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Australian Army

Land Warfare Procedures - General

LWP-G 7-3-0

Australian Defence Force Range Orders (General)

2023

This publication supersedes *Land Warfare Procedures - General 7-3-0, Australian Defence Force Range Orders (General)*, 2022.

SAFETY PUBLICATION

This is a safety publication. These orders and procedures deal with actions designed to preserve human life. They are mandatory, require strict adherence and deviation is not permitted. Orders are clearly phrased as orders (for example, 'must' 'is to' or 'are to'). Failure to comply with orders by ADF members, or lawful and reasonable directions by APS employees may result in administrative or disciplinary action, or APS Code of Conduct action respectively. Defence employees generally remain at all time subject to Work Health and Safety legislation and other safety legislation (except at certain times on warlike operations overseas), breaches of which may result in personal liability or civilian charges.

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Australian Army

Land Warfare Procedures - General

LWP-G 7-3-0

Australian Defence Force Range Orders (General)

2023

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glenn.ryan
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Digitally signed by
glenn.ryan1
Date: 2022.12.14
16:28:19 + 11'00'

GJ Ryan, CSC and Bar
Brigadier
Director General Training and Doctrine

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Preface

1. Australian Land Warfare Doctrine and Land Warfare Procedures publications are authorised land doctrine for the guidance of Australian Defence Force operations. Land Warfare Doctrine publications are authored at the philosophical and application level while Land Warfare Procedures publications are authored at the procedural level.
2. The content of this publication has been drawn from general lessons, principles and doctrine contained in other relevant publications, instructions and agreements. Every opportunity should be taken by users of this publication to examine its contents, applicability and currency. If deficiencies or errors are found, amendment action should be taken. Land Doctrine invites any assistance to improve this publication.
3. This publication is the lead publication for range safety. Information is consolidated into this publication from both *Land Warfare Procedures - General 7-3-1, Australian Defence Force Range Orders (Dismounted)* and *Land Warfare Procedures - General 7-3-2, Australian Defence Force Range Orders (Mounted)* that is fundamental to land range safety.
4. All live firing, both on operations and in training, has the potential to cause accidental casualties. All personnel must contribute to the prevention of these casualties by practising responsible individual behaviour under the supervision of competent officers and non-commissioned officers. The doctrine provided in this publication is designed to prevent accidental casualties, but to achieve this it must be thoroughly understood and properly applied.

Aim

5. This publication is a 'general order' pursuant to Section 3 of the *Defence Force Discipline Act 1982*. All Defence personnel must comply with the mandatory requirements outlined in this publication; failure to do so may result in disciplinary and/or administrative action being taken.
6. The aim of this publication is to provide all users of Australian Defence Force land ranges with the range orders and directions required for the safe and effective conduct of all range practices and training using live ammunition, in order to prepare personnel to operate weapon systems in a combat team that includes land or joint elements.

Precedence

7. Training area standing orders reflect safety requirements for specific ranges at specific locations. Training area standing orders are not to reduce the safety requirements contained in this publication in any manner, but may include requirements to enhance the safety regulations contained herein to suit local ranges and conditions
8. When an amendment to this publication affects other weapon and range safety publications, those publications are to be amended to conform to this publication.
9. For the conduct of combined arms range practices, the orders contained in this publication are to be applied in conjunction with the relevant publications.
10. When Army is the lead planning agency for range practices involving other Services, the orders contained in this publication are to be applied in conjunction with the relevant corps/Service-specific orders and instructions.

Level

11. This publication has primacy for Australian Defence Force range orders in the Land Warfare Procedures - General 7-3 range safety series of the Land Warfare Doctrine and Land Warfare Procedures hierarchy. It supports and expands the *Defence Safety Manual* and supports the training of operators in the use of weapon systems, laser devices, explosives and pyrotechnics.
12. This publication provides procedural-level doctrine. It applies to all users of Defence ranges, whether approving, controlling or supervising a range practice or participating in it, and applies to third-party users as well as Defence personnel.

Scope

13. This publication informs the planning of and conduct of range activities. It also includes information for specific Defence activities.

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14. The personal protective equipment mandated in this publication is the minimum required to safely conduct range activities. Commanders may stipulate additional personal protective equipment in accordance with their training requirements and their risk assessment.

15. The Land Warfare Procedures - General 7-3 series detail the safety regulations for the conduct of range practices during training both in Australia and when deployed overseas in training or on operations. A major general or equivalent may issue specific orders for the relaxation of the regulations contained in this publication for:

- a. the Ready battlegroup (or single-Service equivalent) as part of the force generation cycle (or single-Service equivalent)
- b. a deploying force or unit, or personnel warned out for operations.

16. A training centre commandant, colonel or equivalent, may authorise the activities and regulations where a formation commander is specified.

17. **Royal Australian Artillery caveat.** Artillery safety supervisors are not required to be qualified on the current in-service Howitzer/gun; however, they must have successfully completed the artillery safety course. The artillery safety supervisors must be thoroughly familiar with their actions when conducting safety supervisor checks on the current in-service Howitzer/gun to ensure that it fires in a safe manner (see *Land Warfare Procedures - General 7-3-3, Australian Defence Range Orders [Indirect Fire]*).

18. The conduct of range siting boards and range safety boards is detailed in the *Defence Training Area Management Manual*.

Authority to approve certain regulations

19. Designs and specifications for the construction of the different types of land small arms ranges can be found on the Defence Estate Quality Management System website¹.

Safety publication

20. This is a safety publication. These orders and procedures deal with actions designed to preserve human life. They are mandatory, require strict adherence and deviation is not permitted. Orders are clearly phrased as orders (for example, 'must' 'is to' or 'are to'). Failure to comply with orders by Australian Defence Force members, or lawful and reasonable directions by Australian Public Service employees may result in administrative or disciplinary action, or Australian Public Service Code of Conduct action respectively. Defence employees generally remain at all time subject to Work Health and Safety legislation and other safety legislation (except at certain times on warlike operations overseas), breaches of which may result in personal liability or civilian charges.

Land Range Safety Branch website

21. Personnel appointed to key range positions are to consult the Australian Defence Force Land Range Safety Branch website prior to the conduct of any range activity and adhere to current safety requirements. Failure to comply to this directive may result in injury or death, and/or result in administrative or disciplinary action. In addition, users are to ensure that printed copies of this publication are maintained with the latest amendments. Amendments are promulgated on Doctrine Online and safety matters are notified by signal. Amendments for safety, weapon and range publications are available on the Australian Defence Force Land Range Safety Branch website (<http://drnet/Army/LRS/LRS/Pages/adf-land-range-safety.aspx>).

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1. <http://intranet.defence.gov.au/estatemangement/>

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Amendment record

Amendments to this Land Publication are issued on the authority of the Chief of Army pursuant to Army Standing Instruction (Knowledge Management) Part 2 – *Management and Governance of Land Publications*.

1. Proposals for amendments or additions to the text of this publication should be via Land Publications Online intranet website, select the 'Feedback' icon.
2. It is certified that the amendments promulgated in the undermentioned amendment lists have been made in this publication.

Amendment list		Authorised by
Number	Date of amendment	
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Summary of changes

1. Land Publication content is subject to periodic review. Changes have been made to this publication and a familiarisation with all of the content is highly recommended.
2. Significant changes from the most recent rewrite are listed in the following table.
3. Previously saved copies of this publication are to be destroyed.

Summary of significant changes
This range publication is reviewed and updated annually, resulting in changes throughout the entire publication that require the reader's familiarisation with all current content.

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Chapter 1

Overview

Section 1-1. Introduction

1.1 Defence training areas and Live Fire ranges provide facilities to effectively train personnel for the conduct of operations.

1.2 The aim of this publication is to provide all users of ADF land ranges with the range orders required for the safe and effective conduct of range practices undertaken in order to prepare personnel to operate weapon systems on operations. Range users include ADF personnel, APS employees, contractors, state and federal police forces, customs personnel, correctional services personnel, ADF cadets, visiting forces and authorised civilian shooting clubs.

Section 1-2. Land Range Safety doctrine

Structure

1.3 The orders contained in the range safety series of publications govern the conduct of range practices with all land weapon systems. Range safety doctrine comprises the following publications:

- a. *Land Warfare Procedures - General 7-3-0, Australian Defence Force Range Orders (General)*. The orders contained in this publication govern the conduct of ADF range practices. This publication comprises the following:
 - (1) *General information*. This part provides the overarching direction for ADF range safety requirements, including a description of training areas and Live Fire ranges and the control of ranges.
 - (2) *Planning*. This part provides planning information and procedures for the conduct of range practices; including planning, general range safety instructions, health support to range activities, ammunition safety and laser safety precautions.
 - (3) *Templates and traces*. This part provides information for the development of range danger area safety traces (RDASTs) for weapons and laser devices.
 - (4) *Conduct*. This part contains the procedures for the conduct of range practices and incident management.
 - (5) *General activities*. This part contains information for general activities; including joint and complex activities, the firing of non-Defence service weapons, test and evaluation, range practices at sea, and integrated range regulations.
- b. *Land Warfare Procedures - General 7-3-1, Australian Defence Force Range Orders (Dismounted)*. This publication details the specific safety requirements for the conduct of dismounted range practices.
- c. *Land Warfare Procedures - General 7-3-2, Australian Defence Force Range Orders (Mounted)*. This publication details the specific safety requirements for the conduct of mounted range practices involving armoured fighting vehicles (AFVs) and non-AFVs.
- d. *Land Warfare Procedures - General 7-3-3, Australian Defence Force Range Orders (Indirect Fire)*. This publication details the specific safety requirements for the conduct of indirect fire range practices.
- e. *Land Warfare Procedures - General 7-3-4, Air and Missile Defence Range Orders*. This publication details the specific safety requirements for the conduct of ground-based air defence range practices.
- f. *Land Warfare Procedures - General 7-3-5, Demolitions and Mines: Range Practices and Non-operational Tasks*. This publication details the specific safety requirements for the conduct of demolitions and mine range practices.
- g. *Land Warfare Procedures - General 7-3-7, Army Defence Force Range Orders (Army Aviation)*. This publication details the specific safety requirements for the conduct of Army Aviation range practices.

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- h. *Land Warfare Procedures - Combat Service Support 4-1-7, Logistic Ammunition Disposal*. This publication details the specific safety requirements for the conduct of authorised explosive ordnance (EO) tasks in support of operations and training.
- i. *Land Warfare Procedures - General 7-3-9, Disposal of Malfunctioned Explosive Ordnance*. This publication details the specific safety requirements for the conduct of disposal of malfunctioned explosive ordnance (DMEO) range practices.

Range safety doctrine hierarchy

1.4 The hierarchy of range safety doctrine is illustrated in [Figure 1–1](#). The purpose of this hierarchy is to identify the breadth and precedence of doctrine that must be understood and applied at the respective levels of planning and conduct of range practices.

1.5 The development of specialist range safety doctrine is the responsibility of the relevant sponsors. Should there be a contradiction between this publication and any other document, direction is to be sought from COMDT CATC through the *ADF LRS Branch*.

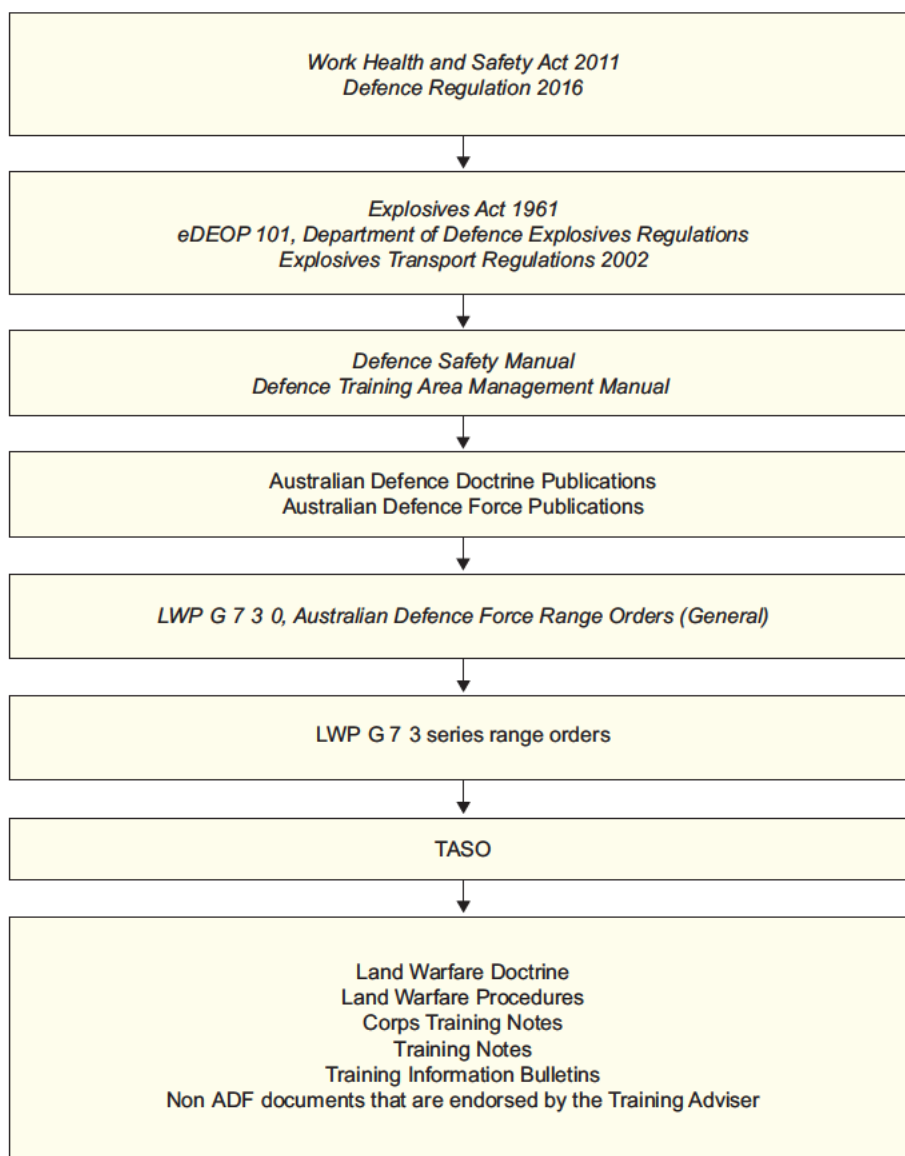


Figure 1–1: Hierarchy of range safety doctrine

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Chapter 2

Training areas and Live Fire ranges

Section 2-1. Introduction

2.1 The *Defence Training Area Management Manual* defines training areas and ranges as follows:

- a. *Training area*. This refers to any area of land, sea or air that may be designated for any military manoeuvres or simulated wartime operations involving planning, preparation and execution, carried out for the purpose of training and evaluation. It may be a combined, joint or single-Service exercise or activity depending upon the participating organisations. This also includes exercise areas and Live Fire ranges.
- b. *Range*. This refers to all air, land and/or sea areas used for Defence live firing weapons practices, tests or operations.

2.2 This chapter describes the use of Defence (Land) Live Fire ranges/facilities, including:

- a. the types of Defence (Land) live fire facilities
- b. the categories of Defence (Land) live fire facilities
- c. ADF use of non-ADF live fire facilities
- d. the use of Defence live fire facilities by non-Defence personnel
- e. use by non-ADF users, including ADF cadets.

Section 2-2. Types of ranges

2.3 There are two types of land ranges: Permanent and Manoeuvre. Within these two types are different classifications and complexity levels and each range is designed to achieve a different training outcome. The land range hierarchy detailing the complexity and Army training level (ATL) outcomes, as well as appointment requirements is detailed in [Figure 2–1](#).

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Permanent ranges

2.4 Permanent ranges are established through range siting and safety boards; they have permanent RDASTs applied. These types of ranges are subject to a scheduled technical and non-technical inspection regimen and normally have airspace restrictions. They have designated firing points (FPs), specified targets and impact areas, and are operated under a Certificate of Range Safety Compliance and approved range training area standing orders (TASO).

2.5 Where a Permanent range certification no longer meets all user requirements for a range (eg, current arcs of fire/FPs are too restrictive or there is a requirement to overlay a field firing trace over the facility to allow enhanced training), the user unit is to approach the range control officer (RCO) for local resolution. In the event that local resolution is not possible, the user unit is to prepare and submit a user requirement with RDAST (if required) through their chain of command to the Director Operations Training Area Management.

2.6 There are two sub-types of Permanent range:

- a. *Permanent Basic range*. These are ranges that are applicable to all corps. The qualifications for this range are gained through the all corps training continuum.
- b. *Permanent Complex range*. These are specialist ranges which involve the use of specialist weapons and/or platforms. Qualifications for the individual ranges are delivered through specialist courses.

2.7 ATL 1 and ATL 2 are generally conducted on Permanent Basic ranges, with ATL 2 and ATL 3 activities generally conducted on Permanent Complex ranges. Some ATL 4 activities may be conducted on Permanent Complex ranges.

2.8 The following ranges are examples of Permanent Basic ranges:

- a. Indoor Test ranges
- b. 25 m Barracks ranges
- c. Open ranges
- d. Classification ranges
- e. Electronic Open ranges, including:
 - (1) Marksmanship Training ranges (MTRs)
 - (2) Group and Zero ranges
 - (3) Static Mechanical ranges
- f. Combat Shooting ranges:
 - (1) Combat Individual Snap ranges
 - (2) Combat Gallery ranges
 - (3) Steel Target Transition ranges (in development).

2.9 The following ranges are defined as Permanent Complex ranges:

- a. Sneaker ranges
- b. Section Defence ranges
- c. Vehicle ranges (formerly Type A and Type B Static Armour ranges)
- d. Grenade ranges:
 - (1) Standard Grenade ranges (SGRs)
 - (2) Assault Grenade ranges (AGRs)
- e. High Explosive ranges:
 - (1) Direct Fire Support Weapon (DFSW) ranges
 - (2) M18A1 Claymore ranges
 - (3) Demolition ranges

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- f. Complex Combat ranges:
- (1) Battle Inoculation or Section Attack ranges
 - (2) Urban Assault or Building Clearance ranges.

Manoeuvre ranges

WARNING

Any practice conducted on a Manoeuvre range (eg, conducting a sneaker practice on a Manoeuvre range) must comply with the requirements of *LWP-G 7-3-1, Australian Defence Force Range Orders (Dismounted)* [Chapter 6], for example manoeuvre qualified safety staff, range instruction, risk assessment (RA), CO's checklist, and so on. Failure to comply with this directive may lead to administrative or disciplinary action.

2.10 Manoeuvre range activities are user-designed live fire training serials conducted within designated sectors within Defence training areas for the purpose of operational tactical mounted and/or dismounted training. These ranges may also be constructed on non-Defence owned land, as specified in the *Defence Training Area Management Manual*. To plan, to conduct and to supervise a manoeuvre activity, all range-conducting staff are to have a manoeuvre qualification. The unit must prepare range details, a range instruction, an RA, and an RDAST approved by the unit commanding officer/independent sub-unit officer commanding (UCO/IOC) and the relevant range authority. Specialist or platform-specific ranges such as Artillery including mortars) or Army Aviation are covered separately in their relevant publication.

Other ranges

2.11 **Weapon training simulation system.** A WTSS is an indoor small arms training facility that is used for marksmanship and tactical training.

2.12 **Special Forces training facilities.** SF conduct highly specialised missions that require the development of unique TTPs. SF ranges are designed and constructed to facilitate SF-specific training to meet their unique requirements. The procedures for these ranges are detailed in *LWP-G 7-3-1, Australian Defence Force Range Orders (Dismounted)* [Chapter 7] (restricted use).

2.13 **Defence test and evaluation facilities.** Defence test and evaluation facilities are operated by Defence test agencies or contractors for the performance and function testing of weapons and EO, often under unusual circumstances. They are purpose-designed for the performance of designated testing or experiments under scientifically repeatable conditions.

2.14 **Manoeuvre activities on Permanent ranges.** Manoeuvre activities can be conducted on Permanent ranges. If the manoeuvre activity has not been included in the range siting board, the activity is designated as a user-designed range and the rules for Manoeuvre ranges apply. This also includes the use of weapons not approved for that type of range. The alternate use of a range must be safe and not damage or degrade the infrastructure and must be approved by the RCO.

2.15 **Army Aviation ranges.** AAvm ranges are live fire practices conducted by AAvm aircraft. *LWP-G 7-3-7, Australian Defence Force Range Orders (Army Aviation)* details the planning, risk management, range safety positions, responsibilities, qualifications and currency requirements for AAvm ranges.

Defence practice areas

2.16 Defence practice areas are training areas declared by the Minister for Defence and gazetted under the provisions of the *Defence Regulation 2016* [Part 11]. Procedures for the declaration of Defence practice areas on Commonwealth-owned/leased or non-Commonwealth training areas are described in the *Defence Training Area Management Manual*. Unless authorised by the DCA, only small arms¹ and subcalibre training devices may be used on non-Commonwealth owned Defence practice areas.

Close training areas

2.17 Most close training areas (CTAs) are areas identified for low-level personnel training (dry and live), normally contained within a Defence-owned training area or base. Training in a CTA is to be conducted in accordance with this publication and local TASO (where they exist). Where a CTA, depot or unit open area (eg, a sports oval) that has no TASO is used for training, including the use of live munitions (ie, usually blank, NLTA, pyrotechnics or battle noise simulation [BNS]) the regulations contained in this publication apply. Any

1. Small arms includes all calibres (including vehicle based weapons) up to 12.7 mm.

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unexploded explosive ordnance (UXO) is to be marked/destroyed in accordance with this publication, and local TASO (if published). Where training with weapon systems is approved in and around a base or military controlled area, which is not identified as a CTA, the CTA regulations in this publication apply. See [paragraph 5.51](#) and [Annex B to Chapter 11](#) for additional information.

Maritime training areas

2.18 Maritime practices may be conducted in designated exercise areas, the high seas or in and around coastal environments in the littoral environment. Gazetted practice areas are shown in the *Seafarers Handbook for Australian Waters* [Section 11.10]². Additional requirements are contained within [Chapter 16](#) and [Chapter 17](#).

Section 2-3. Non-Defence ranges and training areas

2.19 This section provides a brief overview of the use of non-ADF ranges and training areas.

2.20 Civilian ranges. ADF units may use civilian ranges when the following criteria are met:

- a. The range in question has been approved for use by a range safety board and has a current Certificate of Range Safety Compliance issued.
- b. TASO have been written and approved for use by the range safety board.
- c. All terms, conditions and approvals contained within the *Defence Training Area Management Manual* have been satisfied.

2.21 Non-Australian Defence Force ranges. Range practices on non-ADF ranges are to be conducted in accordance with the orders detailed in this publication and in the local TASO.

2.22 Non-Defence land. The *Defence Training Area Management Manual* details Defence policy relating to the use of non-Defence land.

2.23 Operational Theatre ranges. Where the operational situation permits, an Operational Theatre range (OTR) may be established. An OTR enables deployed personnel to test and zero weapons and conduct range practices while on operations. OTRs are constructed to the standard required for a field-expedient range (further details are available from the Defence Infrastructure Division website³). For a range to be categorised as a Permanent range, a range safety board is to be conducted in accordance with the *Defence Training Area Management Manual* and endorsed by the theatre commander as the confirming authority. The design of OTRs may be modified to meet specific requirements; however, the safety of personnel and the general public is not to be compromised. Live fire practices on an OTR are to be conducted in accordance with the provisions of this publication and TASO are to be issued. The following ranges are examples of OTRs:

- a. A field-expedient AGR may consist of two throwing bays with the control tower replaced by a bunker and waiting bays constructed of sandbags. The design criteria for the throwing bays, bunker and waiting bays is still to provide the required blast- and splinter-proof cover detailed in this publication.
- b. A field-expedient open range may consist of three firing lanes without a bullet catcher, a target trench, flagpoles and so on. There is to be no reduction in the application of the RDAST.
- c. SF ranges may be established for mission-specific requirements.

Section 2-4. Australian Defence Force personnel conducting overseas range training

2.24 When ADF personnel use foreign range facilities (other than OTRs), as either individual deployments or part of a unit deployment, the regulations for each type of range are as follows:

- a. *Australian Defence Force personnel posted to foreign nations (individual posting or deployment).* Where Australian Defence personnel are formally posted or deployed to an armed force of a foreign nation, the procedures of the host nation are to be employed. If there is doubt regarding the

2. Australian Hydrographic Service 2016, *Seafarers Handbook for Australian Waters*, 4th edn, Wollongong, NSW.

3. <http://www.defence.gov.au/id/>

procedures, the authority under which the attachment is made is to be consulted. Training in the foreign nation's weapons systems and range qualifications is to occur as required.

- b. *Australian personnel training in foreign training areas (unit deployment).* Where units/sub-units deploy and conduct training in foreign training areas, they are to adhere to host nation regulations. Where the host nation's safety regulations are different from those set out in this publication, the more stringent of the two is to apply. Where these regulations cannot be met, a waiver is to be sought from COMDT CATC. Requests are to be accompanied by a report detailing the shortcomings of the range/facility to be used and a detailed military risk management (MRM) completed.
- c. *Use of foreign weapons and ammunition.* Australian personnel may fire and/or employ host nation weapons and/or ammunition. Where the host nation's weapons and/or ammunition(s) are similar to Australian weapons and/or ammunition, the Australian qualification(s) apply after the relevant familiarisation training has been conducted. Where the host nation's ammunition differs to the Australian equivalent and is to be fired through an Australian weapon system, approval to do so is to be sought from COMDT CATC.

2.25 Australian Defence Force personnel on deployments as training staff. Where ADF personnel are deployed and required to supervise/advise foreign forces (under an operational or training mandate), it will generally not be possible for safety staff to be qualified on all weapons being fired. At a minimum, and prior to any Australian personnel acting as an officer-in-charge (OIC) Practice or safety supervisor (SS) for weapon systems for which they are not qualified, the following training is to be completed:

- a. A period of formal instruction on the weapon(s) is to be conducted, with emphasis placed on safety features, degrees of weapon readiness (DOWR) and immediate action.
- b. The weapon handling test (WHT) (or equivalent) is to be passed. Where no WHT or equivalent exists, the senior instructor is to develop one applying the Australian equivalent weapon system as the template.
- c. The Australian forces should then live fire the weapon where approval is granted by an Australian unit commander MAJ (E) or higher.
- d. A unit routine order (RO) (or single-Service equivalent) is to be raised, and a copy is to be placed in each member's competency logbook (or single-Service equivalent).
- e. A briefing on the foreign force's methods of operation, including infantry minor tactics or vehicle movement, is to be conducted as applicable.
- f. All other regulations and procedures are in accordance with this publication, with special emphasis placed on briefings, walk-throughs and progression of training (dry, blank and live for field firing).

Section 2-5. Application of the 7-3 series range publications on operational deployment

2.26 The LWP-G 7-3 series range of publications apply to all range practices while deployed unless a MAJ GEN (E) or higher has issued specific orders for the relaxation of the regulations as detailed in [paragraph 15.](#) of the preface. Where a local regulation/rule is equal to and/or more stringent than the regulations contained in the relevant LWP-G 7-3 series range publication, the more stringent regulation is to be applied. It is understood that some regulations in the LWP-G 7-3 series may not be applicable in theatre (eg, ammunition receipt, flags and Range Control procedures to clear ranges). Where there are differences and/or where a regulation cannot be complied with due to the operational situation, the local commander with the minimum rank of LTCOL (E) may modify these regulations for local use. However, safety regulations pertaining to revision, progression of training WHTs, SS ratios, qualifications, safety angles and templates cannot be waived. Where there is doubt with regard to the applicability of a regulation contained in the LWP-G 7-3 series, the unit is to contact HQ CATC LRS for a determination.

Section 2-6. Non-Australian Defence Force range users

2.27 The Director Operations Training Area Management is responsible for authorising and controlling all non-Defence use and access to managed ranges and training areas managed by the E&IG. The regulations concerning access to non-E&IG managed ranges and training areas are contained within the *Defence*

Training Area Management Manual, which is the primary reference regarding non-ADF use of ADF ranges and training areas, including authorisation.

2.28 Current State and Territory weapons legislation does not permit civilians to use ADF weapons, including the weapon simulators within the WTSS capability. This includes employees of the Department of Defence, unless the requirement is directly linked to their employment duties.

2.29 Indemnity form. When ADF personnel are conducting range practices and non-Defence personnel are invited to actually participate in the live fire practice, the organiser of the range practice is to contact their supporting legal officer at the earliest opportunity to arrange for an indemnity form to be drafted and subsequently signed by all non-Defence participants prior to the practice. Non-Defence personnel may include APS employees, contractors, members of state and federal police forces, Border Force personnel, correctional services personnel and affiliated civilians. While these personnel are on Defence ranges they are not to use weapons unless directly linked to their employment of duty. This does not include visiting forces.

Foreign visiting forces

2.30 Members of foreign forces may visit Australia as either individual deployments or part of unit deployments. The regulations for each deployment type are as follows:

- a. *Individual deployments.* When individuals visit or are posted into ADF units (eg, Exercise LONG LOOK which is an exchange position) they are to comply with all regulations contained in this publication. Recognition of prior learning may be obtained from the training authority for that weapon or range ([paragraph 2.33](#) and [paragraph 2.34](#) detail the requirement for foreign forces to live fire Australian weapon systems).
- b. *Unit deployments.* When visiting forces are required to fire live ammunition with their weapons on Australian ranges, the following safety regulations are to be enforced other than where a status of forces agreement exists that exempts them:
 - (1) Approval by the appropriate authority in accordance with the *Defence Training Area Management Manual* [Chapter 4] is to be sought.
 - (2) Visiting forces that use their own weapon systems and EO on Defence training areas do not require a manned firing authority (MFA).
 - (3) Where Australian ammunition danger area (ADA) templates exist for the types of ammunition to be fired, those templates are to be used. If no template is in force, advice from the Land Engineering Agency⁴ is to be sought (unless this requirement has been waived by COMDT CATC).
 - (4) When a foreign unit deploys and conducts training in isolation from ADF units, that unit may conduct range and field firing practices under their own national rules and regulations (less use of non-Australian authorised ADAs) provided that TASO are not contravened.⁵
 - (5) Where a foreign unit exercises in conjunction with the ADF, the foreign unit is to comply with the regulations contained in this publication.
 - (6) When ADF exercise with United States Marine Corps/Singaporean Armed Forces rotation units deployed to Australia for periods exceeding 30 days:
 - (a) The United States Marine Corps/Singaporean Armed Forces ADA may be used for weapon systems where no Australian equivalent is available. Australian forces are to comply with Australian ADA's or the most conservative ADA available unless exempted by Commander Northern Command (COM HQ NORCOM).
 - (b) The senior ADF unit is to provide subject matter experts (SMEs) in order to assist the foreign unit understand and comply with Australian safety requirements where required.
 - (c) Additionally, members of foreign forces must have received familiarisation on the particular range facility or training area being used and the relevant Australian regulations and licensing requirements.

4. Land Engineering Agency (lea.weapon.system@defence.gov.au).

5. The United States Marine Corps or Singapore Armed Forces (or similar) rotational deployments to Australia of greater than 30 days are exempt from using Australian authorised ADA when they exercise in isolation from Australian personnel.

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- (7) Where Australian forces are integrated with the United States Marine Corps/Singaporean Armed Forces range activities, Australian forces will provide the range safety staff unless the visiting forces have the equivalent safety qualification(s) for the training being conducted. Equivalency is to be determined by confirmation of core competencies, attending briefs and practical demonstrations (which may be provided by video/CGI etc) as necessary. (The LRS regional adviser may assist with this process.)
- (8) When ADF units/sub-units and/or personnel train with the MRF-D⁶, the COM HQ NORCOM may, with the appropriate RA, training progression and standards achieved, authorise Australian personnel to operate applying 'Training with Modified Safety' (see *LWP-G 7-3-1, Australian Defence Force Range Orders (Dismounted)*, [Annex J to Chapter 6]), and in conjunction with like-qualified and authorised (if required) United States Marine Corps personnel. This approval is in addition to the regulations contained [paragraph 2.30b\(5\)](#).
- (9) RDAs on Basic Permanent ranges – where a Basic Permanent range requires an RDAST applied (eg, firing ammunition that exceeds the gazetted RDAST) for a match/practice and that match/practice is conducted is a permanent basic practice (except for the RDAST that has been applied), the CO may authorise the use of the range as a Permanent Basic range and the safety staff only require the Permanent Basic range qualification to conduct/SS this range and the regulations for Permanent Basic ranges apply (this regulation also applies to Manoeuvre ranges which operate as a Permanent Basic range due to there being no Permanent Basic range available).
- c. *Visiting forces.* Where a visiting force in conjunction with the ADF are using a Permanent Basic range and an RDAST is to be applied (eg, for firing ammunition that exceeds the gazetted RDAST):
 - (1) The CO may authorise the use of the range as a Permanent Basic range for the match or practice conducted as a Permanent Basic practice. The safety staff require only the Permanent Basic range qualification. The regulations for Permanent Basic ranges apply (these regulations also apply to Manoeuvre ranges that operate as a Permanent Basic range when a Permanent Basic range is not available).
 - (2) When a foreign unit is exercising under their national rules and regulations (see [paragraph 2.30b\(4\)](#)) their range danger area (RDA) boundaries are in close proximity to other exercising units, and there is concern in regard to the foreign ADA templates in use, the Range Control authority is to seek guidance from the Land Engineering Agency.

2.31 When there is doubt as to the level of training of visiting safety staff or exercise participants, Australian safety staff are to be provided to supervise and advise visiting forces. Generally, it will not be possible for Australian safety staff to be qualified on the weapons to be fired; therefore, the following minimum training is to be conducted for all members required to act in a safety appointment:

- a. A period of formal instruction on the weapon(s) is to be conducted, with emphasis placed on the safety features, DOWRs and immediate action.
- b. A briefing is to be conducted on the practice to be fired.
- c. A briefing is to be conducted on the methods of operation of the visiting forces, including infantry minor tactics or vehicle movement, if applicable.

2.32 When visiting forces are to train with and live fire Australian weapons systems, the following will apply at a minimum:

- a. They are to receive training on the Australian weapon in accordance with the weapons publication, including passing the WHT and live firing the qualification practice, noting that if blank only is to be fired there is no requirement to live fire the weapon (qualification practice).
- b. They are to have the qualification recorded in unit ROs (or their equivalent).

2.33 Foreign forces training in Australia (not posted individuals) may wear their approved soldier combat ensemble (SCE) or in-service equipment, PPE and night vision goggles (NVG) when firing on ADF approved ranges using Australian weapon systems, where use or issue ADF webbing, PPE or NVG is impractical and/or not possible.

6. Marine Rotation Force – Darwin.

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2.34 Where foreign forces use a derivative of the Australian weapon system, they are to receive instruction on the Australian variant and pass the Australian WHT prior to employing the Australian weapon system.

2.35 The provisions of [paragraph 2.30](#) and [paragraph 2.32](#) do not apply when foreign forces are conducting a familiarisation practice using Australian weapon systems where Australian safety staff are employed. In those circumstances, once written approval to conduct the familiarisation practice is obtained from the UCO/IOC hosting the visiting force, the regulations contained in this publication for familiarisation practices apply.

2.36 ADF personnel may fire the weapons of a visiting force after complying with the requirements of this publication (see [Section 2-4](#) for the regulations to fire foreign weapon systems).

Use of Australian Defence Force ranges by approved non-Defence agencies and their authorised personnel

2.37 Where an approved non-Defence agency (such as Special Police Tactical Groups) uses an ADF range they are to do one of the following:

- a. use an equivalent ADF template for the nature used (if one exists)
- b. provide an appropriate ADA to the ADF LRS Branch, which will seek advice from the Land Engineering Agency
- c. seek advice from the Land Engineering Agency.⁷

2.38 The weapon and range qualifications provisions of this publication do not apply to the use of ADF ranges by other non-ADF approved government agencies. All other safety requirements detailed in this publication and the relevant TASO are to be complied with.

Section 2-7. Participation by Australian Defence Force personnel in non-Australian Defence Force training activities using non-Australian Defence Force weapon systems in Australia

2.39 When ADF personnel participate in non-ADF controlled training activities in Australia (eg, with the Australian Federal Police or foreign forces), on either Defence-controlled or non-Defence controlled facilities, using either ADF weapon systems or non-ADF weapon systems, and the training is not a demonstration or familiarisation practice (see [Annex A](#)), the regulations in this section apply. To ensure that such activities comply with these regulations and are safe, it is essential that effective liaison with the host occurs early in the planning process.⁸

2.40 Where the activity is enduring and there is an expectation that the ADF will participate regularly in this training with the host, the following rules applies:

- a. If the host employs an ADF weapon, all ADF personnel participating in the training are to hold the equivalent ADF weapon qualification prior to training commencing.
- b. If the host employs a model or variant of an ADF weapon type not used by the ADF, all ADF personnel are to hold the equivalent ADF weapon qualification, receive gap and/or upgrade training from the host, and pass the host's WHT or equivalent proficiency test for that model or variant prior to training commencing.
- c. If the host employs a non-ADF weapon system including nonlethal training rounds weapons and nonlethal training rounds weapon inserts, ADF personnel are to receive training from the host in the weapon system that the ADF do not employ and pass the host's WHT or equivalent proficiency test prior to training commencing.

2.41 Where the involvement in the training activity is a one-off or occurs infrequently, ADF personnel need not be qualified in the host's weapon systems. However, ADF personnel are to receive sufficient training from the host to be competent in the weapon system, ammunition and any ancillaries used; and pass the host's WHT or proficiency test prior to training commencing.

7. COMDT CATC may waive the requirement to apply for an ADA and may direct that an ADA be used for a particular activity.

8. The use of non-Defence weapons described in this section differ from those described in [Chapter 15](#).

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2.42 Where the activity occurs on the host's range facility and the host's range safety regulations or rules are different from those set out in this publication then the more stringent of the two is to apply.

2.43 Where ADF-specific regulations contained in this publication are not covered by the host's regulations, or cannot be met, a waiver is to be sought from COMDT CATC. The waiver request is to be accompanied by a report detailing the shortcomings and be supported by a comprehensive RA.

2.44 Where the ADF hosts (or co-hosts) training, using ADF and/or non-ADF personnel to run and/or participate in the training, also employing non-ADF owned weapon systems (with or without Australian weapons being employed), and the activity is not a demonstration or familiarisation practice (see [Annex A](#)), the regulations contained in this publication apply.

Section 2-8. Other range users

Australian Defence Force cadets

2.45 ADF cadets is the collective term for the Australian Navy cadets, Australian Army cadets and Australian Air Force cadets. Members of the ADF cadets may participate in Live Fire range practices on Defence Live Fire and non-Defence Live Fire ranges as directed by the respective Director-General of their Service cadet organisation.⁹ The practices are to be conducted in accordance with the provisions of this publication. The range is to be booked in accordance with local range requirements (ie, the Training Area Safety Management Information System [TASMIS]).

2.46 The Defence policy on the use of firearms and live firing by cadets is contained in the ADF Cadets Defence Weapons Policy and the ADF Cadets Firearms Policy. These weapons and firearms policies address the use of service firearms and Defence-approved ADF cadet firearms, including privately owned 0.22 inch rimfire bolt-action rifles and air rifles. The parent Service is to ensure that:

- a. all cadet live fire activities on Defence training areas or Defence-approved civilian ranges are conducted by qualified personnel in accordance with the provisions of this publication and the weapons and firearms policies
- b. all non-Defence owned firearms approved by Defence for use by cadets are recorded on the cadet firearms register and have been inspected and certified safe by a qualified civilian gunsmith within the last 12 months
- c. all non-Defence ranges used have been approved for use in accordance with Defence regulations and policies (ie, subjected to and approved by a range safety board; including the provision of military TASO endorsed by the relevant authority and a current Certificate of Range Safety Compliance).

Use of Australian Defence Force ranges by approved Australian Defence Force sport shooting associations

2.47 The provisions of [Section 15-2](#) apply to serving Defence personnel who are current financial members of an ADF or single-Service approved (or recognised) sport shooting association and who are shooting in a supervised association-sanctioned event conducted on an ADF range. All practices are to be conducted in accordance with the provisions of this publication.

2.48 Provided that practices are conducted in compliance with state laws and the regulations of the sport-governing body, including the registration of firearms and licensing of users, and that a suitable ADA template is applied for the weapon and ammunition to be used, there is no obligation for civilian firearms and ammunition to comply with ADF technical regulation requirements. However, the safety requirements detailed in this publication and the relevant TASO (enforced by the OIC Practice, the SS and in briefings) are to be adhered to.

2.49 Additionally, practices are to be conducted on boarded Permanent ranges approved for the use of 0.303 inch/7.62 mm (F1 and M855) ammunition. Firers are to hold the appropriate weapon qualification for the type of firearm used. The following additional conditions are to be met:

- a. All firers are to be current serving Defence members.
- b. All firers must sign an indemnity to the Commonwealth in order to use the range.

9. For the purpose of this publication, ADF cadets approved 0.22 inch rimfire bolt-action weapons are regarded as in-service weapons. Accordingly, ADF cadets are authorised to fire approved 0.22 inch rimfire weapons on Category 2, Category 3 and Category 4 ranges in accordance with the provisions of this publication and the relevant TASO.

- c. The use of handguns is restricted to 0.22, 0.32, 0.38 special, 0.38 super, .357 magnum, .357 Sig and 9 mm calibres.
- d. Rifles with calibres up to .303 inch (or the metric equivalent) may be used.
- e. No ammunition (commercially purchased or hand-loaded) is to exceed the Sporting Arms and Ammunition Manufacturers' Institute¹⁰ standard for that calibre.
- f. No rifle or wildcat calibres are to be used for pistols.
- g. No wildcat calibres are to be used for rifles.
- h. All firers using hand-loaded ammunition must sign an additional indemnity to the Commonwealth prior to entering the range.

Civilian contractors working for Defence

2.50 Civilian contractors who are contracted to deliver bespoke training on behalf of the ADF may, in the performance of their employment duties, mentor and assist the SS(s) and/or the OIC Practice during the conduct of live fire activities. When such an appointment occurs, the civilian contractor(s) are to comply with the directions of the OIC Practice and are to have rehearsed the performance of their duties with the OIC Practice and SS(s) prior to any live fire or other type of practice. Additionally the following is to be adhered to:

- a. Civilian contractor(s) are not to act as the OIC Practice for live fire Defence practices.
- b. When there is a known shortfall in qualification or a risk mitigation, a CO may approve the use of civilian contractors to fill the role of an additional SS.
- c. Additionally, the civilian contractor is:
 - (1) to be fully qualified in the training being delivered (usually they would be a former ADF member who was qualified in the skill being passed on)
 - (2) to be current and competent in the skill being taught
 - (3) to have their qualification currency and competence recognised by an ARA unit CO on behalf of Defence
 - (4) to have their appointment supported by an ARA unit CO accompanied by an RA.

2.51 Civilian contractors who do not deliver bespoke training to ADF personnel may live fire weapons on Defence-controlled/owned ranges in accordance with their employment duties (eg, introduction into service contractors, armourers and Thales staff). In these circumstances the Defence contractor may perform the duties of the OIC Practice and/or SS as they are not overseeing or assisting to train ADF personnel in operational TTPs. Where this occurs they are to perform these functions in accordance with the regulations contained in this publication and the relevant weapons publications. Prior to being appointed as OIC Practice or SS:

- a. They must be qualified for the range, in accordance with this publication, for which they will be performing the duties of the OIC Practice or SS.
- b. They must be qualified on the weapons employed.
- c. Their qualifications must be recognised by Defence (if not qualified in accordance with this publication and the relevant weapons publications, they must attend and pass the appropriate ADF range and/or weapons qualification course[s]).

Section 2-9. Skill at arms competitions

2.52 Skill at arms. Skill at arms competitions, conducted in Australia or overseas (whether tri-Service, single-Service, unit or sub-unit conducted [eg, AASAM¹¹]), are designed to test the competing firers' abilities to apply consistent superior combat marksmanship shooting skills over a broad set of TTPs on various ranges in all seasons, weather and terrain. As these competitions test the competitors' small arms skills, there is a requirement to apply modified safety regulations that reflect the higher preparedness and training of the competitors.

10. <https://saami.org/technical-information/>

11. Australian Army Skill at Arms Meeting.

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2.53 Prerequisite Training Certification. A competition CO may request of formations/units providing competitors to provide a statement of qualifications, training and experience (including when training was conducted) for each firer/team prior to the competition to confirm base standards of all competitors/teams. Where this occurs the competition CO is to detail the required qualifications, training and experience to safely participate in the competition. This request is to include the acceptable time frame these skills were last applied. The competition CO uses the returns to finalise the competition RA and identify any lead up training that may be necessary for the safe participation of individuals/teams in the competition. Manoeuvre ranges require careful consideration of qualifications, training and experience as do range activities that require firers and teams to apply high-level drills such as changeover drills and/or conduct urban activities. Gap/lead up training may be necessary to develop/confirm individual and/or team standards of training and weapon handling prior to the competition for all/select firers/teams.

2.54 Authorisation. A unit CO may authorise, in writing, the following variations (the authorisation is to detail the approved variations) in accordance with the activity RA:

- a. *Abbreviated range briefs.* Where the competitors will attend the same range for a different match or practice, the OIC Practice may, in accordance with the CO's written approval, abbreviate the range brief to firers and safety staff if all present have previously attended the complete range brief. The range brief must cover the match or practice to be fired and include any required demonstrations or rehearsals, and any amendments to the range from the original brief. The OIC Practice conducting the abbreviated range brief is to confirm that all firers have previously received the full range brief.
- b. *Officer-in-Charge Practice not conducting the range brief to firers.* When teams wait their turn on a range where they will complete a match/practice and they have attended that range previously, the CO may appoint an additional OIC (known as OIC Briefs/Clearance who is fully qualified to act as a OIC for the range activity) whose only responsibility is to conduct range briefs to the team immediately waiting (next team to fire only). This approval reduces time between practices and workload of the OIC Practice and is to be monitored by Director of Practice (DPRAC)/Director of Practice Safety Officer (DSO)¹².
- c. *Clearance.* The OIC Briefs/Clearance, when appointed, may also be authorised by the CO to conduct clearances on and off the range to which they are appointed. These range clearances need not include the warning if the competitors are moving to an adjacent range, travel by foot and remain observable.
- d. *Range danger areas on Permanent ranges.* Where a Permanent Basic range requires an RDAST applied (eg, for firing ammunition that exceeds the gazetted RDA trace), the CO may authorise the use of the range as a Permanent Basic range for the match or practice conducted as a Permanent Basic practice. The safety staff require only the Permanent Basic range qualification. The regulations for Permanent Basic ranges apply (these regulations also apply to Manoeuvre ranges that operate as a Permanent Basic range when a Permanent Basic range is not available).
- e. *Weapon familiarisation safety staff and competitors.* COs are to detail the standard of weapon familiarisation necessary for range safety appointments to carry out their duties safely (normally competently pass WHT for weapon system); and competitors may operate weapons they are not trained on safely (normally pass WHT and at a minimum fire a familiarisation and/or qualification shoot).
- f. *Fatigue management plan.* COs are to mandate a fatigue management plan that rotates range staff on ranges where there is a high workload and/or extreme weather conditions. The rotation plan is to be appropriately supervised by staff nominated to check safety on ranges (eg, DSO).

2.55 A formation commander may in writing approve the regulations with any restrictions deemed necessary to ensure the activity is conducted in accordance with the safety staff's and competitor's qualifications, currency and experience compared to the nature and skills the competition will test. The request to apply these modified skill at arms regulations must clearly detail the training level tested, the basic skills required and the mechanism to verify that competitors met these standards. This information may not be available from international teams. Accordingly, international teams will compete under the regulations approved for the competition and, where possible, fire at least one practice to allow the team's skill level to be assessed.

12. DSO (formerly known as a senior safety officer [SSO]).

2.56 The regulations the formation commanders may modify are:

- a. *Walk-throughs.* Walk-throughs (except urban) for competitors may be modified as necessary in accordance with the complexity of the range and qualifications; and currency and experience of the safety staff and firers. However, competitors must conduct walk-throughs for all urban operations (UOs) range practices unless the conditions contained in *LWP-G 7-3-1, Australian Defence Force Range Orders (Dismounted)* [Chapter 6, Annex J and Annex K] can be met.
- b. *Range flag.* In lieu of a blue flag on the range flag pole while work parties are forward, a flashing blue strobe light at the FP/firing line may be used.
- c. *Officer-in-Charge Practice and safety supervisor.* The employment of both an OIC Practice and SS on simple Manoeuvre ranges with up to two firers may be modified.
- d. *Risk assessment.* In lieu of the requirement to produce an RA for each Manoeuvre range, a single RA may be authorised that covers each range conducted over the competition.

2.57 Interpreters. Interpreters are integral to the successful conduct of ranges for international competitors. AASAM staff are to conduct familiarisation range briefs to all Australian interpreters, which is to ensure that range terminology and how a range/practice will be conducted is effectively communicated to the interpreters. These briefs are to ensure that interpreters, who may not be range qualified, understand how the range operates and that they can pass on this information during their discussions with the international team they support.

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Annex A to Chapter 2

Familiarisation and demonstration range practices

Familiarisation practices

1. A familiarisation practice is defined as a live firing practice conducted for the purpose of permitting military who have not been formally trained to fire an in-service or non-service weapon.
2. The following regulations for the conduct of this activity apply:
 - a. Only static targets are to be engaged.
 - b. Before live firing takes place, a briefing on range procedures and range safety is to be conducted.
 - c. Military personnel who have previously conducted burst firing with the F88 may fire automatic using rifles/IWs from the Prone position, firing bursts of no more than 2 to 3 rounds.
 - d. Automatic fire is permitted using a machine gun (MG)/light support weapon (LSW) from the Prone position (or from a stable vehicle platform or sandbagged/secured tripod), firing bursts of no more than 2 to 3 rounds.
 - e. One SS is to be appointed per firer unless the practice involves only one firer, in which case the duties of the OIC Practice and SS may be combined.¹⁵

Armoured fighting vehicle/non-armoured fighting vehicle familiarisation practices

3. The following regulations apply for the conduct of this activity:
 - a. Targets are to be engaged from a static position only.
 - b. Before live firing takes place, a briefing on gun controls, ammunition and AFV safety is to be conducted.
 - c. Firing is only to occur with a qualified instructor-in-gunnery (IG) in the commander's position.
 - d. Switch positions (Weapon, Ammunition Select, Rate of Fire, etc) are to be pre-set where possible.
 - e. The commander or IG is to have the ability to override the firer and be in a position to observe all gunner drills/actions.
 - f. At the completion of the practice, safety switches are to be applied and a qualified crew member is to clear the weapon systems.

Public live firing demonstrations

4. Demonstrations are defined as live firing practices conducted for the purpose of permitting both military and/or civilian personnel to observe an activity from a safe location. The principles of planning and conducting practices for demonstrations are no different from those for any practice. However, certain additional precautions are necessary due to the increased risk associated with having large numbers of spectators.¹⁶
5. **Authority.** The authority to approve public demonstrations is vested in the commander of the formation conducting the activity. The Director Navy Communications and Coordination, the Directorate of Coordination – Army, or the Directorate of Coordination – Air Force (as appropriate) is to be notified of any live firing demonstrations to be attended by members of the public. For some audiences, it may be desirable to reduce the safe distances used in planning the practice to enhance the realism of the demonstration; however, overall safety is not to be compromised to enhance spectator experience. The authority for such reduction is also vested in the formation commander.
6. The authority to approve demonstrations for ADF public servants and contractors is the UCO/IOC. Any reduction in safety distance is the same as in [paragraph 5](#).
7. **Appointments.** Where demonstrations involve participation by more than one unit or sub-unit, a DPRAC may be appointed. The DPRAC bears overall responsibility for the safe conduct of the

15. Additional detail on non-ADF members attending and/or participating in familiarisation shoots is contained in [Section 2-6](#).

16. Joint fires commanders need to consider the additional risk associated with potentially having large numbers of spectators at the observation post.

demonstration. All other safety personnel retain the usual responsibilities involved in the planning and conduct of any practice. Detailed planning of the demonstration is the responsibility of each OIC Practice and includes:

- a. Attend all planning conferences associated with the demonstration and offer advice on the safety aspects associated with the employment of indirect fire.
- b. Ascertain the aim of the demonstration and the detailed requirements necessary to achieve it.
- c. Conduct a thorough reconnaissance of the range area that is to be used for the demonstration.
- d. Plan the practice using the usual appropriate safety criteria, unless otherwise authorised by the commander of the formation conducting the activity.
- e. The extent of the spectator stand must be clearly marked.
- f. A special arrangement must be in place to prevent spectators moving outside the stand while firing is in progress.
- g. The impact area should be cleared of any hard object that may cause ricochet unless the practice has been planned on the hard target criterion. This consideration must be applied when placing artificial targets, such as armoured vehicle hulls, in the safe target area.
- h. If laser range devices are to be used and it is possible that a specular reflector is present in the target area, consideration must be given to laser safety. The OIC Practice is to be cognisant of the fact that optical magnification devices (eg, binoculars and cameras) may be present in the spectator area, and is to take steps to ensure that they are not used by any person while a laser hazard exists.
- i. If a laser hazard exists the OIC Practice is to conduct a laser safety brief.

8. Additional medical precautions. An appropriately qualified (depending on the assessed level of risk) medical technician, with a first aid kit, stretcher and vehicle, is to be positioned at the spectator area throughout the demonstration. This requirement is additional to the medical arrangements detailed in [Chapter 6](#).

9. Communication. Where a DPRAC is appointed, each OIC Practice must ensure that they maintain continuous communications throughout the demonstration with both the firing positions under their control and the DPRAC. Communication with the DPRAC must also be maintained throughout the demonstration with the senior safety appointment for spectator area (if not the DPRAC). Where no DPRAC is appointed, the OIC Practice is to maintain continuous communications with the safety appointment for the spectator area (in addition to other requirements in the relevant TASO).

10. Conduct. The demonstration may be conducted in any desired manner or sequence, provided that all safety requirements have been met. Each OIC Practice must determine their appropriate location, that is, whether to be positioned at the spectator stand area or in a remote location¹⁷ (eg, with the assaulting personnel in a battle run).

11. Disposal of malfunctioned explosive ordnance. The *eDEOP 101, Department of Defence Explosives Regulations* [Regulation 1.3] contains procedures for dealing with malfunctioned EO in the presence of the public.

Range safety during the conduct of public live fire demonstrations

12. The following paragraphs detail the general principles and regulations that are to be observed for all demonstrations regardless of the audience in attendance.

13. When demonstrations are conducted involving the use of ammunition and/or weapon systems, all extant regulations relating to the ammunition natures and weapon systems are to be enforced. Demonstrations are to be carefully planned to ensure that all spectator positions are located outside of weapon and ammunition range danger traces and/or minimum safety distances (whichever is the greater distance).¹⁸

17. The OIC Practice for an indirect fire practice must also consider the requirement to establish an anchor observation post for the practice.

