARATION FACILITIES

Introduction

7.1 An explosive ordnance preparation facility is any area, room or building licensed as such at user establishments, in which Explosive Ordnance (EO) is unpacked, tested and prepared for use as required by the appropriate instructions, and in which these processes are reversed.

Purpose

7.2 This procedure addresses the administration of EO preparation facilities at user establishments. The general procedures of Regulation 4.4 Procedure 1 apply, and when preparation facilities are used for maintenance operations, as distinct from preparation, the conditions of Regulation 4.4 Procedure 5 are also applicable.

Applicability

7.3 The use of Integrated Weapon Facilities and Guided Weapon Workshops is very similar to that for preparation facilities as defined in this procedure except that it is normal practice for the maintenance of guided weapons and components to be undertaken simultaneously with preparation and testing operations. Since the facilities are designed on this basis, this procedure does not apply to them and they will be operated under different conditions as specified in Regulation 4.4 Procedure 8.

Construction

7.4 EO preparation facilities are to be constructed in accordance with the requirements specified in Regulation 6.1 Procedure 1.

Licensing and Authorisation

7.5 The EO preparation facilities referred to in this procedure are to be licensed in accordance with the requirements of Regulation 5.2 Procedure 1.

7.6 When a preparation facility is used as an EO workshop for maintenance purposes under the terms of Regulation 4.4 Procedure 5, the facility is to be separately licensed as such.

7.7 An Explosives Work Authorisation Board (see Regulation 4.4 Procedure 5) is to be used to display details of each new job undertaken in preparation facilities.

7.8 Maximum Net Explosives Quantity. The maximum Net Explosives Quantity (NEQ) permitted in any preparation facility, at any time, is not normally to exceed 1 200kg however, this limit may be increased at the discretion of the Licensing Authority to a maximum of 9 000kg NEQ. The quantity of EO and the number of personnel employed in the facility is always to be restricted to the minimum required to maintain the safe, economical and efficient functioning of the facility but the number of personnel must not exceed the number determined in accordance with Regulation 4.4 Procedure 5.

Multi-Purpose Explosive Ordnance Preparation/Storage Buildings

7.9 Multi-purpose EO preparation/storage buildings may be used for combined preparation, short-term storage of prepared EO and ready-use storage of ancillary explosive components associated with the preparation task. Preparation is not to be carried out in a compartment containing prepared weapons and the total NEQ held in the building at any time is not to exceed 1 200kg.

7.10 Pyrophoric countermeasures (class 4.2 dangerous goods) may be prepared for the mission with other ordnance in countermeasure preparation facilities and stored in ready use lockers with other ordnance. In these instances the pyrophoric countermeasures are to be treated as HD 1.3 for quantity distance purposes.
7.11 The terms of paragraphs 7.2 to 7.8 inclusive of this procedure are also applicable to multi-purpose EO preparation/storage buildings.

Electro-Explosive Devices – Testing and Fitting

7.12 A room intended to be used essentially as an Electro-Explosive Device (EED) preparation room, e.g. explosive bolt or aircraft power actuated device preparation room, is to be constructed to not less than the standard specified in Regulation 6.1 Procedure 1.

7.13 Where EED or stores containing them are handled, maintained, assembled, tested or prepared for use, the earthing and anti-static requirement of Regulation 6.3 Procedure 1 and 2 are applicable.

7.14 Working surfaces provided for the maintenance of EED are to be fitted with blast shields manufactured of not less than 3.0 mm mild steel plate. Shields are to be high enough to provide protection to the body without obstructing vision and of sufficient length to project at both ends at least 150 mm beyond the store being handled. Blast shields may be interchangeable for various types of store (see also Regulation 4.4 Procedure 1). Alternatively, blast shields made of clear plastic may be used, providing that they offer the same level of protection as the above mild steel plate.

7.15 All electrical testing of EED is to be carried out with the store placed in a special-to-type brick or metal box fitted with a secured steel plate lid, and vented to atmosphere. Operation of the test instrument to the EED should only be possible when the lid is closed and secured. For guided weapon maintenance facilities EED are to be tested in accordance with manufacturer’s instructions and approved procedures.

7.16 The maximum quantities of explosives permitted to be tested in this manner are as follows:

a. HD1.1 - 2.5 grams
b. HD1.2 - 2.5 grams
c. HD1.3 - 500 grams

7.17 EED are to be tested only with the approved safety ohmmeter nominated in the process instruction.

7.18 Personnel are to dissipate body static electricity before entering the working area by grasping, for a brief period, the earthing device provided. During long periods of work, personnel are to repeat this process at regular intervals.

7.19 Personnel are to wear protective clothing, e.g. dust coats, at all times and conductive or anti-static footwear as prescribed in local or maintenance instructions. The footwear is not to be worn outside the working area and is to be kept clean and free from oil and dirt.

7.20 Suitable eye protection must be worn by all personnel whenever EED or their ancillary components are being tested or serviced. Face shields are the preferred equipment to provide such protection.

7.21 Protective gloves are to be worn only when handling components contaminated with fuels, greases or other noxious substances. The use of gloves made of highly insulating material is prohibited.

Electro-Explosive Devices – Testing and Fitting Outside EO Storage Area

7.22 Where it is necessary to test, or test and fit, electrically initiated cartridges, e.g. fire extinguisher or impulse cartridges, to parent equipments, and approved EO preparation facilities within an EO storage area are not provided, these operations may be undertaken in a selected area outside the EO area, e.g. aircraft maintenance hangar (see also Regulation 4.4 Procedure 9). The selected area is to be licensed and authorised for use in accordance with Regulation 5.3 Procedure 1.
**7.23** The area is to provide sufficient space for the working surface and at least two operators. It may be in any suitable area within a building providing the walls are of brick, breeze block or concrete construction; or in the open with or without overhead cover. The area approved for these operations is to be located at least 3 metres from maintenance bays, flammable liquids or EO ready-use lock-ups.

**7.24** A working surface and test fittings meeting the requirements of paragraphs 7.14 and 7.15 are to be provided. Any containers used for the storage of cartridges are to be of clean and unpainted metal, located on the working surface. Metal clamps, suitable to the types of stores to which cartridges are to be fitted, are to be firmly bolted to the working surface. During all operations, the operators are to stand on an earthed metal or conducting rubber mat. Alternatively, wrist straps may be used to ensure that no static charge accumulates on the operator’s body.

**7.25** The working surface and metal mat are to be bonded to an earth electrode and the total resistance to earth is to be maintained at 0.5 ohm or less. Earthing and bonding is to be in accordance with Regulation 6.3 Procedure 1.

**7.26** Only the minimum number of cartridges compatible with the task in hand are to be on the work surfaces. The requirements of paragraphs 7.17 to 7.21 inclusive are to be applied.

**Electrical Testing of Launchers and Similar Equipment**

**7.27** Under no circumstances are the electrical circuits of Decoy or Rocket Launchers and similar equipment to be serviced or tested in preparation facilities, unless such testing is part of the procedure for fitting the explosive components and is specified in the appropriate process documentation.
PROCEDURE 8 - INTERGRATED WEAPON FACILITIES AND GUIDED WEAPON WORKSHOPS

Introduction

8.1 Integrated Weapon Facilities (IWF) and Guided Weapon (GW) Workshops are facilities in which both maintenance and preparation for use or breakdown of guided weapons and ancillary equipment is undertaken. The introduction of programmable automatic test equipment (ATE) for routine testing of guided weapons has necessitated a review of the design concept for associated maintenance facilities. Design of ATE systems requires a separation between the test equipment room and test cell containing an explosives loaded weapon under test of only 30 electrical metres or less. This equates to a physical separation of less than 15 metres, which is well inside the limits for Process Building Distance separation for the quantities of explosives normally processed.

8.2 The concept of the IWF was developed in response to the requirement for these reduced quantity-distances whilst at the same time providing for the survivability of personnel, weapons and equipment in the case of an accidental explosion within any element of the facility. An IWF is an integrated system of explosive resistant barriers and shelters designed to protect other weapons, equipment and personnel from the effects of an accidental blast. Special equipment and techniques have been incorporated in the design to minimise the possibility of fire and to direct the effects of blast, fire and debris away from working areas.

Purpose

8.3 This instruction addresses the administration of Integrated Weapon Facilities and GW workshops. The instructions in Regulation 4.4 Procedure 1 and 5 are also applicable, except as amended herein.

Construction

8.4 IWF and GW Workshops are to be constructed to the requirements specified in Regulation 6.1 Procedure 1 in addition to the special design features necessary to ensure the survivability of other elements in the event of an accidental explosion in one element.

Licensing and Authorisation

8.5 IWF and GW Workshops are to be licensed on the appropriate Explosives Limit Licence form in accordance with the requirements of Regulation 5.2 Procedure 1. Each element of an IWF, ie each Weapon Assembly Room (WAR) and Test Cell (TC), or room in a Guided Weapon Workshop is to be separately licensed.

8.6 An Explosives Contents Board of suitable design is to be used to list the type and quantity of GW or explosive items permitted in each element or room of a facility at any given time. This board replaces the Work Authorisation Board required in explosives workshops by Regulation 5.2 Procedure 1. The Workshop Supervisor or equivalent is to formally authorise the type and quantity details shown on the Contents Board and all subsequent changes.

8.7 Maximum Net Explosives Quantity. The appointed Licensing Authority (see Regulation 5.2 Procedure 1) determines the maximum Net Explosives Quantity (NEQ) for GW Workshops and IWF, however the maximum NEQ for an IWF which can be authorised is not to exceed the design explosives limits for each element. In either instance the quantity of explosives and the number of personnel employed in the facility is always to be restricted to the minimum required to maintain the safe, economical and efficient functioning of the facility. Furthermore, since the weapons processed in IWF and GW Workshops are usually relatively high cost items and limited in numbers in the ADF inventory, the question of total value of assets which could be involved in a single explosive incident must also be considered when deciding on licence limits.
Explosives Safety

8.8 All explosives safety requirements prescribed throughout this manual apply within IWF and GW workshops. In particular, personnel are to observe the following precautions at all times while performing work on Guided Weapons or Guided Weapon sections:

a. Display Hazard Division signs externally on buildings whenever EO is contained within.

b. Discharge themselves to any provided earthing plates situated at the entrance to buildings.

c. Comply with Regulation 6.3 Procedure 2 for earthing of weapons and personnel.

d. If worn due to the provision of anti-static flooring, anti-static shoes are to be tested upon entry to the building. Anti-static wrist-stats are to be tested prior to use each day or after any suspected damage.

e. Comply with all Warnings, Cautions and other safety procedures in the authorised Weapon Processing Instructions and/or locally prepared safety and operating instructions.

f. Wear clothing appropriate to the task, either coveralls, dust coat or shirt and trousers of cotton or specialist anti-static/flame retardant material.

Instructions for IWF and GW Workshop Operations

8.9 No work of any kind is to be undertaken in IWF and GW Workshops unless it is described in Weapon Processing Instructions and/or locally prepared safety and operating instructions.

8.10 Operatives and supervisors undertaking any explosives work are to ensure that they have authorised work instructions and any other data they may require available at the work site. The instructions are to be constantly referred to by the operatives and supervisors to ensure correct processing and the safety of themselves and that of other personnel nearby.

Tools and Test Equipment

8.11 Only tools and test equipment authorised in Weapon Processing Instructions and/or locally prepared safety and operating instructions are to be used.

Operating Restrictions

8.12 Roadways. Vehicles and personnel are not permitted to proceed beyond activated red traffic lights on approach roads without prior permission from the appropriate weapon supervisor.

8.13 Explosives Testing. Unless authorised by the Directorate of Ordnance Safety (DOS) for Alongside Testing (AT), all testing of GW in a test cell with explosives or propellants present is performed remotely. No personnel are permitted to remain in the test cell, an adjacent test cell or the designated hazardous surrounding area when a remote test is in progress. Testing is not to be commenced if explosives loaded vehicles are at or approaching the adjacent WAR.

8.14 WAR Loading Doors. The main loading door between the WAR and its loading bay is to remain closed when a remote test is in progress in an adjacent test cell on an explosive loaded weapon.

8.15 Loading Bays. Loading and packaging operations are not permitted at a loading bay when a remote test is in progress on an explosives loaded weapon in an adjacent test cell. A test is not to be commenced if explosives are present in the adjacent loading bay.
Personnel and Explosives Limits

8.16 Personnel and explosives limits based on the requirements of Regulation 4.4 Procedure 5 are to be applied to operations conducted in an IWF and GW Workshop. These limits apply to an IWF provided the explosive design limits for any particular element in the IWF is not exceeded, otherwise the lower limit is to apply.

8.17 Unlike explosives workshops of conventional construction, the design features of IWF minimise the risk of serious injury from one room to another hence personnel limits need to be applied only to each WAR separately, with no overall building limit being applicable.

8.18 Explosives Limits. The following requirements apply to the promulgation of explosives limits and the handling of explosives loaded weapons or components in IWF or GW workshops:

a. The issued licence for each element of an IWF or room in a GW Workshop is to state the explosives limits by Hazard Division.

b. Any special conditions or caveats for use of the building are to be stated on the issued licence.

c. No Guided Weapons, weapon sections or explosive components are to be stored closer than one metre from any side wall or conductor forming part of the above ground lightning protection system (including the metal cladding of an outer wall which is bonded to the lightning protection system). In addition, no warhead is to be positioned within six metres of a wall adjacent to an adjoining citadel, or beyond the design warhead blast line of a TC unless in transit. The explosive perimeters are to be marked by a red line on the floor of the explosives building.

8.19 Personnel Limits. The following requirements apply to the determination and display of personnel limits in IWF and GW workshops:

a. Only essential personnel, i.e. those actually involved in work on GW plus supervisory staff who are always or frequently present plus associated inspection staff and authorised visitors are permitted in areas of IWF or GW Workshops which contain explosives.

b. Generally, the number of essential personnel must be kept to the minimum required for efficient, economical and safe operation of the facility.

c. The personnel limit for test cells when performing AT is to be the minimum number of personnel who are required to conduct the necessary test operations. Exceptionally, the OIC may authorise the presence of extra personnel for training purposes.

d. Personnel limits, both for essential personnel and visitors must be displayed in each explosive maintenance or test area.

8.20 Personnel Accommodation. No personnel are to be permanently accommodated in a WAR or TC. Any administrative work conducted in a WAR or TC must be limited to work essential in that area for efficient maintenance of GW.

Visitors

8.21 Occasional authorised visitors may be permitted in IWF and GW Workshops while work is in progress. The number of visitors at any time and the periods of stay are to be confined to the minimum consistent with the purpose of the visit, e.g. QA Audits, Re-certification Inspections, training or familiarisation visits etc.

8.22 Other than in exceptional circumstances, visitors are not permitted in areas of IWF or GW Workshops containing disassembled weapons exposing Electro-Explosive Device (EED), fuel, flammable gases or explosive. The OIC may allow visitors with a legitimate reason to enter areas
containing disassembled weapons after ensuring they comply with the same precautions that apply to the GW operatives.

Design Limits and Operating Restrictions

8.23 When new IWF and GW Workshops are accepted for use, the design explosive limits for each workshop or IWF element within the facility, and the operating restrictions applying thereto, are to be included by the Licensing Authority on issued licences.

Safety and Operating Procedures

8.24 Detailed local safety and operating procedures for IWF and GW Workshops are to be prepared and promulgated to all personnel involved in the operation of the facility.

Compliance with Instructions

8.25 All personnel are to comply with approved local safety and operating instructions and the warning signs and notices displayed throughout the IWF and GW Workshops.

8.26 Compliance with these instructions is mandatory unless approval for waiver is obtained in accordance with Regulation 1.2 Procedure 1.

8.27 Normally, IWF and GW Workshop’s electrical equipment and fittings are to comply with the Restricted Electrical Area (REA) electrical standards specified in Regulation 6.3 Procedure 1. In particular, fixed fittings such as power outlets and light fittings are to comply. However, in large rooms where a number of different tasks, both explosive and non-explosive, are undertaken, it is permissible to divide the room into zones for electrical category purposes. Where zoning is proposed, an area of about five metres (exact dimensions can depend on room configuration) around the explosive item is to be permanently marked and all electrical fittings and equipment inside the marked area are to be REA standard. Electrical equipment and fittings outside the marked area do not need to be REA standard, but consideration should be given to cost effectiveness, commonality of fit out and flexibility in use of the facility.

8.28 Notwithstanding the requirements of paragraph 8.27, it is recognised that ATE and other special to type test equipment supplied by the Original Equipment Manufacturer (OEM) or authorised contractor may not meet all the REA requirements. Under written authorisation from the governing Authorised Engineering Organisation (AEO), electrical test equipment that does not meet all the REA requirements may be used. Guidance for the AEO is that the equipment must be specified by the OEM or other recognised authority, it must be appropriate for the task for which it is to be used and it must be maintained in good working order. The written authorisation is to be kept in the applicable work area.

8.29 The concession to REA requirements applies only to the maintenance of GW. Where non-guided munitions are to be maintained in a facility, the requirement for REA electrical equipment and fittings is to be maintained.
**PROCEDURE 9 - UNDER-PRECAUTIONS FACILITIES AND OPERATIONS**

**Introduction**

9.1 Certain operations are performed in explosive ordnance workshops on Explosive Ordnance (EO) which, because of its nature or condition, presents a potential hazard to the personnel involved. These tasks are performed under–precautions with the operator located remotely from the apparatus used for the operation and physically protected by a container traverse and/or mantelets from the effects of any inadvertent explosion.

**Purpose**

9.2 This procedure addresses the administration of EO workshop facilities in which ‘under–precautions’ operations are performed.

**Applicable Procedures**

9.3 The procedures in Regulation 4.4 Procedure 1 and 5 are also applicable to the administration of under–precaution facilities and operations conducted therein.

**Licensing and Authorisation**

9.4 Solitary under–precautions cells or EO workshops with under–precautions features are to be licensed in accordance with the requirements of Regulation 5.2 Procedure 1.

9.5 Details of the authorised task are to be displayed on an Explosives Work Authorisation Board (see Regulation 4.4 Procedure 5) in the under–precautions cell.

**Approval to Conduct Under–Precautions Operations**

9.6 Unless directed to conduct under–precautions breakdown by an external agency authorised to do so, any internally generated requirements to perform operations on suspect stores are to be assessed and authorisation to conduct the under–precautions operations is to be given, in writing, by the Officer-in-Charge of the establishment. These authorisations are in addition to normal facility tasking documentation.

**Approved Maintenance Instructions for Under–Precautions operations**

9.7 The types of EO and the circumstances under which operations on these items need to be performed under–precautions are to be defined in the relevant maintenance instructions. Under–precautions operations must only be performed in accordance with approved maintenance instructions.

**Design Requirements for New or Modified Under–Precautions Facilities**

9.8 When a new under–precautions cell is designed or major modifications are made to an existing cell, the cell is to be designed to contain the fragment and overpressure effects a single internal explosion of a level equal to the total Net Explosives Quantity (NEQ) of the item(s) proposed to be manipulated in the cell in any given operation. The siting of a new under–precautions cell is to take into account the high probability of an explosion occurring during its use.

9.9 Where the under–precautions cell is designed as an integral part of a workshop, the workshop design is to meet the normal design criteria for EO workshops and the requirements of paragraph 9.8 also apply to the design of the cell. In such integrated designs the remainder of the workshop cannot be in use when the under–precautions cell is being operated.

9.10 Major building modifications to under–precautions cells or to EO workshops incorporating such cells, are to be approved by the Explosive Ordnance Branch (EOB).
PROCEDURE 10 - MAINTENANCE OF WATERCRAFT, VEHICLE OR AIRCRAFT COMPONENTS CONTAINING EXPLOSIVES

Introduction

10.1 Where a requirement exists for the maintenance of watercraft, vehicle or aircraft components or assemblies containing small amounts of explosives, eg egress systems, fire extinguishers, cable cutters or emergency flotation equipment, a separate building or room of a building, or area located in the open, may be licensed to perform those operations specified in the appropriate maintenance schedule. The designated area or facility may be sited within an Explosive Ordnance (EO) area or any other suitable location external to the EO area, eg aircraft or vehicle maintenance hangar.

Purpose

10.2 This procedure addresses the administration of facilities or areas in which maintenance operations on components or assemblies containing explosives are to be performed.

Constructional and Safety Requirements

10.3 The building or room of a building in which the maintenance work will be performed is to meet the following requirements:

a. Have walls of brick (or equivalent material) at least 230 mm thick with openings only to normally unoccupied areas, eg building corridors or areas outside the building, otherwise the requirements of paragraph 10.7 apply;

b. Be free from readily flammable materials;

c. Be provided with appropriate fire fighting appliances;

d. Electrical lighting is to conform to local domestic standards; other electrical installations are to conform to the requirements of Regulation 6.3 Procedure 1; and

e. Lightning protection is not required for the building unless the building is sited within an EO area.

Licensing and Authorisation

10.4 The building, room or open area in which the maintenance work will be performed is to be licensed as a small quantity facility and authorised using Form EO 077 Authorised Use and Explosives Content of an Explosives Facility in accordance with Regulation 5.3 Procedure 1.

Authorised Maintenance Instructions

10.5 The operations to be conducted in the maintenance facility are to be authorised by appropriately approved maintenance instructions. No other operations are permitted in the particular room or area whilst explosives are present.

Maximum Net Explosives Quantity and Compatibility Mixing Rules

10.6 The maximum authorised Net Explosives Quantity (NEQ), for a facility located outside an EO area is not to exceed 1kg of Hazard Division 1.2 and/or 1.3 and/or 1.4 explosives. This NEQ limit does not apply if the facility is located inside an EO area. The mixing rules for explosives compatibility groups do not apply, irrespective of the location of the facility.

Quantity Distances

10.7 If the facility is located outside an EO area and the construction of the room or building does not meet the specifications of paragraph 10.3a, a minimum inside and outside quantity distance of 6 metres is to apply, measured from the walls of the maintenance facility to the walls of the other
facility in question. If the facility is located within an EO area, the normal quantity distances are to apply as if the facility is a process building. If the maintenance area is in the open a quantity distance of 6 metres is also to apply.

**Personnel Limit**

10.8 The number of personnel should be limited to that required for efficient and economic completion of the tasks. Normally, at least two persons should be present in case of accident.

**Display of Fire Symbols and Forms**

10.9 Only the following symbols and forms are to be displayed:

a. If the facility is located outside a designated EO area, the appropriate fire division symbol on the outside of each door immediately leading into the maintenance area; and

b. Form EO 002 Small Quantity Facility Explosives Limit Licence and Form EO 077 inside the maintenance area immediately adjacent to the main entrance\(^1\).

**Testing and/or Fitting of Electro-explosive Devices and Electrically Initiated Cartridges**

10.10 If the maintenance work being conducted under the requirements of this instruction requires that electro-explosive devices or electrically initiated cartridges be tested, or removed from, or fitted to the components or assemblies, the requirements of Regulation 4.4 Procedure 7, paragraphs 7.11 to 7.26 apply.

\(^1\) Forms EO 001 to 005 and EO007 are available on application using Form AE303
PROCEDURE 11 - CONTROL AND OPERATION OF BURNING AND DEMOLITION GROUNDS

Introduction

11.1 Procedures for siting, establishing and licensing of burning and demolition grounds are detailed in Regulation 5.5 Procedure 1.

11.2 Before a burning or demolition ground is put to use, all personnel who will operate those facilities are to be trained and authorised as competent for those duties and they are to have available appropriately approved written procedures by which to operate those facilities and for undertaking destruction of individual items of Explosive Ordnance (EO) and other dangerous goods.

Purpose

11.3 This procedure specifies:

a. Responsibilities for the management of logistics disposal activities at burning and demolition grounds,

b. Minimum qualifications requirements for personnel carrying out disposal activities at such facilities, and

c. Measures and precautions applicable to the operation of such facilities.

RESPONSIBILITIES

Training and Authorisation of Personnel

11.4 The appropriate single Service authorities are responsible for prescribing training and authorisation requirements and for ensuring that all staff employed on duties involving the logistical disposal of EO are trained and authorised as competent for those duties. Minimum training and authorisation requirements are detailed in paragraphs 11.7 – 11.11.

Operating Procedures

11.5 Officers-in-Charge (OIC) of individual units and establishments are responsible for issuing operating instructions as follows:

a. **General Operating Instructions.** General operating instructions for burning and demolition grounds under their control are to be prepared in accordance with the guidance provided in this instruction. These operating instructions are to be formally approved prior to implementation.

b. **Specific Operating Instructions.** Specific instructions for the burning or demolition of individual types of EO are to be issued, drawing attention to the general instructions, as required, and specifying:

   (1) The type and number of items of EO which may be taken into the burning or demolition ground at any time, including:

   (a) EO to be destroyed;

   (b) Ignition or demolition charges, including safety fuse or detonating cord;

   (c) Initiators or detonators; and

   (d) Firing devices;
(2) The type and number of items of EO which may be destroyed at any one time;

(3) the method of destruction;

(4) Specific misfire procedures, if not covered by the general instructions; and

(5) Specific environmental control measures, if not covered in the general instructions.

QUALIFICATION AND AUTHORISATION OF PERSONNEL

General

11.6 Because of the potential hazards involved in burning and demolition operations, it is essential that all personnel involved are familiar with the characteristics of the EO being disposed of, the ignition and demolition charges, the means of initiation and the precautions necessary to ensure safety. The training and authorisation requirements for personnel employed on burning or demolition grounds are to be specified as required by paragraph 11.4 and in accordance with Regulation 1.1 Procedure 1. The minimum requirements are detailed in paragraphs 11.7 – 11.11.

Training

11.7 All personnel taking part in burning or demolition operations must have completed training in the following subjects:

   a. Explosives and explosive safety;
   b. Explosives disposal techniques, which may be incorporated into the explosives course or be carried out independently; and
   c. Occupational health and safety.

11.8 First aid training is desirable for all staff, but not essential, provided that at least one member of any team carrying out the burning or demolition task has a current first aid certificate (see paragraph 11.54).

Authorisation

11.9 All staff taking part in the disposal of EO must be authorised for those duties. The authorisation may be restricted in the type of destruction, eg burning only, or in the types of EO which may be destroyed.

Re-authorisation

11.10 Because of the potentially hazardous nature of disposal activities, it is essential that personnel carry out disposal tasks on a regular basis. Refresher training should be considered following a lengthy period that no disposal tasks have been carried out.

Withdrawal of Authorisation

11.11 If an individual is transferred to duties that do not require him or her to carry out disposal of EO, the authorisation may be withdrawn and the individual required to re-qualify if transferred back to duties involving disposal. Any breach of safety instructions will be cause for withdrawal of authorisation.
CONTROL AND OPERATING REQUIREMENTS

Authority for Disposal of Explosive Ordnance

11.12 **Unusable Explosive Ordnance.** Unusable EO is not to be destroyed before confirmation of sentence except in the following circumstances:

- EO which is considered to be in such a dangerous condition that it could not be stored safely pending approval for disposal, and
- EO recovered from EOD operations.

11.13 **Breakdown.** Breakdown is normally conducted for the following reasons:

- Safety and Suitability for Service (S3) assessments,
- Trials,
- Defect investigations,
- Recovery of economic quantities of produce from EO to be destroyed, and
- Removal and replacement of unserviceable components in otherwise serviceable major assemblies or end items.

When breakdown for such logistical purposes is considered necessary, the activity is to be authorised by the appropriate controlling authority for these functions (eg Project Directors may authorise breakdown for trials or S3 assessments purposes, and Product Item Managers may authorise breakdown for defect investigation, disposal or maintenance purposes) and conducted in accordance with approved breakdown procedures. Policy for the breakdown of EO for all other purposes, including the breakdown of EO in declared Areas of Operation, is given in Regulation 2.4 Procedure 1. Because of the risks associated with the breakdown of EO the general principle applicable to such activities is that they must not be undertaken by any individual or groups without proper authorisation in accordance with the policy prescribed here and in Regulation 2.4 Procedure 1.

11.14 **Foreign Explosive Ordnance.** The principles of operational disposal should be applied to the logistical disposal of Foreign EO.

Recording of Disposal Activities

11.15 **Records.** Detailed and accurate records for burning and demolition grounds are to be maintained in a hardbound book with numbered pages. These records are to show, as a minimum:

- The location of the burning or demolition ground;
- Burning or demolition ground activity and use, ie date of use, location of activity, type of activity, Net Explosives Quantity (NEQ), type and quantity of EO or dangerous goods destroyed or used for destruction;
- Names of the Conducting Officer and Safety Officer; and
- Site clearance and environmental tests and decontamination measures (as applicable).

11.16 **Environmental Aspects.** Destruction of explosives or EO, particularly burning operations, give rise to products hazardous to the environment, which may be leached out of the soil and pollute local waterways. Compliance with Defence policy and procedures on environment and heritage protection (see Departmental (Department of Defence) Environmental Instructions), is mandatory. Actions taken to comply with environmental requirements must be recorded.
11.17 **Retention of Records.** Burning and Demolition ground records are not to be destroyed. If a burning or demolition ground is closed, the records are to be retained at the establishment for future reference. If an establishment which contains a burning or demolition ground is closed, the Officer-in-Charge is to seek advice as to where the records should be sent or appropriate archival action is to be taken as a last resort.

**Operating Hours, Weather and Light Conditions**

11.18 **Operating Hours.** The hours during which destruction is permitted are to be specified. Normally, all destruction should be completed within working hours and by such a time that any small fires started by lobbed firebrands could be extinguished in daylight.

11.19 **Weather Limits.** The weather conditions under which destruction is not to take place or is to be suspended are to be specified, eg cloud base, wind speed and direction, imminence or approach of thunderstorms, declared fire restrictions. Disposal operations are not to be undertaken in high wind conditions, during thunderstorms or, for electrically initiated tasks, during sand or dust storms. Demolition on days of heavy overcast should be limited to avoid inconvenience to the civil community due to increased noise levels.

11.20 **Safe Light.** Disposal operations are not to be undertaken unless safe light conditions exist. Safe light conditions are considered to exist if all operations can be conducted without areas of darkness or shadow being present. As a guide, when relying on ambient light for illumination, safe light is usually available from one hour after sunrise until one hour before sunset. Disposal of EO is only to be undertaken during these hours of daylight. During heavily overcast days however, an earlier finishing time may be necessary due to reduced visibility.

**Prohibited and Restricted Articles**

11.21 **Those articles which are prohibited or restricted in EO areas are also to be controlled in burning and demolition grounds, when in use. A list of such articles (see Regulation 4.4 Procedure 1), with any additions which the OIC may direct, are to be incorporated in standing orders and displayed prominently on warning signs at all entrances to burning and demolition grounds.**

**Food and Drink**

11.22 **The consumption of food and drink is to be strictly controlled inside burning and demolition grounds. Food and drink should not be introduced to burning and demolition grounds except where it is administratively or operationally inconvenient for personnel to leave the area for refreshment. In these circumstances the OIC may authorise the consumption of non-alcoholic drinks and food at approved places within the area. Attention must be paid to personal hygiene prior to the consumption of food and drink to avoid the ingestion of toxic residue from explosives. The introduction of alcoholic drinks into a burning or demolition ground is forbidden.**

**Control of Access**

11.23 **Keys.** The entrance to demolition grounds should be controlled on all road entrances. Keys for entrance gates are to be issued during quiet hours to watchmen or duty staff. It is not necessary to control access to burning grounds when they are not in use, providing the ground is not located within the demolition ground.

11.24 **Entry Control.** During normal working hours, details of all personnel and vehicles entering or leaving the burning and demolition grounds are to be recorded by a gatekeeper situated at the entrance to the EO area. The gatekeeper is to maintain records sufficient to enable clear identification of the number of personnel and vehicles in the burning or demolition ground at any one time. Accurate records are essential to enable the timely evacuation of the area in the event of an emergency. During quiet hours, vehicles are not to enter the area without the permission of duty staff, and all details are to be recorded by the watchmen. The gatekeeper or watchman is to refuse access to personnel if the man limits of the burning or demolition ground are exceeded, unless the express permission of the OIC is obtained, or an emergency situation is in existence.
**11.25 Sentry Posts.** Sentry posts are to be sited so as to prevent the entry of persons or livestock into the burning or demolition ground when in use. The posts are to be located at all entrances to the burning or demolition grounds and any other locations deemed necessary, but in all cases are not normally to be sited any closer than the minimum Hazard Safety Distance\(^1\) for the most hazardous nature undergoing disposal. Sentry posts sited within this Hazard Safety Distance are to be constructed to provide appropriate frontal, side and overhead protection, but must not obstruct the sentry's view of the approaches. For such items that may achieve fragment ranges beyond the Hazard Safety Distance, e.g. aircraft bombs\(^2\), sentry posts sited within the predicted maximum fragment ranges are also to be given frontal, side and overhead protection.

**Communications**

**11.26 Communications.** Communications are to be established between the demolition shelter or the firing point of the burning ground, the sentry posts and the establishment's administration area. Communications should preferably be by landline, however radio or mobile phone communications may be used, provided that the Electro-Explosive Hazard (EEH) precautions in Regulation 6.3 Procedure 2 are strictly observed.

**Control of Personnel**

**11.27 Disabled Personnel.** Careful consideration should be given before employing disabled personnel in burning or demolition grounds. The disability should not limit coordination, movement, hearing or sight to such an extent that safety is compromised. Such persons are to be employed only when the OIC is satisfied that the nature of the disability is not likely to produce an unacceptable risk.