18. Spectator areas must be distanced from participating personnel so as not to interfere with range safety and participant procedures, yet be close enough to be able to clearly observe weapon effects (firing and terminal effect) and procedures as applicable to the demonstration. This requires careful consideration by exercise planners.

14. Spectator areas are to be clearly marked and easily observable from the ground and/or air. An officer, WO or NCO is to be appointed to control each spectator area. That person is responsible for the safety of the spectators and at a minimum is to provide a brief to spectators detailing the limits of the safe area. They are also to be in contact with the OIC Practice.

15. Prior to the actual demonstration, participating troops are to conduct a live fire rehearsal with the spectator area(s), FPs and target areas marked and identifiable. No amendment to the live firing serials of the activity should occur from this point.

16. In planning any form of demonstration, exercise planners are to ensure that range and participant safety is not compromised as the result of endeavours to enhance spectator experience at the event. Spectators witnessing a firing demonstration must not be permitted within the normal ground danger area.

17. The regulations for public demonstrations detailed in [paragraph 12](#) to [paragraph 16](#) (less approvals and indemnity) apply to all demonstrations.

Original equipment manufacturer demonstrations

18. A live fire demonstration conducted exclusively by an original equipment manufacturer (OEM) or agent where Defence personnel maintain a safe distance, and using weapons and EO not provided by Defence, may be conducted on Defence ranges after consultation with the Land Engineering Agency. Such activity does not require an MFA to be issued. The OEM or agent is to seek approval for commercial use of a Defence range in accordance with the *Defence Training Area Management Manual*. However, the Commonwealth retains overall responsibility for the safe conduct of the activity and should appoint an appropriate OIC Practice.¹⁹

19. The OIC Practice must be qualified to conduct the category of range used for the activity and should be qualified on a weapon system similar to that being fired. They are to stop the practice if, in their judgement, any activity is unsafe. The OEM or agent is to act in accordance with the direction of the appointed OIC Practice.

20. A unit CO may approve ADF members to live fire OEM weapons that are demonstrated on either an ADF-controlled range or a civilian range, where there is a genuine requirement for ADF members to fire these weapons (eg, as part of evaluation, market testing and/or skills transfer). Prior to approval the approving authority is to be satisfied that the template applied is appropriate and that the weapon system meets civilian safety requirements.

19. Where an ADF OIC Practice is appointed, the appointment is to be approved by COMDT CATC.

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Chapter 3

Control of military range

Live Fire Range Incursions

In recent years there have been a number of dangerous occurrences where personnel have entered live range areas. Most range incursions have been a result of a Sentry allowing people into an area due to misunderstanding or miscommunication, or members going through red flags or barriers due to previous clearance from an earlier physical sentry point. Strict control and coordination measures and clear communication are essential to ensuring the safety of all range users. As such, careful consideration of location and management of manned and unmanned sentry points is essential to ensure unauthorised entry into live fire training areas does not occur.

Prior to any live fire activity, the OIC should consider all access points into the training area and the number of personnel required/available to control these points. All range staff should be briefed on the Sentry locations and their status (manned/unmanned) and their Call sign or number/name. All range users should plan and schedule administration routes or timings and brief these to their supporting elements as well as inform other range users at the daily Range Conference.

Manned Sentry Points

OICs are to deliver a brief and provide the written orders (sentries to sign) to sentries on posting to their area of responsibility. Sentries are to remain alert and in contact with the control station on the range safety net. The primary function of the sentry is to prevent other personnel on the training area from inadvertently entering an active/live RDA. Sentries are to stop all personnel and vehicles approaching their post and ensure that they do not enter the range or danger area until authorised by the OIC Practice. Sentries should remain firm but courteous in their interactions – they are authorised to stop all personnel regardless of rank.

Unmanned Sentry Points

OICs are to liaise with range control to coordinate the location of unmanned sentry points and ensure that their presence is communicated to all range users. OICs are to ensure that all unmanned sentry points have a physical barrier and the correct warning signage and a red flag, or red light for night activities as per [paragraph 3.15](#).



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Section 3-1. Introduction

3.1 This chapter describes the range regulatory authorities, range management agencies and Range Control responsibilities. It also describes access control, range safety appointments and range qualifications.

Section 3-2. Regulatory authorities

3.2 The detailed responsibilities of regulatory authorities are contained in the *Defence Training Area Management Manual*. This section describes the additional authorities for the regulation of Defence training areas and ranges.

3.3 Capability Acquisition and Sustainment Group. CASG, through the Land Engineering Agency, is responsible for determining range safety parameters and weapon danger areas/ADAs, and the associated levels of risk for ground weapons and Navy non-guided weapons. CASG also has carriage, through its equipment acquisition processes, of the technical regulatory framework for operational equipment.

3.4 Directorate of Ordnance Safety. The Directorate of Ordnance Safety, which is part of Joint Logistics Command, is responsible for:

- a. the development and monitoring of EO safety policy
- b. setting standards for EO safety
- c. the provision of advice on range safety policy
- d. procedures and methodologies
- e. conducting monitoring audits for compliance with policy and standards.

3.5 Infrastructure division. The Deputy Secretary Defence Support, through the First Assistant Secretary, Infrastructure Division, is the design authority for range design and construction. The designs and specifications are based on formal 'user requirements' provided by the relevant service through the Defence Estate Quality Management System. The Director Estate Engineering Policy also manages the range inspectors and the inspection program for Defence ranges.

3.6 Work health and safety adviser. The VCDF has appointed COMDT CATC as the ADF WHS Adviser Small Arms and Indirect Fire Practices. The WHS Adviser is responsible for the oversight of all WHS matters involving small arms weapon and range training. In consultation with the relevant Service HQ, the ADF WHS Adviser Small Arms and Indirect Fire Practices is authorised to carry out the following:

- a. suspend range and weapon qualifications
- b. direct retraining/requalification as required
- c. stop training for a particular weapon, ammunition or range
- d. direct investigations into weapon, ammunition or range incidents
- e. suspend a unit's or sub-unit's live fire range or activity until doctrinal requirements are satisfied.

3.7 Australian Defence Force Land Range Safety Branch. The ADF LRS Branch is responsible for supporting the ADF WHS Adviser Small Arms and Indirect Fire Practices in the conduct of their duties. To assist the ADF WHS Small Arms Adviser, personnel from the LRS Branch are authorised to conduct assurance visits to observe, comment, and provide guidance on range preparation, training progression, and the conduct of range activities to ensure that range practices are conducted in accordance with extant doctrinal requirements, on behalf of the COMDT CATC.

Section 3-3. Range and training area management authorities

3.8 This section describes the management authorities for Defence training areas and ranges. The management authorities and their responsibilities are as follows:

- a. The Deputy Secretary E&IG is the training area management authority and is responsible for the overall management and operation of training areas in accordance with the *Defence Training Area Management Manual*. The Deputy Secretary E&IG may delegate management and operational responsibilities to Training Area Operational Authorities E&IG, RAN, RAAF, DSG, JLU and SF, who

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exercise control through regional or functional command via RCOs, assistant RCOs and range managers.

- b. The COMD JOC is responsible for establishing priorities for the conduct of joint and/or combined training activities in training areas and for establishing joint training priorities to guide the development of Defence training areas and related range systems.
- c. Unit commanders are responsible for:
 - (1) the safe conduct of their training activities
 - (2) ensuring that training is conducted in a manner that does not compromise the sustainability of the training area by minimising damage to training area assets and the environment
 - (3) ensuring that their activities comply with the regulations set out in this publication, the relevant weapon publications and TASO as well as compliance with the applicable Commonwealth/state/territory legislation; Defence doctrine, procedures and policies and environmental certificates of compliance and/or other environmental assessment approval conditions
 - (4) ensuring that requirements for post-activity verifications and reports are completed
 - (5) ensuring that the training area is left in the agreed state prior to departure.

3.9 These management authorities retain responsibility for the overall management and control of training areas. In the case of large combined arms or joint activities, aspects of control of the training area may be delegated to the officer conducting the exercise (OCE).

Section 3-4. Range Control responsibilities

Range control officer

3.10 RCOs are responsible for the safe and effective coordination of training activities on assigned training areas. RCOs are generally located at or near their training area.

3.11 The duties of RCOs include but are not limited to:

- a. the production, maintenance and enforcement of TASO
- b. the coordination of range activities
- c. acceptance/rejection of range details from units
- d. advising user units on the requirement to provide a DPRAC when safety coordination between units is required
- e. checking RDAST submissions for:
 - (1) signature by the OIC Practice (unless not required in accordance with this publication)
 - (2) signature by a qualified Defence member who is authorised and qualified to check the accuracy of their respective RDA trace, and who is one of the following:
 - (a) a senior range adviser (SRA)
 - (b) RAAC SGT (minimum rank)
 - (c) demolition supervisor
 - (d) EO disposal technician/ammunition technician (AT)
 - (e) CBRN supervisor
 - (f) qualified aviation member in accordance with *LWP-G 7-3-7, Australian Defence Force Range Orders (Army Aviation)*
 - (g) air weapon safety trace in accordance with *AAP 8600.001, RAAF Air Weapons Practices (Operations and Operational Requirements Manual)*. See also *LWP-G 7-3-0, Australian Defence Force Range Orders (General)* [[Chapter 14](#)]
 - (3) signature by the UCO/IOC of the user unit or their delegate (in either case not below the rank of MAJ [E])

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- (4) confirmation that the RDAST fits within the impact area or range boundary and does not target infrastructure or other prohibited areas
- f. adjusting RDASTs (reducing angles) as required when coordinating practices
- g. controlling access to and movement within the training area
- h. granting approval to commence practices
- i. the suspension of firing
- j. briefing range users, contractors and visitors.

Training area standing orders

3.12 TASO are lawful general orders for members of the ADF and are reasonable directions for APS employees and other government and civilian agencies. The Directorate of Operations and Training Area Management is responsible for the issue of TASO and posting on TASMIS. Hard copies of local TASO may be available for units on request. TASO are not the authority for the conduct of a practice. No range practice is to take place until the DPRAC and/or the OIC Practice has obtained a copy of the TASO, is fully conversant with their content and has received a brief from the Range Control staff (under the direction of the RCO). Key information about TASO are as follows:

- a. They detail the following information:
 - (1) the types of practices and weapon systems that may be used in a training area
 - (2) the specific requirements that must be addressed by exercise planners in the design of their training activity in order to gain authorisation to conduct the activity in a particular training area
 - (3) the requirements for the conduct of range safety briefings/conferences, particularly when there are multiple users
 - (4) the operation of a training area safety net, including the net control station.
- b. The detailed requirements may vary between training areas, depending upon how briefings or conferences are managed and operate; in particular, regional training areas.

Range contractors

3.13 Range staff and/or contractors are assigned by Range Control to specific range activities to operate the range equipment (eg, control the console at the MTR) in accordance with the range user's direction. Though they are not under the direct control of the OIC Practice and/or SSs for tasks related to the operation and maintenance of the equipment, they are to comply with all regulations in this publication (as well as TASO and other relevant publications) and safety instructions issued by the OIC Practice and/or SSs.

3.14 During night range activities where there is blackout and/or movement and range staff are operating mobile targets, units should provide range staff (who are trained in their use) with night vision equipment. Provision of night vision equipment ensures that the operator has similar visibility to the firers and safety staff.

Section 3-5. Control

3.15 Land. In order to restrict entry into live firing areas, the following measures are used:

- a. *Access control.* Entry to a training area for all personnel is to be made via entrances nominated and controlled by the range authority.
- b. *Training area boundaries.* The land boundary of a range is to be marked with permanent warning noticeboards located at those places where the public may be likely to enter the danger area. The warning is outlined in the *Defence Training Area Management Manual*.
- c. *Red flags and lights.* Red flags by day and red lights by night are used to indicate danger. Red flags and lights on the training area boundary, within the training area itself and at each individual range, indicate that the area or range is in use. Flag and light use is described in [Annex A](#).
- d. *Manned sentries.* Manned sentries are to be positioned in accordance with TASO, Range Control directions and/or as identified by the OIC. Sentries are to be briefed and equipped in accordance with this publication. Where TASO direct the positioning of sentries, these are to be filled. The OIC Practice

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is responsible for ensuring that the positions and number of manned sentry points for their activity is adequate:

- (1) Personnel are NOT to proceed past an manned sentry point as it marks the boundary of an active RDAST; only Range Control, DPRAC or the OIC Practice can authorise a member to proceed beyond any manned sentry point.
 - (2) Members of the ADF cadets are not to be used as sentries on any live firing range (adult officer of cadets and instructor of cadets may be appointed as sentries, but must acknowledge the sentry brief in writing).
- e. *Unmanned sentry points.* An unmanned sentry point may be a locked or an unlocked closed gate; or it may be a barrier across a road, track or an entry point; all of which will have signage and a red flag, or red light for night activities. Additional detail is contained in [Annex A](#). Range Control are authorised to place unmanned sentry points as required. The OIC Practice is responsible to ensure that the positioning and number of unmanned sentry points for their activity is adequate:
- (1) Personnel are NOT to proceed past an unmanned entry point as it marks the boundary of an active RDAST. Only Range Control, the DPRAC or the OIC Practice can authorise a member to proceed beyond any unmanned sentry point.
 - (2) An unmanned sentry point is different to any locked gates to which range users have been given a key by and have prior authorisation from Range Control to open and proceed past.
 - (3) Unmanned sentry points are not to be used for ADF cadet¹ range practices.
- f. *Target areas.* If a road, track or path enters an unfenced target area of a range to which the public may have access, a noticeboard is to be erected and marked in accordance with the *Defence Training Area Management Manual*.

3.16 Air. Aircraft are restricted from entering live fire areas by the establishment of either permanent or temporary Prohibited, Restricted or Dangerous airspace over Defence training areas. A notice to airmen (NOTAM) is raised by range staff to advise Air Services Australia of Prohibited, Restricted or Dangerous airspace activation; however, declaring a NOTAM does not ensure aircraft will not enter the range airspace.

3.17 Sea. Vessels are warned to avoid entering live fire areas through a notice to mariners (NOTMAR) from range staff to the local harbourmaster for the maritime community; however, declaring a NOTMAR does not ensure vessels will not enter the range maritime space.

Section 3-6. Range safety appointments

3.18 Range practices are to be conducted by qualified and current personnel. For more specific detail regarding the supervisory appointments, which must be filled for a particular range practice, refer to the relevant chapter in the applicable LWP-G 7-3 series publication. Additional detail containing currency requirements is contained in [Section 3-8](#).

Key tenets of range safety

3.19 All range practices are safe when conducted in accordance with the regulations contained within the ADF LWP-G 7-3 series of publications and the appropriate weapon publication. The four key tenets of range safety are:

- a. *First tenet.* The first tenet of safety is that all personnel on the range are responsible for their own safety and that of all others on the range. If a breach of safety or a dangerous occurrence (by an act or by omission) is observed, it is the responsibility of the person observing the breach or dangerous occurrence to give the order: 'STOP STOP STOP!' in a loud, clear voice or by alternate means as appropriate. The OIC Practice is to stop the practice, and resolve the safety breach prior to recommencing the practice. The key safety messages in this paragraph are to be included in all safety briefs.
- b. *Second tenet.* The second tenet of safety is the delivery of clear, concise orders by the activity commander and the range safety staff.

1. ADF cadets are defined in [paragraph 2.45](#).

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- c. *Third tenet.* The third tenet of safety is that the primary role of safety staff, with or without the appointment of an activity commander, is the oversight of the safe location of all personnel at all times during a range practice.
- d. *Fourth tenet.* The fourth tenet of safety is positive control by safety staff. Positive control is where the safety staff are engaged with the activity while not interfering with the activity commander's plan and are able to maintain situational awareness of all members under their control, are positioned to be able to immediately identify a safety breach, and then immediately issue an adjustment/correction or 'STOP STOP STOP!' as required.

3.20 Range safety staff and activity commanders. Range safety staff complement the activity commander's tactical plan by policing safety; noting that all personnel are responsible for safety. This safety supervision role frees the activity commander to concentrate on commanding their unit, team, manoeuvre group or the individual. Regardless of an activity commander's rank, orders or directions, the safety staff retain overall control of the activity.

3.21 During walk-throughs and subsequent progression of training, the safety staff will highlight errors in safety and will discuss the safe location of personnel from both enemy and friendly fire during each phase, bound, room and so on. This reinforcement training assists operators to develop heightened situational awareness, to be responsible for their own safety in relation to others and to be aware of where others are so they do not fire their weapon(s) when not safe to do so. This reinforcement training has an operational focus as it teaches operators to be aware and preserve life in both training and on operations.

3.22 An activity commander (section/platoon/company commander, etc), when appointed due to the nature of the practice, will command the tactical movement and firing of the participants. It is essential to note that the activity commander is not a safety appointment and must adhere to and comply with all safety- and range-related instructions from the OIC Practice regardless of rank. With larger practices there may be a number of subordinate activity commanders; for example, for a platoon attack there may be the platoon commander and three section commanders. Where this occurs the subordinate activity commanders are to conform to the direction of the SS assigned to their area of the activity with regard to safety.

3.23 Risk management. This publication sets the range safety framework for the safe conduct of range practices; with the exception of Aviation range practices, which are covered under LWP-G 7-3-7, *Australian Defence Force Range Orders (Army Aviation)* or AAP 8600.001, *RAAF Air Weapons Practices (Operations and Operational Requirements Manual)*. Where this publication requires an RA or allows a UCO/IOC or higher to authorise an action or set of actions beyond those approved in this publication, the authorising officer is to ensure that an RA is completed in accordance with single-Service doctrine, and that it is rigorous, identifies the risk, and then mitigates those risks and is within the single-Service risk tolerance thresholds for the approving officer. For example, a UCO/IOC may accept a risk that is categorised as medium (or lower) where the likelihood of the event happening is occasional and the impact is catastrophic or critical. However, there must be continual review of the activity to ensure that the risk level remains as defined.²

Appointment of range practice safety staff

3.24 The range practice safety staff for each range practice are to be appointed in writing (using unit ROs, range details or range instructions). Sufficient notice of the appointment is to be given to allow the staff to carry out the appropriate preparation for the safe conduct of their allocated duties. Sufficient notice is a minimum of 48 hours for a simple range practice on Permanent ranges and 72 hours for a complex range practice (eg, on all Manoeuvre ranges). The CO of a unit may waive the 48-hour minimum notice for Permanent ranges only where safety staff have been nominated in current RO and the risk threshold is within their delegation. The procedure to change appointments at short notice is detailed in [paragraph 3.54](#).

3.25 An example of the hierarchy of range safety appointments is shown in [Figure 3-1](#). The actual structure may change due to the complexity of the activity. Additional safety appointments may be allocated during the conduct of joint and complex activities (see [Chapter 14](#)).

2. Definitions of risk tolerance thresholds, likelihood impact descriptors and sources of risk are in accordance with the single-Service doctrine.

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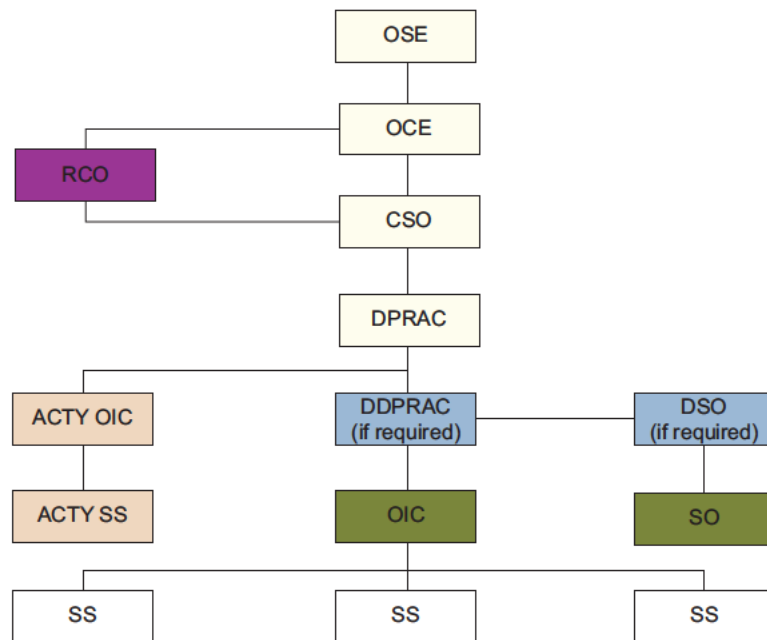


Figure 3-1: Example hierarchy of range safety appointments

3.26 The approving/appointing authorities for range OIC Practice and safety officer (SO)/SS appointments are to ensure that the level of training and experience required to conduct or safely supervise a particular range practice is commensurate with the individual or collective ability and experience. To assist the appointing authority to determine the suitability of individuals for a particular range appointment the OIC Practice is to check the qualifications and currency of appointees.³ The minimum approving authorities for range safety appointments for individual practices are shown in Table 3-1. Additional safety appointments that may be required for integrated, combined arms, joint and complex activities are covered in Chapter 13 and Chapter 14.

Table 3-1: Range safety appointments

Appointment	Authority
OCE	Formation commander or CO (see Chapter 14)
CSO	Formation commander or CO
DPRAC	Formation commander or CO (see Chapter 14)
DDPRAC	Formation commander or CO
DSO	CO
OIC Practice	CO or delegate, or OC of an independent sub-unit, in either case not below the rank of MAJ (E)
SO	CO or DPRAC
SS	OIC Practice (see LWP-G 7-3-1, Australian Defence Force Range Orders [Dismounted] [Annex I to Chapter 6] for exception)
AFV CC/non-AFV CC/non-AFV SS	OIC Practice

3. The approving authority is to also ensure that all firers (operators) are appropriately trained, and are current and competent to safely undertake the training. They are also to ensure that the progression of training prior to and during the activity is satisfactory for the activity to be conducted safely.

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<i>Appointment</i>	<i>Authority</i>
Ammunition SS	OIC Practice
BNS SS	OIC Practice
Health support	OIC Practice
Driver	OIC Practice
LSO	CO or delegate, or OC of an independent sub-unit (in either case, not below the rank of MAJ [E])

3.27 The appointing authority is to ensure that the training is in accordance with the training directive for the unit, its complexity is appropriate for the experience and weapon maturity of the firers, and that sufficient pre-activity training is conducted. The appointing authority is to ensure that the activity develops progressively. To assist the appointing authority to complete this task, a UCO/IOC checklist is provided in [Chapter 4](#).

Range appointments

3.28 Chief safety officer for the exercise/activity. For the conduct of all complex joint and combined exercises, a chief safety officer (CSO) can be appointed in writing by the OCE. A CSO may also be appointed by a formation commander when a unit is conducting a complex live fire activity with integrated single-Service or joint support, and the RA requires a higher level of control to be in place. The CSO is responsible to the OCE for the planning, coordination, monitoring and control of all aspects of safety within an activity area.

3.29 Director of Practice. The responsibilities of the DPRAC, which are covered in [Chapter 13](#) and [Chapter 14](#), are focused on formation-level activities. However, in some situations, units will be required to appoint a DPRAC to ensure there is safety coordination between OIC Practices when a unit conducts multiple practices.

3.30 The officer scheduling the exercise (OSE) is responsible for determining if a DPRAC is to be appointed based on the complexity of the range activity. Complexity is determined by frequency of occurrence of the range practice, experience of staff and firers, number of ranges operating simultaneously, safety management and coordination required, and so on.

3.31 An RCO may also recommend the appointment of a DPRAC when safety coordination between unit exercises/range practices is required. When units (or sub-units) appoint a DPRAC for a range practice or series of range practices, the roles and responsibilities described in [paragraph 3.29](#) to [paragraph 3.32](#), and [Chapter 13](#) and [Chapter 14](#) apply to both the DPRAC and the CSO/Director of Practice Safety Officer (DSO).

3.32 The DPRAC is responsible for the coordination of range safety for all units and sub-units placed under their control. It is not necessary for the DPRAC to be qualified as the OIC Practice for all range practices under their control; however, they must have rank and experience commensurate with the complexity of the activity and a current DPRAC proficiency. The DPRAC is to be present on the range when live firing is taking place, and at a minimum, the requirement is to maintain communications with OIC Practices under their control.

3.33 The appointment of range staff may also include, where appropriate, any caveats to the activity including approval for authorising short-notice changes to the nature of the practice.

3.34 Deputy Director of Practice. For the conduct of complex exercises, the OCE may choose to appoint a number of Deputy Directors of Practice (DDPRACs) also in writing in the same instrument as appointment of the DPRAC. DDPRACs are responsible to the DPRAC for the coordination of the range practices that they have been appointed to oversee and control. The responsibilities of the DDPRAC are identical to those of the DPRAC. DDPRACs are to understudy the DPRAC and are to provide routine reports on progress or any issues.

3.35 Director of Practice Safety Officer. Is an SME of their field and is appointed to a dedicated area of responsibility. One or more officers, or WOs (WO2 [E]), may be appointed as DSO(s) to be responsible for overseeing all matters of safety for the DPRAC for the conduct of the practice. This will include direct liaison with the OIC Practice and safety staff as to particular range requirements, and close liaison with the DPRAC

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to ensure that the safety measures meet the required standard. DSOs are to be qualified as OIC Practices and current in accordance with [Table 3-3](#), and the rank and experience of the appointee is to be commensurate with the complexity of the activity.

3.36 DSOs are to be on the range while the activity is underway and, are to have communication with the DPRAC and OIC Practice. The DSO is to conduct assurance checks for the DPRAC by visiting practices to observe the OIC Practice's safety and firers' briefs and the conduct of the practice during critical moments, as identified in the RA.

3.37 Officer-in-Charge Practice. An OIC Practice is to be appointed for every range practice. The OIC Practice must be qualified for that range type and be of the appropriate rank and experience to conduct the range safely. The OIC Practice must be qualified in at least one weapon from the group (weapons groups are detailed in [Annex B](#)) for all weapons used on the range, with the following exceptions:

- a. Integrated range practices (combined mounted/dismounted practices) on all Permanent and Manoeuvre ranges, as long as the SSs are qualified and current in the weapons they are supervising, the OIC Practice does not need to be qualified on all the weapons used in the activity. When an OIC Practice is not qualified on all the platforms involved in a range activity, a qualified SO is to be appointed to supervise the platform(s) concerned.
- b. Artillery/mortar live fire practices, as long as the artillery/mortar SSs meet the prerequisite requirements of their appointments in accordance with the appropriate artillery safety publication⁴ for the weapon systems they are supervising, the OIC Practice for artillery/mortar live fire practices does not need to be qualified on the weapon systems employed.
- c. The OIC Practice has been authorised in writing by their unit CO specifying the weapon system(s).
- d. Where the OIC Practice for an AFV/non-AFV practice is not qualified on all the weapon systems/platforms involved in the activity, they must hold a qualification as an AFV crew commander (CC)/non-AFV CC/non-AFV SS of an in-service AFV/non-AFV that is participating in the range activity (not an administrative/safety vehicle), and appoint an SO who is qualified on the weapon system platform being fired. When participating vehicles are fitted with a remote weapon station (RWS), the OIC Practice or SO must be qualified in that system.

3.38 The OIC Practice has the following responsibilities:

- a. They must be present on the range during firing, and must be positioned to be able to control all aspects of the practice.
- b. They are responsible for the orders given, the safe conduct of the practice and the safety of all personnel under their control including all personnel on the range.
- c. They are to ensure that all personnel on the range have an appointed SS. Visitors may require the appointment of an additional SS to ensure these personnel remain separate from and safe during the practice.
- d. They are to ensure that positive control is maintained by all SSs regardless of the range practice and/or management metric applied. They are to adopt an appropriate position to control the momentum of the practice and are able to control all other aspects of safety.
- e. They must conduct a safety brief to all safety staff and firers prior to every range practice. However, the OIC Practice may modify the brief when the following applies:⁵
 - (1) the range practice is a simple practice that is conducted a number of times using the same safety staff and firers and with no changes to each practice; for example, a platoon range day or simple section/platoon attack would only require the initial safety brief to safety staff (however, all safety staff are to attend all of the OIC Practice's briefs to firers)
 - (2) the range practice is a simple practice that is conducted a number of times using the same safety staff but different firers, with no change to each practice; for example, a unit range competition or a simple section attack will usually only require a confirmatory safety staff brief (however, all safety staff are to attend all of the OIC Practice's briefs to firers)

4. For indirect fire practices see *LWP-G 7-3-3, Australian Defence Force Range Orders (Indirect Fire)* and for ground-based air defence practices see *LWP-G 7-3-4, Air and Missile Defence Range Orders*.

5. Regardless of the exemptions to safety staff briefs outlined in [paragraph 3.38e](#), any change in safety staff will require a full safety brief from the OIC Practice as well as adherence to the requirements described in [paragraph 3.54](#).

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- (3) the range practice is a simple or complex practice that is conducted a number of times using the same safety staff (with the same or different firers), with no change to each practice, but with significant periods between each practice (greater than 3 hours) that will require, at a minimum, a confirmatory brief to safety staff (however, all safety staff are to attend each of the OIC Practice's briefs to firers), or
 - (4) it becomes impracticable to do so due to the size of the activity (eg, a unit-level live fire for a battalion attack), in which case the chain of command can brief those firers not briefed by the OIC Practice, using the OIC Practice's brief.
- f. The OIC Practice is to brief all safety staff⁶ prior to conducting the brief to all firers. All safety staff are to be present during the OIC Practice's brief to firers. If an activity commander is appointed, they must brief all firers prior to the OIC Practice's brief to firers.
 - g. The OIC Practice is to brief all sentries and ensure they are posted prior to the commencement of the practice.
 - h. They, or their authorised representative, are to ensure that all unmanned sentry points are in the correct physical location, are set up correctly and have the requisite signage displayed prior to the commencement of their activity.
 - i. If not already familiar with the range layout, the OIC Practice is to familiarise themselves with the layout of the range and its operation (usually done during the reconnaissance) and, at a minimum, conduct a walk-through with SSs and other range staff (for simple ranges this may be conducted from the FP).
 - j. They must maintain situational awareness of all the SSs and firers under their control. During some practices (mortar, sniper and DFSW practices on Manoeuvre ranges) it may not be possible to directly view the fire from individual call signs. In these situations the OIC Practice is to maintain situational awareness by communications with their SS. Specific requirements for walk-throughs for mounted and integrated range practices are detailed in [Chapter 13](#) and *LWP-G 7-3-2, Australian Defence Force Range Orders (Mounted)* [Chapter 4].
 - k. They are to ensure that the RDAST is clear of personnel and vehicles prior to and during firing.

3.39 When the OIC Practice requests permission to open fire⁷, Range Control is to be advised that the range is clear and this has been confirmed by a positive check to ensure all personnel, including contractors, are accounted for and are safe. Range Control will request the OIC Practice to confirm this information. Where overlapping templates occur (ie, adjoining ranges), Range Control is to confirm with the relevant OIC Practices that no personnel or equipment are in the adjoining RDAST. When the OIC Practice of the adjoining/affected range reports that personnel are forward of the FP, they must also confirm that the dangerous area from the overlapping RDAST is easily identifiable and that all personnel have been briefed to keep out of the unsafe area(s). Where there is no Range Control, the relevant OIC Practices are to confirm with each other that the dangerous area is clear and will remain clear for the duration of the practice.

3.40 Personnel forward of the firing point. Prior to personnel moving forward of the FP, the OIC Practice is to suspend firing and advise firers and safety staff that firing on the range has been suspended until the personnel return. The following is to occur when personnel move forward of the FP to conduct work on the range:

- a. Prior to moving forward the blue flag is to be raised, and personnel are to establish radio communication or voice control where positive control can be maintained, with the OIC Practice.
- b. Firing is not to recommence until personnel return and report to the OIC Practice and the nominated SS must confirm with each other that the personnel have returned and it is now safe to commence firing. Once all personnel are confirmed as having returned the blue flag is to be lowered.
- c. When firers, as a group and/or the OIC Practice/SS move forward after a range has been opened to inspect targets, and/or adjust, replace, fix, or patch targets, and/or collect fall of shot information, there is no requirement to close the range for firing as long as the OIC Practice maintains positive control of the firing detail.

6. The OIC Practice is to also brief the firer's opposite number (OPPO) when appointed.

7. When a DPRAC has been appointed, the DPRAC must gain approval from Range Control prior to opening any range for live fire.

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3.41 The regulation contained in [paragraph 3.39](#) does not preclude personnel from being within an RDAST on a Manoeuvre range but outside the weapon safety angle (usually 600 mils) of the firers as allowed in this publication.

3.42 Safety officer. An SO(s)⁸ is appointed to assist a DPRAC or the OIC Practice in the conduct of range practices. The SO(s) provides advice to a DPRAC or the OIC Practice on the safe operation of a weapon system/platform, including incident management procedures and clearance of personnel and equipment post activity. The CO or DPRAC may appoint an SO(s) for a range practice if they determine that additional safety staff are necessary due to the complexity of the practice. The requirements for SOs are as follows:

- a. The appointment of an SO occurs at the following times:
 - (1) An SO may be appointed for a manoeuvre group participating in a live fire manoeuvre activity.
 - (2) SOs must be appointed if a practice contains more than one manoeuvre element that cannot be observed at all times by the OIC Practice.
 - (3) For AFV practices, only when the OIC Practice is not qualified on that particular platform.
 - (4) An SO may be appointed for a single troop participating in live fire manoeuvre exercises (LFMX). However, SOs must be appointed if a practice contains more than one manoeuvre element. This includes a single troop with fire support or split patrols in LFMX. The OSE may appoint more SOs and is to determine the quantity and positioning of SOs for LFMX. When flanking fire is to be employed, an SO is to be appointed for each troop position providing supporting fire and for the unit or sub-unit being supported. The OSE may appoint an SO for a static AFV/non-AFV range practice if the OSE determines that additional safety staff are necessary due to the complexity of the practice.
 - (5) An SO does not need to be appointed for the conduct of blank ammunition activities, including the use of smoke grenades and pyrotechnics.
- b. The SO may be responsible for giving specific detailed briefs, in accordance with the OIC Practice's overall plan/intent.
- c. SOs are to be OIC Practice qualified for the activity being conducted.
- d. SOs must have completed training in their duties and are to have completed currency training in accordance with the latest range doctrine package for the type of range practice being conducted.
- e. An SO is to be appointed in writing by the unit commander.
- f. A SO appointed to assist a DPRAC is to be of the minimum rank of WO2 (E).

3.43 When appointed as an SO, and the OIC Practice is not qualified or experienced on all the weapon systems in accordance with [Annex D](#), the SO must provide information on specific weapon- and/or platform-related safety considerations, including the construction of the RDAST, the writing of the instruction, the planning and placement of the targetry, and the physical conduct of the practice. In addition the SO is to:

- a. be either physically located with the OIC Practice or in direct communication, and cannot perform any other role (eg, an SS supervising a trainee)
- b. may be the CC for the safety vehicle.

3.44 Safety supervisor. Only members qualified as SSs for the range used may be appointed as SSs. SSs are to be qualified in the weapon systems/platforms they are supervising. SSs are responsible for the safety of their allocated firers/platforms and the safe conduct of their tasks in accordance with the directives of the OIC Practice. They have the following responsibilities:

- a. They are to maintain positive control over their firers and situational awareness of flanking troops/vehicles at all times.
- b. They are to be fully conversant with the practice.
- c. When an unsafe practice is observed, SSs are to directly intervene to correct the unsafe act, or advise the OIC Practice (if direct intervention is not possible) and if necessary stop the practice.

8. This appointment may also be known as a 'range SO' in Joint Doctrine.

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- d. They are to assist the OIC Practice with clearances, ammunition distribution, brass collection, and checking for lost magazines, link and EO (ensuring that any lost ammunition is reported to the OIC Practice).
- e. For AFV/non-AFV- specific qualifications refer to *LWP-G 7-3-2, Australian Defence Force Range Orders (Mounted)*.

3.45 Mounted SS are not required to accompany the OIC of a mounted manoeuvre activity or the OIC of an integrated manoeuvre activity on the safety walk through for that activity.

3.46 Ammunition safety supervisor. The minimum rank for an ammunition SS for Permanent Basic is PTE (E) and Permanent Complex and Manoeuvre is LCPL (E). Additional information on qualification requirements and responsibilities of ammunition SSs are covered in [Annex B to Chapter 7](#).

3.47 Ammunition safety supervisor's assistant. The ammunition SS's assistant need not be a qualified SS or hold a minimum rank of LCPL (E). A member of the APS or a civilian employed as a Defence contractor may be employed as a ammunition SS's assistant provided they are briefed on their duties by the ammunition SS. Details on this appointment are contained in [Annex B to Chapter 7](#).

3.48 Battle noise simulation safety supervisor. A qualified BNS SS is to be appointed for any activity involving the use of BNS. The BNS SS is to have no other task while conducting the duties of a BNS SS. However, once all BNS has been expended, the BNS SS may then be employed for other tasks, such as an SS.

3.49 Laser safety officer. Only personnel laser safety officer level 2 (LSO2) or higher may be appointed as a range laser safety officer (LSO). The range LSO may be a standalone appointment or an additional responsibility for the OIC Practice and/or SS/SO. More than one LSO may be appointed for each range. Their responsibilities include:

- a. ensuring that the laser template (boarded or user provided) applied is appropriate for the laser(s) employed
- b. identifying speculative reflection and apply the appropriate laser template safety distance
- c. ensuring that lockouts and/or filters (if fitted) are in place (ie, set/fitted correctly)
- d. where approved, adjusting the settings from the issued settings and ensuring that the laser is set to the minimum power required for the activity
- e. confirming with Range Control that the appropriate laser dangerous space (including speculative reflection, magnification safety distance) is applied and the wavelength of the lasers employed is recorded
- f. ensuring that correct laser filters are applied (if required/employed)
- g. ensuring that lasers are employed in accordance with [Chapter 8](#) and the relevant training publication
- h. ensuring that a laser brief is included in the various range briefs as appropriate.

3.50 Laser safety staff. Laser safety appointments are described in [Chapter 8](#) and in the *Defence Radiation Safety Manual*.

3.51 Medical appointments. [Chapter 6](#) details the medical requirements for range practices. Appointments (medic and driver) are to be made in writing. However, this may not always be possible (including meeting the time requirements set down in [paragraph 3.24](#)). The OIC Practice is to confirm that health support will be provided in accordance with [Chapter 6](#) prior to the commencement of the practice, including the identification of personnel during the range safety briefs.

3.52 Sentries. [Annex A to Chapter 11](#) provides example sentry orders, which include the sentry's responsibilities.

Declining an appointment

3.53 Any members appointed to a range safety position who do not believe that they are suitable for a particular practice are to advise the appointing officer. Reasons for declining include the member not being appropriately qualified, having insufficient experience to safely conduct the range practice (usually a

Complex range practice) or not having conducted that type of practice for many years. The appointing officer is then to review the appointment and take the following action:

- a. confirm the appointment and provide assistance to the member, such as additional training and/or practical experience and/or supervision, or
- b. appoint another suitably qualified and experienced officer/WO/senior non-commissioned officer (SNCO) or JNCO as appropriate.

Change of appointment – Officer-in-Charge Practice, safety supervisor, ammunition safety supervisor and assistant, medical staff, and driver

3.54 Should any appointments – such as OIC Practices, SSs or ammunition SSs – change during the practice, the members holding the appointments are to obtain approval from the CO or their delegate or an independent sub-unit OC (not below the rank of MAJ [E]) prior to formally handing over their responsibilities. Where more than one person is nominated for a safety appointment for a range practice (eg, to allow the OIC Practice[s]/SS[s] to qualify or to relieve their fatigue during courses), the change of OIC Practice[s]/SS[s] may occur in accordance with that written appointment.

3.55 The new OIC Practice will sign for the range and, if required, will be briefed by Range Control staff prior to the range recommencing. The Range Control staff brief may be conducted in person or by electronic means and may be as simple as signing for the range and confirming that the range brief has been passed on by the outgoing OIC Practice and is understood. Where multiple OIC Practices have been nominated by the appointing authority, have been briefed by Range Control and have signed for the range prior to the changeover, Range Control need only be notified that the change has occurred (all other procedures laid down in this regulation must be adhered to).

3.56 Such pre-approval is an exception and is used where nominated safety staff cannot be guaranteed or where rotation is required for courses or relief from fatigue, and it does not relieve the outgoing/incoming OIC Practice/SS from following the approved changeover procedure. The approving authority is to ensure that the person taking over is not only qualified and suitably experienced but also capable of taking over the practice at short notice. Prior to the handover, the following is to occur:

- a. The person taking over the responsibility is to ensure that they are qualified to conduct that duty and appointed to do so in accordance with this paragraph and [Table 3–1](#). If they have not received authorisation from the CO, CO's delegate or independent sub-unit OC, they are not to accept the responsibility.
- b. The person taking over the responsibility is to ensure that they receive a thorough briefing from the member they are relieving. The OIC Practice is to brief all new SSs. The OIC Practice should also consider a quick confirmatory brief for all SS. This briefing must include, at a minimum:
 - (1) the practice being conducted
 - (2) safety aspects applicable to the practice being conducted (including the provision of a copy of the MRM, if one was required for the practice, and a brief on the content of the MRM)
 - (3) administrative aspects applicable to the practice being conducted, including ammunition control
 - (4) the location of all personnel under their command.
- c. In the case of a change of OIC Practice, the range controlling authority, the chain of command and/or the DPRAC is to be informed of the change of appointment.
- d. In the case of a change of SS or ammunition SS, the OIC Practice is to approve the change of appointment.
- e. All new OIC Practices and SSs, on taking up an appointment, are to receive a detailed activity handover, range layout brief and complete a walk-through brief for Manoeuvre range practices.
- f. All new ammunition SS are to receive a briefing.
- g. The person taking over the responsibility is to acknowledge in writing that they have been thoroughly briefed by the person they are relieving and are qualified to conduct their duties.
- h. If the replacement OIC Practice/SS has been pre-nominated and approved by the appointing authority, has attended the OIC Practice brief and walk-through and has been in attendance on the range for at least two live fire serials immediately prior to the changeover, the procedure described in this paragraph may be modified by the OIC Practice in accordance with the situation, awareness and

experience of the incoming OIC Practice/SS; that is, for simple practices the changeover may consist of a verbal brief only. The requirement for an incoming OIC Practice to comply with [paragraph 3.55](#) and [paragraph 3.56](#) remains extant.

3.57 The person handing over the responsibility is to ensure that [paragraph 3.54](#) has been complied with prior to handing responsibility to another person.

3.58 Changing range medical staff and/or driver appointments. Rotation of range medical staff and/or driver(s) is permitted in order to meet unit and/or personal duty requirements of those members so appointed. Range health support staff and/or drivers are not to be rotated to allow them to live fire unless specifically authorised in writing by the UCO/IOC or CO's delegate. Where rotation of the range health support and/or drivers is authorised, the safety brief is to include details of the rotation plan. Firing is to pause during rotation and the rotation is to only occur on command of the OIC Practice. Weapons and webbing are to be cleared and stored in a secure location prior to the incoming range health support staff and/or driver assuming their responsibilities.

Combining appointments

3.59 Officer-in-Charge Practice and safety supervisor. An OIC Practice (SGT [E] and above only) may perform the functions of both the OIC Practice and the SS for static daylight practices involving 10 or fewer firers, or for standard daylight practices involving movement where five or fewer firers are involved. For Live Fire Range in a Box practices an ARA Infantry CO may appoint a CPL to be both (combined) the OIC Practice and SS. This combined appointment is only to occur for Permanent ranges. Combining the OIC Practice and SS appointments is not permitted for recruit, officer cadet or ADF cadet training, qualification or familiarisation practices except as detailed in subsequent chapters.

3.60 For indoor weapon test ranges/facilities the approving authority (eg, JLU CO or their delegate not below the rank of MAJ [E]) may appoint an appropriately qualified CPL or civilian equivalent to combine the roles of OIC Practice, SS and Ammunition SS.

3.61 Officer-in-Charge Practice and disposal of malfunctioned explosive ordnance operator. An OIC Practice may perform the functions of both the OIC Practice and the DMEO operator for a range practice. On the occurrence of malfunctioned EO the OIC Practice is to appoint a member (who does not have to be qualified as an OIC Practice for that range – usually an SS for the range) to ensure that range safety requirements are maintained while the OIC Practice conducts the DMEO task. The OIC Practice is to brief the member on the safety requirements that are to be maintained, and Range Control is to be notified. The briefing is to include, at a minimum:

- a. details of the safety requirements of the DMEO task
- b. the location of all personnel present on the range, including PPE requirements and movement restrictions
- c. applicable safety aspects pertaining to the range practice
- d. communications, including those with sentries and Range Control
- e. any other administrative aspects.

3.62 Small arms coach. SSs may perform the duties of a small arms coach. However, while conducting coaching tasks they are only responsible for the firer they are coaching/supervising at the time. An OIC Practice is not to perform the duties of a small arms coach.

Section 3-7. Range qualifications

3.63 Range practices are only to be conducted by personnel who have attained formal range qualifications appropriate to the range in use. Qualification requirements are to be in accordance with an LMP issued by the appropriate training adviser. The training criteria for the qualification of range safety staff for each range are given in [Annex C](#) and [Annex E](#), and in the relevant chapter for the range type.

3.64 The following two Manoeuvre range qualifications may be awarded for Dismounted, Mounted and Integrated ranges:

- a. *Manoeuvre range qualification.* This qualification authorises the member to conduct all Manoeuvre ranges for the weapon qualifications they hold.⁹ They must display the appropriate skill and experience for the range practice to be conducted.

- b. *Restricted Manoeuvre range qualification.* This qualification authorises the member to conduct Manoeuvre ranges using the IW and LSW only. There is to be no firing of HE natures, overhead fire (OHF), flanking fire, effects bunker or battle inoculation. The member must display the appropriate skill and experience for the range practice to be conducted.

3.65 Certification of previous qualifications. Personnel who do not have their qualifications recorded on PMKeyS are to seek recognition of prior learning/recognition of current competency (commonly known as RCC) through COMDT CATC. This includes personnel previously qualified in accordance with the following publications:

- a. *Infantry Training, Volume 3, Ranges and Courses, Pamphlet 33, Range Construction, Instructions and Safety Precautions (All Arms)*
- b. *MLW 2-8-1, Range Instructions and Safety Precautions* [superseded]
- c. *MLW 2-9-2, Range Regulations* [superseded]
- d. *LWP-G 7-3-1, Australian Defence Force Range Orders (Land)* [superseded].

3.66 Senior range instructor/instructor-in-gunnery. An SRA/IG or single-Service equivalent is qualified to review and advise commanders on range planning, as well as to mentor and assist the OIC Practice to conduct range training. SRAs/IGs (E) are also qualified to conduct range qualification training. The minimum rank for an SRA/IG is SGT (E) who has successfully completed the ADF SRA Course. Accordingly, though not a safety appointment, they are a critical capability in the ADF range safety system. SRAs/IGs are to build their expertise within units by actively assisting units develop and conduct Live Fire range training. The duties of an SRA include but are not limited to:

- a. reviewing range planning as part of the checking and verifying of RDASTs; SRAs/IGs do not need to be qualified on the weapon or ammunition nature to be used when verifying a trace (see [paragraph 10.39](#) for additional guidance)
- b. mentoring and advising less experienced OIC Practices/SS staff during the planning for and the conduct of live firing
- c. auditing range practices for CO/OC to ensure that they are conducted safely and in accordance with doctrine
- d. conducting range qualification/requalification training
- e. assisting with range siting boards.

3.67 Range danger area trace approving officer sign off. The RDAST is to be countersigned by the approving officer. The approving officer is to confirm that the RDAST is correct (either by detailed self-check if qualified or gross error check if not), and appropriate for the planned activity. If they are the approving authority, they are to ensure that the RA (where required) is complete and details the risks for the range activity. They are also to ensure the safety staff and operators are qualified, current and capable of conducting and/or participating in the planned activity. Where no RDAST is required, the appointing officer performs the duties as detailed in [Section 3-6](#) and [Section 3-7](#).

3.68 [Table 3–2](#) details the authorities for the issue of range qualifications.

9. With the exception as detailed in [paragraph 3.37](#).

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Table 3-2: Range qualification authority matrix

Qualification								
Authority	Officer-in-Charge Permanent Basic and Permanent Complex	Safety supervisor Permanent Basic and Permanent Complex	Safety supervisor Manoeuvre/C3 ⁽¹⁾	Safety supervisor Mounted Manoeuvre	Officer-in-Charge Manoeuvre/C3 ⁽¹⁾	Officer-in-Charge Manoeuvre	Officer-in-Charge safety supervisor Category F	Officer-in-Charge safety supervisor Army maritime firings
SOI (issuing person to be SRA)	Yes	Yes	Yes	No	Yes	Yes – Dismounted	Yes	Yes (Manoeuvre qualification supports)
SOARMMD (issuing person to be IG)	Yes	Yes	No	Yes	No	Yes – Mounted	Yes	No
Nominated 2nd DIV unit (issuing person to be SRA)	Yes	Yes	Yes	No	Yes	No	No	No
SRA or single-Service equivalent	Yes	Yes	Yes	No	No	No	No	No
SRA/IG School of Transport	Yes	Yes (Category 8a only)	No	Yes	No	No	Yes	No
Watercraft testing officer AST Maritime Wing	No	No	No	No	No	No	No	Yes
Note: 1. C3 – Restricted Manoeuvre qualification only authorises a member to conduct Manoeuvre ranges using the IW and LSW only.								

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Section 3-8. Range currency

3.69 In order to be appointed to a range safety position, individuals are required to be qualified and experienced (ie, assessed by the approving authority as being capable of carrying out their duties for the particular range) for the position and class of range to which they are to be allocated. If personnel are not current, it is the responsibility of the commander to make every possible effort to ensure currency is attained prior to allocating an individual to a range safety position. If an individual has not conducted a range activity in the past 24 months, they may still be appointed to a range position but must be supervised by an SRA/IG (in accordance with their qualifications) and RAN Senior Sailor Weapon User Category for Permanent Basic ranges, to re-attain range activity currency. Should there be doubt as to the experience or capability of an individual to perform the duties of range safety staff, a SRA/IG is to be appointed to mentor the individual until such a time as the SRA/IG is satisfied that the individual is at the acceptable standard. SRA/IG certification of range safety staff is to be recorded in the PEX¹⁰ based LRSMT¹¹ by the certifying SRA/IG, for units without LRSMT the certification is to be recorded in unit RO.

3.70 Prior to fulfilling a range appointment, range qualified personnel are required to meet currency requirements (see [Table 3–3](#)).

Table 3–3: Range qualification currency requirements

<i>Currency requirements⁽¹⁾</i>				
<i>Range appointment</i>	<i>Theory test⁽²⁾</i>	<i>Practical test</i>	<i>Qualified on weapon/platform type</i>	<i>Range activity⁽³⁾</i>
DPRAC	Annually	Not required	Not required	Not required
DSO	Relevant OIC test Annually	12 months Manoeuvre only	Weapon group Platform unless qualified SO appointed	Not required
OIC Practice	Relevant OIC test Annually	12 months Manoeuvre only	Weapon group Platform unless qualified SO appointed	24 months
SO	Relevant OIC test Annually	12 months Manoeuvre only	Specific weapon/platform supervised	24 months
SS	Relevant SS test Annually	12 months Manoeuvre only	Specific weapon/platform supervised	24 months
Ammo SS	Not required	Not required	Yes ⁽⁴⁾	Not required
SRA ⁽⁵⁾	Annually Dismounted Manoeuvre OIC	12 months Dismounted Manoeuvre	Weapon group/platform	Not required
IG ⁽⁵⁾	Annually Mounted Manoeuvre OIC	12 months	Platform/weapon systems	Not required

10. Patriot Excalibur.

11. Land Range Safety management tool.

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<i>Currency requirements⁽¹⁾</i>				
<i>Range appointment</i>	<i>Theory test⁽²⁾</i>	<i>Practical test</i>	<i>Qualified on weapon/platform type</i>	<i>Range activity⁽³⁾</i>
<p>Note:</p> <ol style="list-style-type: none"> These requirements are to be met prior to fulfilling a range appointment. Theory test is linked to the current doctrine that is released on 15 January each year (eg, 2021 doctrine is active from 15 January 21 to 14 January 22), and you must pass the relevant 2021 recertification test in the PEX-based LRSMT, or on the Australian Defence Education and Learning Environment (known as ADELE) to fulfil a range appointment within this period. Updated draft doctrine and new recertification tests will be available in November on the LRS Sharepoint to allow planning/booking of range activities prior to its release on 15 January the following year. The currency activity requirements as provided in paragraph 3.69 cannot be met on the WTSS. See Annex B to Chapter 7 for exceptions. SRA and IG are qualifications not appointments but are also required to remain current if providing range advice. 				

Annexes:

- A. [Range safety flags, lights and unmanned sentry post barriers](#)
- B. [Weapon groupings](#)
- C. [Categories of range safety qualifications](#)
- D. [Weapon qualification categories](#)
- E. [Range appointments and qualifications](#)

Annex A to Chapter 3

Range safety flags, lights and unmanned sentry post barriers

1. This annex describes the use of flags and lights, and range barriers.
2. Coloured flags are used in training areas in the following manner:
 - a. by day, to indicate:
 - (1) range boundaries
 - (2) sentry locations
 - (3) the range or weapon in use
 - (4) the DOWR or the state of the weapon, or
 - (5) as a signalling device to indicate an unsafe occurrence.
 - b. by night, flags are replaced by the appropriate coloured light source.
3. **Red flags.** Red flags are used to indicate danger. Red flags on the training area boundary, within the training area itself and at each individual range indicate to military personnel and civilians alike that the training area or range is in use. Red flags are also used to mark static firing positions¹² within dismounted Manoeuvre range practices. The procedure to use red flags is as follows:
 - a. *Training area boundary flags.* These are red flags (a minimum size of 120 x 90 cm) and are located around the training area boundary at locations specified in the relevant TASO to indicate that the training area is in use. Noticeboards, manned or unmanned sentry points at specified points may also be required. The training area boundary flags are the responsibility of the range controlling authority and are flown permanently.
 - b. *Range in use flag.* These are red flags (a minimum of 120 x 90 cm) and are raised on each range at a specific location, such as a flagpole, grenade control tower or range entrance. The flags remain raised to indicate to all that the ranges are in use. At the end of the firing practices, the flags are lowered. The use of these flags is the responsibility of the OIC Practice. At night, a red light source is to be used to replace the red flag.
 - c. *Sea danger areas.* If the range or training area has a sea danger area, red flags are to be hoisted to half-mast 30 minutes before firing is due to start, and to mastheads immediately before firing begins. The flag must be visible to passing vessels.
 - d. *Manoeuvre range practices.* These are red flags (a minimum size of 120 x 90 cm) and are to be raised in a prominent position at the entrance and/or at the rear of the movement box/firing line. Any roads or track systems that are cut by an RDAST are to have manned and/or unmanned sentry points to indicate to all that an active/live RDAST is in use. This is to prevent other units using the training area from inadvertently entering an active/live RDA. The positioning of unmanned sentries is the responsibility of the DPRAC and/or OIC Practice. The placement of unmanned sentries can be conducted under local arrangements between the range authority and range contractor, but all aspects of the positioning and use of unmanned sentries remains the responsibility of DPRAC and/or OIC Practice. At the end of the firing practice, the flags are lowered, manned and unmanned sentries recovered, and locked gates opened. At night, a red light source is to be used to replace the red flag(s).
 - e. *Support weapons.* When DFSW, artillery or mortars are fired, no red flags are used on the gun or mortar line or at individual FPs. In the event of DFSW or mortar subcalibre firing taking place on Permanent or purpose-designed ranges, the system of flags relevant to that range, as specified in the TASO, is to be adopted.

12. The classification markers' gallery was previously red but has now been changed to a green flag for consistency. Details are provided in LWP-G 7-3-1, *Australian Defence Force Range Orders (Dismounted)* [Annex A to Chapter 4].

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4. Green flags. Green flags are used to indicate that weapons are clear or that an emergency is occurring. The procedure to use green flags is as follows:

- a. *Weapons effects bunkers/classification range markers gallery (butts).* All effects bunkers/classification range markers gallery (butts) are to be provided with a green flag (a minimum size of 120 x 90 cm). The flag is to remain up until all personnel are under cover. It is then lowered on the order of the OIC Practice. It is not to be raised after this unless the OIC Practice has given the order to raise it; and only then are personnel to leave cover. Only in the event of an emergency is the green flag to be raised without the permission of the OIC Practice. If this is the case, all firing is to stop immediately. Personnel in the weapons effects bunker/classification range markers gallery (butts) must remain under cover, even in an emergency, until the OIC Practice indicates that it is safe to emerge. At night a green light source is to be used to replace the green flag.
- b. *Overhead/flanking fire gun position.* A green flag (a minimum size of 120 x 90 cm) is to be used to show the state of weapon readiness of the weapons to be used. It is raised and lowered as a result of orders from the OIC Practice. The green flag is to be raised while the gun is in the UNLOAD condition and lowered when the gun is in the LOAD condition. This provides a visual reference for the OIC Practice as to the condition of the weapons. At night, a green light source is to be used to replace the green flag. In the case of an emergency, the green flag is raised and all firing is to stop immediately. Personnel are not to leave the overhead/flanking fire gun position unless authorised by the OIC Practice.

5. Blue flags. A blue flag (a minimum size of 120 x 90 cm) or blue light is a visual reminder to all personnel that there are personnel forward of the FP or within the RDA performing a task. Firing is not to commence or is to cease immediately.

6. Signal flags to vehicles. Flags flown as FP flags for vehicle-mounted range practices are raised on the orders of the OIC Practice as an order to firers and to indicate the state of the range. The flags are to be flown from a prominent position on the FP or from the safety vehicle. The types of flags are as follows:

- a. *Firing point green flag/light.* The green flag/light signifies that all weapons are clear and laser devices are not energised. It is to be raised at the FP as soon as any vehicle-mounted weapon is positioned there. No weapon is to be LOADED while the green flag is flying. When the OIC Practice receives clearance to fire, they will order that the green flag be lowered and the red flag be raised. A green flag is not to be flown with any flag other than the blue and white chequered flag.
- b. *Firing point red flag/light.* A red flag/light indicates that the range is open and that live firing will or has commenced. Weapons on the FP may be loaded and firing will occur under the direction of the OIC Practice.
- c. *Firing point yellow flag/light.* A yellow flag/light is to be raised to indicate that weapons are not safe or that there has been a loss of communications. All vehicles are to make safe and clear guns. When all guns are clear the green flag is to be flown and communications confirmed with the safety vehicle/staff.
- d. *Blue and white flag.* A blue and white chequered flag indicates that a practice with moving vehicles is being fired.
- e. *Blue flag/light.* A blue flag/light is a visual reminder to all personnel that personnel are within the RDA performing a task. The blue flag is to be flown with the green flag and is not to be removed until the OIC Practice has verified that all personnel have returned to the FP.

7. Vehicle flags. On a live firing range, each firing vehicle is to have three flags (40 x 40 cm): one red, one green and one yellow. These vehicle weapon flags are to be raised by the vehicle SS to reflect the state of the vehicle weapons, as follows:

- a. *Vehicle green flag/light.* A green flag/light is flown to show that weapons are UNLOADED and clear. It is to be flown from each vehicle on the positioning of the weapon at the FP.
- b. *Vehicle red flag/lights.* A red flag/light indicates that all weapons on the vehicle are LOADED, and firing may be conducted under the control of the SS.
- c. *Yellow flag/light.* A yellow flag/light is flown in the event of a prolonged stoppage or misfire, if there is a loss of communications with the safety vehicle/staff, or if for any reason the immediate unloading and clearing of weapons cannot be completed safely. As soon as the stoppage or misfire or the

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communication fault has been cleared, the yellow flag is to be lowered and the red flag flown before firing recommences.

- d. *Vehicle night lights.* During night firing practices the flags are to be replaced by the applicable light source.
- e. *Blank ammunition.* When an activity includes the use of blank ammunition only (including the use of smoke grenades and pyrotechnics), vehicle flags are not required to be flown.

8. Unmanned sentry point barriers. Barriers that are used for unmanned sentry points are to have a warning sign attached that describes the requirements. The signage is to be manufactured in accordance with AS 1319: *Safety signs for the occupational environment*, and are to be a minimum size of 450 x 600 mm. They are to have the following message:

STOP, RANGE DANGER AREA. DO NOT PROCEED PAST THIS POINT. CONTACT RANGE CONTROL. UNMANNED SENTRY CHECKPOINT #____.

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Annex B to Chapter 3

Weapon groupings

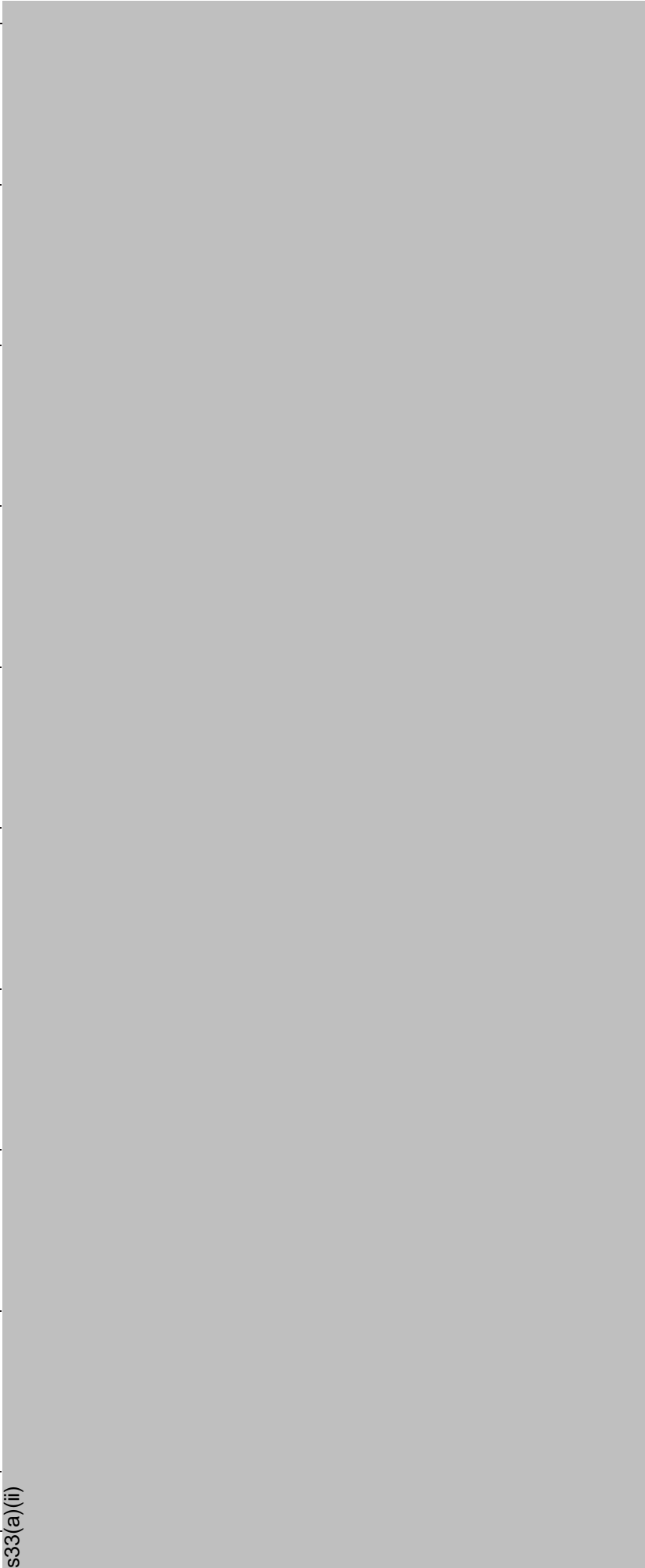
1. Weapon groupings are categorised in [Table 3–4](#). These categories are used to allow personnel to be the OIC of range practices without being qualified in each IW. As long as the OIC Practice is qualified in one weapon within the group for each weapon used on the range they may be appointed as the OIC Practice. SSs must be qualified in the weapon they are supervising.
2. **Armoured fighting vehicle/non-armoured fighting vehicle groupings.** By nature of the various operating systems incorporating like-for-like methodologies the following groupings are used. These groupings (see [Table 3–5](#)) account for the operation of systems, planning considerations/constraints relevant to each group, experiential learning and types of ammunition generally used by each vehicle within the groups:
 - a. *Group 1 – individual operated platforms.* These vehicles use simple weapon mounts that are controlled by the AFV CC/non-AFV CC/non-AFV SS. They are generally shoulder-controlled employing plat/ring/swing mounts and usually have no fire control system other than the firer having direct control of the weapon. The M113AS4 family of vehicles are included in this group because they are commanded and operated by a single firer using the fitted turret. Firing on the move is generally restricted to no more than 10 km/h as no stabilised fire control system is fitted to these vehicles.
 - b. *Group 2 – remote weapon stations.* These vehicles use a variety of remotely operated weapons, usually controlled by a single operator who is positioned within the hull while the weapon station is external to the vehicle the RWS may be stabilised or unstabilised. The inherent characteristics of the RWS usually involves bespoke engagement and clearance techniques that are not used by Group 1 vehicles to safely conduct range activities using the RWS, and so an understanding of how the systems operate and are controlled is required. The RDAs usually differ from standard weapon templates to compensate for the operation of such systems.
 - c. *Group 3 – multi-crewed/turret.* These vehicles operate in a crewed environment whereby the gunner operates the weapon system under direct control of the AFV CC, they are primarily designed to fire on the move and use a fire control system. The fire control system is contained within the turret and enables 360° engagements. They will operate with a variety of sensors and ammunition types.
3. **Use of the grouping system.** In addition to holding the appropriate range qualification for Mounted ranges (Category 12A, Category 12B, Mounted Manoeuvre) the OIC Practice must be qualified as a CC (or equivalent) on a vehicle within the appropriate group to hold a range appointment. Where the OIC Practice is not qualified on all the vehicles within a range activity an SO must be appointed to provide platform-specific advice to the OIC. There is no hierarchy within the grouping system; for example, a Group 3 qualified OIC Practice cannot conduct a Group 2 activity unless qualified on an RWS within that group.

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Table 3-4: Weapons grouping

Serial (a)	Weapon Group 1 – pistols (b)	Weapon Group 2 – revolvers (c)	Weapon Group 3 – sub-machine gun (d)	Weapon Group 4 – rifles (automatic) (e)	Weapon Group 5 – rifles (automatic with grenade launcher attachment) (f)	Weapon Group 6 – rifles (bolt action) (g)	Weapon Group 7 – shotgun (h)	Weapon Group 8 – grenade launcher attachment (i)	Weapon Group 9 – machine guns (j)
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Table 3–5: Armoured fighting vehicle/non-armoured fighting vehicle mobility groupings

Serial	Individual operated (no fire control system)	Armoured fighting vehicle/non-armoured fighting vehicle – remote weapon stations	Armoured fighting vehicle – multi-crewed/turret (fire control systems)
(a)	(b)	(c)	(e)
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Annex C to Chapter 3

Categories of range safety qualifications

1. Range safety qualifications are categorised as shown in the following paragraphs together with the qualification criteria for specific range categories.

Permanent ranges

2. Permanent Basic ranges comprise the following range categories:

- a. Category 1 – Indoor Test ranges
- b. Category 2 – 25 m Barracks ranges
- c. Category 3 – Open ranges
- d. Category 4 – Classification ranges
- e. Category 5 – EORs
- f. Category 6 – (Reserved)
- g. Category 7 – Combat Shooting ranges.

3. Permanent Complex ranges consist of the following categories:

- a. Category 8 – Individual and Section Small Arms range
- b. Category 9 – Grenade ranges
- c. Category 10 – HE ranges
- d. Category 11 – Combat Manoeuvre ranges
- e. Category 12 – AFV/Non-AFV ranges.

4. Types of Permanent ranges and the categories they fall into are shown in [Table 3–6](#).

Table 3–6: Categories of Permanent ranges

Category	Range type	Range sub-type
1	Indoor Test range	
2	25 m Barracks range	
3a	Open range	25 m Open range
3b		100 m Open range
4	Classification range	
5a	EOR	MTR
5b		Group and Zero range
5c		Static Mechanical range
6	(Reserved)	
7a	Individual Combat Shooting ranges	Combat Individual Snap range
7b		Combat Gallery range
8a	Individual and Section (IW only) Small Arms range	Sneaker range
8b		Section Defence range

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Category	Range type	Range sub-type
9a	Grenade ranges	SGR
9b		AGR
10a	HE ranges	DFSW range
10b		M18A1 Claymore
10c		Demolition
11a	Combat Manoeuvre range	Battle Inoculation or Section Attack range
11b		Urban Assault or Building Clearance range
12a	AFV/Non-AFV range	AFV Static
12b		AFV Mobile

5. Hierarchy of Permanent ranges. Permanent range qualifications will be awarded as follows:

- a. *Category 1 Indoor Test facility.* Personnel who hold the Category 1 Indoor Test facility range qualification are authorised to conduct/safety supervise indoor Live Fire range practices in accordance with the weapons they are qualified on, the facility TASO and the certification of the facility. All live firings are to be single weapons per lane and be either handheld (enclosed light armaments facility) or mounted in an authorised weapon mount (enclosed light armaments facility and armourer facilities).
- b. *Restricted Permanent range.* Personnel who hold the Restricted Permanent range qualification are authorised to conduct/safety supervise Permanent range practices with the IW and LSW only on Category 1 to Category 4 (less butts party), Category 5 to Category 7, only during daylight hours (this qualification is usually awarded to officer of cadets/instructor of cadets).
- c. *Permanent range.* Personnel with the Permanent range qualification are authorised to conduct/safety supervise all Category 1 to Category 7 range facilities using all weapons and vehicles on which they are qualified and the range is boarded for.
- d. *Permanent range firing on the move endorsement.* Personnel who hold the Permanent range firing on the move endorsement are authorised to safety supervise Permanent ranges where firing on the move occurs. These personnel are to be qualified on the weapons and vehicles being employed, and the range is to be boarded for their use. Personnel holding this qualification must have the Permanent range (not restricted Permanent range) qualification prior to being awarded the Permanent range firing on the move qualification.¹³
- e. *Grenade ranges.* Personnel who hold the Grenade range qualification are authorised to conduct/safety supervise Category 9a and Category 9b range facilities using the in-service grenades. Personnel must hold the Category 9a SGR qualification before holding the Category 9b AGR qualification.
- f. *High Explosive ranges.* Personnel who hold a HE qualification are authorised to conduct/safety supervise those respective HE ranges.

6. Permanent range Category 1 to Category 7 qualification criteria. To be qualified to hold safety appointments for Permanent ranges (Category 1 to Category 7), personnel must meet the following criteria:

- a. The trainee must have received instruction on each range facility and have attained a score of 100 per cent in an open-book examination appropriate to these ranges.
- b. The trainee must have been assessed as competent by a qualified SRA/IG14 while fulfilling the appropriate range safety appointments during a live fire practice on a Category 2 to Category 7 range. Where available, a Category 4 range is to be used for the assessment. Alternatively, a trainee may

13. SOCOMD personnel who have successfully completed the close combat shooting or target prosecution continuum course(s) are deemed qualified to conduct firing on the move and may be awarded the Permanent range firing on the move endorsement.

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be assessed by a RAN-qualified small arms instructor, through an approved Training Authority using a CATC-approved LMP and proficiency number.

- c. The trainee must, while on the course, pass the WHT for the weapons and/or vehicle platform being used during the course and be weapon qualified live fire (QLF).
- d. For all other weapons that are permitted on these ranges, safety staff, if not already qualified, must be trained (as per the relevant weapon/vehicle publication) on each weapon/vehicle to conduct a practice for that weapon/vehicle. All weapon/vehicle qualifications are to be entered in the member's record on PMKeyS.
- e. For new weapons and vehicles entering service, safety staff are required to be trained on that weapon and vehicle prior to fulfilling any range safety appointments.
- f. The training is to be authorised and conducted in accordance with the CATC-approved LMP.

7. Permanent range Category 8 to Category 12 qualification criteria. To be qualified to hold safety appointments for Category 8 to Category 12 ranges, personnel must meet the following criteria:

- a. The trainee must hold the Permanent range safety qualification.
- b. The trainee must have received instruction covering the responsibilities of range safety appointments on each range for which a qualification is to be awarded, and have attained a score of 100 per cent in an open-book examination appropriate to the course.
- c. The trainee must have been assessed as competent by a qualified SRA (Category 10a/Category 10b) or demolitions supervisor/ammunition technical officer (ATO)/AT for Category 10b/Category 10c ranges¹⁴ while fulfilling the appropriate range safety appointments under supervision using each specific range for which they will be qualified. The assessment of SS must include live firing.
- d. The trainee must be weapon qualified for the weapons being used during the course and be either QLF or (if authorised by the relevant weapon publication) qualified simulation fire (QSF). During the course, the WHT must be passed prior to firing and those trainees with the QSF are to be upgraded to QLF once they live fire the weapon during the course.
- e. For all other weapons that may be fired on each facility that are not used on the course, safety staff who are not already qualified must be trained in accordance with the relevant weapon publication before they can use the weapon on the facility. All weapon qualifications are to be entered in the member's record on PMKeyS.
- f. For new weapons entering service, safety staff are required to be trained on that weapon in accordance with [paragraph 6e](#) before fulfilling any range safety appointment and gain either the QLF or QSF (if QSF is authorised for that weapon system).
- g. All ranges within Category 9 to Category 12 are to be taught and tested separately. The trainee will only be qualified for the ranges specifically covered on the course. Trainees must be qualified on the SGR prior to training on the AGR.
- h. The training is to be authorised and in accordance with the CATC-approved LMP.
- i. At the completion of the course, the member will be qualified to use the range facilities tested on the course with the weapons on which they are qualified. On dual-purpose ranges (eg, AGR approved to fire DFSW), the facility is to be regarded as two ranges (AGR and DFSW) and the appropriate qualifications will apply.
- j. Where a member with incomplete Category 9 or Category 10 range qualifications (ie, a training shortfall to a Stage 3 training outcome) also has a Manoeuvre range qualification, they may be appointed SS on a Manoeuvre range but must not safety supervise weapons that are fired in accordance with the Category 9 or Category 10 range deficiency; that is, a member who is deficient in the Category 9b qualification cannot safety supervise the throwing of grenades on a Manoeuvre range.
- k. If an appropriate Category 9 to Category 12 range is not available, a field-expedient range may be constructed and used. However, the range must meet the equivalent Category 9 to Category 11 range standards and must be conducted as a Manoeuvre range, and all safety staff must be Manoeuvre

14. Though an SRA is responsible for the assessment, trainees may be directly supervised by a qualified OIC Practice who holds the training and education assessor qualification.

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range qualified. Approval to conduct these practices on a field-expedient range is to be given in writing by the UOC/IOC.

- I. To be an OIC of an activity on a Category 11 range, a manoeuvre qualification is required. To safety supervise, either a Manoeuvre range qualification or a firing on the move endorsement is required.

Manoeuvre ranges

8. A Manoeuvre range qualification is required for certain Permanent Open ranges such as Category 11a Battle Inoculation ranges or Category 11b Urban Assault ranges. It is also required for user-designed tactical live fire exercises and demonstrations conducted on a live fire practice area. These user designed practices (UDPs) are commonly referred to as field firing. The conduct of practices on a Category 11a or Category 11b range or live fire practice area is designed to progress personnel from technical competence on weapons, confirmed during Stage 1 to Stage 3 of training the battle shot, to the application of that technical competence in a realistic tactical environment under simulated battle conditions (Stage 4 and Stage 5).

9. **Previous qualifications.** Personnel who previously qualified for Category C1 ranges may still conduct Manoeuvre range practices, but may only conduct sub-unit field firing with IW and LSW only. Personnel who are qualified for Category command and control (C2) ranges are classified as fully qualified for Manoeuvre ranges.

10. Manoeuvre range qualifications are currently being awarded, as follows:

- a. *Manoeuvre Restricted category (formerly C3).* Personnel who hold a Manoeuvre Restricted category range qualification are authorised to conduct Manoeuvre range practices with IW and LSW only (no HE, OHF and flanking fire permitted).
- b. *Manoeuvre.* Personnel with the Manoeuvre range qualification are authorised to field-fire all small arms, vehicles and HE natures on which they are qualified, as well as conduct OHF and flanking fire.

11. **Dismounted Manoeuvre qualification criteria.** To be qualified to hold safety appointments for a Dismounted Manoeuvre range practice, personnel must meet the following criteria:

- a. For Manoeuvre category ranges, safety staff must be qualified for Category 1 to Category 7 ranges, with Category 8 to Category 11 as required
- b. The trainee must be weapon qualified on the weapons or vehicle platform being used during the course and be either QLF or (if authorised by the relevant weapon publication) QSF. During the course, the WHT must be passed prior to firing and those trainees with the QSF are to be upgraded to QLF once they live-fire the weapon during the course.
- c. To supervise field firing on those weapons not used on the course, the trainee must be qualified in accordance with the relevant weapon publication. All weapon qualifications are to be entered in the member's record on PMKeyS.
- d. For new weapons entering service, safety staff are required to be trained on that weapon before fulfilling any range safety appointments.
- e. The trainee must have received instruction covering the responsibilities of range safety appointments for field firing. They must also have attained a score of 100 per cent in an open-book examination appropriate to the course.
- f. Trainees awarded an OIC Practice qualification must have passed tests in the construction of RDASTs and the production of a range instruction for a field firing exercise. Practical testing for SS and OIC Practice is to be conducted on a live field firing practice.
- g. The training is to be authorised and conducted in accordance with the CATC-approved LMP.

Sustained fire machine gun practices (previously Category D range qualification)

12. Sustained fire machine gun (SFMG) practices are usually conducted on a field firing range where MGs are mounted on tripods with ancillary sights and equipment, employing predicted data or line-of-sight firing techniques. The SFMG role is defined in *LWP-G 7-3-1, Australian Defence Force Range Orders (Dismounted)* [Annex I to Chapter 6].

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13. Sustained fire machine gun practice qualification criteria. To be qualified to hold safety appointments for SFMG practices, personnel must meet the following criteria:

- a. The trainee must have received instruction covering the responsibilities of range safety appointments and attained a score of 100 per cent in an open-book examination appropriate to the course.
- b. The trainee must have been assessed as competent by a qualified assessor and SME while fulfilling the appropriate range safety appointments under supervision on a live firing practice.
- c. The trainee must have passed the officer/NCO DFSW course in accordance with the CATC-approved LMP (personnel with previous qualifications for SFMG and Category D range practices retain that qualification in accordance with current doctrine).
- d. For new weapons entering service, safety staff are required to be trained on that weapon in accordance with the relevant weapon publication before fulfilling any range safety appointments.
- e. Trainees must have completed the appropriate manoeuvre course to hold an OIC Practice or SS qualification (trainees with Manoeuvre range SS qualification only are not authorised to be appointed as the OIC Practice for SFMG range practices until they become OIC Practice Manoeuvre range qualified).

All-arms air defence ranges

14. To be qualified to hold safety appointments for All Arms Air Defence (AAAD) ranges, personnel must meet the following criteria:

- a. The trainee must be qualified for all Category 1 to Category 7 ranges.
- b. The trainee must be weapon qualified for the weapons being used during the course and be either QLF or (if authorised by the relevant weapon publication) QSF. During the course the trainee must pass the WHT.
- c. To supervise firing on those weapons not used on the course, the trainee must be qualified in accordance with the relevant weapon publication. All weapon qualifications are to be entered on PMKeyS.
- d. For new weapons entering service, safety staff are required to be trained on that weapon before fulfilling any range safety appointments.
- e. The trainee must have received instruction covering the responsibilities of range safety appointments for AAAD. They must also have attained a score of 100 per cent in an open-book examination appropriate to the course.
- f. Trainees awarded an OIC Practice qualification must have passed tests in the construction of RDASTs and the production of a range instruction for AAAD range practices. Practical testing is to be conducted on a live AAAD practice.
- g. At the completion of the course, the trainee will only be qualified to conduct static AAAD practices.
- h. The training is to be conducted in accordance with the CATC-approved LMP.
- i. Personnel who are qualified to hold safety appointments for Manoeuvre Category ranges are also qualified to conduct AAAD range practices. Personnel with OIC Practice Manoeuvre Category range qualifications may, with the CO's approval, conduct moving AAAD practices. Further information is provided in [paragraph 3.24](#).

Australian Defence Force watercraft 25 m and less range

15. The ADF watercraft 25 m and less range qualification is a qualification which permits live fire from Army watercraft in accordance with [Chapter 16](#) with a Permanent Basic range qualification. This qualification does not currently include HE natures. To be granted this qualification, trainees must meet the following criteria:

- a. The trainee must be qualified for all Category 1 to Category 7 ranges and have successfully completed the Maritime Terminal Officer's course, or hold the Subject 4 SGT Supervisor Marine qualification and additionally must hold the minimum rank of SGT (E), or for SS only Subject 4 CPL Advanced Marine Specialist course and hold the minimum rank of CPL (E).

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- b. The trainee must be qualified (QLF or QSF) on the weapons being used during the course. The WHT must be passed prior to firing and those trainees with QSF are to be upgraded to QLF once they have live fired.
- c. For weapons entering service, safety staff are required to be trained on that weapon and the weapon qualification is to be entered into the member's PMKeyS record before fulfilling any range safety appointments.
- d. The trainee must have received instruction covering the responsibilities of range safety appointments for firing from Army watercraft. They must have also attained a score of 100 per cent in an open-book examination appropriate to the course.
- e. Trainees awarded an OIC Practice qualification must have passed tests in the construction of RDAST(s) and in the production of a range instruction for the field firing exercise. Practical testing for the SS and the OIC Practice is to be conducted on a live fire watercraft practice.
- f. The training is to be authorised and conducted in accordance with the CATC-endorsed LMP.

16. Mounted Manoeuvre range qualification. Details to be qualified as a Mounted Manoeuvre range safety appointment are provided in *LWP-G 7-3-2, Australian Defence Force Range Orders (Mounted)* [Chapter 3].

17. Army Aviation range qualification. Details to be qualified as an AAvn range safety appointment are provided in *LWP-G 7-3-7, Australian Defence Force Range Orders (Army Aviation)*.

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Annex D to Chapter 3

Weapon qualification categories

1. There are five weapon qualification categories, as detailed in the following paragraphs.

Weapon qualified live fire

2. This qualification applies to all weapons unless the relevant weapon publication states otherwise. The qualification QLF is awarded after Service personnel successfully meet the qualification criteria in accordance with the relevant LMP and live fire the qualification practice for that weapon.

Qualified simulation fire

3. The qualification QSF is awarded after Service personnel successfully meet the qualification criteria as currently required less the live fire practice. The live fire qualification practice is replaced by an equivalent WTSS practice. This qualification is only available for weapon systems where the applicable weapon publication specifically authorises its use. The following caveats apply:

- a. This qualification may be upgraded to QLF where the weapon publication specifically allows this to occur. In order to upgrade, Service personnel must successfully complete the WHT followed by the appropriate live fire qualification practice for that weapon.
- b. Service personnel deploying on operations who have the weapon qualification QSF will be required to upgrade to the QLF qualification prior to deployment for the primary weapon systems they are issued. However, this may not be required with all weapon systems (eg, Javelin).
- c. Service personnel who have the weapon qualification QSF may attend all range qualification courses and attain the range qualifications of OIC Practice and SS on all ranges. They may then be appointed as the OIC Practice or hold an SS position at all practices using all weapon systems on which they are qualified QLF or QSF.

Qualified emergency use only

4. The qualification 'emergency use only' (EUO) is granted at the completion of the qualification criteria up to and including the WHT. There is no requirement to live fire or WTSS fire the qualification practice prior to the granting of this qualification. EUO is only available for weapon systems where the individual publication specifically authorises its use. The following caveats apply:

- a. The weapon qualification EUO is designed to train Service personnel who do not require training in the weapons while in Australia, but when deployed may be required to operate these weapon systems (eg, piquet duty and/or an operational emergency). The training allows soldiers to safely operate these weapon systems if required in an emergency while deployed only.
- b. The EUO qualification may be upgraded to either QSF or QLF by completion of the appropriate weapons WHT and live fire or WTSS-authorised practice where the applicable weapon publication allows the EUO qualification to be awarded.
- c. Service personnel with the EUO qualification are not qualified to be appointed as the OIC Practice or hold an SS position for the respective weapons to which the EUO qualification applies, regardless of their range qualifications.

Qualified foreign weapons handler

5. The qualification of 'Foreign Weapons Handler' for a particular weapon is granted once the member has met the qualification criteria (up to and including the WHT). This qualification supports foreign weapon training where it is impossible to live fire a foreign/former Australian weapon in Australia.

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Annex E to Chapter 3

Range appointments and qualifications

1. [Table 3–7](#) details the range appointments and qualifications required to run Permanent ranges Category 1 to Category 11 and Manoeuvre ranges.
2. [Table 3–8](#) details range appointments and qualifications for ADF cadets and specialist range practice qualifications.

Table 3-7: Dismounted range appointments and qualifications – Australian permanent and reserve forces

Serial (a)	Range category (b)	Minimum rank to safety supervisor (c)	Minimum rank to Officer-in-Charge Practice (d)	Ammunition safety supervisor (e)	Remarks (f)
1.	1 to 7	Qualified PTE (E) less SS butts (Category 4)	CPL (E)		<p>Must hold the qualification for the conduct and/or safety supervision of the range in use (from the Permanent Category list of range types) IAW a CATC-approved LMP. They may not be appointed as a SS for practices involving dismounted fire and movement unless they hold the Permanent range firing on the move endorsement or can be appointed as Manoeuvre Category SS.</p> <p>GRes members obtain the SS qualification for Permanent Category ranges on Module 1 of Subject 1 CPL and OIC Practice qualification for Permanent Category ranges on Module 2 Subject 1 CPL etc.</p> <p>Qualified RAAF LAC ADG or RAAF CPL and above with Air Force Weapon Instructor (AFWI – 113724) or Permanent Basic Range Qualification or LCPL (E) or above may be appointed as SS Butts (must have been trained and assessed on a Classification range).</p> <p>A CPL who is qualified as an OIC Practice (Category 1 to Category 8 ranges) may be appointed as the OIC Practice for those ranges in the following circumstances:</p> <ol style="list-style-type: none"> The practice is to be conducted by day only. Night practices may be conducted where the range is equipped with lighting that allows the OIC Practice to conduct the range practice applying daylight regulations. The use of NVG is not regarded as applying daylight regulations in this situation. The detail is to consist of not more than 12 firers. There is to be no movement between FPs during the conduct of the practice (with the exception of administrative movement or during the conduct of individual sneaker practices). They are not to fulfil the duties of OIC Practice and SS concurrently. They are not to be appointed as OIC Practice for Category 3c ranges. If qualified in CS they may conduct CS live fire except those containing shooting on the move practices. <p>A LCPL who is qualified as either Manoeuvre Category or Permanent range firing on the move endorsement may be appointed as SS for practices involving dismounted fire and movement.</p> <p>An SF CO may appoint in writing a qualified SF TPR/PTE who is OIC Practice Permanent Category range qualified to OIC Permanent Category range practices or SS butts.</p> <p>Qualified SGT or above may be appointed as the OIC Practice on Permanent Category 1 to Category 8 ranges without restrictions.</p>

Serial (a)	Range category (b)	Minimum rank to safety supervisor (c)	Minimum rank to Officer-in-Charge Practice (d)	Ammunition safety supervisor (e)	Remarks (f)
2.	8 to 11	Qualified LAC (see remarks) or LCPL	CPL (E)		Must hold the qualification for the conduct and/or safety supervision of the range in use (from the Permanent Category list of range types) IAW a CATC-approved LMP. Qualified RAAF ADG LAC or RAAF CPL with SECFOR Range Qualification (217580) or Permanent Complex Range Qualification or LCPL (E) or above may be appointed as SS. Only a CPL who has completed SUBJ 1 SGT and SUBJ 2 SGT (or Corps equivalent) including ADRQ may be appointed to OIC. Engineer demolition supervisor (IAW LWP-G 7-3-5, <i>Demolitions and Mines: Range Practices and Non-operational Tasks</i>) can OIC/SS Claymore practices on Category 10 ranges.
3.	Dismounted Manoeuvre	Qualified LAC (see remarks) or LCPL	SGT		Must hold the qualification for the conduct and/or safety supervision of the range in use (Manoeuvre) IAW a CATC-approved LMP. Qualified RAAF ADG LAC or RAAF CPL with SECFOR Range Qualification (217580) or Dismounted Manoeuvre range qualification or LCPL (E) or above may be appointed as SS on Dismounted Manoeuvre ranges. Personnel with Manoeuvre Category (formerly C2) and Restricted Manoeuvre Category (formerly Restricted C3) range qualifications are limited to IW and LSW weapons for range practices for which they are appointed as the OIC Practice or SS. Personnel with AAAD and/or SFMG range practice qualifications are qualified to conduct those practices on Manoeuvre Category IAW their qualifications (additional information is contained in the relevant chapters). A CPL (E) who is a sniper supervisor and qualified to conduct Manoeuvre Category ranges may be appointed OIC of a sniper practice by an ARA/permanent CO where all firing is conducted from a stationary position.
4.	1 to 7 8 to 12	PTE (E) LCPL (E)	N/A	Ammunition SS	Minimum PTE (E) for Permanent Category 1 to 7 ranges. Minimum LCPL (E) or Qualified RAAF LAC ADG for Permanent Category 8 to 12 ranges. Qualified SS for Permanent ranges Category 8 to Category 12 IAW a CATC LMP. When the Ammunition SS is not qualified on the weapons being used the Ammunition SS to receive a safety brief by the OIC on all ammunition types being used for weapon system during the practice and the OIC Practice must deem them safe to handle these ammunition types prior to the commencement of the range practice. If the duties require the preparation or supervision of ammunition procedures then the Ammunition SS must be qualified in the weapon or ammunition. See Chapter 7 for further detail. Ammunition SS for demolitions must be worn rank CPL and Category 10c IAW LWP-G 7-3-5, <i>Demolitions and Mines: Range Practices and Non-operational Tasks</i> .

Table 3--8: Range appointments and qualifications – Australian Defence Force cadets and specialist range practice qualifications

Serial (a)	Rank (E) (b)	Qualifying course (c)	Qualification categories (d)	Remarks (e)
<i>Australian Defence Force cadets</i>				
1.	OOO LT (E) and instructor of cadets CPL (E) and above	Unit range qualifying courses	SS (Category 1 to Category 7) OIC Practice (Category 1 to Category 7)	<p>Courses are conducted externally to CATC.</p> <p>Courses are to be conducted and tested by a qualified SRA with a CATC LMP OOC (LT) (E) and instructor of cadets CPL (E) may also hold the restricted OIC Practice and/or restricted SS Permanent Basic range qualification.</p> <p>Practices are to be conducted in daylight hours or at night where there is sufficient ambient or artificial light to replicate daylight conditions (firing at night must be authorised in writing by the appointing authority).</p> <p>There is to be no movement between FPs during the conduct of the practice (with the exception of administrative movement).</p>
<i>Specialist range practice qualifications</i>				
2.	LCPL to LT	DFSW Officer/NCO	OIC Practice/SS (Manoeuvre range [SFMG])	<p>Qualified SGT or above may be appointed as the OIC Practice.</p> <p>Qualified LCPL or above may be appointed SS.</p>

Chapter 4

Planning

OIC Practice Hints and Tips

All live firing, both on operations and in training has the potential to cause unnecessary casualties. Every soldier must contribute to safe practice by responsible individual behavior under the supervision of competent NCOs and officers.

MLW Part 2 Inf Trg Vol 8 Pam 1 Range Instruction and safety Precautions (All Corps), 1984

The purpose of this document is to inform and assist a young NCO or officer about to conduct their first range practice now they are qualified.

The successful completion of a safely completed range practice is in the planning whilst other factors may impact on its success. Firstly, the aim of the practice. Correctly selected and maintained this ensures no mission creep that comes with the inevitable shonky or poorly planned activities. Secondly, the conduct of the practice commencing with instructions and orders to all participants being issued early and appropriately. On arrival at the range, safety precautions being conducted with sentries posted and briefed, the clearance of weapons and equipment as well as the checking of ammunition and stores.

The briefing of both staff (possibly conducted prior to the firers arriving) and firers, the dividing into details and the issue of ammunition. Control and supervision at the firing point is critical and the OIC assist's this by orders issued calmly, clearly and as an order.

The clearance of weapons post serial and the changing of details assist with the smooth and safe conduct of the practice. In the unlikely event of an injury or worse, calm leadership with a pre-arranged and a rehearsed plan will ensure the casualty is dealt with swiftly and appropriately.

At the conclusion of the activity, the clearance of weapons, equipment, and the range itself followed by a thorough debrief to participants will conclude a successful and safely conducted range practice.

Section 4-1. Introduction

4.1 Range activities vary from simple range practices to complex exercises involving combined arms and/or forces. The complexity of the activity determines the planning requirement. Activity planning encompasses the following three phases, which may overlap:

- a. concept of range training design
- b. detailed planning
- c. implementation.

4.2 In addition to planning responsibilities, this chapter provides an overview of the concept development and detailed planning phases of the activity planning process. The complexity of the activity will determine whether the full process or an abbreviated process is appropriate. The detailed planning information is contained in [Chapter 5](#) to [Chapter 8](#).

4.3 [Chapter 11](#) describes the conduct of a range activity, including the implementation phase and the post-activity action phase of the activity planning process. This chapter and [Chapter 11](#) are to be read in conjunction with *ADFP 7.0.3, Exercise Planning and Conduct*, the relevant LWP 7-3 series publication and the land warfare doctrine and land warfare procedure publications applicable to the practice are to be read.

Section 4-2. Responsibilities

4.4 This section details the responsibilities of the following personnel for the planning of Basic, Complex, Manoeuvre, Combined (Integrated), or Joint range practices, and is to be read in conjunction with [Chapter 3](#), [Chapter 13](#) and [Chapter 14](#).

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4.5 Officer scheduling the exercise. The OSE is responsible for issuing an initiating directive for an activity or training. Initiating directives are required for exercises/activities down to unit level. The initiating directive is to identify the OCE and should also cover:

- a. constraints and limitations
- b. the forces involved in the exercise and their C2 arrangements/status
- c. risk management
- d. specific safety requirements
- e. evaluation and validation
- f. acknowledgement requirements.

4.6 Officer conducting the exercise. The OCE is responsible to the OSE for the conduct of all aspects of the exercise, including planning and the issue of all necessary instructions/orders. The OCE allocates senior safety and range appointments in writing.

4.7 Chief safety officer. A CSO is to be appointed in writing for all joint and combined exercise at formation level. A CSO must also be appointed in writing when a unit conducts a joint live fire activity. The CSO is responsible for ensuring all safety aspects relevant to the agencies involved are part of the planning for the activity.

4.8 Director of Practice. For the conduct of all joint and combined exercises at formation level and other Complex range activities as designated by OCE, a DPRAC is to be appointed in writing by the OSE. Where appointed, the DPRAC is to convene planning conferences in order to monitor the development of activity design and safety concepts.

4.9 Officer-in-Charge Practice. The OIC Practice is responsible for detailed planning (including the development of the range instruction) up to and including combined and joint activities, with the DPRAC (if appointed) retaining overall responsibility.

4.10 Unit commanders. Unit commanders are responsible for the issue of range instructions in accordance with this publication and, where appropriate, corps/Service-specific doctrine.

4.11 Range Subject Matter Experts. Each unit/formation in the ADF will have members that due to their position, skills, training and/or experience are considered the SMEs in the planning and conduct of range activities. Generally, but not exclusively, this role resides at CSM/SSM/RSM level but can also be provided by technical experts such as SRA/IG or other specialists. It is the SME's responsibility to advise the Approving Authority who then makes a command decision. Approving authorities rely on this SME advice for the safe planning and conduct of range activities and relevant SMEs are to ensure that the advice provided is relevant and current. Approving authorities are to seek this advice and record that advice and the basis of their decisions in the CO checklist. This does not abrogate command responsibility but ensures that SME are accountable if the advice they provide is found to be deficient.

Section 4-3. Concept of range training design

4.12 The purpose of range training is to develop the individual and collective training requirements of the unit. The training requirements are directed in the Formation Commander's Directive, which details the ATL/standard that must be achieved. A range activity should not be seen as a single activity, but a series of events designed to meet the required ATL/standard over the course of a training cycle.

4.13 For example, the design of dismounted infantry training should be in conjunction with *LWP-G 7-7-8, Train the Battle Shot*. Training of the battle shot follows a logical progression from simple to complex shooting, which is conducted under conditions similar to battle conditions. The design of range training should follow this progression, as well as account for the consolidation of basic skills before being combined into collective exercises.

4.14 Depending on the complexity of the activity, the concept design phase includes scoping, concept analysis and refinement, the conduct of development and initial planning conferences, and the development of the endorsed concept document. The concept includes the aim and objectives of the activity.

4.15 Progression of training. Unit COs are responsible for the training progression that ensures each participant (OIC Practice, SS and firers) is at the required level to commence the ensuing activity. The OIC Practice is responsible for the activity progression specific to that range (walk-through with SS and firers,

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dry, blank, live for Manoeuvre ranges, etc). All training must be conducted in accordance with the unit or sub-unit training program or mission profile. The culture of range activities should be seen as a training continuum, designed to develop the collective proficiency with SA and support weapons and platforms, rather than been seen as a testing and regimen. A live fire exercise is not necessarily the culmination of readiness, it is a step on the path of an overall assessment by a certifying authority for readiness. This means, it is appropriate to conduct walk-throughs and dry rehearsals, to ensure range participants develop their understanding of the correct TTPs. The training progression must be included in the range administration instruction and RA, including any approval to conduct UOs on a Manoeuvre range. The OIC Practice must ensure that progressive training (relative to the complexity of activity) has occurred and that firers and safety staff are at the appropriate standard prior to commencing the live fire.

4.16 If it is not possible for the OIC Practice to personally assure that firers and small teams have completed the appropriate training progression, the relevant commander (section or platoon [E]) is responsible to guarantee that their organisation has completed the training progression as detailed in the range administration instruction and RA. The relevant commander is to note any training deficiencies (eg, individuals and/or small teams that either missed or were assessed as not yet competent in lead up training activities) and any steps that have been taken to rectify these deficiencies (eg, retraining and/or detailed rehearsals). Live fire is not to commence until the OIC Practice is satisfied that the correct training progression has occurred and/or appropriate mitigation is in place (this assurance may require additional rehearsals, walk-throughs, reassigning positions, additional safety staff, identification of inexperienced firers, or removal of personnel and/or small teams from the practice).

4.17 Complex live fire activities are to progress in a natural and logical sequence; for example, for dismounted elements the activity progression must include:

- a. walk-throughs
- b. demonstrations
- c. individual movement
- d. pairs
- e. fire teams
- f. section manoeuvre.

4.18 The progression should include dry¹, blank, training system emulators (eg, laser systems) or non-lethal training ammunition (NLTA), and then ball firing as deemed appropriate by the OSE (minimum rank LTCOL [E]) in accordance with the standards of the safety staff and firers. It is to be conducted on the ground/objective/facility that the final activity is to be conducted on unless stipulated otherwise in this publication or has been waived by the OSE (minimum rank LTCOL [E]).

4.19 When assessing the requirement to include various aspects into the progression of training for a particular range practice the OIC Practice is to consider the impacts that the type of activity (buildings trenches, close country, etc), ground, weather and fatigue may have on the safe conduct of their range practice.

4.20 A dry rehearsal/walk-through is to be conducted prior to each progression of training and is to reinforce the safety brief. Only the OIC Practice may authorise target placement and/or target changes. Where target placement changes arcs of fire, the safe placement of personnel is to be considered and if necessary a dry practice is to be conducted.

4.21 Training is to be in accordance with the mnemonic DRIPS as follows:

- a. **D** = demanding
- b. **R** = realistic
- c. **I** = interesting
- d. **P** = progressive
- e. **S** = safe (most importantly).

1. Mounted training progression is in accordance with LWP-G 7-3-2, *Australian Defence Force Range Orders (Mounted)* [Chapter 9].

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4.23 Considerations. Before commencing the planning and preparation of an activity, planners are to be conversant with this publication and the relevant publications listed in the associated publications list. When planners are familiar with the appropriate information, they should consider the following, at a minimum:

- a. the aim of the range practice
- b. development or confirmation of the training continuum for the activity, taking into consideration the current level of training and experience of all participants
- c. the training required to achieve the aim
- d. the requirement for reconnaissance
- e. the need to submit bids for the required ranges
- f. the location (grid references) and condition of the range/training area and associated facilities
- g. restrictions on the use of the range/training area
- h. the assistance required
- i. briefing, training, coaching, ammunition points, and target and impact areas (as applicable)
- j. access routes and travelling times
- k. communications requirements
- l. medical requirements
- m. sentry and work party requirements
- n. stores requirements
- o. time and space relationships, including:
 - (1) the number of personnel to be exercised
 - (2) the time available
 - (3) the number of frames/lanes (as applicable)
 - (4) the availability of coaches/range staff
 - (5) planning for the activity, including concurrent training
 - (6) appointing and giving a preliminary brief to officers, WOs and NCOs who are to assist in the conduct of the practice after confirming their qualifications to do so
 - (7) commencing RA.

4.24 After action review. To support after action review requirements, for the purpose of debriefing activity participants and safety staff and in order to assist with lessons learned, the use of recording devices is encouraged where practicable and appropriate to do so.

4.25 Fire threat. When planning a range activity, the user must be aware of and comply with the requirements of the *Defence Training Area Management Manual*, Defence personnel must not conduct live fire activities on any training area or range when a Catastrophic Fire Danger Rating (Code Red Rating) is identified by the state or territory fire authority unless the activity occurs at a purpose-built indoor range and all projectiles and pyrotechnics can be contained within the facility. While a state or territory may declare a Total Fire Ban, the decision to allow live fire activities rests with specific personnel listed in *Defence Training Area Management Manual* and is dependent on factors listed within that manual.

4.26 When planning training using live ammunition (including blanks, pyrotechnics and NLTA), the possibility of fire is to be considered and appropriate measures taken to mitigate the risk. Planning is to include actions in the event of a fire as well as measures to manage any fire, including the protection of personnel, equipment, property and the environment (in that order). This planning is to occur for all range activities, including those activities conducted in CTA/depos/unit open areas.

4.27 Short-notice change to the nature of practice. Prior to implementing any short-notice changes² to an activity, the OIC Practice is to ensure the updated activity is within the training level and capability of the activity participants and staff. The OIC Practice is to ensure that Range Control and the UCO/IOC is aware of, and approves, such changes. The RA is to be reviewed and amended as required.

4.28 Ground. During the planning phase the ground is to be considered with regard to the possible impacts on the safe conduct of the activity (eg, trip hazards and impediments on target visibility, and potential communications equipment black spots). Mitigation is to be developed and included in the range briefs.

4.29 Use of lasers. When planning activities that incorporate laser use, consideration is to be given to the laser safety requirements, including the development of laser hazard area (LHA) templates, as described in the *Defence Radiation Safety Manual*, and this publication.

Section 4-4. Detailed planning phase

4.30 During the detailed planning phase, the concept is developed and the supporting plans and instructions are produced. This phase may include site survey or reconnaissance, planning conferences, and player planning.

4.31 Planners during this phase are to:

- a. submit bids for the required ranges, ensuring complete details of the ammunition to be used are included (see [Chapter 7](#) for additional information)
- b. start administrative preparation
- c. prepare a plan for the activity, including concurrent training and risk management
- d. prepare the exercise safety structure
- e. appoint and brief the personnel who are to assist in the conduct of the practice, after having confirmed their qualifications to do so.

4.32 Bids for ranges. Bids are to be submitted to the appropriate authority in accordance with the procedures laid down by the relevant range authority HQ.

4.33 Administration. Administrative preparation must commence as soon as possible after requested range bookings are confirmed. The following is an administrative checklist of points to be considered when planning a range practice:

- a. submit range details as per local TASO
- b. issue a wngo
- c. carry out administrative briefings
- d. submit requests for:
 - (1) ammunition

2. Short-notice changes include, but are not limited to: the use of ammunition with an increased ADA or training requirements; and the use of different weapon systems and different FPs. This does not include changes such as the use of a different ammunition types where there is no increase in ADA, or the movement of the practice between adjacent ranges with identical TASO where Range Control has directed and/or approved the change.

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- (2) transport
- (3) assistance (eg, coaches, an armourer and work parties)
- (4) accommodation, if applicable
- (5) stores and portaloos, as applicable to the practice
- (6) rations and water
- (7) warning advertisements, as necessary
- (8) targets and equipment
- (9) medical personnel and equipment
- (10) communications equipment
- (11) public address equipment, if required
- (12) a qualified DMEO operator and equipment for the destruction of UXO
- (13) firefighting equipment
- e. ensure the provision of maps, range orders and an RDAST
- f. ensure weapon serviceability
- g. indent for any range-specific stores not already covered in this paragraph
- h. formulate a casevac procedure/plan
- i. check references for amendments (safety signals, etc)
- j. determine the requirement for and submit, any waivers to COMDT CATC no later than 28 days before the activity.

Range instruction and risk assessment

4.34 With the introduction of LRSMT (commonly known as Land Range Safety Management Tool), COs checklist and updates to LWP-G 7-3 suite of range safety publications, the requirements for a written standalone range instruction has changed. Formations and units may require range and administrative instructions (usually for new, major or complex activities) but these are no longer mandated.

4.35 Range activities may now be approved via an OPOD or other written communication that includes the necessary mounting details not covered by the LRSMT and CO's checklist. Formations and units can develop standing RAs for use of a range facility (see [paragraph 4.39](#) for additional information).

4.36 Permanent ranges. Instructions and RA are not mandatory for practices conducted on Permanent gazetted ranges if the range is covered by a TASO and the practice is conducted in accordance with the LWP-G 7 series and applicable weapons publications. However appointments must be notified in writing (Range instruction, PRD³, OPOD, ROs or LRSMT) and a (standing) RA to get to, operate on, and return to base may be required in accordance with the Unit CO's directions.

4.37 Manoeuvre ranges. Manoeuvre range practices require the following documentation to be completed and certified by the relevant authority (see [Table 4-1](#)):

- a. RDA safety trace
- b. RA
- c. LRSMT authorisation (as per requirements)
- d. health support plan (HSP)
- e. CO's checklist
- f. Appropriate training/progression program as necessary
- g. Mounting Documentation. All range appointments are to be notified in writing (Range instruction, PRD, OPOD, ROs or LRSMT). For Company and above range practices a detailed mounting safety

3. Permanent Range Detail.

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instruction (OPORD or instruction) is required unless waived by unit CO or Formation Commander. See [paragraph 4.39](#) for additional information on safety instructions.

- h. Communications annex/document where a DPRAC is appointed.

Table 4–1: Documentation for the conduct of a range practice

<i>Range category</i>	<i>LRSMT authorisation</i>	<i>Risk assessment</i>	<i>Range danger area trace</i>	<i>Health support plan</i>	<i>CO checklist</i>	<i>Range instruction/OPORD</i>
Permanent Basic/Complex	Yes ⁽¹⁾	No	No	Standing HSP up to 12 months	No	No
Manoeuvre	Yes ⁽¹⁾	Can be standing or exercise wide ⁽²⁾⁽³⁾	Yes	Yes	Yes	Yes Coy and above ⁽⁴⁾
Note: <ol style="list-style-type: none"> 1. If no access to LRSMT can be authorised by a Range instruction, PRD, OPORD or ROs. 2. Unit CO may authorise no RA for the conduct of a simple manoeuvre activity (limited to individual through to section static and manoeuvre activities on open ground by day with no HE or urban terrain). 3. Standing or overall RAs require the OIC is to prepare a SRSC. 4. For Coy and above range practices a detailed mounting safety instruction (OPORD or instruction) is required unless waived by unit CO or Formation Commander. 						

4.38 Regardless of the range type used, the appointing authority is to ensure all safety requirements (including range briefs and walk-throughs) from the relevant LWP-G 7 series publications are met and that an appropriate training continuum (including rehearsals) is developed.

4.39 Risk assessments. All ranges that require a separate RDA safety trace must be covered by a RA developed following the Military Risk management methodology. The only exception to this requirement is that a unit CO may authorise (in CO's Checklist) the conduct of a simple manoeuvre activity (limited to individual through to section static and manoeuvre activities on open ground by day with no HE or urban terrain) without requirement for a RA. A RA may take the form of a standing RA (covering various range complexes/areas/facilities which identifies and mitigates the general risks for unit exercise activities), be part of a wider activity RA (under a DPRAC/CSO) or be a specific document pertaining to that range activity. Standing RAs are to be reissued annually and reviewed by the OIC practice prior to each range activity. Regardless of the form of the RA, it is vital to ensure that all risks for the specific range activity (including risks such as training progression and experience levels of staff and participants) are identified and minimised as reasonably practical through updating and re-authorising the document prior to the conduct of the activity. It may not always be possible to include all risks specific to each activity in an overarching RA and as such when standing or wider activity RA are employed, OIC is to prepare a specified range safety check (SRSC).

4.40 Specified range safety check. The SRSC identifies and mitigates the specific risks the range practice will create, such as the experience levels of firers and safety staff (weapon maturity of firers, time working together as a team, currency, complexity, time availability, tiredness, etc [see [Annex C](#) for an example]). This SRSC ensures that the OIC Practice has a thorough understanding of the potential dangers and the actions required to remove/limit their impact. This document is to be authorised by the CO and attached to the CO's checklist.

4.41 RA/SRSCs are to be reviewed prior to and during the range activity. Where additional mitigations to the identified risks are required during the activity, the OIC must implement those changes and update the documentation.

4.42 The following applies when documentation is developed centrally under the direction of the DPRAC/CSO (formation exercises) or DPRAC (unit-level exercises):

- a. OIC Practices are not required to prepare their own documentation (less SRSC when required) if it is not practical to do so.