**11.28 Personnel Limits.** The number of personnel permitted in the disposal area during burning or demolition activities is to be kept to the minimum commensurate with safe and effective operation. Each burning or demolition ground is to have personnel limits prescribed to reflect the minimum number of personnel required for safe conduct of individual disposal tasks. The prescribed limits do not include visitors.

**11.29 Visitors.** Visitors are not to be admitted to the burning or demolition ground without prior approval of the OIC. They are to be briefed on safety and security requirements and are to be escorted at all times.

**11.30 Non Commonwealth Employees.** Personnel entering the burning or demolition ground who are not employed by the commonwealth, eg to carry out maintenance, read meters or who are employed by the agistment lessee, are to be issued with a written warning explaining that the burning or demolition ground may contain Unexploded EO (UXO) and other contaminants, and that they would be at some degree of risk. In addition, such personnel are to give an undertaking to comply with safety and security measures as required by the OIC, including liability for search of both personnel and vehicles. Access by such personnel is to be strictly controlled for safety and security reasons.

**11.31 Briefing.** The OIC is to ensure that personnel entering the burning or demolition area are briefed on the following aspects prior to entry:

a. Prohibited articles,

b. Restricted articles,

c. Emergency procedures,

---

\(^1\) The Hazard Safety Distance is the measured or theoretical maximum range for all predictable fragments for the EO item under consideration. It should be noted that occasional unpredictable fragments, due to the construction of certain items, may achieve ranges in excess of this Hazard Safety Distance, e.g. nose section, baseplate and suspension lugs of aircraft bombs. Accordingly, special attention should always be given to the orientation of such items since fragments from these areas will travel the maximum distance.

\(^2\) The prescribed Hazard Safety Distance equates to the 'Predicted Maximum Fragment Range' given in the United States Series 60 Explosive Ordnance Disposal publications.
d. Security requirements,

e. The likelihood of UXO,

f. The hazards of handling UXO, and

g. Any other restrictions.

11.32 **Drugs and Alcohol.** The introduction or the consumption of non prescription drugs or alcohol within burning or demolition grounds is not permitted.

11.33 **Level of Competency.** The OIC is responsible for ensuring that all personnel employed on disposal tasks are adequately trained, have the appropriate experience applicable to the task in hand and are authorised as required at paragraph 11.10.

### Control of Vehicles

11.34 **Authorised Vehicles.** Vehicle access to burning or demolition grounds is to be limited to the minimum necessary for the transport of personnel and EO to the site. Vehicles are to leave the hazard area once they are no longer required for the task. The officer responsible for the conduct of the disposal task (Conducting Officer) may retain one vehicle. It should be parked where it is unlikely to be damaged by debris, eg behind a traverse, and parked facing away from the site to facilitate evacuation if this becomes necessary.

11.35 **Private Vehicles.** The use of private vehicles, other than commercial/tradesmen’s vehicles should not be permitted within burning or demolition grounds.

11.36 **Inspection of Vehicles.** Vehicles involved in burning or demolition tasks are to be safe and suitable for the tasks.

11.37 **Carriage of Personnel.** Personnel are not to travel in load area of a vehicle carrying EO, whether the EO is serviceable or not.

11.38 **Radio Transmitters including Mobile Telephones.** Vehicles entering burning and demolition grounds are to be inspected to ascertain that those radio transmitters not approved for use within the area are switched off. The occupants are to be warned not to switch on or transmit whilst inside the area.

11.39 **Speed Limits.** Speed limits within burning and demolition grounds are dependent on local conditions, but in any case are not to exceed 40 km/h. Speed limits are to be signposted at all entrances to burning and demolition grounds and at selected points within the ground.

11.40 **Road Condition Cautionary Signs.** Use is to be made of standard road condition cautionary signs to signpost traffic hazards within burning and demolition grounds.

11.41 **Transport of Explosive Ordnance for Disposal.** The following precautions are to be observed when transporting EO for disposal:

a. EO filled WP is to be transported as a separate load;

b. Vehicles may transport EO for disposal to an area adjacent to, but not closer than 10 m (except for propellant disposal tasks) from the disposal site;

c. Vehicles are not permitted closer than 25 m to unpacked propellant;

d. Vehicle engines are to be switched off when EO is being loaded or unloaded; and

e. Vehicles loaded with EO are to be unloaded and removed to a safe area prior to opening any packages containing EO for disposal or demolition explosives.
11.42 Parking. Vehicles loaded with EO are not normally to be parked overnight in burning or demolition grounds.

Control of Airspace

11.43 Current policy on control of airspace is contained in Australian Ordnance Council (AOC) Proceeding 205.95 ‘Control of Airspace Above Explosive Facilities and Sites of Planned Demolitions’ dated 14 July 1992 and is to be consulted as required.

Special Fire Precautions

11.44 Inspection of Firebreaks. Firebreaks around burning and demolition grounds are to be inspected for serviceability prior to disposal tasks being undertaken.

11.45 Inspection of Area. Burning and demolition grounds are to be inspected prior to disposal tasks being undertaken, to ensure that grass, undergrowth and other ground cover does not present a serious fire risk.

11.46 Inspection of Firefighting Equipment. First attack firefighting equipment must be available at firefighting points near to the destruction site. The firefighting points are to be inspected prior to disposal tasks being undertaken to ensure availability and serviceability of all items of equipment. Adequate supplies of fire beaters, knapsack sprayers filled with water and rakes are to be available. If a reticulated water supply is available, hoses are to be rigged ready for immediate use. If a static water source, such as a tank or dam is used, the pump must be tested prior to commencing destruction operations.

11.47 Requirement for Firefighting Vehicle. Under adverse fire conditions a firefighting vehicle may need to be dedicated to the disposal activity or be available at immediate notice.

11.48 Special Precautions. All fire precautions special to the nature of EO to be destroyed are to be taken.

11.49 Final Inspection. On completion of disposal operations each day, the Conducting Officer is to ensure that the area is inspected to ascertain that all flammable material is destroyed and smouldering vegetation or debris is extinguished.

Conduct of Operations

11.50 Pre-disposal Actions. The requirements detailed in paragraphs 11.52 – 11.58 are to be implemented prior to any disposal task being undertaken.

11.51 Notification to Civil Authorities. Well prior to disposal operations the Conducting Officer is to liaise with the following local authorities to ensure advance notice to the civil community:

a. Police.
b. Air Services Australia.
c. Local airport/flying schools.
d. Fire or Bushfire Brigades.
e. Local hospital or medical centre.

11.52 Warning to Establishment Staff. The following establishment personnel will normally require prior warning of planned disposal operations:

a. Establishment management.
b. Establishment security.
c. Establishment fire station.

d. EO Workshop supervisor(s), so that workshop operations can be modified or suspended as necessary.

e. Establishment medical or first aid section.

11.53 **Communications.** Communications are to be established between the burning or demolition ground, the sentry posts and the establishment’s administration area. The designated telephone or radio in the administrative area is to be manned at all times while the disposal operations are in progress.

11.54 **Mandatory medical support.** All burning and demolition activities require mandatory medical support in accordance with LWP-G 7-3-1 Australian Defence Force Range Orders (Land).

11.55 **Inspection of Demolition shelter.** The Conducting Officer is to inspect the demolition shelter to ensure its serviceability prior to conducting disposal tasks. Fixed firing circuits and communication links should also be checked at this stage.

11.56 **Fire Prevention and Firefighting Checks.** The Conducting Officer is to undertake the fire checks specified in paragraphs 11.45 – 11.49 prior to any disposal operations.

11.57 **Escape Routes.** Escape routes are to be kept clear and checked prior to destruction activities commencing. The Conducting Officer is to ensure that all personnel are familiar with the escape routes and the procedure for ordering evacuation in the event of an emergency.

11.58 **Warning Flags and Sentries.** Red warning flags are to be used to indicate that the burning or demolition ground is occupied and that destruction of EO is about to take place. Sentries are to be posted so as to prevent the entry of persons or livestock into the burning or demolition point. Sentries are to be located at all entrances to the area and any other locations deemed necessary, but in all cases are not to be sited any closer than the minimum unprotected safety distance applicable to the most hazardous nature for disposal. Depending on the topography, additional sentries may have to be posted to prevent personnel approaching dangerous areas along routes hidden from the firing point.

11.59 **Briefing of Sentries.** Each sentry is to be briefed on the disposal task being undertaken and provided with the following:

    a. Details of the danger area;
    b. A duty statement;
    c. A communications net diagram;
    d. Explicit instructions on action to be taken in respect of all persons approaching or entering the demolition or burning ground;
    e. A radio or other suitable means of communication; and
    f. A red flag.

11.60 **Controlled Articles.** The Conducting Officer is responsible for controlled articles taken into the burning or demolition ground. In particular, smoking materials are to be controlled by the implementation of the following procedures:

    a. Prior to entering the burning or demolition ground, or EO area if entry is through that area, all smoking materials are to be collected and placed in a lockable container.
    b. This container is to remain under the control of the Conducting Officer.
A clearly defined smoking area is to be established not less than 50 metres from the destruction point or any area where EO is being used.

11.61 **Storage and Transport of Explosive Ordnance.** All demolition stores to be used on disposal tasks are to be transported and stored in their service containers until immediately prior to when they are required for use. In particular, electrically initiated demolition stores such as Cap Blasting Electric are to be carried in their service package or when a fraction quantity is required, in a totally enclosed steel package, such as the M19A1, until immediately prior to use. Such packages are not to be opened within the applicable frequency hazard safety distance of any radio equipment being used.

11.62 **Security of Explosive Ordnance.** EO for use during disposal tasks is to be placed in a secure location at the burning or demolition ground. EO is to be guarded if it is necessary for personnel to move out of sight or be more than 100 metres away.

11.63 **Personal Safety Equipment.** All personnel involved in disposal tasks are to wear protective dress which may include safety boots (anti-static if electro-explosive devices are involved), facemask or goggles, long-sleeved fire-resistant overalls, helmets, gloves and earmuffs.

11.64 **Conduct of Disposal Tasks.** The conduct of disposal tasks is to accord with the following:

a. **Operating Instructions.** The operation of burning and demolition grounds during disposal tasks and the conduct of individual disposal tasks are to accord with the instructions issued in accordance with the requirements of paragraph 11.5.

b. **Misfire Procedures.** Precautions must be taken in the event of a misfire particularly in regards to the minimum waiting time to be observed. The minimum waiting time is to be at least ten minutes when using electrical initiation methods and thirty minutes when the non-electric method is used. Safety must be the overriding consideration.

11.65 **Post-disposal Actions.** Following the completion of individual disposal tasks or at the end of the working day, as appropriate, the Conducting Officer is to ensure that, as a minimum, the following actions are implemented:

a. The requirements detailed in paragraphs 11.50, 11.67, 11.69 and 11.77 – 11.79.

b. The recording requirements of paragraphs 11.15 – 11.17, as appropriate.

**Packages and Produce**

11.66 **Free From Explosives (FFE) Certification.** The Conducting Officer is to ensure that all packaging and produce, prior to its removal from the burning or demolition ground, is inspected and certified FFE (see Regulation 2.3 Procedure 1).

11.67 **Recovery of Produce.** No produce which cannot be certified FFE or which might contain toxic residue is to be removed for resale. In particular, produce from SAA burns is not to be recovered but removed to a secure metal tip.

11.68 **Removal of Produce.** At the completion of each days disposal tasks, and before leaving the burning or demolition ground, all personnel, including sentries, are to be warned by the Conducting Officer of the consequences of removing produce from those areas.

**Special Provisions**

11.69 **Design, Construction and Approval of Destruction Facilities.** Where specific facilities, eg pits, drums, demilitarisation furnaces, detonator destructors, etc, are utilised for destruction, the design, construction and operating restrictions are to be approved by the Explosives Ordnance Branch (EOB). Some facilities, such as demilitarisation furnaces or detonator destructors, are designed to contain the effects of deliberate detonation of small quantities of EO. The operation of these machines is to be considered by the Licensing Authority in conjunction with burning or demolition ground licence applications.
11.70   **Decontamination of Plant.** Burning grounds may be used for the decontamination of plant items by heating, using a gas flame or other fire. Before heating, every effort must be made to remove all explosive contamination from the items. The items must be approved by a suitable technically qualified person delegated by the establishment OIC, as suitable for decontamination by heating.

**Inspection of Burning and Demolition Grounds**

11.71  Burning and demolition grounds are to be inspected for the following aspects at least every three months:

   a.  Cleanliness;
   b.  Serviceability of boundary fencing;
   c.  Serviceability of fixed communications;
   d.  Signposting (entrances and boundary fence);
   e.  Serviceability of fire fighting equipment;
   f.  Fire breaks; and
   g.  Estate management.

**Estate Management**

11.72   **Environmental Management Plan.** A balanced plan of environmental management is to be implemented in accordance with Departmental (Department of Defence) Environmental Instructions.

11.73   **Firebreaks.** The requirement for firebreaks is as detailed in Regulation 4.5 Procedure 1, paragraph 1.12.

11.74   **Fire Fighting.** Fires burning in known demolition grounds are not to be fought from within that area because of the danger from UXO. Fire fighters should concentrate on preventing the spread of the fire to bordering areas.

11.75   **Environmental Aspects.** Disposal sites within burning and demolition grounds are to be located to lessen any environmental impact on the local area. Of particular concern is secondary damage from wind and water erosion.

11.76   **Site Clearance.** On completion of any destruction of EO, the site is to be searched and cleared of any residual explosives. The search area is to be wide enough to ensure that any lobbed EO or explosives are recovered. Any waste contaminated with explosives, eg the wrappers for PE, is also to be collected. All the recovered items are to be destroyed, usually as the final operation of the day.

11.77   **Clearance of Residue.** On completion of each days activities or weekly during large scale disposal tasks, remaining residue, such as non-explosive components and large fragments are to be gathered into a designated collection area for later removal. This operation is to be conducted under the direct supervision of a suitably qualified officer who is to ensure that the work party is briefed as to the identification of possible hazards and action to be taken if encountered. At the same time, disposal areas should be restored by filling craters and removing debris from roads, tracks and work areas.

11.78   **Disposal of Residue, Inert Explosive Ordnance and Components.** Residue collected from burning and demolition grounds, inert EO and components for disposal by mutilation and burial are to be placed in inert rubbish tips.

11.79   **Vermin Control.** Active measures are to be taken to eliminate vermin from burning and demolition grounds. Vermin control parties are to be briefed as to areas that may be accessed; personnel are not to enter areas that could be contaminated by UXO. See Regulation 4.5 Procedure 1 paragraphs 1.26 – 1.28 for further details.
11.80 **Firing Ranges.** Firing ranges are not to be sited within burning or demolition grounds.

**Surrender of Burning or Demolition Grounds**

11.81 When a burning or demolition ground, either in whole or in part, is no longer required for the disposal of EO and its use as such is to be surrendered, the provisions of DI(G)ADMIN 63-1 – *Management of Land affected by Unexploded Ordnance* are to be implemented.
PROCEDURE 12 - USE OF EXPLOSIVES FOR DISPLAYS AND DEMONSTRATIONS

Introduction

12.1 The use of any explosives for display/demonstration (hereinafter called display) purposes, but in particular the use of commercial fireworks, can be extremely hazardous to both operators and spectators alike if appropriate procedures are not applied and safety precautions not taken at all stages of an event.

Purpose

12.2 This procedure prescribes requirements for the storage and use of military Explosive Ordnance (EO) and commercial explosives for display purposes, and the procedures and safety precautions to be observed.

Applicability

12.3 Except where specifically excluded at paragraph 12.4, this procedure applies:

a. In all situations where explosives or pyrotechnics, including theatrical effect explosives and fireworks in UN Class 1, are used or stored for official or private display purposes.

b. When the display is organised by Defence, or is conducted on Defence owned or controlled property, or is conducted outside Defence owned or controlled property where Defence personnel are participating and are on duty.

c. To significant public firework displays involving major Defence assets such as ships or aircraft, eg Centenary Naval Review, Amberley Air Show.

12.4 This procedure does not apply to:

a. Events such as firepower demonstrations, where complete weapon systems are demonstrated to military and/or civilian audiences at approved firing ranges.

b. Operation of saluting guns that are controlled by single Service gun drill procedures.

c. Firing of blank SAA at Unit Open Days and authorised Unit training where local safety procedures address the activity.

d. Functioning of Navigational and/or Emergency signalling pyrotechnics for the purpose of training or demonstration where a local procedure addresses the activity.

e. The conduct of commercially operated Battle Noise Simulator and Battle Effects displays for the training of Defence personnel by state/territory approved operators using commercial explosives. These activities are authorised provided they are conducted via an authorised contract and are conducted in accordance with AS2187 and state legislation.

f. The conduct of Battle Noise Simulation and Battle Field Effects Simulation when conducted in accordance with single service doctrine (i.e. LWP-G 3-6-6 Demolitions) using approved service explosives, simulation systems and techniques.
Licensing

12.5 Display areas are to be licensed by the Licensing Authority, located in the Explosives Ordnance Branch, using Form EO 005 Fireworks and Display Area Licence\(^1\) (See Regulation 5.2 Procedure 1).

Display Management

12.6 For each display a Safety Officer is to be appointed by the Officer-in-Charge (OIC) of the unit concerned with organising the display. The Safety Officer should be of Senior Non-commissioned Officer (SNCO) rank or classification of APS Level 6 (TO4) as a minimum. The Safety Officer should have a sound appreciation, through training or experience, of the explosive effects of the items to be fired and all hazards associated with their use. For each display a Display Operator is also required. The responsibilities of Display Operators are defined in Australian Standard 2187.4 - 1998 Explosives - Storage, Transport and Use Part 4: Pyrotechnics – Outdoor Displays (AS 2187.4 - 1998) and their competencies are addressed in paragraphs 12.9 to 12.10. The Display Operator may be a contractor or may be appointed by the OIC of the unit concerned. Where appropriate the one person may perform both the duties of the Safety Officer and the Display Operator.

12.7 When a commercial operator is engaged the Safety Officer is to sight a current Display Operator’s Licence and a Public Liability Certificate of Currency.

Operation of Displays

12.8 Displays are to be conducted in accordance with the provisions of AS 2187.4 - 1998, particularly Section 4.

Competency of Display Operators

12.9 Defence staff, trained in the use of Defence EO, are not to be assumed as competent firework Display Operators but must take advantage of courses provided by the individual firework manufacturers or other accredited trainers to gain such competencies. The use of either a professional Display Operator or the firework manufacturer to conduct the display should be considered as the first option.

12.10 Displays involving the use of fireworks are not to be conducted by Defence personnel who are not trained in their use. The Display Operator is to be licensed under the relevant State legislation. If military EO or commercial explosives (not fireworks) are to be used, the Safety Officer or the Display Operator is to hold a current Defence qualification to initiate the items to be used.

Safety Assessment of Display

12.11 The reasons for conducting displays are to entertain or awe spectators and/or expose them to simulated battle effects. Such occasions, while requiring spectators to be proximate to the displays, are always to be conducted within the requirements and spirit of the explosives safety rules in AS 2187.4 - 1998 and this Manual. The spectators need to be located close enough to experience the visual and sound effects of the explosives without being so close as to face the risk of injury. Safety distances are to be determined in accordance with AS 2187.4 - 1998 and paragraph 12.24, as appropriate.

Significant Public Firework Display

12.12 When significant Defence assets are to be used in conjunction with a public firework display single Service safety authorities have prime responsibility for the safety of those assets and spectators, and are to ensure that appropriate risk assessments are conducted. Joint Logistics Command (JLC) staff will provide explosives safety expertise to the display management entity as requested.

\(^1\) Form EO 005 is available on application using Form AE303
Use of Defence Explosives

12.13 Defence owned or controlled EO is not to be used for non-public funded displays.

Displays Using Commercially Procured Explosives

12.14 Displays using commercially procured explosives for activities such as theatrical effects at air shows, open days, ceremonial events and similar functions, are normally to be limited to explosives of HD 1.3 and HD 1.4. If so limited, the approval of the Deputy Director Explosive Ordnance Licensing Authority (DDEOLA) at DEOLC in accordance with paragraph 12.20 and site licensing in accordance with paragraph 12.5 are not required. The Safety Officer for the display is to ensure that the provisions of AS 2187.4 - 1998 are adhered to. If the display site perimeter, as calculated from the methodology outlined in AS 2187.4 - 1998 is within 200 m of a valuable or hazardous Defence asset (see Annex A), the single Service safety authority is to be consulted.

12.15 All fireworks are to be manufactured and labelled in accordance with paragraph 2.1 of AS 2187.4 - 1998 and packaged and transported in accordance with paragraphs 2.2.1 and 2.2.2 of AS 2187.4 - 1998. Other explosives are to be labelled with the hazard classification code (HCC) as a minimum.

12.16 It is recommended that complete display kits be purchased which include instructions for setting up the display area and detailed operating instructions.

12.17 JLC staff are able to provide advice on the safety aspects of display contracts or proposals, if required.

Storage of Commercially Procured Explosives

NOTE

Due to the higher risks presented by the storage and handling of fireworks compared to authorised Service EO, this storage should normally be in an isolation storehouse if available.

12.18 Fireworks may be stored during the day at the display site for use the same night in accordance with paragraph 2.2.3 of AS 2187.4 - 1998. Fireworks may also be stored for up to 72 hours in a licensed EO storage building or other suitable facility at the discretion of the Licensing Authority. Commercial explosives of HD 1.1 and 1.2 are always to be stored in accordance with the provisions of this manual. Particular care is to be taken when handling fireworks due to the inherent weakness of the paper or cardboard cases and the high probability of spillage of the filling. On arrival, and prior to storage in an EO storage building, the fireworks are to be suitably over-packed to prevent the leakage of black powder or pyrotechnic composition. Firework fillings are very sensitive to impact, friction, heat or sparks. Storage facilities are therefore to be carefully cleaned before and after fireworks storage, and before any other explosive is stored. If fireworks are to be stored for periods in excess of 72 hours, the Safety Officer for the display is to apply to the Secretary, Explosives Storage and Transport Committee (ESTC) in the Directorate of Ordnance Safety for formal classification prior to the arrival of the fireworks at the unit. Receipt of formal ESTC classification is necessary for storage of fireworks in excess of 72 hours.

Use of Military Explosive Ordnance and Commercial Explosives (Not Fireworks)

12.19 When an explosive demonstration is part of an authorised training syllabus, it may be carried out at a licensed demolition ground, burning ground or approved EO firing area without reference to a higher authority. When it is intended to include a demonstration in a new training course, the course sponsor is to obtain approval for the explosives activity through single Service channels and apply to the Licensing Authority if a new or revised licence is required.

12.20 When military or commercial explosives of HD 1.1 or HD 1.2 are to be used for displays (other than for approved training courses), authority is to be obtained in advance from EOLA for each
occasion. Normally, a minimum of 28 days notice is required. Requests are to be made by the Safety Officer for the display and are to include the following information:

a. Purpose and details of the display.
b. Date and location of the display.
c. Proposed display site.
d. A marked up map of the display site showing the distance of display sites from:
   (1) Spectators.
   (2) Inhabited buildings, vital installations and other buildings and facilities.
   (3) The firing party.
   (4) Taxiways.
   (5) Runways.
   (6) Radar and radio installations.
   (7) POL facilities.
   (8) The Departmental property boundary.
e. Type and quantity of explosives to be used, and initiation method.
f. Distance between charges.
g. Type of ground at the display site, type of soil, length of grass, tree cover, terrain features etc.
h. Misfire and disposal procedure to be used.
i. Proposed action to inform local authorities, hospitals, unit personnel, etc of the planned display.
j. Safety arrangements for the display party.
k. A copy of the display instruction.
l. Fire fighting facilities.
m. Details of the display party, their qualifications and recent training history.
n. Confirmation that an underground cable and services clearance has been conducted in the display area.
o. Details of the system for controlling and coordinating the firing to ensure major assets and crowd safety, eg sentries, radio links, landlines etc. The system of control is to be designed to be fail-safe, ie no firing is to take place until the display controller, who is to be in a position to observe the whole area, gives a positive clearance to fire.

12.21 The requirement at paragraph 12.20 is based on a reasonably extensive display using a total NEQ greater than 1 kg and involving non-departmental spectators or a large group of departmental employees. Small displays are also undertaken where the total NEQ is less than 1 kg and only a small group of departmental employees are present as spectators, such as for ad-hoc bomb awareness training. In this instance approval (paragraph 12.20) and site licensing (paragraph 12.5) are required,
but only the elements of paragraph 12.20 sub-paragraphs a, b, c, e, and j need be addressed and a simple site plan is to be provided to the approval authority.

**Limits on Types and Quantities of Explosives**

12.22 The following Defence EO may be used for displays:

a. Detonating Cord, up to 10 g/m loading density.


c. Caps Blasting Electric and Non-electric.

d. Igniters Time Blasting Fuse Electric.

e. Fuze Blasting Time.

f. Non-electric (NONEL) system items.

g. CE primers, simulators and similar non-fragmenting explosives.

h. Various flares and signalling devices.

12.23 The Net Explosives Quantity (NEQ) of HD 1.1 explosives used in the make-up of any single effect is to be the minimum to produce the desired effect, but is not to exceed 0.23kg (8oz). Small quantities of POL, not in excess of 10 litres per container, may be used for pyrotechnic effects and must be contained in non-fragment producing containers eg plastic not metal. Wherever possible, initiation of charges is to be conducted using electrical methods. Such initiation is to be carried out using Service approved initiating devices. Improvised means of initiation are not permitted, eg bare batteries not contained in a firing device.

**Safety Distances**

12.24 The safety distances for fireworks are to be in accordance with AS 2187.4 - 1998. Where HD 1.1 or 1.2 explosives are to be used, the display site is preferably to be a licensed demolition ground, burning ground, or EO firing area, or, for applications in accordance with paragraph 12.20, the minimum safety distances to be applied are the authorised demolition safety distances for the particular explosives to be used.

**Display Models and Props**

12.25 Display models or props built to be destroyed, or which may be potentially destroyed by explosives, particularly when HD 1.1 explosives are used, are to be constructed from non-lethal fragment producing materials such as paper, cardboard, polythene, plastic ties and adhesive tape etc. The use of wood is to be confined to small quantities, by weight and surface area, of thin plywood. Wooden battens, metal objects, nails, metal banding tape and similar items are not permitted. Similarly, to reduce the potential for lethal fragments, the use of metal cordan junction clips is not permitted.

**Post – Display Actions**

12.26 Site Clearance. At the conclusion of the display, a thorough search of the display area is to be conducted by the Safety Officer to ensure the area is free from explosives and explosives refuse. The display instruction is to indicate this requirement.

12.27 Post Display Evaluation. The Safety Officer is to conduct a post–display evaluation. The evaluation should focus on the adequacy of the outcomes of the event in relation to the safety factors considered in the planning phase, with a view to improving the requirements of this instruction. The evaluation report is to be forwarded to DEOLC (DDEOLA). Any suggested improvements are to be forwarded to the sponsor of this Manual.
Annex:
A. Valuable or Hazardous Defence Assets
VALUABLE OR HAZARDOUS DEFENCE ASSETS

1. When a fireworks display is being planned, safety distances are to be in accordance with the provisions of Australian Standard 2187.4 – 1998 Explosives - Storage, transport and use - Pyrotechnics - Outdoor displays (AS 2187.4:1988).

2. However, when sites and facilities exposed to the firework’s effects are valuable or hazardous Defence assets and within 200 m of the display site perimeter, the relevant single Service safety authority is to be consulted – see Regulation 4.4 Procedure 12 paragraph 12.14. The following assets are prescribed for the purposes of this approval:

   a. Military war-fighting vehicles, vessels or aircraft.
   b. Control centres and workshops for the equipment at sub-paragraph a.
   c. Communication or navigation aid towers, transmitters or receivers.
   d. Petroleum, Oils and Lubricants storage greater than 500 litres.
   e. EO licensed facility.
   f. Large flammable areas such as tent camps.
   g. Other facilities deemed by local commanders to be vital for base, establishment or force operations.
PROCEDURE 13 - PRINCIPLES FOR THE OPERATION OF SMALL QUANTITY FACILITIES

Introduction

13.1 Limited quantities of Explosive Ordnance (EO), usually of less than 50 kg Net Explosives Quantity (NEQ) and required for specific operational or training use may be stored or processed in designated open areas, buildings, rooms or special containers usually located outside designated EO storage areas. Such a facility is known as a ‘Small Quantity Facility’ (SQF) and is to be licensed using Form EO 002 unless not required in accordance with Annex A paragraph 24 to this procedure.

Purpose

13.2 This procedure prescribes the requirements for the operation of SQF.

Applicability

13.3 This procedure applies to all SQF unless specifically stated otherwise.

Siting of Small Quantity Facility

13.4 The establishment, siting and installation of SQF must be closely coordinated with:

a. The Licensing Authority (LA) to ensure that the facilities are established only on the basis of actual and genuine need, and

b. The responsible security authority to ensure that the necessary security standards are implemented and maintained.

13.5 The siting of SQF does not require the convening of a Board of Officers (see Regulation 5.1 Procedure 1 paragraph 1.4). However, advice is to be sought from the LA prior to any siting commitment and/or construction.

13.6 Generally, a SQF should not be sited adjacent to, or in a room or compartment in which incompatible processes¹ are undertaken, or is assessed as a Domestic Inhabited Room (DIR)². It may be in a compartment where related maintenance activities are undertaken, but is to be at least 3 m from incompatible processes within that room unless otherwise determined by the LA. Where it is essential that an incompatible process be in an adjacent compartment and the EO in the SQF is unpacked, then the separating wall is to be of fire proof construction and is to be full ceiling height. SQF are to be at least 10 m from bulk storage of liquid Dangerous Goods (DG) that exceeds 200 litres and 25 m where the DG storage exceeds 1000 litres. For DG quantities less than 200 litres, SQF separation is determined by the LA. Where the SQF is in a large work area, such as a vehicle, ship or aircraft maintenance facility, it is to be clear of traffic and personnel paths and at least 3 m from incompatible processes and DIR. Unless the SQF is a fixed storage facility or an approved safe, then the SQF location is to be clearly marked on the floor of the facility. This marking should be permanent, but may be by a temporary barrier for SQF that do not continuously contain EO, eg seat storage area.

Quantity Distance Criteria for Small Quantity Facility

13.7 SQF are not normally subject to the Quantity Distance (QD) criteria prescribed in Regulation 5.4 Procedure 1.

---

¹ Incompatible processes are those that are not directly related to the SQF and that involve use of substances classed as Dangerous Goods (DG), chemical-cleaning processes or hot work. The term includes areas where such substances are used or where they are stored ready for use. It does not include bulk storage of DG.

² A domestic inhabited room (DIR) is defined as one that is normally occupied by staff not directly related to the SQF, and where numbers of personnel assemble for purposes not directly connected with work activities.
13.8 The determination of SQF QD and the quantities of EO to be held in a SQF, is to be based on an Explosives Risk Assessment (ERA) as detailed in Regulation 5.3 Procedure 1. The LA is to conduct the ERA and determine the appropriate SQF QD and NEQ allowable for each SQF. Because of the complexity of risk assessments and the number of variables to be considered, each SQF case must be assessed individually by the LA, except as provided for at paragraph 13.18. However, for EO of any Hazard Division (HD) and NEQ (up to 50 kg) in a SQF that complies with the QD requirements of Regulation 5.4 Procedure 1, QD siting criteria may be used in lieu of a risk assessment for that HD and NEQ only.

13.9 Small Quantity Facility as an Exposed Site (ES). Where the explosive consequences of a Potential Explosive Site’s (PES) initiation, and in particular the probability of propagation of the explosion from the SQF is not significantly increased, the SQF need not be considered as an Exposed Site ES when determining QD in accordance with Regulation 5.4 Procedure 1. A SQF occupied by personnel undertaking EO activities is to be treated as an ES in accordance with Regulation 5.4 Procedure 1.

Permitted NEQ and Hazard Division Aggregation in Small Quantity Facility

13.10 The EO that may be stored or processed in a SQF may be of single or mixed HD. The total NEQ of HD 1.1, 1.2 and 1.3 is not to exceed 50 kg and an additional HD 1.4 quantity, up to 50 kg may be permitted by the LA. In exceptional circumstances where it is demonstrated by the user unit to be essential for Defence capability, the LA will determine the additional quantity of HD 1.4S EO (only) that may be stored or processed with EO of other HCC in the SQF.

13.11 EO of HD 1.1 and 1.2, especially fragmenting EO, should not normally be stored in SQF. When the LA permits such storage, on the basis that it is an essential requirement, the licensed quantities are to be kept to the absolute minimum.

Compatibility Mixing in Small Quantity Facility

13.12 Small quantities of EO in Compatibility Groups B, C, D, E, F and S may be stored together in any one SQF. However, EO in Groups G and H are normally to be stored in a separate compartment or SQF. Because of the nature of Group F stores, these should also be considered for separate storage. The LA may specify compatibility mixing requirements on the Explosives Limit Licence.

Construction of Small Quantity Facility

13.13 Justification for the storage or processing of EO outside a designated EO storage area must be agreed by the LA in writing before construction of new SQF can commence.