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- b. OIC Practices must read, familiarise themselves and acknowledge the range documentation as it relates to their activity.
- c. OIC Practices must conduct a reconnaissance and walk-through prior to commencing the practice. OIC is to read and confirm that the RA covers the requirements of their particular practice. If not, they must develop a SRSC and raise the discrepancies observed with the DPRAC/CSO, as appropriate. These discrepancies must be recorded and mitigated (in the SRSC) before proceeding and approval to commence from the DPRAC/CSO is granted.

4.43 The following guidelines for preparing HSPs apply:

- a. HSPs are to be approved in accordance with *ASI(P) Part 8 - Medical* [Chapter 6, Health Support Plans].
- b. For maritime firings, HSPs not prepared by a medical officer, are to be endorsed by the Fleet Health Division, before being approved by the UCO.

Battle Inoculation ranges

4.44 Battle Inoculation ranges. Battle Inoculation ranges are boarded purpose designed manoeuvre ranges that may have multiple start points, firing locations, grenade pits, overhead towers, etc. Administration to use a Battle Inoculation range is similar to that required to conduct a Permanent Basic/Permanent Complex range noting that the staff conducting the activity must be manoeuvre range qualified. At most, a SRSC will be required unless the Battle Inoculation range activity has been conducted by the same personnel and safety staff numerous times without a lapse greater than 30 days. However a (standing) RA to get to, operate on, and return to base may be required in accordance with the Unit CO's directions.

Modifications

4.45 Modifications of range practices. There may be occasions when the standard live fire practices on permanent ranges do not meet unit-training requirements. Standard Practices may be modified without changing the qualification requirements for that range when:

- a. A part, or parts, of a published practice (eg, firing the 100 and 200 m serials only, or firing serials from different live fire practices) are used, this does not constitute a modified practice and there is no requirement to complete an RA.
- b. The revised practice meets the requirements of the TASO for that range - no requirement to complete an RA (eg, different exposure times, sequence firing distance etc).

4.46 Where a revised practice does not comply with TASO it becomes a user defined practice and Manoeuvre range regulations and requirements apply.

4.47 An example of an instruction is provided in [Annex A](#). This example is oriented towards Manoeuvre ranges and will require modification by planners to suit Permanent ranges. The UCO/IOC may modify the content in accordance with their requirements.

4.48 Communications. Large complex range activities require a communications plan. An appointing authority may also direct a communications plan be developed where simultaneous range activities occur or the range practice(s) are complex. Communications plans are to incorporate all exercise and range safety nets and net diagrams.

4.49 For mounted activities – the SO AFV/non-AFV is to have voice communications with:

- a. OIC Practice
- b. each troop leader
- c. each AFV CC.

4.50 Exercise safety instruction. Depending on the scale and complexity of the exercise or activity conducted, an instruction may be required. A safety instruction will be required for multinational, joint, combined arms activities, where more than one manoeuvre element operates simultaneously, or where the Formation Commander/OCE/CO directs. The OCE may delegate the responsibility to produce this instruction to the DPRAC or an OIC Practice for a smaller or less complex exercise or activity.

[Paragraph 4.37](#) provides additional detail for unit and simultaneous sub unit activities larger than a single platoon.

4.51 Approving authority review. The approving authority is to ensure that, at a minimum:

- a. the practice is in accordance with the unit training directive, the OPORD or mission statement
- b. the planning is detailed and accurate, and all relevant risks for the activity are identified and mitigated
- c. all preparation training is progressive and manages complexity
- d. the activity is within the weapon handling maturity of the firers and experience of the safety staff
- e. the level of complexity for the activity is appropriate for the experience of the firers and safety staff
- f. the range layout has been confirmed (ie, triangulation confirmed, dangerous space marked if required, and firing lines/points marked or identifiable)
- g. the walk-throughs and build up training on the range is appropriate and planned to occur
- h. when appropriate or required the CO's checklist is completed and signed
- i. all equipment used is serviceable and associated training has been completed.

4.52 To assist the approving authority to complete this task, a Commanding Officer/approving authority/officer conducting exercise/Officer in Charge Practice checklist is included in [Annex B](#). This checklist is to be completed for all ranges directed by the UCO/Approving authority/IOC and at a minimum for all Manoeuvre ranges, or when a RDAST is being applied to a permanent range.

Range danger area safety trace

4.53 It is the responsibility of the OIC Practice to ensure that the RDAST is completed correctly and has been approved prior to the conduct of the activity in accordance with [paragraph 10.39](#). Aviation Range practices are to be checked in accordance with *LWP-G 7-3-7, Australian Defence Force Range Orders (Army Aviation)*.

4.54 All range and exercise framework documents (range and exercise instructions, the HSP, RA, CO's checklists, and RDASTs) are to be appropriately authorised (signed) and held in accordance with the *Records Management Policy Manual*.

Annexes:

- A. [Example Small Arms Manoeuvre range instruction](#)
- B. [Commanding officer/approving authority/officer conducting exercise/Officer-in-Charge Practice checklist for Manoeuvre ranges](#)
- C. [Example specified range safety check \(completed by OIC Practice and approved by approving authority\)](#)

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Annex A to Chapter 4

Example Small Arms Manoeuvre range instruction

Range instruction for exercise [insert exercise name]

1. A range instruction should explain what is to take place, when, where and for whom.⁴

Aim

2. This should be a clear, concise statement of the aim of the exercise.

Objectives

3. The objectives which are to be achieved and which are relevant to the aim should be listed.

Exercise appointments and duties

4. The rank, name and PMKeyS number of the OIC Practice is initially stated. The responsibilities of the OIC Practice and other staff appointments, including SS, target operators, radio operators, administrative staff and specialists, together with their duties⁵, are described in an annex to the instruction as appropriate. If tasks for staff appointments are detailed and lengthy, a separate annex may be used for each appointment.

5. The location, date and time for rehearsals for all range staff can be included.

Concurrent activity

6. Responsibilities and details for concurrent activities are to be outlined.

Coordinating instructions

7. **Timings.** Outline timings can be given in this paragraph. Detailed timings can be given in a sequence of events and attached as an annex.

Range layout

8. An outline of the layout of the exercise area is provided. A detailed layout of the exercise area, including the location of the assembly area, in the form of a sketch map and an RDAST, is provided in separate annexes. The detail that must be included on an RDAST is covered in [Chapter 11](#). The details in the sketch map will vary according to the type of practice/exercise. In the case of field firing exercises, a sketch map should consist of:

- a. a map of the general area
- b. a map of the exercise/target area (including target triangulation overlays)
- c. a sketch map that includes:
 - (1) datum point (eight-figure grid reference)
 - (2) north point
 - (3) scale
 - (4) distance and bearings to target position from datum point
 - (5) vehicle park(s) (where necessary)
 - (6) concurrent activity area(s)
 - (7) briefing areas
 - (8) medical location
 - (9) ammunition point
 - (10) assembly area
 - (11) battle procedure area

4. References should also be stated (publications, maps used etc).

5. It is not necessary to reiterate in the instruction safety staff duties detailed in this publication. Qualified safety staff must be fully conversant with their duties and responsibilities before being appointed.

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- (12) administration points, if different from [paragraph 8c\(8\)](#) and [paragraph 8c\(9\)](#)
- (13) overlays of target triangulation (where possible/necessary)
- (14) positions of the OHF gun, effects gun (effects bunker) and flanking fire gun
- (15) BNS area(s).

9. Locations. Key locations during the exercise will be detailed using a grid reference. These locations will include:

- a. control HQ/OIC Practice
- b. assembly areas
- c. FPs
- d. concurrent training areas
- e. administrative areas
- f. sentries.

Sentries

10. The following details are specified under this heading:

- a. the number of sentries (manned and unmanned) and their locations as required for the exercise
- b. the rank and name of the member responsible for issuing each sentry with the written brief
- c. the name of the OIC Practice responsible for ensuring that the sentries (manned and unmanned) are posted and briefed or established
- d. the report time for the sentry, the place of parade and the person to whom they are to report
- e. the rank and name of the member responsible for establishing the unmanned sentry point(s).

11. A separate order should be prepared for each sentry post. These should be included as annexes to the range instruction.

Communications

12. This paragraph details the communication plan for the exercise, including:

- a. when to establish communications
- b. the instructions for closing down
- c. the actions on loss of communications.

13. Responsibilities for the testing of communication equipment are detailed in this paragraph. Communication equipment requirements for the exercise, together with net diagrams, are listed in separate annexes.

14. Progression of training. This paragraph is to detail the skills, knowledge and attitudes that participants are to have achieved prior to the range practice and then detail the progression of training during the practice.

Briefings

15. Brief to firers. An outline brief giving details of the exercise and range practices should be promulgated to firers as early as possible. This can be given verbally. A detailed brief is issued to firers in the exercise area and can be attached to the instruction as a separate annex. This brief should include:

- a. the safety precautions/hearing protection checked
- b. the range layout (see [paragraph 16e](#))
- c. the exercise aim
- d. the exercise objectives/scoring system (if used)
- e. the type of target being used
- f. the DOWR for all weapon types

- g. details of the danger area, particularly if fire and movement are involved, including air danger height
- h. a warning of the burst safety distances for any pyrotechnics or exploding ammunition being used
- i. the actions on misfires/blinds
- j. the action to be taken if the muzzle of a weapon becomes blocked with mud/dirt
- k. the actions on a prolonged stoppage
- l. the emergency signal to cease fire and the action to be taken on hearing or seeing this signal
- m. the location of health support and the evacuation plan
- n. the action to be taken if a member is hurt or injured (minor/major casualty)
- o. the battle picture
- p. the orders to the commander.

16. Brief to staff. A brief is to be given to staff as early as possible. It can be attached to the instruction as an annex and it must include:

- a. the confirmed allocation of responsibilities
- b. the aim of the exercise
- c. the exercise objectives/lessons to be brought out and critique points
- d. the battle picture/scenario
- e. the layout of the area, including:
 - (1) the briefing area
 - (2) the ammunition point
 - (3) the battle procedure area
 - (4) the concurrent activity stand(s)
 - (5) the start line/FP
 - (6) the arcs of fire
 - (7) the range boundaries
 - (8) the danger areas, including air danger height
 - (9) the flanking fire gun and OHF gun, if applicable
 - (10) the effects gun, if applicable
 - (11) the location of health support
 - (12) the location of firefighting equipment
- f. the emergency signals to cease fire and the subsequent action to be taken
- g. the actions on observing dangerous practices
- h. the actions on observing a barrel blockage
- i. the actions on a prolonged stoppage
- j. the actions on a firer being left behind, for example, a prolonged stoppage
- k. the actions on misfires/blinds
- l. the action if a casualty occurs (to include the medical evacuation plan)
- m. the actions on the outbreak of fire (major/minor)
- n. the timings for reconnaissance and walk-through rehearsal, with the walk-through brief to cover:
 - (1) firers' limits (left, right and forward)
 - (2) target exposures, conducted in exercise sequence, to include switch targets

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- (3) a briefing of battle inoculation weapons and BNS safety staff
 - (4) an explanation of 'tunnel vision' (for weapons with scopes, where applicable)
- o. a statement emphasising that safety staff are not to become unnecessarily involved in the conduct of participants in the activity, unless safety is being compromised.

17. Risk management. A detailed RA is to be conducted which specifically targets those aspects of the activity where there is risk, and not just the movement to and from the range/training area. It is to be included as an annex to the instruction. The risk management plan is a 'live' document, which is to be continually reassessed prior to and throughout the conduct of the range practice.

Administration

18. An outline of the administrative plan to support the exercise is included in this paragraph. The rank and name of the member responsible for the submission of documentation for these items to the appropriate controlling authority is provided. If administrative requirements are complex, they should be included as separate annexes.

Dress and equipment

19. Dress. Dress for firers and staff are detailed in this paragraph. Requirements for the wearing of high-visibility clothing by safety staff, combat helmets and body armour, and the use of ear and eye protection are to be included as required for the activity.

20. Special equipment. Any items of special equipment such as maps, compasses and protractors required by staff, firers, officers or NCOs are detailed in this paragraph. Any additional items of special equipment are detailed in a separate paragraph.

21. Weapons. This paragraph details the time at which the armoury is to open, who is to collect weapons and any additional weapons that are required. Time should be allocated for RAEME certification of relevant weapons, accuracy testing of flanking fire and OHF guns as appropriate, and zeroing/boresighting details (as applicable).

22. Transport. This paragraph details the location, time and to whom vehicles are to report.

23. Stores. The stores required for the exercise can be listed in a separate annex. In this paragraph, the rank, name or appointment of the member responsible for drawing exercise stores, along with the place and time of pick-up, are detailed.

24. Ammunition. Ammunition requirements for the exercise can be listed in a separate annex. The number, rank and name of the member responsible for the collection/transport of ammunition, as well as the time and place of pick-up, are detailed.

25. Rations. In this paragraph, the rank and name of the member responsible for the indent of rations is given together with an outline of the ration plan. The outline may include details of pick-up, delivery times and the location for meals and refreshments.

26. Medical. Details of medical cover for the exercise, including the evacuation plan, means of movement and the location of the nearest medical facility, are included here. Reporting times for medical assistants may also be specified. A telephone/extension number of the nearest medical facility must be included.

Coordinating conference

27. The convening of a coordinating conference and orders will often be necessary to ensure a successful exercise. The location, date and time of the conference and attendance will be detailed in this paragraph. An agenda may also be included.

28. As this is only an example of a Small Arms Manoeuvre range instruction, the annexes listed here are not provided. For an example of 'Orders for sentries including sentry net diagrams' see [Chapter 11](#).

Signature Block

Name (*Unit CO or the nominated delegate*)

Rank

Appointment

Date

Annexes:

- A. Risk management
- B. Exercise appointments and safety responsibilities
- C. Sequence of events
- D. Layout of exercise area (sketch map)
- E. Safety trace
- F. Orders for sentries including sentry net diagrams
- G. Brief to firers
- H. Brief to staff
- I. Net diagram for all radio nets
- J. Administrative requirements

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Annex B to Chapter 4

Commanding officer/approving authority/officer conducting exercise/Officer-in-Charge Practice checklist for Manoeuvre ranges

1. This checklist (see [Table 4–2](#)) is to be completed for all Manoeuvre ranges or when a RDAST is being applied to a Permanent range.
2. A single CO/approving authority/OCE/OIC checklist may be completed for multiple range activities during an exercise or course. Where this occurs the checklist must be approved by the unit CO/approving authority/OCE/OIC and is to include details of the activity name or ranges covered by the checklist with a notation in the remarks column when signing that all ranges have been checked. Each OIC Practice is to complete a separate confirmation which is to be attached to the signed checklist.
3. This checklist is to be attached to the range instruction.
4. Once completed, the checklist is a legal document that must be held in accordance with the *Archives Act 1983* as amended.
5. A guide to the completion of the checklist can be found at the *ADF LRS Branch* SharePoint site⁶.

6. <http://drnet/Army/LRS/LRS/Pages/adf-land-range-safety.aspx>

~~OFFICIAL - Sensitive~~**Table 4–2: Checklist for Manoeuvre ranges – Commanding officer, approving authority, officer conducting the exercise/Officer-in-Charge Practice**

Activity name		Activity start date		Activity end date	
Serial	Action	Yes/No or N/A	Remarks		
(a)	(b)	(c)	(d)		
Concept development and planning – CO/OCE to approve					
1.	Is training IAW commander's training directive/mission/intent?				
2.	Is the range practice IAW the training program?				
3.	Has the OIC Practice conducted a reconnaissance of the range ¹ ?				
4.	Does the range instruction and RAS adequately identify hazards and treat all foreseeable risk?				
5.	Have waivers been requested and if so, have controls been identified to support acceptance of increased risk?				
6.	If the range practice is advanced or complex has this been reflected in the RAS?				
7.	Has all applicable doctrine been identified?				
8.	Are the firers and safety staff qualified to conduct/participate in this training?				
9.	Is the training complexity appropriate to the firers' and safety staff's abilities and currency?				
10.	Is the maturity of weapon handling and behaviour appropriate to the task?				
11.	Is there a planned progression of training (including at the range)?				
12.	Does this progression cater for different standards of firers?				
13.	Are there planned walk-throughs for staff and firers?				
14.	Have all OIC Practices been provided with sufficient time to develop an in-depth understanding of the practice and to prepare?				

Serial (a)	Action (b)	Yes/No or N/A (c)	Remarks (d)
15.	Has the CSM/RSM/Coy OC reviewed the plan and been involved in its development?		
16.	Are all appropriate approvals in place (range instruction, RAS, PRD and RDAST)?		
17.	Has the CSM/OPSWO/Coy OC/OPSO reviewed the range and safety briefs to staff and firers ICW the OIC Practice SOM/layout/progression?		
18.	Has the OIC planned all the range activities IAW the relevant doctrine and procedures?		
	APPROVED/NOT APPROVED	Signature:	
Comments: 			
	PMKeyS: Name: Rank: Appointment: Date:		
Conduct – OIC Practice to confirm prior to commencement of activity			
19.	Has a DPRAC been appointed?		
20.	Have the DPRAC checklists at Chapter 14 (Appendix 1 to Annex C, and Annex C to Chapter 14) been completed?		
21.	Is the range construction appropriate for the activity?		
22.	Has the range been constructed IAW the Instruction and RAS?		
23.	Has the SS(s) completed reconnaissance/walk-through and/or wargamed the activity with the OIC Practice?		Has the OIC Practice conducted a walk-through with the SS(s)?
24.	Have targets been triangulated?		

Serial (a)	Action (b)	Yes/No or N/A (c)	Remarks (d)
25.	Are FPs marked (if required)?		
26.	Is dangerous space marked?		UO training
27.	Are no-go areas identified and marked?		
28.	Have briefings to safety staff and firers been prepared?		
29.	Has the doctrine been applied correctly?		
30.	Are all approvals and/or waivers in place?		
31.	Does the activity authorising officer authorise the range IAW this checklist?		
32.	Is there a schedule of review(s) that a member of the command team will conduct during the range activity?		
Deficiencies to be reported to CO/OCE prior to commencement of activity.			
CONFIRMED/NOT CONFIRMED		Signature:	
Comments:			
PMKeyS: Name: Rank: Appointment: Date:			
Post-activity – CO/OCE to confirm completion			
33.	Have all post-activity ammunition requirements been met?		OIC/ATO
34.	Has a TASMIS exit report been completed?		Ops Cell
35.	Has the PAR been completed?		Ops Cell
36.	Were there any incidents?		OIC/OC
37.	Have these been investigated and reported to the appropriate authorities?		OIC/OC

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Annex C to Chapter 4

Example specified range safety check (completed by OIC Practice and approved by approving authority)

<i>Risk</i>	<i>Mitigation (therefore)</i>	<i>Second/third order consequences (so what)</i>
Combatants have not completed task previously	A planned gradual build up with dry, NLTA at unit location Training program and progression of training to be developed and approved by UCO	Complete TNA base line required Training program developed to address gaps Program to be reviewed by appropriate members in CoC Supervision and oversight from experienced unit members Lessons conducted by qualified current and experienced members
Activity will also be conducted at night	Night movement and firing to be revised and taught as required (new team members). Night firing program developed Progression of training developed	Training program amended to reflect night serials Develop synergies as required from daytime training serials in training program
New members in team	Pair an experienced combatant Time required to integrate into team	Attend all lessons and training activities Assessment by experienced unit members after each teaching phase
Changed range conditions	Detailed reconnaissance by all range staff and walk throughs with firers prior to range activity	Time to achieve this limited and may need to be finalised immediately prior to activity
New equipment	All members to complete training in equipment and pass training test as required All members to use equipment dry in lead up training as appropriate and approved by UCO	
Inexperienced range staff	Attend similar ranges to gain experience Invite and appoint an experienced supervisor to mentor range staff and oversight range	Time and space considerations
Prepared by:	Checked by:	Approved by:
		LTCOL/MAJ

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Chapter 5

General safety

Section 5-1. Introduction

5.1 This chapter describes the general range safety precautions applicable to Permanent and Manoeuvre ranges. Specific range safety that is relevant to other ranges is contained in this chapter as well as in other LWP-G 7-3 series publications.

WARNING

As close to an activity as is reasonably possible, the OIC Practice and SS(s) (and the DPRAC, DSO/CSO when appointed) are to confirm that the doctrine procedures and equipment they will be applying and using are correct and up to date. This confirmation is conducted by checking Doctrine Online and the *ADF LRS Branch* SharePoint site¹ for updates and changes to doctrine, procedures, safety requirements, restrictions, caveats and so on which may be relevant to the planned activity. Changes and updates are to be implemented immediately. Failure to comply with this directive may result in injury or death. Additional information is available in [Chapter 11](#).

Section 5-2. Personal protective equipment safety precautions

5.2 Dress. All personnel are to wear the applicable protective dress as determined by the nature of the practice being conducted in accordance with the stipulations in the relevant LWP-G 7-3 series publication.

5.3 Wearing of helmets. Only authorised Combat helmets are to be worn when employing all natures of HE ammunition.

5.4 Hearing protection. Hearing protection is to be worn by personnel participating in all firing activities in accordance with the *Defence Safety Manual*. It is the responsibility of personnel conducting practices or activities to ensure that all personnel participating in, or who are in the vicinity of, the practice or activity are wearing approved hearing protection. Personnel conducting practices or activities are not to commence the practice or activity until all participants have satisfied this requirement. Hearing protection applied is to comply with AS/NZS 1269.3: *Occupational noise management - Hearing protector program*.

5.5 Double hearing protection. Double hearing protection is the wearing of both earplugs and earmuffs together (reactive hearing protection is not double hearing protection). Live firing with certain weapons requires both double hearing protection and a combat helmet. Where the interface between a combat helmet and hearing protection precludes the wearing of combat helmets, the wearing of double hearing protection takes precedence.

5.6 Protective eyewear. When required for the conduct of certain range practices or the firing of certain natures of ammunition and weapons, the approved protective eyewear compliant with AS/NZS 1337.1: *Personal eye protection - Eye and face protectors for occupational applications* is to be worn. UCO/IOC may with the appropriate RA authorise range firers and/or safety staff to not wear protective eyewear where it is not practical (eg, during a parade where blank ammunition is fired) or when it contravenes TTPs. Clear lenses are to be worn at night and/or in low light conditions unless the lens worn is specifically designed for night use (noting that some lens colours filter the spectrum of light and will impact the user's ability to observe lasers and read maps). Protective eyewear is not required while using NVG, but must be fitted as soon as it is not in use. Range practices where protective eyewear is to be worn include:

- a. all F88, EF88, HK417, F89, MAG-58 and 12.7 mm Live Fire range practices²

1. <http://drnet/Army/LRS/LRS/Pages/adf-land-range-safety.aspx>

2. If firers have been approved to not wear eye protection by UCO/IOC when conducting dismounted static MG practices, cushioning material must be placed at the FP. It must be placed under the ejection opening to stop ejected rounds and link bouncing.

- b. 84 mm DFSW practices in accordance with *LWP-G 7-3-1, Australian Defence Force Range Orders (Dismounted)* [Annex D to Chapter 5, and Chapter 6]
- c. all close combat shooting techniques/UOs range practices
- d. 9 mm self-loading pistol practices where the distance between firers is 4 m or less
- e. where using the magazine fill station to fill BlueFire® simulated magazines in the WTSS
- f. when the OIC Practice assesses through their RA that a ricochet hazard exists (eg, where the dirt will form clods after firing BNS charges placed below ground level)
- g. during use of 12 gauge Shell cracker from the Remington 870P.

5.7 Dress and use of body armour with or without training plates and/or soft armour inserts. Unless otherwise specified, training plates and/or soft armour inserts may be worn with the body armour vest as part of the SCE during live fire (including WTSS) practices. Unless specific dress is mandated for a range practice or weapon nature, the UCO/IOC may vary dress as required to meet training requirements.

5.8 Lasers. Laser hazards and the safety requirements that apply to laser use are detailed in the *Defence Radiation Safety Manual* and [Chapter 8](#).

Fumes and lead content

5.9 Indoor ranges present a number of hazards to users, cleaning staff and other contractors who are required to work within them. One hazard is the risk of exposure to an excess level of inorganic lead. Legislation defines a lead hazard as being in the form of fumes, small airborne particles of lead, and deposits of lead dust on horizontal surfaces and areas of entrapment.

5.10 Indoor ranges are to be the subject of lead-management plans in accordance with *National Standard for the Control of Inorganic Lead at Work* (NOHSC: 1012 [1994]). These plans rely on informing contractors and users of the ranges of the risk from lead, the effective personal control measures available to eliminate or minimise an individual's exposure and the elimination of the lead risk by appropriate design, including the use of ventilation and effective cleaning methods.

5.11 The risk management strategy must address the biological monitoring of personnel considered at risk, the verification of the cleaning process by testing and the correct use of appropriate PPE.

5.12 Personnel at risk of exposure are to comply with the lead-management plan applicable to their range. This requires a formal induction briefing on the lead risk (among other safety risks) and the implementation of personal control measures; primarily cleanliness, the isolation of potentially contaminated clothing, and not consuming food or drink within the range facility where a risk of lead contamination is present.

Impulse noise, blast overpressure and whole body vibration

5.13 The noise and sounds effects generated during the execution of some activities goes beyond what can adequately be protected against through the use of in-service hearing protection. This means that during the execution of high-level training and complex live fire activity, participants could be exposed to potentially dangerous levels of noise, pressure and vibration. Individual testing is conducted on each platform or weapon system to inform a review of safe work practices for crew members and local dismounted personnel. Outcomes of this testing are to be included when publishing enforceable exclusion zones and allowable noise exposure tables. Specific safety requirements are detailed in the relevant LWP-G 7-3 series publication and cover off on the following three areas of concern:

- a. *Noise injury.* The risks associated with noise exposure relate to short duration impulse noise (>140 dB for <10 ms) which has the potential to cause auditory injury.
- b. *Overpressure injury.* The risks associated with overpressure exposure relate to the rapid expansion of gases during the firing of main armaments or detonation of explosives that produces a supersonic blast wave which has the potential to cause serious, permanent, injury.
- c. *Whole body vibration injury.* The risks associated with whole body vibration relate to the transmission of vibration to mounted crews when the main armament is fired which has the potential to cause musculoskeletal injury and organ damage.

Section 5-3. Range qualification and weapons training

5.14 Personnel with range qualifications are to undertake currency training each year. This training will usually be conducted during or as near as possible to the annual induction training by passing a theory test (and a practical test [only for Manoeuvre ranges]) for the range qualifications they are likely to employ in the following year. A qualified member cannot hold a range appointment until they have successfully undertaken the relevant currency test. Prior to fulfilling a range appointment on a specific category of range for the first time in the 12 months, a practical refresher/rehearsal is to be conducted prior to the conduct of the range. Additional details are contained within [Chapter 3](#).

5.15 Range qualification courses. Trainees undergoing training and/or assessment for the OIC Practice and SS qualifications while on approved ADF range qualification courses may observe the firing/throwing, flight and strike of HE natures of ammunition (as appropriate for the ammunition in use) on Permanent Complex and Manoeuvre ranges and/or during field firing practices. This authorisation only applies while trainees perform the duties of the OIC Practice and SS and are under direct supervision of the qualified OIC Practice and SS for the practice.

5.16 Dry training. Dry training activities are only to be conducted after all weapons, webbing and equipment have been inspected and confirmed clear of ammunition or produce. Careful examination of magazine pouches is to occur and the standard declaration that the operator has 'NO AMMUNITION OR PRODUCE IN MY POSSESSION' is to be made. At the completion of the activity the same clearance is to occur.

5.17 Effective date of qualification. Qualifications become effective when the record of attainment has been signed and the qualification has been entered into PMKeyS. For ADF cadets qualification occurs when the record is entered into PMKeyS and/or the ADF cadet approved electronic records system (some qualifications also have a minimum rank prior to being usable), with the following two exceptions:

- a. during the conduct of a range qualification course where trainees are required to act as OIC/SS on practices while under supervision and/or they act as OIC/SS on a range for a weapon type on which they have just passed the qualification assessment³
- b. during a course where personnel qualify on a weapon(s) that is to be employed on other ranges and/or field training in the course of training and where it is not practical to complete the record of attainment until after the course is completed (where this occurs the evidence of qualification is to be signed by the assessor and student and is to be kept until the record of attainment is signed and the qualification is entered into PMKeyS).

5.18 Range Officer-in-Charge Practice and safety supervisor training. When range OIC Practice and/or SS training is undertaken, the trained OIC Practice and SS remain responsible for all aspects of range conduct and supervision. In addition, they are to be present and in control of the range regardless of the orders and supervision provided by the trainees.

5.19 Weapons handling test or test of elementary training. UCO/IOC are to ensure that WHT or test of elementary training⁴ for the applicable weapon(s) are conducted and passed by all firers and safety staff prior to participating in range practices.⁵ UCOs/IOCs are to designate in writing (eg, in unit RO) the appropriate period, no longer than two weeks within which this testing is to be conducted. For completion of the Individual Readiness weapons component live fire, the WHT must be performed within the preceding 24 hours. Where the Individual Readiness practice is conducted in a WTSS facility the WHT is to be completed preferably on the same day but may be up to seven days prior to the event. Mounted WHTs are in accordance with *LWP-G 7-3-2, Australian Defence Force Range Orders (Mounted)*.

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3. This information applies to range qualification courses where personnel progress from being supervised as OIC/SS on a one-to-one basis (when deemed competent) to operating with minimal supervision (eg, officer NCO mortar course).
 4. ADF cadets conduct a modified test of elementary training on the basis of one instructor per cadet. For additional information refer to the ADF LRS Branch SharePoint site at <http://drnet/Army/LRS/LRS/Pages/adf-land-range-safety.aspx>
 5. When using the WTSS, a WHT is not required for Individual Readiness-qualified personnel (or single-Service equivalent) when conducting live fire practices and computer-generated imagery activities. Personnel are to be qualified in the weapon(s) being employed. This exemption does not apply when conducting the Individual Readiness or equivalent practice as the WHT is integral to the Individual Readiness testing. For further information refer to *LWP-G 7-3-1, Australian Defence Force Range Orders (Dismounted)* [Chapter 3].

5.20 Training establishments. Training establishment staff who conduct weapons training on a regular basis are exempt from completing a WHT prior to every range practice if exempted by the unit CO. The CO of the unit is to stipulate the frequency of WHTs for small arms weapons instructors (the maximum interval which may be granted is six months).

5.21 High-readiness units may alter the frequency for WHTs in unit RO (or single-Service equivalent). As a guide, for weapons which are fired daily (eg, IWS and pistol) the WHT maximum interval is six months. Less frequently fired weapons systems would have a WHT interval no longer than three months. All other weapon systems WHTs are as per [paragraph 5.19](#). A WHT is to be conducted as part of a weapon qualification and applied for all subsequent practices for newly qualified members regardless of their training level within the high-readiness unit until the UCO/IOC declares these firers safe and competent with the new weapon system.

5.22 Revision/dry practice period(s). Prior to all range practices, appropriate weapon handling drill revision is to be conducted. This revision is to be relevant to the range practice and all members are to conduct the revision until they are deemed proficient and safe. The OIC Practice and SS are to pay particular attention to correct equipment set up, state of weapon readiness drills, application of safety catches, finger off the trigger, correct holstering and changeover drills.

5.23 Weapon handling/range maturity. Maturity in weapon handling, range use, range conduct and SS responsibilities comes from constant exposure to appropriate and relevant training activities supported by the gradual increase of complexity and responsibility during the progression of training. Training complexity is not to advance beyond the weapon handling, range use, range conduct, and team or individual experience, currency and/or qualifications of the safety staff and firers. Additionally, team cohesion and collective skills and experience must be assessed as part of the training progression.

5.24 Prior to approving any range practice the appointing authority is to be satisfied that the individual, the team and the safety staff are weapon and range mature (in accordance with their responsibilities) to conduct and/or participate in the range activity safely. They are also to ensure that the training progression has been appropriate. The adherence to this principle is to be enforced by all commanders and becomes critical when advanced and/or complex conduct and/or management procedures are applied.

5.25 Appointing authorities are to ensure that complex activities and/or advanced training and/or range procedures are introduced gradually and that individuals and then teams are assessed as safe prior to undertaking the additional complexity, independent and/or advanced behaviours. Safety staff are to maintain positive control at all times regardless of the standard of training achieved.

5.26 Firer's opposite number. The UCO/IOC may authorise the use of an OPPO (previously known as a range buddy) during advanced training. The primary role of the OPPO is to mentor the firer. Prior to approving the use of OPPOs, the UCO/IOC is to ensure that those appointed have the appropriate experience to conduct their responsibilities safely. The safety staff must also be experienced and able to provide positive control even though an OPPO has been appointed. The OIC Practice is to brief and rehearse the OPPOs in their role prior to the conduct of the activity.

Section 5-4. General safety precautions

Weapon handling

5.27 Unless specifically stated otherwise in this publication, a firer may only fire one weapon at a time.

5.28 Aimed fire. All firing on ranges and as part of field-firing activities is to be aimed. Firers may use the weapon's sighting system or aim their weapon instinctively at a target. There is to be no deliberate uncontrolled or un-aimed fire.

5.29 Rates of fire. Rates of fire are not to be exceeded. Operators are to monitor the heat load in their weapons. The OIC Practice and SS are to enforce the published rates of fire and monitor heat load when weapons are fired for extended periods. When not included in the weapon publication, the rates of fire information is located on the *ADF LRS Branch* SharePoint site⁶. Excessive heat build-up is the primary cause of cook-offs. Barrels and operating groups are to be cool to the touch with bare hands prior to any extended firing serials.

6. <http://drnet/Army/LRS/LRS/Pages/adf-land-range-safety.aspx>

Rates of Fire

In recent years there have been numerous cook-offs due to the use of excessive rates of fire and incorrect barrel change procedures. These cook-offs have led to injuries and weapon damage. In order to ensure a safe working environment and the maintenance of capability, all personnel need to understand and apply the correct rate of fire and barrel change requirements for all weapons under their control in all circumstances, be it in training or operations.

The aim of the rates of fire is to allow the commander to maintain combat capability ie, applying a measured approach to only fire the appropriate number of rounds to cause an effect as the situation dictates. Individuals applying unmoderated excessive rates of fire are not likely to regain or maintain the initiative during an engagement in anything less than a dire emergency over a short period. Junior commanders and individual firers responsible for rates of fire and fire control orders must be constantly assessing the situation during the battle and adjust the rates of fire in order to efficiently neutralise or destroy a threat.

The rates of fire and barrel change requirements for each weapon are calculated to allow it to continue to function with minimum stoppages and to achieve the suppression or neutralization of the threat. Rates of fire will vary from weapon systems and ammunition types and this information can be found in the relevant weapon publications.



APPLYING THE CORRECT RATE OF FIRE WILL KEEP YOUR WEAPON IN THE FIGHT

5.30 Obstacles. The OIC Practice, SS and firers are to ensure that there is a clear line of fire from the muzzle to the target (no obstacles), including the possibility of striking an obstacle (eg, a tree) if a round was fired off-line. Targets are not to be engaged where an obstacle is present and that will cause or is likely to cause detonation inside the burst safety distance for the munitions in use, splashback, and/or ricochets that endanger life and/or material.

5.31 Weapon carriage. The High Ready and Low Ready positions are authorised for use on all ranges in accordance with TTPs and/or LWP-G 7-7-8, *Train the Battle Shot*, noting that:

- all orders to 'UNLOAD' and 'INSPECT WEAPONS' are to be carried out with the weapon pointing downrange and in arcs
- the weapon is to be at ACTION while in the High Ready and Low Ready positions
- the weapon is only brought to INSTANT when it is presented into the Engagement position.

5.32 Use of slings. Slings are used for weapon retention and are an essential item on the modern battlefield for the conduct of such actions as weapon transition and grenade drills. The use of slings on live fire activities has the following restrictions:

- Personal weapons which are slung to the front of the body and which are under positive control of the firer may be at the ACTION condition.
- Personal weapons which are slung to the rear and/or not under positive control of the firer are to be at the LOAD condition.

5.33 Muzzle awareness. Muzzle awareness refers to operators being aware of the direction in which the muzzle is pointing at all times while carrying the weapon. Operators are not to intentionally point weapons at other operators (with exception of force-on-force training exercises or during dry firing exercises using aiming discs).

5.34 Safe direction. The direction the barrel is pointing is such that, in the event that the weapon is discharged, it will not result in death, injury and/or damage to equipment (including ricochet/splashback). A

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safe direction is neither necessarily parallel to the ground nor angled into the air or the ground, but is determined by the individual operator depending upon the situation at the time. During range practices a safe direction will be determined by the OIC Practice in accordance with the regulations in the LWP-G 7-3 series of publications, the standard of training of personnel and the template in use at the time.

5.35 Downrange. The term 'downrange (and within arcs)' is used to describe the safe direction weapons are to be pointed when on a range (includes NLTA). During the conduct of the Unload and Inspect Weapons drill, the barrel is to be parallel to the ground pointing downrange and within arcs or safe direction. Weapons in the UNLOAD condition need not point downrange and within arcs.

5.36 Line of engagement. Firers are to have a clear line of engagement to the target and visible dangerous space that exists from the muzzle to and beyond the target prior to and during any engagement. This includes an allowance for rounds that may be fired off-line (this is particularly important inside the burst safety/splashback/ricochet distance). OIC Practices/SSs are responsible for ensuring that the approved safety angle is adhered to and that all dangerous space is clear prior to firers engaging targets.

5.37 Situational awareness. Maintaining situational awareness is a critical tenet of range safety. It is everyone's responsibility to maintain situational awareness at all times (not just the OIC Practice and safety staff). Situational awareness includes but is not limited to knowing what your role in the activity and includes:

- a. knowing where you are to be at any time
- b. knowing what is occurring around yourself and team
- c. knowing the location of other participants/teams (noting that SS and participants may only know where they and the next team is meant to be).

5.38 Situational awareness is generated and maintained by:

- a. appropriate training
- b. skills and competence to complete the task supported by clear orders with questions and answers
- c. update briefs as required
- d. walk-throughs
- e. rehearsals
- f. target placement
- g. location of firing positions
- h. easily identifiable and marked phase or report lines
- i. wearing a light source (at night)
- j. appropriate use of signals and radios.

5.39 Regardless of the complexity of the practice, the OIC Practice/SS and participants are to ensure that they maintain a high level of situational awareness.

5.40 Lasers and light-emitting diode devices. The use of lasers and LED lights is to be in accordance with the regulations in this publication. Lasers and LEDs are to be employed like weapons. Instructions on the safe use of lasers and LEDs are located in the relevant laser safety paper (LSP) and are to be included in briefings.

5.41 Personal electronic devices. These devices are not to be used during range practices (includes use of phones for personal entertainment purposes). Personal electronic devices may be used for legitimate military purposes.

5.42 Silent cocking the F88/enhanced F88 family of weapons. Silent cocking is a procedure used to minimise noise when maintaining weapons in close proximity to enemy forces, and may be employed in training where approved by the UCO/IOC for the activity noting that:

- a. in the absence of firing the weapon, the only method of ensuring the correct operation of the weapon is the conduct of the trigger function test
- b. where silent cocking is used, a trigger function test is to be conducted prior to the period the drill will be employed (eg, immediately prior to leaving the patrol base).

Weapon cook-off and malfunctions

5.43 Cook-off. Where a cook-off has occurred, the OIC Practice is to cease firing similar weapons. Different weapons firing on the same practice may continue until the serial they are firing is complete. Weapons on the FP are then to be unloaded. The weapon in question is to be unloaded once the barrel has cooled sufficiently to be held in the bare hands without discomfort. The practice is to cease until the reporting procedures in accordance with [Chapter 12](#) are complete. At that time, the OIC Practice may recommence the practice on advising the UCO/IOC or their authorised delegate and in accordance with [Table 3–1](#) of their intent to recommence firing.⁷ Further use of the weapon is to be in accordance with the following:

- a. if injury to a person and/or damage to the weapon has occurred, it is to be quarantined until inspected and then cleared as fully functional by an armourer, or
- b. if no injury to a person and/or damage to the weapon has occurred, the weapon may be reused once cleaned and then a final function test by the OIC Practice/SS deems it is serviceable.

5.44 Weapons malfunction. Weapons that malfunction on an FP are to be unloaded and inspected by safety staff before they are repaired or removed. Where a weapon cannot be unloaded and cleared because of a malfunction, it is to remain pointing downrange until cleared by an armourer and reported in accordance with the *eDEOP 101, Department of Defence Explosives Regulations*.

5.45 Where a weapon fired from a mobility platform (eg, a helicopter or ship at sea) incurs a malfunction that cannot be unloaded and cleared, and where it is impossible for an armourer to be accessed to clear the weapon before removal from the FP, the following is to occur:

- a. The OIC Practice is to determine, if possible, whether the malfunction has occurred with a fired case or a live round remaining in the chamber.
- b. If it can be positively determined that a fired case remains in the chamber and all other live rounds can be removed from the weapon, the weapon is to be visually cleared as much as is possible, isolated, tagged with a brief description of the incident and the words 'WEAPON NOT CLEARED, SUSPECTED FIRED CASE IN CHAMBER', and secured in a transit chest, box or other suitable container until it can be rectified by an armourer.
- c. If it cannot be positively determined that there is no live round in the chamber, if it is determined that a live round is in the chamber, or if live ammunition cannot be removed from the feed mechanism of the weapon, the weapon is to remain pointed/trained in a safe direction and an effort made to obtain advice on dealing with the situation from an armourer or the weapon fleet technical adviser at CASG.
- d. If the malfunction is unable to be rectified, as a last resort only, the weapon is to remain pointed/trained in a safe direction and:
 - (1) if possible without endangering personnel, a bullet-trap blank firing attachment (if available) is fitted to the weapon
 - (2) the weapon is placed into a weapon-clearing station and secured in place, or
 - (3) the weapon is placed into a transit chest or other container in which it can be effectively immobilised.
- e. All personnel are to be removed from the path of the muzzle of the weapon prior to any movement.
- f. The weapon (and container, if used) is to be clearly tagged with a brief description of the incident and the words 'WEAPON NOT CLEARED, LIVE AMMUNITION IN WEAPON'.
- g. The malfunctioning weapon is to be moved by the shortest practical route to a place where it may be inspected by an armourer. The movement is to occur such that the weapon remains pointed in a safe direction and, if necessary, additional material such as filled sandbags placed to absorb any round that may be fired during movement. The weapon is to remain segregated from all other weapons and equipment and, unless secured in an armoury, under the physical control of a responsible person appointed by the OIC Practice to ensure that it remains pointed in a safe direction and that no person, other than an armourer, accesses the weapon without authority from the OIC Practice.
- h. Where possible, the armourer is to be brought to the weapon, rather than the weapon taken to an armourer. This is to minimise the possible danger to personnel and equipment in transporting the weapon in an unsafe condition.

7. The UCO/IOC may place caveats on the practice to reduce the potential for further incidents.

Negligent/unauthorised discharges

5.46 A negligent/unauthorised discharge (ND/UD) is an occurrence where a person performs a negligent or unauthorised act or omission that causes or contributes to the discharge of a weapon. The ammunition used at the time is not a mitigation and an ND/UD can occur with any nature including ball, CTR, blank and NLTA. Where a UD/ND occurs the actions contained within *EMEI Weapon A 229-1, Issue 3, Inspection of Small Arms, Inspection after Suspected Negligent Discharge* are to be complied with. An unauthorised discharge is defined as an occurrence where a person, intentionally and without authorisation, discharges a weapon. In either case, operators may be subject to corrective training and/or disciplinary action.

Suspension of firing

5.47 Firing on all ranges must cease in the following circumstances:

- a. COMDT CATC as the ADF WHS Adviser issues a notice to suspend firing
- b. an ammunition incident occurs, in accordance with the *eDEOP 101, Department of Defence Explosives Regulations* [Regulation 1.3]
- c. aircraft approach the range at a height judged to be less than the restricted airspace height approved for that range, or the danger height for the nature of the ammunition used, whichever is the greater (these heights are specified in [Chapter 10](#))
- d. personnel enter the area
- e. animals enter the direct line of fire
- f. electrical storms approach (if electrical detonators or electrically fired cartridges are being used), or
- g. as directed by Range Control staff or safety personnel.

5.48 The authority that imposes the suspension of firing is responsible for the lifting of that suspension.

5.49 Emergencies, unsafe practices and stop signals. Should any emergency or unsafe practice occur on the range, firing is to cease immediately. The initial order for such a ceasefire may be given by any person giving the command 'STOP STOP STOP!' in a loud, clear voice (or by radio as appropriate). The SS or OIC Practice is immediately also to order 'STOP STOP STOP!' or initiate a predetermined action to signal 'STOP!'.

5.50 On being ordered to stop, firers are to place safety devices on their weapons at SAFE, AFVs/non-AFVs are to 'MAKE SAFE' (ADF cadets using bolt-action rifles are to place the bolt to the rear) and, if possible, place the weapons on the ground. Immediate action is to be taken to deal with the emergency. Firing may recommence once it is safe to do so. The procedures laid down in the *eDEOP 101, Department of Defence Explosives Regulations* [Regulation 1.3] on the investigation of a range incident are to be followed (see [Chapter 12](#)).

Unexploded explosive ordnance

5.51 All UXO is to be recorded, reported and destroyed in accordance with the relevant TASO.

Firing from vehicles

5.52 The procedure for firing from vehicles is described in *LWP-G 7-3-1, Australian Defence Force Range Orders (Dismounted)* [Annex C to Chapter 6], and *LWP-G 7-3-2, Australian Defence Force Range Orders (Mounted)*. Specific information is provided as follows:

- a. For IW, LSW and general support MG firing from non-AFV troop hatches for a Category 8 or Category 12 activity refer to *LWP-G 7-3-2, Australian Defence Force Range Orders (Mounted)* [Section 6-4].
- b. For IW, LSW and general support MG firing from AFV/non-AFV during a mounted manoeuvre or an integrated manoeuvre activity refer to *LWP-G 7-3-2, Australian Defence Force Range Orders (Mounted)* [Section 10-5].

5.53 Vehicle-mounted weapons. Any weapon fired from a mounting fitted in or onto any AFV or non-AFV is, for the purpose of this publication, is a vehicle-mounted weapon and will be subject the additional requirements of *LWP-G 7-3-2, Australian Defence Force Range Orders (Mounted)*. A mounting (cradle, pintle or canopy rail mount) is to be of a Service-approved design and is to be used as originally fitted. Vehicle-mounted weapons are normally fired as part of a field-firing activity; however, they may be fired on Permanent and purpose-designed ranges.

5.54 Non-approved/improvised weapon mounts. The firing of a weapon from any improvised mounting, or from any mounting installed in a manner not previously approved, is not permitted (except in the case of an authorised trial, in accordance with [Chapter 15](#)).

5.55 Practice ammunition. The regulations contained in this and the appropriate weapon publications are to be applied when firing practice natures of ammunition. PPE, as required by the relevant publication, is to be worn.

5.56 Practice/rehearsal areas. These are areas where practice (individual and/or group) is conducted. Such areas must be designated for this purpose and a person(s) with the appropriate skills, knowledge and attitude is to be appointed to supervise all training. Ideally range safety staff should be used. No ball ammunition is to be allowed in this area.

Section 5-5. Night practices

5.57 Use of torches. At night, torches with white light are to be used when filling magazines, clearing weapons, equipment and vehicles. Torches may also be used for scoring and supervising during night firing, and should be fitted with filters to avoid impairing night vision. It is recommended that blue filters be used, as red light impairs the use of surveillance, target acquisition and night observation devices.

5.58 Limit of night visibility. The range at which targets may be effectively engaged at night is termed the limit of night visibility. This is determined by the amount of ambient light, the sighting system of the weapon or the need for artificial illumination. For example, when using iron sights and the naked eye, a firer may be able to identify and engage a target at 50 m. With a night weapon sight the same firer could engage the same target to 200 m. With the aid of some artificial illumination, that same firer, with a night weapon sight, could engage the same target to 300 m.

5.59 Night firing. With the exception of MGs on tripods with C2 sights, the following is to occur during night firing:

- a. Except as specified in [paragraph 5.58](#), no target is to be engaged beyond the limit of night visibility. The OIC Practice is to confirm the engagement distance prior to the practice, using the appropriate sight or illumination.
- b. Safety staff must be able to control:
 - (1) the arc or line of fire
 - (2) the minimum engagement distance
 - (3) the quadrant elevation (QE)
 - (4) the location of firers under their control.
- c. If safety staff are required to move along a firing line when firing is in progress and the OIC Practice determines that the safety of these staff may be jeopardised, they can position a light (other than red in colour) on either end of the firing line.
- d. On practices where targets cannot be engaged within the limit of night visibility (eg, an ambush prior to the trip flare achieving full brightness) or when Claymores fire and create sufficient dust to obscure the targets at the point of initiation, the OIC Practice is to ensure that the rounds fall within the arc by using arc markers or arc stakes.
- e. If firers are to use night fighting equipment (NFE), all the safety appointments must use, at least, the equivalent NFE.

Night fighting equipment

5.60 40 mm and handheld signal illumination flares. When firing handheld signal illumination flares and/or the 40 mm illumination, and/or IR rounds in a field firing situation (can be dry/blank/NLTA or ball), 40 mm illumination rounds may be fired without the requirement of an RDAST. All handheld signal illumination flares and or the 40 mm illumination, and/or IR rounds are to be fired when the following conditions are met:

- a. The firing takes place to a flank and/or from the forward area of personnel.

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- b. No personnel are to be under the flight path of the round including the trajectory of the carrier shell if any (ie, no personnel inside the area that the weapon ADA would cover for each firing including allowance for wind).
- c. All weapon/range safety specific requirements are complied with.
- d. Where flares are used as an alternate form of safety for activity control by the OIC or SS, it is not a requirement to be fired from the flank.

5.61 NFE, while enhancing the conduct of training at night, has certain limitations that must be considered by the OIC Practice when planning and conducting live firing activities. The limitations when using NFE are as follows:

- a. a reduced field of view that impairs peripheral vision
- b. a two-dimensional perception, which reduces the ability to accurately assess distance
- c. an inability to apply hand angles during field firing activities
- d. an inability to distinguish colours
- e. reduced clarity of close objects without refocusing the equipment.

5.62 As a result of these limitations, the rules for the use of NFE will vary depending on the type of live firing practice being conducted and the category of range being employed. Instructions for the use of NFE on the various range categories are detailed in the relevant LWP-G 7-3 series publication.

Section 5-6. General safety precautions physical protection

Blast- and splinter-proof covers

5.63 Blast- and splinter-proof covers are constructed:

- a. to protect the weapon operator(s) and the safety staff from the effects of the blast when firing/throwing/posting, in accordance with doctrine
- b. to protect other participants, observers and/or other personnel within the blast and fragmentation area.

5.64 An ARA unit CO may authorise in writing the inclusion of other personnel in close vicinity of the weapon being fired; that is, authorise protection from the effects of the weapon ammunition nature, forward of the FP to the target only, for those personnel in close vicinity (eg, a manoeuvre team of four firing the medium direct fire support weapon [MDFSW] from a four-person parallel trench). Where this approval is granted the CO has to be satisfied that safety will not be compromised and that action on rehearsals appropriate to the weapon system applied are conducted in accordance with the relevant LWP-G publication (eg, HE grenades will apply the doctrine in *LWP-G 7-3-1, Australian Defence Force Range Orders (Dismounted)* [Chapter 5 and Chapter 6] ensuring that firers and combatants within 20 m have blast and splinter proof cover to protect them in the event of a dropped grenade and the throwing team have blast and splinter proof cover to retire to in case of a dropped grenade. Where personnel undertaking such training have sign off by a formation commander as having met the conditions contained in *LWP-G 7-3-1, Australian Defence Force Range Orders (Dismounted)* [Annex J to Chapter 6], the CO may reduce the inside 20 m distance that blast and splinter proof cover is required to 10 m if supported in an appropriate RA.

5.65 When taking cover after employing the weapon system, the cover is to be high enough and long enough to fully cover an operator in body armour and webbing or individual combat load carrying equipment. Blast- and splinter-proof cover is usually only applied at or adjacent to the FP or specialist bunkers within the RDA, and may be natural or artificial.

5.66 User-constructed blast- and splinter-proof cover must have a minimum uniform thickness, depending on the material used, as follows:

- a. packed earth or fold in the ground: 750 mm
- b. sandbags filled with sand or earth: 750 mm
- c. solid timber: 600 mm
- d. reinforced concrete: 100 mm

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- e. mild steel: 20 mm
- f. the armour on an AFV.

Weapons effects bunkers

5.67 Weapons effects bunkers are constructed in accordance with the design authorities' specifications. If manned weapons effects bunkers are sited within the RDA the following regulations apply:

- a. Personnel in the effects bunker are to be in contact with the OIC Practice at all times. Should communications fail, the practice is to be stopped immediately and the OIC Practice is to make contact with personnel in the bunker and re-establish communications before continuing the activity.
- b. Effects bunkers are to be manned by a minimum of two personnel.
- c. The regulations for the use of flags are to be observed (see [Annex A to Chapter 3](#)).
- d. Falling plates or hard targets are not to be positioned in line with or forward of an effects bunker. The minimum distance that a hard target may be placed in line with the opening to or forward of an effects bunker is 50 m due to the danger of splashback and ricochet.
- e. Targets are to be sited so that:
 - (1) fragments or ricochets do not enter the bunker(s)
 - (2) fire is not directed at the bunker(s).
- f. The throwing of simulators and/or smoke grenades from an effects bunker is prohibited, as a dropped simulator or smoke grenade would require the immediate evacuation of the bunker, thereby placing personnel in danger.
- g. Effects bunkers are not to be manned when in the human dispersion angle and ricochet area (ie, the ADA) of a HE weapon being fired (less HE grenades thrown or posted noting that effects bunker personnel are to be advised when grenades are posted/thrown, are behind blast- and splinter-proof cover which protects them from the grenade detonation and no grenade is to detonate closer than 15 m to the effects bunker).

5.68 Use of weapons in a bunker. The following regulations apply to the use of weapons in an effects bunker:

- a. The weapon is not to be loaded without an order from the OIC Practice.
- b. The weapon is not to be fired in a manner that may cause dangerous ricochets or splashback.
- c. The OIC Practice is to ensure that the weapons are unloaded and cleared by the SS prior to any personnel passing the effects bunker, unless the personnel moving past the effects bunker do not enter the safety angle (ie, the ADA) of the weapon being fired.
- d. Flanking fire guns may be fired from an effects bunker. The regulations for flanking fire are given in *LWP-G 7-3-1, Australian Defence Force Range Orders (Dismounted)* [Annex E to Chapter 6].
- e. HE weapons are not to be fired from an effects bunker (this excludes BNS, Claymores and 40 mm ammunition).

5.69 Flag. The flags used in an effects bunker are vital for safety. They allow for communication between the SS in the effects bunker and the OIC Practice when other means fail. Their use is detailed in [Annex A to Chapter 3](#).

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Chapter 6

Health support to range activities

Section 6-1. Introduction

6.1 The ADF range safety system has been developed over many years and is robust and effective. When all aspects of the range safety training system are complied with, especially the application of range safety controls contained in these orders, an applied progression of training and the positive control of all movement onto and within the range space, the likelihood of a serious, critical, or catastrophic incident occurring is rare. However catastrophic events such as fatal wounding on ranges do occur and there have been seven deaths since 1980 on Australian ranges (five gunshot and two HE weapon systems).

6.2 If a gunshot or fragmentation wounding occurs, it is imperative that first aid is applied as soon as practicable and evacuation is co-ordinated without delay. The health support required for a range practice is based upon extant best practice health policy where progressive controls are applied to treat the identified risks. It is imperative that health support to range activities is planned in concert with the activity concept and mandatory RA.

6.3 This chapter sets out the minimum standards needed to respond to potential illness and injuries during a range practice where advanced medical treatment is available within 3 hours. Where advanced medical treatment is not available within 3 hours, a detailed RA is to be prepared and approved in accordance with single-Service procedures and risk tolerance levels. Regardless, each live fire activity must comply with the requirements of [paragraph 6.8](#).

Health support plans

6.4 All activities conducted within Defence training areas, range facilities or their single-Service equivalent are to have a HSP in place.

6.5 The scope and complexity of the HSP will be informed by the nature of the activities being undertaken, the location of those activities, the identified risks and consequences of injury to participants, and the time it will take to reach advanced medical treatment. For example, a standing HSP may be generic in nature for the support to simple fixed range practice activities (eg, MTRs) and/or those Complex range practices which are completed regularly with the same participants.

6.6 HSPs are to be developed in conjunction with activity planning and are not to be prepared in isolation. The HSP will mandate the minimum medical requirements for the range practice(s) to be undertaken. HSPs will also include details on firing limitations for HE weapons where blast overpressure may adversely impact firers, crew and personnel located in close proximity (ie, within 10 m). [Table 6-2 on page 6-7](#) details the permitted number of firings in a 24-hour period for each weapon system where blast overpressure is to be managed.

Key components of health support

6.7 The key components of health support provision are:

- a. *Prevent.* The preparation of personnel to minimise the impact of environmental and occupational threats to which personnel will be exposed.
- b. *Treat.* Casualties must receive prompt and effective treatment in accordance with their prioritised need through the continuum of first aid, resuscitation, and higher medical or surgical intervention as is clinically required.
- c. *Evacuate.* Casualties requiring evacuation must be moved as soon as is safely practicable from the point of injury or illness, using an appropriate (ie, equipped, configured and staffed) evacuation platform to the health facility or location identified in the HSP.

Section 6-2. Mandatory health support requirements

6.8 The mandatory health support requirements for all live fire practice are as follows:

- a. *Health support plan.* The provision of a HSP that is aligned to the activity RA is required.¹ Health planners must be involved in the RA process to ensure that all risks are considered and based on relevant health threat analysis. HSPs can remain valid for up to 12 months where no significant change in the conduct of the activity has occurred. Health Support Planning should be conducted in accordance with *ASI(P), Part 8 - Medical* [Chapter 6, Health Support Plans].²
- b. *Onsite health support.* All live firing range activities must have designated health support ranging from an Army first aider through to higher level medical support, depending on the complexity and type of practice and the ammunition type to be used. The level of medical support for each type of range is outlined in [Table 6–1](#). The identification and location of the personnel responsible for first aid must be included in the brief to firers. These designated health support personnel must be positioned with an appropriate medical kit to provide treatment as soon as is practicable after injury in accordance with the HSP. Additional details for AFV practices are contained within *LWP-G 7-3-2, Australian Defence Force Range Orders (Mounted)* and additional medical requirements for all maritime firings are provided in [Chapter 17](#).
- c. *Concurrent tasking.* Personnel occupying health support appointments for range activities are not to be concurrently tasked with other activities that have potential to detract from their responsiveness or performance in the primary appointed role.
- d. *Actions on.* All personnel participating in an activity must be briefed on the actions to be taken in the event of a casualty and the specific procedures to be followed. All personnel participating are to be briefed on the location of all the health and safety assets supporting the activity.
- e. *Evacuation.* A suitable mode of casevac with evacuation procedures is to be rehearsed with a focus on route suitability, gate access and time to a suitable medical facility.
- f. *Consultation.* Where it is appropriate (for the conduct of large-scale or remote exercises), the OIC/DPRAC is to ensure the supporting health facilities are aware of the period of the practice or periods of heightened risk. Further, when developing a HSP that has the potential to use civilian health facilities, consultation with such facilities must be undertaken to confirm the capabilities and capacity of the facility.
- g. *Rehearsals.* All key components of a health support response (eg, casualty collection and evacuation processes) are to be rehearsed prior to the commencement of the activity. Remote military and/or civilian responders who are on standby to assist must be contacted immediately prior to the activity to confirm availability, marry-up procedures, rendezvous points, and exchange and/or pickup points.

1. This publication sets out the procedures and processes to treat known risks. These procedures and processes are to be followed for low-complexity fixed ranges, which comply with the regulations in this chapter, and have mitigated these risks as far as is reasonably practicable. Additional information on when an RA is required is detailed in [Chapter 4](#).

2. [http://drnet/Army/EMPA/ASI/P8/Pages/ASI\(P\)_Part_8.aspx](http://drnet/Army/EMPA/ASI/P8/Pages/ASI(P)_Part_8.aspx)

Table 6–1: Minimum medical support required for Australian Defence Force ranges

Type/Category of Range	Army First Aider (1)(9)(14)	Combat First Aider (2)(9)	Patrol Advanced First Aider (4)(9)(11)	Combat Medical Attendant Grades 1 to 5(4)(9)	ADF Medical Technician or ECN 169 Combat Paramedic(5)(9) or (14)	SOF Medic or RAN Clinical Manager	Nursing Officer(7)(9) or Contracted Registered Nurse(14)	Medical Officer(8)(9) or Contracted Doctor(14)
<i>Dismounted practices</i>								
1 to 7	X	X	X	X	X	X	X	X
8a and 8b (Sneaker and Section Defence Range)	X	X	X	X	X	X	X	X
9a ⁽¹⁰⁾ and 9b (SGR and AGR)					X	X	X	X
10a and 10b (DFSW and Claymore)		X	X	X	X	X	X	X
Manoeuvre and 11a (less Urban – no HE natures)		X	X	X	X	X	X	X
Manoeuvre and 11b (Urban and/or – HE natures)					X	X	X	X
NLTA practices and OC spray (training) ⁽¹¹⁾	X	X	X	X	X	X	X	X
CS Gas practices		X	X	X	X	X	X	X
Watercraft Small Arms (No HE)		X	X	X	X	X	X	X
Watercraft HE					X	X	X	X
10c Demolitions ⁽¹²⁾ , EOD, BNS, DMEQ tasks ⁽¹⁰⁾					X	X	X	X
10c EOD HE Practice (HE with NEQ greater than 600 gm per shot)					X	X	X	X
10c Neutralisation/render safe practices (All EOD disruptors ⁽¹³⁾ (No HE in TGT)	X	X	X	X	X	X	X	X

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<i>Type/Category of Range</i>	<i>Army First Aider (1)(9)(14)</i>	<i>Combat First Aider (2)(9)</i>	<i>Patrol Advanced First Aider (4)(9)(11)</i>	<i>Combat Medical Attendant Grades 1 to 5(4)(9)</i>	<i>ADF Medical Technician or ECN 169 Combat Paramedic(5)(9) or Contracted Paramedic (14)</i>	<i>SOF Medic or RAN Clinical Manager</i>	<i>Nursing Officer(7)(9) or Contracted Registered Nurse (14)</i>	<i>Medical Officer(8)(9) or Contracted Doctor(14)</i>
10c EOD Small quantities practice (HE with NEQ (method and target) of less than 600 gm per shot)		X	X	X	X	X	X	X
10c Explosive threat reduction (EOD Sim No1/ITBFE/F4 couplers)	X	X	X	X	X	X	X	X
Artillery practices					X	X	X	X
E1 to E3 ⁽¹⁰⁾					X	X	X	X
<i>Mounted practices</i>								
12a (non-explosive natures)		X	X	X	X	X	X	X
12a (explosive natures)					X	X	X	X
12b (non-explosive natures)		X	X	X	X	X	X	X
12b (explosive natures)					X	X	X	X
Mounted Manoeuvre					X	X	X	X
Aviation practices					X	X	X	X

Type/Category of Range	Army First Aid (1)(9)(14)	Combat First Aid (2)(9)	Patrol Advanced First Aider ⁽⁴⁾⁽⁹⁾⁽¹¹⁾	Combat Medical Attendant Grades 1 to 5 ⁽⁴⁾⁽⁹⁾	ADF Medical Technician or ECN 169 Combat Paramedic ⁽⁵⁾⁽⁹⁾ or Contracted Paramedic (14)	SOF Medic or RAN Clinical Manager	Nursing Officer ⁽⁷⁾⁽⁹⁾ or Contracted Registered Nurse ⁽¹⁴⁾	Medical Officer ⁽⁸⁾⁽⁹⁾ or Contracted Doctor ⁽¹⁴⁾
<p>Note:</p> <ol style="list-style-type: none"> Person trained in Army first aid with the minimum of a First Aid Kit, Basic (NSN 6545-66-146-8479, SCES No. 014523). Combat first aid with the minimum of a First Aid Kit, Combat First Aider (NSN 6545-66-146-8480, SCES No. 014522). Where HE or CS natures, or for mounted practices are employed the combat first aid is to be trained in and deploy with oxygen-delivery capability (CES No. 01452/2). Patrol advanced first aid (SASR only) with the minimum of a Medical Kit, SF Field (NSN 6465-66-149-1627, SCES No. 14542) with oxygen-delivery capability. Combat medical attendant (minimum IET CMA Module 1 qualified) with the minimum of a First Aid Kit, Combat First Aider (NSN 6545-66-146-8480, SCES No. 014522) with oxygen-delivery capability. ECN 169 combat paramedic or a medical technician (Australian Defence Force Medic Course qualified) with the minimum of a Medical Equipment Set, Medical Assistant, Advanced (NSN 6545-66-148-3059, SCES No. 14539) with oxygen-delivery capability. SOF medic or RAN clinical manager with the minimum of a Medical Equipment Set, Emergency Treatment Tri-Service Pattern (NSN 6545-66-132-7801, SCES No. 11440) ADD Fleet Medical Emergency Kit with oxygen-delivery capability. Nursing officer (Military Advanced Resuscitation Course qualified) with the minimum of a Medical Equipment Set, Emergency Treatment Tri-Service Pattern (NSN 6545-66-132-7801, SCES No. 11440) with oxygen-delivery capability. Medical officer with the minimum of a Medical Equipment Set, Emergency Treatment Tri-Service Pattern (NSN 6545-66-132-7801, SCES No. 11440) with oxygen-delivery capability. All levels of health support must have current skill competence as per trade, LMP or professional registration requirements, with skills maintenance logbooks completed and in date. A medical officer signed authority is mandatory. When firing or disposing of WP or RP munitions, members must also have 20 L of sterilised water. A driver and vehicle capable of transporting a patient on a stretcher must be present at all times. Live OC spray is only employed on OPS. NM140 is not considered an HE nature in this context. Includes 12 gauge blank and projectiles, 0.5 cal blank cartridges, 30 mm RAKED. Or single-Service equivalent – members must have received training in the management of gunshot wounds. Under Field Training Medical Support Standing Offer contracted health staff (civilian, non-uniformed) are coordinated by formation HQ. 								

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First aid

6.9 The provision of first aid to a casualty is to be applied as soon as safely practicable. First aid may be applied by the nearest person until the mandated first aid qualified person arrives.

Resuscitation

6.10 Resuscitation is the provision of treatments that seeks to extend life, supported by advanced interventions to treat and stabilise essential body functions and/or to prevent further deterioration. This level of care will usually be provided by a medical officer-led team and be delivered in a designated ADF facility (or civilian equivalent); or in an area with access to appropriate equipment, medical stores and pharmaceuticals.

Specialist medical and surgical intervention

6.11 Hospital-level care provides an extension of previous treatments that may include surgical intervention to address serious life- or limb-threatening situations arising from injury, and to further stabilise the casualty's condition. This level of care will usually be provided in a designated hospital facility (military or civilian).

Evacuation requirements

6.12 The aim of evacuation is to move the casualty safely and efficiently (with en route care provision) from the point of injury to the designated health facility as soon as is safely possible. Evacuation capabilities (ie, personnel, vehicles and equipment) in support of the activity are to be detailed in the HSP.

6.13 The OIC Practice and personnel responsible to effect the evacuation (ie, medic or driver) are to understand and comply with the TASO evacuation plan. Where the TASO do not include an evacuation plan, the activity HSP is to detail the evacuation routes (including alternates) and the supporting health facility's contact details. The evacuation routes are to be rehearsed prior to the commencement of the activity to confirm route status.

6.14 Evacuation capabilities may be ADF or civilian assets and could comprise surface, water or air platforms.

6.15 Surface evacuation. When military or civilian ambulance assets are available but not permanently onsite, the activity may continue on the basis that the assets to move a Priority 1 or Priority 2 casualty are available to reach and transport the casualty to medical treatment within the time frame stipulated in the HSP. Where the Priority 1 and Priority 2 medical transport is not onsite, a dedicated driver and vehicle capable of transporting a sitting Priority 3 casualty must be onsite. Where practicable, the evacuation driver is to have a navigator/assistant to assist with route identification, reading route cards, accessing gates as the medic is with the casualty.

6.16 Aeromedical evacuation. When planning to use aviation assets for casevac, the OIC Practice or delegated health representative must liaise with the supporting agency (military or civilian) to confirm aeromedical coverage, available capability, limitations and communication requirements prior to commencement of the activity. Additionally, the marry-up procedures between the aeromedical evacuation platform and the relevant medical facility to which the casualty is to be taken are to be rehearsed prior to the commencement of the activity.

6.17 Maritime evacuation. When planning to use maritime assets for evacuation, personnel responsible for the conduct of range practices must complete direct liaison with the supporting military or civilian agency to confirm the availability, capability and the communication requirements prior to commencement. Maritime assets must have a suitable access to the receiving hospital/medical facility or have arranged procedures for transferring casualties to the supporting hospital/medical facility.

Health support approval and communication

6.18 The following guidelines for preparing HSPs apply:

- a. HSPs are to be approved in accordance with *ASI(P) Part 8 - Medical* [Chapter 6, Health Support Plans].
- b. For maritime firings, HSPs not prepared by a medical officer, are to be endorsed by the Fleet Health Division, before being approved by the UCO.

6.19 Where a range practice is to be conducted and the mandatory requirements in this chapter cannot be met (eg, remote location and an extraordinary circumstance develops during planning/conduct that has

additional unforeseen risks to be mitigated), advice must be sought from appropriately qualified health personnel during the planning phase or as soon as the issue is identified to confirm if any additional support requirements or risk controls are needed.

6.20 Personnel conducting practices/activities must confirm that a means of direct communication to all supporting military or civilian health support assets is available and functioning prior to the commencement of the activity.

Blast overpressure

6.21 Table 6–2 details the number of rounds personnel within 10 m are allowed to be subject to in a 24-hour period with weapons that have significant blast effects. The limits in Table 6–2 are not to be exceeded. Additional requirements are detailed in LWP-G 7-3 series publications.

6.22 When firing heavy calibre MGs, and so on, from enclosed structures (includes overhead protection but excludes turrets which separate the crew from the blast overpressure), a separate RA is to be produced that treats the risk of blast overpressure on firers and personnel collocated with the weapon firing.

6.23 Blast overpressure calculations. Table 6–2 details the allowable number of rounds per day per firer/SS when firing the M72A6 and 84 mm Carl Gustaf all natures including subcalibre. Each round has a specified points value and each firer/SS is not to exceed 100 points in total in a 24-hour period.

Table 6–2: Blast overpressure calculations

Round type	Allowable number of rounds per day	Point value per round
s33(a)(ii)		

6.24 Firing positions. Only those firing positions detailed in Table 6–2 are to be used. Firing from the prone position with 84 mm Carl Gustaf and M72A6 all natures is prohibited.

6.25 Noise and blast overpressure exposure rates for AFV are all specified in LWP-G 7-3-2, *Australian Defence Force Range Orders (Mounted)* [Chapter 4].

6.26 Each AFV or non-AFV is to carry the current first aid kit in accordance with the applicable CES.

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Chapter 7

Ammunition

Section 7-1. Introduction

7.1 The term 'ammunition' encompasses all munitions, pyrotechnics, explosives and inert versions of the live ordnance. Live ammunition is ammunition that contains an energetic chemical composition (propellant, explosive, pyrotechnic etc). Blank and practice natures are classified as live ammunition for EO handling and accounting purposes. However, the different natures have different safety requirements when being employed. For additional requirements see *LWP-G 7-3-1, Australian Defence Force Range Orders (Dismounted)* [Chapter 3] and *LWP-G 7-3-2, Australian Defence Force Range Orders (Mounted)*. Drill, dummy and cutaway (sectionalised) instructional ammunition is inert ammunition. The OIC Practice is responsible for the safe conduct of the ammunition activities associated with the activity which includes the safe return of unused ammunition to the supply organisation.

7.2 The return of ammunition is to take place in accordance with the *Electronic Supply Chain Manual, Volume 4, Supply Management Process* [Section 8, Chapter 1].

7.3 The general safety precautions and procedures required for the handling and movement of ammunition are contained in the following publications:

- a. *Explosives Act 1961*
- b. *Explosives Transport Regulations 2002*
- c. *Australian Code for the Transport of Explosives by Road and Rail*, 3rd Edition
- d. *Defence Road Transport Manual*
- e. *eDEOP 101, Department of Defence Explosives Regulations*
- f. *Defence Security Principles Framework*.

7.4 It is the responsibility of units moving ammunition to comply with these instructions and procedures.

Section 7-2. Handling all natures of ammunition

7.5 This section describes the general handling precautions for all natures of ammunition. These precautions are to be observed in addition to those detailed for specific natures in subsequent chapters.

7.6 With the exception of when ammunition is secured in an approved ammunition storage facility, ammunition is never to be left unattended.

7.7 Breaking down, tampering with or experimenting with ammunition, components or ammunition/explosive/ordnance produce (referred to as 'produce' in the remainder of this publication) is forbidden.

7.8 All ammunition is to be considered 'live' unless it has been determined otherwise by an ATO/AT or the Munitions Branch, CASG.

7.9 Marking of inert explosive ordnance. Inert EO that was categorised as presenting a high safety risk prior to inspection must be certified and marked to indicate that it no longer contains dangerous goods, and is safe to use for display, training or research purposes in accordance with *EDEOP 101 Regulation 2.4*.

7.10 Live firing demonstrations at which the public are in attendance may be approved at formation level, provided that safety is assured and the Director Navy Communications and Coordination, Directorate of Coordination – Army, or Directorate of Coordination – Air Force (as appropriate) is notified prior to the commencement of the activity.

7.11 UCOs/IOCs are to ensure that ADF members/contractors are trained and appointed by RO/directive to carry out the following:

- a. examine emptied EO packages and certify them free from explosives (FFE)
- b. examine functioned EO and certify them as being FFE (eg, empty fired components/produce)

- c. examine EO and certify them free from misfire
- d. supervise the transportation/handling of EO.

7.12 The first three functions in [paragraph 7.11](#) are to be recorded in a local register and/or unit RO and retained for a minimum of five years.

7.13 The appointment of a supervisor for transportation/handling is to be recorded in a local register and/or unit RO and retained for a minimum of two years.

7.14 Regulations for the carriage of service ammunition (ball) during training exercises. Occasions will arise, both in Australia and overseas, where participants in training or exercises will need to carry, and in some instances use, ball ammunition. Regulations for the carriage of service ammunition (ball) during training exercises are detailed in [Annex A](#).

Section 7-3. Requirements during set up and prior to conduct of activity

7.15 Damaged packages containing ammunition are to be left undisturbed and immediate direction from an ATO and/or an AT is to be sought.

7.16 Only serviceable in-life ammunition provided through the ADF supply system is to be used. Approvals to use foreign ammunition is to occur in accordance with [Chapter 2](#). The RCO is to be advised the details of all ammunition natures to be used when booking a range. If a non-ADF/commercial ammunition type is to be used, this ammunition type is to be specified in the booking request.

7.17 Units are to only accept ammunition that is issued in depot, by the ATO or in the manufacturers' sealed boxes.

7.18 Only service ammunition packaging is to be used for the storage, transport and handling of ammunition. Sandbags and other receptacles are not to be used with live ammunition but may be used for the collection of produce only.

7.19 Smoking and the presence of naked flame is forbidden within 15 m of an ammunition point.

7.20 Stored ammunition must be kept clean, dry, boxed, shaded and ventilated (allowing air to circulate around pallets/stacks), and stored on dunnage (off the ground).

7.21 Ammunition is to remain boxed, with seals intact, until required for use/tactical carriage. Loose ammunition is to be re-boxed at all other times.

7.22 Ammunition belts may be joined (with ammunition of the same type and lot) or shortened; however, the making of belts of ammunition from individual rounds and pieces of link is forbidden. The OIC Practice may authorise the removal of tracer ammunition from belts if required to meet operational needs or range fire restrictions. If tracer is removed it must be returned and may not be fired during the practice.

7.23 Functioned F3 practice grenades are not to be reconditioned during grenade practices or prior to return to the ammunition supply unit/contractor. The reconditioning of grenades is only to occur with drill grenades which are used during dry training prior to a range activity; this is only to occur if all grenades on site are drill grenades. Drill grenades can be requested via the EO supply chain system.

7.24 Ammunition control. The OIC Practice is responsible for accounting for all ammunition issued for that activity. An ammunition SS is to be made responsible for the issue of ammunition to personnel as directed by the OIC Practice. The duties of an ammunition SS are detailed in [Annex B](#).

7.25 OIC Practices are to ensure that only approved ammunition natures are fired for the weapon systems in use, and that the natures used are in accordance with TASO for a particular range.

Section 7-4. Requirements during conduct of the activity

7.26 Ammunition is to be placed into SCE or in-service equivalent immediately following issue. Ammunition is to be stored in SCE or in-service equivalent during the practice and is only to be removed prior to use.

7.27 Only authorised handling drills are to be used.

7.28 Projectiles, grenades, pyrotechnics and other HE/incendiary natures that fail to function after being projected/initiated are described as UXO and may be dangerous if disturbed. UXOs are not to be disturbed and are to be destroyed in accordance with *LWP-G 7-3-9, Disposal of Malfunctioned Explosive Ordnance*

and reported in accordance with the *eDEOP 101, Department of Defence Explosives Regulations* [Regulation 1.3].

7.29 Misfired ammunition is to be unloaded in accordance with the relevant weapon publication. Misfires are to be set aside for destruction in accordance with *LWP-G 7-3-9, Disposal of Malfunctioned Explosive Ordnance* and reported in accordance with the *eDEOP 101, Department of Defence Explosives Regulations* [Regulation 1.3].

7.30 Ammunition that is involved in a stoppage is to be examined. If it is unserviceable it must be reported in accordance with the *eDEOP 101, Department of Defence Explosives Regulations* [Regulation 1.3] and disposed of in accordance with current procedures. Such ammunition that is still serviceable may be fired as part of the activity.

7.31 HE and practice natures of ammunition are not to be mixed but may be used on the same activity.

7.32 Inert ammunition is to be segregated from live ammunition and may only be mixed to create realistic stoppages during live firing. Dummy cartridges may only be used at live (including blank) firing practices when the following applies:

- a. the mixing of incompatible categories is confined to stoppage practices
- b. mixing occurs only at the range or area of intended use
- c. magazines and belts are only filled by the personnel appointed by the OIC Practice
- d. all dummy cartridges are separated and accounted for immediately following the stoppage practice.

7.33 Personnel issued with ball ammunition are not to:

- a. carry or use blank ammunition, or
- b. carry or have blank firing attachments fitted to their weapons.

7.34 Close training round. The following requirements apply to the Close Training Round:

- a. The CTR is approved for use with F88AS2, EF88 FOW, M4 FOW and the F89 MINIMI FOW. It must not be used with the F89A1 Para MINIMI (Suppressed).
- b. Users must use doctrinal rates of fire to prevent excessive chamber temperatures to prevent a round from being deformed in the chamber.
- c. Ammunition remaining chambered in hot weapons can cause deformation or break up of projectile in the weapon. Weapons should be unloaded as soon as practicable at the completion of each practice.

7.35 All ammunition incidents as defined by the *eDEOP 101, Department of Defence Explosives Regulations* [Regulation 1.3] and *EMEI Weapon A 229-1, Issue 3, Inspection of Small Arms, Inspection after Suspected Negligent Discharge* are to be reported in accordance with these instructions. Examples of ammunition incidents include accidents and near misses, defects, malfunctions and untoward happenings where ammunition is present, even if that ammunition is not directly involved or thought to be at fault (eg, unauthorised/negligent discharges).

7.36 Minimum safety ranges 76 mm grenade launching system. Due to the fragmentation effect of HE type grenades, crews are to be closed down and no personnel are to be within 400 m of the firing vehicle.

7.37 The minimum ranges of engagement and safety restrictions for natures of ammunition are given in [Table 9–1](#).

7.38 The following information relates to safety distances and protection levels for minimum ranges of engagement:

- a. **Closed down.** When an AFV has all its hatches closed and locked with the crew inside, the vehicle is considered to be closed down. If any other vehicles are within the minimum engagement area, they must be at the same level of protection before firing is permitted. Troops under cover must be outside the closed-down safe distance and troops in the open must be outside the stated minimum safe distance.
- b. **Opened up.** This means that the AFV turret and rear hatches are open, if applicable, and the driver is closed down. All crew are down behind armour, and other personnel are under cover at the time of firing. For field firing when using explosive natures, if there is a risk of tree strike causing early detonation, the 'troops in open' safety distance is to be applied. Cover is designed to protect the crew

and other personnel from the effects of blast and firing. All vehicles and personnel within the danger area must be at the same level of protection before firing is permitted. The level of cover must have a uniform thickness as follows:

- (1) the armour on the main battle tank (MBT), combat reconnaissance vehicle, AS4 family of vehicles and the protected mobility vehicle (PMV) – medium
 - (2) packed earth or a fold in the ground: 750 mm
 - (3) sandbags filled with sand or earth: 750 mm
 - (4) solid timber: 600 mm
 - (5) reinforced concrete: 100 mm, or
 - (6) mild steel plate: 20 mm.
- c. *Troops in open.* This means that no protection is available for personnel on the ground. It applies when firing from static FPs and for live fire demonstrations where personnel and spectators are outside the troops in open safety distance. All B vehicles are classed as troops in open in regards to safety distances.
- d. *Safety distances.* Safety distances are measured from the line, gun-to-target.

Section 7-5. Requirements post-activity

7.39 The OIC Practice is to ensure that all ammunition is accounted for, including any unexploded or lost ammunition within the area. The OIC Practice is to ensure that ammunition checks are undertaken during the reorganisation phase of a training drill and that a search is conducted for lost ammunition, if required. Any ammunition that is declared lost by the firer is to be reported to the OIC Practice. The OIC Practice is to report lost ammunition to Range Control in accordance with the TASO and this publication.

7.40 After an activity, surplus ammunition is to be returned to a unit ammunition storage/magazine or bulk ammunition storage warehouse for later issue. The return of ammunition is to take place in accordance with the *Electronic Supply Chain Manual, Volume 4, Supply Management Process* [Section 8, Chapter 1]. Sealed boxes are to remain sealed. Unsealed boxes, before storage, are to be inspected for number and condition by unit personnel with a minimum rank of CPL (E).

7.41 Ammunition or components must not be retained after an activity.

7.42 Live ammunition/components must not be packed with inert ammunition or produce.

7.43 Unused ammunition¹ is to be repacked into the original packages before transport. Box markings are to be amended to reflect the contents.

7.44 Ammunition to be returned to the depot or collected by a contractor is to be jointly inspected for quantity, type and serviceability. This must be agreed upon prior to the completion of handover documentation.

7.45 Additional requirements for specific ammunition natures are included within the relevant LWP-G 7-3 series publications.

Section 7-6. Special requirements for M72A6

7.46 This section describes the regulations governing the accounting requirements for the M72A6.

7.47 The OIC Practice and the delivering agency are to verify the following prior to their departing the point of delivery:

- a. quantity
- b. serial numbers
- c. that the consignment is signed for on the Computer System Armaments issue voucher.

1. Any unserviceable ammunition is to be segregated from serviceable ammunition.

7.48 Where storage of M72A6 systems is required they are to be treated as weapons and appropriate security measures applied.

7.49 The following applies to the destruction of misfires and UXO:

- a. The destruction is to be carried out by an appropriately qualified person.
- b. A minimum of two personnel must be nominated by the OIC Practice for any disposal task. The person appointed to observe the DMEO task need not be DMEO qualified. The observer is to remain at a safe distance, as determined by the DMEO operator, from the UXO, observing the actions of the DMEO operator, and is then to inspect the UXO to confirm that the DMEO task has been completed once the DMEO operator has determined that it is safe to do so.
- c. The security of the M72A6 during the task is the responsibility of the nominated personnel.
- d. The DMEO operator responsible for the task must sign the destruction voucher.
- e. The person observing the destruction must countersign the destruction voucher.
- f. The serial number of the M72A6 that has been destroyed must be marked on the issue/return documentation and on the AC430 Declaration of Demolition Stores Used – Demo Log.

7.50 The OIC Practice is to verify that:

- a. the empty fired launchers have been inspected with the end caps off, and only refurbished (end caps not to be closed) if requested by the EO services contractor
- b. the serial numbers of empty fired M72A6 weapons are checked (the EO services contractor will then certify boxes FFE when the empty fired launches have been repacked for return to the depot)
- c. the serial numbers of returned unfired M72A6 weapons are annotated on the return documentation (live M72A6 weapons are not to be placed in a pack with empty fired launches)
- d. the serial numbers of all live M72A6 weapons destroyed by the DMEO operator have been recorded and annotated as required.

7.51 The return paperwork is to be completed, checked and signed off by the OIC Practice before the OIC Practice and contractor depart the range/collection point.

7.52 All empty fired M72A6 weapons are to be returned to the ammunition depot. The retention of launchers for any purpose, including as training aids, is forbidden.

Section 7-7. Linking and de-linking of 7.62 mm, 12.7 mm and 25 mm ammunition

7.53 For the procedures pertaining to linking, delinking or making belts of ammunition refer to the relevant weapon publication.

Annexes:

- A. [Regulations for the carriage of Service ammunition \(ball\) during training exercises](#)
- B. [Duties of an ammunition safety supervisor](#)

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Annex A to Chapter 7

Regulations for the carriage of Service ammunition (ball) during training exercises

Use of ball ammunition for protection against wild fauna

1. The nature of the operating environment in Australia and overseas necessitates the carriage of ball ammunition at times during training exercises, courses or operational patrols. The carriage of ball ammunition is just one measure that may be applied by commanders when planning a risk reduction strategy against wild fauna.

Military risk management and health support plan

2. Ball ammunition is to be carried only after the need has been identified during the MRM process and is to be supported by the HSP for the activity. The rationale for the carriage of ball ammunition must be clearly articulated in the risk treatment measures where fauna poses a significant risk.

Authority

3. A unit commander not below the rank of LTCOL (E) may approve the carriage and use of Service ammunition for the protection of personnel.

Carriage of ball ammunition

4. Every activity must be commanded by CPL (E) or above. Activity OICs are responsible for safety sentry locations and changes to degrees of weapon readiness. Only designated members are to be issued ball ammunition and under no circumstance is a soldier to be placed in a safety sentry position without prior approval from the activity OIC.

5. Designated members are to carry one magazine containing no more than 30 rounds of 5.56 mm ball ammunition. The magazine containing the ball rounds is to have a strip of white tape around the base and over the top to identify and prevent accidental chambering of a round. It is to remain in a designated pouch on the members SCE until either directed to be removed by the activity OIC, or required to enable a reaction to a potentially life-threatening situation. The barrel of the weapon carried by the designated member is also to be marked with white tape. At no stage is the designated member to conduct collective weapon cleaning or strip and assemble drills whilst in the company of members conducting blank firing activities.

6. Members carrying ball ammunition are not to carry blank ammunition at the same time and must be considered a dedicated safety sentry for the duration of the identified risk period. The issue of ball ammunition is to be strictly controlled by the activity OIC in accordance with [Chapter 7](#). During high risk period where the RA stipulates the need for ball ammunition as a risk reduction, it is to be carried on weapons at the 'LOAD' condition until ordered to change by the activity OIC. The Activity OIC is to brief, inspect and supervise designated safety sentries when changing degrees of weapon readiness, or when changing locations.

Environmental factors

7. Prior to each activity, the activity OIC is to provide designated safety sentries with a fully developed environmental force protection brief that clearly identifies all suspected fauna threats and species, along with their typical behaviours, in order to avoid unwarranted, and potentially illegal destruction of wildlife.

Blank firing attachments

8. Members carrying ball ammunition are not to be issued with blank firing attachments. Only authorised personnel may carry ball ammunition while participating in training or exercises.

Safety briefing

9. The safety brief is to inform all activity participants those personnel who will be designated as a safety sentry and therefore receiving ball ammunition. On each occasion that members are to be issued ball ammunition, the Activity OIC is to brief all participants on handling, accounting procedures and the circumstances under which live ammunition may be used. Designated safety sentries are to acknowledge ammunition receipt, confirm their task and account for all rounds when returning ammunition. The Activity OIC is to be present during the return of all ammunition.

10. All members to be issued ball ammunition are to complete a weapon handling test immediately prior to the issuing of ball ammunition by the Activity OIC.

Land operations

11. Members are only to adopt the 'LOAD' condition in areas where the risk of attack by wild fauna is identified. In these circumstances the Activity OIC may order safety sentries to adopt the 'ACTION' condition with orders to fire at the soldier's discretion if a threat is seen approaching any participant and personnel are considered to be in imminent danger.

Water operations

12. Dedicated members carrying ball ammunition are to be positioned based on an assessment by the Activity Commander and are to remain in the 'UNLOAD' condition during transit to identified risk areas. During risk events (eg, landing or embarking in known crocodile areas) the Activity OIC may order safety sentries to adopt a higher state of readiness up to 'ACTION', with orders to fire at their own discretion if a threat is seen approaching any participant and personnel are considered to be in imminent danger.

Reporting

13. Activity OICs may approve situational amendments to the requirements outlined above if the need for immediate action is required and personnel are considered to be in imminent danger. Any amendment to these requirements or firing upon fauna is to be recorded, briefed to chain of command, and reported through single Service reporting mechanisms. In a circumstance where fauna is engaged with live ammunition to prevent possible injury, an event is to be raised in Sentinel as a 'near miss'.

Notification to civilian law enforcement agencies

14. Where activities are conducted in non-Defence areas, and where the operational situation permits, civil policing authorities should be notified that ADF personnel are carrying live rounds.

Annex B to Chapter 7

Duties of an ammunition safety supervisor

1. Ammunition SSs are appointed for each range practice by the OIC Practice. The ammunition SS is responsible to the OIC Practice for the control, management and security of all ammunition issued for live firing activities. This includes:
 - a. receipt of the ammunition from the EO services contractor's (EOSC's) transport representative
 - b. the setting up and operation of the ammunition point
 - c. short-term storage arrangements
 - d. the issue of ammunition to firers as directed by the OIC Practice
 - e. the return of unexpended ammunition, components and packaging to the EOSC representative.
2. Unit resource management staff retain responsibility for the higher level accounting for and management of ammunition on behalf of the CO. This includes forecasting for training and exercise consumption, the raising and submission of demands for ammunition, and accounting for ammunition issued and consumed by the unit. Where an ammunition SS is unclear about any aspect of their responsibility, they are to seek advice from the OIC Practice.
3. **Appointment of an ammunition safety supervisor.** Any person with a minimum rank of PTE (E) for Permanent Basic ranges and blank firing activities with the minimum qualification of ALTC – 216555 – Explosive Ordnance Ammunition Safety Supervisor course (P125126) (or DEOTS2 or equivalent training) (see *LWP-G 7-3-1, Australian Defence Force Range Orders [Dismounted]* [Chapter 3] for additional information), and LCPL (E) for Permanent Complex and Manoeuvre ranges. Additionally they are to be qualified as follows:
 - a. SS for Permanent Complex and Manoeuvre ranges in accordance with a CATC-approved LMP
 - b. ALTC – 216555 – Explosive Ordnance Ammunition Safety Supervisor course (P125126) (or DEOTS2 equivalent training)
 - c. when not qualified on the weapons being used, the ammunition SS is to receive a safety brief from the OIC on all ammunition types being used for the weapon system during the practice; and the OIC Practice must deem the ammunition SS safe to handle these ammunition types prior to the commencement of the range practice. If the duties require the preparation or supervision of ammunition procedures then the ammunition SS must be qualified in the weapon or ammunition.
4. In the event that the ammunition SS is not qualified in the weapon being used, the UCO/IOC may approve in writing an ammunition SS who is not qualified in the weapon systems if that person(s) has undergone training in the ammunition types being used (the training is to include identification, safe handling and preparation of the ammunition).

Preparation

5. Personnel appointed to act as ammunition SS for a particular range practice or live fire training exercise (including blank ammunition activities) are to receive a brief from unit resource management staff on ammunition supply arrangements. Ammunition will typically be either collected from the unit resource manager (URM) or magazine or delivered to the FP under unit arrangements. Alternatively, the EOSC will be used to deliver ammunition to the training location and will return to collect unexpended ammunition, components and packaging.
6. Ammunition SSs are to be in possession of the appropriate certification labels and marking and sealing material for the repackaging of ammunition before returning it to the EOSC. Unit ammunition SSs are to challenge any disagreement about issued or returned quantities between the unit and the EOSC and ensure that they are resolved before EOSC personnel leave the training area. The OIC Practice is to assist with the dispute resolution.
7. **Collection from explosive ordnance services contractor.** When receiving EO at the delivery point, the ammunition SS is to be in possession of:
 - a. a copy of an authorised AD665 EO Demand, Amendment or Cancellation Request

- b. a current Defence identity card
- c. an authorised SQ079 Order to Draw Ammunition annotated with the unit demand reference number.

8. Ammunition natures and quantities are to be checked against the AD665 Explosive Ordnance (EO) Demand, Amendment or Cancellation Request provided by the URM and the delivery paperwork held by the EOSC representatives (Computer System Armaments issue voucher). Ammunition containers and boxes are to be checked to ensure that they have intact EO depot seals. Units are only to accept ammunition issued in the depot or the manufacturer's sealed boxes. Should any unsealed boxes be identified in the course of the firing practice (eg, containers in the centre of pallets), these are to be segregated and the quantities checked. On completion of the check the ammunition SS is to sign both copies of the Computer System Armaments issue voucher. One copy is to be returned to the URM at the completion of the practice. The ammunition SS is to confirm to the OIC Practice that the ammunition has been delivered as requested.

Operation of the ammunition point

9. An ammunition point is to be established for each range practice or live fire training activity. As detailed in the *Defence Security Principles Framework*, this is to be manned by a minimum of two personnel at all times (one of these is to be the ammunition SS; the other person need not be a qualified SS or hold a minimum rank of LCPL [E]). The second person is to understudy and assist the ammunition SS in their duties, including security and accounting for all ammunition at the ammunition point.

10. Under no circumstances is the ammunition point to be left unattended while ammunition is present. If an ammunition point is closed during a range practice, a piquet is to be appointed. If a security piquet is required, it is to be manned by a minimum of two personnel at all times. Neither of these personnel need to be qualified as an ammunition SS. Opening and closing of the ammunition point is to occur only on command of the OIC Practice. The range safety brief is to advise staff and firers that the ammunition point will close at times during the practice (including circumstances and/or when), and the brief is to detail the process of opening and closing the ammunition point as well as the personnel involved (emphasising that no ammunition is to be issued when the ammunition point is closed). If staff appointed as ammunition SSs and/or assistants are to fire weapons, they are to be cleared prior to returning to the ammunition point and their weapons and webbing stored in a secure location.

11. The ammunition point must include separate spaces for live ammunition and damaged ammunition. Standard demolition kits may be stored at the ammunition point in support of a specific practice.

12. The distribution of ammunition is to be carried out in accordance with the direction of the OIC Practice. When issuing ammunition, the ammunition SS is to comply with the following:

- a. handle ammunition in accordance with this publication and extant regulations
- b. maintain a continuous record of ammunition issues and returns
- c. record the lot/batch number for every container opened
- d. only issue from one lot or batch at a time (this will make segregation possible in the event of an incident)
- e. only open containers immediately prior to issue
- f. only issue ammunition in the quantities directed by the OIC Practice
- g. do not transport ammunition or produce to or from the range unless appointed in RO and/or a directive.

13. A separate salvage point is to be established for empty ammunition containers, produce and salvage. No ammunition is to be kept at the salvage point. The salvage point is to be placed in view of the ammunition SS but no closer than 5 m to issuing points or live ammunition containers.

14. On completion of firing, all unfired ammunition, any damaged small arms ammunition is to be returned to the ammunition point. Produce, salvage and empty containers are also to be returned to the salvage point.

Returns to the explosive ordnance services contractor

15. When a unit receives ammunition from the EOSC, they may also be required to return surplus ammunition, components and packaging to the EOSC. Alternatively, these items will be returned to a unit ammunition storage area or magazine under unit arrangements. The URM will have contacted the EOSC for agreed collection times prior to the activity. Ammunition SSs are to confirm this time with the OIC Practice and notify the EOSC at least 2 hours prior to the collection time required.

16. Unexpended ammunition is to be repacked into original service packaging before transport. Where physical quantities differ from those marked on the original container, the container is to be clearly marked to reflect the correct quantities. Live ammunition/components are not to be packed with inert ammunition or produce. Containers are then to be sealed using the EO022 Defence Transit Seal. Damaged small arms ammunition is to be separately packaged.

17. Completion of AD667 EO Return Voucher. Separate EO return vouchers are required for EO in sealed boxes, EO in unsealed boxes, components such as small arms ammunition cartridge cases, range produce and packaging. The ammunition SS is required to confirm the item quantity being returned and tick the applicable box at the top of the form to notate the type and condition of the EO or produce being returned. Ammunition collected by the EOSC representative is to be jointly inspected for quantity, type and serviceability. The EOSC representative will then tick either the 'acquitted to the unit at time of collection' or 'subject to technical inspection' box and sign the EO depot acceptance of goods section. The ammunition SS is to return the signed copy of the AD667 EO Return Voucher to the URM.

Free-from-explosives certification

18. As part of the return process, the ammunition SS will be required to certify produce and packaging as being FFE or free from misfire and in an unarmed state. The current training course for the public sector FFE competency, to examine and certify free from EO, was developed for personnel working in ammunition depots. Within Army, ATs and operator supply personnel have this competency. Unit ammunition SS do not require this specific competency, as they are only certifying that produce and packaging are empty of explosive content and misfired ammunition so that the items can be transported back to the supporting ammunition depot.

19. Authorisation to certify free from explosives. Ammunition SSs are to be authorised in writing by unit commanders to certify produce and packaging as being FFE. This may occur via unit RO or the range instruction prepared for the particular live fire activity. Further guidance is available in the *eDEOP 101, Department of Defence Explosives Regulations* [Regulation 1.3].

20. Empty packaging and produce. In the case of empty produce and packaging (fired small arms ammunition cartridge cases) a thorough visual inspection of all empty packaging, containers and produce is to be conducted by the ammunition SS to ensure that they are FFE. This check is to be repeated by the OIC Practice or a nominated SS. All labels or markings specifying a hazard classification code or UN serial number are removed, defaced or covered. The following processes are then to be followed for the certification of produce and packaging:

- a. *Expended ammunition produce.* An EO051 Salvage or Return Label is to be completed in black ink. The word 'Return' on the label is to be struck out. The ammunition SS is to enter their own personal details and the location at which the certification is being made. Where an ammunition package is being used to transport produce, such as small arms ammunition, it must be inspected to ensure that it does not contain live ammunition. The EO051 is to be firmly attached to the package. Unpackaged large-calibre cartridge cases may be palletised in bulk with one completed EO051 attached to the pallet.
- b. *Empty ammunition containers.* An EO052 Certified Empty Label (FFE) is to be completed in black ink. The applicable heading is to be circled and the remaining heading struck out. The ammunition SS is to enter their own personal details and the location at which the certification is being made. The EO052 is to be attached in such a manner that it would tear if the container lid were opened. If necessary, a second EO052 label is to be used to ensure sealing. Only sufficient labels for immediate use should be prepared to prevent their unauthorised use.

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Chapter 8

Safety precautions applicable to laser devices

WARNING

To avoid injury to personnel, when employing any laser and before any laser is fired, warning procedures are to be adopted.

Section 8-1. Introduction

Definition

8.1 This chapter details the safety precautions to be observed and procedures to be followed when using laser devices at defence training areas, ranges and operational and training facilities. The detailed requirements of laser safety are covered in the *Defence Radiation Safety Manual* and the *Australian Radiation Protection and Nuclear Safety Regulations 2018*.

8.2 The purpose of this chapter is to provide overarching guidance for the use of lasers at Defence training areas, ranges and operational and training facilities. The specific duties and guidance to LSOs are detailed in the *Defence Radiation Safety Manual* [Chapter 3 and Chapter 6]. The specific controls and processes for each platform and device are located in the relevant technical manuals or in the LWP-G 7-3 series publication.

8.3 The relevant standards publications can be located on the WHS Governance, Legislation & Policy website¹ under 'Further Codes, Guidance & Resources, Australian Standards Database'.

Characterising lasers

8.4 A laser is any device that can be made to produce or amplify light by the process of stimulated emission. The word laser is the acronym for 'light amplification by stimulated emission of radiation'. A laser beam directly striking human tissue (or even reflected onto the tissue) may be capable of inflicting damage. The principal concern, however, is with damage to the retina of the eye, as the lens of the eye is capable of increasing light intensity many thousands of times by its focusing power. Skin damage is also possible with increasing laser intensity. As some laser emissions (in the infra-red or ultraviolet region) cannot be sensed as either light or heat, they can be especially hazardous if personnel are not aware of their presence. There are also a number of non-beam hazards associated with laser systems, these include:

- a. electrical shock
- b. exposure to toxic dyes and other chemicals used in their construction
- c. production of potentially hazardous beam plumes.

8.5 Description of laser classes. Lasers must be classified in accordance with the methodology detailed in *AS/NZS IEC 60825.1: Safety of laser products - Equipment classification and requirements*. The standard takes into account a number of parameters including:

- a. power output of the laser
- b. wavelength of electromagnetic radiation emitted
- c. beam width and divergence
- d. exposure time.

1. <http://drnet.defence.gov.au/People/WHS/WHS-Governance-Legislation-and-Policy/pages/WHS-Governance-Legislation-and-Policy.aspx>

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8.6 Analysis of this data against a predetermined maximum limit, termed the accessible emission limit (AEL), determines the classification of the laser and the relative risk the laser poses. The classes are as follows:

- a. *Class 1*. This class of laser is safe under reasonably foreseeable conditions of operation, including the use of optical instruments for intra-beam viewing. Class 1 laser products do not permit human access to laser radiation that is in excess of the AEL of Class 1 for applicable wavelengths and emission durations.
- b. *Class 1C*. This class of laser is specifically designed for contact application to the skin or non-ocular tissue. The accessible emission is stopped or reduced to below the AEL of Class 1 when the laser is removed from contact with the skin or non-ocular tissue.
- c. *Class 1M*. This class of laser emits in the wavelength range from 302.5 to 4000 nm. Class 1M laser products are safe under reasonably foreseeable conditions of operation, but may be hazardous if the user employs optics within the beam.
- d. *Class 2*. This class of laser emits visible radiation in the wavelength range from 400 to 700 nm where eye protection is normally afforded by aversion responses including the blink reflex. This reaction may be expected to provide adequate protection under reasonably foreseeable conditions of operation including the use of optical instruments for intra-beam viewing. Outside the visible spectrum (wavelength range from 400 to 700 nm), any additional emissions of Class 2 lasers are required to be below the AEL of Class 1.
- e. *Class 2M*. This class of laser emits visible radiation in the wavelength range from 400 to 700 nm where eye protection is normally afforded by aversion responses including the blink reflex. However, viewing of the output may be more hazardous if the user employs optics within the beam. Outside the visible spectrum (wavelength range from 400 to 700 nm), any additional emissions of Class 2M lasers are required to be below the AEL of Class 1M.
- f. *Class 3R*. This class of laser emits in the wavelength range from 180 to 106 nm where direct intra-beam viewing is potentially hazardous, but the risk is lower than for Class 3B lasers and fewer manufacturing requirements and control measures for the user apply than for Class 3B lasers.
- g. *Class 3B*. This class of laser is normally hazardous when direct intra-beam exposure occurs (ie, within the nominal ocular hazard distance [NOHD]). Viewing diffuse reflections are normally safe.
- h. *Class 4*. This class of laser is hazardous when direct intra-beam exposure occurs and are also capable of producing hazardous diffuse reflections. They may cause skin injuries and could also constitute a fire hazard. Their use requires extreme caution.

Section 8-2. Risk management

8.7 Minimising risk. In order to minimise the risk posed by the use of Service lasers it is important to follow the processes laid out in the *Defence Radiation Safety Manual* and abide by the specific restrictions articulated in this publication. All safety staff are to be aware of the primary (direct/indirect exposure) and secondary hazards. There are a variety of secondary hazards that are associated with laser sources, which must be considered as part of any laser radiation safety management plan. These hazards include:

- a. electric shocks
- b. fire
- c. hazardous materials.

8.8 Risk assessment. Before a laser device can be used as part of an approved activity, there must be steps taken to understand the risks that may arise from the laser radiation hazards identified. This requires an understanding of the physical characteristics of laser radiation hazards and the physiological processes by which the hazard can affect or harm people.

8.9 Physiological effects of laser radiation. Due to the intensity of some lasers there is the potential to cause damage to eyes and skin if not managed appropriately. As the wavelength of some emissions means that they cannot be sensed either as light or heat, they can be especially hazardous if personnel are not aware of their potential danger.

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8.10 Laser protection standards. Fundamental principle for laser radiation protection is to place limits on human exposure. The *AS/NZS IEC 60825.1: Safety of laser products - Equipment classification and requirements* adopts the maximum permissible exposure (MPE) limits published by the International Commission on Non-Ionizing Radiation Protection. The MPE represents the level of laser radiation to which, under normal circumstances, persons may be exposed without suffering adverse effects. From the MPE the NOHD and the nominal skin hazard distance can be calculated and appropriate safety distances instated.

8.11 Laser hazard controls. Once the risk is quantified, there will be a requirement to apply controls. Controls vary in their effectiveness depending on whether they modify the source, the target or the pathway between them and whether they are inherent in the system's design or need to be consciously applied by the user.

8.12 Hierarchy of controls. The hierarchy of controls is as follows:

- a. elimination
- b. substitution
- c. engineering
- d. administration
- e. PPE.

8.13 Control effectiveness. Elimination, substitution and engineering controls are normally enacted as part of the procurement process during the project initiation and design phase; they offer the greatest potential to limit exposure. Administrative controls and use of PPE is specific to each Service laser, with details included in the relevant LSP for each device. The use of PPE is of extremely limited benefit as it only controls exposure of the individual user and only as long as it is being worn.

8.14 Administration controls. There are a number of administration controls that should be considered:

- a. *Laser safety paper.* An LSP is a means of documenting the hazards and risks associated with a hazardous laser system and establishing a control regimen so that it may be used safely. Under the licence conditions set by Australian Radiation Protection and Nuclear Safety Agency to manage the increased risks associated with high power lasers, only Class 3B and Class 4 lasers require an LSP. For lasers below Class 3B, compliance with the requirements of the *Work Health and Safety Regulations 2011* [Regulation 223 – Lasers] is required:
 - (1) The LSP consists of a description of the laser system, a description of intended operation, a description of the laser radiation hazard zone(s) and other hazards (eg, electrical or toxic substances) associated with the laser system, and the engineering and administrative control measures which have been implemented.
 - (2) LSPs are to be reviewed and updated in accordance with the *Defence Radiation Safety Manual*.
- b. *Laser certification.* To ensure the safe operation of lasers used by Defence or operated on Defence ranges, all lasers must be certified to be safe for use. The classification of lasers within Defence must be carried out in accordance with the *Defence Radiation Safety Manual* and *AS/NZS IEC 60825.1: Safety of laser products - Equipment classification and requirements*:
 - (1) *Service-specific issues.* Service laser devices, do not always comply with existing international standards for design requirements, due to unique design requirements specific only to military equipment. These unique requirements are identified during the design and evaluation phase and risks articulated in the LSP.
 - (2) *Laser radiation emission warning.* Each Class 3R laser system in the wavelength range below 400 nm and above 700 nm and each Class 3B and Class 4 laser device should give audible or visible warnings when switched on and operating. This is not feasible given the tactical employment of these systems, and as such the specific feature is not included in the design of Service lasers. The risk is articulated in the LSP and mitigated through the use of specific administration controls. For more information refer to the *Defence Radiation Safety Manual*.
 - (3) *Laser radiation hazard warning signs.* Warning signs are to be erected to designate restricted access and no-entry boundaries for LHAs. Except where operational circumstances prohibit such action, warning signs must comply with *AS 1319: Safety signs for the occupational environment*. Placement of the sign must be in accordance with *AS/NZS IEC 60825.14: Safety*

of laser products - A user's guide. Laser radiation hazard warning signs must be selected to suit the particular application from the following:

- (a) *Symbolic warning sign.* This sign comprises a pictogram of a laser beam (Hazard Sign No. 448 from AS 1319: *Safety signs for the occupational environment*), which designates a non-ionising radiation hazard (see Figure 8–1).



Figure 8–1: Example of a symbolic warning sign for laser hazard

- (b) *Composite sign.* This sign comprises the symbolic warning sign, below which is a briefly worded message that qualifies or augments the sign (eg, the phrase 'Laser Eye Protection Must be Worn' with a brief safety advisory or a description of the action required).
 - (c) *Word-message sign.* This sign comprises the complete message in words but may also include a symbolic warning sign to the left of the worded message.
 - (d) *Danger sign.* This sign comprises the word 'danger' in white letters inside a red symbolic oval shape and a worded warning message in black uppercase letters. Use of danger signs must be confined to situations where the laser hazard is likely to be life-threatening.
- (4) *Other symbolic warning signs.* These signs, which comply with AS 1319: *Safety signs for the occupational environment*, may be placed below or to the right of the laser hazard warning sign to amplify or qualify the warning. The exact combination of these control measures depends on the power and type of laser, laser environment, and procedures conducted with laser equipment. Proposals for laser warning labels and signs are to be included in the LSP.
- c. *Laser hazard areas.* The LHA of each hazardous laser product or system is determined during the design and evaluation phase of procurement and articulated in an LSP. The calculations done as part of the LSP will enable the NOHD and nominal skin hazard distance to be calculated. The NOHD is used to define the LHA. Specific details defining an LHA and applicable procedures for weapon ranges and military training areas can be found in the *Defence Radiation Safety Manual* [Annex B to Chapter 6].
 - d. *Laser site security.* Access to all hazardous laser radiation sources is to be managed as for a live fire RDA. Adequate boundaries must be established around site perimeters or, alternatively, around the LHA to restrict inadvertent access of personnel and the general public to areas that exceed the exposure limitations of the lasers in use.