13.14 Several types of SQF may be required to support an establishment’s operational or training role. The construction of SQF must aim to meet the following minimum criteria:

a. If it is a room, a SQF is to be of fire resistant material.

b. SQF licensed for EO storage and/or equipment maintenance (only) are to comply, as far as practicable, with the (electrical) requirements of a Restricted Electrical Area (REA) as defined in Regulation 6.3 Procedure 1 Annex D. All other SQF are to be assessed in accordance with Regulation 6.3 Procedure 1 Annex B, and those found not to be classified as a REA are to be referred to the LA for further advice.

NOTE

Circumstances such as type of use, size, structure and location of SQF may mean full compliance with Regulation 6.3 Procedure 1 Annex D cannot be achieved. Advice on the application of Regulation 6.3 Procedure 1 Annex D is to be sought from the LA. Note that direct EO hazards are to be mitigated. Exemptions to paragraph 13.14 b are to be referred to the Directorate of Ordnance Safety.
c. The SQF must meet the basic security requirements as determined by the responsible security authority.

d. Windows, if fitted to SQF, are to be protected against unauthorised entry as determined by the responsible security authority.

e. Improvised containers may be used in lieu of purpose built lockers and magazines but they are to be made of steel and be large enough to store the required number of items in a safe manner. All lockers and containers are to be secured within a room to a wall, floor, or other substantial structure, unless their bulk and weight, or the physical environs precludes easy removal.

f. Containers sited in the open must be weatherproofed and shielded from direct sunlight where possible.

g. SQF licensed to hold HD 1.1 and 1.2 EO are normally to be internally and/or externally traversed (see paragraph 13.15).

h. A security fence is required for SQF in an open area unless a security assessment, to be conducted by the responsible security authority, determines that it is not required.

i. Lightning protection for a SQF in the open is not normally required in accordance with Regulation 6.2 Procedure 1 paragraph 1.8. However, SQFs that are metal lockers and containers in the open must comply with the earthing requirements of Regulation 6.2 Procedure 1 paragraph 1.8 d.

Traversing and unitisation requirements for Small Quantity Facility

13.15 If SQF are required to be traversed, an internal traverse in lieu of an external traverse may be fabricated using sandbags. EO of HD 1.1 or HD 1.2 is to be stored in units no larger than 5 kg NEQ and a double row of sandbags is to surround the EO. The height of the sand bag wall is to be at least 300 mm above the EO stack. Outer or internal walls of a structure may form part of the traverse provided the walls are brick or concrete. The internal traverse may also be constructed of a double row of bricks, equivalent thickness of reinforced concrete or other suitable sand filled container. Further advice may be sought from the LA. Multi-bay SQF that have effective traversing between bays may, at the discretion of the LA, have each bay licensed in isolation to the other bays. SQF containing HD 1.1 or HD 1.2 may also have an external traverse, but such traverses are to be constructed in accordance with the normal traverse design rules in Regulation 6.1 Procedure 2.

13.16 Certain items are permitted to be stored within an SQF that are exceptions to the 5 kg rule as defined in paragraph 13.15. These items have been approved for storage under the conditions outlined in paragraph 13.15. Items are assessed individually and authorised by the ESTC on request. The authorised items are listed below:


Licensing of Small Quantity Facility

13.17 SQF are to be licensed by the LA using Form EO 002 Small Quantity Facility Explosives Limit Licence (see Regulation 5.2 Procedure 1).

13.18 Common Use Small Quantity Facility. Throughout Defence several types of SQF have been authorised for similar purposes under the same conditions and requirements. The LA has completed an ERA on these types of SQF as required at paragraph 13.8. Applications for SQF licences which meet the criteria in Annex A may be authorised without further risk assessment.

---

3 Form EO 002 is available on application using Form AE303
13.19 Safeguarding of Small Quantity Facility. Due to the special requirements and limitations applicable to SQF, and since each SQF is licensed by risk assessment in accordance with paragraph 13.8, SQFs do not require to be safeguarded in accordance with the requirements of Regulation 5.6 Procedure 1. However, the location of SQF are normally annotated on Safeguarding Maps of an EO establishment. Any changes to facilities or new developments occurring adjacent to SQFs, a review of the EO risk hazard assessment previously conducted must be carried out.

Authorisation of SQF

13.20 All SQF are to be authorised for use by the Officer-in-Charge of the unit using Form EO 077 Authorised Use and Explosives Content of an Explosives Facility - See Web Forms for a specimen of Form EO 077. This form promulgates the explosives limits for SQF, up to but never to exceed the limits authorised by the applicable Explosives Limit Licence Form EO 002, and lists the EO and maximum quantities approved to be in the facility, including non-Defence EO.

13.21 Forms EO 077 are to be prepared by the person responsible for the operation of the facility and are to be authorised by the current OIC. Compilation instructions for the form are given by way of notes on the reverse of the form.

NOTE

The use of an Electronic Data Sheet (EDS) may be used to record EO quantities in SQFs with a high turnover of items, in lieu of completing the ‘Facility Contents’ section of Form EO 077. The EDS must be attached to Form EO 077.

13.22 After approval, Forms EO 077 are to be distributed as follows:

a. The original is to be held in the Explosive Ordnance Facility Authorisation Register - see Regulation 5.2 Procedure 1.

b. One copy is to be displayed adjacent to the Explosive Limit Licence (Form EO 002) for the facility (unless Form EO 002 is not required in accordance with Annex A paragraph 24 of this Procedure).

Display of Licence and Authorisation Form

13.23 Copies of the current licence (if required) and authorisation forms are to be displayed in a prominent position inside or near to each SQF.

Explosives Contents Board

13.24 An Explosives Contents Board prescribed in Regulation 4.4 Procedure 2 is not required for SQF licensed under this instruction.

Fire Prevention and Firefighting

13.25 Attention must be given to ensure that personnel and property are exposed to minimum risk when any outbreak of fire occurs involving, or likely to involve EO. SQF must therefore be protected as much as possible from any risk of fire. Accordingly, the following precautions are to be observed:

a. SQF are not normally to form part of, or be within 3 m of a building or room in which small quantities of flammable goods are stored or used (see also paragraph 13.6).

b. The use of flames or smoking is prohibited within 3 m of SQF. This is to be promulgated in local instructions.

c. A water type fire extinguisher shall be readily available for isolated SQFs and located within 5 m of the SQF. Internal SQF shall have a fire extinguisher located not more than 3 m from the SQF.
d. For SQF that are lockers located in the open, a clear non-grassed area of 1 m is required around the SQF. At a distance of 1 m to 5 m of the SQF, the grass is to be kept short, ie between 50 mm and 300 mm. No bushes, undergrowth or overhanging tree branches are permitted. These requirements may be varied at the discretion of the LA and/or in consultation with the local fire authority.

13.26 Display of Fire Symbols for Small Quantity Facility. Whenever EO is present in an SQF an appropriate fire symbol, including any supplementary fire symbol(s), is to be displayed on the side(s) facing the most likely vehicular or pedestrian approach, as appropriate. The fire symbols may be attached to the SQF or sign-posted a short distance (up to 5 m) from the SQF. These symbols must be changed whenever Hazard Divisions or supplementary risks change. In cases where the NEQ is low (at the discretion of the LA) and only HD 1.3 or 1.4 EO is involved, and the SQF is a room, locker or container within a building or other large structure, eg aircraft hangar, external signage may not be required and only the SQF itself and the door to the room need to have signage. In these circumstances the placement of fire symbols is at the discretion of the LA. Also, there may be occasions where the LA or local emergency authorities require additional signposting and this will be specified on the ELL or in local emergency instructions. Fire symbols are never to be obscured and must be clearly visible at all times. Notwithstanding the above, a unit in a remote location may apply for a concession to the local fire authority if display of fire symbols could draw attention to the storage of EO.

Electrical Hazards

13.27 EO is sufficiently protected from the harmful effects of Electro-Static Discharge (ESD) when it is contained in its approved packaging. Where susceptible explosive material or Electro-Explosive Devices (EEDs) are exposed or being handled, then the requirements of Regulation 6.3 Procedure 2 are applicable.

13.28 EO containing EEDs require protection from RADHAZ in accordance with Regulation 4.4 Procedure 15.

Principles for the Operation of Small Quantity Facility

13.29 SQF are to be in the charge of an appropriately qualified and responsible person who is to ensure the safe custody of the EO at all times. SQF are to be operated in accordance with the following principles. This list is in no way exhaustive and the instructions in Regulation 4.4 Procedure 2 for the operation of EO storehouses in designated EO storage areas also apply where applicable:

a. Drill, dummy or instructional ammunition and weapons are not to be stored with live EO. The only exception to this is when an explosive or inert component is packaged separately from the parent item. Such components may be stored together, eg components of the Grenade Hand Practice F3.

b. Packaged kits, eg Ramset kits, and their components may be stored together.

c. Empty packages are not to be stored in SQF with live EO.

d. For security reasons, fired cartridge cases may be stored in SQF with live EO pending ‘free from explosives’ certification, and provided the cartridge cases are in a sealed container and clearly marked. Such storage is to be for the minimum time required.

e. Handling of EO is to be avoided during the approach or progress of an electrical storm.

f. Only those persons actually engaged in the handling of EO are to be in the immediate vicinity of such operations.

g. For EO of HD 1.1 and HD 1.2, the maximum use of unitisation to reduce external hazards is to be adopted. NEQ for each unitised quantity of EO is not to exceed 5 kg
except for storage of small quantities of pyrotechnic stores and Small Arms Ammunition (SAA). Safes so used are not to contain any other valuable and attractive items and are not to contain files or documents that would require the safe to remain unsecured for lengthy periods.

j. The storage of SAA in SQF is to be restricted to ammunition that is not of high explosive configuration and below a calibre of 19.1 mm.

k. Ball and blank SAA should be stored in separate SQF, but must be stored in separate compartments that are clearly marked, to reduce the possibility of contamination of blank ammunition with ball rounds.

l. Co-located SQF lockers are to be separated by a minimum distance of 1 m otherwise the NEQ of each SQF are to be aggregated and the lockers licensed as a single site. Relocatable magazines constructed in accordance with AS 2187.1-1998 may have a lesser minimum distance separation requirement from each other or to another SQF without requiring aggregation at the discretion of the LA. The LA may also require increased minimum separation distance to mitigate explosive risks.

m. EO from fraction containers, ie containers having fewer than the recognised full quantity, should always be used first.

n. Unpackaged EO, in particular SAA, is not to be stored in bags. EO that has been issued, and then returned unused, is to be packed into its authorised package before being placed in a SQF for storage.

o. Packages containing EO that have been wetted are to be carefully wiped dry, especially around the lid, before being placed in a SQF. Where the package is suspected or known not to be airtight, it is to be opened and the EO inside inspected and, if necessary, dried carefully item by item.

p. Packages are to be stored in SQF’s in such a way that air may be circulated freely around and under them.

q. Dangerous goods other than Class 1 such as paints, oils, chemicals, other dangerous goods and cleaning rags etc are not to be stored in SQF unless they have been allocated a DEOCL number.

r. The issue or receipt of EO, from or to, packages in SQF is permitted provided all packages are subsequently closed (see Regulation 2.3 Procedure 4 paragraph 4.30).

**Inspection of Explosive Ordnance in Small Quantity Facility**

13.30 The examination of EO in storage SQF or those items removed from equipment undergoing servicing, eg those from life rafts, parachute packs and aircrew vests, is to be visual only. If the inspection involves dismantling, eg the removal of a fire extinguisher cartridge from its bottle assembly, the inspection is to be performed in a licensed SQF EO process facility.

**Security**

13.31 Establishments should always be aware of the threat of theft of EO and implement security measures for SQF accordingly. The LA may require Defence Security Authority to conduct a security assessment of the SQF in question before a licence is authorised.
Instructions and Emergency Plans

13.32 Establishments are to indicate in standing orders or instructions that SQF are to be managed and operated in accordance with the requirements detailed in this procedure.

13.33 In accordance with Regulation 4.7, establishments with SQF are to ensure that the hazards associated with the explosives contents of such facilities are addressed in the establishment’s emergency response plan.

Annex:
A. Common Conditions for Storage of Explosive Ordnance in Small Quantity Facilities
COMMON CONDITIONS FOR STORAGE OF EXPLOSIVE ORDNANCE IN SMALL QUANTITY FACILITIES

Introduction

1. Under the provisions of Regulation 5.2 Procedure 1 storage and handling areas for small quantities of Explosive Ordnance (EO) may be licensed after a risk assessment has shown that the risk is acceptable. Because of the extremely large number of combinations of quantity and nature of EO, handling activities and physical situations that occur in the handling of small quantities, each situation normally requires an individual risk assessment so that all relevant factors are taken into consideration when determining risk. However, after several years of licensing Small Quantity Facility (SQF), it is apparent that across the three Services there are a number of common scenarios and conditions for handling small quantities of EO that have been risk assessed many times and have been shown to present similar very low levels of risk.

2. The following paragraphs describe those scenarios that are commonly found to occur at numerous sites and that have been shown by risk assessments to be of similar very low levels of risk. The descriptions contain the natures of EO that may be handled, where relevant the Net Explosive Quantity (NEQ) permitted and any special conditions that are to apply to ensure that the scenario is within the limits of previous risk assessments. Where a handling scenario complies with one or more of the following descriptions it is to be licensed, but an individual risk assessment is not necessary. Scenarios that do not meet the following descriptions may also be licensed, but these require risk assessments to be carried out to the satisfaction of the Licensing Authority (LA).

Metal Lockers and Containers

3. Metal lockers and containers, of any size appropriate for the quantity of items held, are suitable containers for EO from a security and explosives safety point of view. Where metal lockers or containers are prescribed for storage in scenarios described in the following paragraphs of this annex the following conditions are to apply:

   a. It is to be painted white if practicable.

   b. The word EXPLOSIVES in red lettering, a minimum of 25 mm high, is to be visible from the most common approach routes. Paint, sticker, decal or other reliable form of marking is acceptable.

   c. The appropriate fire class symbol, and if necessary supplementary fire symbol, is to be fixed so as to be visible from the most common approach routes. These symbols should be fixed to the locker or container, but may be attached to a nearby structure. Advice may be sought from the local Fire Authority.

   d. It is to be of solid steel construction with welded seams, tamper-proof hinges and a tamper-proof locking system.

   e. The key or combination is to be under the positive control of a designated, responsible person. A register of names of current designated persons is to be maintained by the establishment's Explosives Custodian Officer (RAN) or Base Armament Manager (RAAF) and by the Executive Officer of Australian Regular Army, Reserve and Cadet Units.

Designated Containers and Structures

4. In addition to metal lockers and containers prescribed at paragraph 3, the following propriety containers and magazines are designated as suitable for use as an SQF:

   a. A or B class safe.
c. Purpose built Enhanced Self Defence Capability (ESDC) lockers.
d. Masonry magazines, armouries and enclosures fitted with Defence Security Authority approved doors and locks.
e. ISO and Tricon type shipping containers.

5. The conditions at paragraph 3c and e above are to apply to designated containers and structures. Safes are suitable for SAA, smoke producing EO and some other pyrotechnics as determined by the LA.

Storage of SAA and Pyrotechnics

6. All storage facilities approved by this Annex are suitable for storage of HD 1.4 SAA, smoke producing EO and most other pyrotechnics as determined by the LA. Approved NEQ and HDs will depend on facility dimensions and location.

Ready Use Stocks of Installed Explosive Ordnance

7. Platform and component servicing or maintenance areas are often used to remove and replace items of installed EO. To maintain efficient operations it is acceptable for such areas to store small quantities of EO. The installed EO that has been removed and serviceable EO awaiting installation may be stored together, but the quantity stored is not to exceed that normally resulting from two working weeks of operations. The storage container is to have a physical barrier to create separate compartments for storage of unserviceable and serviceable EO as the requirements of Regulation 4.1 Procedure 1 paragraph 1.14 still apply in this scenario. Each compartment is to be clearly marked to indicate the status of items within. The storage facility is to be in accordance with this Annex. The area where EO is removed from the platform is normally not required to be licensed, but maintenance areas for components containing EO are to be licensed. See below for conditions for electrically initiated cartridges.

Areas for Maintenance of Components Containing Electrically Initiated Cartridges

8. Maintenance of components containing electrically initiated cartridges is to be carried out in a licensed site within a workshop or hangar. The licensed site includes the work area and the approved EO storage facility. Components, either with or without cartridges, may be stored with new and time-expired cartridges in the approved EO storage facility. However, each category of article is to be in a separate, clearly marked compartment. The requirements of Regulation 4.4 Procedure 8 paragraphs 8.21 to 8.26 are to apply.

Ammunitioning of Ships

9. Provided main magazines are not accessed, any wharf may be licensed for handling pyrotechnic items that make up a ship’s navigation outfit, smoke generators required for crew work-up and proficiency training or testing, and SAA for ship’s staff individual weapons. The EO is to be stowed in an approved EO stowage that does not contain main gun ammunition, torpedoes or guided weapons. After the ship sails the EO may be moved into another magazine if required. The following risk minimisation measures are to be implemented:

a. All non-EO gangway activity is to cease while ammunition is being transferred.
b. Ammunitioning is not to occur in conjunction with fuelling or handling of other dangerous goods.

---

1 Installed EO is EO that is always fitted to a weapon platform for its function and/or safety of operation, eg fire extinguisher/cable cutter/ejection seat cartridges.
c. EO handling personnel are to be afforded direct, unhindered access between the wharf and the EO stowage onboard.

d. The EO delivery vehicle is a potential source of fire and, consequently, EO initiation. Suitable fire suppression equipment is to be immediately available to douse a vehicle fire.

e. The EO delivery vehicle is to be parked as close as practicable to the gangway. However, a minimum safety distance of 10 m should be observed between the delivery vehicle and inhabited facilities. In some instances, a parking position will be annotated on the licence.

f. No smoking or mobile phones or transmitters are permitted within 3 m of the delivery vehicle and the ship's access route.

Conditions of Storage for Ejector Cartridges

10. Small quantities of ejector release unit cartridges held for ready-use purposes, up to 3 kg NEQ, may be stored in an approved EO storage facility.

Conditions of Storage for Aircraft Ejection Seats (Without Rocket Motors)

11. Complete ejection seats, including seat sub-assemblies, removed from aircraft that contain cartridge actuated devices of any HD (but not rocket motors) are normally to be placed in a separate licensed EO storage facility. However, an area may be designated in a licensed workshop or hangar area. The number of seats that are held in this area is to be the minimum required to meet maintenance requirements. When in use the designated area and individual seats are to be placarded with a warning sign that is visible to all persons who may approach it. The warning sign is to have the following notice stencilled in 25 mm red letters on a white background:

![ARMED EJECTION SEAT
DO NOT TOUCH](image)

Conditions of Storage for Aircraft Ejection Seats fitted with Rocket Motors

12. When complete ejection seats or seat sub-assemblies, with rocket motors attached are removed from aircraft, the seats, sub-assemblies or detached rocket motors are normally to be removed to the EO storage area or other approved purpose built EO storage facility that is appropriately licensed. Paragraph 15 outlines the requirements for a purpose built facility. It is preferred that rocket packs be removed from the seat and stored individually in OEM packaging or in accordance with the Topic -025 of the item publication. The seat may then be stored under the conditions of paragraph 11. However, for efficiency of maintenance operations, storage of ejection seats fitted with rocket motors may be stored in a licensed workshop or hangar area for a period not to exceed 24 hours.

Conditions of Storage for Aircraft Canopy (Without Rocket Motors)

13. Aircraft canopies removed for maintenance or replacement and fitted with explosive transfer lines\(^2\) (but not rocket motors) may be moved to an EO storage area located in a workshop or hangar that is appropriately licensed for that activity. Canopies and components are to be stored on suitable racks or stands or in containers designed for the storage of the particular item. The number of canopies held in this area is to be the minimum required to meet maintenance requirements. The designated area is to be placarded with a warning sign that is visible to all persons who may approach

\(^2\) Shielded Mild Detonating Cord (SMDC), Thin Line Explosive (TLX), Flexible Confined Detonating Cord (FCDC).
it. The warning signs are to have the following notice stencilled in 25 mm red letters on a white background:

![ARMED CANOPY DO NOT TOUCH](image)

**Conditions of Storage for Aircraft Canopies fitted with Rocket Motors**

14. When a canopy with rocket motors installed is removed from an aircraft, the canopy is to be moved to a licensed area in a workshop or hangar. It is preferred that rocket motors are removed from the canopy and stored individually in an approved EO storage facility within the OEM packaging or in approved packaging in accordance with the Topic - 025. When the canopy rocket motors are removed, the canopy is then to be stored under the conditions of paragraph 13. However, for efficiency of maintenance operations, storage of canopies fitted with rocket motors may be stored in a licensed workshop or hangar area for a period not to exceed 24 hours.

**Design Principles of a Purpose Built Rocket Motor Storage Facility**

15. Where construction of a purpose built rocket motor storage facility is contemplated, or use of a suitably modified existing facility, the following design principles are to apply:

   a. The primary aim in the event of an accidental rocket motor initiation is to contain the seat and all its components.

   b. Rocket efflux is to be vented safely without endangering personnel, assets or facilities. A 1 m clear zone is to be designated around the facility.

   c. Projection of building debris is to be minimised and is not to present a hazard to nearby personnel, assets or facilities.

   d. Appropriate security and fire prevention measures are to be incorporated.

   e. The separation distance of the EO storage facility from the Commonwealth property boundary is to be at the discretion of the LA, but must comply with security requirements.

16. Any design concept meeting the above principles is acceptable. Design packages are only to be forwarded to the LA for design consideration once the final design certificate has been provided by the designated authority.

**Conditions of Storage for SAR Equipment Sets, Life Rafts, Survival Packs and Flying Clothing Containing Pyrotechnics and Matches**

17. Some items of survival equipment containing pyrotechnics and matches are classified as Dangerous Goods (DG), but not Class 1. Where this is the case, the items are to be stored in accordance with requirements for their DG Class. Where the items are Class 1, they must be stored in a licensed work and maintenance areas in a site that meets the requirements for siting of an SQF. Areas where items of any DG Class are maintained, and EO items are removed or fitted, are to be licensed. The general requirements for siting SQF apply. New EO items, sufficient for ready use requirements, and time expired EO items, may be stored together in an approved licensed storage facility in the maintenance section provided they are separated from each other within the storage facility.

18. Flying clothing containing survival pyrotechnics and matches may be stored in either of the following conditions:

---

3 Includes canopy rocket motors
ANNEX A

a. In open racks in an acceptable and authorised flying clothing SQF.

or

b. In the aircraft cockpit and treated as installed EO with no ELL required, providing the following conditions are met:

(1) There is no authorised or acceptable flying clothing storage SQF within the location.

(2) Authorisation is required from the Unit CO after consultation with the Airfield Manager/equivalent.

(3) Maintenance is not to be conducted on the flying clothing, only visual inspection not involving dismantling permissible.

(4) Adequate aircraft/airfield security is to be provided.

(5) Period of storage is not to exceed 72 hours.

Conditions for Temporary Storage of Practice Bombs, Ball Ammunition, Chaff and Flares

19. Practice bombs, ball ammunition and countermeasures held ready for loading to aircraft during turnarounds, may be held in temporary storage (eg trolley) in selected licensed and authorised areas convenient to the aircraft dispersals. The areas are to be at least 25 m from all buildings, installations and aircraft not involved in the EO operations. The area is to be clearly marked with warning signs and red flags. The amount of EO so stored is not to exceed that required for one day, and cannot exceed 50kg in total.

Conditions for Storage of Towed Target System Explosive Bolts

20. Explosive bolts and release link assemblies from the Towed Target Release System may be stored in the banner preparation room in an approved licensed storage facility.

Conditions for Storage of Matches

21. Matches safety or matches non-safety may be stored in a SQF provided that they are packed separately in a metal ammunition box. If the SQF is a room, the matches are to be held in a metal cupboard.

Conditions for Storage of Enhanced Self Defence Capability Explosive Ordnance

22. The LA may waive some compliance requirements of the eDEOP 101 and determine that SAA ammunition, in approved storage configurations and quantities, may be stored in dedicated ESDC lockers with weapons and related equipment.

Exercise, Practice and Telemetry Explosive Ordnance

23. Exercise, practice and telemetry EO that is classified as HD 1.4 may be handled without the need to apply QD. Movement of these items into or out of ship’s magazines and armoured vehicles, and loading onto aircraft, does not pose a significant risk to other EO already accommodated provided the other EO is not being handled. Accordingly, it is not normally necessary to count the NEQ of the already-loaded EO in the handling activity. However, if other natures of EO are required to be moved or handled to facilitate this evolution, then normal application of QD for the total EO contents of the platform is required. The following risk minimisation measures are to be implemented:

a. All non-EO activity is to cease while ammunition is being transferred.

b. Ammunitioning is not to occur in conjunction with fuelling or handling of other dangerous goods.
ANNEX A

c. EO handling personnel are to be afforded direct, unhindered access between the EO delivery point and the EO storage on the platform.
d. The EO delivery vehicle is a potential source of fire and, consequently, EO initiation. Suitable fire suppression equipment is to be immediately available to douse a vehicle fire.
e. No smoking or mobile phones or transmitters are permitted within 3 m of the delivery vehicle.

24. The maintenance and storage of these items within designated facilities, movement into and out of ship’s magazines and armoured vehicles, and loading onto aircraft does not pose a significant risk to other EO already accommodated provided the other EO is not being handled.

Very small quantities of HD 1.4 EO

25. Very small quantities of HD 1.4 EO, up to a total NEQ of 0.01 kg, may be stored and handled in an SQF without the need for an explosive limit licence provided that:
   a. Item(s) have a DEOCL number.
   b. Items are held in approved packaging or parent assembly when not being handled.
   c. Explosive Risk Assessment (ERA) shows that the item(s) are unlikely to cause the subsequent initiation of other hazardous materials, significant damage to equipment or injury to personnel.
   d. Does not apply to detonators and items of HD 1.4D.

Notes:

A form EO 077 and appropriate explosive, fire and PPE signage is still required for EO stored and/or handled under the conditions of this paragraph.

The requirements of Regulation 6.3 do not apply to SQF approved under conditions of this paragraph.
PROCEDURE 14 - TRANSFER OF EXPLOSIVE ORDNANCE

Introduction
14.1 The transfer of Explosive Ordnance (EO) whether onto a road vehicle, ship, watercraft, or aircraft exposes it to a higher level of risk than most other operations. It is therefore important that the appropriate policies and responsibilities be promulgated to ensure maximum safety and efficiency during these transfer operations.

Purpose
14.2 This procedure prescribes the policies applicable to the transfer of EO.

Transfer of Explosive Ordnance
14.3 Transferring EO is the process involving the movement of EO from one place to another using any form of transport or Mechanical Handling Equipment (MHE). This process is to occur at a site that is licensed as an approved EO transfer facility.

GENERAL

Responsibilities – General
14.4 The Commanding Officer (CO) or duly authorised civilian equivalent of the unit/organisation involved in EO transfer operations is responsible for ensuring that:
   a. Detailed local operating procedures are prepared, based on this procedure, and that staff involved in the operations are conversant with them; and
   b. An officer/ supervisor is appointed to be responsible for each EO transfer operation and that his/her duties and responsibilities are included in the local operating procedures.

Local Procedures for Defence Establishments
14.5 Detailed local procedures, authorised by the CO or official delegate who has command responsibility of the EO transfer site on a Defence establishment or which is under the control of Defence, are to be prepared covering all aspects of local EO transfer operations. As a guide, a list of topics that should be considered when drafting local procedures is given in Annex A. Specialist advice to assist in the preparation of these procedures should be sought from the Commanding Officer, Joint Explosive Ordnance Services (JEOS).

Local Procedures for Commercial Sites
14.6 At commercial sites EO transfer operations are to be undertaken in accordance with local procedures authorised by the Site Manager. These procedures are to meet the minimum Defence requirements specified in this procedure.

Security
14.7 Security practices required to be undertaken during the transfer of EO are detailed in the Defence Security Principles Framework (DSPF).

Logistic Paperwork
14.8 The logistic paperwork, such as EO Demand Requests (AC 665) or Ammunition Issue Record (SQ 080) etc., which is required to accompany the EO when being moved is detailed in the Electronic Supply Chain Manual (ESCM), V04S08C01 – Management, Accounting and Assurance of Explosive Ordnance at Unit Level.
14.9 The EO User Guide produced by DEOS detail processes and procedures that are required when interacting with the EO Services Provider. The EO User Guide is available on the ESCM, V04S08C01.

Handling of Explosive Ordnance

14.10 Care is to be taken at all times when handling EO. In particular, the following precautions are to be observed when lifting EO during transfer operations:

a. Lifting equipment is to be used in accordance with its user instructions.

b. The route used in the transfer is to be planned to ensure it passes over the minimum number of dangerous projections as possible and is clear of obstructions such as parked trolleys or containers, empty pallets, etc.

c. Items are to be lifted no higher than is necessary to clear obstructions (see also paragraph 14.11).

d. Where practicable, loads are not to be traversed over EO or personnel. Guide ropes are to be used if the lift is sufficient height to require them.

e. Packages, pallets, cages etc are only to be slung by the specified points and using the equipment authorised for the particular task.

f. Packages are not to be slung by their handles.

Maximum Lifting Heights

14.11 As a result of the reaction of certain items of EO to drop testing some items have been allocated a Maximum Lifting Height (MLH), sometimes known as safe lifting height. These MLH are specified in item publications and are to be observed at all times. Where a MLH is not specified, the maximum height lifted is to be limited to 12 m (40 ft). The requirements of paragraph 14.10b should always be the basis of any lifting operations.

Lifting and Handling Equipment

14.12 Lifting and handling operations are only to be undertaken using equipment that is within the prescribed test period. Special purpose lifting and handling equipment is not to be used for other applications unless specifically authorised by the OIC.

Defective and Damaged Explosive Ordnance

14.13 Any damaged, defective, misfired, malfunctioned or suspect EO is not to be included in an EO transfer operation until it has been examined and a Certificate of Safety provided in accordance with Regulation 3.1 Procedure 2. If an authorised inspector is not prepared to provide a Certificate of Safety, the EO is not to be transferred and local Explosive Ordnance Disposal (EOD) staff is to be called to deal with the EO. Defective and damaged EO is to be reported in accordance with Regulation 1.3.

Authenticity Sealing of Packages at the Point of Exchange

14.14 When EO packages are received at the exchange site with broken seals and the inner packages without seals are not damaged and interference with the contents is not suspected, the contents may be examined and the packages sealed by an appropriately qualified and authorised person detailed in Regulation 2.3 Procedure 3. Should damage or interference be suspected, the incident is to be reported in accordance with Regulation 1.3.

Authenticity Sealing of ‘Broken Seal’ Packages during Transfer of Explosive Ordnance

14.15 So as to comply with Explosives Transport Regulations 2002 Statutory Rules No. 92, 2002 (ETR), packages with broken seals are not to be transported on public roads or waterways. Hence, unsealed or incomplete packages of EO which do not carry valid seals are to be checked for visual
serviceability, that external safety devices are fitted and that the EO is properly packed in its authorised packages. The packages are then to be authenticity sealed as required at Regulation 2.3 Procedure 3. This activity is to be completed by an appropriately qualified and authorised person. Incompatible activities, such as re-fuelling and Radio Frequency (RF) transmissions, are to be controlled or restricted during this time and appropriate fire precautions are to be in place.

14.16 Operating Instructions. Appropriate arrangements to mitigate any risks associated with the inspection and authenticity sealing of broken seal packages, permitted at paragraphs 14.14 and 14.15, are to be detailed in local operating instructions.

Lightning Risk Conditions

14.17 Responsibilities and actions relating to lightning risk condition occurring during EO transfer operations are set out in Regulation 4.4 Procedure 1.

Firefighting Equipment

14.18 The positioning and state of readiness of this equipment for EO transfer operations is the responsibility of the authority that has command responsibility of the facility, and these requirements are to be detailed in local standing instructions.

Requirements for Transfer of Explosive Ordnance at Wharves and Anchorages

14.19 Additional requirements for transferring EO at wharves and anchorages are detailed in Annex B.

Annexes:
A. Checklist for Preparing Local Operating Procedures
B. Additional Requirements for Transfer of Explosive Ordnance at Wharves and Anchorages
CHECKLIST FOR PREPARING LOCAL OPERATING PROCEDURES

1. Below is a list of topics that should be addressed when drafting local procedures relating to Explosive Ordnance (EO) transfer operations. The list is intended as a guide and as such not all topics may be relevant to each transfer operation. Developers of local operating procedures are to tailor the following topic list to suit their requirements:

   a. Access/Control of Personnel.
   b. Adverse weather conditions.
   c. Attendance of Specialist Staff.
   d. Broken Seal Containers.
   e. Competencies and Authorisation of Personnel.
   f. Control of EO Stores.
   g. Control of Expended EO.
   h. Control of Empty Packages.
   i. Control of Material Handling Equipment.
   j. Crane Operations.
   k. Damaged/Defective Stores.
   l. Duties of Personnel.
   m. Emergency Procedures.
   n. EO Transfer Operations.
   o. EO Mixing Limitations.
   p. EO Accounting Procedures.
   q. Explosives Licence Limits.
   r. Firefighting Requirements.
   s. Incompatible Operations.
   t. List of authorised lifting and handling equipment.
   u. Loading/Unloading Plan including Launcher Alignment checks.
   v. Locality of nearest licensed site.
   w. Mooring arrangements and Operations.
   x. Non–explosives Transfer Operations.
   y. Precautions During Lifting.
   z. Pre-operations Conference.
aa. Preparation of Wharf for EO Transfer Operations.

bb. Radiation Hazards Aspects.

c. Security/Control during Silent Hours.

dd. Use of Shot Mats etc.

e. Vehicle Authorisation and Control.

ff. Wharf Limitations.

gg. Calibration of gauges, lifting appliances etc.

hh. Personal Protective Clothing and Equipment.
INTRODUCTION

1. The transfer of Explosive Ordnance (EO) at wharves and anchorages, whether onto a road vehicle, ship or watercraft, exposes it to a higher level of risk than most other operations. It is therefore important that the appropriate policies and responsibilities be promulgated to ensure maximum safety and efficiency during these transfer operations. In the context of this annex, the requirements for wharves also apply to piers or jetties.

PURPOSE

2. This annex prescribes the policies and responsibilities applicable to EO transfer operations at wharves and anchorages, in addition to the procedures detailed in Procedure 14, when the transfer operations involve HMA Ships and Submarines and other military watercraft, foreign military vessels and commercial vessels loading/unloading Commonwealth EO. This annex is to be read in conjunction with ABR 862 Volume 2, Chapter 5.

EXPLOSIVE ORDNANCE TRANSFER OPERATIONS

3. An EO transfer operation is the process of moving EO from one place to another using any form of transport or Material Handling Equipment (MHE). In the context of this annex, an EO transfer operation involves the movement of EO onto/over a wharf to/from a transport vehicle/transport watercraft/shipping and includes ship to ship transfers at wharves and anchorages. The use of the term ammunitioning is restricted to the movement of EO to or from a ship (see ABR 862 Volume 2, Chapter 5).

4. Except for the transfer of small quantities of pyrotechnic EO such as a navigational outfit, the transfer or replenishment of EO between ships is prohibited when one of the ships is also involved in transfer operations at wharf-side or at anchorage.

SPECIFIC RESPONSIBILITIES OF STAFF INVOLVED IN TRANSFER OF EXPLOSIVE ORDNANCE

SHIP’S STAFF

5. The general responsibilities of ship’s staff are set out in ABR 862 Volume 2, Chapter 5.

SHORE ORGANISATION’S STAFF

6. The Officer-in-Charge of the shore organisation’s staff at EO transfer operations is responsible for the control, coordination and safety aspects of those operations as set out in this manual. Specific responsibilities are as follows:

a. Ensure that the ship is at its allocated buoy/buoys, anchorages or is in its correct berthing position at a wharf in accordance with approved licence conditions.

b. Ensure arrival at shipside prior to operations commencing and scheduled planned operations are confirmed.

c. Ensure that operations are conducted in accordance with relevant Operating Procedures, including:

   (1) Fire hoses charged and ready for use.

   (2) Fire hoses ready on Crane Stores Lighter (CSL), where applicable.

   (3) No smoking piped.
(4) Appropriate flags displayed by ship.

(5) The ship's RADHAZ Board correct and locked.

(6) EO transfer operations and re–fuelling activities do not take place simultaneously.

(7) Loaded lighters/trucks staged/parked correctly observing appropriate separation distances.

(8) Non–essential personnel vacated.

(9) Appropriate and minimum staff numbers in position at transfer points.

(10) Appropriate lifting methods utilised for each type of EO or unit load.

(11) Appropriate Personal Protective Equipment worn by personnel.

(12) Ensure NEQ limits for lighters/trucks not exceeded and that loaded lighters/trucks correctly placarded.

(13) Ensure Emergency Response Control Plan in place.

Regional Explosives Ordnance Services Staff

7. At all sites where Regional Explosive Ordnance Services (REOS) are established, representatives are to attend all operations involving the transfer of Commonwealth EO to or from HMA ships and submarines and other military watercraft, and foreign military vessels. At sites where REOS are not established, the Explosives Custodian Officer of the sponsor establishment is to provide support.

8. In accordance with ABR 862 Volume 2, Chapter 5, REOS staff attending EO transfer operations are to provide specialist technical advice and assistance on all aspects of EO and to act as safety observers. The core responsibilities prescribed in ABR 862 Volume 2 are amplified at paragraphs 9 to 11. In the event that a foreign warship is involved in the EO transfer operation the safety observer has the additional responsibility to ensure that Australian law and the EO licence conditions applying to that EO transfer site are not breached.

9. Embarkation. REOS in attendance at embarkation are responsible for:
   
a. Providing assistance to ship's staff in accordance with ABR 862 Volume 2, Chapter 5.

b. Sentencing of guided weapons, as required, and providing Certificates of Safety for damaged EO (see Regulation 3.1 Procedure 2).

c. Providing advice to the ship's Commanding Officer (CO) should an incident involving EO occur.

d. Safety observation, (see paragraph 11).

10. Disembarkation. REOS in attendance at disembarkation are responsible for:

   a. Visual examination to assess the ongoing certification of guided weapons in accordance with local procedures, to allow re–issue to the fleet without further inspection and sentencing by delegated personnel within Authorised Maintenance Organisation (AMO) maintenance facilities.

   b. Examination, identification and labelling of suspect, defective, damaged or malfunctioned/misfired EO requiring special attention or priority examination and/or maintenance at the receiving depot. Certificates of Safety are to be issued when required, (see Regulation 3.1 Procedure 2).
c. When applicable, examination and sealing of broken seal packages for suspect EO and guided weapons.

d. Provision of advice and assistance to the ship’s CO and the shore organisation’s staff should any incidents involving EO occur during the operation. The services of an EOD team should be sought by REOS whenever an EO incident leads to immediate disposal requirements, i.e. a Certificate of Safety cannot be issued.

e. Safety observation, (see paragraph 11).

11. **Safety.** The responsibility for the safe conduct of EO transfer operations rests with both the relevant CO of the ship and of the shore organisation’s staff. Whilst on board REOS staff are responsible to the ship’s Senior EO Safety Officer (SEOSO) and are to act as safety observers. During EO transfer operations any observed unsafe practices are to be immediately reported to the CO of the particular ship’s ammunition group, or the CO of the shore organisation’s staff, as appropriate, who is to ensure that the unsafe practice is corrected before operations continue. The REOS’ safety observer is to provide advice as to the best course of action if an EO incident occurs and to continue to assist the ship’s staff until the EO incident is resolved or the safety observer is relieved by EOD personnel.

12. **Inspection and Sentencing.** All inspection and sentencing of EO is to be conducted in accordance with authorised procedures.

13. **Authorisation of Personnel.** All personnel attending EO transfer operations in an official capacity are to be authorised for the task.

**WHARVES**

**Electrical Standards**

14. Wharves are not regarded as EO facilities for the purpose of determining electrical standards. The possibility of fire in such situations is still a great hazard, but as far as electrical causes are concerned it can be taken care of by well–installed and carefully maintained equipment of good commercial quality. However, special attention is to be given to the apparatus installed in the open at or near deck level, especially near the sides of a wharf where the possibility of damage from the movement of vehicles, vessels or cargo must be borne in mind. It is essential therefore, that the importance of installation of correct equipment, protection against the elements and good maintenance cannot be over-emphasised.

15. Fixed cranes are to be bonded to earth in accordance with Regulation 6.2 - Lightning Protection. Mobile cranes must be fitted with appropriate earthing systems if required to lift EO in configurations susceptible to electrical and electrostatic discharge.

**Firefighting Equipment at Wharf Areas**

16. At initial design, firefighting equipment for wharf areas is to be determined by specialist fire staff.

17. Thereafter, the positioning and state of readiness of this equipment for EO transfer operations is the responsibility of the authority that has command responsibility of the facility, and these requirements are to be detailed in local standing instructions.

18. At EO transfer operations, all aspects associated with the use of firefighting equipment, including training, is the responsibility of the OIC of the shore organisation undertaking the transfer operations.

**Licensing**

19. Wharves used for EO transfer operations are to be licensed in accordance with Regulation 5.2 Procedure 1.
ANCHORAGES

20. EO transfer operations at anchorages are to be conducted only at licensed sites. Transfer operations at such sites are to accord with the requirements of ABR 862 Volume 2, Chapter 5.
PROCEDURE 15 - PROCEDURES FOR THE MANAGEMENT OF RADHAZ TO ORDNANCE

Introduction

15.1 A large proportion of the ADF’s munitions and explosively actuated systems employ Electro-Explosive Devices (EEDs). An EED is a discrete device that contains an explosive, propellant or pyrotechnic material, which is designed to be initiated by the application of an electrical impulse of specified value and duration. EEDs are therefore unavoidably susceptible to initiation by the application of a specified amount of electrical energy, regardless of its source.

15.2 One of the advantages of EEDs is that they can be designed so that the required amount of electrical energy for initiation is beyond that normally encountered in the natural world. However, certain extremes of the natural environment and many man-made electrical environments are capable of providing the electrical energy necessary to initiate EEDs. Electro-Explosive Hazards (EEH) are those hazards which have the potential to cause inadvertent initiation of EEDs by the application of unintended electrical stimuli. Devices which employ EEDs, known as electrically initiated devices, must therefore be specifically designed to minimise the risk of inadvertent initiation posed by various sources of electrical energy, while maximising their ability to be initiated, when commanded, by the deliberate application of electrical energy to the firing circuit. The risk of inadvertent initiation must be further mitigated by controlling the usage of electrically initiated devices within their operating environment, and by controlling the use of man-made sources of electrical energy which may impact on the safe, reliable operation of electrically initiated devices.

15.3 The sources of EEH are:

a. Inadvertent application of power, including the effects of Electromagnetic Interference (EMI);
b. Radiation Hazards (RADHAZ) to Ordnance;
c. Electrostatic Discharge (ESD), including precipitation static (p-static);
d. Lightning;
e. Electromagnetic Pulse (EMP);
f. Transient Radiation Effects on Electronics (TREE); and
g. Magnetic Fields.

15.4 These hazards, and the requirements for managing the associated risks, are explained in detail in DEOP 115(AM1) Defence Electro-Explosive Hazards Manual. A brief description of the most common of theses hazards is provided in the following paragraphs.

15.5 RADHAZ to Ordnance. Electromagnetic radiation poses a hazard to electrically initiated devices, as electromagnetic waves with frequencies in the RF spectrum have the ability to couple with EED firing circuits. If sufficient energy is coupled to these leads, electrical energy sufficient to initiate or dud the EED can be generated. In nature, there exists a natural background level of RF radiation, however, in most places; this level is far exceeded by emissions from man-made RF emitters. The RF spectrum is widely used both for civilian and military purposes, and is occupied by emissions from systems as diverse as large, powerful surveillance radars, powerful radio broadcast stations and small portable communications devices such as mobile phones and combat radios. Furthermore, the output power and efficiency of RF emitters is increasing, while their size is decreasing, making control of the electromagnetic environment around electrically initiated devices more difficult. Control of the RF environment to manage RADHAZ to Ordnance is in most cases achieved by ensuring there is an adequate safe distance between RF emitters and electrically initiated devices. Safe distances to manage RADHAZ to Ordnance are provided in this Procedure.
15.6 ESD. ESD poses a considerable hazard to electrically initiated devices, as electrostatic build-up is an unavoidable hazard of both the natural and man-made environment, and has the ability to transfer significant amounts of electrical energy when discharged. ESD can pose a significant hazard if not considered during the design stage of any electrically initiated device. Even when electrically initiated devices include design features to minimise the risk posed by ESD, precautionary procedures are necessary to reduce the risk to an acceptable level. These procedures are provided in Regulation 6.3 Procedure 2.

15.7 Lightning. Lightning is a form of electrostatic discharge worthy of separate consideration, due to the exceptionally large amounts of electrical energy transferred during a lightning strike. Lightning strikes not only transfer large amounts of electrical current, but also generate significant electromagnetic fields in the vicinity of the strike, which can also pose a hazard to electrically initiated devices, even if not struck directly by lightning. The procedures for the protection of EO from lightning are provided at Regulation 6.2 Procedure 1.

RADHAZ to Ordnance Environments

15.8 ADF Baseline RADHAZ to Ordnance Environment. The RF environment against which electrically initiated devices are assessed in the ADF is known as the ADF Baseline RADHAZ to Ordnance Environment. The ADF Baseline RADHAZ to Ordnance Environment is an extreme level likely to be encountered by EO containing EEDs throughout the lifecycle known as the Manufacturer to Target or Disposal Sequence (MTDS), including transport and storage. However, the field strength defined by the ADF Baseline RF Environment may be exceeded in close proximity to RF emitters.

15.9 ADF Restricted RADHAZ to Ordnance Environment. Where personnel are interacting with EO during handling, loading and unloading activities there is a requirement to reduce the RF exposure levels because of the possible increase in coupling RF energy into EEDs, and to protect personnel from the harmful effects of RADHAZ. This reduced RF environment is known as the ADF Restricted RADHAZ to Ordnance Environment.

15.10 ADF RADHAZ to Ordnance Susceptible Environment. Whenever EO is considered susceptible to the ADF Baseline RADHAZ to Ordnance Environment and the magnitude of the susceptibility is unknown, the RF environment must be limited to the ADF RADHAZ to Ordnance Susceptible Environment. This is the minimum RF environment in which the risk to all serviceable ADF EO in the all up round configuration can be considered acceptable.

15.11 ADF RADHAZ to Ordnance Unsafe Environment. There are situations where the protection from RADHAZ due to the munition design is compromised and the likelihood of coupling RF energy into EEDs or firing circuits is significantly increased. In these instances, the RF environment must be reduced to an extreme minimum known as the ADF RADHAZ to Ordnance Unsafe Environment. Exposure is to be limited to this environment if EO containing EEDs are found in the following configurations:

a. The EO internal wiring is exposed by anything other than by design.

b. Tests are being conducted on the EO that results in additional electrical connections to the EO, unless the test configuration has been subjected to a RADHAZ assessment.

c. EEDs having unshielded wire leads are present, handled, or loaded in any but their assessed/tested condition eg, those damaged during an incident. Note that demolition detonators are assessed by assuming the use of unshielded firing lines.

d. The EO is being assembled or disassembled unless this configuration has been subjected to a RADHAZ assessment.

e. The EO has been damaged causing exposure, or possible exposure, of internal wiring or components, or destruction of RADHAZ protective devices such as RF gaskets.

f. Or when specified in EO Item Publication Topic – 027.
15.12 The RADHAZ to Ordnance environments are defined in detail in DEOP 115(AM1) Defence Electro-Explosive Hazards Manual and are depicted as tables of power density versus frequency.

**RADHAZ to Ordnance Classifications**

15.13 EO in service with the ADF is classified in accordance with its ability to withstand exposure to the ADF Baseline RADHAZ to Ordnance Environment. The RADHAZ to Ordnance classification system is therefore independent of platform-specific electromagnetic environments. The RADHAZ Classification of all ADF EO containing EEDs is published in EO Item Publication Topic – 027. There is no requirement to classify percussion fired EO, as RADHAZ is not a credible threat to such EO.

15.14 **ADF RADHAZ to Ordnance SAFE.** When trials or assessment proves EO is able to withstand the ADF Baseline RF Environment, the EO is classified as ADF RADHAZ to Ordnance SAFE (or RADHAZ Safe). It is important to note that the RF environment may exceed the ADF Baseline RADHAZ to Ordnance Environment in close proximity to emitters, and safe distances will be required.

15.15 EO that has been proven safe in the ADF Restricted RADHAZ to Ordnance Environment during the handling and loading/unloading exposure scenarios has a low probability of inadvertent initiation since for the protection of personnel from the harmful effects of radiation, the RF environment must be kept below the ARPANSA RPS No3 Maximum Exposure Levels to radiofrequency Fields – 3 kHz to 300 GHz limits which are lower or similar to the ADF Restricted RADHAZ to Ordnance Environment.

15.16 **ADF RADHAZ to Ordnance SUSCEPTIBLE.** EO that is classified as ADF RADHAZ to Ordnance Susceptible (or RADHAZ Susceptible) has been proven to be adversely affected when exposed to the ADF Baseline RADHAZ to Ordnance Environment. The EO susceptibility is expressed as the maximum safe power density versus frequency, and is published in EO Item Publication Topic – 027.

15.17 **ADF RADHAZ to Ordnance UNSAFE.** EO found in the configurations at paragraph 15.11 are classified as ADF RADHAZ to Ordnance Unsafe.

**RADHAZ TO ORDNANCE SAFE DISTANCES FOR GENERAL USE TRANSMITTERS**

15.18 The following safe distances have been developed in accordance with DEOP 115(AM1) Defence Electro-Explosive Hazards Manual. The basis for the safe distances is EO Div Design Report RADHAZ Safe Distance For Explosive Ordnance Containing Electro-Explosive Devices From General Use Transmitters of 02 Feb 11. Safe distances are provided for a number of typical exposure scenarios where there is a requirement to have EO in proximity to some common RF transmitters. For situations that are not covered by the provided scenarios, or where the safe distances are operationally overly restrictive, or where the safe distance cannot be complied with, then further assessment must be conducted on a case by case basis in accordance with DEOP 115(AM1) Defence Electro-Explosive Hazards Manual. This may require the conduct of RF measurement surveys and EEH trials of specific EO configurations.

15.19 It must be noted that DEOP 115(AM1) Defence Electro-Explosive Hazards Manual requires a minimum safe distance of 3m be applied where the calculated safe distance is less than 3m, unless specifically exempted here or by authoritative advice from DOS.

15.20 Where doubt exists as to the safe distances to be applied for a given situation, DOS is to be contacted for authoritative advice.

**Transportation**

15.21 It is not practicable to achieve a safe EED environment during transportation through the observance of calculated safe distances. For this reason, all EED and systems containing EEDs offered for transportation should be assessed as safe in the ADF Baseline RF Environment for sea and air transportation. It is highly unlikely that the RF environment along road transport routes will exceed that allowable by ARPANSA RPS No3 Maximum Exposure Levels to radiofrequency Fields –
3 kHz to 300 GHz for the General Public, and any EO cleared to the ADF Restricted RF Environment will therefore be safe for transport in this fashion without the need for further protection or screening.

15.22 Service EEDs and systems containing EEDs which have not been cleared to the levels of the ADF Restricted RF Environment and those requiring protection in a more severe RF environment (eg, ship or aircraft transportation) must be protected during transit by enclosure in a metal box or by approved materials providing sufficient screening. Specific instructions for munitions incorporating EEDs which are either cleared or not cleared for transportation depending on RF protection are to be found in EO Item Publication Topic – 027.

15.23 Where munitions are required to be closer than the minimum 3m to vehicle fixed transmitters/antenna authoritative advice should be sought from DOS. Dependent on the power output, frequency and cable routing this may in some cases be reduced to 0.2m for systems assessed as safe in the ADF Baseline RF Environment.

15.24 When it is considered necessary to transport systems containing EEDs of unknown susceptibility, the RF environment must be limited to the ADF RADHAZ to Ordnance Susceptible Environment. All personnel engaged in the carriage of such articles should be aware of RF hazards and observe consignor’s instructions fully. Note should be made of any special instructions covering loading/unloading/handling when EEDs are typically most vulnerable to EM radiation.

Unit/Flight Line Safe Distance

15.25 Considering the large mixed inventory of EO stored, maintained, transported and used within the ADF, and their varying susceptibilities, and the numerous facilities at which they can be found, the most effective methodology to determine a generic safe distance for all serviceable ADF EO is to assume that all in-service electrically initiated devices are only safe when subjected to the ADF Susceptible RF Environment. The safe distances in Table 15-1 are based on this assumption.

15.26 For radio systems only, where the transmitter information is known, but the susceptibility of the munition is unknown, the safe distances in Table 15-1 are to be maintained. Where the gain of the antenna is not known then a Gain of 6 dBi is to be assumed (indicated in RED in Table 15-1) for stub, stick or whip type antennas. Table 15-1 is not to be used to determine safe distances from pulsed emitters such as radars.

<table>
<thead>
<tr>
<th>ANTENNA GAIN RATIO (dBi)</th>
<th>TRANSMITTER POWER IN WATTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 W</td>
</tr>
<tr>
<td>UNITY (0)</td>
<td>3.0</td>
</tr>
<tr>
<td>SPECIAL (2)</td>
<td>4.0</td>
</tr>
<tr>
<td>STANDARD (3)</td>
<td>4.0</td>
</tr>
<tr>
<td>HIGH GAIN (5)</td>
<td>6.0</td>
</tr>
<tr>
<td>HIGH GAIN (6)</td>
<td>6.0</td>
</tr>
</tbody>
</table>

Table 15–1: Quick Reference Minimum Separation Distance (metres) for Serviceable ADF EO from Radios Operating between 2 MHz to 1 GHz

15.27 RADHAZ Unsafe EO. When EO is transported around facilities in non-standard configurations as defined in paragraph 15.11, the EO is classified as RADHAZ Unsafe and the safe distances at Table 15-2 must be maintained for frequencies up to 300 MHz. Above 300 MHz to 1GHz, the safe distances at Table 15-1 must be maintained. Where the gain of the antenna is not known then a Gain of 6 dBi is to be assumed (indicated in RED in Table 15-2) for stub, stick or whip type
antennas. Table 15-2 is not to be used to determine safe distances from pulsed emitters such as radars.

<table>
<thead>
<tr>
<th>ANTENNA GAIN RATIO (dBi)</th>
<th>TRANSMITTER POWER IN WATTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 W</td>
</tr>
<tr>
<td>UNITY (0)</td>
<td>11.5</td>
</tr>
<tr>
<td>SPECIAL (2)</td>
<td>15.0</td>
</tr>
<tr>
<td>STANDARD (3)</td>
<td>15.0</td>
</tr>
<tr>
<td>HIGH GAIN (5)</td>
<td>25.0</td>
</tr>
<tr>
<td>HIGH GAIN (6)</td>
<td>25.0</td>
</tr>
</tbody>
</table>

Table 15–2: Quick Reference Minimum Separation Distance (metres) for RADHAZ Unsafe EO from Radios Operating Below 300 MHz

Demolition Detonators

15.28 The safe distances for an operator laying a demolition circuit is based on the worst case of:

a. an operator holding the detonator wires with the potential to form a 2 metre dipole, and

b. the use of an electrically connected configuration, assuming a 100 m length of black and brown twisted firing cable between the EED and firing box.

15.29 When handling/connecting the detonator the distances in Table 15-2 must be maintained for transmitters whose frequencies are 300 MHz and below. Above 300 MHz to 1 GHz, the safe distances in Table 15-1 must be maintained.

15.30 Once connected to 100 m of laid black and brown cable the firing circuit will remain safe from all transmitters up to 100 Watts at a distance of 10 m. For larger lengths, or for unmoulded twin electrical cable where the separation between the two wires is uncontrolled (i.e. NOT figure 8 cable or twisted pair), or charges initiated by a loop circuit, authoritative advice should be sought from DOS.

15.31 Demolition firing cable D10 was originally procured for telephone cable and is a black sheathed, loose bound pair of steel wires. Though it should not be encouraged it is in common use for routine demolition work by all 3 Services as there is an abundant stock available. When D10 is used all radios should maintain a distance greater than the 6 dBi distances in Table 15-2, unless specific authoritative advice has been provided by DOS.

Managing Transmitters Inside Explosive Ordnance Areas

15.32 Transmitters outside the Explosive Ordnance Area perimeter. Transmitters outside an EO Area can radiate into an EO Area and therefore control of these transmitters is necessary. Radios of 50 watts or less, with an antenna gain of 6dBi or less, may be safely operated outside the EO Area and at least 100m from a process building. For higher power radios, radars or where shorter distances are required, authoritative advice from DOS is to be sought.

15.33 A RADHAZ Map is to be maintained by EO facility managers that shows the locations of all transmitters and licensed areas on Base, and is to list any restrictions that are necessary for the transport, handling and storage of electrically initiated EO.
15.34 **Transmitters inside Explosive Ordnance Area.** In the past there has been a blanket ban on the use of transmitters within an EO Area. But now there are a number of portable radios (both hand-held and manpack) in service or being used by contractors/site personnel during maintenance and movement periods and it is likely that they will become more widely used. The use of remote equipment such as lawn mowers, cable or pipe locators, management radios, data links and RFID tags, Wi-Fi, automatic gate opening transmitters etc. is also becoming more common. With the increase in use of mobile transmitters this blanket ban is becoming much more difficult to uphold in order to maintain efficient and safe working practice. Therefore the owner/managers of a facility must assess all RF transmitters to be used within the EO Area for their potential RADHAZ. The paragraphs below set out the rules for transmitters inside EO Areas and licensed EO buildings.

15.35 The safe distances apply equally to the use of transmitters in vehicles transporting EED in EO Areas.

15.36 Where a hazardous atmosphere, or an explosive hazardous atmosphere exists, only transmitters that meet the requirements for the applicable Zone may be used. These requirements are at Regulation 6.3, Procedure 1.

15.37 **Approval of transmitters inside Explosive Ordnance Areas.** The use of transmitters inside EO Areas may be approved by EO facility managers provided the requirements of this chapter are met. In approving the use of transmitters in EO Areas, EO facility managers are required to:

a. Assess whether the use of the transmitter is essential for the activities conducted in that facility,

b. Ensure the transmitter meets the requirements of this chapter for the area it is to be used in,

c. Provide any approval of the use of transmitter, by make and model, in writing, and

d. Maintain a register of all approved transmitters.

15.38 **Inside Explosive Ordnance Area External to Licensed EO Buildings.** No deliberate RF transmitters of any power are to be allowed inside an EO Area unless they are essential for an activity that is taking place there. Portable radios, personnel communication equipment, mobile phones, Personal Electronic Devices (PED), and data communications transmitters may be used inside an EO Area and external to licensed buildings subject to the following (summarised at Table 15-3):

a. For all transmitters with a power output of ≤ 20 W, an antenna gain of ≤ 6 dBi, at a frequency of > 1000 MHz are safe at a distance of ≥ 5 m from the exterior of the buildings.

b. For all transmitters with a power output of ≤ 10 W, with an antenna gain of ≤ 6 dBi, at a frequency of > 300 MHz are safe at a distance of ≥ 10 m from the exterior of the buildings.

c. All transmitters with a power output of ≤ 1 W, with an antenna gain of ≤ 6 dBi, across the frequency spectrum are safe at a distance of ≥ 10 m from the exterior of the buildings.

d. All transmitters with a power output of ≤ 5 W, with an antenna gain of ≤ 3 dBi, across the frequency spectrum are safe at a distance of ≥ 10 m from the exterior of the buildings.

e. Within an EO Area and external to buildings where EO containing EED are stored in their approved packaging (i.e., ordnance not unpacked, handled or worked on) transmitters with a power output of ≤ 25 W, with an antenna gain of ≤ 6 dBi, across the frequency spectrum are safe at a distance of 3 m from the exterior of the buildings. Due to the possible problems with ensuring that all items remain packed at all times the use of radios at this power level shall only be permitted where absolutely essential and where strong controls are in place and can be assured to be in place for the
lifetime of the transmitter. Where there is doubt the safety distances and power levels of paragraph 15.38 a to d above shall be applied.

f. During deployment where ordnance is stored on open ground sites but are housed within their approved packaging (i.e. ordnance not unpacked, handled or worked on) transmitters with a power output of ≤ 25 W, with an antenna gain of ≤ 6 dBi, across the frequency spectrum are safe at a distance of 3m from the nearest packed item.

g. Anti-Theft Tracking Devices. Some vehicles, especially 'white van fleet' are now fitted with anti-theft tracking devices/stolen vehicle recovery systems, such as Tracker, Trackback, and Demonscan, often without the driver's knowledge, and as such it must be assumed that all vehicles entering an EO Area have them fitted. The typical tracking system has a maximum power output of 2 Watts. A safe distance of 5 m between the vehicle and the exterior walls of any building containing explosives must be maintained. All EO at a minimum, during transportation and storage, should be safe in the ADF Restricted RF Environment and as such will not be at hazard from the radiated power from the anti-theft tracking device.

<table>
<thead>
<tr>
<th>Power Output (W)</th>
<th>Gain (dBi)</th>
<th>Frequency (MHz)</th>
<th>Safe Distance (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 20</td>
<td>≤ 6</td>
<td>≥ 1000</td>
<td>≥ 5</td>
</tr>
<tr>
<td>≤ 10</td>
<td>≤ 6</td>
<td>≥ 300</td>
<td>≥ 10</td>
</tr>
<tr>
<td>≤ 1</td>
<td>≤ 6</td>
<td>All Frequencies</td>
<td>≥ 10</td>
</tr>
<tr>
<td>≤ 5</td>
<td>≤ 3</td>
<td>All Frequencies</td>
<td>≥ 10</td>
</tr>
</tbody>
</table>

EO containing EED stored in their Approved Packaging
<table>
<thead>
<tr>
<th>Power Output (W)</th>
<th>Gain (dBi)</th>
<th>Frequency (MHz)</th>
<th>Safe Distance (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 25</td>
<td>≤ 6</td>
<td>All Frequencies</td>
<td>≥ 3</td>
</tr>
</tbody>
</table>

Table 15–3: Safe Distance (metres) inside Explosive Ordnance Area - External to Licensed EO Building

NOTES

Transmitter power is to be taken as the maximum the set is capable of emitting – not a level which may be operator or software controlled.

The above safe distances shall also be maintained between the transmitter and EO Area transit routes.

By convention and for ease of measurement and estimation, distances are rounded up to 3, 5 or 10 m.

15.39 For all other transmitters outside these parameters authoritative advice should be sought from DOS.

15.40 Information relating to transmitter parameters is generally available in the equipment handbooks, manufacturer product specifications or from appropriate specialist agencies (eg, GTESPO or Electronic Systems Division, DMO).

15.41 Inside EO Building - Outside of Process Room. No deliberate RF transmitters of any power are to be allowed inside an EO Building unless they are essential for an activity that is taking place there, and which meet the following requirements:

a. Process Building. Transmitters with an Effective Isotropic Radiated Power (EIRP) less than 5 W are permitted inside EO process buildings. A minimum safe distance of 3m must be maintained between the transmitters and electrically initiated devices, and
b. **Explosive Ordnance Store House.** Transmitters with an EIRP less than 10 W are permitted inside EO store houses. A minimum safe distance of 3m must be maintained between the transmitters and electrically initiated devices.

15.42 **Inside Explosive Process Room.** No transmitters with an EIRP in excess of 1W shall be permitted inside an EO process room (unless using a transmitter is part of the documented approved maintenance process). A minimum safe distance of 3m must be maintained between the transmitters and electrically initiated devices.

15.43 **Mobile Phones, Pagers and Associated Communication Devices.** Use of mobile phones and pagers must be controlled in the vicinity of EO. As their power output is unpredictable and can be well in excess of 1W, mobile phones, pagers and associated communication devices may NOT be used:

a. in Explosive Ordnance Storehouses (EOSH);

b. at Potential Explosion Sites (PES);

c. in magazines;

d. in munition stowage areas;

e. in explosive process buildings;

f. close to ordnance under preparation; and

g. where a hazardous atmosphere, or explosive hazardous atmosphere exists.

15.44 **Subject to the above,** mobile phones and pagers may be used in other areas provided that:

a. only standard handheld phones/pagers are used. (That is mobile phones or pagers without any external devices used to improve signal strength such as amplifiers, additional high gain antennas, network extenders, cell phone boosters or cellular repeaters.) and

b. a minimum separation distances of 3m is maintained.

15.45 **Personal Role Radio.** The Personal Role Radio (PRR) has been assessed as being safe for use by personnel handling in-service explosive items. No further control is therefore required for them except in process areas where the rules of paragraph 15.42 should be applied.

**Exemptions to 3m Rule**

15.46 With the introduction of low power transmitters in logistic systems and office information systems, there are compelling reasons based on improving productivity and efficiency for the use of these systems closer than 3 metres to ordnance or for use in storage, assembly, and munition build-up areas. Examples of these sorts of devices are Automatic Identification Technology (AIT) devices, wireless laptops, passive Radio-Frequency Identification (RFID) and active RFID. These devices are generally very low output devices (i.e., less than 1 watt) and their proximity to ordnance and low output power require different techniques for mitigating electro-explosive hazards. The ensuing paragraphs provide exceptions to the minimum safe separation distance of 3 m, as well as general guidance for the use of these types of devices in and around ordnance locations and aircraft.

15.47 Table 15-4 provides exceptions to the minimum safe separation distance requirement of 3 metres and is particularly useful for handheld devices radiating at less than 1 watt.
### Table 15–4: Exceptions to the 3m Minimum Safe Separation Distance

<table>
<thead>
<tr>
<th>Minimum Separation Distance (m)</th>
<th>EO RADHAZ Clearance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RADHAZ Safe in the ADF Baseline or Restricted RF Environment</td>
</tr>
<tr>
<td>1.5</td>
<td>0.5 &lt; EIRP ≤ 5 watts All Frequencies</td>
</tr>
<tr>
<td>0.3</td>
<td>0.1 &lt; EIRP ≤ 0.5 watts All Frequencies</td>
</tr>
<tr>
<td>0</td>
<td>EIRP ≤ 0.1 watts All Frequencies</td>
</tr>
</tbody>
</table>

EIRP = Pt x Gt

Where:
- EIRP is the effective isotropic radiated power in watts.
- Pt = average power output of the transmitter in watts.
- Gt = numerical (far field) gain ratio (not the dB value) of the transmitting antenna, derived as follows:
  
  \[ Gt = 1 \times 10^{G/10} \]

Example: If the antenna far field gain is 2.15 dBi, the far-field gain ratio is

\[ 1 \times 10^{2.15/10} = 1 \times 10^{0.215} = 1.64 \]

15.48 **Wi-Fi and Bluetooth.** With the emergence of wireless networks many mobile computers come standard with built in Wi-Fi (short for “Wireless Fidelity”) radios, as defined by IEEE Std 802.11. Wi-Fi can be used to provide high-speed connections (11 Mbps or greater) to mobile computers, desktop computers, Personal Digital Assistants (PDAs). There are several Wi-Fi standards that use different transmission channels. The four commonly used in general commercial equipments offer different modes of operation, which lets them reach different data transfer speeds depending on their range as follows:

- **a. WiFi 802.11a.** The 802.11a standard (called WiFi 5) allows higher bandwidth (54 Mbps maximum throughput, 30 Mbps in practice). The 802.11a standard provides 8 radio channels in the 5.8 GHz frequency band. The 802.11a standard relies on a technology called Orthogonal Frequency Division Multiplexing (OFDM). Dependent of the baud rate the RF transmit power can be as high as 29dBm. Devices that are confirmed to be using 802.11a transmitters are considered safe at a distance of 1m from all serviceable ADF EO.