8.15 Personal protective equipment. The use of PPE as a radiation control must never be specified simply as a matter of convenience. It should be the last option considered from the hierarchy of controls. Personnel who are required to use PPE must be trained in its use and maintenance. Where PPE (clothing and eyewear) is required, the type of PPE is to be detailed in the LSP.

Section 8-3. Laser safety appointments and qualifications

8.16 Training and education. Laser safety training within Defence currently comprises the following four levels:

- a. Level 1 – laser safety officer level 1 (LSO1)

- b. Level 1 – LSO1 – range safety
- c. Level 2 – LSO2
- d. Level 3 – this level incorporates:
 - (1) Level 3A – user laser safety training – operator course
 - (2) Level 3B – maintenance laser safety training – maintainer training
 - (3) Level 4 – laser radiation general awareness training.

8.17 The conduct of laser radiation safety training is to be documented in PMKeyS.

8.18 Laser safety officer. The duties of a unit LSO are contained in the *Defence Radiation Safety Manual*. An LSO1 (E) is to prepare and check the laser clearance template for practices where Class 2 or higher lasers are employed.

8.19 Laser safety officer – qualifications and duties. Defence LSOs are subject to the following requirements:

- a. *Laser safety officer Level 1.* All Defence LSO1 are required to successfully complete a laser safety course approved by the Directorate of Radiation Safety Assurance Committee (DRSAC). On successful completion of an approved LSO1 course, the LSO1 is qualified to perform the duties detailed in the *Defence Radiation Safety Manual*.
- b. *Specialist laser officer Level 1 – range safety.* All specialist LSO1 working in the field of weapon range, operational and training facility safety are required to successfully complete a DRSAC approved LSO1 course appropriate for this task. Specialist LSO1s are authorised to:
 - (1) produce, endorse, technically review and release LSPs
 - (2) conduct laser range surveys
 - (3) endorse range safety clearance papers.
- c. *Laser safety officer Level 2.* All Defence LSO2 are required to successfully complete a laser safety course approved by the DRSAC. In general a qualified LSO2 should be under the technical coordination of a qualified LSO1. On successful completion of an approved LSO2 course, the LSO2 is qualified to perform the duties detailed in the *Defence Radiation Safety Manual*.

8.20 Level 3A – user laser safety training – operator course. This comprises training delivered to users of specific laser systems as a module of a qualification course for specific equipment or weapon systems that use Class 3R, Class 3B or Class 4 laser systems. Training is delivered by someone who holds the qualification of an LSO1/LSO2 or is already qualified on the platform, weapon system or service laser. This training informs users on how to:

- a. operate the equipment safely
- b. identify potential laser hazards
- c. extant safety operating procedures and the appropriate precautions to be undertaken.

8.21 Level 3B – maintenance laser safety training – maintainer training. This comprises training delivered to maintainers of all Class 3R, Class 3B and Class 4 laser systems. This training informs maintainers on laser hazards and potential risks, how to operate and maintain the laser equipment safely, and the appropriate precautions to be undertaken. The training is to be delivered by a suitably qualified person (see Level 3A in [paragraph 8.20](#)), is competency based and is to be incorporated into relevant Defence trade training programs.

8.22 Level 4 – laser radiation general awareness training. This comprises annual training for all personnel on the nature of laser hazards (usually conducted as part of induction training). The training is to be conducted with input by the unit LSO or another suitably qualified person. The current training course details are to be entered by the unit as the course proficiency for laser safety – general awareness training. This training is to be provided to all personnel who are or may be exposed to laser hazards or at a site where hazardous lasers are operated.

Section 8-4. Laser range safety

Overview

8.23 When planning activities that incorporate the use of a Service laser at Defence training areas, ranges and operational and training facilities, users are to consider the laser safety requirements, including the development of LHA templates and Range Laser Safety Clearance Papers, as described in this chapter and relevant safety publications and policy.

8.24 All use of lasers on Defence training areas is to be coordinated between the LSO, OIC Practice, and the RCO to ensure all relevant safety, WHS requirements and operating and training outcomes can be met.

Qualifications and competencies

8.25 Officer-in-Charge Practice and safety supervisors. Personnel fulfilling safety appointments on all ranges where Class 2 lasers (or higher) are employed are, at a minimum, have the following qualifications:

- a. have the appropriate range conducting/supervisor qualification for category of range used
- b. be weapon qualified in accordance with this publication
- c. be qualified on the laser device being used during the practice or have a SO/SS who is qualified in accordance with the relevant LWP-G 7-3 series publication
- d. be qualified to deliver Level 3A safety training as identified in the *Defence Radiation Safety Manual*
- e. have attended the annual laser safety awareness training (Level 4).

8.26 Operators of laser equipment. All personnel operating Class 3R, Class 3B and Class 4 lasers are to be qualified on the equipment and to have conducted the user level safety training (Level 3A). All other personnel who are or may be exposed to laser hazards are to receive laser radiation general awareness training (Level 4).

Laser ranges and training areas

8.27 Where the calculated NOHD or extended nominal ocular hazard distance (NOHDe) exceeds the distance to the range boundary, or where persons might be at risk within the NOHD or NOHDe, the laser beam must be terminated by a natural or an artificial backstop within the boundaries of the Defence property, or surveillance must be maintained over the entire hazard area to ensure a very high level of confidence that no one is at risk. Procedures must be adopted whereby the laser operation can be stopped if unprotected persons could be exposed to hazardous levels of laser radiation.

8.28 The LSO, OIC Practice and RCOs are to ensure that laser operations are conducted within the range/training area in such a manner as to cause an insignificant risk of laser injury to any unprotected person. Detailed responsibilities for the guidance of LSO of weapons ranges, operational and training ranges are given in [Section 8-7](#).

8.29 Unless specifically authorised by the range or training area control officer, a laser operator is to engage only designated targets or target areas. All lasers to be used as part of force-on-force training are to be limited to their lowest possible power setting, or restrictions briefed as part of the safety briefings.

Use of lasers

8.30 The following general instructions apply to the use of lasers on training ranges in Australia during peacetime:

- a. **Class 3R lasers.** Class 3R laser systems in the wavelength range below 400 nm and above 700 nm and Class 3B and Class 4 laser systems are only to be fired on established Defence property that has been certified for use by a LSO1 specialist in weapon ranges, operational and training facilities.
- b. **Class 2, Class 2M and Class 3R lasers.** Class 2, Class 2M and Class 3R laser systems in the visible spectrum (wavelength range above 400 nm and below 700 nm) is at the discretion of local commanders. Class 2, Class 2M and Class 3R laser systems in the visible spectrum may be operated outside approved areas provided the area is authorised for military training. Cognisance must be taken of the presence of members of the public whose curiosity might put them at risk by close and intense scrutiny of the laser beam and its source. Further, it should be noted that the light from these lasers might dazzle motorists or aircrew.

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- c. *Class 1M lasers.* Class 1M lasers are safe without the use of magnifying optics and may be operated outside approved areas. Operators should be cognisant that the light from Class 1M lasers might dazzle motorists or aircrew.
- d. *Class 1 lasers.* Class 1 lasers are intrinsically safe, including with the use of magnifying optics and may be operated outside approved areas. Operators should be cognisant that the light from Class 1 lasers might dazzle motorists or aircrew.

Targets and target areas

8.31 The target area is the area defined by the laser beam when it is traversed between the limits in azimuth and elevation (see Figure 8–2). Where possible, artificial targets constructed to produce only diffuse reflections should be used. In any case, targets that might produce hazardous specular reflections are not to be engaged unless the specular surfaces have been covered or removed. The effect of wet surfaces on targets must also be taken into account when assessing their suitability for laser operations.

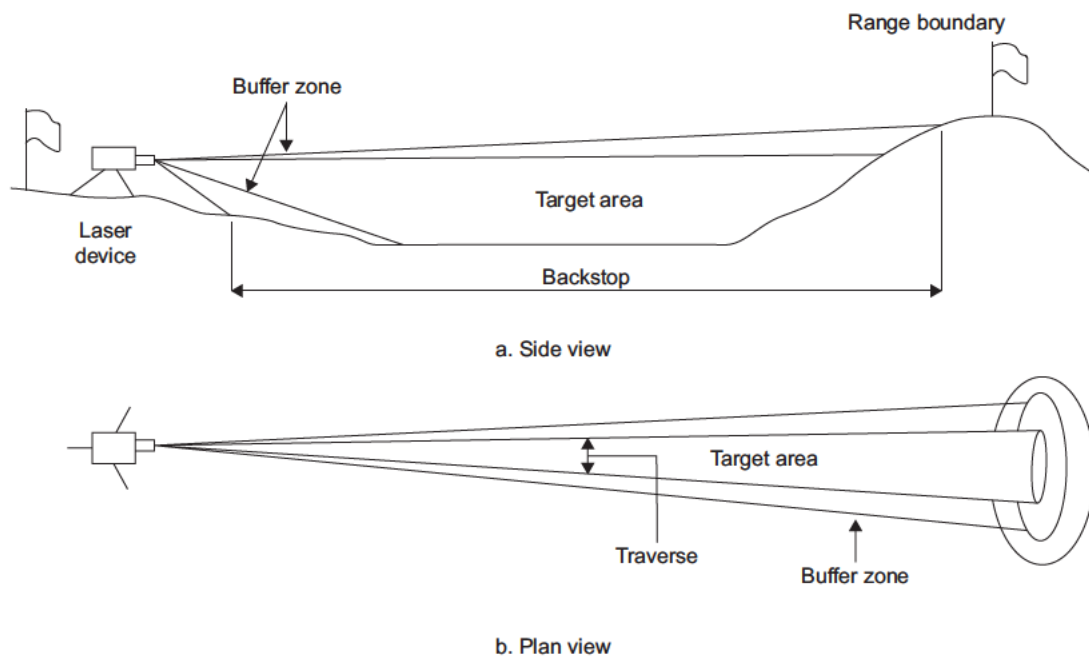


Figure 8–2: Target area – side and plan view

8.32 When constructing artificial targets:

- a. use corrugated or slatted material – slats should be rounded or angled face downward; hessian or sackcloth is also suitable for target application
- b. use dark matte paints and endeavour to obtain a stippled or undulating finish, possibly with the addition of sand or similar material – the use of glossy or reflective finishes, such as reflective tape, is particularly hazardous; ensure that the target is free from glass surfaces, such as windscreens, periscopes and mirrors
- c. use earth mounds (if appropriate)
- d. when using aerial targets the LHA must take account of reflection hazards – if the target is manned, the aircrew is to be advised on the hazards involved and must wear correctly fitting laser protective eyewear of the appropriate optical density.

Retro-reflective targets

8.33 The use of retro-reflective materials on targets could enable significantly reduced laser energy levels to be used during training. Such targets must only be used with suitably filtered laser equipment because of the additional hazard they could present to the operator.

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Backstops on land ranges

8.34 When the NOHD, or the NOHDe, cannot be contained within the boundaries of the authorised laser range or training area, the laser beam should be terminated by a backstop to eliminate any possible hazard to persons outside the range boundary. If no suitable backstop is available, advice from the LSO1 specialist in weapon ranges, operational and training facilities is to be sought to assess the laser hazard to military or civilian persons who could potentially view the laser source both directly and with the use of magnifying optical instruments. Any material with a non-reflective surface is suitable for use as a backstop.

Buffer zones

8.35 A buffer zone around a beam of laser radiation (the size of which depends on the ability to maintain the laser beam on the target) is required so that personnel are not exposed to laser radiation levels in excess of the MPE. The requirement for buffer zones is to be articulated in the specific LSP.

Laser hazard area

8.36 The LHA is the entire zone in which a person could be at risk from direct intra-beam viewing of laser radiation. The dimensions of the LHA are dependent on many factors, including the NOHD, the angular divergence of the beam and the buffer zone. The method of constructing an LHA is detailed in the *Defence Radiation Safety Manual*. The target area is the area that will encompass all possible laser designation targets (ie, one or more targets may be within this area).

8.37 With certain laser systems, mostly air-to-surface, a fault hazard area (FHA) may be included within the LHA. The FHA is an area that could possibly be irradiated in the event of a severe control system malfunction that causes the laser to point in an unintended direction. Where the risk level to persons in an FHA is sufficiently small, the LSO1 specialist in weapon ranges, operational and training facilities may advise that laser operations can be carried out under specified conditions.

Personal protection

8.38 The LHA is to be cleared of all unnecessary personnel during laser operations. When personnel are required to remain within the hazard area, it is essential to adopt protective measures before firing a hazardous class of laser. All personnel must wear authorised laser protective eyewear that gives protection at the laser wavelength being used. The eyewear is to be approved for use for the specific type of laser device employed in accordance with AS/NZS 1337.4: *Eye and face protection - Filters and eye protectors against laser radiation (laser eye-protectors)* by the LSO. All authorised eyewear must be marked in accordance with AS/NZS 1337.4: *Eye and face protection - Filters and eye protectors against laser radiation (laser eye-protectors)* [Section 6]. Further, only eyewear of the relevant wavelength should be available during the activity. The term 'eyewear' includes authorised laser protective filters fitted to optical instruments. The specification of the laser eyewear is to be recorded in the LSP and SOP.

Optical magnifying instruments

8.39 Where it is known or suspected that optical magnifying instruments may be used for intra-beam viewing within the area of laser operations, the hazard area must be based on the NOHDe. No such optical instruments are to be used within the NOHDe unless they are fitted with appropriate laser safety filters or protective eyewear is worn. Provided all specular surfaces within the target area have been removed or covered, there is no need for protective eyewear to be used when viewing targets from positions outside the beam path, except when Class 3B and/or Class 4 laser systems are being used.

Inclement weather and night operations

8.40 Class 3R lasers are to be treated as Class 3B lasers for night operations. No special additional precautions are required during rain, snow or fog, but cognisance should be taken of the effects of wet targets.

Range safety procedures

8.41 The following information (as appropriate) is safety procedures to be put in place when firing a Class 3R laser system in the wavelength range below 400 nm and above 700 nm, a Class 3B system and a Class 4 system (specific details are contained in the *Defence Radiation Safety Manual*):

- a. **Laser firing.** Lasers used in conjunction with small arms are to be employed as a weapon and, before any such lasers are fired, the warning procedures adopted for conventional weapon firings must be applied.

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- b. *Prevention of accidental laser firing.* When laser equipment is unattended, it must be made safe in accordance with the device's LSP and the relevant technical manual or in accordance with the administrative controls described in the relevant LWP-G 7-3 series publication.
- c. *Preparation of laser targets.* All targets used for laser operations must be free from glass surfaces and should have a rough, non-glossy finish.
- d. *Preparation of the ground.* Wherever practicable, the ground within the hazard area over which a laser is to be fired must be cleared of flat, shiny surfaces that might produce specular reflections. Specular reflections from small, still-water puddles could create a hazard for individuals on the ground or in aircraft downrange from the puddle.
- e. *Firing over the sea.* If laser firings take place over the sea, specular reflections are possible and due allowance must be made for the worst case scenario (ie, when the sea surface is flat calm).
- f. *Wet target caution.* The viewing of wet targets through magnifying optical instruments when the target is close to a Class 3B or Class 4 laser could be hazardous. Advice on the engagement and observation of such targets is to be sought from the unit LSO.
- g. *Retro-reflectors.* Retro-reflectors are not to be used on ranges unless explicitly authorised by the LSO1 for the range and are only to be used in accordance with explicit directions contained within an LSP, a range safety clearance paper or LSO1-authorised local range operating procedures.
- h. *Personal protective equipment.* PPE is to be worn in accordance with directions contained in an LSP, a range safety clearance paper or LSO1-authorised local range operating procedures.
- i. *Lowest practicable output mode.* Laser devices used on the range and in training exercises are to operate in the lowest possible output mode consistent with achieving the training objective.
- j. *Laser warning signs.* There is no requirement to mark the LHA with warning signs, provided the LHA is fully contained within the range danger boundary area. Where the LHA extends outside such a boundary and in all other areas where lasers are used, the LHA should be marked wherever reasonably practicable. Details on warning signs are given in *AS/NZS IEC 60825.1: Safety of laser products - Equipment classification and requirements* and *AS/NZS IEC 60825.14: Safety of laser products - A user's guide*.
- k. *Livestock and fauna.* Lasers are not to be fired deliberately at livestock and fauna. The LHA should be kept as clear as possible of livestock and fauna.
- l. *Spectators and other people near lasers.* Under normal circumstances there is no hazard to spectators, operators and other people in the vicinity of a laser, provided they remain outside the LHA. The presence of specular reflectors within the LHA and/or the use of optical aids (eg, cameras and binoculars) may introduce a hazard. These aspects need to be cleared and/or controlled as appropriate, or a series of 'what if' NOHD calculations performed to determine the safety of a position. The LHA should be treated as a controlled area.
- m. *Aircraft and helicopters.* Because of the use of automatic warning/avoidance systems on ADF aircraft and helicopters, laser energy should not be focused on these platforms to avoid the inadvertent automatic movement of the aircraft.
- n. *Inspections.* Safety staff are to conduct specific inspections in accordance with the relevant platform publication, technical manual or LWP-G 7-3 series publication.
- o. *Laser power settings.* Unless authorised by a formation commander, lasers are to be set at their lowest operating power setting (usually Class 1) during force-on-force training or when other personnel are operating in the vicinity (includes public). Once confirmed as set at the lowest operating setting the laser is to be test fired in a safe direction to confirm that it is set at the lowest setting (if possible to discern). The laser power settings are to be regularly checked and minimum engagement distances are to be enforced. Additional specific laser range safety requirements are listed in the relevant LWP-G 7-3 series publication.
- p. *Safety briefing.* Instructions for the conduct of LHA safety briefings are included in the relevant LWP-G 7-3 series publication and must form part of the activity briefings. A laser safety brief is provided in [Annex A](#).

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Section 8-5. Laser radiation safety management

8.42 First aid. The minimum medical requirements when operating Class 3R laser systems in the wavelength range below 400 nm and above 700 nm, and Class 3B and Class 4 laser systems, are as per the activity being conducted.

8.43 Notification and reporting requirements. All incidents that have caused or could have caused an injury are notifiable in accordance with the *Australian Radiation Protection and Nuclear Safety Regulations 2018*. Incidents involving lasers are subject to Defence reporting requirements, in accordance with the *Defence Radiation Safety Manual*. Notification and reporting is effected using the Sentinel Work Health and Safety Event Investigation Report, with copies to Defence Radiation Safety and Assurance Committee, the Australian Radiation Protection and Nuclear Safety Agency, and Comcare, as appropriate.

8.44 Laser overexposure investigation details. The relevant supervisor is to be notified as soon as possible of all suspected or confirmed laser overexposures and injuries. The UCO/IOC is responsible for instigating investigations. In such cases, a competent person such as an LSO or an independent investigator shall conduct an investigation into the incident and as detailed in the *Defence Radiation Safety Manual*.

Section 8-6. Light-emitting diode safety

8.45 The regulations contained in this chapter regarding the safe use of lasers extend to LED lights.

8.46 If not handled correctly, LED lights pose an ocular hazard similar to that generated by lasers. LED lights can cause permanent eye damage. Operators are to know the risk group of any LED light and handle it accordingly. Under no circumstances are personnel to look directly into any LED light source. LED lights are to be employed on the lowest power setting appropriate to the illumination required. Additional information on LEDs is available in *LWP-G 7-4-50, Precision Targeting Technologies*.

WARNING

Any LED device is potentially hazardous even for momentary exposures, but your blink reflex provides adequate response and even protection. If illuminated, close your eyes. Maintaining eye contact with a light beam emitted from an LED device may cause eye injuries.

Section 8-7. Responsibilities of unit/formation laser safety officers

8.47 LSOs covering weapons ranges, operational and training facilities must engage with the OIC Practice and the RCO to ensure that all relevant safety, operating and training requirements are met. The laser safety responsibilities of the LSO include:

- a. providing advice on the identification and marking of suitable sites from which laser operations may be conducted
- b. providing advice on the provision of suitable targets or target areas with adequate backstops and buffer zones, and with all known specular objects on the targets and in the target area and/or backstops which might cause a hazard, removed or covered to prevent reflections
- c. providing advice on the marking of the LHA, wherever reasonably practical, with suitable warning signs, where the LHA is not wholly contained within the range danger boundary area and ensuring that no employees are within the area when laser operations are in progress
- d. providing advice on the erection of suitable barriers and arrangements for patrols and/or sentries
- e. assisting in the preparation and publication of SOPs and TASO appropriate to the type(s) of laser to be used
- f. authorising the use of a reduced NOHD should local visibility deteriorate owing to meteorological conditions
- g. providing advice on wet target caution

- h. assisting in determining the need to establish control and/or surveillance of the air or sea space within the LHA and the method of implementing any control measures found necessary
- i. assisting in ensuring that all employees involved in laser operations are instructed in the safety precautions and SOPs to be followed
- j. assisting in ensuring that magnifying devices such as binoculars, telephoto lenses or telescopes are not operated on the range during laser operations without LSO approval
- k. assisting in retention of positive control of all laser equipment operated on the range
- l. the immediate reporting of any suspected overexposure to laser radiation in accordance with [Section 6-2](#), and ensuring that the individual concerned is referred at once to the unit medical officer so that the necessary examination can be performed within 24 hours of the incident.

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Annex A to Chapter 8

Laser safety brief for range users

1. Confirm all SSs and firers are qualified on the laser equipment being used.
2. The safety brief checklist is presented as a vui tui. The safety brief is to be used only as a guide and do not remove the need for the OIC Practice to apply the regulations in this publication.

<i>Laser safety brief</i>	
1.	All personnel are to be warned that lasers are being used during the activity/practice.
2.	The laser is to be treated in the same way as any weapon.
3.	Do not use magnifying optics to view lasers; ie, to observe through cameras, binoculars or any other optical device unless those devices have been fitted with laser filters.
4.	Do not look directly into a laser.
5.	Muzzles and lasers are to be pointed in a safe direction at all times.
6.	Only illuminate targets or threats within the target area of the range.
7.	Do not point or fire the laser at:
a.	personnel
b.	any objects with highly reflective surfaces
c.	aircraft, vehicles or structures
d.	any livestock or fauna
e.	anything, at any time you consider that there is a danger to any person.
8.	Devices are only to be switched on when ordered by the safety staff.
9.	Devices are to be switched off when unattended or not in use (not on the firing mound) (not firing).
10.	Batteries are to be removed prior to final weapon clearances.

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Chapter 9

Direct fire ammunition danger area template

Section 9-1. Introduction

9.1 An ADA template is a scaled drawing of the area of danger created when a single round of ammunition is initiated from a static FP along a single line of fire (usually shown as a scaled drawing or template). Each separate combination of platform, weapon and specific ammunition nature produces a distinct ADA. The ADA design parameters are based on mathematical calculations that assume a high degree of range discipline on the part of all personnel involved in firing the ammunition nature. Details about aviation and artillery ADA templates are contained within their respective LWP-G 7-3 series publications.

9.2 The dimensions of an ADA are based on a combination of:

- a. the ballistic characteristics of the ammunition
- b. the degree of accuracy of the weapon/platform
- c. the angle of fire of the weapon
- d. the type of ammunition, propellant and charge
- e. an accepted degree of human error
- f. the ground and conditions of firing.

9.3 An ADA template (see [Figure 9-1](#)) comprises:

- a. **Firing point.** The FP is the position from which firing occurs. It may take the form of a point for an IW, a line for a number of weapons, or an area for one or more weapons firing from different positions.
- b. **Impact area.** An impact area is an area that has designated boundaries within the limits of which all ordnance is to make contact with the ground. An impact area consists of:
 - (1) the target area, which is the point or location at which fire from the weapon or EO is to be directed or detonated
 - (2) the dispersion/human error angle, which delineates an area on both sides of the line of fire to cover such eventualities as human error (eg, unsteady aim or the effects of meteorological conditions)
 - (3) the ricochet area, which is the area in which ricochets of ammunition and EO may be expected to travel.
- c. **Burst safety distance.** The impact area is surrounded by a burst safety distance for exploding ammunition or ordnance, which is defined by a radius from the point of burst within which a danger exists from blast, fragments and debris.
- d. **Back blast danger area.** The back blast danger area (BBDA) is created when a rocket launcher or antitank guided weapon is fired. The detonation of a round forms exhaust gases to the rear of the weapon as a triangular-shaped gaseous overpressure area. Within the specified danger area (the BBDA) there will be blast overpressure and debris will be projected rearwards. No personnel are to be in the BBDA.
- e. **Sabot discard area.** The separation of the sabot petals from the penetrator creates a hazard to unprotected personnel in close proximity to a firing AFV. As the round fires, the pressure wave produced acts on the sabot petal surface and these become unstable having the potential to fly erratically. Sabot discard areas must be considered when producing ADA templates. Data for ammunition with a sabot discard area is contained within *LWP-G 7-3-2, Australian Defence Force Range Orders (Mounted)* [Annex C to Chapter 9].

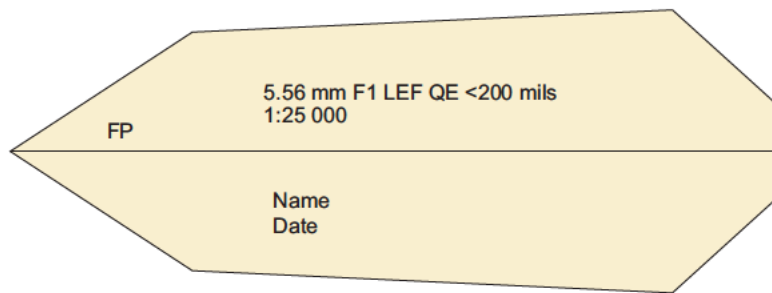
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Figure 9-1: Ammunition danger area template

Section 9-2. Definitions

9.4 The following definitions apply to danger areas:

- a. *Angle of elevation.* The angle of elevation is the angle between the horizontal plane and the axis of the weapon barrel when it is raised above the horizontal plane.
- b. *Angle of depression.* The angle of depression is the angle between the horizontal plane and the axis of the weapon barrel when it is lowered below the horizontal plane.
- c. *Arc of fire.* The arc of fire is that area within which firing is to be directed. It is marked from the FP or area and then indicated to the firers prior to firing.
- d. *Culminating point.* The culminating point is the highest point to which the projectile will rise above the line of sight along the trajectory.
- e. *Ammunition danger area template.* An ADA template is a scaled drawing of the area of danger created when a single round of ammunition is initiated from a static FP along a single line of fire. Each separate combination of weapon and specific ammunition nature has a distinct danger area template and must be combined with a high degree of range discipline. The dimensions of a danger area template are based on a combination of the factors listed in [paragraph 9.2](#).
- f. *Direct fire.* Direct fire is fire aimed at a target visible to the firer. It is normally delivered at a low angle of elevation.
- g. *Hard target.* A hard target is one that is designed or likely to cause a ricochet, such as concrete structures, steel/aluminium plate, hard crystalline and sedimentary rock such as granite, basalt and sandstone and robotic targets. If part of the target area is a hard target, the whole area is treated as a hard target area.
- h. *Low elevation fire (previously known as field firing area).* Low elevation fire (LEF) occurs when weapons are fired at ground targets where the QE is below that required for high elevation fire (HEF). The LEF template is the most commonly used (see [Table 9-1](#) in Annex A).
- i. *High elevation fire.* HEF occurs when weapons are used in the air defence role or against high-mounted targets such as those representing an enemy in an upper window or on the roof of a building. HEF templates are to be applied wherever the firing elevation is above that shown in [Table 9-1](#) in Annex A.
- j. *Indirect fire.* Fire is indirect when it is delivered at a target that cannot be seen by the firer. Indirect fire is usually directed onto the target by an observer who can see the target and who relays information, including adjustment of fire, to the firer.
- k. *Quadrant elevation.* The QE is the angle of elevation, measured from the horizontal plane at which a projectile is launched from a weapon barrel.
- l. *Range danger area safety trace.* An RDAST diagrammatically defines the limits of the dangerous area created when an ADA template is applied from all FPs to all target positions on a map of the same scale. It is constructed by range users to determine the maximum permissible arcs of fire and is used by range authorities to determine whether the activity can be conducted safely and within the confines of the range boundaries. It is also used to determine the requirement for sentries, closure of access points, and warning of local inhabitants and other range users.

- m. *Soft target.* The target area is considered a soft target when there are no hard crystalline rocks, concrete or metal objects in the impact area which could cause an increased ricochet risk. Trees are considered to be soft targets.
- n. *Ground ricochet area.* A ground ricochet area is that area of ground enclosed by the limits of range and the distance on either side of the line of fire to which a projectile may ricochet.
- o. *Ground danger area.* The ground danger area is that area in which personnel may suffer injury from the effects of projectiles landing in the ground ricochet area. The following points should be noted:
 - (1) For solid projectiles such as APFSDS, APDS and DS practices, the ground danger area coincides with the ground ricochet area.
 - (2) For projectiles with an explosive content, the ground danger area is the ground ricochet area extended on all sides by the safe distance from a ground burst.
 - (3) For recoilless guns and guided weapons, the back blast is added to extend the ground danger area at the FP.
- p. *Normal ground danger area.* The normal ground danger area is the ground ricochet area extended on all sides by the normal safe distance from the point of burst. The normal safe distance is the distance beyond which it is theoretically impossible for a splinter to travel. Normal safe distances are listed in column (o) of [Table 9-1](#) in Annex A, and the template is illustrated in [Figure 9-2](#).

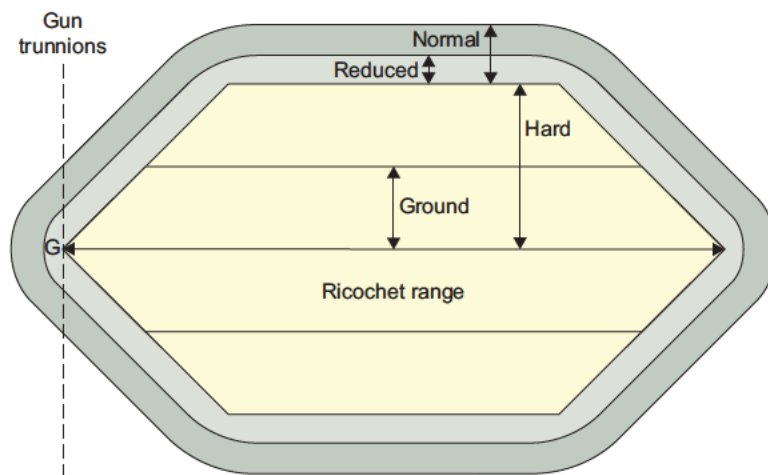


Figure 9-2: Normal ground danger area template for an explosive projectile

- q. *Reduced ground danger area.* The reduced ground danger area is the ground ricochet area extended on all sides by the reduced safe distance from the point of burst. The reduced safe distance is the distance at which the chance of being hit by a splinter has been reduced to a reasonable and acceptable risk. Reduced safe distances are listed in column (p) of [Table 9-1](#) in Annex A.
- r. *Extended ground danger area.* The extended ground danger area is the ground ricochet area extended along the axis of the bore by the distance a round may travel if a QE greater than that in column (k) of [Table 9-1](#) in Annex A is applied to the gun. Depending on the type of ammunition used, that distance might be more than twice the maximum ricochet distance given in [Table 9-1](#) in Annex A.
- s. *Danger areas for armoured fighting vehicle-mounted weapons.* When firing takes place from weapons mounted in AFVs, the area to the rear of the gun trunnions is considered safe and excluded from both the normal and reduced ground danger areas. The exceptions to this rule are as follows:
 - (1) Special instructions may be issued to the contrary, as in the case of ammunition fitted with fuzes that are likely to produce premature detonation.
 - (2) Recoilless guns or guided weapons are exceptions to the rule. In the case of these weapons, the following are to be observed:
 - (a) *Recoilless guns.* The normal ground danger area for recoilless guns will include the entire back-blast area (including the caution area). The reduced ground danger area will include only the BBDA at the rear of the trunnions.

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- (b) *Guided weapons.* Because of the possibility of a wild missile, the standard template is used for guided weapons regardless of the mount. The normal ground danger area to the rear includes the BBDA.
- (c) *Bunkers and shelters.* Troops provided with adequate protection by approved bunkers or shelters may be permitted to be inside the RDA. TASSO are to specify the conditions (including details of weapons, ammunition, FPs and arcs of fire) under which the bunkers or shelters may be occupied when firing is taking place.
- (d) *Templates.* Details of templates for AFV weapons are contained in [Annex C](#).
- t. *Blast and fragmentation.* After ricochet, a projectile having an explosive content may detonate at any distance up to the perimeter of the ground ricochet area. Therefore, the effects of blast and fragmentation may extend beyond the limits of the ground ricochet area. The maximum distances to which those effects may extend from the point of burst are shown in column (o) and column (p) of [Table 9-1](#) in Annex A. The combination of the ground ricochet area and the blast and fragmentation area gives the normal ground danger area for an explosive.

Armoured fighting vehicle ranges

9.5 A projectile fired on the range may, after striking the target, the ground or any object on the range, ricochet for a considerable distance. The ranges up to which ricochets can occur are detailed in column (f) of [Table 9-1](#) in Annex A, opposite the particular gun/projectile combination.

9.6 On ricochet, a projectile may be deflected to either side of the line of fire. The maximum distance to which a projectile can ricochet in this manner is shown in column (j) and column (k) to [Table 9-1](#) in Annex A. Hard targets, in column (k), include concrete, steel armour and hard crystalline and sedimentary rocks such as granite, basalt and sandstone. All other surfaces, including water, are considered to be ground, in column (j) of [Table 9-1](#) in Annex A.

Section 9-3. Ammunition factors

9.7 The ammunition planning factors affecting template design are specified in [Annex A](#). These factors include:

- a. projectile ranges
- b. ricochet angles and distances
- c. QE data
- d. air danger heights
- e. burst safety distances
- f. minimum engagement distances.

Section 9-4. Design considerations

9.8 The following factors must be taken into account when designing an ADA template:

- a. selection of the appropriate dispersion/human error angle
- b. ricochet characteristics
- c. burst safety distances
- d. air danger heights
- e. BBDA
- f. minimum engagement distances
- g. the firing position or platform (eg, the QE of the weapon, stabilised/unstabilised)
- h. whether the practice is static or mobile
- i. the inclusion of BNS
- j. whether an LEF or HEF ADA template can be used.

9.9 Dispersion/human error angle. The dispersion/human error angle accounts for inconsistencies in the weapon, ammunition, platform and the firer. [Table 9–6](#) in Annex A details the dispersion/human error angle for various weapons fired in different scenarios. When developing an ADA template, the appropriate dispersion/human error angle is to be applied. Where this value cannot be accurately measured, it is to be rounded up to a measurable value.

9.10 Ricochet characteristics. The ricochet characteristics are based on the weapon systems and ammunition natures being fired. For additional detail, consult the relevant weapon or LWP-G 7-3 series publication. When determining the dimensions of a template, consideration must be given to the following ricochet factors, which affect the final design:

- a. A ricochet occurs when a projectile strikes a surface, then rebounds one or more times.
- b. A ricochet is dependent on the ammunition nature, impact area and impact angle.
- c. The range at which a projectile achieves an angle of descent of 530 mils is taken as its maximum ricochet range. The weapon elevation that achieves this range is taken as the elevation above which ricochets will not occur. If a projectile strikes at an angle of less than 530 mils to the surface and does not explode or disintegrate, it may ricochet in any direction from the line of fire up to the maximum range for the weapon. Projectiles fired at high elevation (mortar bombs) do not ricochet because their angles of descent are greater than 530 mils.
- d. Where the QE can be guaranteed to be below that specified for the ammunition in [Table 9–1](#) in Annex A, an LEF template may be used. In all other cases the HEF template is used.
- e. The angle at which a projectile will ricochet laterally depends on the type of surface struck. The lateral ricochet distance for hard and soft surfaces is the same in most instances, because of the loss of kinetic energy after deflection.
- f. Ricochet angle for AFV/non-AFV is to be 800 mils unless specified in the remarks columns in [Table 9–1](#) (see Annex A).

9.11 Burst safety distance. When using exploding ammunition, the burst safety distance is added to the outline of the ricochet template to complete the basic ADA template for the ammunition concerned. Burst safety distances for different ammunition natures are specified in [Annex A](#). The burst safety distance to be used when spectators attend exercises, demonstrations or trials may be reduced with the authorisation of a MAJGEN (E) when it is deemed necessary for the success of the practice and as long as the spectators comply with the safety measures applicable to the participants.

9.12 Air danger heights. Safety traces are concerned not only with danger areas at ground level but also with air danger heights. Although ammunition may only reach the culminating point in certain very small portions of the overall area, the air danger height is still applied over the whole template area. Air danger heights are specified in [Annex A](#). The maximum expected QE of the weapons used determines the air danger height to be applied. The air clearance required for any range practice is calculated by applying the appropriate air danger height for the weapon used, measured from the FP, not from mean sea level (unless the FP is at sea level). Therefore to calculate the air danger height that will apply to any range practice the height of the FP above mean sea level is to be added to the appropriate air danger height for the weapon system used.

9.13 Back - blast danger area/dangerous space. The BBDA for rocket launchers and DFSW creates a hazardous area to the rear of the weapons when fired. At all times during firing, the BBDA must be clear of personnel, equipment or any form of obstruction. Safety distances for in-service guided missiles, rocket launchers and DFSW are specified in [Annex A](#). Further details on the BBDA are contained within the respective weapon publications for the Javelin, 66 mm light DFSW and 84 mm MDFSW systems. The BBDA is not required to be shown as part of the template.

9.14 Minimum engagement distance. The minimum distance at which targets may be engaged is specified in [Chapter 7](#) and in the relevant LWP-G 7-3 series publication.

9.15 Battle noise simulation. ADA templates for BNS are not required. However, this type of activity can only be carried out on a Manoeuvre range or on a training area where BNS has been authorised by the appropriate authority.

9.16 Stabilised fire control system. The stabiliser systems are designed to maintain the gun on whatever line and elevation it is laid. This is usually achieved by fitting gyros to the weapon system, to sense the

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movement of the vehicle (hull) and guns, in elevation and azimuth. When using stabilised weapon templates the dispersion angle is zero.

9.17 It should be noted that some weapon systems are fitted with camera stabilisation systems. These reduce the vibration of the camera/sensor only and are not weapon stabilised weapon platforms. They are to be treated as non-stabilised for the purposes of producing an ADA template.

9.18 Non-stabilised fire control system. When producing an ADA template for non-stabilised weapon systems a dispersion angle is to be applied. The dispersion angle delineates an area on both sides of the line of fire to cover tolerances in ammunition manufacture and human error (eg, unsteady aim or the effects of meteorological conditions). The dispersion angle is to be applied at all times when weapons are to be fired from a non-stabilised/fixed sighted platform (eg, pintle-mounted MGs). Dispersion angles are determined as follows:

- a. stationary vehicle: 50 mils
- b. moving vehicle: 90 mils
- c. OIC Practice may authorise vehicle-mounted shoulder-controlled firing on the move under 10 km/h, dependent on crew experience.

Low – elevation fire and high – elevation fire range templates

9.19 The QE at which maximum range is said to occur varies from one ammunition nature to another. The danger area for HEF templates is longer than the LEF template range. LEF and HEF range templates are defined as follows:

- a. *Low elevation fire range templates.* These are the most commonly applied templates for dismounted field firing activities where the terrain permits a QE less than that detailed in [Table 9–1](#) in Annex A.
- b. *High elevation fire range templates.* These are applied where the QE limit for the LEF template is exceeded. These are the most commonly applied templates used for mounted field firing activities, as it is more difficult to establish a known QE.

9.20 HEF range templates are to be applied where firing takes place above the QE specified in [Annex A](#) and the cone of fire is not captured by ground. The elevation at which HEF is said to occur varies from one ammunition nature to another. In general terms, it is at that particular angle above which a ricochet is not expected under normal circumstances. The danger area for HEF is longer than the LEF danger area. The high - elevation template is not to be applied where firing is to take place below the angle specified in [Table 9–1](#) in Annex A.

9.21 The ADA template makes provision for a wind velocity of up to 50 km/h (13.9 m/s). Where firing practices are proposed in wind conditions in excess of 50 km/h (13.9 m/s), the danger periphery on the downwind side must be extended by at least 500 m.¹ Where in such circumstances the danger area would extend outside the range boundary, firing is not permitted. RDASTs may require adjustment on the day firing occurs.

9.22 The angle at which HEF for each ammunition nature will occur is specified in [Annex A](#). In every case, the danger height will exceed 150 m above range level, so airspace clearance must be obtained in accordance with the appropriate TASO.

Armoured fighting vehicle/non-armoured fighting vehicles safety restrictions

9.23 No-one is permitted to be within the normal ground danger area or reduced ground danger area when firing is taking place, except as provided in this paragraph. For more realistic training, COs may allow their troops in closed-down AFVs to operate within the normal ground danger area, but not the reduced ground danger area. Unless otherwise stated in command or formation orders, authority to operate AFVs within the normal ground danger area is vested in the unit or company.

9.24 While flying a red AFV flag, the AFV CCs, the non-AFV CCs or the non-AFV weapon operators are to elevate their weapon system at any time another participating AFV/non-AFV enters an arc 800 mils either side of the bore of the weapon.

1. Where [Table 9–1](#) in Annex A notes a different wind speed from 50 km/h for a nature of ammunition, the 500 m is to be applied in accordance with this paragraph once the noted wind speed is exceeded.

Section 9-5. Standard template design

9.25 The standard ADA template design, used for all current direct fire weapon systems, is depicted in [Figure 9–3](#). The LEF range ADA template and the HEF range ADA template differ only in length.

9.26 Certain weapon systems cannot be accommodated within the standard designed ADA template. Weapon-specific templates for such cases are provided in [Annex B](#).

9.27 Before commencing the construction of an ADA template, it is necessary to determine the following:

- the ammunition type to be fired
- the scale of map to be used (to determine the scale of construction)
- the QE to be used, in order to determine whether an LEF or a HEF range template for the relevant ammunition is to be used
- the type of surface in the target area (hard or soft)
- the type of practice to be fired
- whether the ammunition is to be fired from a static or moving position to a static or moving target
- whether the platform is stabilised or unstabilised.

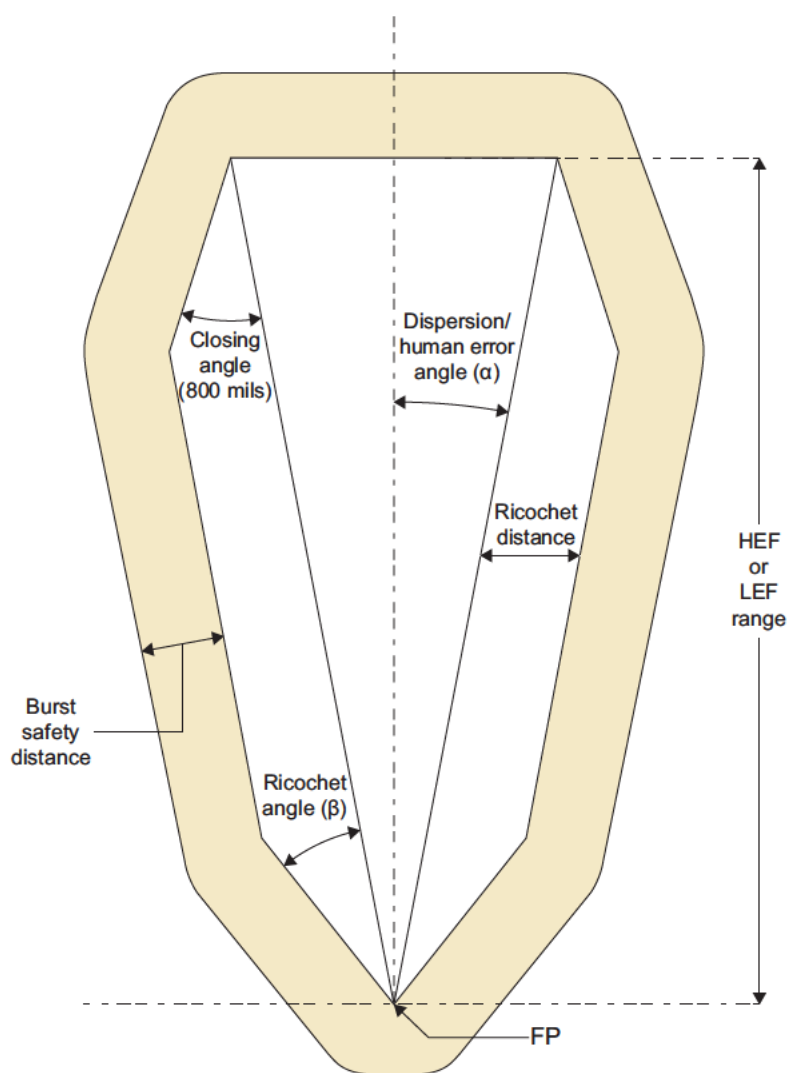


Figure 9–3: Standard ammunition danger area template

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Section 9-6. Template construction

9.28 Ammunition danger area template for non-exploding ammunition. The LEF ADA template is applied when the QE to be used is at or less than the angle shown in [Table 9-1](#) in Annex A. In all other cases the HEF ADA template is applied.

9.29 The process to be followed when constructing an ADA template for non-exploding ammunition is detailed in this paragraph. The example shown in [Figure 9-3](#) is based on a fictitious nature of ammunition. When constructing an ADA template, all data is to be taken from [Table 9-1](#) in Annex A for the applicable nature of ammunition. After securing a piece of graph paper to a firm working surface, proceed as follows:

- a. *Line of fire.* Draw a single centre-line which will indicate the line of fire (see [Figure 9-4\[a\]](#)). From the FP (Point A), measure a distance, to scale, of the reduced range for the nature of ammunition being used along the line of fire (Point B).
- b. *Dispersion/human error angle.* At Point B, draw a line of any length 1600 mils perpendicular to the line of fire. From Point A and on each side of the line of fire, draw lines AC and AD at the appropriate dispersion/human error angle to AB (see [Figure 9-4\[a\]](#) and [Table 9-6](#) in Annex A).
- c. *Ricochet angles.* Draw a line from Point A at the appropriate ricochet angle detailed in [Table 9-1](#) in Annex A (β mils) from line AC (the dispersion/human error line, not the line of fire). Repeat the process from line AD. From Point C and Point D, draw lines back at an angle using [Table 9-1](#) in Annex A (β mils) to meet the other two lines at E and F respectively (see [Figure 9-4\[b\]](#)).
- d. *Ricochet boundaries.* Draw a line GH parallel to line AC and at a scale distance appropriate to the ricochet distance from line AC (see [Figure 9-4\[c\]](#)). Similarly, draw a line IJ parallel to AD as detailed in [Table 9-1](#) in Annex A.
- e. *Confirmation.* Confirm that all angles and scale distances are correct.
- f. *Completed template.* Erase all construction lines to leave the seven-sided shape AGHCBDJIA (see [Figure 9-4\[d\]](#)). Inscribe all relevant information onto the completed template.

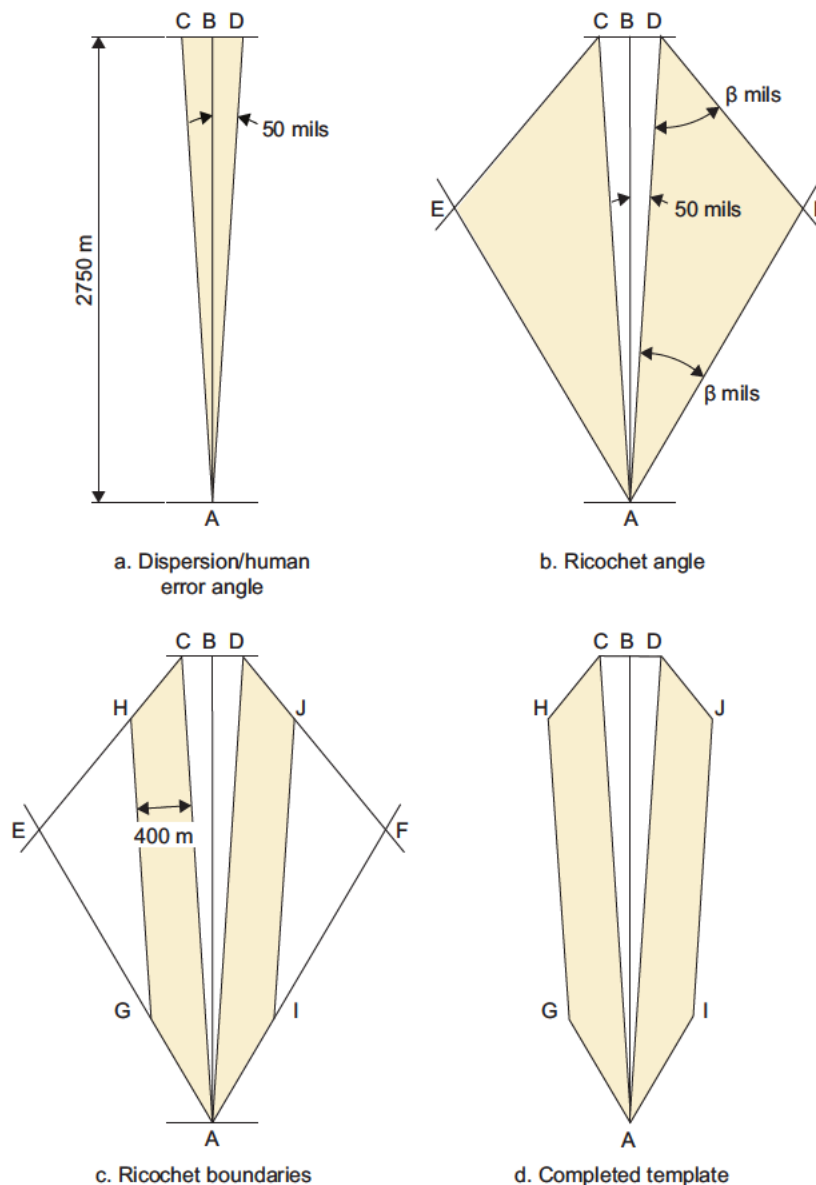


Figure 9-4: Construction (by stages) of a danger area template for non-exploding ammunition (5.56 mm F1)

9.30 Template for exploding ammunition. When using exploding ammunition the burst safety distance is to be added to the outline of the ricochet template to produce the danger area for the weapon and the type of ammunition being fired. The example shown in Figure 9-5 is based on a fictitious HE round. The danger area template is constructed as follows:

- Step 1.* The line of fire, dispersion/human error angle, ricochet angles and ricochet boundaries are constructed using the method described in paragraph 9.29 (see Figure 9-5[a]).
- Step 2.* Parallel to, and at the required distance from, the perimeter of the figure produced in Step 1, construct an outer envelope which represents the burst safety distance (see Figure 9-5[b]).
- Firing from armoured fighting vehicle.* When firing HE munitions from an AFV using the main armament with no exposed personnel (less AFV crew in vehicles), draw a perpendicular line through point A. Remove the bottom of the template where the line (KL) bisects the burst safety distance (see Figure 9-5[b]).

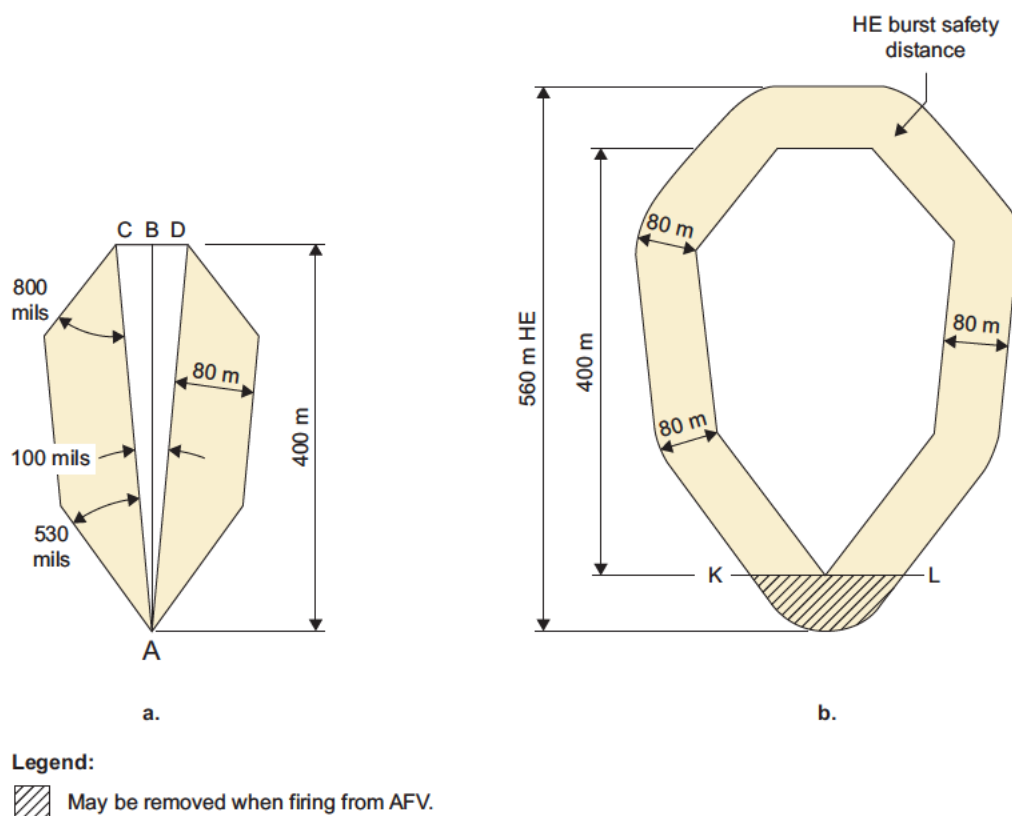


Figure 9-5: Construction (by stages) of a danger area template for exploding ammunition

9.31 Transferring the template to talc. When the accuracy of the template has been verified, it should be transferred to talc or rigid transparent film. This is achieved by placing the talc or film over the completed template, firmly securing it in place and proceeding as follows:

- Using the point of a sharp metal instrument, trace the shape onto the talc or film. A straight edge should be used when tracing straight lines.
- Lightly etch in the line of fire. It is not necessary to show the dispersion/human error angle, as this is no longer required once the danger area shape has been determined.
- Remove the talc from the drawing and cut along the outside lines to remove the template from the sheet.
- Use fine sandpaper to rub off any burrs along the edges of the talc and to correct any oversize bias in the shape. Ensure that sharp corners are not rounded off. Finally, check the completed template against the construction drawing to ensure that it is accurate in every respect.

9.32 Template annotation. An example of a completed template is shown in [Figure 9-6](#) in Appendix 1 to Annex B. All completed ADA templates are to be annotated with the following information:

- the calibre of ammunition used
- the nature of ammunition (eg, HE or PRAC)
- the scale of the template
- the FP (to avoid incorrect usage of the template)
- who the template was constructed by
- the QE, where applicable
- dispersion/human error angle, where applicable
- the date of construction
- the nature of the target (if applicable) – hard or soft.