- **b. WiFi 802.11b.** The 802.11b standard is currently the most widely used one. It offers a maximum throughput of 11 Mbps (6 Mbps in practice) and a reach of up to 300 metres in an open environment. It uses the 2.4 GHz frequency range, with 3 radio channels available and Direct Sequence Spread Spectrum (DSSS) technology. In Australia the RF transmit power is typically 23 dBm in 802.11b mode for 1 - 11 Mbps. Devices that are confirmed to be using 802.11b transmitters are considered safe at a distance of 0.3m from all serviceable ADF EO.

- **c. WiFi 802.11g.** The 802.11g standard offers high bandwidth (54 Mbps maximum throughput, 30 Mbps in practice) on the 2.4 GHz frequency range, with OFDM coding. In North America and Australia the RF transmit power is typically 20 dBm in 802.11g mode for 6 - 54 Mbps. Devices that are confirmed to be using 802.11g transmitters are considered safe at a distance of 0.3m from all serviceable ADF EO.

- **d. WiFi 802.11n.** Devices incorporating the improved 802.11n standard, by adding multiple-input multiple-output antennas (MIMO), are becoming increasingly common.
802.11n devices operate on both the 2.4GHz and 5GHz bands and typically have a combined RF transmit power of 20 dBm. Devices that are confirmed to be using 802.11n transmitters are considered safe at a distance of 0.3m from all serviceable ADF EO.

15.49 The above safe distances assume an antenna gain of 6dBi or less. For WiFi devices with higher antenna gains, authoritative advice from DOS is to be sought.

15.50 **Bluetooth.** Bluetooth uses a radio technology called frequency-hopping spread spectrum, which ‘chops up’ the data being sent and transmits chunks of it on up to 79 bands (1 MHz each) in the globally unlicensed Industrial, Scientific and Medical (ISM) range 2402-2480 MHz. Bluetooth systems are designed and constructed to meet the requirements of the Bluetooth specification. There are three classes of operation dependent on range:

a. Class 1, operating at 100mW for 100m range,

b. Class 2, operating at 2.5mW for 10m range, and

c. Class 3, operating at 1mW for 1m range.

15.51 There are no restrictions to Bluetooth operating at Class 2 or 3. Class 1 Bluetooth transmitters should maintain a distance of 0.3 m from EO considered safe in the ADF Baseline RF Environment and the ADF Restricted RF Environment.

15.52 **Data Loggers.** To assist with in-service monitoring of the natural and induced environments that EO is exposed to throughout its life cycle there maybe a requirement for the use of data loggers in close proximity to electrically initiated devices. Data Loggers installed within munition storage containers with transmitters operating shall have an EIRP less than 50 mW and shall operate at a frequency greater than 2000 MHz.

**Devices Requiring Separate Advice**

15.53 **Radio Frequency Identification.** RFID is a technology that uses communication via electromagnetic waves to exchange data between a terminal and an object e.g. ammunition containers. There are three types of RFID tags:

a. Passive RFID tags, which have no power source and require an external electromagnetic field to initiate a signal transmission.

b. Active RFID tags, which contain a battery and can transmit signals once an external source interrogator has been successfully identified.

c. Battery assisted passive (BAP) RFID tags, which require an external source to wake up but have significantly higher forward link capability providing greater range.

15.54 As both frequency and power output can vary significantly from system to system, generic safe distances from explosive stores containing EED cannot be provided. Before any system is introduced, authoritative advice must be sought from DOS.

15.55 **IEEE 1902.1 Standard Devices (RuBee).** Another technology used for automatic identification and tracking is the wireless asset tracking system utilising the IEEE 1902.1 long wavelength wireless network protocol (also known as RuBee). Unlike the RFID technology discussed above, IEEE 1902.1 operates in the long wave magnetic field spectrum, below 450kHz. Due to the low magnetic field radiated, and the mismatch in receive antenna length of the EO compared to the frequency of radiation, there is not perceived to be an EEH from this type of device to electrically initiated devices, but tests are still on going. IEEE 1902.1 devices are not to be used on EO items, in EO packages or in explosive facilities without authoritative advice from DOS.

**Transportation Emergency Procedures**

15.56 In the event of an incident/accident during transportation of munitions, items which do not normally present a high RADHAZ risk may become acutely vulnerable if there is damage to their
inherent protection i.e. structural or packaging, and which become RADHAZ Unsafe. Pending a detailed inspection the following restrictions on RF transmissions in the immediate vicinity should be imposed immediately:

a. No RF transmission is to be allowed within a radius of 10 metres from the explosives load.

b. Emergency services using radios with an EIRP greater than 15 watts should not transmit within 50 metres of the damaged equipment.

c. All non-essential transmitters should be either switched off or removed to a distance greater than 50 m.
REGULATION 4.5 - FACILITY MAINTENANCE

General Overview

5.1 Explosive Ordnance (EO) Facilities are purpose designed structures that contribute to the protection of personnel and surrounding assets in the event of an emergency incident occurring (e.g., grass fires). For the facility to function as designed, they must be maintained in a serviceable condition. This concept extends to include the surround grounds (e.g., traverses, buffer zones, etc.) and vegetation.

Requirements

5.2 EO facilities and areas are to be kept in a serviceable condition so that the risks of an unscheduled EO event occurring, and the consequences of such an event, are kept to a minimum.

Control of Vegetation

5.3 Vegetation. Vegetation is to be controlled so as not to present a fire hazard. Grass is to be kept short. Trees and shrubs are to be trimmed of excessive foliage. Removed foliage and excessive grass clippings are to be removed.

5.4 Fire Breaks. Fire breaks may need to be installed to inhibit the spread of fire.

5.5 Herbicides. Herbicides must not be used to kill grass cover on earth traverses and earth covered buildings such as igloos.

5.6 Certain herbicides may be used in EO areas to kill or control weed and grass growth.

5.7 Use of Fire. Fire may be used as means of hazard reduction with approval and under special conditions.

Control of Livestock

5.8 Use of Livestock. Livestock may be used to control vegetation under certain conditions, should it be determined that livestock is the most appropriate method of controlling vegetation. Electric fences may be used to protect open stacks of EO from grazing animals.

Control of Vermin

5.9 Any animal or bird likely to cause damage to buildings, traverses or installations in EO facilities is considered vermin. Active measures are to be undertaken to eradicate, as far as possible, all such vermin from EO areas and facilities.

5.10 Pesticides. The use of pesticides and insecticides is to be carefully controlled to ensure that no deleterious effects will occur to stored EO and that all occupational health and safety requirements are met.

5.11 Shooting. Firearms may only be introduced into EO areas under strict control for specific purposes. Shooting for vermin control is permitted if written authorisation is given by the Officer-In-Charge (OIC) of the establishment.

Work Services

5.12 Work services for construction, maintenance, or repair activities are permitted in EO areas and facilities. Written approval from the OIC of the establishment is to be obtained prior to work commencing.

5.13 Precautionary measures. Consideration is to be given to the desirability and practicability of removing EO from an area before work commences.
5.14 For security and safety reasons, an officer is to be detailed to maintain close liaison with, or directly supervise contractor's staff, throughout the progression of the work. All the relevant safety instructions, either in this manual or in local instructions, are to be observed. Local instructions for contractors are to be prepared setting out the conditions of entry and general safety precautions in relation to EO.

5.15 Repair and Maintenance of EO Facilities. The repair and maintenance of EO facilities is to be undertaken under the following conditions:

a. **Zones 0E, 1E, 2E, or Zone 20E facilities.** No repairs or maintenance of any kind to the structure or equipment are to be carried out while EO is in the building.

b. **Zones 21E, 22E and Zone REA facilities.** Minor repairs and maintenance are permitted without removing EO, provided adequate protection against possible damage to EO can be achieved by the facility supervisor.

c. **Items requiring repair.** Items that require repair must be cleaned and inspected to ensure that no explosive contamination is present prior to work commencing.

d. **Hot Work.** All work that requires the use of heat generating equipment requires a 'Hot Work Permit' authorised by the OIC of the establishment.

e. **Fire Fighting Appliances.** Adequate fire fighting appliances are to be readily available when work is being conducted that requires a 'Hot Work Permit'.

f. **Fire Detection Systems.** Fire detection systems may require to be deactivated when conduct work that requires a ‘Hot Work Permit’.

5.16 Vacation of EO Facilities for periods exceeding Four Months. When a facility is removed from service for a period likely to be greater than four months the OIC is to request the Licensing Authority to withdraw the Explosive Limit Licence.

5.17 Mechanical Appliances and Tools. The use of mechanical appliances and tools, including any associated consumables (such as fuels, oils, etc) are permitted however the conditions of use must be addressed within the local instructions.

5.18 Repairs to Roads. Roads into, and servicing EO areas and facilities are to be kept in good condition.

5.19 Maintenance of Machinery and Plant. The maintenance of machinery and plant is to be undertaken by the appropriate authority in accordance with standard maintenance routines.

5.20 Standards of Maintenance. All work in EO areas and facilities is to be under the supervision of, or undertaken by, appropriately qualified personnel. When electrical work is undertaken a certification is to be obtained from the electrician that the work conforms to the electrical standard of the facility.

Responsibilities

5.21 Each element of Defence, including contractors, whose role involves use of an EO facility or area are responsible for the maintenance and upkeep of the facility.

Procedures

5.22 Procedures are used to implement the requirements of this regulation are:

a. **Procedure 1 – Control of Vegetation, Livestock and Indigenous Fauna and Vermin**

b. **Procedure 2 – Work Services within Explosive Ordnance Areas and Facilities**
PROCEDURE 1 - CONTROL OF VEGETATION, LIVESTOCK AND INDIGENOUS FAUNA AND VERMIN

Introduction

1.1 In the interest of protecting explosive ordnance buildings and open stacks of Explosive Ordnance (EO) from fire, the growth of natural vegetation within the EO area must be controlled. In order to prevent damage to facilities and traverses within such areas, the grazing of introduced livestock, and indigenous fauna and vermin may also need to be controlled. In effecting such control due cognisance must be given to all applicable environmental legislation.

Purpose

1.2 This procedure details minimum requirements for the control of vegetation, livestock and vermin in designated EO areas.

Applicability

1.3 Since fire and environmental protection requirements vary considerably throughout Australia, more or less stringent requirements than those detailed in this instruction may be required to provide adequate fire safety and other controls whilst complying with environmental laws. Also, special circumstances, eg historical and significant forest area, wetlands, etc, may affect compliance with these instructions. Accordingly, Officers-in-Charge (OIC) of establishments must consult with Regional Fire Safety Officers (RFSO) and Regional Environmental and Sustainability Officers (RESO) in the Estate and Infrastructure Group (E&IG), and local authorities, as appropriate, in implementing these instructions. OIC may therefore authorise lesser conditions provided the variations are considered adequate by RFSO/RESO. Conversely, where the RFSO/RESO considers the stipulated requirements are inadequate, the OIC is required to achieve the minimum requirements stipulated by the RFSO/RESO. In either case, the OIC is to ensure that the requirements together with justification for them are detailed in writing by the RFSO/RESO concerned.

1.4 Generally, the requirements of this instruction should also be applied to buildings and lock-ups licensed to hold small quantities of EO (Small Quantity Facilities) for ready-use purposes and not located in designated EO areas. Specific requirements for Small Quantity Facilities are detailed in Regulation 5.3 Procedure 1

CONTROL OF NATURAL VEGETATION

General

1.5 General Requirements. General requirements for the control of vegetation surrounding EO buildings and open stacks of EO are detailed in paragraphs 1.9 to 1.12 inclusive.

1.6 Specific Requirements. The extent of natural vegetation control in the vicinity of EO facilities depends largely on whether or not the facilities are of fire-resistant construction and are traversed or untraversed. Vegetation control measures vary accordingly and are detailed in paragraphs 1.13 to 1.16 inclusive.

1.7 Concealment of EO Buildings. Where concealment of EO buildings and stacks from airborne observers is a requirement, specialist advice is to be sought on how this can be achieved whilst still maintaining an appropriate level of fire protection.

1.8 Methods for Control of Vegetation. The methods used to control vegetation will depend on the type of vegetation and the terrain. Cutting or slashing is suitable for cultivated or reasonably level natural grassed areas. Herbicides may be used in accordance with paragraphs 1.17 to 1.20. Where the terrain or trees prevent easy access for cutting or slashing, the clearing of undergrowth and other obstacles to grass cutting is not intended and vegetation should be left in its natural state. In these circumstances fire may be used to reduce the undergrowth in accordance with paragraphs 1.21 and 1.22.
General Requirements

1.9 Control of Vegetation in General Area. Vegetation in EO areas is to be controlled so as not to present a fire hazard. Normally, the height of the grass in this area is to be maintained at not more than 200 mm (see Note). When it is impracticable to deal with the whole area at once, the grass in the general area away from EO buildings and stacks, i.e., beyond 15 to 20 m radius, may be permitted to grow to a maximum height of 350 mm, provided that the height is reduced to below 200 mm as soon as possible.

NOTE

Throughout this instruction the height of the grass is the height to the top of the grass leaves in natural repose measured from the ground. The height does not include the length of the flower or seed stems.

1.10 Priority for Grass Cutting. In reducing the height of grass to below 200 mm, first priority is to be given to the area 15 to 20 m around all EO buildings and stacks, and the general area is to be cut only after all buildings and stacks have been attended to in this regard.

1.11 Cut Vegetation. Cut tree and shrub foliage and excessive cut grass is to be removed on the day of cutting from the area within 20 m of any building or stack of EO. Cut tree and shrub foliage anywhere else within the EO area is to be removed within three days of cutting.

1.12 Fire Breaks. Firebreaks may need to be installed to inhibit the spread of fire and to provide a safe point from which to conduct firefighting operations (back-burning if conditions permit). In addition to the firebreak (no growth of any kind) requirements of paragraphs 1.14 to 1.16, a firebreak at least 15 m wide may be required on the inside and adjacent to the EO area perimeter fence. This width may require considerable widening depending on local conditions. If necessary, additional internal fire breaks may be installed to a width of approximately 7 m. Access tracks and sealed roads may be utilised to augment the installed firebreak system. Soil degradation effects should be carefully considered before ploughing or rotary hoeing is proposed for use in forming firebreaks. The above notwithstanding, no firebreaks may be installed without the concurrence of the RESO.

Specific Requirements

1.13 Fire-Resistant Buildings - Untraversed. In the vicinity of EO buildings that are of fire-resistant construction, i.e., Type 2 – heavy walled construction with protective roof, Type 3 – earth-covered building and Type 4 – igloo construction, the growth of natural vegetation within 15 to 20 m of the building is to be controlled as follows:

a. Suitable native evergreen plants that have a mature height not exceeding 300 mm should, if possible, be grown in the 15 to 20 m wide area around the building. Ground ivy is a suitable evergreen plant in temperate climates as it is easily confined, and does not grow high. In other climates, fire retardant ground covers that are non-invasive (obtain advice from the RESO) should be grown. Generally, growing of evergreen plants in the vicinity of the buildings, and on the earth covering of Type 3 and Type 4 buildings is preferable since they reduce the fire hazard and require less maintenance, such as mowing, than do ordinary grasses.

b. Where natural grass is grown in the 15 to 20 m wide area, and where circumstances permit, e.g., small number of buildings, adequate funds, facilities and manpower, the height of the grass is to be maintained at less than 200 mm. Where the number of buildings within the EO area is such that maintaining the height of grass at less than 200 mm is assessed by the local service or civilian fire authority as impracticable, the grass in this 15 to 20 m wide area may be permitted to grow to a maximum height of 350 mm, provided that the height is reduced to below 200 mm as soon as possible.

c. Trees and shrubs or their foliage are not permitted within a 15 to 20 m wide area around the building.
1.14 **Fire-Resistant Buildings - Traversed.** Where fire-resistant buildings are surrounded by a solid-wall or earth traverse, the requirements of paragraph 1.13 apply, except as follows:

a. The area between the walls of the building and the foot of a solid-wall traverse is preferably to be kept free of any growth, or natural grass is to be kept to a height less than 100 mm. In the case of earth traverses, the growth-free area is not to be permitted to encroach on the foot of the traverse in order to ensure the foot of the traverse is not eroded. Concrete or bitumen paths around the building are suitable as a means of meeting this growth free requirement; alternatively, the area may be treated with herbicides (see paragraphs 1.17 to 1.20) or rotary-hoed or ploughed. However, soil degradation effects should be carefully considered before ploughing or rotary hoeing is used to form the clear area.

b. Every reasonable effort should be made to establish native evergreen plants (not exceeding 300mm mature height) on earth traverses otherwise the height of natural grass must never be permitted to exceed 200 mm.

1.15 **Non-Fire-Resistant Buildings and Explosive Ordnance Stacks – Untraversed.** The requirements for the control of vegetation surrounding untraversed non-fire-resistant buildings and open stacks of EO are the same as those stated in paragraph 1.13 for untraversed fire-resistant buildings except as follows:

a. **Explosive Ordnance Buildings.** For buildings with walls of brick, concrete or any other non-combustible materials such as metal cladding, growth of natural grass within 2 m of the walls is not to exceed 100 mm.

b. **Stacks of Explosive Ordnance.** The height of natural grass within an area of 15 to 20 m of the stack is not to exceed 100 mm.

1.16 **Non-Fire-Resistant Buildings and Explosive Ordnance Stacks – Traversed.** The requirements for the control of vegetation surrounding traversed non-fire-resistant buildings and open explosive ordnance stacks of EO are the same as those stated in paragraph 1.14 for traversed fire-resistant buildings except as follows:

a. The height of the natural grass on earth traverses is not at any time permitted to exceed 200 mm.

b. For stacks of EO the height of natural grass within 30 m of the stack (and includes the traverse) must never exceed 200 mm.

**Use of Herbicides**

1.17 Herbicides **MUST NOT BE USED** to kill grass cover on earth traverses and earth covered buildings such as igloos. Destruction of the grass may quickly lead to the erosion and/or subsidence of the earth cover thereby diminishing or destroying the explosive and protective characteristics of the building/traverse combination, or the traverse ie for a traverse, the ability to effectively trap incoming or outgoing fragments. If the grass cover is totally destroyed other forms of protection for the earth cover from the weather, must be applied.

1.18 Herbicides may be used in EO areas to kill or control weed and grass growth, provided that for each herbicide:

a. The manufacturers Material Safety Data Sheet indicates the product is non-flammable and noncorrosive;

b. The manufacturers directions and safety precautions are followed and all other occupational health and safety requirements are met;

c. The product is authorised for use by the appropriate Departmental authority (eg Defence Safety Management Agency); and
Approval for use of herbicides in the locality is given by the RESO or the use of herbicides for the purpose is authorised in the local Environmental Management Plan.

To ensure that herbicides and EO do not come into contact with one another and thereby cause a possible compatibility problem, the application of herbicides is to comply strictly with the following:

a. **Herbicides Applied by Spraying.** Herbicides may be sprayed anywhere in EO areas except:
   1. Within 5 m of a closed EO Storehouse (EOSH) and a closed and empty EO Workshop (EOW),
   2. Within 50 m of an EOW which contains EO or an open EOSH,
   3. Within 50 m of a loading/unloading operation (eg at a wharf, EOSH, EOW etc),
   4. Within 50 m of packaged EO exposed to the weather (eg EO on a wharf awaiting loading), and
   5. In windy conditions.

b. **Herbicides Applied by a Wand (eg Zero Weeding Wand).** Herbicides may be applied by means of a wand anywhere in EO areas.

c. **Herbicides Applied in Granular Form (eg Ciba-Geigy Erase).** Granular herbicides may be used anywhere in EO areas provided granules are not left exposed on walkways or roads.

After the application of herbicides dead foliage is to be removed so as not to become a fire hazard.

**Use of Fire**

Fire may be used as a means of hazard reduction under the following conditions:

a. Unless the use of fire for the purpose is authorised in the local Environmental Management Plan, burning is only to take place after approval is given by the OIC of the establishment in consultation with the RESO and the local fire or bushfire authority, who may be invited to assist with the operation.

b. The requirements of Regulation 4.4 Procedure 1 relating to the control of the means of ignition are followed.

c. Burning is only to take place in suitable weather conditions, allowing easy control of the fire.

d. Burning is NOT to take place when fire bans are in force.

e. Burning is NOT to take place within 30 m of any EO storage facility or within 200 m of any open EO storage area.

f. Burning should normally take place in autumn or spring. Autumn is preferred as the vegetation will be dry after the summer and there is less likelihood of the fire flaring up again after apparently being extinguished.

g. During burning operations, all doors, windows and ventilators of EO storage facilities and workshops are closed. No work is to be carried out in EO workshops.

h. Fires are to be extinguished before nightfall, but arrangements are to be made to patrol the burned area until all likelihood of a flare up has passed.
Fallen dead timber should preferably be removed rather than burned as it can smoulder for a considerable time after the main fire has been extinguished.

1.22 It is advisable to maintain liaison with the local fire or bushfire authority and adjacent landowners or tenants to obtain advice of any hazard reduction burns that may be planned for areas surrounding the EO area.

CONTROL OF LIVESTOCK

General

1.23 The recent trend has been away from grazing livestock in EO areas due to the inherent problems, however if grazing is determined to be the most appropriate method of vegetation control, the following conditions are to be met:

a. Correct authorisation (including issue of leases) for grazing on such areas is obtained through the appropriate agency.

b. EO in open stacks, except bombs and projectiles, is protected by fencing of a type suitable to exclude the livestock.

c. Earth traverses are not damaged.

1.24 Electric wire fences may be used to protect open stacks of EO from grazing animals. However, these fences, and the equipment used to electrify them, are to be of a type approved by the Directorate of Explosive Ordnance Services and are only to be operated by a 6 or 12 volt battery. Under no circumstances are they to be connected to a mains supply of electricity. Such fences are not to be sited within 5 m of any stack of EO and are to be turned off during handling and loading of items in the stack.

Livestock in Transit

1.25 Provided approval has been given by the OIC of the establishment, livestock in transit is permitted to pass through an EO area.

CONTROL OF VERMIN

General

1.26 Any animal or bird likely to cause damage to buildings, traverses or installations in EO facilities is considered vermin. For example, rabbits may damage traverses and buildings, small rodents may damage packaging or electrical insulation and burrowing insects such as termites will damage any wooden packages or structures. Active measures are therefore to be taken to eradicate, as far as possible, all such vermin from EO areas and facilities.

1.27 The use of pesticides and insecticides is to be carefully controlled to ensure that no deleterious effects will occur to stored EO and that all occupational health and safety requirements are met. In general, the requirements given in paragraph 1.18 for the use of herbicides are to be applied to the use of pesticides and insecticides. It may be necessary to move stock to other locations while pesticides and insecticides are being applied. Workshop operations may have to be suspended temporarily if no alternative workshop is available.

Shooting

1.28 Firearms may only be introduced into EO areas under strict control for specific purposes (see Regulation 4.4 Procedure 1). Shooting for vermin control is permitted if written authorisation is given by the OIC of the establishment. This authorisation is to include the conditions under which shooting is to take place and specify:

a. The names of those authorised to shoot;
b. The name of the person responsible for supervising the operation;

c. The date(s) and time(s), normally, only in daylight outside working hours on days when fire bans are not in force;

d. The area(s) and direction(s) of fire to which shooting is to be limited;

e. The number and type(s) of firearms and ammunition to be used;

f. Any other restrictions considered appropriate.
PROCEDURE 2 - WORK SERVICES WITHIN EXPLOSIVE ORDNANCE AREAS AND FACILITIES

Introduction

2.1 Good storage facilities for explosive ordnance (EO) are essential to preserve these valuable assets as well as ensuring that overall safety is not compromised. It is just as important to ensure that these facilities are maintained in good order and that any maintenance required is carried out in a safe and timely manner.

Purpose

2.2 The purpose of this procedure is to prescribe the requirements to be observed in relation to work services permitted in EO areas and in individual EO facilities.

GENERAL

2.3 Works Services for construction, maintenance, or repair activities are permitted in EO areas and facilities only with the written approval of the Officer-in-Charge (OIC) of the establishment, or his/her delegated representative, who is to be informed of the nature of the work to be done, the methods to be employed and the type of plant to be used, in order that he/she may decide on the potential risk before the work begins. When the EO area is not clearly defined and work services are required for the EO area or facilities, the OIC of the establishment, or his/her delegated representative, is to give precise details of the restricted areas to contractor's staff responsible for such work services.

NOTES

Where the term 'Officer-in-Charge' appears in this instruction it may be read to mean 'Officer-in-Charge or his delegated representative' unless otherwise specified.

In general, work on Army unit storage facilities is only to be authorised by an Ammunition Technical Officer or Warrant Officer Ammunition Technician.

Precautionary measures

2.4 Consideration is always to be given to the desirability and practicability of removing the EO from an area or building before work is commenced in the vicinity.

2.5 For security and safety reasons, an officer is to be detailed to maintain close liaison with, or directly supervise contractor’s staff, as appropriate, throughout the progress of the work. This officer is to ensure that the necessary precautions are taken to protect the EO from damage or risks and that the work is done in accordance with the agreed method.

2.6 All the relevant safety instructions, either in this publication or in local instructions, are to be observed.

2.7 Local instructions for contractors are to be prepared setting out the conditions of entry and general safety precautions in relation to EO. For convenience these instructions can be incorporated into instructions covering security aspects as required by the electronic Defence Security Manual (eDSM). The unconditional acceptance of these instructions is to be a condition of the work contract. These instructions should address, but not necessarily be limited to the following:

a. Conditions of entry and control of access to establishment, EO area and facilities;

b. Private and LPG fuelled vehicles;

c. Searches;
d. Cameras;
e. Prohibited articles;
f. Permitted articles;
g. Permits required;
h. Use of mechanical tools and appliances;
i. Storage of materials;
j. Fire extinguishers;
k. Mobile radio transmitters (including those fitted to vehicles);
l. Mobile phones and pagers;
m. Occupational health and safety legislation and local instructions;
n. Control of asbestos; and

FACILITY CONSTRUCTION SITES

Safety distances to be applied to facility construction sites

2.8 The overarching explosive safety principle of exposing the minimum number of personnel to the minimum quantity of explosives for the minimum amount of time is applicable, as is the principle of sharing information in relation to risk and liaising closely where contractors are involved. In addition, the requirement for the Work Health and Safety legislation to reducing risks so far as reasonably practicable needs to be met.

2.9 The inhabited building distance (IBD) represents a level of risk to construction workers equivalent to the level of risk presented to sites permanently occupied by the general public from a potential explosion site (PES). Construction work on EO facilities is to be undertaken with a minimum distance from the surrounding PES of the IBD; the NEQ in the PES is to be reduced if required to achieve IBD. The requirements of paragraphs 2.3 – 2.7 are also to be met.

2.10 Should it be impractical to reduce EO holdings to achieve the IBD, the project sponsor must provide a dedicated safety case which will form the basis of the consultation, cooperation and coordination plan (EO CCC plan) of relevant activities showing:

a. Why it is not reasonably practicable to reduce EO holdings at the surrounding PES to achieve a separation distance of at least the IBD. Considerations for determining this may include EO required to be held to meet operational requirements, moving EO from PES introduces greater overall risk than retaining it in place. Any argument to retain EO in the PES must not rely solely on cost or time considerations.

b. The EO quantity has been reduced as far as reasonably practicable (SFARP).

c. Any risk to EO being stored in adjacent PES from the construction work has been reduced SFARP.

d. Any additional risk reduction and/or mitigation arrangements required to reduce the risk to construction workers SFARP. This may include minimising the number of workers and time of exposure or handling time restrictions in adjacent buildings etc.
2.11 The intent of this EO CCC plan is to explore all possible options to reduce the constructions risks SFARP both to the construction workers and the surrounding facilities, including any EO that may be stored within, rate the identified risks and identify the most appropriate course of action. This is to include mitigation control measures and a means of ensuring that the control measures have been implemented.

2.12 Once the EO CCC plan has been developed it is to be endorsed by the Explosives Storage and Transport Regulator (ESTR) and returned to the project manager for implementation.

2.13 Where an EO CCC plan is required, the project manager is to add a special condition to the construction contract. The special condition is to state:

a. In carrying out the works the parties recognise that contractor employees will work in the proximity of a PES and that there are inherent risks to the safety of those workers arising from the EO stored and deployed in buildings adjacent to where the Contractors Activities will be performed.

b. The Contractor agrees that it, its employees, sub-contractors and sub-contractor employees will perform work under this Agreement provided that:

   (1) the parties and any relevant PCBU develop and participate in a dedicated plan regarding consultation, cooperation and coordination of relevant activities (EO CCC Plan);

   (2) prior to any of the contractor's activities being performed in the vicinity of the EO facilities the EO CCC Plan must have been developed and agreed, and specific risk assessments jointly carried out addressing the risks relating to the performance of construction work in the vicinity of the EO facilities. Those risk assessments must specifically address the question whether EO stock relocation would create risks to Defence personnel/contractors engaged in relocation that is disproportionate to those explosives risks to the contractors employees should the EO remain in place;

   (3) In all other respects the requirements of the eDEOP 101 are to be complied with.

REPAIR AND MAINTENANCE

Repairs and maintenance of explosive ordnance facilities

2.14 The repair and maintenance of EO facilities is to be undertaken under the following conditions:

a. In Zones 0E, 1E, 2E or Zone 20E EO facilities, no repairs or maintenance of any kind to the structure or equipment are to be carried out while EO is in the building. In exceptional circumstances the OIC of the establishment may authorise the testing of electrical equipment to be carried out within the terms of Regulation 6.3 Procedure 1 and under the precautions/procedures specified in subparagraph b below (as appropriate).

b. In Zones 21E, 22E and Restricted Electrical Areas (REA) EO facilities minor repairs and maintenance are permitted without removing the EO, provided adequate protection against possible damage to the EO can be achieved by the facility supervisor. Where major repairs or maintenance are required and EO cannot be removed, the OIC of the establishment may permit work to proceed subject to the following requirements:

   (1) The OIC of the establishment certifies that the removal of EO will cause unacceptable production delays and personally signs the Permit to Work for a
particular process. Guidelines for the preparation of a Permit to Work are given in Annex A.

(2) EO must be positioned at least 4 metres from the site of the repair/maintenance work. EO should also be moved away from the area of work where there is a possibility of damage, eg tools being dropped from a height onto explosive stores. Alternatively, and at the discretion of the OIC of the establishment, the EO may be adequately protected by provision of cushioning, catch nets or some other means, taking into account the EO risk involved, particularly where EO storehouses are concerned.

(3) Work on the EO is prohibited.

(4) The maintenance work area is to be defined by ropes or other means.

(5) Electrical supplies to powered equipment are to be isolated by removal of fuses or locking of switchboards, except when checking and maintaining installed electrical/electronic test equipment.

(6) Hand tools required for the maintenance task are to be recorded and checked on completion of the work.

(7) Leads from electrical appliances are to be positioned well clear of EO. A minimum distance of 0.6 metres is to be observed.

(8) The OIC of the establishment is to nominate a responsible person to be in attendance. The attendant is to be given instruction to ensure that no breach of EO safety instructions occurs and is to be empowered to stop the work if any unsafe practice is observed.

c. The items requiring repair whether fixed (eg walls, space heaters), or loose (eg tools), must be cleaned and inspected to ensure that no explosive contamination is present before work is allowed to commence. Cleaning can usually be effected by brushing and washing with hot water.

d. If articles have been subject to contamination, eg workbenches with metallic coverings, and retention of explosive dust is possible, then a special inspection is required to determine the presence and type of contamination.

e. All floors suspected of contamination are to be brushed and washed with hot water before being repaired.

f. Where work requires the use of heat generating devices a ‘HOT WORK PERMIT’ is to be approved by the OIC of the establishment. Local instructions are to be raised covering the procedures for the issue of hot work permits and ensuring hot work sites are declared free from hazards at completion of the work.

g. Adequate fire-fighting appliances are to be readily available when any repair involving the use of heat generating devices is being carried out in any EO building.

h. In EO buildings where fire detection systems and/or sprinklers are present local instructions are to address whether or not the fire alarm sector where Hot Work is taking place, is to remain active or is to be deactivated. This decision is to be based on local circumstances, the consequences of false alarms causing the call out of local fire services and the extent of water damage to equipment and stores if sprinklers are accidentally activated.
Standards of maintenance

2.15 All work in EO areas and facilities is to be under the supervision of, or undertaken by, appropriately qualified personnel.

2.16 When electrical work is undertaken a certification is to be obtained from the electrician that the work undertaken conforms to the electrical standard of the facility.

Vacation of explosive ordnance facilities for periods exceeding four months for work services

2.17 When a facility is temporarily removed from service for a period likely to exceed four months, eg for major repairs or modification, the OIC is to request the Licensing Authority to withdraw the Explosives Limit Licence for the facility in question.

Mechanical appliances and tools

2.18 Plant driven by internal combustion engines, stocks of oil or petrol for such plant (which are to be kept to a minimum), air compressors, pneumatic drills, and other such appliances and tools used in the construction, repair, and maintenance of roads and buildings are permitted, but must be addressed by the local instructions at paragraph 2.7. This is in addition to the conditions applicable to vehicle and mechanical handling equipment at Regulation 4.6 Procedure 2.

2.19 Mechanical appliances may only be taken into and used in EO areas subject to:

a. Provision of adequate first-attack firefighting equipment at the site;

b. Appliances being fully serviceable and, other than as stated in sub-paragraph c below, fitted with the necessary safeguards, eg spark arrestors (see Regulation 4.6 Procedure 2); and

c. Special appliances, which do not comply with the regulations for vehicles, etc, in EO areas, may be used provided that precautions are taken to minimise any consequent risks.

Maintenance of machinery and plant

2.20 The maintenance of machinery and plant is to be undertaken by the appropriate authority in accordance with Standard Maintenance Routines or other approved maintenance documents.

Repairs to roads

2.21 Roads into, and serving EO areas and facilities, are to be maintained in a good state of repair to lessen the risk of accident to vehicles and to minimise the entry of mud, grit, etc. into buildings, also see Regulation 4.4 Procedure 1 paragraph 1.42.

2.22 Those roads that are in direct support of aviation operations e.g. Ordnance Loading Aprons, EO Preparation Areas and in between, are to be constructed and maintained such that they keep the possibility of Foreign Object Damage (FOD) to an absolute minimum.

2.23 Speed limits are to be strictly adhered to, see Regulation 4.6 Procedure 2 paragraph 2.29.

Annex:
A. Permit to Undertake Maintenance Work in Explosive Ordnance Buildings with Explosives in Place (Guidance for Preparation)
PERMIT TO UNDERTAKE MAINTENANCE WORK IN EXPLOSIVE ORDNANCE BUILDINGS WITH EXPLOSIVES IN PLACE (GUIDANCE FOR PREPARATION)

File Reference: ........................................

PERMIT TO UNDERTAKE MAINTENANCE WORK IN EXPLOSIVE ORDNANCE BUILDINGS WITH EXPLOSIVES IN PLACE

1. The maintenance work detailed below is hereby authorised subject to strict observance of the precautions specified.

Building Number and Description:

...........................................................
...........................................................
...........................................................

Work to be Done:

...........................................................
...........................................................
...........................................................

Precautions to be Observed:

...........................................................
...........................................................
...........................................................

a. Demarcation of Work Area. (The area where the work is to be done is defined and instructions given to ensure its segregation by roping off, flags or other means.)

b. Location of Explosives during Maintenance Work. (The positioning of explosive components and weapons is to be defined to ensure a clear minimum distance of four metres from the maintenance work. Work on explosives is to be prohibited. Electrical supplies to powered equipment are to be broken by locking of switchboards or removal of fuses—except when checking and maintaining installed electrical/electronic test equipment.)

c. Fire Precautions. (To be described and additional fire equipment listed.)

d. Tools. (All equipment and tools for the maintenance work, but alien to the normal process work are to be logged in and out. On completion of the work, the attendant member is to certify that all equipment and tools brought into the building for the maintenance task have been removed and that equipment worked on is properly closed up.)

e. Supervision. (A responsible officer is to be nominated to be in attendance while work is proceeding. Duties are to be defined and the officer must ensure that the terms of the Permit to Work are observed, and that no action is taken to breach explosive safety regulations. The officer is to have the authority to order work to cease immediately any unsafe practice is observed.)

Signature: ............................................

Name: ................................................

Officer-in-Charge: ...................................

Date: ..............................................
REGULATION 4.6 - PERSONNEL AND EQUIPMENT

General overview

6.1 Department of Defence has an obligation to ensure that its personnel can conduct their duties in a safe manner and environment. Through the provision and use of serviceable, applicable tools and aids, Defence endeavours to reduce the risk of an incident occurring thus ensuring personnel are able to complete their duties safely. Likewise all personnel have an obligation to adhere to the promulgated regulations and procedures which ensures that they contribute to the overall safety of the workplace.

Requirements

6.2 Personnel and Equipment are to be managed in accordance with the requirements of the Defence Safety Manual (SafetyMan) and this regulation including its associated procedures.

REGULATIONS

Personnel

6.3 A person is not to be employed in the Explosive Ordnance (EO) area unless the person is of suitable age, fit for duty, appropriately trained and authorised for such employment.

6.4 Hazards including potential hazards are to be identified, appropriately reduced and promulgated so that the user can be appropriately trained, so that they can conduct their duties in the safest possible manner.

6.5 Suitable Personal Protective Equipment (PPE) is to be supplied to the user when it is required to be worn.

Equipment

6.6 All equipment used in the processing, maintenance, and/or inspection of EO is to be assessed and approved for use by the relevant System Program Office/Authorised Engineering Organisation or equivalent agency and assigned an Australian Defence Force Logistics Manager (ADFLM).

6.7 MHE and Vehicles are to be classified and certified for use prior to being employed at any EO facility.

6.8 All mechanical handling, lifting, securing appliances and associated equipment is to be authorised, serviceable and within allowable test periodicity before being put to use in lifting and/or handling EO.

6.9 All MHE requirements including maintenance and testing requirements are to be documented and/or listed in the applicable EO, platform or Service publication.

6.10 Results of tests conducted as specified by the maintenance program, if applicable, are to be documented and maintained for the life of the item.

6.11 Dedicated vehicles and specialised equipment is to be provided when required in support of EO activities.

6.12 Operation of MHE and vehicles are to be managed and controlled.

RESPONSIBILITIES

6.13 All persons employed or visiting an EO area/facility are to follow Defence’s work health and safety requirements.
6.14 It is the responsibility of each person to report to their Officer-in-Charge (OIC), a change in their personal circumstances or health status, should it occur, which may affect their suitability for the working role.

6.15 Personnel introducing equipment into service are to ensure hazards, conditions of use, operating procedures and any training requirements are identified and promulgated to the users of the equipment.

6.16 The OIC of a facility/establishment/assigned task is responsible to ensure that the requirements of this regulation are adhered to.

PROCEDURES

6.17 Procedures used to implement the requirements of this regulation are:


b. Procedure 2 – Handling Equipment and Mechanical Aids including Vehicles for use with Explosive Ordnance and its Associated Equipment.
PROCEDURE 1 – PERSONNEL WORKING WITH EXPLOSIVES, EXPLOSIVE ORDNANCE AND ASSOCIATED EQUIPMENT

Introduction

1.1 Explosives and Explosive Ordnance (EO) is inherently dangerous if not treated correctly or maintained and operated outside their respective designed limitations. Therefore, employees involved with the maintenance, inspection, preparation and use of explosive ordnance are subject to certain restrictions and requirements that assist in ensuring a safe working environment is maintained.

Purpose

1.2 The purpose of this procedure is to specify the minimum restrictions, requirements and precautions for employees involved with the manufacture, maintenance, inspection and preparation of EO.

PERSONNEL EMPLOYED ON EXPLOSIVES AND EXPLOSIVE ORDNANCE RELATED TASKS

Personnel employed in explosive ordnance areas

1.3 A person is not to be employed in the EO area unless the Officer-in-Charge (OIC) of the establishment is satisfied that the person is suitable, appropriately trained and authorised for such employment.

Medical and mental suitability

1.4 The advice of a designated medical officer may be required regarding the medical suitability of persons selected for work in EO areas. The physical suitability and the mental stability of personnel is to be reviewed when necessary. Any suspected cases of addiction to excessive consumption of alcohol or drugs are to be referred to the medical officer for deliberation.

Restrictions on young persons

1.5 Before being selected for employment on EO work or in an EO area, a person must produce satisfactory evidence as to age. Whilst it is not intended to discriminate against personnel on the basis of their age, it is important that personnel employed on EO work be assessed as being sufficiently mature and competent to work on and/or handle EO, or that they are under appropriate supervision to do so. The OIC of the establishment is to be satisfied with the maturity of all personnel employed on EO work and is to take due cognisance of ‘duty of care’ requirements. As a guide the following may be used:

   a. 18 years and over - Normally no restrictions will apply.
   b. 16-17 year - Should normally work under supervision appropriate to the EO task being performed.
   c. Under 16 years - Should not normally be employed on EO work.

Disabled persons

1.6 Discrimination against disabled persons on the grounds of their disability alone is forbidden by the Disability Discrimination Act 1992. Persons employed in EO facilities, however, require certain physical and mental capabilities in order to carry out their duties without hazard to themselves or to their fellow workers. This includes the ability to respond to emergency situations, such as the need to evacuate a building quickly, as well as carrying out scheduled tasks. Before employing a disabled person on any work involving EO, the OIC of the establishment is responsible for ensuring that the nature of the disability is not such as to cause risk either to the individual concerned or other personnel. The following guidelines cover specific disabilities.
1.7 Persons with physical disabilities which inhibit their use of first aid fire appliances or the rapid evacuation of buildings or areas should not be employed on work involving EO or on any work undertaken in the EO area.

1.8 Electrical hearing or other medical aids must meet the requirements of Regulation 6.3 Procedure 1. In no circumstances is any attempt to be made to remove or replace the battery of hearing or other aid in an EO area; the devices are to be adequately secured to ensure that there is no danger of dropping while in use and steps are to be taken to prevent inadvertent opening of the battery compartment.

**GENERAL REQUIREMENTS FOR EMPLOYMENT**

**Induction into the workplace**

1.9 Before commencing work in an EO area each person is to be formally inducted into the workplace by receiving adequate instructions on the basic safety precautions required in such an area. Personnel are to be made familiar with the action to be taken in an emergency such as explosion, fire or injury. Instructions to this effect are to be made known to personnel and steps taken to ensure that they understand them.

**Compliance with regulations and procedures**

1.10 Staff involved with the handling or use of EO are to comply with all regulations and procedures which may affect them in the course of their duties.

**Disobedience of regulations**

1.11 Any person who infringes or attempts to infringe, any of the explosives regulations and procedures is to be removed immediately from the EO area and not allowed to re-enter without the permission of the OIC of the establishment, who may also take disciplinary action against the person concerned.

**Training and authorisation**

1.12 All staff employed in an EO area are to be trained and authorised competent to undertake all the tasks which they may be required to perform, in accordance with the requirements of Regulation 1.1 Procedure 1. OICs are to ensure that continuation training programs are implemented to maintain levels of expertise in EO safety and fire-fighting.

**WORK, HEALTH AND SAFETY**

1.13 The *Work Health and Safety (WHS) Act 2011* requires, in part, that an employer:

   a. Takes all reasonably practical steps to protect the health and safety at work of employees.
   
   b. Provides and maintains a working environment and a workplace which is safe and without risk to health, and which provides adequate facilities for the welfare of employees at work.
   
   c. Ensures the safety at work of employees and third parties, ie visitors, and the absence of risk to their health, in the use, handling, storage and transport of plant and substances.

1.14 The WHS Act also requires employees in part to:

   a. Not create a risk or increase the existing risk, to the health and safety of the employee or of other persons at or near the workplace.
b. Use equipment in accordance with any instructions issued by the employer consistent with its safe and proper use.

1.15 Additional information on Defence’s overarching policy, roles, responsibilities and requirements for WHS can be found in the Defence Safety Manual (SafetyMan).

Personal protective equipment

1.16 Defence management has a duty of care to take all practicable action to safeguard the health and safety of employees while they are at work. The provision of Personal Protective Equipment (PPE) will be adopted only after all other methods of direct control of hazards have been evaluated and excluded. The handling of explosives requires special precautions to be taken and specific types of PPE to be worn.

1.17 Prior to selection of PPE, the circumstances and restrictions of the task to be performed, the acceptable level of the hazard to which the worker may be exposed and the performance requirement for the PPE are to be assessed by way of a formal assessment.

GENERAL PERSONAL PROTECTIVE EQUIPMENT

Explosives workshop and guided weapon maintenance facilities staff

1.18 Staff employed in EO workshops and maintenance facilities operating under Classes 2 or 4 conditions (see Regulation 4.4 Procedure 5) are to wear the following PPE:

a. **Military personnel.** Service Uniform applicable to workshops.

b. **Civilian personnel.** APS staff and Defence Civilians are to wear the following types of dress:

   (1) Operators:

   (a) Satin drill or 100% cotton drill coveralls, shirt and long trousers or laboratory coats (shorts are not permitted); and

   (b) Safety footwear or, if electrostatic hazards exist, anti-static or conducting safety footwear, as appropriate, in accordance with Regulation 6.3 Procedure 2.

   (2) Supervisory or Quality Control Staff and Visitors:

   (a) Satin drill or 100% cotton drill dustcoat or laboratory coat, and

   (b) Sturdy footwear or, if electrostatic hazards exist, conducting shoes, conducting overshoes or leg-stats.

   **CAUTION**

   SHORTS ARE NOT PERMITTED TO BE WORN UNDER DUST OR LABORATORY COATS FOR SUPERVISORY OR QUALITY STAFF BUT MAY BE PERMITTED FOR VISITORS AT THE DISCRETION OF THE OFFICER-IN-CHARGE

1.19 All persons entering EO workshops operating under clean conditions (Classes 1 and 3) are to wear the clothing specified in Regulation 4.4 Procedure 6. This entails changing existing PPE to special issue PPE.
Other staff involved in maintenance or preparation of explosive ordnance

1.20 Staff employed on the maintenance and/or preparation of EO in areas other than EO workshops are to wear the following PPE as a minimum (see also Regulation 6.3 Procedure 2):

a. **Military personnel.** Service Uniform applicable to workshops.

b. **Civilian personnel.** APS staff and Defence Civilians are to wear the following types of dress:

   (1) Satin drill or 100% cotton drill overalls or laboratory coat, and

   (2) Safety footwear or, if electrostatic hazards exist, anti-static or conducting safety footwear, as appropriate, in accordance with Regulation 6.3 Procedure 2.

**ADDITIONAL REQUIREMENTS FOR CONTACT WORKERS**

1.21 Contact work is where powdered explosives are exposed or the process undertaken may generate explosive dust, or where high explosives, propellant and pyrotechnic substances or any mixture of such substances are exposed in any manner contrary to their normal use.

**Contact work**

1.22 All contact work is to be conducted under clean conditions (see Regulation 4.4 Procedure 6).

1.23 All appliances used on contact work are to be of an approved pattern and specified in the relevant maintenance instructions. Any variation for emergencies is to be authorised in writing by the Officer-in-Charge.

1.24 All areas where contact work is conducted are to be adequately ventilated. Ventilation arrangements may need to include an approved method for removing dust or fumes at the point of origin.

1.25 The floor, workbenches, trucks, trolleys and fittings or appliances on which explosive dust may accumulate are to be cleaned by an approved method at least once a day or more often if necessary. This applies in particular to the handles of all tools and appliances used in the operations.

1.26 Approved dust masks, face shields and disposable gloves are to be provided as required.

1.27 Personnel are to be provided approved means for:

   a. Protecting the skin.

   b. Cleansing any contamination from the skin.

1.28 Facilities complying with the latest WHS requirements are to be provided to enable contact workers to remove any traces of contamination.

1.29 Where employees duties are assessed such as they require medical monitoring, employees are to be examined or interviewed by an appointed medical officer before they are first employed on contact work. Those found to be suffering from pre-existing conditions are to be excluded. Subsequent medical examination/interview of contact workers is to be at intervals advised by the medical officer working conditions should be controlled, if possible, so that physical contact with explosive substances can be prevented. All cases of illness, rashes and skin pigmentation or skin disorders are to be reported to the medical officer.

1.30 No person returned to duty after medical suspension is to be employed in contact work without written permission from the medical officer.
1.31 No worker who is developing permanent conditions due to exposure to explosive substances is to work in contact with it again.

Additional requirements and precautions to be observed by contact workers

1.32 Every person employed on contact work is to deposit in the place or places provided, all clothing removed prior to work.

1.33 Every person is to wear approved clothing and protective gloves and respirators or face shields, if applicable, when employed on contact work and remove and deposit them in the place provided before eating or leaving the work place.

1.34 Contaminated clothing is not to be taken home for laundering, and must be cleaned by an approved contractor.

1.35 Before eating, going to the toilet, or leaving the work place, every contact worker is to wash in clean water in the wash place provided. The skin is to be cleaned with approved substances.

1.36 Fingernails are to be kept short and clean.

1.37 No person is to interfere in any way, without proper permission, with the means provided for the removal of vapour, fumes and dust from the workshop.

Posting of safety notice

1.38 The Officer-in-Charge is to have the requirements at paragraphs 1.32 to 1.37 inclusive, posted in each shifting room in a position where the notice can be easily read by contact workers – see Regulation 4.4 Procedure 6.
PROCEDURE 2 - HANDLING EQUIPMENT AND MECHANICAL AIDS INCLUDING VEHICLES FOR USE WITH EXPLOSIVE ORDNANCE AND ASSOCIATED EQUIPMENT

Introduction

2.1 Handling equipment and mechanical aids are common use items that assist in the safe movement of Explosive Ordnance (EO) and its associated equipment. Mechanical Handling Equipment (MHE), powered or not and also specialist lifting equipment such as cranes, present unique hazards to personnel and equipment when in use. Simple rules implemented surrounding the storage and operation of such devices will ensure that safe work conditions are likely to be upheld.

Purpose

2.2 The purpose of this procedure is to prescribe requirements and general management controls to minimise potential hazards when this equipment is used on EO in its authorised packaging, certain EO items outside the approved packaging and its associated equipment within, or close to, EO areas or facilities.

Overarching requirements

2.3 Defence’s Work, Health and Safety (WHS) policy for plant is to be complied with in conjunction with the requirements of this procedure. The WHS policy can be found in the Defence Safety Manual (SafetyMan).

DESIGN, CONSTRUCTION AND SPECIFICATION OF VEHICLES AND POWERED MECHANICAL HANDLING EQUIPMENT

Zoning of potential explosion sites

2.4 EO buildings are classified according to the nature of EO stored, handled or processed in the building. Electrical installations and equipment are afforded the same category as the building in which they are installed or used. The same system is used to determine the protection to be afforded to vehicles and MHE permitted inside buildings containing EO. See Regulation 6.3 Procedure 1 for more information on Zoning.

2.5 Different categories of military diesel powered vehicles, diesel powered mobile MHE, electrically powered vehicles and electrically powered mobile MHE, are in some cases compatible, although some are not. Electrical requirements for MHE and vehicles are found in Regulation 6.3 Procedure 3 which includes a matrix clarifying the compatibility of the different standards, see Table 3-1 of Regulation 6.3 Procedure 3. Vehicles and powered MHE must not enter zones that they are not approved for.

2.6 Identification of MHE¹. Mobile MHE, including cranes, permitted to operate in Zones 1E, 2E, 20E, 21E, 22E and 33E hazardous areas, are to be clearly identified by suitable means such as sign writing, plating etc., to define the zones in which the MHE has been cleared for use. Mobile MHE used within Restricted Electrical Areas or Vehicles or powered MHE that have been hired for the activity need not be marked with this requirement.

Vehicles and MHE authorised to enter a potential explosion site

2.7 Electrically operated vehicles and MHE, including lifting or stacking appliances, are preferable from a safety viewpoint to those operated by internal combustion engines for use in EO facilities. Electrically operated vehicles and powered mobile MHE are permitted in a Potential Explosion Site (PES) subject to the restrictions detailed in Regulation 6.3 Procedure 3.

¹ Individual Services may have additional requirements for MHE EO certification.
2.8 Petrol engines are not permitted in a PES. However, military diesel powered vehicles and diesel powered mobile MHE such as compliant forklifts, are permitted in such facilities under certain specific conditions. Diesel engines that have petrol starting systems and vehicles powered by Liquid Petroleum Gas (LPG), butane or propane are to be treated as petrol engines and are therefore not permitted.

2.9 Details of the construction of petrol and diesel engine vehicles that are intended for the conveyance of Government and Visiting Forces’ EO by road outside EO areas are contained in Explosives Transport Regulations 2002 Statutory Rules No. 92, 2002 (ETR). These vehicles are not permitted into PES except as provided for in Regulation 6.3 Procedure 3, Annex B.

Vehicles and MHE authorised to enter explosive ordnance areas

2.10 LPG or LPG/petrol powered vehicles and MHE are not permitted for the handling and transportation of EO. They are permitted to enter EO areas to undertake tasks that do not involve explosives, eg a contractor required to work in an EO area, provided the conditions in this procedure governing the use of petrol engine vehicles are observed. They should not normally form part of the Defence fleet of vehicles required to regularly enter EO areas.

2.11 On certain occasions, an unprotected vehicle or unprotected powered mobile MHE is required to enter EO areas without entering a PES. The requirements for these unprotected vehicles are detailed in paragraphs 2.12 - 2.14.

Vehicles and MHE authorised to enter explosive ordnance areas without entering a PES

2.12 Privately owned vehicles may enter an EO area for the sole purpose of transiting personnel, provided that they are equipped with a fire extinguisher and do not present an increased fire risk. Authority for such vehicles is subject to the written permission of the Officer-in-Charge of the establishment. Privately owned vehicles are not allowed in a PES and are to be parked in designated car parks.

2.13 On certain occasions contractors are permitted to enter EO areas with vehicles and powered mobile MHE. Whenever possible the requirements of this procedure are to be met. Where the requirements cannot be met, the procedure incorporated in Regulation 4.5 Procedure 2 is to be adopted.

2.14 Emergency Vehicles. Subject to appropriate pre-planning by establishment emergency organisations, emergency vehicles are normally to be granted unimpeded access to EO areas. During an emergency practice or exercise, due regard to the content of this procedure is to be given.

Internal combustion engine

2.15 Internal combustion engines are to be Compression Lignition (CI) engines. Cold starting fluids are only to be used in a permanently installed systems that inject fluid into the inlet air manifold downstream of (i.e. after) the inlet flame arrestor. The length and bore dimensions of any cold starting fluid injection jet are to be proportioned so that the jet is flameproof. Cold starting fluids are not to be used in conjunction with any electrical starting aids.

Fuel

2.16 Diesel fuel is to have a flash point of not less than 55°C. Other fuels may be used in diesel operated internal combustion engines provided that it has a flash point of not less than 38°C and the ambient temperature of the area in which the vehicle is working is at least 5°C below the flash point of the fuel. Due allowance is to be made for solar heat gain where vehicles are working in strong sunlight. The auto-ignition temperature of either fuel is to be not less than 250°C. All the temperatures above are derived from the Institute of Petroleum Method 170.

2.17 When fuels are used with additives (i.e. for cold climates) flash point and auto-ignition temperature will normally be reduced. Fuel and cold starting aid fluid is only to be carried in a fixed tank. No provision is to be made for the carriage of spare fuel or starting fluid.
Tyres

2.18 If the vehicle or MHE is to operate in an environment where static protection precautions are required (i.e. anti-static regime or conductive regime) then the tyre of at least one road wheel is to be electrically conducting in accordance with the requirements of BS2050:1978, Table 2, Item 8. All wheels on any one axle are to be fitted with tyres of the same type.

Ancillaries

2.19 Ancillary items in use with vehicles and powered mobile MHE are to comply with the equivalent standards as the main equipment with which they are utilised.

Maintenance and repairs

2.20 The manufacturer is to be required to provide a user’s handbook, with each item of MHE, which includes the maximum performance limits of the equipment. A comprehensive maintenance schedule for the equipment must also be provided which details the periodic maintenance and testing required ensuring adequate continued explosion hazard safety.

2.21 All MHE is to be properly maintained and periodically tested in accordance with approved Motor Transport Servicing Instructions that take into account the manufacturers requirements.

2.22 MHE found to have any defect that may affect its safety is to be taken out of service until the defect has been rectified.

2.23 Following any maintenance or repairs to the exhaust system it must be reassembled with new gaskets and tested for leaks before the MHE is put back into service. Exhaust system flame emission tests are not required during routine maintenance.

Modifications

2.24 No unauthorised modification is to be made to any vehicle or MHE without written authorisation from the manufacturer.

MANAGEMENT AND CONTROL OF VEHICLES AND POWERED MECHANICAL HANDLING EQUIPMENT

Serviceability

2.25 No unserviceable vehicle or powered MHE is to be permitted to enter an EO area. In this respect, particular attention should be paid to exhaust systems. Furthermore, if a fault is discovered on any vehicle or MHE during use that affects its safety, it is to be promptly withdrawn from use.

Speed and load limits

2.26 The maximum permitted speed and load limits for each type of MHE are to be fixed for each site by the Officer-in-Charge (OIC) of the Establishment, taking into account the manufacturers’ published performance limits and other requirements as appropriate. The speed and load limits are to be appropriately promulgated.

Maximum rated capacity

2.27 The ‘test before use’ principle provides additional confidence that lifting appliances will not fail during Service use. On no account is the Maximum Rated Capacity (MRC) to be exceeded.

Parking

2.28 Vehicles and powered mobile MHE are not to be left unattended in a PES. Parked vehicles loaded with EO are required to be treated as a PES.
Garaging

2.29 Above ground garaging. Garaging of vehicles and internal combustion engine MHE in an aboveground EO facility is not to be within the Inter Magazine Distance of any PES.

2.30 Underground garaging. Vehicles and MHE used in underground sites should normally be garaged at a selected area aboveground. Where this is not possible, the Licensing Authority may authorise a selected area underground that is sited as far as possible from the explosives.

Breakdowns

2.31 Should a breakdown, including failure to start readily, occur in the vicinity of a PES, the vehicle or MHE is to be off-loaded of any EO and whenever possible, is to be moved a distance of at least 25 m from the nearest PES, before repairs are attempted. Normally only first-aid repairs of a minor nature, sufficient to permit the vehicle or MHE to be moved, are permitted within an EO area.

2.32 Vehicles or MHE requiring major repairs are to be removed to an approved repair facility.

Refuelling arrangements

2.33 Vehicles and MHE are normally only to be refuelled at authorised aboveground refuelling points and tanks are not to be filled beyond the specified capacity. No spare fuel is to be carried. Where refuelling points are authorised in underground sites, the fuel is to be taken underground in approved containers in sufficient quantities for one day’s work only. The refuelling point is to have a floor of concrete impervious to fuel and a suitable method of spillage containment.

Fire fighting appliances and precautions

2.34 Vehicles and powered MHE are to carry fire extinguishers of types suitable for use against electrical fires and the particular fuel applicable to the vehicle or MHE. Additional fire fighting equipment is to be provided at PES where MHE is working, and garages, refuelling points and battery charging facilities.

Ventilation

2.35 Where vehicles and MHE are permitted in a PES, adequate ventilation is to be provided to remove exhaust fumes.

Loading/unloading of vehicles

2.36 The engines of all load carrying road vehicles are to be switched off during loading and unloading of EO unless the engine is required to facilitate the loading or unloading of the vehicle.

Mobile cranes, ship and barge mounted cranes and cranes not in regular use

2.37 All mobile cranes, ship/barge mounted cranes of all kinds and cranes not in regular use are to be subjected to the following tests before use:

a. All pre-use checks recommended by the manufacturer.

b. Testing of every crane motion for several minutes without load, each motion individually at first then by a combination of two or more motions simultaneously as appropriate, and then repeating the test with an inert load on the crane. For this test the load is to be at least equal to the maximum load to be handled. For mobile cranes the strength and stability of the crane at its location is important. The test should include simulating the maximum reach the crane would be required to move the load.

c. On floating cranes, the test lift (with load) is to be repeated after any break of one hour or more, or at any time when required by the ship’s Commanding Officer’s representative,
the loading supervisor/master stevedore or the crane driver. The test lift is to be witnessed by a representative of both the loading and receiving parties.

d. Assurance is also to be obtained that cranes not in regular use are adequately maintained and that the probability of failure is at least equal to that which the crane would be afforded if it was subject to regular use.

REQUIREMENTS FOR NON-POWERED MECHANICAL HANDLING EQUIPMENT

2.38 General purpose equipment. General purpose lifting equipment is permitted to be used with EO items provided the items of EO are packed in their authorised packaging and the equipment is maintained and used as intended by the manufacturer i.e. in a serviceable condition and within its Working Load Limit (WLL) etc. An example of general purpose lifting equipment is a commercial of the shelf, pallet jack.

Note

The authorised packaging referenced above means the packaging as listed in the Defence Explosive Ordnance Classification Listing (DEOCL). This includes robust items packaged on pallets such as 155mm.

2.39 Special to type equipment. Special to type lifting and handling equipment or bespoke equipment such as Guided Weapons maintenance trolleys, is only to be used for handling EO that it has been specifically designed for. Each item is to be authorised for use in applicable publications/orders etc., in a manner so that users can easily identify the item. Once authorised for use with EO, the approved equipment is not to handle or lift general goods. It is to remain as a dedicated EO lifting/handling apparatus.

2.40 All equipment must be surveyed, tested and maintained in accordance with the manufacturer’s recommendations and instructions for that particular item, before the item can be specifically designated as authorised for use. Where fitted, each appliance test plate or other suitable marking medium and all relevant documentation are also to be marked accordingly.

2.41 To ensure that all items are surveyed, tested and maintained at prescribed periodicities, an effective re-call system is to be implemented. Units are to maintain a complete list of approved MHE that they have within their facility or area of responsibility. The OIC of the facility is to ensure that each item is included in the effective re-call system.

2.42 Results of any tests conducted are to be recorded on individual appliances or equipment on a test plate or other suitable marking medium. Any equipment that fails testing is to be segregated and is not permitted for use. The following marking and test particulars are to be recorded as a minimum:

a. Unique identification number.

b. Date of the test/inspection conducted.

c. The outcomes of the tests conducted i.e. pass, WLL.

d. Date of the next test due.

e. Initials or identification mark of the testing officer.

2.43 Any appliance whose configuration includes hooks are to be fitted with a closed hook.

Action prior to use

2.44 The user and/or operator of any lifting and handling equipment for use in any activity involving EO, is to carry out the following checks, as a minimum, just prior to use:
a. Ensure the appropriate equipment that has been selected for use is authorised for the task in hand.

b. Check the appliance test plate to ascertain that the equipment is within its test period and suitable for the task required i.e. not operating outside the WLL, as identified via the test plate required by paragraph 2.42.

c. Inspect the equipment, including associated structural fittings, for any defects. Particular care is to be given to less endurable items such as wire ropes, cordage, splices, strops, and lifting and securing slings.

SPECIALIST ADVICE

2.45 Since the failure of equipment when lifting and handling EO can have catastrophic consequences, users or operators are not to hesitate to call in the specialist maintenance, survey and testing authorities for any defects found or suspected and/or for technical advice.
REGULATION 4.7 - EMERGENCY MANAGEMENT

General Overview

7.1 Potential exists for emergency situations and incidents, which may or may not involve or threaten Explosive Ordnance (EO) or Explosive Hazardous Areas (EHA), to escalate to become a catastrophic event. Emergency situations require immediate decisive management to ensure that undesirable situations are controlled.

Requirements

7.2 The emergency control arrangements resulting from these requirements are not intended to stand alone for EO activities and should be incorporated into the emergency arrangements of the establishment as a whole.

Emergency Control

7.3 Each major EO storage facility is to establish an Emergency Control Organisation comprised of an Emergency Control Committee (ECC) that is to be supported by an established Emergency Control Room (ECR) or area. The Manual of Fire Protection and Engineering (MFPE), details the requirements for each of the following:

a. **Emergency Control Committee.** An ECC is to be formed from within the staff resources of the unit/establishment.

b. **Emergency Control Room.** The ECR is to be staffed during all emergencies by the members appointed to the ECC.

c. **Emergency Response Plan.** The ECC is to formulate an Emergency Response Plan (ERP) appropriate to their facility, which will be followed in the event of an emergency. The ERP is to be promulgated in local instructions. In developing the ERP the reporting and investigating requirements for accidents, fires and explosions detailed in Regulation 1.3 Procedure 1 are to be incorporated.

d. **Training.** All staff is to receive annual instruction in the identification, operation and use of first attack firefighting and emergency equipment held by the facility.

e. **Practice Drills/Exercises.** Practice drills/exercises are to be conducted to simulate emergencies involving EO eg dropped EO, fire in EO workshops or storage areas, transport incidents, injuries to personnel from an explosion or exposure to toxic by-products, etc. In addition to the requirements of the MFPE, the following guidelines apply to the conduct of practice drills/exercises:

   (1) All practice drills/exercises and the personnel who attended are to be recorded in the ECR Incident Log Book.

   (2) Local arrangements must be in place to filter messages resulting from practice drills/exercises to ensure that outside assistance is not involved unnecessarily.

f. **Inspections and Reporting.** To supplement the Fire Safety Surveys required by MFPE, the unit/establishment fire officer accompanied by appropriate technical inspection staff (EO qualified Technical Officer) are to conduct quarterly fire safety inspections on major unit/establishment facilities. The results of these inspections and any rectifying actions are to be recorded in the ECR Incident Log Book.

g. **Housekeeping.** The highest possible level of housekeeping is to be maintained in EO storage areas.