9.33 Commercially constructed templates. Commercially constructed templates may be used; however, all responsibility for their accuracy rests with the user.

9.34 Laser hazard area templates. LHA templates are created separately, as described in the *Defence Safety Manual* and this publication. In order to define all danger areas, the area covered by both the RDAST and the area defined by application of the LHA template must be combined.

Annexes:

- A. [Ammunition planning factors](#)
- B. [Ammunition danger area templates](#)
- C. [Armoured fighting vehicle weapon and ammunition templates](#)

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Annex A to Chapter 9

Ammunition planning factors

1. Table 9–1 and Table 9–5 details the ammunition planning factors, Table 9–6 and Table 9–7 details the dispersion/human error angles, and presents notes relevant to planning for the use of some types of ammunition.
2. The dispersion/human error angles shown in Table 9–6 and Table 9–7 are to be adhered to when constructing ADAs. Guidance on the application of these angles as they apply to a particular ADA is provided as follows:
 - a. *Field firing ranges.* The angles specified in Table 9–3 and Table 9–7 apply to the following firing situations:
 - (1) static to static: dismounted – firing from static positions, usually after movement as part of fire and movement; mounted – firing from a static position
 - (2) static to moving: dismounted and mounted – firing from static positions engaging a moving target, usually after movement as part of fire and movement
 - (3) moving to static: dismounted – firing on the move at a static target (urban practices only); mounted – firing while moving, in accordance with this publication
 - (4) moving to moving: dismounted – firing on the move at a moving target (urban only with CO approval); mounted – firing while moving, in accordance with this publication.
 - b. *Permanent ranges.* The angles specified in Table 9–6 and Table 9–7 apply to the following firing situations:
 - (1) static to static, dismounted and mounted – firing while stationary from a prepared or other approved FP/position on a Permanent range
 - (2) static to moving, dismounted and mounted – as for paragraph 2b(1) except that the targets are moving
 - (3) moving to static, dismounted – (urban and other approved practices only) mounted – firing while moving but at static targets (eg, on mobile B2 ranges)
 - (4) moving to moving, dismounted – urban practices and specified practices from LWP-G 7-3-21, *Small Arms Range Practices* (to be published) and UDPs in accordance with this publication and TASO; mounted – approved practices in accordance with LWP-G 7-3-21, *Small Arms Range Practices* (to be published) and approved UDPs in accordance with this publication and TASO.
3. Significant terms used in Table 9–6 and Table 9–7 are defined as follows:
 - a. *Handheld/shoulder-controlled.* Handheld/shoulder-controlled weapons are freestanding IWs/LSWs and not attached to the vehicle when fired.
 - b. *Vehicle-mounted.* Vehicle-mounted weapons are attached to the vehicle via a mount (or equivalent attachment) and are thereby supported when firing. Vehicle-mounted fire control system (FCS) weapon systems are dealt with in the remainder of this paragraph.
 - c. *Vehicle-mounted with an unstabilised fire control system.* Vehicle-mounted weapons with an unstabilised FCS have a mechanical FCS that is not stabilised.
 - d. *Vehicle-mounted with a stabilised fire control system.* Vehicle-mounted weapons with a stabilised FCS include the M242 and M256 weapon systems.
 - e. *Aimer deviations (dispersion/human error angle).* Aimer deviations for moving to static and moving-to-moving are dependent on terrain. Two types of terrain are recognised in Table 9–6 and Table 9–7: formed roads/tracks (usually on Permanent ranges) and off-road (usually on Field Firing ranges), as follows:
 - (1) *Formed road/track.* This refers to a defined road or track which has had a degree of effort applied to its construction and maintenance, and is typically free of potholes. It is expected that

such a road/track would be easily accessible even by a commercial two-wheel-drive vehicle driven at speeds up to 60 km/h.

- (2) *Off-road*. This refers to terrain or a track which has not had a degree of effort applied to its construction and maintenance. The terrain or track would generally only allow limited accessibility to a commercial two-wheel-drive vehicle.²

2. Aimer deviation for field firing is larger than on purpose-designed ranges as Field Firing ranges generally have off-road tracks, while purpose-designed ranges have a purpose-designed road. It is to be noted that, when a formed road supports a field firing RDAST, the field firing aimer deviation is to apply.

Table 9-1: Planning factors

(a) Serial	(b) Ammunition nature	(c) Range (m)		(d) Angles (mils)				(e) Ricochet distance (m)		(f) Air danger height (ft) (as per paragraph 9.12)			(g) Burst safety distance (m)		(h) Minimum engagement distance (m)	
		(c) Low elevation fire range (formerly field firing area)	(d) High elevation fire range	(e) Soft target	(f) Hard target	(g) Closing angle	(h) Quadrant elevation angle limits		(i) Soft target	(j) Hard target	(k) Low elevation fire range (field firing area)	(l) High elevation fire range	(m) All arms air defence	(n) Normal safe distance	(o) Reduced safe distance	(p) Soft/soft ground target

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Serial	(a)	Ammunition nature	(b)	Range (m)	(c)	(d)	Angles (mils)	Ricochet distance (m)	Air danger height (ft) (as per paragraph 9.12)	Burst safety distance (m)	Minimum engagement distance (m)
s33(a)(ii)	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)

(a) Serial	(b) Ammunition nature	Range (m)		Angles (mils)					Ricochet distance (m)		Air danger height (ft) (as per paragraph 9.12)			Burst safety distance (m)		Minimum engagement distance (m)		
				Ricochet angle (β)		Quadrant elevation angle limits												
	(c) Low elevation fire range (formerly field firing area)	(d) High elevation fire range	(e) Soft target	(f) Hard target	(g) Closing angle	(h) Reduced range (field firing area)	(i) All arms air defence angle	(j) Soft target	(k) Hard target	(l) Low elevation fire range (field firing area)	(m) High elevation fire range	(n) All arms air defence	(o) Normal safe distance	(p) Reduced safe distance	(q) Soft/soft ground target	(r) Hard target		
			(c) Low elevation fire range (formerly field firing area)	(d) High elevation fire range	(e) Soft target	(f) Hard target	(g) Closing angle	(h) Reduced range (field firing area)	(i) All arms air defence angle	(j) Soft target	(k) Hard target	(l) Low elevation fire range (field firing area)	(m) High elevation fire range	(n) All arms air defence	(o) Normal safe distance	(p) Reduced safe distance	(q) Soft/soft ground target	(r) Hard target

s33(a)(ii)

(a) Serial	(b) Ammunition nature	Range (m)		Angles (mils)				Ricochet distance (m)		Air danger height (ft) (as per paragraph 9.12)			Burst safety distance (m)		Minimum engagement distance (m)	
		(c) Low elevation fire range (formerly field firing area)	(d) High elevation fire range	(e) Soft target	(f) Hard target	(g) Closing angle	Quadrant elevation angle limits	(h) Reduced range (field firing area)	(i) All arms air defence angle	(j) Soft target	(k) Hard target	(l) Low elevation fire range (field firing area)	(m) High elevation fire range	(n) All arms air defence	(o) Normal safe distance	(p) Reduced safe distance

Serial	(a)	(b)	Range (m)		Angles (mils)				Ricochet distance (m)		Air danger height (ft) (as per paragraph 9.12)			Burst safety distance (m)		Minimum engagement distance (m)	
			(c) Low elevation fire range (formerly field firing area)	(d) High elevation fire range	Ricochet angle (β)		Quadrant elevation angle limits		(j) Soft target	(k) Hard target	(l) Low elevation fire range (field firing area)	(m) High elevation fire range	(n) All arms air defence	(o) Normal safe distance	(p) Reduced safe distance	(q) Soft/soft ground target	(r) Hard target
					(e) Soft target	(f) Hard target	(g) Closing angle	(u) Reduced range (field firing area)	(i) All arms air defence angle								

(a)	Serial	(b)	Ammunition nature		Range (m)		Angles (mils)				Ricochet distance (m)		Air danger height (ft) (as per paragraph 9.12)			Burst safety distance (m)		Minimum engagement distance (m)																	
		(c)	Low elevation fire range (formerly field firing area)	(d)	High elevation fire range	Ricochet angle (β)		Quadrant elevation angle limits		(e)	Soft target	(f)	Hard target	(g)	Closing angle	(h)	Reduced range (field firing area)	(i)	All arms air defence angle	(j)	Low elevation fire range (field firing area)	(k)	High elevation fire range	(l)	All arms air defence	(m)	Normal safe distance	(n)	Reduced safe distance	(o)	Soft/soft ground target	(p)	Hard target	(q)	(r)

s33(a)(ii)

Serial	(a)	(b) Ammunition nature	Range (m)		Angles (mils)					Ricochet distance (m)		Air danger height (ft) (as per paragraph 9.12)			Burst safety distance (m)		Minimum engagement distance (m)	
			(c) Low elevation fire range (formerly field firing area)	(d) High elevation fire range	(e) Soft target	(f) Hard target	(g) Closing angle	Ricochet angle (β)		Quadrant elevation angle limits		(l) Low elevation fire range (field firing area)	(m) High elevation fire range	(n) All arms air defence	(o) Normal safe distance	(p) Reduced safe distance	(q) Soft/soft ground target	(r) Hard target
33(a)(ii)																		

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Serial	(a)	Ammunition nature	(b)	Range (m)		Angles (mils)					Ricochet distance (m)		Air danger height (ft) (as per paragraph 9.12)			Burst safety distance (m)		Minimum engagement distance (m)		
				(c) Low elevation fire range (formerly field firing area)	(d) High elevation fire range	Ricochet angle (β)	Quadrant elevation angle limits	(e) Soft target	(f) Hard target	(g) Closing angle	(h) Reduced range (field firing area)	(i) All arms air defence angle	(j) Soft target	(k) Hard target	(l) Low elevation fire range (field firing area)	(m) High elevation fire range	(n) All arms air defence	(o) Normal safe distance	(p) Reduced safe distance	(q) Soft/soft ground target

s33(a)(ii)

Serial	Ammunition nature	Range (m)		Angles (mils)				Ricochet distance (m)		Air danger height (ft) (as per paragraph 9.12)			Burst safety distance (m)		Minimum engagement distance (m)	
(a)	(b)	Range (m)		Angles (mils)				Ricochet distance (m)		Air danger height (ft) (as per paragraph 9.12)			Burst safety distance (m)		Minimum engagement distance (m)	
		Low elevation fire range (formerly field firing area)	High elevation fire range	Ricochet angle (β)		Quadrant elevation angle limits		Soft target	Hard target	Low elevation fire range (field firing area)	High elevation fire range	All arms air defence	Normal safe distance	Reduced safe distance	Soft/soft ground target	Hard target
(c)				Soft target	Hard target	Closing angle	Reduced range (field firing area)	(i)	(j)						(q)	(r)
(d)																

Note:

1. Hard targets.
2. Dispersion angle of 50 mils is to be applied for static vehicles and ground mounted weapons, or 90 mils for moving vehicles when fired from a non-stabilised vehicle platform.
3. For minimum engagement distance firing 12.7 mm ammunition against hard targets constructed with armour plate, users are to consult Land Engineering Agency via the ADF LRS Branch.
4. 200 m is the splashback distance from a hard target as well as the burst safety distance.
5. This information is only for ammunition fired from AIMTEST in M1A1 Abrams.
6. See [Appendix 2](#) to Annex B to Chapter 9.
7. See [Appendix 3](#) to Annex B to Chapter 9.
8. 50 m is the splashback distance from a hard target.
9. This ammunition type has a sabot discard area.
10. There is a 1000-rnd exposure limit per 24 hr for those within 1 m of firer when firing coloured smoke, IR ILLUM and riot control CS/15-P with 1.3 second delay.
11. See [Annex B to Chapter 9](#).
12. In training, the minimum training distance for the F1 grenade is 20 m, and for the F3 grenade 3 m.
13. See [Appendix 14](#) to Annex B to Chapter 9.
14. Firing shall not be undertaken at QE less than 711 mils due to the potential for the IR candle to strike the ground and initiate a fire, and firings shall not be undertaken at QEs greater than 1422 mils due to the potential for the cartridge case falling back on the firing position following IR payload deployment.

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Table 9-2: Planning factors for 30 mm

Serial	Ammunition nature	Range (m)		Angles (mils)				Ricochet distance (m)	Air danger height (ft)			Burst safety distance (m)		Minimum engagement distance (m)							
		(c) Low elevation fire range	(d) High elevation fire range	Ricochet angle β		Closing angle λ			Quadrant elevation limits		(l) Low elevation fire range	(m) High elevation fire range	(n) All-arms air defence	(o) Normal safe distance	(p) Reduced safe distance	(q) Soft target	(r) Hard target				
(a)	(b)	(c)	(d)	Soft target		Hard target		(g)	Reduced range		All-arms air defence		(i) Soft target	(k) Hard target	(u) Low elevation fire range	(v) High elevation fire range	(w) All-arms air defence	(o) Normal safe distance	(p) Reduced safe distance	(q) Soft target	(r) Hard target
				Soft target		Hard target			Reduced range		All-arms air defence		(i) Soft target	(k) Hard target	(u) Low elevation fire range	(v) High elevation fire range	(w) All-arms air defence	(o) Normal safe distance	(p) Reduced safe distance	(q) Soft target	(r) Hard target
				Soft target		Hard target			Reduced range		All-arms air defence		(i) Soft target	(k) Hard target	(u) Low elevation fire range	(v) High elevation fire range	(w) All-arms air defence	(o) Normal safe distance	(p) Reduced safe distance	(q) Soft target	(r) Hard target
				Soft target		Hard target			Reduced range		All-arms air defence		(i) Soft target	(k) Hard target	(u) Low elevation fire range	(v) High elevation fire range	(w) All-arms air defence	(o) Normal safe distance	(p) Reduced safe distance	(q) Soft target	(r) Hard target
				Soft target		Hard target			Reduced range		All-arms air defence		(i) Soft target	(k) Hard target	(u) Low elevation fire range	(v) High elevation fire range	(w) All-arms air defence	(o) Normal safe distance	(p) Reduced safe distance	(q) Soft target	(r) Hard target
				Soft target		Hard target			Reduced range		All-arms air defence		(i) Soft target	(k) Hard target	(u) Low elevation fire range	(v) High elevation fire range	(w) All-arms air defence	(o) Normal safe distance	(p) Reduced safe distance	(q) Soft target	(r) Hard target
		Soft target		Hard target		Reduced range		All-arms air defence		(i) Soft target	(k) Hard target	(u) Low elevation fire range	(v) High elevation fire range	(w) All-arms air defence	(o) Normal safe distance	(p) Reduced safe distance	(q) Soft target	(r) Hard target			
		Soft target		Hard target		Reduced range		All-arms air defence		(i) Soft target	(k) Hard target	(u) Low elevation fire range	(v) High elevation fire range	(w) All-arms air defence	(o) Normal safe distance	(p) Reduced safe distance	(q) Soft target	(r) Hard target			
		Soft target		Hard target		Reduced range		All-arms air defence		(i) Soft target	(k) Hard target	(u) Low elevation fire range	(v) High elevation fire range	(w) All-arms air defence	(o) Normal safe distance	(p) Reduced safe distance	(q) Soft target	(r) Hard target			
		Soft target		Hard target		Reduced range		All-arms air defence		(i) Soft target	(k) Hard target	(u) Low elevation fire range	(v) High elevation fire range	(w) All-arms air defence	(o) Normal safe distance	(p) Reduced safe distance	(q) Soft target	(r) Hard target			
		Soft target		Hard target		Reduced range		All-arms air defence		(i) Soft target	(k) Hard target	(u) Low elevation fire range	(v) High elevation fire range	(w) All-arms air defence	(o) Normal safe distance	(p) Reduced safe distance	(q) Soft target	(r) Hard target			
		Soft target		Hard target		Reduced range		All-arms air defence		(i) Soft target	(k) Hard target	(u) Low elevation fire range	(v) High elevation fire range	(w) All-arms air defence	(o) Normal safe distance	(p) Reduced safe distance	(q) Soft target	(r) Hard target			

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Table 9–3: Planning factors for 8.6 x 70 mm

Serial	Ammunition nature	Range (m)	Quadrant elevation limit (mils)	Ricochet angle (mils)		Closing angle (mils)	Ricochet distance (m)		Air danger height (ft)	Burst safety distance (m)		Minimum engagement distance (m)	
				Soft target	Hard target		Soft target	Hard target		Normal	Reduced	Soft target	Hard target
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)

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Contents

Table 9-4: Planning factors for 7.62 x 51 mm Lapua B416 Subsonic

Serial	Range (m)	Quadrant elevation limit (mils)	Ricochet angle (mils)		Closing angle (mils)	Ricochet distance (m)		Air danger height (ft)	Burst safety distance (m)		Minimum engagement distance (m)	
			Soft target	Hard target		Soft target	Hard target		Normal	Reduced	Soft target	Hard target
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)

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Table 9-5: Planning factors for 40 x 46 mm Rheinmetall Riot Control CS Grenade

Serial	Range (m)	Quadrant elevation limit (mils)	Ricochet angle (mils)		Closing angle (mils)	Ricochet distance (m)		Air danger height (ft)	Burst safety distance (m)		Minimum engagement distance (m)	
			Soft target	Hard target		Soft target	Hard target		Normal	Reduced	Soft target	Hard target
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)

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Table 9–6: Dispersion/human error angles – Manoeuvre ranges

Practice	Dispersion/human error angle (mils)		
	Static to static ⁽¹⁾	Static to moving ⁽¹⁾	Moving to moving ⁽¹⁾
<i>Dismounted</i>			
Rifle and MG	50	90	90
Pistol	80	120	80
SG	80	120	80
Shoulder-launched DFSW	50	90	–
Grenade launcher	100	150	–
	50	150	–
Marksman	20	20	–
Sniper ⁽²⁾	10	10	–
<i>Mounted</i>			
Rifle and MG	Shoulder-controlled	90	90
	Flex mounted	90	90
	Unstabilised FCS	–	90
	Stabilised FCS	–	–
Grenade launcher high velocity	Flex mounted	100	–
	Unstabilised FCS	50	–
	Stabilised FCS ⁽³⁾	50	90
25 mm chain gun	Stabilised FCS ⁽³⁾	–	0
120 mm cannon	Stabilised FCS ⁽³⁾	–	0

Practice	Dispersion/human error angle (mils)		
	Static to static ⁽¹⁾	Static to moving ⁽¹⁾	Moving to moving ⁽¹⁾
<i>High-angle firings</i>			
AAAD	–	150	–
HEF (excluding AAAD) ⁽⁴⁾	150	150 ⁽⁴⁾	150 ⁽⁴⁾
Note: 1. For an explanation of dispersion/human error angles refer to paragraph 2 . 2. Dispersion/human error angle for sniper is 5 mils, and can be used if it can be accurately applied. During the conduct of a Sniper Basic Course Module 2, the 5 mil dispersion/human error angle may be applied once trainees have been deemed competent and passed the Sniper Marksman Practice assessment. 3. Fully functioning FCS, with no errors. 4. HEF is firings above the QE which results in a maximum range trajectory.			

Table 9–7: Dispersion/human error angles – Permanent ranges

Practice	Dispersion/human error angle (mils)		
	Static to static ⁽¹⁾	Static to moving ⁽¹⁾	Moving to moving ⁽¹⁾
<i>Dismounted</i>			
Rifle and MG	30	30	90
Pistol	80	120	80
SG	80	–	–
DFSW	30	–	–
Grenade launcher	100	–	–
	50	–	–
Marksman	20	20	–
Sniper	5	5	–

Practice		Dispersion/human error angle (mils)		
		Static to static ⁽¹⁾	Static to moving ⁽¹⁾	Moving to moving ⁽¹⁾
Mounted				
Rifle and MG	Handheld – formed road ⁽²⁾	30	30	240
	Flex mounted – formed road ⁽²⁾	30	30	120
	Unstabilised FCS – formed road ⁽²⁾	–	–	50
	Stabilised FCS ⁽³⁾	–	–	–
25 mm chain gun	Stabilised FCS ⁽³⁾	–	–	–
120 mm cannon	Stabilised FCS ⁽³⁾	–	–	–
High-angle firings				
AAAD		–	150	–
HEF (excluding AAAD) ⁽⁴⁾		150 ⁽⁵⁾	150 ⁽⁵⁾	150 ⁽⁵⁾
Note: <ol style="list-style-type: none"> For an explanation of dispersion/human error angles refer to paragraph 9.9. Formed road can only be applied to a Category 12 range. Fully functioning FCS, with no errors. HEF is firings above the QE which results in a maximum range trajectory. Unless the LEF dispersion angle is greater. 				

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Annex B to Chapter 9

Ammunition danger area templates

1. An ADA template indicates the area of most danger from the worst possible effects of particular ammunition fired from a single weapon from a static FP on a fixed line of fire. [Figure 9–6](#) to [Figure 9–22](#) in [Appendix 1](#) to [Appendix 18](#) illustrate selected examples of ADA templates.
2. The dispersion/human error angles used in the ADAs provided in the templates within [Appendix 1](#) to [Appendix 18](#) are based on [Table 9–6](#). When constructing an ADA the OIC Practice is to ensure that the correct dispersion/human error angle as shown in [Table 9–6](#) is applied.

Appendices:

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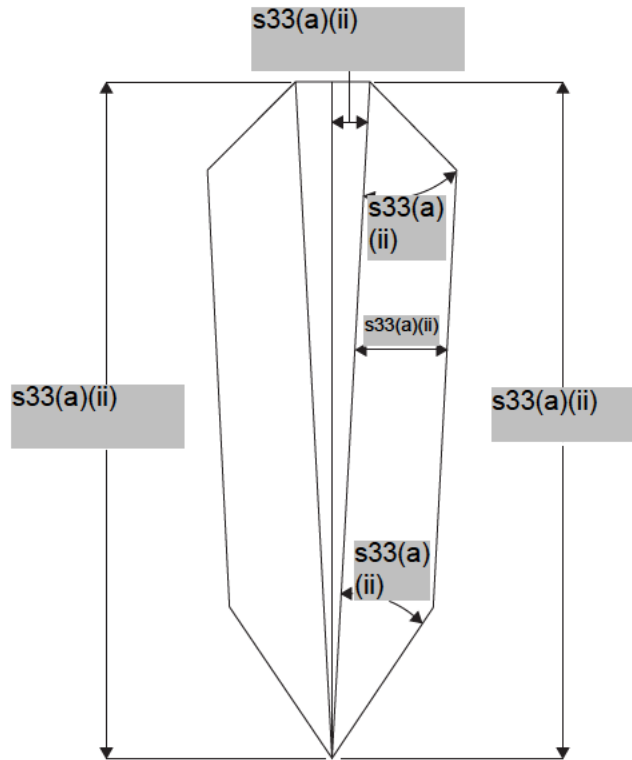


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Appendix 1 to Annex B to Chapter 9

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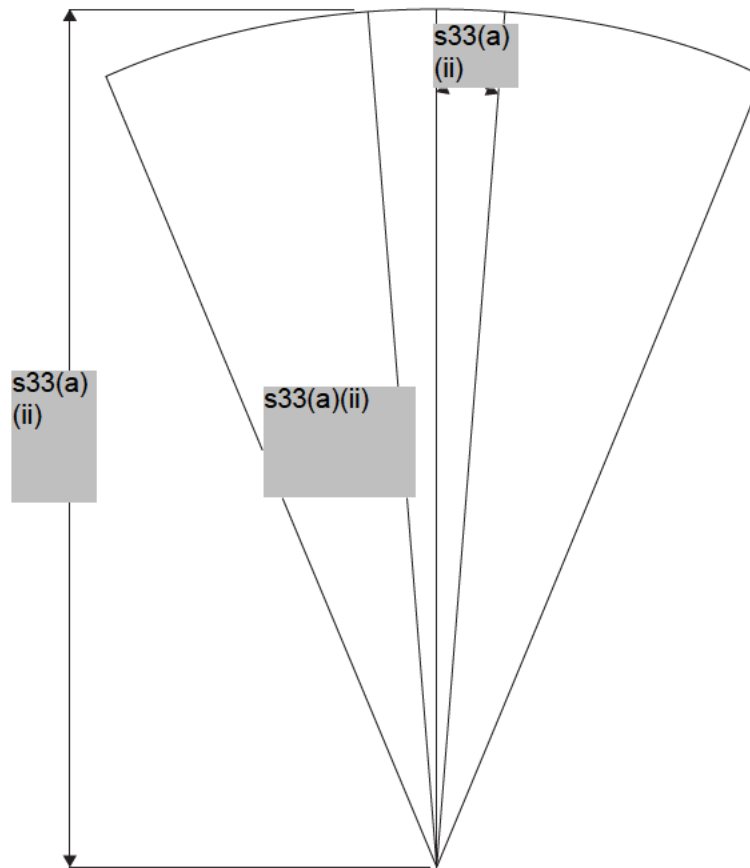
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Appendix 2 to Annex B to Chapter 9

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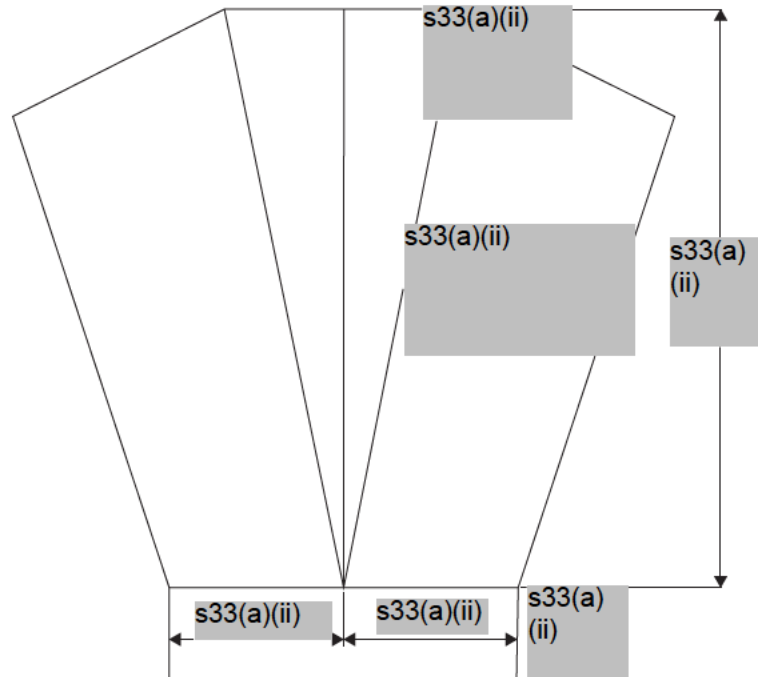


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Appendix 3 to Annex B to Chapter 9

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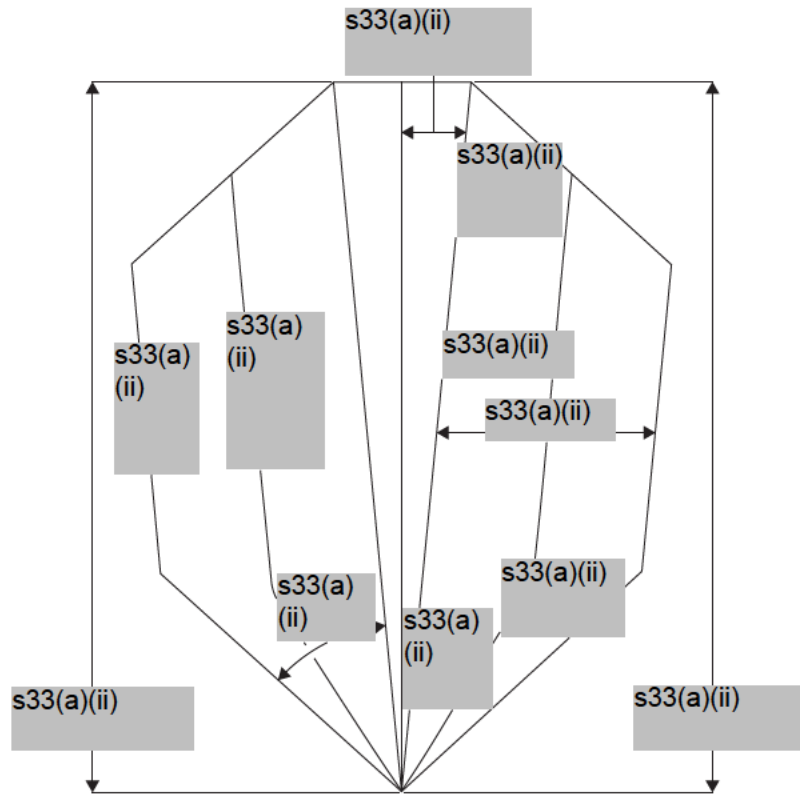
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Appendix 4 to Annex B to Chapter 9

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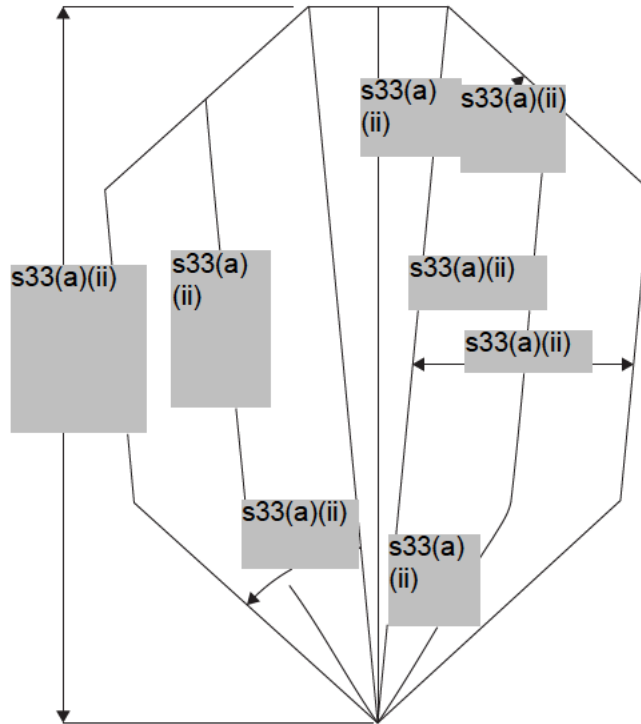


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Appendix 5 to Annex B to Chapter 9

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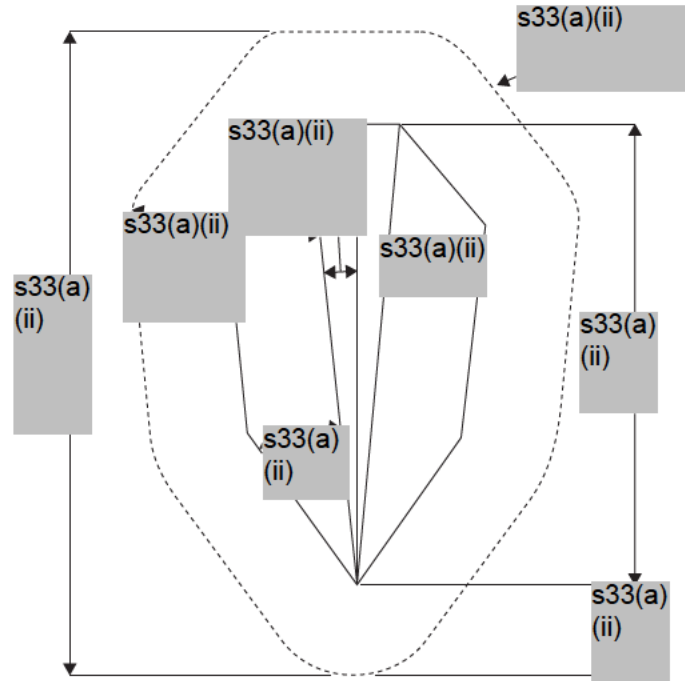
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Appendix 6 to Annex B to Chapter 9

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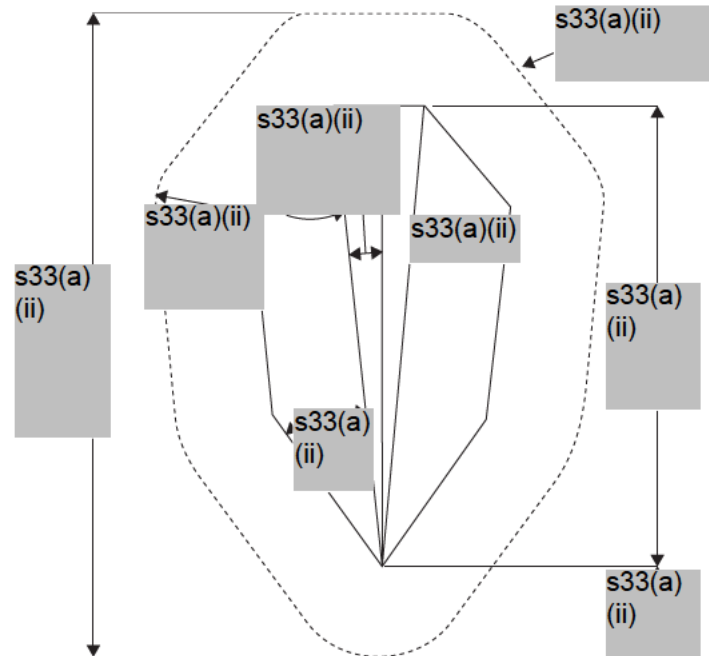
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Appendix 7 to Annex B to Chapter 9

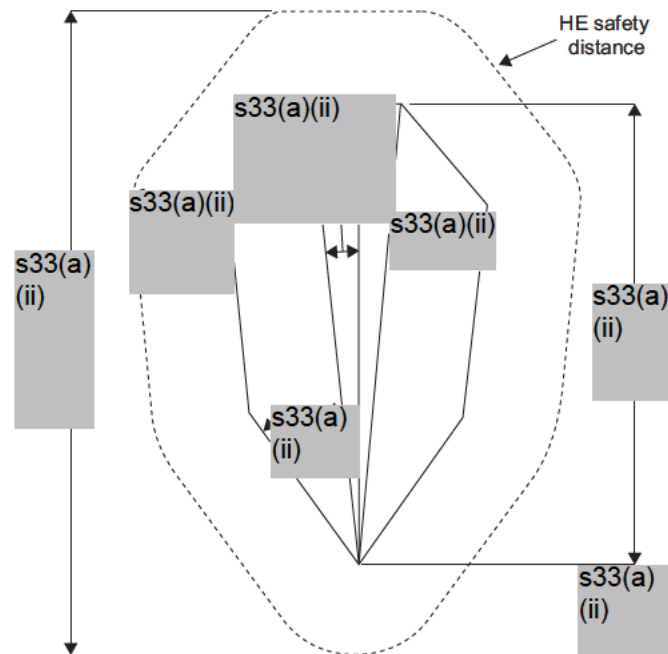
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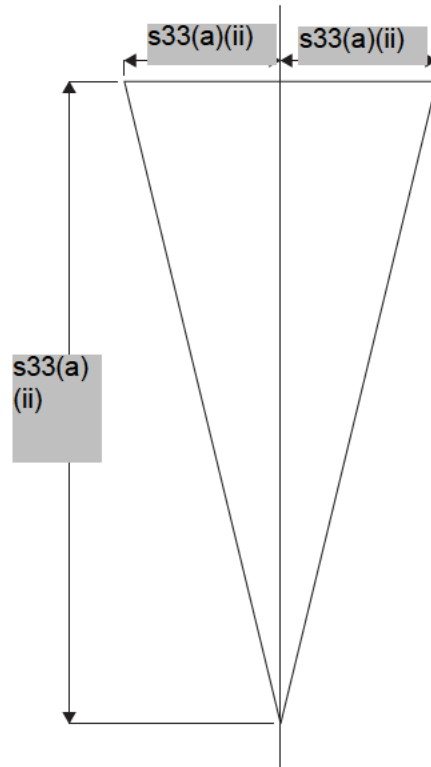
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Appendix 9 to Annex B to Chapter 9

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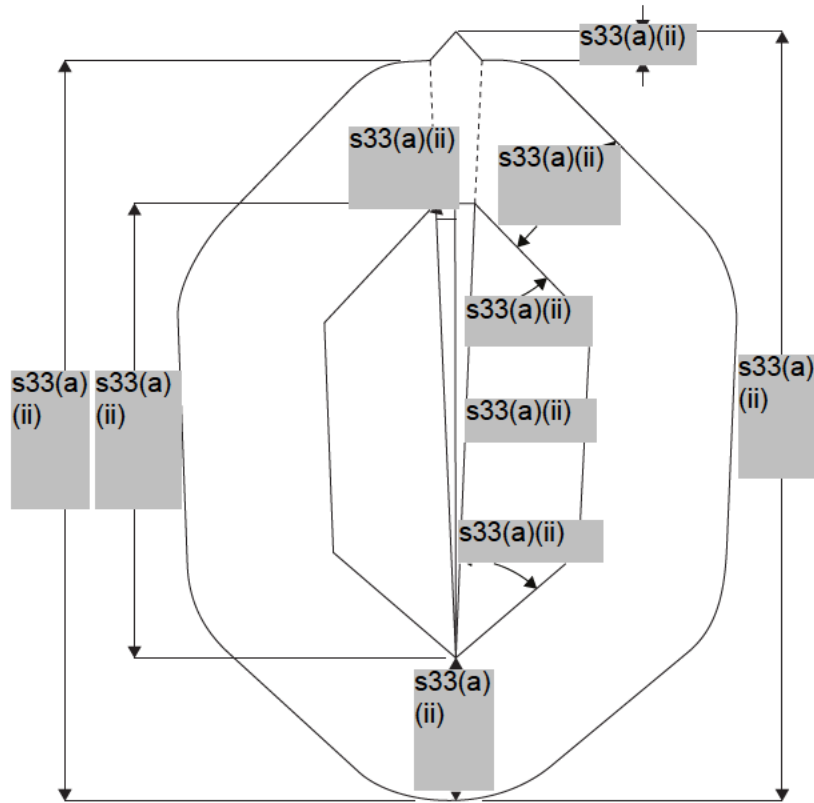
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Appendix 10 to Annex B to Chapter 9

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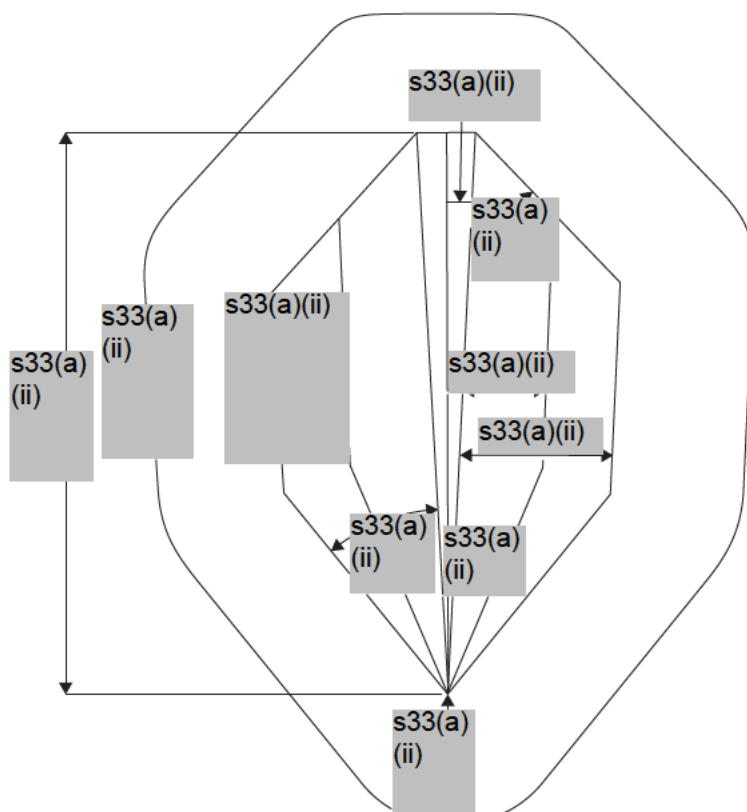
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Appendix 11 to Annex B to Chapter 9

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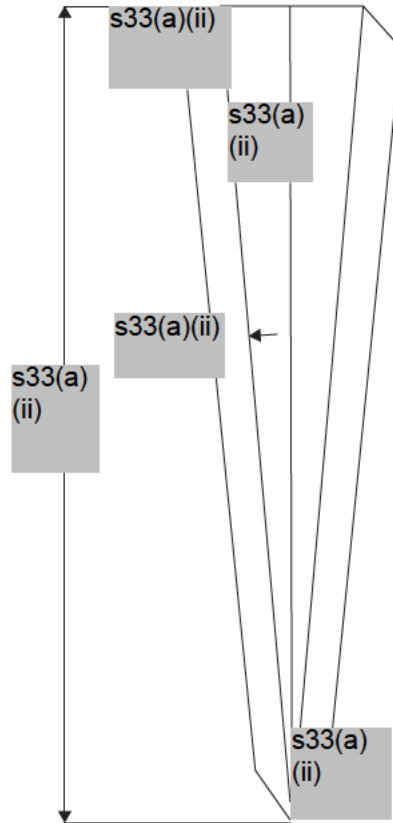
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Appendix 12 to Annex B to Chapter 9

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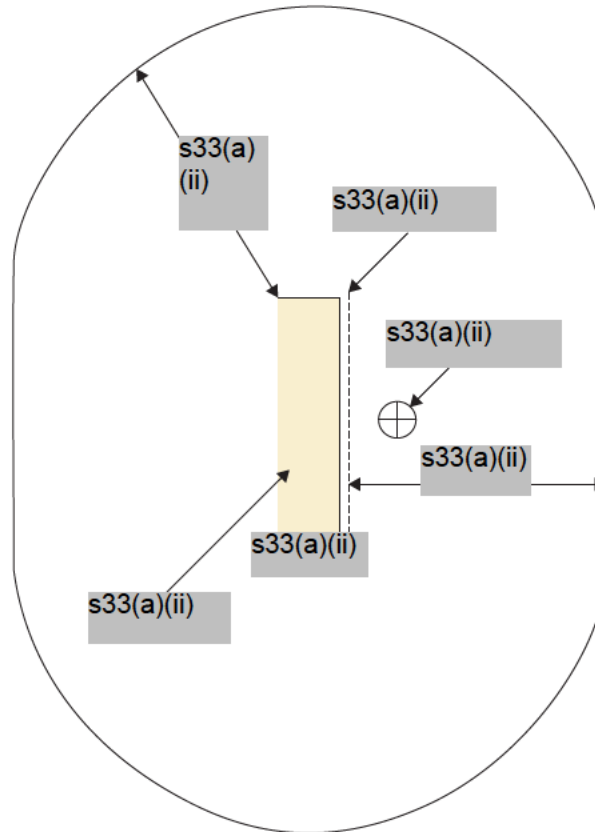


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Appendix 13 to Annex B to Chapter 9

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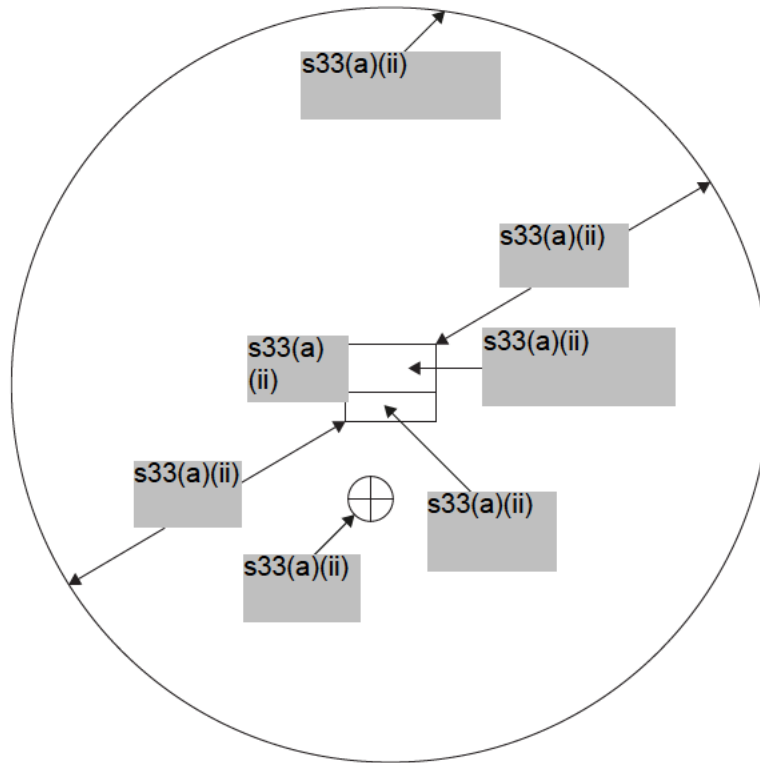


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Appendix 14 to Annex B to Chapter 9

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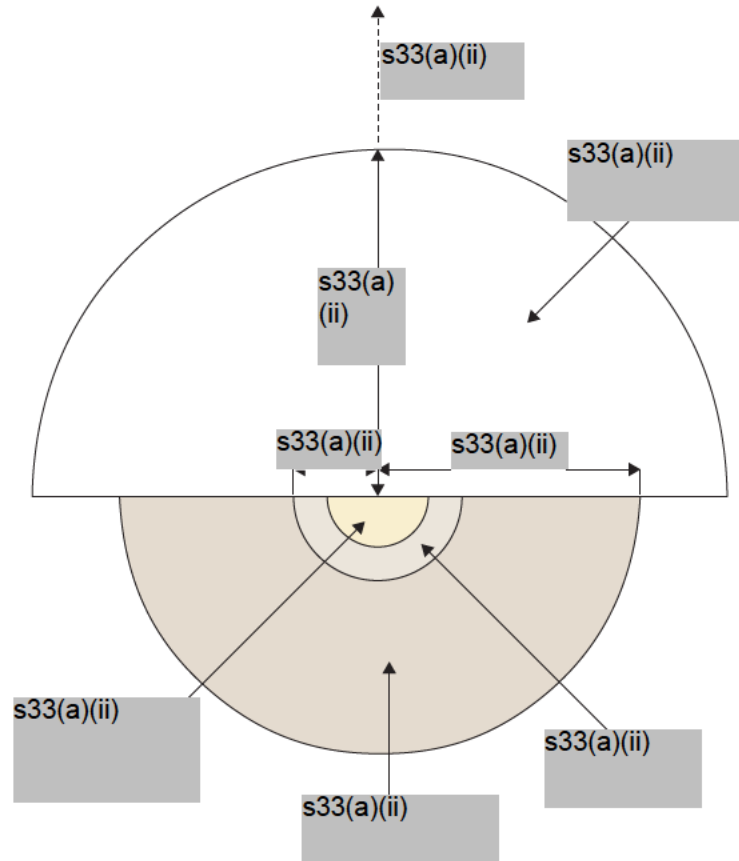


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Appendix 15 to Annex B to Chapter 9

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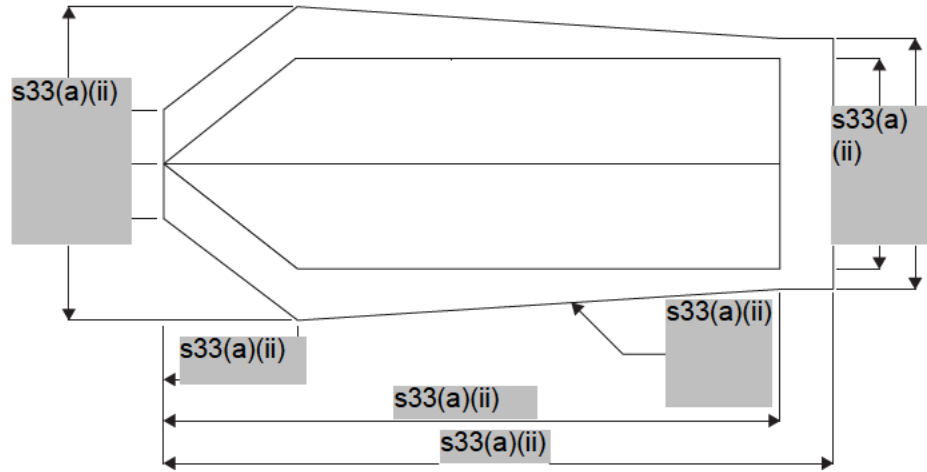
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Appendix 16 to Annex B to Chapter 9

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Appendix 17 to Annex B to Chapter 9

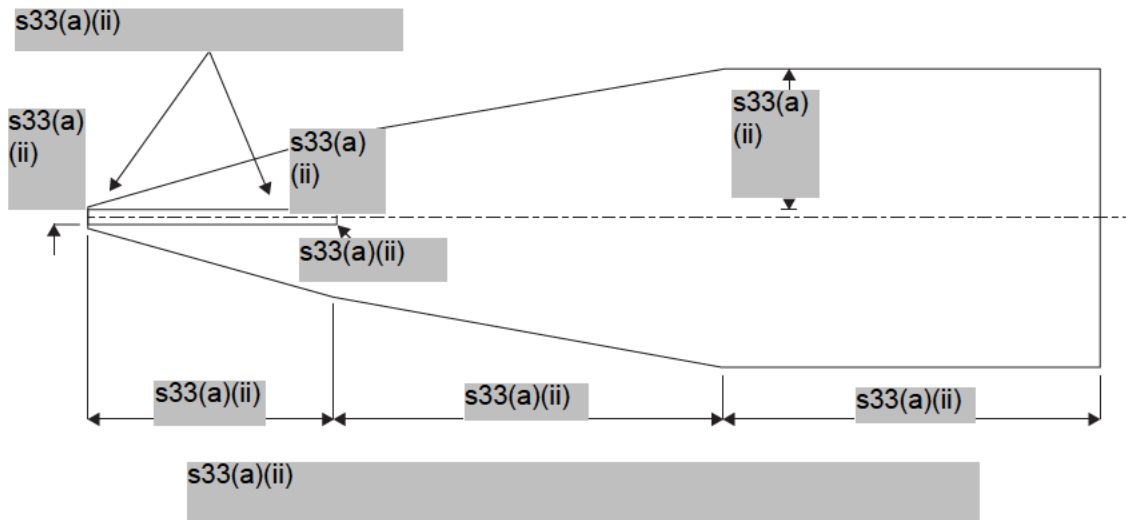
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Appendix 18 to Annex B to Chapter 9

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Annex C to Chapter 9

Armoured fighting vehicle weapon and ammunition templates

WARNING

The figures contained in this annex are not drawn to scale. To calculate the danger area on any given map, a template to the dimensions shown in the applicable figure must be drawn to the same scale as the map. An RDA template produced using an incorrect scale may result in injury to or death of personnel.

Weapon templates

1. Examples of templates for current armoured weapons and ammunitions are shown in this annex. Note that the templates reflect ricochet area and distance only.

WARNING

Ammunition fired on incorrect scales can travel in excess of the limits shown on the templates. Failure to apply the correct scales to the safety template could result in injury or death.

2. For direct fire, a template is used to establish the normal ground danger area, the reduced ground danger area and the ground ricochet area for both static and mobile firing. For indirect fire, a template is used to establish the restricted impact area and the trajectory danger area.
3. A weapon template is drawn to scale on transparent material for use with a map of the same scale. For the construction of templates and safety traces for AFV/non-AFV, apply the data detailed in [Table 9-1](#).
4. When traces are being constructed, the danger area is to be based on the worst combination of the relative positions of gun and target.

Direct fire templates

5. A direct fire template is constructed as follows:
 - a. *Step 1.* Select Point G representing the gun position. Go to [Table 9-1](#) column (f), or column (p) if high elevation fire is used for the ricochet distance applicable to the ammunition type. Draw a line to that length in scale with the map to be used, as demonstrated in [Figure 9-23](#).

Step 1 G —————

Figure 9-23: Direct fire template – Step 1

- b. *Step 2.* Go to [Table 9-1](#) column (g) and column (h), and apply the scale widths at right angles to the line of fire. Draw lines at the appropriate distance parallel to the line of fire, as demonstrated in [Figure 9-24](#).

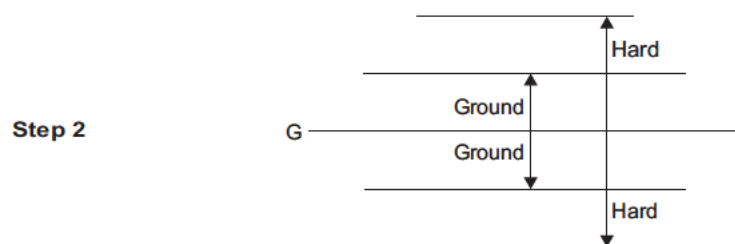


Figure 9-24: Direct fire template – Step 2

- c. *Step 3.* Apply an $s33(a)(ii)$ angle (unless otherwise detailed in the remarks column in [Table 9-1](#)) to the top and bottom of the line generated in Step 1, as illustrated in [Figure 9-25](#). If the ammunition to be used is non-explosive, move to Step 6. If it is explosive, continue to Step 4.

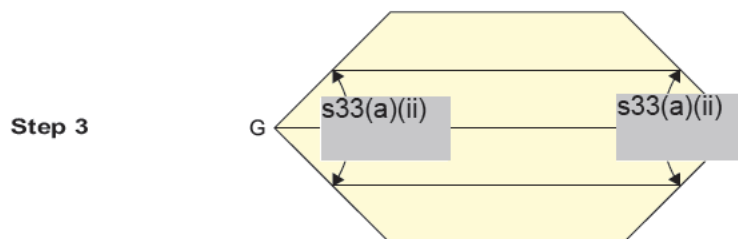


Figure 9-25: Direct fire template – Step 3

- d. *Step 4.* Go to [Table 9-1](#) column (i) and column (j) for the normal and reduced safe distances for bursting ammunition. Apply these widths to scale as a belt around the template from Step 3. Round the edges, as this distance is a radius from the corners constructed in Step 3, as illustrated in [Figure 9-26](#).