7.4 **Familiarisation Visits.** Annual familiarisation visits by emergency services such as fire, medical and police, are to be encouraged providing security requirements can be satisfied.
Planning of Facilities

7.5 Emergency management aspects are to be incorporated into the planning of new facilities or upgrades to existing facilities e.g. Fire Safety. The following aspects are to be considered:

a. Alarms;
b. Fire Breaks;
c. Fire Fighting Equipment, including the maintenance of such equipment;
d. Emergency Communication Equipment;
e. Emergency Showers; and
f. Eye Wash Stations;

Control of Items

7.6 The following items require control in EHAs:

a. Fires;
b. Heating Appliances;
c. Boiler Houses;
d. Stoves;
e. Appliances/Tools used for repair Buildings or Static Equipment;
f. Fuel and Flammable Liquids;
g. Incinerators;
h. Smoking;
i. Electrical Power; and
j. Rubbish and Waste.

Responsibilities

7.7 All personnel employed on and around EO are to ensure compliance with this regulation and the associated procedures.

7.8 The OIC is to appoint suitable staff to the ECC.

7.9 The ECC is responsible for:

a. Formulating, promulgating and implementing all procedures associated with emergencies, e.g. Emergency Response Plan, including training, call-out and liaison with local emergency authorities. Procedures are to be based on local conditions and the requirements of the Australian Standard AS 3745-2010/Amdt 2-2018, MFPE, and this regulation; and
b. Controlling emergencies from the ECR.

7.10 Staff involved with the planning or upgrading of new/existing facilities is to ensure that the requirements of this regulation are incorporated into the building design as applicable.
Procedures

7.11 Procedures used to implement the requirements of this regulation are:

a. Procedure 1 – Fire Protection, Prevention and Fire Fighting Emergency Arrangements for Explosive Ordnance; and

b. Procedure 2 – Explosive Ordnance Emergency Arrangements for other than Fire.
PROCEDURE 1 - FIRE PROTECTION, PREVENTION AND FIREFIGHTING EMERGENCY ARRANGEMENTS FOR EXPLOSIVE ORDNANCE

Introduction

1.1 An outbreak of fire in the vicinity of Explosive Ordnance (EO), or amongst the EO itself, must be recognised as a potential source of extreme and immediate danger to life and property. It is of the utmost importance that fire protection and prevention measures are taken, and that the organisation is such that if a fire occurs it is responded to immediately and energetically in a planned and rehearsed manner. Personnel employed in or adjacent to an EO area must be made aware of the possible danger and how to operate the first attack firefighting equipment available.

Purpose

1.2 This instruction details procedures to aid in the development and implementation of fire safety practices in relation to EO, and in the event of a fire, an efficient and well-practised response. To this end, the subject is divided into three areas, namely:

a. Fire Protection. The design and construction of buildings and facilities to fire safety standards, the provision of fire detection and suppression systems, and the provision of first attack firefighting equipment.

b. Fire Prevention. The procedures adopted by occupants of facilities to reduce the risk of fire occurring, limit its spread, ensure that first attack firefighting equipment is available and serviceable, and to train occupants in evacuation procedures and the action to be taken in the event of a fire.

c. Firefighting. The action taken by specialist and auxiliary firefighting personnel to assess the circumstances surrounding the outbreak of fire involving EO and determine subsequent action relating to rescuing personnel, extinguishing the outbreak and limiting damage to facilities and materiel.

1.3 Minimum firefighting requirements applicable to Small Quantity Facilities (SQF) are detailed in Regulation 4.4 Procedure 13. Because of the vastly different conditions that may pertain to the various SQF, lesser conditions than those specified may be authorised on the licence for SQF at the discretion of the Licensing Authority.

FIRE PROTECTION REQUIREMENTS

General

1.4 Fire protection provisions for Defence EO facilities are addressed in the Manual of Fire Protection Engineering (MFPE). Additional requirements are dealt with at paragraphs 1.5 to 1.12.

Fire Safety Planning for New and Upgraded Explosive Ordnance Facilities

1.5 Matters which need to be considered in the formulation of fire safety plans for new EO facilities and the upgrading of existing facilities are explained in the MFPE.

1.6 Staff responsible for detailed planning of new EO facilities and the upgrading of existing facilities are to take cognisance of the requirements in the MFPE particularly in respect of undertaking an analysis of the site in question with a view to achieving the prescribed levels of fire safety. Advice is available from the sponsor of the MFPE.

1.7 The requirements for fire safety assessment are detailed in the MFPE, Chapter 17 paragraphs 17.5 and 17.6.
Fire Alarm System

1.8 An efficient alarm system should be installed which is to be audible throughout the whole EO area including inside of buildings. Power operated alarm systems are to be tested weekly, with scheduled times being notified to all concerned including civil authorities where appropriate.

Fire Breaks

1.9 Fire breaks may need to be established and maintained inside and adjacent to the EO area perimeter fence, throughout the EO area and around each EO facility as required by Regulation 4.5 Procedure 1.

Scales of Fire Fighting Equipment

1.10 Basic scales of firefighting equipment are prescribed in the ‘Building Code of Australia’. Special minimum acceptable requirements with respect to first attack appliances, water supplies, water reticulation systems and other fire fighting resources for EO depots are detailed in the MFPE, Chapter 17. Particular note is to be taken of the requirement at paragraph 17.11 of the MFPE, that fire points within EO storage areas be equipped with extinguishers only in order to limit personnel to fighting a fire only at the insipient stage.

Maintenance of Firefighting Equipment

1.11 All hose and other firefighting equipment is to be maintained in accordance with the MFPE and AS 1851 AS 1851-2012/Amndt 1-2016 in its various parts.

Emergency Communications Systems

1.12 Emergency communication systems are to be tested regularly. The testing cycle is to be based on local conditions and the reliability of local phone systems.

FIRE PREVENTION ARRANGEMENTS

General

1.13 As the greatest threat to EO areas is fire, restrictions and precautions additional to those applicable to the establishment as a whole, are to be implemented. Details of the additional restrictions and precautions are given below.

Control in Explosive Ordnance Areas

1.14 Fires. Ideally the use of fires within EO areas should be completely forbidden, however it may not be practicable to impose an absolute ban due to the requirement to minimise ground fuel build-up by controlled burning. Fires may therefore be authorised subject to the conditions laid down in the following paragraphs and provided that:

a. The fire is authorised in writing by the OIC of the establishment if satisfied of its necessity, in consultation with Estate and Infrastructure Group (E&IG) Regional Fire Safety/Regional Environmental and Sustainability Officers (RESOs) and appropriate local authorities; and

b. The authorisation is withdrawn immediately the requirement ceases to exist.

1.15 Open Fires. Open fires are prohibited in buildings within EO areas.

1.16 Heating Appliances. Heating appliances within offices etc within the EO area are to be of the oil filled electric type or reverse cycle air conditioners complying with the requirements of Regulation 6.3 Procedure 1.
1.17 **Boiler Houses.** Boiler-houses are prohibited within EO areas, however oil fired heating plant in support of hot water heated air conditioning may be used.

1.18 **Stoves.** Combustion stoves are prohibited within EO areas.

1.19 **Liquid Fuelled Heating Appliances.** Liquid fuelled heating appliances are prohibited within EO areas.

1.20 **Repair of Buildings or Static Equipment.** The use of blowlamps or other heat or flame producing appliances within EO areas are to be strictly controlled subject to the provisions of Regulation 4.5 Procedure 2.

1.21 **Domestic Incinerators.** Domestic incinerators for the disposal of rubbish, classified waste paper etc are prohibited within EO areas.

1.22 **Incinerators for Disposal of EO.** Incinerators for the destruction of EO are not to be sited within EO areas, but in a separate licensed burning ground.

1.23 **Smoking.** Smoking is not permitted within EO areas and demolition or burning grounds except in places authorised and signposted by the OIC of the establishment as a ‘SMOKING AREA’. (See Regulation 4.4 Procedure 1)

1.24 **Control of Smoking or Fire Lighting Materials.** Where smoking areas or fires are authorised, special arrangements are to be made for the conveyance of the controlled articles within EO areas. Lockable containers are to be used and the keys are to be held by a responsible person. (See Regulation 4.4 Procedure 1).

1.25 **Promulgation of Smoking Areas.** The OIC of the establishment is to promulgate in local instructions, the location of approved smoking areas and the arrangements for taking smoking materials into EO areas, demolition or burning grounds.

1.26 **Electrical Power.** All non-essential power supplies are to be switched off whenever EO buildings are not occupied.

**Prohibited/Controlled Articles**

1.27 Articles which are liable to increase the fire risk are not to be taken into EO areas unless special authority has been granted, except that materials such as paints, oils, solvents and cleaning rags essential for the maintenance or repair of EO may be used or stored in EO areas providing that these materials are handled strictly in accordance with the provisions of this manual. A list of prohibited and controlled articles is included in Regulation 4.4 Procedure 1. The conveyance of controlled articles within EO areas is to be regulated by local instructions issued by the OIC of the establishment.

**Flammable Liquids**

1.28 **Storage Overnight.** Under no circumstances are paints, solvents, paint brushes or similar articles and substances to be left in an EO building or anywhere within EO areas (except in an approved flammable liquid storage location) overnight. Opened containers of flammable liquids are not to be left unattended at any time.

1.29 **Approved Storage Locations.** Flammable liquids may be stored overnight within EO areas only if they are contained in flammable liquids storage cabinets designed and constructed to AS 1940, eg:

a. DSN 7125-66-066-5474 - Cabinet, Storage, Steel, Flammable Liquid, 3 shelf, 100 litre capacity; or

b. DSN 7125-66-066-5473 - Cabinet, Storage, Steel, Flammable Liquid, 3 shelf, 200 litre capacity.
1.30 Limitations on the Use of Flammable Liquids Cabinets. The use of flammable liquids cabinets is subject to the following criteria:

a. They are to be sited external to any EO building and at least 3 m from any building openings, eg doors or windows, and any electrical switch board or other possible ignition source;

b. If sited against a building wall, the wall is to be of fire-resistant construction, eg brick, concrete or metal cladding, with an air gap of at least 100 mm maintained between the cabinet and the wall;

c. They are to be sited on ground free of fire hazards;

d. They are to be located in a well ventilated area;

e. The quantities held in them are to be kept to the minimum required for day-to-day use as specified by the area supervisor, and regular checks are carried out to guard against excessive holdings;

f. The storage area is to be kept clean and free of soiled rags; and

g. The location is to be adequately provided with firefighting equipment.

1.31 Bulk Stocks. Bulk stocks of flammable liquids are not normally to be stored inside EO areas, but are to be stored in an approved external location such as a paint store or Depot Equipment Store, see Annex B, paragraph 12.

Spontaneously Combustible Materials

1.32 Articles liable to spontaneous combustion, eg oily rags, are not to be taken into an EO building containing EO except when required for immediate use. Such articles are to be disposed of in metal garbage bins with close fitting lids, and are to be cleared to a safe distance of 3 m from the EO building whenever it is vacated or work ceases for any period of time. At the conclusion of daily activities these materials are to be removed from the EO area for disposal. (See Regulation 4.4 Procedure 1).

Rubbish and Waste

1.33 Separate garbage bins with close fitting lids are to be provided for the disposal of other types of rubbish and waste. Such articles are to be cleared to a safe distance of 3 m from the EO building whenever it is vacated or work ceases for any period of time. (See Regulation 4.4 Procedure 1).

Environmental Management Plan

1.34 A balanced plan for estate management is to be implemented to reduce the risk of fire. The fire hazard may be reduced by the installation of fire breaks and the control of vegetation by grazing livestock, controlled burning, the selective use of herbicides or cutting. Regulation 4.5 Procedure 1 provides guidance on the creation of firebreaks and the control of vegetation.

Operations During Periods of High Fire Danger

1.35 All States of the Commonwealth have enacted various legislation restricting or prohibiting fires in the open during specific periods. Demolitions, including those conducted during EO disposal tasks, are deemed to be fires for the purpose of the various legislation.

1.36 The Department of Defence or the Commonwealth is not protected by any special legislation in this area. Therefore the Commonwealth in almost all circumstances would be liable for any damage caused by a fire which was started on Commonwealth property.

1.37 In light of the above, the following procedures are to be adopted:
a. All Defence establishments holding EO are to comply with fire restrictions imposed by state and/or Territorial Governments or agencies. No controlled burning is to be conducted during such periods.

b. If operations/exercises are required to be conducted during proclaimed high fire danger periods, establishments are to ensure that adequate firefighting resources are provided to minimise the risk of fire outbreaks spreading to adjoining non-Commonwealth property.

c. Officers controlling EO disposal operations are to ensure that appropriate measures are implemented to minimise the risk of fire occurring. Dependent on circumstances, either or both of the following are to be adopted:

   (1) The local civil fire brigade is to be requested to attend the scene; and

   (2) Response vehicles are to be equipped with portable fire extinguishers and/or knapsack sprays and appropriately trained staff is to be available to use that equipment if called to do so.

d. Establishments are not normally to conduct demolitions, destruction or proof during periods of high fire danger. If such operations are essential, adequate firefighting resources are to be provided to minimise the risk of fire outbreaks spreading to adjoining non-Commonwealth property.

**FIREFIGHTING ARRANGEMENTS**

**General**

1.38 Although departmental organisations such as E&IG are responsible for the provision of certain firefighting equipment and services, the Officers-in-Charge (OIC) of establishments are responsible for ensuring that adequate measures are in place for the protection of EO, and EO storage and handling facilities against the hazards of fire.

1.39 Since the initial reaction of personnel could be crucial in limiting the consequences of an outbreak of fire, all personnel involved with EO storage, handling and inspection are to be instructed annually on the application and use of first attack firefighting equipment. Note that the limitation of responsibility for firefighting by EO staff, ie nonprofessional firefighters, to the use of first attack firefighting equipment only is intentional. Personnel should never put their safety at risk by continuing to fight a fire if the EO is involved directly or is likely to be affected before the person(s) in attendance is able to retire to a safe distance.

**Responsibilities**

1.40 Officers-in-Charge. OIC of establishments are responsible for fire prevention and the firefighting organisation at their establishments - see MFPE. This responsibility includes the following:

   a. The firefighting organisation in the establishment caters for all contingencies and is efficient;

   b. Firefighting equipment is adequate, appropriate, well maintained and always ready for instant use;

   c. The efficient training of personnel;

   d. The maintenance of the required fire breaks within the EO area, see Regulation 4.5 Procedure 1;

   e. Coordination of all available means, including the provision of suitable radio communications equipment, to ensure that any outbreak of fire is brought under control as quickly as possible;
f. Arrangements for the evacuation of all personnel to a safe place in response to a fire alarm; and

g. Fire orders are issued and kept up to date and that all personnel are made aware of their duties.

Commanding Officers of independently located units or detachments which provide their own services are responsible for the organisation and efficiency of fire services at those locations, the promulgation of their own fire orders and other applicable responsibilities given above.

Planning

1.41 Each establishment is to prepare a plan for fire prevention and firefighting to include efficient arrangements relative to the raising of the alarms, safe evacuation of personnel, fire fighting measures and the adequate identification of all EO facilities.

1.42 An Emergency Control Organisation that will react in the event of any emergency is to be established in accordance with the requirements detailed in MFPE.

1.43 Consideration is to be given to the possible need to involve local civilian emergency support authorities such as fire services, police, ambulance and hospitals and predetermined arrangements made as necessary.

1.44 A plan of the establishment showing the location and identity of each facility and the layout of the principal mains, including water, gases, electricity and telephone lines is to be maintained and be kept at strategic points on the establishment. For security reasons, the plan should contain only the minimum information necessary for effective firefighting.

Emergency Procedures - Fire

1.45 Detailed fire procedures that address, as a minimum, the aspects listed at Annex A, are to be prepared and issued to all sections and brought to the notice of all personnel. These procedures are to form part of the establishments procedures required by MFPE.

Firefighting Measures

1.46 Firefighting measures within an EO establishment call for close attention to detail and the coordination of all available means to ensure that an outbreak of fire is responded to immediately and energetically and brought under control as quickly as possible. These measures may be conveniently sub-divided as follows:

a. First attack measures,

b. Establishment measures, and

c. Civil authorities measures.

1.47 First Attack Measures. Firefighting 'first attack' measures are to be provided at an EO facility, or in the vicinity of an EO stack in the open. First attack measures may include firefighting appliances and local fire alarms for operation by those on the spot. The prompt use of these appliances may be the means of preventing a more serious incident, and all concerned must be trained to be fire conscious and capable of operating the equipment efficiently. However, note the requirements of paragraph 1.39.

1.48 Establishment Measures. Establishment measures may comprise, as necessary, the provision of firefighting media and equipment including adequate supplies of water from static supply and/or mains, fixed firefighting installations, hydrants, hoses, mobile fire appliances including pumps, positive pressure breathing apparatus, an efficient general fire alarm system, means of communication and trained firefighting personnel, according to the risk.
Civil Authorities Measures. Civil authorities measures are those taken by local fire and other authorities and may include the provision of all the normal equipment used by them, together with trained firefighting personnel.

Firefighting Responses

When a fire incident occurs involving EO, staff in attendance must immediately raise the alarm to activate the Emergency Control Organisation and then attempt to extinguish the fire if safe to do so using available first attack firefighting equipment. Subsequent firefighting actions will be determined in accordance with the prescribed emergency control arrangements.

The firefighting response is to be based on the guidance given in Annex C. Consideration of the following will be necessary prior to attempting firefighting action beyond first attack:

a. Classification(s) of EO involved in the incident, its reactions to fire and its strategic value;
b. Construction of the storage facility concerned and the type of traverses provided;
c. Capabilities of professional firefighters to respond to the incident;
d. Availability of protective areas from which to conduct firefighting operations;
e. Resources available both in manpower and equipment;
f. The likelihood of spot-fires occurring from blast residue or other storage facilities becoming involved as a result of fragments penetrating roofing, etc; and

g. Command, control and communications in place should further firefighting actions, additional to the original incident, be necessary.

Prompt application of firefighting measures will usually prevent serious fires. The following are intended to give general guidance:

a. Every effort must be made to prevent EO becoming involved in the fire. Firefighting may have to be carried out from behind substantial cover such as traverses, walls or buildings.
b. Radiant heat, sparks and flying embers from a fire are possible sources of spreading, therefore the damping down of EO, vehicles, buildings etc within range of the fire should commence early. Spray jets should be used for this purpose.
c. Wherever practicable, the fire should be fought from upwind.

Firefighting Classification of Explosive Ordnance

For firefighting purposes EO is divided into four fire divisions (Fire Divisions 1, 2, 3 and 4) according to its behaviour when involved in a fire. Fire divisions correspond to the hazard division of the EO concerned ie the second digit of the UN Hazard Classification Code for the particular store, eg Fire Division 2 for EO of HCC 1.2D, with the exception of substances and articles of HD 1.5 and HD 1.6 (see paragraph 1.57).

A description of the hazards to be expected during firefighting and the procedures to be employed in the fighting of fires in aboveground sites are detailed in Annex B.

Symbols for Fire Divisions and Supplementary Fire Symbols

Each of the fire divisions is identified by a distinctive symbol/sign in order that the explosive hazard involved can be easily recognised by personnel approaching the scene of a fire. A description
and the use of these symbols together with details of supplementary symbols that indicate the precautions to be taken when fighting a fire are given in paragraphs 1.56 - 1.62 inclusive.

**Fire Division Symbols**

1.56 Fire division symbols are comprised of the word ‘Explosives’, a number (1.1, 1.2 or 1.3 indicating the Hazard Division of the EO concerned) and a bursting bomb within a square symbol standing on its tip. The background colour of the symbol is orange, and the writing, bursting bomb and number are in black. The Fire Division symbol for HD 1.4 has a backgr

1.57 Separate fire division symbols for HD 1.5 and HD 1.6 EO are not necessary since the reaction of HD 1.5 and HD 1.6 EO involved in a fire will be similar to existing fire divisions. Fire division symbols for substances or articles of HD 1.5 and HD 1.6 are to be displayed as follows:

a. HD 1.5 - display Fire Division symbol 1.3 or 1.1 (see Annex B, paragraph 2), and

b. HD 1.6 - display Fire Division symbol 1.2.

1.58 When EO of different fire divisions is stored at the same site, the symbol posted is to indicate the greatest hazard to firefighting personnel.

**Supplementary Fire Symbols**

1.59 Certain EO (pyrotechnic and toxic EO) and non-explosive dangerous goods require special supplementary fire symbols to indicate the precautions to be taken against the additional hazards created by their presence.

1.60 The supplementary fire symbols, except the Trefoil symbol, are shown on the Fire-fighting Poster at Annex C and described in Annex D. Supplementary fire symbols are to have side dimensions of not less than 250 mm.

1.61 EO and non-explosives dangerous goods (NEDG) requiring supplementary fire symbols are indicated in Topic -025 of the item publication.

1.62 When required the supplementary fire symbols are to be displayed immediately below the fire symbol; where more than one supplementary fire symbol applies, they are to be displayed vertically in decreasing order of risk.

**Location of Fire Symbols**

1.63 Each facility containing EO is to have the appropriate fire division symbol, with supplementary fire symbols as appropriate, displayed on each vehicular approach to the facility. Care in positioning the symbol is to be taken to ensure that the view of the symbol is not obstructed by such things as traverses, vegetation etc. Additionally, in a compartmented building the supplementary fire symbol, if applicable to a compartment, is to be displayed adjacent to the door to that compartment. The symbol is to be located so it can be seen even if the door to the compartment is open. The fire division symbol is to be removed if the EO facility does not contain EO.

1.64 The method used to display symbols/signs is to provide for their easy removal or replacement as the need arises.

---

1 The NSN used to order the Symbols Indicating the Fire Hazards of Explosives Poster is 9905-66-120-6214.
Dangerous Goods - Placarding and Firefighting

1.65 Facilities containing dangerous goods (UN Classes 2 to 9), other than those NEDG identified in the Topic -025 of the item publication, are to be placarded using symbols for the relevant dangerous goods class shown in the Australian Code for the Transport of Dangerous Goods (ADG Code). Firefighting instructions are to be based on the HAZCHEM Emergency Action Code shown in the ADG Code.

Display of Firefighting Poster

1.66 The Firefighting Poster (Symbols Indicating Fire Hazards of Explosives) is to be displayed prominently at:

a. Main entrances to EO Storage Areas, and workshop and preparation buildings; and

b. Entrances to rooms or near Small Quantity Facilities licensed under Regulation 5.3 Procedure 1.

Annexes:
A. Local Fire Procedures - Essential Content
B. Firefighting - Hazards to be Expected and Actions Applicable
C. Symbols Indicating Fire Hazards of Explosives
D. Supplementary Fire Symbols
LOCAL FIRE PROCEDURES - ESSENTIAL CONTENT

Local Fire Procedures must address, as a minimum, the following topics:

<table>
<thead>
<tr>
<th>Title</th>
<th>Essential Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Distribution</td>
<td>The distribution of local fire procedures.</td>
</tr>
<tr>
<td>2. Responsibilities</td>
<td>The division of responsibilities for all key personnel involved in firefighting arrangements</td>
</tr>
<tr>
<td>3. Fire Precautions</td>
<td>Fire precautions that must be enforced. Detail local orders about disposal of waste, grass cutting, search of buildings, fire inspections etc.</td>
</tr>
<tr>
<td>4. Emergency and Firefighting Organisation</td>
<td>Details of the Emergency Organisation and its procedures; details of fire parties and mobile equipment they will man; assembly points, telephone numbers; arrangements for staff not in fire parties, viz, assembly points, mustering, first aid arrangements, transport etc for both working and silent hours.</td>
</tr>
<tr>
<td>5. Command and Control between Depot Staff and Civil Authorities</td>
<td>Details of agreed arrangements for command and control when civil authorities (Fire and Police) are called for assistance.</td>
</tr>
<tr>
<td>6. Training and Drills</td>
<td>Arrangements for periodical instruction and drills.</td>
</tr>
<tr>
<td>7. Fire Exercises</td>
<td>Surprise drills and definition of responsibilities in each case.</td>
</tr>
<tr>
<td>8. Maintenance of Equipment</td>
<td>Details of all periodical maintenance routines and tests with details of responsibilities in each case.</td>
</tr>
<tr>
<td>9. Action in the Event of Fire</td>
<td>First attack action including the equipment to be used against the various types of fire. Methods of passing warning and sounding the fire alarm. Position and telephone numbers of people who must be notified. Details of persons responsible for calling in assistance from other parts of the depot. Emphasis on the importance of attacking a fire.</td>
</tr>
<tr>
<td>10. Warning civil population of probable mass explosion</td>
<td>The procedure for warning the civil population in the surrounding area (EO storage depots only).</td>
</tr>
<tr>
<td>11. Records</td>
<td>Detailed instructions governing the maintenance of records of all drills, tests, inspections and fires.</td>
</tr>
<tr>
<td>12. Reports to be rendered after fire</td>
<td>Detailed instructions about the preparation and forwarding of reports.</td>
</tr>
</tbody>
</table>

Annexes/Enclosures:

<table>
<thead>
<tr>
<th>Annexes/Enclosures:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Equipment Lists</td>
<td>Complete details of equipment including reserves to be held in store.</td>
</tr>
<tr>
<td>B. Key Telephone Numbers</td>
<td>A list of key numbers eg Local Fire Service, Hospitals, Police etc.</td>
</tr>
<tr>
<td>C. List of EO Facilities</td>
<td>Generic description of use eg EO Storehouse, EO Workshop.</td>
</tr>
<tr>
<td>D. Special Fire Poster</td>
<td>See Annex C.</td>
</tr>
</tbody>
</table>

Table 1A–1: Topics Required for Local Fire Procedures
FIREFIGHTING - HAZARDS TO BE EXPECTED AND ACTIONS APPLICABLE

Fire Divisions – Hazards to be Expected During Firefighting

1. Since the fire divisions into which Explosive Ordnance (EO) is assigned also indicates its hazard division, the hazards to be expected during firefighting are those relevant to that particular hazard division, ie Fire Division 1 – hazards as for EO of HD 1.1; Fire Division 2 – hazards as for EO of HD 1.2 etc.

2. Fire Division 1 indicates the greatest explosive hazard. The hazard decreases with ascending fire division numbers as follows (but see Regulation 2.1 Annex A for a detailed description of hazards):

<table>
<thead>
<tr>
<th>Fire Division</th>
<th>Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mass Explosion.</td>
</tr>
<tr>
<td>2</td>
<td>Explosion with projection hazard.</td>
</tr>
<tr>
<td>3</td>
<td>Mass fire or fire with minor blast or projections.</td>
</tr>
<tr>
<td>4</td>
<td>Moderate fire – no significant hazard.</td>
</tr>
<tr>
<td>5</td>
<td>Mass fire with low probability of burning to detonation (display Symbol 1.3) unless a very large quantity of explosive is highly confined eg ship cargo or Igloo storehouse, (Display Symbol 1.1).</td>
</tr>
<tr>
<td>6</td>
<td>Fire and heat with no mass explosion hazard but with a low probability of single article explosion with projections.</td>
</tr>
</tbody>
</table>

Table 1B–1: Fire Divisions and expected Hazards

Firefighting in Aboveground Sites

3. Definition of Aboveground Site. For the purpose of fire prevention and firefighting, aboveground sites are those where EO is above ground level and includes sites where part of the stored EO are below ground level.

4. Actions Applicable to All Fire Divisions. The following actions by firefighters are applicable to all fire divisions, regardless of the hazard division and explosive effects:

   a. The fire alarm must be sounded and fire services notified. All non-essential personnel are to be evacuated from the scene of the fire, in accordance with the pre-arranged plan, to a sufficiently safe distance, eg at least Inhabited Building Distance.

   b. If the fire is detected before the EO is involved, prompt action with ‘first attack’ firefighting equipment is to be taken to prevent the development of a serious fire. However, if the EO has become involved all personnel must immediately evacuate to a safe distance.

   c. The actions of the firefighting services are to be directed towards preventing EO from becoming involved in the fire.

5. Actions for Fire Division 1. In addition to those actions at paragraph 4, the following actions and precautions apply in the event of a fire in facilities designated by the Fire Division 1 symbol:

   a. A fire involving EO of HD 1.1 is to be fought during the initial stage with all available means and without awaiting specific instructions. If the fire cannot be immediately controlled, the scene of the fire is to be evacuated at once. EO in this division is expected to explode en masse very soon after the fire reaches it, and of major concern must be the protection of personnel and their equipment from blast, heavy debris and high speed fragments.
b. A fully developed fire that has involved HD 1.1 EO is not to be fought unless it is known:
   
   (1) What types of EO are stored at the scene of the fire,
   
   (2) How long the EO may be exposed to a fire before it explodes, and
   
   (3) How long the EO has been exposed to the fire.

In general, cased ammunition without its own means of initiation can be expected to explode within two to three minutes of the fire reaching it. However, initiators, igniters, propelling charges and rocket motors are extremely sensitive to fire.

c. Buildings containing EO of HD 1.1 should not be entered if smoke is visible from outside the building and where the EO is likely to be involved.

d. Vehicles loaded with EO of HD 1.1 should be abandoned if smoke is visible in the load compartment.

e. If a mass explosion occurs, action is to be confined to preventing the involvement of adjacent buildings and stacks by the application of cooling sprays when safe. Reaction fire suppression systems where fitted on adjacent buildings may be operated.

f. After an explosion, the firefighting forces may approach the scene only if the EO has been completely destroyed by the mass explosion so that only debris is left burning. Qualified EO disposal personnel should assess the safety of the scene before anyone is allowed to approach the area.

6. **Actions for Fire Division 2.** In addition to those actions at paragraph 4, the following actions and precautions apply in the event of a fire in facilities designated by the Fire Division 2 symbol:

   a. If in the initial stage the fire cannot be controlled, the scene of the fire is to be evacuated. EO contained in this division is not expected to explode en masse. Immediately after the fire reaches it, EO of this division gives rise to sporadic explosions. The explosions will increase in intensity as the fire continues. Water should be applied freely to cool those items, which may be ignited by hot fragments, fire brands, lobbed items and self-propelled stores.

b. Buildings containing EO of HD 1.2 should not be entered if a significant volume of smoke is visible from outside the building and where the EO is likely to be involved.

c. Vehicles containing EO of HD 1.2 should be abandoned if a significant volume of smoke is visible in the load compartment.

d. If the fire cannot be extinguished before the first explosions are expected, firefighting services must stay sufficiently far away from the scene of the fire to be protected from the hazards of hot fragments, fire brands, unexploded and self-propelled items which may be projected and explode on impact. If possible, they should move behind substantial cover (buildings, traverses etc) from which they can fight fires propagated in the vicinity of the original fire. If no adequate cover is available, they should retreat from the scene to a distance approximating the Process Building Distance.

e. Reaction fire suppression system where fitted in buildings endangered by the risk of penetration by hot fragments may be operated.

f. After the fire, advice of qualified EO disposal staff is to be obtained prior to firefighting services approaching the scene of the fire. An approach is only to be made after all signs of smoke have been extinguished.
7. **Actions for Fire Division 3.** In addition to those actions at paragraph 4, the following actions and precautions apply in the event of a fire in facilities designated by the Fire Division 3 symbol:

   a. A fire involving EO of HD 1.3 is to be fought at once during the initial stage with all available means and without awaiting specific instructions. If, in the incipient stage the fire cannot be controlled, the immediate area of the fire is to be evacuated. EO contained in this division has only a minor explosion effect.

   b. Buildings containing EO of HD 1.3 are not to be entered if smoke or flame is visible from outside the building.

   c. Vehicles containing EO of HD 1.3 are to be abandoned if smoke or flame in the load compartment is visible.

   d. A fully developed fire is not to be fought from nearby because of the hazards of intense heat. If such a fire cannot be extinguished in the initial stage, firefighting services must stay sufficiently far away from the scene of the fire to be protected from hazards which range from items burning violently and giving off intense thermal radiation, to items burning sporadically with minor explosions. The scattering of firebrands and burning debris may be expected. If possible firefighting services should move behind substantial cover (buildings, traverses etc) from which they can fight fires propagated in the vicinity of the original fire. If no adequate cover is available, they should retreat from the scene of the fire to a distance approximating the Process Building Distance.

   e. After a fire, the advice of qualified EO disposal staff is to be obtained prior to firefighting services approaching the scene of the fire. An approach is only to be made after all signs of flame have been extinguished.

8. **Actions for Fire Division 4.** In addition to those actions at paragraph 4, the following actions and precautions apply in the event of a fire in facilities designated by the Fire Division 4 symbol:

   a. A fire involving EO of HD 1.4 is to be fought at once in all cases and with all available means and without awaiting specific instructions. EO contained in this division is mainly a moderate fire hazard and, after an extended period of time, may explode sporadically.

   b. Care should be taken when entering buildings or approaching vehicles containing EO of HD 1.4 because of the hazards of fragmentation in the vicinity of the fire.

   c. After extended periods of time EO may explode sporadically. For protection against fragments and missiles, firefighting services should not approach the scene of any fire closer than necessity dictates and certainly not closer than 25 m. When possible the fire should be fought from a protected location.

9. **Action for Fire Division 5.** In addition to those actions at paragraph 4, actions and precautions prescribed for Fire Division 1 (see paragraph 5) or Fire Division 3 (see paragraph 7) apply.

10. **Action for Fire Division 6.** In addition to those actions at paragraph 4, actions and precautions prescribed for Fire Division 2 (see paragraph 6) apply.

11. **Metallic Powders.** Stocks of metals which are sometimes used in powder form as ingredients of explosive compounds, and hence may be located in EO areas constitute a special risk because they are capable of burning fiercely and reacting violently with water. Consequently, a fire involving metallic powders is to be fought in a manner prescribed below and the precautions given are to be observed:

   a. Among the substances suitable for use on the majority of metallic powder fires are powdered graphite, talc, soda ash, limestone and sand, all of which must be in a dry
state. The extinguishing agent should be carefully spread on to the fire, starting from outside the burning area and working towards the centre, using long-handled scoops or shovels. The utmost care is necessary to avoid any disturbance of the burning powder until it has cooled below its ignition temperature.

b. Suitable dry chemical powders may also be used in bulk form, as above, or from portable extinguishers having low velocity, long-reach discharge applicators, subject to the dry chemical being non-hygroscopic and not unduly toxic.

c. Water and other extinguishants must not be used. A ‘Use No Water’ supplementary fire symbol is to be conspicuously displayed at each building as appropriate.

12. **Dangerous Goods.** The storage of dangerous goods (other than those non-explosive dangerous goods managed in accordance with Regulation 4.3 Procedure 1) in EO areas should normally be avoided. Specific approval for such storage is to be given by the Officer-in-Charge of the establishment, and the items are never to be stored in the same building as EO. The presence of dangerous goods must be clearly indicated in firefighting plans.

13. **Firefighting Action - Summary.** A summary of firefighting actions to be taken in the event of a fire, for each fire division, is given in the Fire Poster at Annex C.
SYMBOLS INDICATING FIRE HAZARDS OF EXPLOSIVES

FIRST AID FIRE FIGHTING DURING STORAGE

Notes:
1. The action advised applies to all modes of ammunition storage, including buildings, open sites, field stacks, underground storage and vehicles.
2. Where supplementary symbols are displayed with fire division symbols, the indicated or alternative action is to be taken.

HAZARDS
1. Explosive ordnance indicated by this symbol is expected to explode en masse very soon after the fire reaches it.
2. Major hazards will be from high velocity fragments, blast and projected structural debris.

ACTION
1. Sound Alarm.
2. Fire detected in the early stage are to be fought with all available means. If unsuccessful evacuate to a place of safety.
3. No attempt should be made to fight the fire after it reaches the explosive ordnance.
4. All non-essential personnel are to evacuate the area.

HAZARDS
1. Explosive ordnance indicated by this symbol is not expected to explode en masse. Initially there will be small sporadic explosions which will increase in frequency and intensity as the fire continues.
2. Hazards will be from hot fragments, fire brands, unexploded and self-propelled items which may be projected and explode on impact.

ACTION
1. Sound Alarm.
2. Fire detected in the early stage are to be fought with all available means. If such a fire cannot be extinguished, the scene of the fire is to be evacuated and firefighting concentrated on preventing the spread of fire to other exposed sites.
3. All non-essential personnel are to evacuate the area.
4. Take full advantage of any available protection from radiant heat.
5. All non-essential personnel are to evacuate the area.

HAZARDS
1. Explosive ordnance indicated by this symbol has a minor or no explosion effect.
2. The hazard may vary from items which burn violently giving off intense thermal radiation to items which burn sporadically with minor explosions. The scattering of fire brands and burning debris may be expected.

ACTION
1. Sound Alarm.
2. Fire detected in the early stage are to be fought with all available means. If such a fire cannot be extinguished, the site is to be evacuated and firefighting concentrated on preventing the spread of fire to other exposed sites.
3. Take full advantage of any available protection from radiant heat.
4. All non-essential personnel are to evacuate the area.
5. All non-essential personnel are to evacuate the area.

HAZARDS
1. Explosive ordnance indicated by this symbol is mainly a moderate fire hazard.
2. Minor explosion may occur but there will be no blast and fragments will be limited to the vicinity of the fire.

ACTION
1. Sound Alarm.
2. Fire detected in the early stage are to be fought with all available means. If such a fire cannot be extinguished, full advantage is to be taken of any available shielding during continued action.
3. All non-essential personnel are to evacuate the area.

SUPPLEMENTARY FIRE SYMBOLS

Protective Clothing No. 1
This comprises self-contained breathing apparatus, impermeable head covering, coveralls, gloves and covers footwear also protective footwear and undersgarmets.

Protective Clothing No. 2
This comprises self-contained breathing apparatus, coveralls and protective gloves. Must be worn when fighting fires involving harassing agents.

Protective Clothing No. 3
This comprises self-contained breathing apparatus, flame resistant coveralls and gloves. Must be worn when fighting fires involving white phosphorus and other spontaneously combustible materials.

No Water to be used.
This symbol indicates situations where the application of water is NOT TO BE USED.
SUPPLEMENTARY FIRE SYMBOLS

1. Due to the peculiarity of hazardous substances in certain types of ammunition (Compatibility Groups G, H, J and L), the storage of this ammunition may require supplementary symbols. Those supplementary ‘Chemical Hazard Symbols’ are used to indicate the precautions to be taken against the additional hazards proceeding from the chemical agents of that ammunition.

2. These supplementary fire symbols are described below:

a. **Protective Clothing Set No 1 (PC1) – Figure Wearing Protective Suit (red on blue circular background, see figure 1 below).** This symbol advises the need to wear protective clothing designated as PC1. In general terms PC1 consists of:

   (1) Self contained breathing apparatus;
   (2) Undergarments;
   (3) Coveralls;
   (4) Impermeable suit, hood, boots and gloves; and
   (5) Protective footwear.

   PC1 is to be worn for incidents involving EO that produces nerve and/or blister agent hazards.

b. **Protective Clothing Set No 2 (PC2) – Figure Wearing Protective Suit (yellow on blue circular background).** This symbol advises the need to wear protective clothing designated as PC2. In general terms PC2 consists of the following, as a minimum:

   (1) Self contained breathing apparatus;
   (2) Coveralls, which includes normal uniform with long sleeves, overalls with long sleeves and working dress/protective dress with long sleeves; and
   (3) Protective gloves.

   PC2 is to be worn for incidents that produce harassing agent hazards, eg hazards from tear and vomiting/choking gases and screening smokes.

c. **Protective Clothing Set No 3 (PC3) – Figure Wearing Protective Suit (white on blue circular background).** This symbol advises the need to wear protective clothing designated as PC3. In general terms PC3 consists of the following, as a minimum:

   (1) Self contained breathing apparatus;
   (2) Flame resistant coveralls; and
   (3) Flame resistant gloves.

   PC3 is to be worn for incidents involving EO filled with White Phosphorus (WP) or other spontaneously combustible substances. Hazards are from burning WP or similar substances and toxic fumes.

d. **Use No Water Symbol – Water from a bucket being emptied onto a fire negated by a red circle and diagonal band (on a white background).** This symbol advises that water must not be used as a firefighting medium at that location.
e. **Trefoil (Radiological Hazard) Symbol.** The Trefoil symbol advises that radioactive materials are present in addition to the explosive hazard. The fire must not be approached. Copious quantities of water should be applied preferably from a protected, upwind location. The symbol is to be displayed together with one of the protective clothing symbols.

![Supplementary Fire Symbols](image)

**Figure 1 – Supplementary Fire Symbols**

**NOTE**

Since the types and quantities of stores which require the use of the Trefoils symbol are few, the Trefoil symbol has not been included on the Fire Poster at Annex C. Trefoil placards are available through the normal supply system. There is currently no EO in the Defence inventory that requires the display of the Trefoil symbol.
PROCEDURE 2 - EXPLOSIVE ORDNANCE EMERGENCY ARRANGEMENTS FOR OTHER THAN FIRE

Introduction

2.1 Explosive Ordnance (EO) although designed to be safe for normal handling and use, storage or transport can present a serious potential for casualties and damage to property in various emergency situations. Fire is the more commonly considered emergency however; there are many other emergencies that are more likely to arise when dealing with EO. It is important therefore that there are Emergency Response Plans in place to deal with any such emergencies.

Purpose

2.2 This procedure specifies the requirements that need to be addressed in preparing procedures for emergencies other than fire that is addressed separately in Regulation 4.7 Procedure 1.

General

2.3 There are many emergencies other than fire that could occur during handling and use, storage or transportation of EO. The following emergencies are likely possibilities:

   a. Dropped EO.
   b. Spillage of explosive substances.
   c. EO incidents during maintenance and inspection activities.
   d. EO incidents during loading or transfer operations such as at wharves and buoys.
   e. Improvised Explosive Device incidents.
   f. Bomb threats.
   g. Off Base EO transport incidents.
   h. On Base EO transport incidents.
   i. Hazardous material incidents.
   j. Sabotage
   k. Flood.
   l. Civil Unrest.
   m. Break-in.
   n. Damage to structures due to storms or other catastrophes.

2.4 Since the method for dealing with any one of the above listed emergencies will vary from establishment to establishment, it is essential to anticipate the possibility of such emergencies and that detailed local plans be developed and promulgated. These plans should address as a minimum:

   a. Procedures for:

      (1) Activation of emergency control arrangements as required in Regulation 4.7,
      (2) Control of the emergency, and
(3) Management of casualties;

b. Initial incident reporting requirements;

c. Protective clothing required to deal with the incident;

d. Seeking specialist advise;

e. Dealing with EO or hazardous substance involved;

f. Clean-up of incident site;

g. Follow-up incident reporting;

h. Notification of civilian emergency authorities, eg police; and

i. Media releases through Defence Public Relations.

**Practice Drills/Exercises**

2.5 Practice drills/exercises are to be conducted to simulate emergencies involving EO eg dropped EO, fire in EO workshops or storage areas, transport incidents, injuries to personnel from an explosion or exposure to toxic by-products, etc. In addition to the requirements of the Manual of Fire Protection Engineering 2018 (MFPE), the following guidelines apply to the conduct of practice drills/exercises:

a. All practice drills/exercises and the personnel who attended are to be recorded in the ECR Incident Log Book.

b. Local arrangements must be in place to filter messages resulting from practice drills/exercises to ensure that outside assistance is not involved unnecessarily.
REGULATION 4.8 - STOCK MANAGEMENT

General Overview

8.1 Effective stock control procedures are essential to ensuring adequate levels of safety, security and accounting within Explosive Ordnance (EO) storage facilities. Procedures developed should ensure that personnel operating within the storage facility have an overview of the entire stock management system and their role within it.

Requirements

8.2 Stock management of EO is to be conducted in accordance with this regulation and its associated procedures.

Stock Management

8.3 Items of EO are to be actively managed and able to be accounted for at all times. Units are to hold only the stock that they are entitled to and require for completion of the assigned tasking. Any EO surplus to requirements is to be returned to the nearest EO Depot at the earliest available opportunity.

8.4 EO of the same lot number should be stored together in clearly identifiable stacks as far as practicable. Stack record forms may be used, except in EO Depots where they are optional, and in physically small SQFs.

8.5 IT Logistics Management Systems are to be utilised where available in accordance with the procedures for that system.

Inspection of Explosive Ordnance on Receipt

8.6 All EO that has been received from user units should be given an inspection to ensure that it is the correct type and quantity expected, and is in a satisfactory condition for the assigned task, be that item use or general storage as the case may be. This principle applies to both user units and EO Depots alike.

Responsibilities

8.7 All personnel involved in the management of stocks within an EO facility are to ensure compliance with this regulation and its associated procedure.

Procedures

8.8 Procedure 1 – Stock Management for Explosive Ordnance provides detailed information required to implement the requirements of this regulation.
PROCEDURE 1 - STOCK MANAGEMENT FOR EXPLOSIVE ORDNANCE

Introduction

1.1 Effective stock control procedures are essential to ensure adequate levels of safety, security and accounting within Explosive Ordnance (EO) storage facilities. Procedures developed should ensure personnel operating within the storage facility are provided with a clear overview of the entire stock management system and their role within it.

Purpose

1.2 This procedure prescribes the requirements for the stock management of EO within EO facilities including types of, the use of and applicability of stock management forms.

Ordering, managing and returning EO

1.3 The Electronic Supply Chain Manual (ESCM) Volume 04 Section 08 Chapter 01 details the following requirements associated with the management of EO:

a. Security, in conjunction with the requirements of the Defence Security Manual;
b. Accounting;
c. Ordering;
d. Issue;
e. Receipt;
f. Transfer; and
g. Return.

1.4 Stocktaking. Stocktaking of Defence EO is to be conducted in accordance with Defence Logistics Manual (DEFLOGMAN) Part 2 Volume 5 Chapter 17 – Stocktaking of Defence Assets and Inventory.

1.5 IT logistics management systems. The computer based system known as Computer Support for Armament, normally referred to as COMSARM, is the primary stock management system for the EO inventory in Defence. Some single Service units also manage EO stocks via the Military Integrated Logistic Information System (MILIS). Those establishments with access to COMSARM or MILIS are to maintain stock records in accordance with the procedural instructions for those systems.

1.6 Logistics codes for EO. Logistics codes are used within stock management systems to assist with the organisation of stock. Logistics codes consist of the following two types:

a. Condition code. A Condition Code is applied to EO to describe its physical state or condition, i.e. serviceability status. Further information relating to condition codes can be found in Regulation 2.3 Procedure 4 Annex B.
b. Account code. An Account Code is applied to EO within the COMSARM stock management system and is used by inventory managers to segregate stock into discrete groups to facilitate its management. Further information relating to account codes can be found in the Electronic Supply Chain Manual (ESCM) Volume 13 Section 9 Chapter 10.

1.7 Establishments/units without access to COMSARM or MILIS are to maintain stock records in accordance with authorised single Service stores management instructions. Alternatively implement a
physical card system for the management of stock within the storage area, i.e. stack record forms (see paragraph 1.22) and an EO content board (Regulation 4.4 Procedure 2).

1.8 **Issuing EO from an EO depot to HMA Ship and Submarines.** When issuing EO from an EO depot to a HMA ship or submarine the major stores comprising the outfit are to be made up of a number of Lots so that if a restriction is placed on one Lot the ship will have sufficient EO from other lots to continue with training and operational commitments.

**In-Storehouse Practices**

1.9 EO of the same lot number should be stored together in clearly identifiable stacks as far as practicable. Regulation 2.3 Procedure 7 provides guidance on unit loads, including specific marking requirements. Where multiple lot numbers of the same EO are held, each lot number is to comprise a separate stack, unless this is not possible due to the lack of storage space. Oldest lots should be most accessible, as these are to be issued first.

1.10 EO in any stack or building is to be so arranged that it can be readily identified. The serious consequences of confusion, especially under active service conditions are obvious. To this end EO is to be stored separately according to its Condition Code, identified by a stack card and when required is to be appropriately marked, e.g. Repairable labels are to be displayed on the stock if the stock is awaiting the completion of maintenance or repairs.

1.11 Regulation 4.1 Procedures 8 and 9 contain guidance for the stacking of EO.

**Turnover of Stock**

1.12 EO deteriorates with age, becomes less effective in use, and in some instances, more dangerous to handle and store. The rate of deterioration of certain items of EO is hastened by poor storage conditions or extremes of temperature, and guidance to ensure a reasonable life for such explosives is given in Regulation 4.1 Procedures 3 and 4.

1.13 In addition to deterioration by age, poor storage conditions and extremes of temperature, the holding of old ‘Lots’ and ‘dates’ of EO necessitates additional inspection and surveillance with the consequent gradual diminution of the stocks held.

1.14 In some instances, the combination of maintenance cycle and the complexity and duration to complete the maintenance task, demands that certain items of EO be fitted to parent equipment before the remaining ‘storage’ life of the item falls below an arbitrarily fixed level. If the items are not fitted before this level is reached, the fitment of the items becomes uneconomical or, is considered managerially unsound practice. In such instances, the items will ‘storage’ life expire without being fitted for use.

1.15 Once an item of EO’s life expires, be that service or storage life, the item is to be returned to the nearest EO depot. Should the life expired item be desired for training purposes, such as demolition refresher training, the relevant item manager at the EO Management Agency is to be contacted for approval to draw life expired stores out of the depot.

1.16 To avoid unnecessary wastage from these causes, a regular turnover of stock is essential stockholders at both EO depots and user establishments are to ensure that the oldest stock is issued first.

1.17 Stockholders are to take the opportunity whenever possible to reduce holdings of small Lots. For gun ammunition this may be achieved by issuing mixed Lots to Gunnery Ranges as the operation of Ranges usually is not unduly affected by this practice.

1.18 **Exceptions.** To ensure that EO in overseas establishments and to Forces on Operations has as long a life as possible, and to avoid the necessity of replacing at short intervals, stock which has become unserviceable through deterioration by age, issues to such establishments and Forces are to be made from the newest stock, and should also exclude stock earmarked as ‘firstissue’.
Explosive Ordnance being Received

1.19 All EO that has been received is required to be inspected to ensure that the correct type, quantity and the expected condition has been delivered. This is to be compared to the issue or return voucher accompanying the delivery. Refer to the Electronic Supply Chain Manual (ESCM) Volume 04 Section 08 Chapter 01 should any discrepancy be identified with the delivery.

Returned Explosive Ordnance

1.20 All EO returned from user units, sealed with a Defence transit seal in accordance with Regulation 2.3 Procedure 3, is to be given an inspection to ensure that it is suitable for storage and subsequent reissue. The inspection sample size will depend upon Service/Defence Science and Technology Group (DSTG) standard practices. Regulation 1.5 promulgates guidance on the type of inspection required.

1.21 All EO returned from user units sealed with a Defence logistics seal in accordance with Regulation 2.3 Procedure 3, EO Depot seal or manufacturers factory seal, should be considered to be in the condition sentenced by the authorised inspector, as indicated on the package. For example, if the item of EO has been sentenced as serviceable, the item of EO should be accepted as a serviceable item which can be immediately reissued, with no further remediation required to be conducted on the item, should the Service need arise.

Forms used for stock management

1.22 Explosive ordnance stack record form. The explosive ordnance stack record, Form GI051 may be used for the management of stock held in storage facilities including open sites Further information on Form GI 051 is found at Annex A.

1.23 Suspension card (Form AE 468). When EO suspected of being unreliable or in a condition that is other than serviceable, it must be withdrawn from use. An EO Safety Message (EOSM) (see Regulation 1.5 Procedure 3) will be issued from the EO Management Agency informing the user of the degraded condition. Suspension cards (Form AE 468) is then required to be placed upon any stacks of the affected item. Suspension cards are designed to highlight to the user that the item of EO cannot be issued for any purpose other than as directed by the EO Management Agency. Further information on suspension cards is available in Annex B.

1.24 Restriction card (Form AE 467). When EO which has a known defect or a hazard which may alter the EO’s technical integrity, such as its performance no longer meets the required specification or a safety oriented condition that requires special treatment (prior to the item publication amendment) but is still considered safe for storage, transport and is permitted for limited use, it is to be reclassified from a ‘serviceable’ condition. An EOSM will be issued from the EO Management Agency informing the user of the degraded condition. A restriction card (Form AE 467) is then required to be placed on the stack to highlight to users that a restriction affects the item. Further information on restriction cards is available in Annex C.

Annexes:
A. Explosive Ordnance Stack Record (Form GI-051)
B. Suspension Cards (Form AE 468)
C. Restriction Cards (Form AE 467)
EXPLOSIVE ORDNANCE STACK RECORD (FORM GI-051)

Introduction

1. The Explosive Ordnance Stack Record - Form GI-051 may be used for the management of stock held in storehouses or at open sites as it provides the users means of quickly identifying stack information such as type of store, lot, and quantity.

Purpose

2. This procedure prescribes the requirements for, and the use of, Explosive Ordnance (EO) Stack Records (Form GI-051).

Explosive Ordnance Stack Record (Form GI-051)

3. Stack Records may be used in all storage facilities. See Figure 1A-1 for a sample of an Explosive Ordnance Stack Record.

4. The Stack Record is to be displayed on individual stacks of EO and records the:
   a. building number and stock location;
   b. contents of the stack by condition, stock number, short item name and lot or serial number details;
   c. history of transactions involving items to the stack; and
   d. balance of stock within the stack at any given time.

5. Stack Records are to be raised when a new stack is created. Procedures relating to the stacking of EO are given in Regulation 4.1 Procedure 8.

6. Where a stack unavoidably contains mixed lots, (see Regulation 4.1 Procedure 1, paragraph 1.6) the ‘Lot Details’ box on the form is to be annotated ‘Mixed Lots’ and the ‘Stock Balance’ box is to reflect the total stock quantity for the stack.

7. When items in a stack are controlled by serial number the ‘Lot Details’ box is to be annotated ‘Serial No Controlled’ and the serial numbers entered in the remarks column against each transaction.

8. When EO is stored in the open, Stack Records are also to be raised but they are to be held at the Explosives Area Control or Site Office and filed in stock number order.

9. The NATO Stock Number (NSN) used to order Form GI-051 is 7530-66-138-6407.

---

1 Commercial EO Services Providers may substitute an equivalent internal form.
**Explosive Ordnance Stock Record**

<table>
<thead>
<tr>
<th>Building number</th>
<th>Stock location</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stock number</td>
<td>Lot details</td>
<td></td>
</tr>
<tr>
<td>Short item name</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date of transaction</th>
<th>Transaction serial number (TSN)</th>
<th>Receipts</th>
<th>Issues</th>
<th>Stock balance</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Figure 1A-1 – Sample of Explosive Ordnance Stack Record (Form GI – 051)*
SUSPENSION CARDS (FORM AE 468)

Introduction

1. When Explosive Ordnance (EO) fails to perform to specification or is suspected of being unreliable, or of a degraded condition but is not considered unsafe for storage and transport, it must be withdrawn from use. Indications of a change in the condition of the EO may result from defect reporting action, proof test results, manufacturers’ reports or from advice from other Australian and overseas Defence users. Suspension cards are designed to highlight to the user that the item of EO cannot be issued for any purpose other than as directed by the Explosive Materiel Branch (EMB).

Purpose

2. This procedure prescribes Suspension Card procedure for EO found to be of suspect performance or degraded condition but is not considered unsafe for storage or transport.

General

3. Suspension Carding is a procedure for clearly marking EO whose condition or reliability is suspect, confirmed as other than serviceable but is not unsafe for storage and transport.

4. The Suspension Card is a visual indicator that clearly identifies the EO from other items so as to prevent the issue or use of such EO, pending the completion of investigations or other required action. Such EO is to be segregated or isolated from other stock. At all times Suspension Cards override all other condition status indicators on packages. Suspension Cards are divided into the following two types:

   a. **Suspension Card - General.** Has Service/Defence wide application and is used when specific lots of EO are suspected of being other than serviceable or unsafe. Notification of a Suspension - General will be via an Explosive Ordnance Safety Message-Suspension (EOSM-S). See Regulation 1.5 Procedure 3 for further information regarding types of EOSMs.

   b. **Suspension Card - Local.** Is applied to individual items or small quantities of a complete lot by the stockholder or user, when it is suspected that the stock is unfit for issue or use. It is to be applied in conjunction with defect reporting action in accordance with Regulation 1.3 Procedure 1. Additionally the local suspension could be initiated as a means of tracking a modification programme or other than routine maintenance that is in progress.

**NOTE**

Form AE 468 is used for both General and Local Suspensions. The user is to strikethrough the incorrect application at the top of the form thus indicating to other personnel what type of suspension action the affected stock is under.

Registers for Suspension Carded Explosive Ordnance.

5. The EMB is to hold a master register for EOSM-S which is accessed on the EOSM Webpage. A register for Suspension Card - Local is to be held at the unit.

Suspension Card Procedures

6. When EO is suspended, EO Depots, JLU REOS and Units will be informed by an EOSM-S. The stockholder, custodian or user of the EO is responsible for the completion of Form AE 468.

7. The NATO Stock Number (NSN) used to order Form AE 468 is 7530-66-161-7051. An example of Form AE 468 is located below at Figure 1B-1.
8. The completed Form AE 468 is to be placed on suspended stock. The identification particulars of the stock concerned are to be recorded on the form, along with whether it is a General or Local restriction (strike out the incorrect application), the reason for the restriction (in the remarks column) and authority for suspending i.e. EOSM-S Serial Number if applicable.

9. Suspension Cards are to be placed on the stocks immediately when the EOSM-S is received or when Local Red Card action is found necessary. The cards are to remain in position until the suspension is removed or the stores in question are disposed of. Similar action is to be taken in respect of suspended items packed with the parent store. The parent store is also to be suspended until the suspension is lifted or the affected items replaced. Demands for essential replacement stores are to be made in accordance with Electronic Supply Chain Manual (ESCM) Volume 4 Section 08 Chapter 1 Annex B.

Specific Suspension – General Procedures

10. On receipt of an EOSM-S, EO Depots, REOS Personnel and Units are to complete the following actions, as appropriate:

   a. Immediately segregate or isolate the stock concerned, if necessary.

   b. Complete Form AE 468 and place the form on the stock affected. The remarks section of Form AE 468 may be completed by attaching a typed copy of the remarks i.e. Computer Support for Armaments (COMSARM) screen CM03 printout.

   c. Comply immediately with instructions the suspending authority has issued.

   d. Adjust stock records and take the required stores accounting action in accordance with ESCM Volume 4 Section 08 Chapter 1 Annex I;

   e. Demand replacement stores in accordance with ESCM Volume 4 Section 8 Chapter 1 Annex B.

   f. Deal with stores in transit when the EOSM-S is received.

Method for Removing Suspension – General

11. The restrictions imposed by Suspension – General are to be cancelled under the following conditions only:

   a. The issue of a signal that cancels the previous EOSM-S – General action

      or

   b. Disposal action has been taken on the stocks concerned.

Emergency Use of Suspension – General Explosive Ordnance

12. EO which is the subject of a Suspension – General is not normally to be used since the nature of defect has not been determined. Where operational necessity warrants the use of such EO, its use is to be authorised by CJLOG. This dispensation is to be arranged by EMB. When approval is granted the EMB is to be advised by priority message. This message is to state the conditions governing the use of the items. The authority and conditions of use are to be issued as an annotation to the relevant EOSM-S.

Duration of Suspension – General Actions

13. Suspensions are not normally to remain in force for more than 6 months. The EMB is responsible for ensuring that the preparation of any repair, maintenance or other instructions for upgrading suspended stock which can be recovered is expedited. A review of EOSM-S are to be undertaken by the EMB every 6 months and revised recommendations are to be promulgated.
14. The EMB is to establish procedures for controlling the timely upgrade of suspended stocks capable of recovery.

**Specific Suspension – Local Procedures**

15. Suspension - Local procedures are to be used when:

   a. The user is doubtful whether the EO is fit for issue or use, pending the completion of local investigations by EO Depots and/or REOS personnel.

   b. At user establishments, following reports of defective performance and pending receipt instructions from the EMB.

   c. EO awaiting receipt inspection.

   d. EO held in quarantine account as a result of a defect report or not covered by sub-paragraph c.

   e. On EO recovered from an accident.

   f. On EO which was involved in trials.

   g. On experimental EO: the Form AE 468 is to be endorsed ‘Only to be issued or used on the authority of …………….. (Appointment concerned)’.

   h. EO which has not been correctly sealed.

16. **Action by Users.** When the user is doubtful whether EO is fit for issue or following defective performance, the EMB is to be notified by Explosive Incident Report Form EO 016 in accordance with Regulation 1.3 Procedure 1.

17. Where the EMB considers that the Suspension – Local action is applicable to a wider area, action may be extended to other establishments. Suspension – General procedures are to be issued. Suspension – Local are to be cancelled by the stockholder when the need for raising them has passed or as instructed by an EOSM-S.

18. EO, recovered after an accident or returned from a trial, may be submitted for special inspection conducted by an authorised EO Inspector unless it is obviously beyond repair, or in a dangerous state. In this case immediate disposal is to be requested.

19. In the circumstances described in paragraph 15 g, it is unnecessary to notify the EMB.

20. **Action by EMB.** The EMB is to investigate reports of defective items that are received and when necessary, suspend the affected item. EO Depots, REOS personnel and Units are to be informed of the suspension by EOSM-S. Alternatively, when the EMB investigation does not confirm the reason for the local suspension, the local action is to be cancelled. In this case the EMB is to provide direction to the originator.

**Issue of Suspension – Local EO**

21. In the following circumstances, the EMB may authorise the continued use of EO which is under Suspension – Local action when:

   a. The reported defect is known and there is no danger in using the EO, and the performance is acceptable for the purpose required

   or

   b. The EO is safe for use and replacement stocks are not available.
Reporting and Investigating of Outstanding Suspended Explosive Ordnance

22. EO Depots and Users are to report details of suspended EO (including Suspension – Local actions) which have been under Suspension action for a period exceeding 6 months, to the EMB at the end of February and October each year. This report is to include the reasons for the stock remaining under Suspension action and not having been upgraded or disposed of, as appropriate.

23. The EMB is to investigate the reasons for outstanding suspended stocks and, when appropriate, is to hasten or implement action for removal of the suspension.
INSTRUCTIONS FOR USE


2. At all times, suspensions over-ride all other condition status indicators on packages.

3. Reasons for stock being suspended are detailed in the related Explosive Ordnance Safety Message (EOSM).

4. The Suspension card is to be fixed to all stocks of the identified explosive article.

5. Users are to strike out either General or Local depending on the origin of the suspension.

6. The suspension may only be removed or cancelled under the following conditions:
   a. Removal of the restriction by a cancelling EOSM issue from the EO Management Agency.
   b. When stocks have been sentenced ‘Fully serviceable’ by an Inspector of Explosives.
   c. When stocks have been disposed of.

Figure 1B-1 – Form AE 468 Suspension Card – Front and Back Views
RESTRICTION CARDS (FORM AE 467)

Introduction

1. When Explosive Ordnance (EO) which has a known defect or hazard which may alter the EOs technical integrity, such as its performance no longer meets the required specification or may have a safety oriented condition that requires special treatment (prior to the item publication amendment) but is still considered safe for storage, transport and is permitted for limited use, it is to be reclassified from a ‘serviceable’ condition. A Restriction Card is then required to be placed on the stack to highlight to users that a restriction affects the stock.

Purpose

2. This procedure prescribes Restriction Card procedure for EO which has a known defect or has a safety oriented condition but is still considered safe for storage, transport and is permitted for limited use.

General

3. EO which has a known defect or has a safety oriented condition that requires special treatment (prior to the item publication amendment) and which has restricted use may, in certain circumstances, continue to be issued to the Service for use in restricted capacity. These restrictions will apply to either:
   a. Total stocks of an explosive store
   or
   b. Certain lot or batch numbers of an explosive store.

Restriction Card Procedures

4. When an item of EO is restricted in its use, EO Depots, Regional Explosive Ordnance Services (REOS) personnel and Units will be informed via an EOSM-Restriction issued by the Explosive Materiel Branch (EMB) within the Capability, Acquisition and Sustainment Group (CAGS). The EOSM-Restriction will detail the item of EO, type of restriction and instructions to be implemented.

5. See Regulation 1.5 Procedure 3 for additional detail on EOSMs.

6. The NSN used to order the Restriction Card (Form AE 467) is 7530-66-161-7050. An example of Form AE 467 is located below at Figure 1C-1. The Restriction card is used as a visual indicator that the stock has a restriction applied to it. The EO Depots or Users of the EO are responsible for the completion and placement of the Restriction Cards.

7. The completed Form AE 467 is to be placed on the restricted stock pending its re-referencing or use.

Action by EO Depots, REOS and Units.

8. On receipt of an EOSM-Restriction, EO Depots, REOS and Units are to complete the following actions, as appropriate:
   a. Complete Form AE 467 and place the form on the stock affected. The remarks section of Form AE 467 may be completed by attaching a typed copy of the remarks i.e. Computer Support for Armaments (COMSARM) screen CM03 printout.
   b. Comply immediately with instructions the restricting authority has issued.
ANNEX C

c. Adjust stock records and take the required stores accounting action in accordance with Electronic Supply Chain Manual (ESCM) Volume 4 Section 08 Chapter 1 Annex I.
d. Demand replacement stores in accordance with ESCM Volume 4 Section 8 Chapter 1 Annex B.
e. Deal with stores in transit when the EOSM-Restriction is received.

9. When affected stores are available for issue from an EO Depot, users are to be asked if such stores are acceptable and if so, such stores are to be issued in preference to other stock. Issue vouchers are to be suitably annotated that the store has restrictions that are to be adhered to.

Duration of Restriction Actions

10. EOSM applying a restriction to an item of EO will only be cancelled by the issue of a cancelling signal when the restriction is no longer applicable. Alternatively, the restriction no longer applies when the stores service life expires or they are consumed.
INSTRUCTIONS FOR USE

1. Procedure for Restriction card action is promulgated in the eDEOP 101, Regulation 4.8, Procedure 1, Annex D.

2. Stock identified under a Restriction has a known defect but is safe to use in a limited role. See the associated Explosive Ordnance Safety Message (EOSM) issued by the EO Management Agency for further guidance on the restriction.

3. The Restriction cards are to be fixed to all stocks of the identified explosive article.

4. The restrictions may only be removed or cancelled under the following conditions:
   a. Removal of the restrictions by a higher authority.
   b. When the explosive articles service life expires.
   c. When stocks have been consumed.

5. The Restriction card is to be completed with as much information as possible. Any fields that are not applicable to this particular restriction, such as 'New expiry date' (for the item of EO), are to annotate N/A.

Figure 1C-1 – Form AE 467 Restriction Card – Front and Back Views