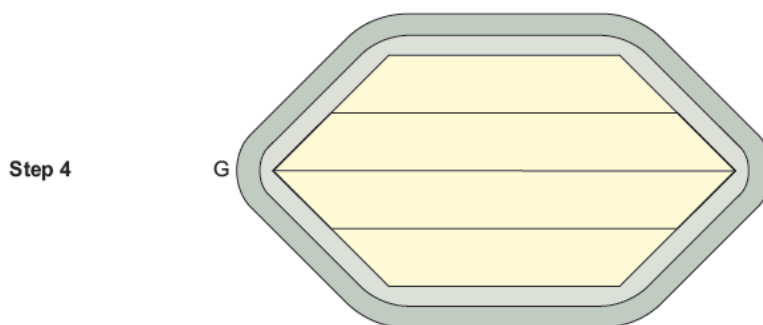
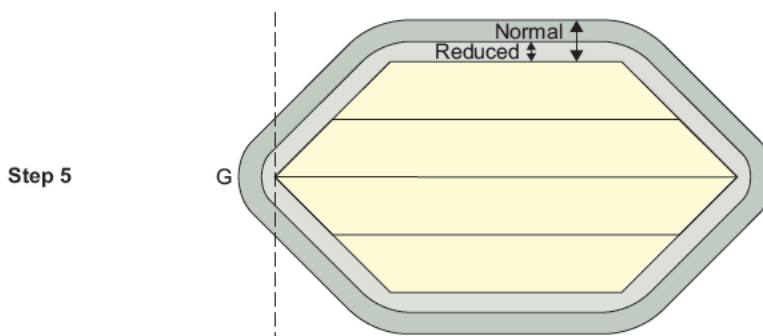


Figure 9-26: Direct fire template – Step 4

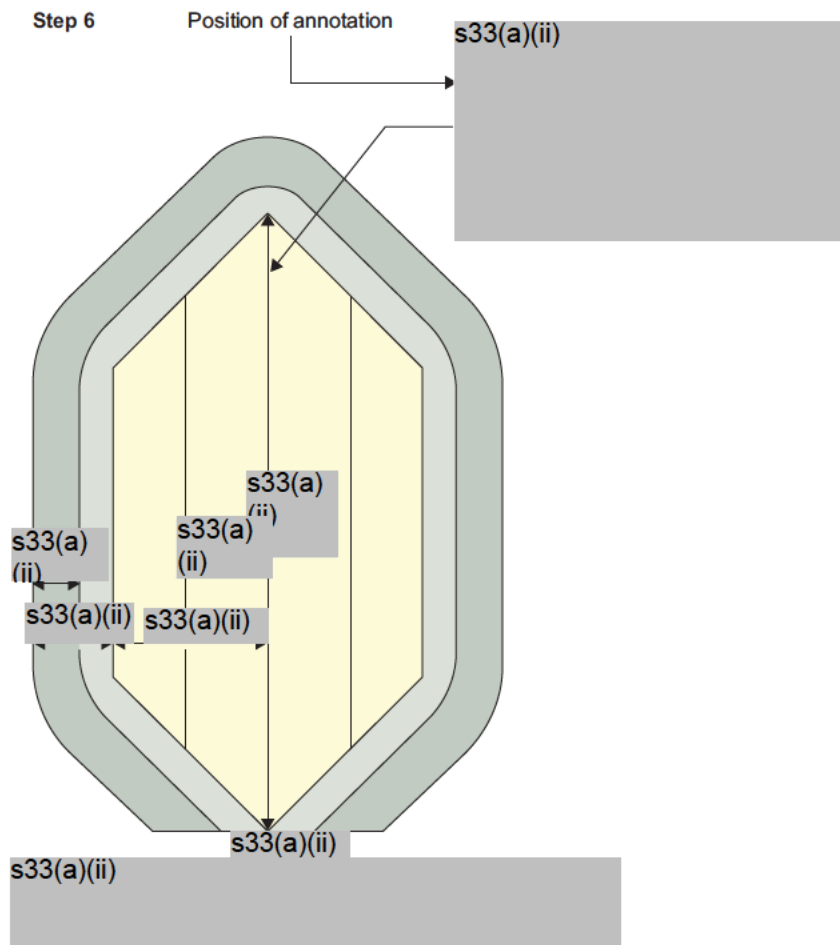
- e. *Step 5.* In accordance with [paragraph 9.4o](#), cut the bottom off the template at right angles to the line of fire through the gun location, as illustrated in [Figure 9-27](#).

**Note:**

If the weapon is AFV mounted, the danger area ends at right angles to the line of fire, level with the weapon, as shown by the broken line.

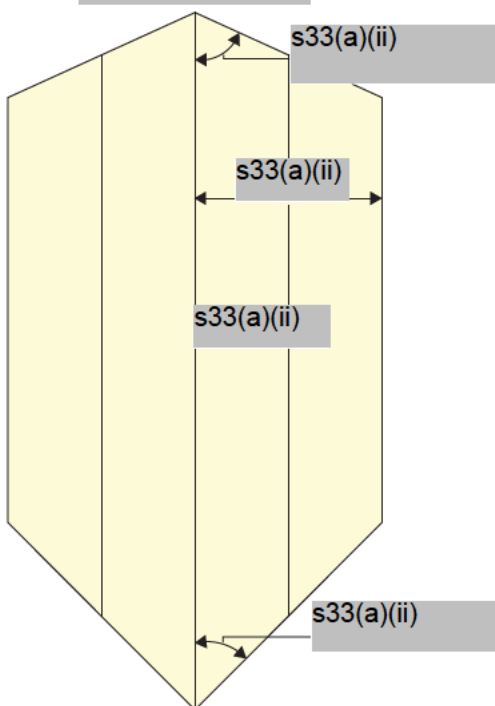
Figure 9-27: Direct fire template – Step 5

- f. Step 6. Annotate the template with the information in accordance with Table 10–1, and as illustrated in Figure 9–28.



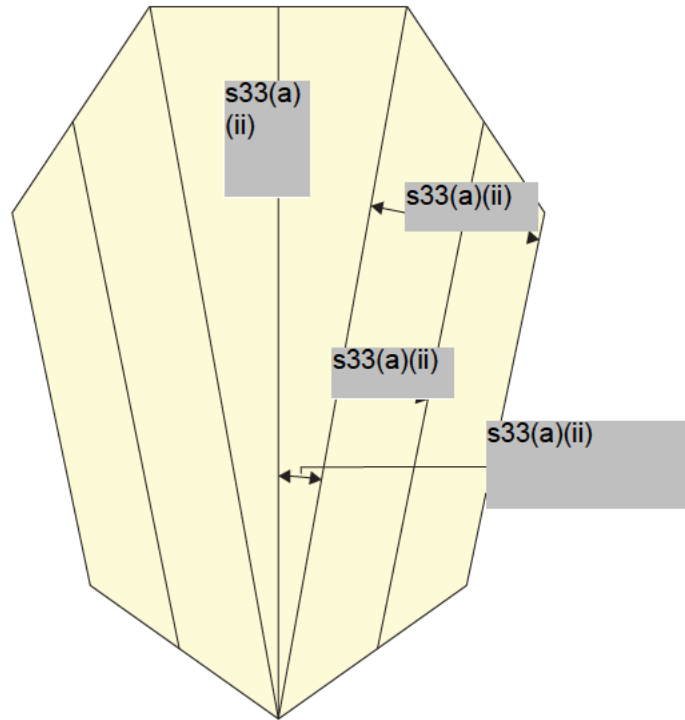
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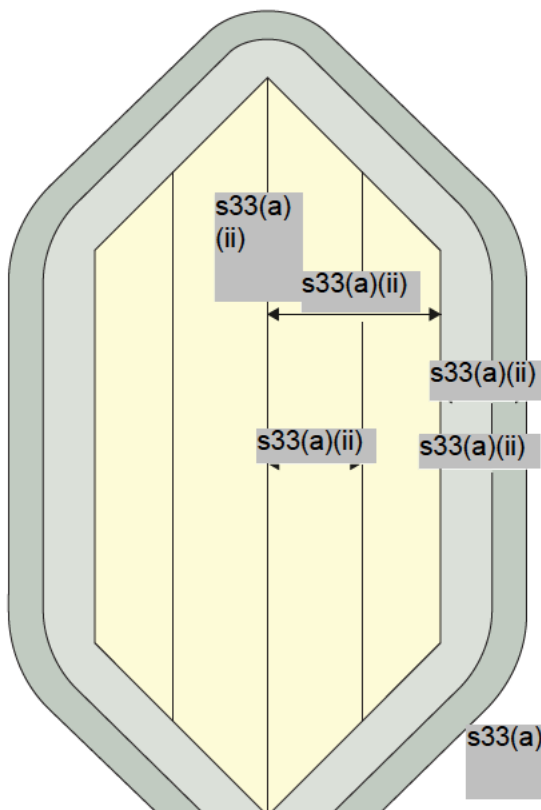
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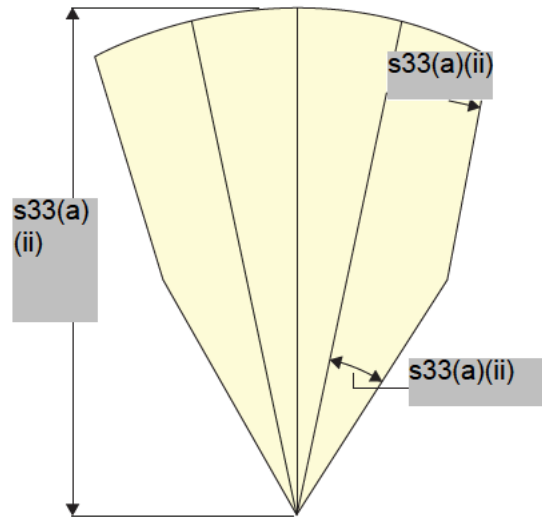
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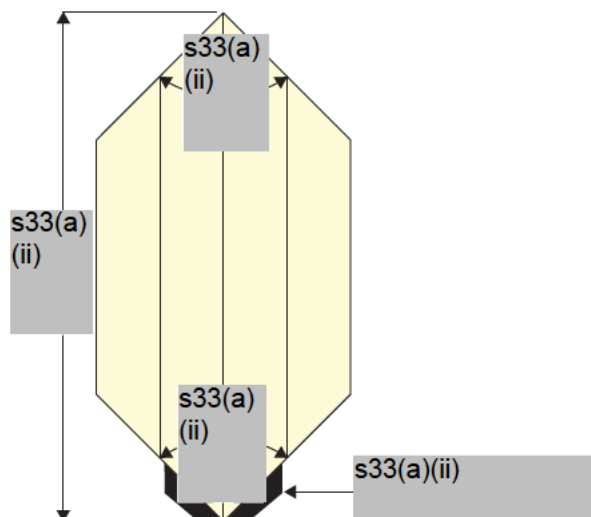


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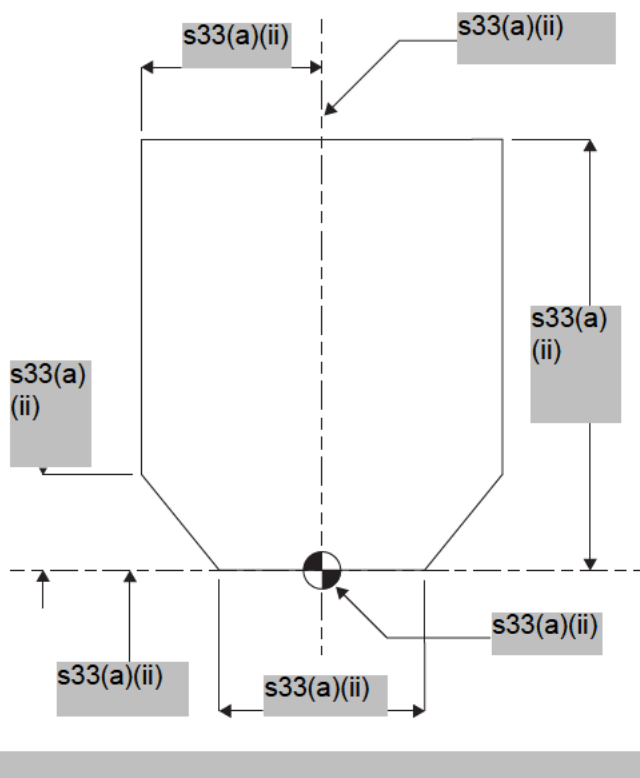
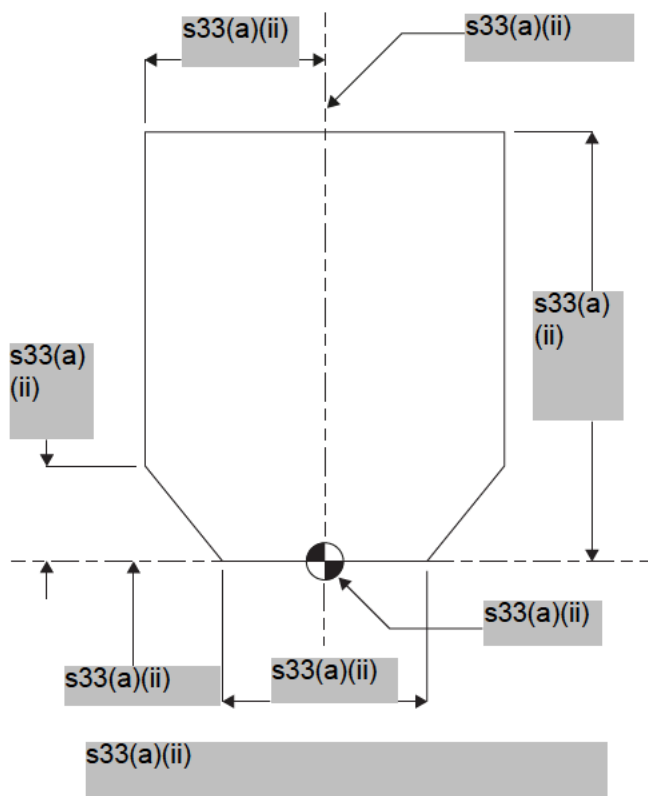
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Chapter 10

Range danger area trace

Section 10-1. Introduction

10.1 An RDAST diagrammatically defines the limits of the dangerous area created when an ADA template is applied from all FPs to all target positions on a map of the same scale. It is constructed by range users to determine the maximum permissible arcs of fire and is used by range authorities to determine whether the activity can be conducted safely and within the confines of the range boundaries. An RDAST is also used to determine the requirement for sentries, the closure of access points, and the warning of local inhabitants and other range users.

10.2 Range Control staff will prepare and issue an RDAST for planned exercises on all Permanent ranges. However, for field firing and other user-designed activities, the user will be required to construct the appropriate trace in order to plan the exercise and obtain the necessary clearances. Only personnel qualified in accordance with a CATC-approved LMPs are to construct an RDAST.

Section 10-2. Range danger area

10.3 An RDA includes those areas of land or water, together with a specified airspace, within which danger to life, limb or property may be expected to arise from the initiation of specified ammunition or EO. Regardless of whether a reduced range, maximum range, combined or non-standard ADA template is used, the principles of application of the template are the same. Figure 10–1 shows an RDAST constructed using an ADA template for HE ammunition.

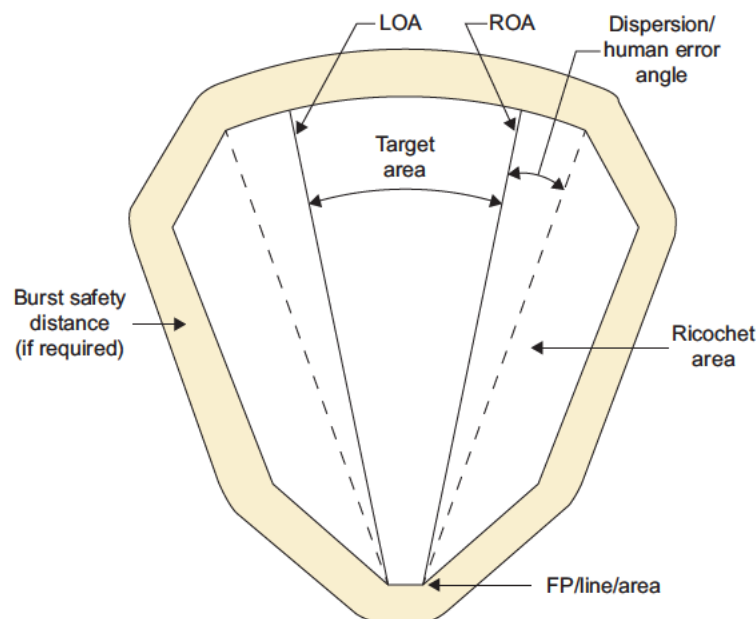


Figure 10–1: Example range danger area trace for high explosive ammunition

10.4 An RDA comprises:

- a. *Firing point.* The FP is the position or area from which firing occurs. It may take the form of:
 - (1) a point for an IW/vehicle
 - (2) a line for a number of weapons/vehicles, or
 - (3) an area for one or more weapons/vehicles firing from different positions.

- b. *Target area.* The target area is the point or location at which fire from the weapon or EO is to be directed or detonated. This is the only area where fire may be directed.
- c. *Dispersion/human error angle.* The dispersion/human error angle forms an area on both sides of the line of fire to cover such eventualities as human error (eg, unsteady aim) or the effects of meteorological conditions.
- d. *Ricochet area.* The ricochet area is the area in which ricochets of ammunition and EO may be expected to come to rest.
- e. *Burst safety distance.* The impact area is surrounded by a burst safety distance for exploding ammunition or ordnance, which is defined by a radius from the point of burst within which a danger exists from blast, fragments and debris.
- f. *Back blast danger area.* The BBDA is created when a rocket launcher or antitank guided weapon is fired. The detonation of a round forms exhaust gases to the rear of the weapon as a triangular-shaped gaseous overpressure area. Within the specified danger area (the BBDA) there will be blast overpressure and debris that have been projected rearwards. No personnel are to be present in the BBDA.

Section 10-3. Application of templates

10.5 When constructing an RDAST, the principal limiting factor will normally be the availability of a large enough area. Personnel should appreciate that full advantage of the area can only be obtained through the skilful application of the correct ADA templates. The key considerations are as follows:

- a. The type of ammunition and weapon must be considered.
- b. The ricochet dimensions to be applied should be considered (if weapons are used against hard targets).
- c. Whether an LEF template, a HEF template or a combination of both is to be used.
- d. The LEF range ADA template may be used when the QE from the firer to the target would normally require the application of a HEF range ADA template and the cone of fire (dispersion/human error angle) can be captured by ground (fully captured or contained by terrain or a terrain feature [see [Chapter 9](#)]) at a range of or less than the length of the LEF ADA template. This will require consultation with the Range Control staff for approval. Range Control staff should liaise with the Land Engineering Agency to confirm that the ground (to capture all rounds fired):
 - (1) *Where ricochet is possible.* RDASTs may be truncated in length and/or width when all rounds fired will be captured by ground (usually a feature). To determine if the feature to the rear and/or flank of the range will capture the rounds fired, the height of the feature above the point of aim plus the cone of fire is compared against the air danger height of the ammunition nature fired. If the height of the feature above the point of aim plus the cone of fire is greater than the air danger height then the RDAST will be safely contained by the feature (ground). With regard to flank truncation, the minimum distance from firers must also be greater than the ricochet distance of the ammunition nature.
 - (2) *Where there is no risk of ricochet.* RDASTs may be truncated where the cone of fire (dispersion/human error angle and group size) will be captured by ground (fully captured or contained by the terrain, feature or stop butt) and ricochet is not possible (due to angle of strike, material struck and firer accuracy). Prior to the application of this no ricochet truncation, the Land Engineering Agency is to be consulted to confirm the size of the cone, and approval by Range Control is to be obtained.
- e. The type of firing position (ie, whether static or moving, stabilised or unstabilised) is to be considered.
- f. RDASTs are concerned not only with danger areas at ground level but also with danger heights. Although ammunition may only reach peak heights in certain very small portions of the overall area, the danger height is still applied over the whole trace area. Danger heights are given in [Table 9–1](#).

Application of a template – single static firing point

10.6 Firing point. The overall size of the RDAST is determined by applying the point of the appropriate ADA template to the FP located on the map and then swinging the template as far to the left and right as any

restrictions allow. The centre-line of the template will then indicate the maximum left of arc (LOA) and right of arc (ROA) for that RDAST (see Figure 10–2).

10.7 Arc of fire. Illustrated in Figure 10–2 is the make-up of an arc of fire from a single FP. The following should be noted:

- Line AB is the LOA; line AC is the ROA.
- The shaded area of the template, although outside the arc, forms the flank boundaries of the RDAST. Point B and Point C are joined by an arc the length of the template, shown as a heavy line to complete the safety trace.
- Any target in the arc ABC may be engaged from the FP (A).
- The application of each template must fall within the range boundary.

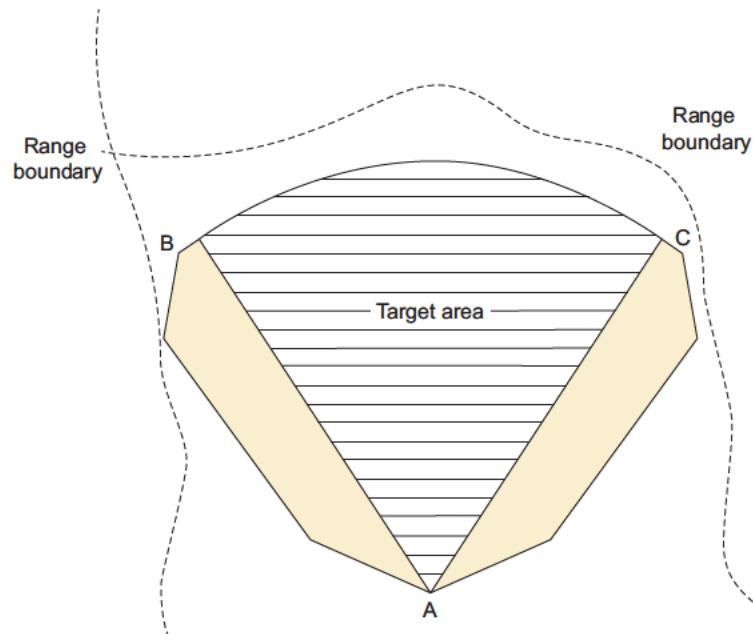


Figure 10–2: Example application of a template to a single static firing point

10.8 Range boundary considerations. The relevant Range Control or authority will dictate how close an RDAST may be to a range boundary. However, unless otherwise indicated by the TASO, the following points should be noted with reference to Figure 10–3[a], which illustrates alignment of the template within the range boundary:

- It is safe to fire at Target Z.
- Target X and Target Y cannot be engaged because the ADA template does not fall inside the range boundary.
- By moving the FP to the south and east, it is possible to engage all targets without the danger area compromising the range boundary. This is illustrated in Figure 10–3[b].
- The proximity of the template to an exterior boundary is not to be less than 200 m unless authorised in the relevant TASO.
- The proximity of a template to internal boundaries/roads and infrastructure is 100 m unless specified differently in the relevant TASO. On boarded ranges the RDA template may be sited closer to internal boundaries/roads and infrastructure due to the siting board process.

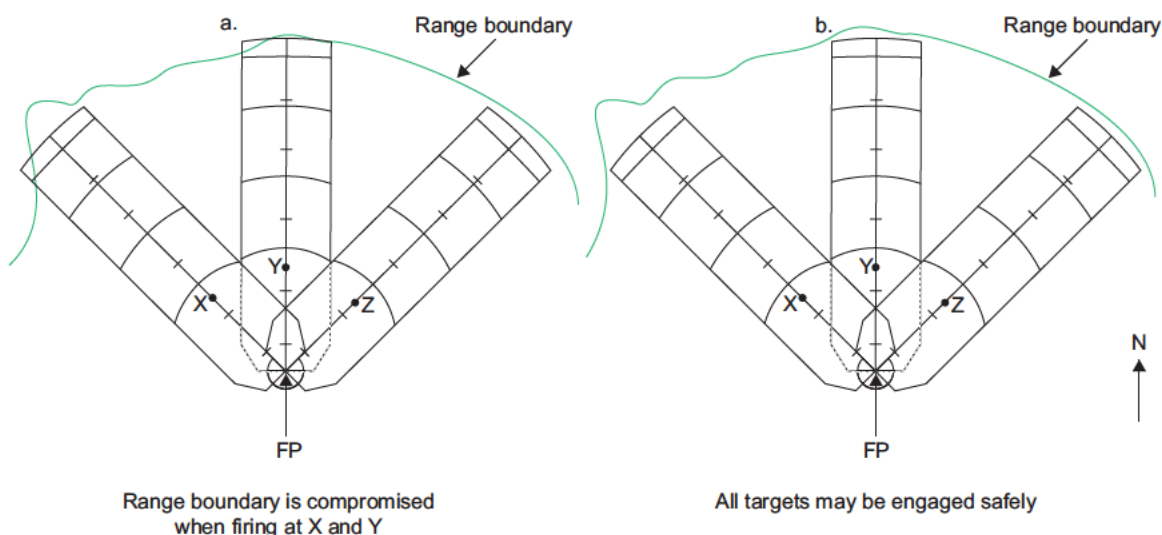


Figure 10-3: Example range boundary

10.9 Firing line – restricted arcs of fire. When a number of firers are to be located along a firing line, and there are boundary or personnel movement restrictions on one or both flanks of the range, the template is applied, in turn, to each end of the line: on the left to establish the LOA and on the right to establish the ROA. The arc lines are drawn onto a map or trace, measured and annotated as grid bearings. Targets are then sited on the ground so that the firer-to-target line is within the grid bearings so defined (see Figure 10-4).

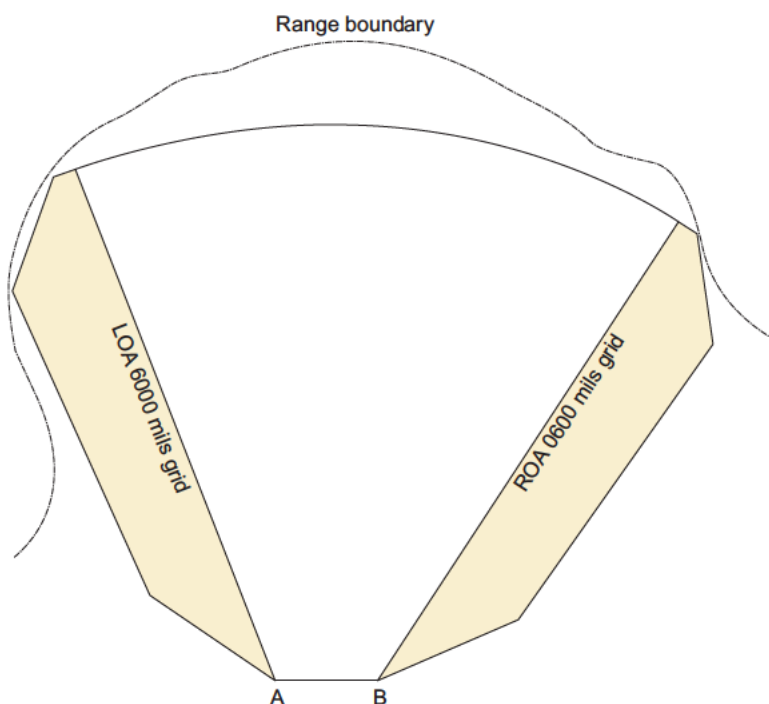


Figure 10-4: Example application of a template for a firing line

10.10 Firing line – unrestricted arcs of fire. When there are no boundary or personnel movement restrictions on one or both flanks of the range, care must be taken to guarantee the safety of personnel on the firing line. Ensure that the LOA and ROA bearings are such that, when a person on the firing line engages

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a target sited between the two bearings, no other person on the firing line is in the danger area of the weapon being fired. In the examples given in Figure 10–5, assuming a range axis of grid north, safety is achieved:

- Left of arc.* The LOA is restricted by the range boundary. As illustrated in Figure 10–5[a], it is safe to engage targets from anywhere along the firing line AB, provided that the LOA of any firer is not less than 6000 mils (eg, 5900 mils would be unsafe).
- Right of arc.* The ROA may be any desired angle. However, to ensure that firers on the right of the firing line are not positioned within the danger area of the left-hand firers, no part of the template may go behind the line which is an extension of the firing line. For example, as illustrated in Figure 10–5[b], firing from line AB to a target along the ROA (line BC) is safe, but firing at a target along line DE from any part of the firing line is unsafe, as it endangers the firers on the right.

10.11 The ADA template is to be applied across the firing line from the LOA to the ROA for all weapons. No part of the template is to bisect the firing line. Should it do so, the arcs or the firing line are to be adjusted.

WARNING

Failure to correctly apply the ADA template could endanger the lives of personnel.

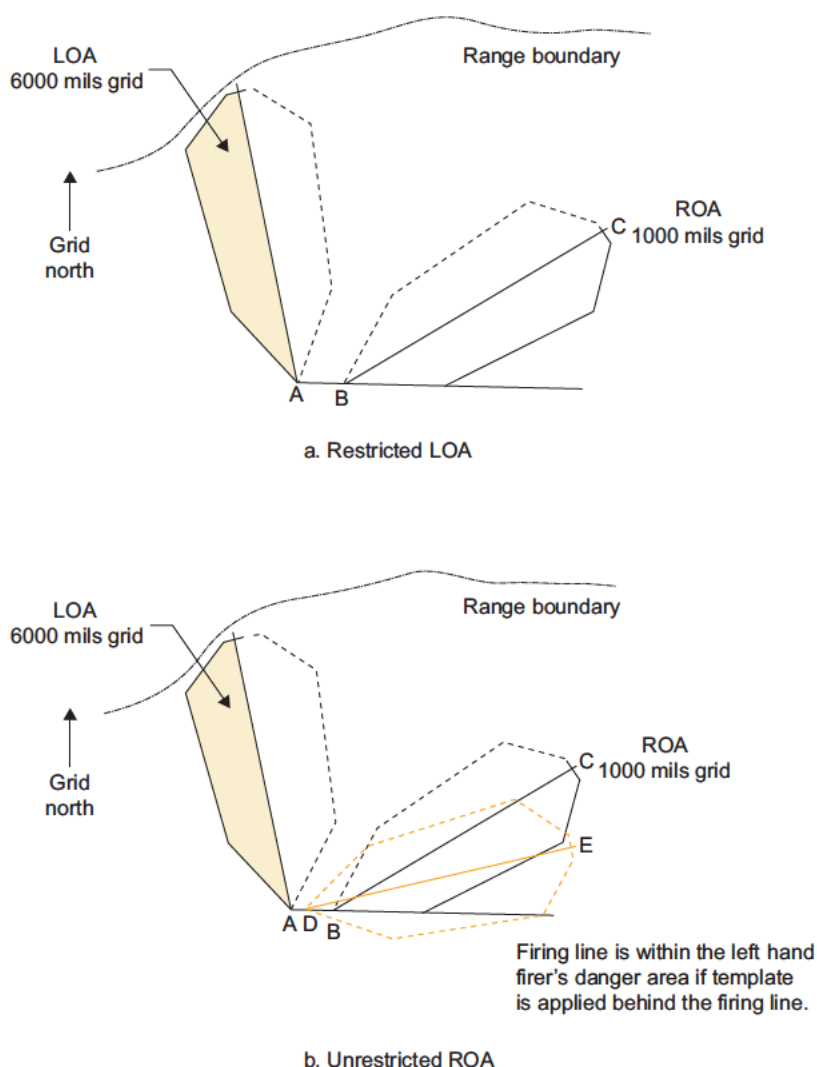


Figure 10–5: Example firing line – unrestricted arcs of fire

10.12 Application of template for overhead, flanking and weapon effects guns. The need for realism in an exercise may require the use of overhead, flanking and weapon effects guns. Under these circumstances, the overall shape of the RDAST may be affected by the arcs or lines of fire, as shown in Figure 10–6. The effects gun template is to be a solid line when outside the danger area.

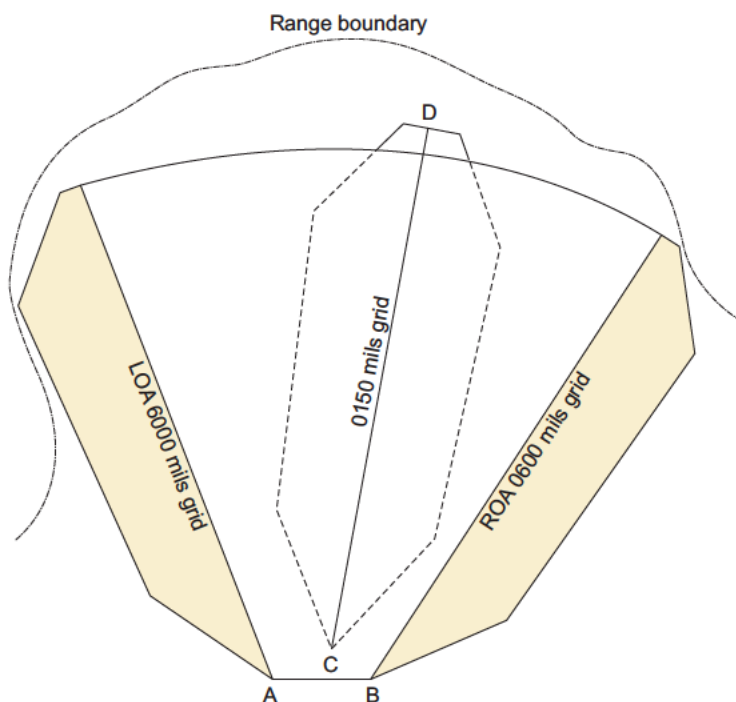


Figure 10-6: Example effects gun firing on a fixed line from a protected bunker (Point C)

10.13 Moving target. The construction of an RDAST involving moving targets is based on the same principles. The appropriate template must be applied from the firer's position (static or moving) to the extremities of the target run, thereby obtaining the required arcs of fire.

10.14 Exploding ammunition. Templates for exploding ammunition are applied in the same manner as those for non-exploding ammunition. However, care must be taken to ensure:

- The burst safety distance, when applied to the template, is to fall within the defined range boundary.
- No personnel, other than the firers and safety staff, are permitted within the RDAST, except as allowed by [Chapter 9](#) and *LWP-G 7-3-1, Australian Defence Force Range Orders (Dismounted)* [Chapter 6].
- When exploding ammunition is to be used in field firing in conjunction with small arms, if any portion of the exploding ammunition template extends outside the RDAST, it is to be shown on the trace. If the trace becomes cluttered and unreadable, a separate RDAST for the exploding ammunition is to be produced.
- When using exploding ammunition the burst safety distance lines on the template can cut the firing line. The ricochet angle must not cut the firing line.

Application of a template – mobile firing point

10.15 The term 'mobile' refers to the firer and/or the firing platform moving; therefore, the danger area must move with them. This can be achieved by applying the appropriate ADA template to every planned firing position and to every target that may be engaged from that position in order to build up an overall RDAST. When a practice involves more than one firer, this method is cumbersome and additional supervisory staff are needed to conduct the practice safely. Training value and realism would also be difficult to achieve.

10.16 Moving vehicle. When determining the RDAST for practices to be fired from moving vehicles, the following additional points are to be noted:

- It must first be determined whether the weapon system is stabilised.
- Unless specified, the HEF range template is to be applied.
- The appropriate ADA template for the ammunition to be fired is applied by selecting the appropriate details from [Table 9-1](#) and [Table 9-6](#).
- The ADA template is then applied to the map to determine the RDAST.

- e. Fixed LOA and ROA markers cannot be used unless clearly visible from all locations within the movement box. Parallel bearings are best used for this application.

10.17 To overcome the problems mentioned in [paragraph 10.15](#), a firing area or movement box must be formed. This usually takes the shape of a square or rectangle around an area that provides the type of ground required by the exercise. Inside this area one or more firers/vehicles may move or fire from any position, provided that such firing is kept within the predetermined arc of fire. The length and width of the firing area is determined by:

- a. the range boundary
- b. the number of firers and their relative firing positions
- c. the lessons to be brought out in the exercise
- d. the nature of the ground required to achieve the aim of the exercise.

10.18 In certain circumstances, the best use of a training area can be obtained by using a succession of firing areas. On these occasions it is essential to establish, on the ground, exactly where one box finishes and the next, with a new arc of fire, starts. This is detailed in [Section 10-5](#).

Section 10-4. Controlling the arcs of fire

10.19 For mobile practices, the arcs of fire are controlled by one of the following two methods:

- a. *Parallel bearings*. This method uses the arcs determined by parallel bearings along the flanks of the firing area.
- b. *Fixed arc markers*. This method uses two distant artificial or natural landmarks.

Parallel bearings

10.20 The use of parallel bearings is the preferred method for most mobile practices. The construction is easier and it provides more scope for range users when designing an RDAST. The following three techniques may be used:

- a. *Mobile firing area – unrestricted arcs*. This is the most common method of constructing an RDAST for exercises involving movement.
- b. *Mobile firing area – full circle*. This method is used where a large enough range area is available. It allows firing within 6400 mils.
- c. *Mobile firing area – part circle*. This method is used where the range area available is larger than that available for mobile firing area unrestricted arcs, but not large enough for the mobile firing area full circle method to be employed.

10.21 Mobile firing area – unrestricted arcs. A mobile firing area (see [Annex A](#)) with unrestricted arcs is constructed as follows:

- a. Select and plot the required firing area (movement box), ABCD (see [Figure 10–7](#)).
- b. Taking care to apply the method shown in [paragraph 10.10b](#) and [Figure 10–5\[b\]](#), apply the template to both extremities of the start line AB. Apply the template to the sides of the movement box (along lines AC and BD). Obtain the maximum angles (on either side) that do not allow any part of the template to cut the range boundary or encroach on any other restrictions.
- c. Measure the bearings for the LOA and ROA. In this case, it would be 5370 mils on the LOA and 0400 mils on the ROA. Apply the LOA and ROA bearings to the start and finish lines (lines AB and CD).
- d. From the start line, using the bearings obtained, mark in the outline of the template ALMN on the LOA and BEFG on the ROA.
- e. Repeat the same action from the limit of advance line: CPQR on the LOA, DHJK on the ROA.
- f. Join the extreme points of the ricochet area as shown by the dotted lines (F to J, N to R) in [Figure 10–7](#). It will be found that these lines will be equal in length and at the same angle to the left and right edges of the firing area.

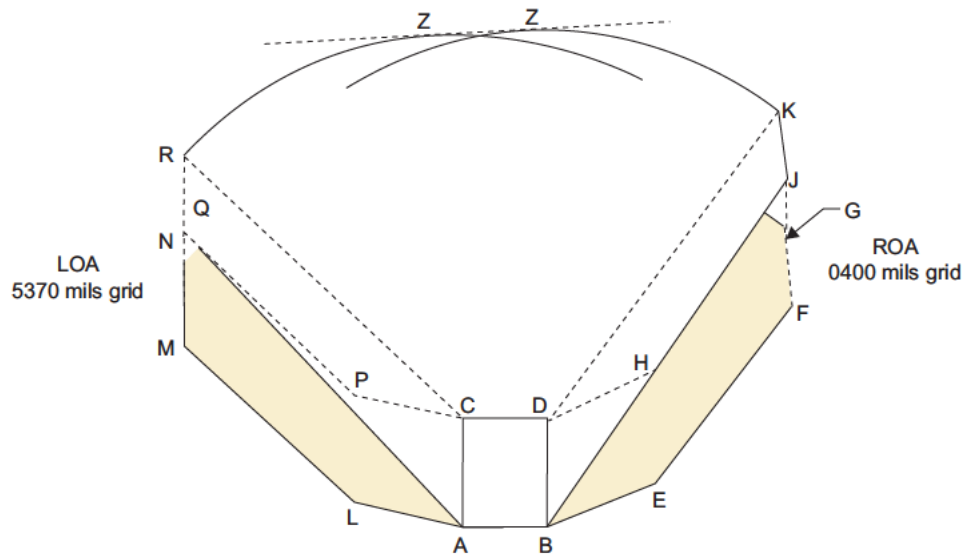


Figure 10-7: Example parallel bearings

- g. Using the length to the outside shoulder on the template as a radius, inscribe an arc from D and then from C. Join the resulting arcs with a common tangent, ZZ.
- h. Extend the arc of fire lines until they come into contact with the outline of the danger area.
- i. Delete the unnecessary internal construction lines so that a completed RDA is formed, as shown in Figure 10-8.

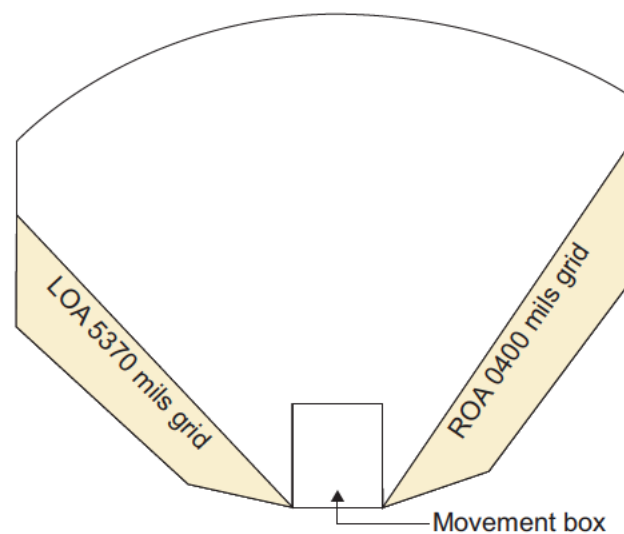


Figure 10-8: Example completed range danger area trace

- j. Targets may be sited inside or outside the movement box. They may be engaged as long as the bearing firer-to-target is within the LOA and ROA. In each case, the application of the template must never endanger other personnel within the movement box. If targets are to be sited outside the movement box, the OIC Practice must check with the range authority to ensure that no RDASTs from any other exercise overlaps these targets. Should an overlap exist, liaison will be necessary to prevent a compromise of safety.

10.22 Mobile firing area – full circle. Where there are no boundary or personnel movement restrictions and there is a requirement for the participating personnel to assault or fire in any direction (eg, circular defence), the danger area is extended to encircle the entire movement area at the length of the relevant

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template. An example is shown in [Figure 10–9](#). When this method is used, internal safety and control are paramount, as the arcs of fire will vary from position to position.

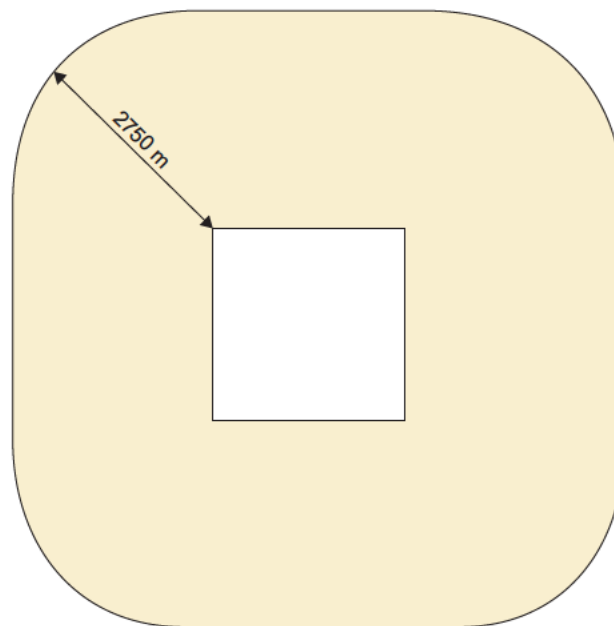


Figure 10–9: Example full-circle range danger area trace

10.23 Mobile firing area – part-circle. A part-circle mobile firing area is constructed as follows:

- Select and plot the required firing area (movement box), ABCD (see [Figure 10–10](#)).
- Commence construction of the RDA by using the sides of the movement box as if they were the start line, beginning with line AC. Apply the template to the new side (line AB) of the movement box. Obtain the maximum angle that does not allow any part of the template to cut the range boundary or encroach on any other restrictions, until the maximum ROA is obtained (as shown in [Figure 10–10](#)).

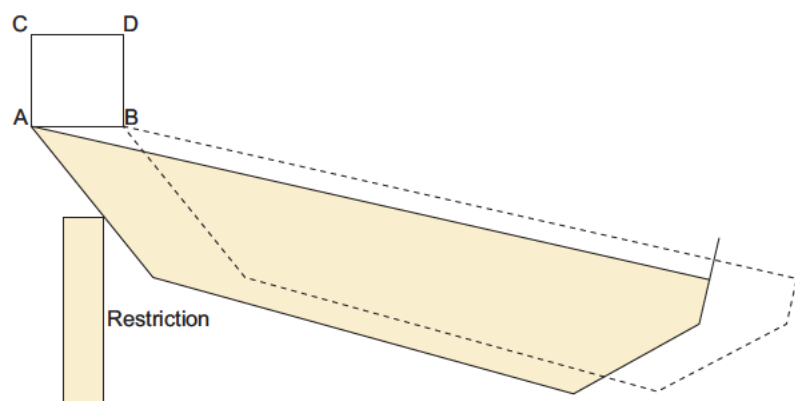


Figure 10–10: Example part-circle range danger area trace – selection of right of arc

- Measure the bearing for the arc. In this case, it would be 1860 mils for the ROA. Apply the ROA bearing to the start and finish lines.
- Mark in the outline of the ricochet area for the ROA as previously explained.
- Complete the actions to obtain the LOA as shown in [paragraph 10.23b](#) to [paragraph 10.23d](#). Ensure that line BD is used as if it were the start line (as shown in [Figure 10–11](#)).

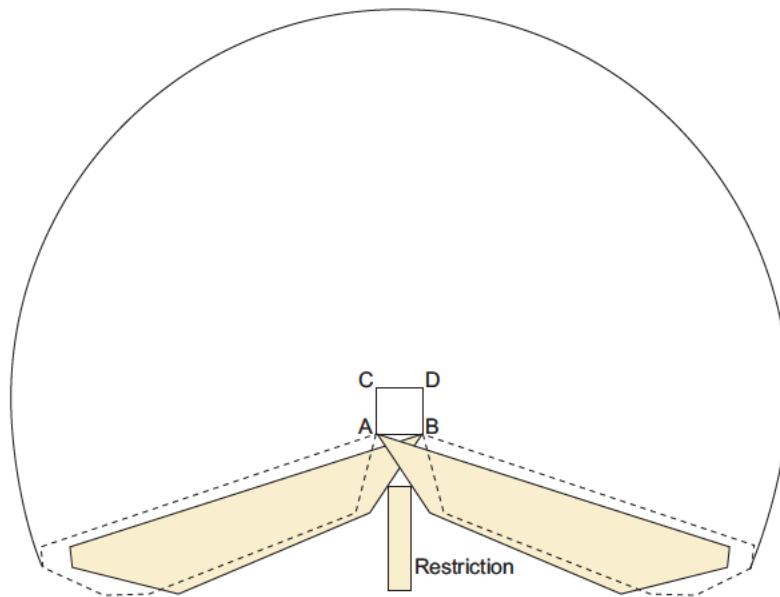
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Figure 10-11: Example construction of part-circle range danger area trace

- f. The danger area is extended to encircle the entire movement area at the length of the relevant template.
- g. Delete the unnecessary internal construction lines so that a completed RDA is formed, as shown in Figure 10-12.

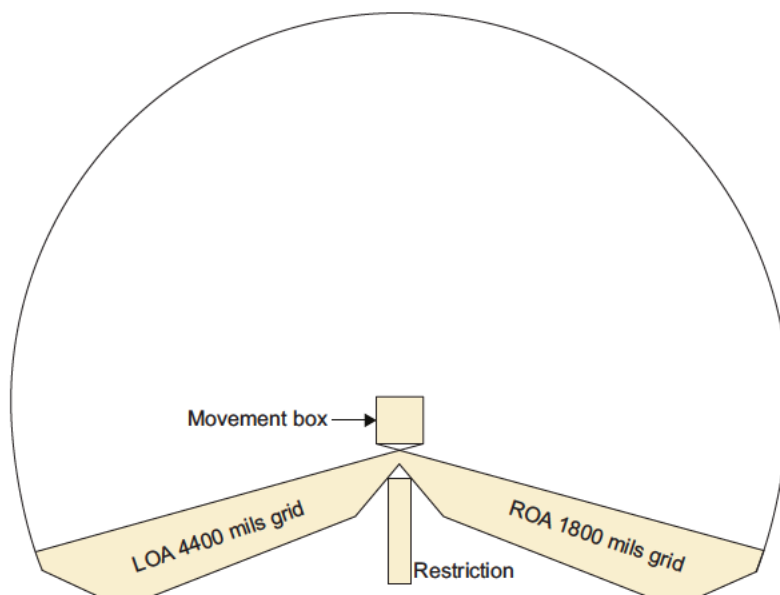


Figure 10-12: Example completed part-circle range danger area trace

Fixed arc markers

10.24 Fixed arc markers are the preferred method for static practices and are used where large open areas of range are available. The following procedure is used to determine the danger area when fixed arc markers are being used (see Figure 10-13):

- a. Locate and plot the required firing area, ABCD.
- b. Select a convenient LOA and ROA, E and F. Targets may be sited inside or outside the firing area and engaged as long as the resulting line of fire does not go outside the arc E and F and the application of the template does not indicate danger to other personnel in the firing area.

- c. To site targets or to outline the RDAST, it is not necessary to apply the template to every firing position. The outside limits of the danger area are obtained by applying the template to the extremities of the firing area through the LOA and ROA, E and F; that is, A, B, C and D through E, and in turn, A, B, C and D through F.
- d. The RDAST is obtained by joining the outside extremities of the template ricochet areas. Convenient safe boundary lines are then marked on the ground and the range map.
- e. Arc markers clearly visible to all positions inside the firing area should then be erected.

10.25 On ranges where fixed arc markers are erected, firers are able to fire through increasingly wider arcs as they advance. The firing area, the limit of advance line CD, the start line BA and the arc markers must be clearly defined on the ground.

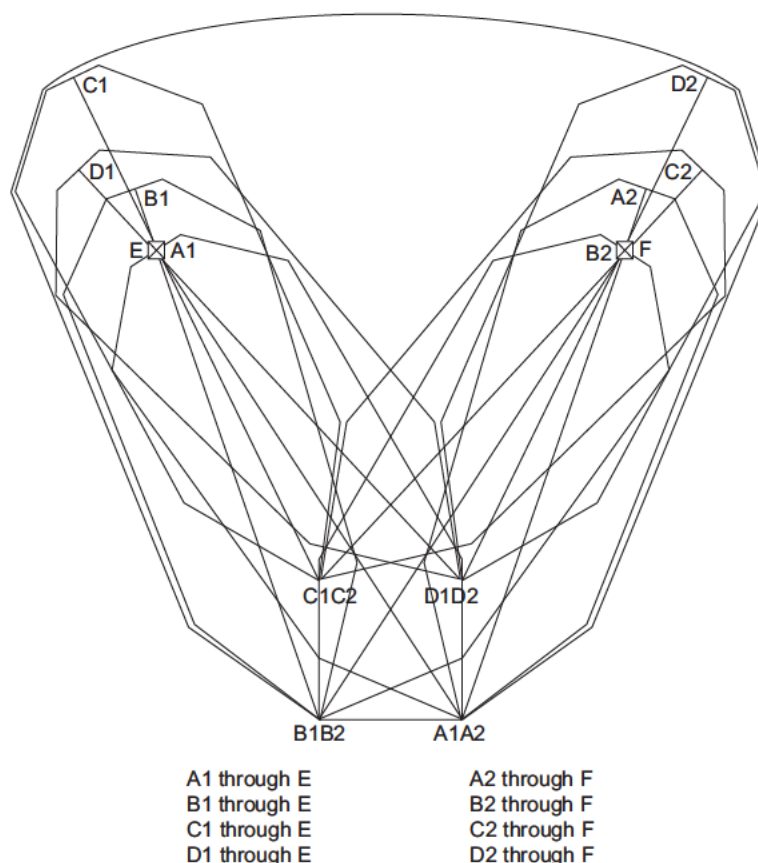


Figure 10–13: Example fixed arc markers

Flexibility of arcs of fire

10.26 The procedure detailed in [paragraph 10.20](#) enables the planner to quickly establish two bearings which are then used to determine the outline of the exercise danger area, which must be the predominant factor along with the QE when siting targets. This procedure normally affords the planner all the scope required to produce realistic exercises.

10.27 There will be occasions when the planner will wish to engage targets outside the two bearings obtained by the parallel bearing method. This is perfectly feasible as long as the outline of the exercise danger area is altered accordingly, and the OIC Practice ensures that all firing is contained within the exercise danger area and that no person is in the danger area of another weapon unless under protective cover.

10.28 [Figure 10–14](#) is an example of the flexibility of the arcs of fire. It shows firing area ABCD, which has produced the LOA and ROA bearings using the parallel bearing method. In this example the planner has decided that the ground at E to F was the best tactical position for personnel to occupy during the reorganisation phase. Consequently, using a template, map and compass, the planner has determined that,

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as long as personnel stay within the confines of the firing line at E to F, it is permissible to engage targets sited within the arc of fire from 4180 mils grid to 5030 mils grid.

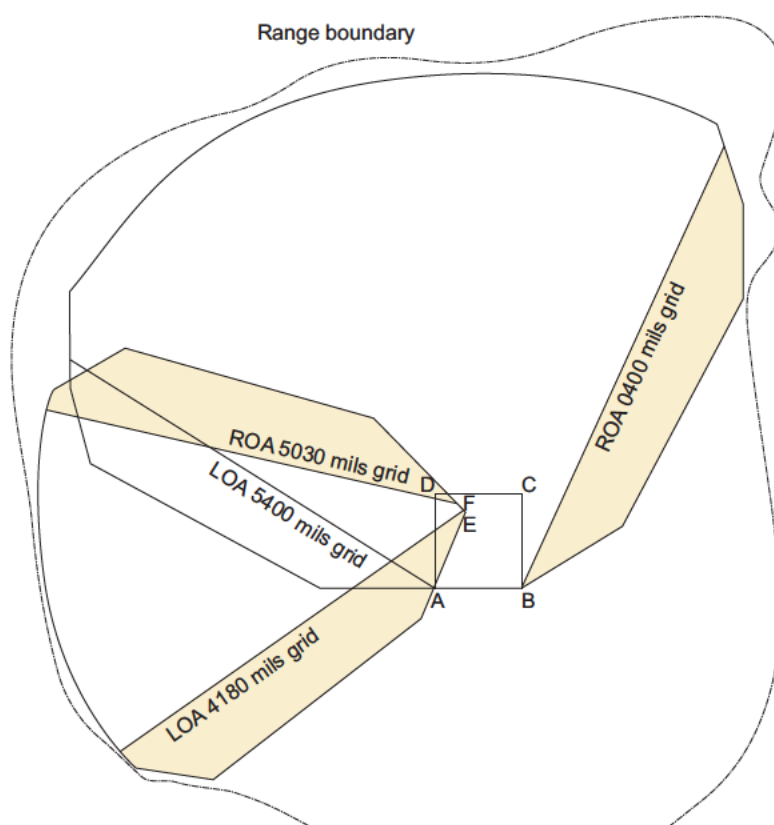


Figure 10–14: Example flexibility of arcs

Section 10-5. Multi-movement box exercises (parallel bearing)

10.29 There may be occasions when the area allocated to the planner is unduly restricted by the range boundaries or other out-of-bounds areas. This situation may be overcome by the use of multi-movement boxes. An example of a multi-movement box exercise is shown in [Figure 10–15](#), where the first phase movement box has a restricted ROA and LOA which would severely limit the flexibility for fire and manoeuvre. This, in turn, may limit the exercise aim and objectives as well as the level of training value for participating personnel. To overcome this problem, a second movement box is added where the arcs are substantially wider, allowing greater flexibility. In the example shown, the second movement box would also allow scope for a flanking movement not possible in the first movement box. The example also demonstrates that a movement box does not necessarily have to be perpendicular, as long as the danger area around it is applied correctly. Subsequent movement boxes may be added depending on the exercise requirements.

10.30 When conducting multi-movement box exercises, the OIC Practice is to ensure that only targets in the first movement box (Phase 1) are exposed to the firers and that targets for Phase 2 (and subsequent phases) are not exposed nor engaged until firers cross the start line of the Phase 2 movement box.

10.31 The construction of multi-movement box RDASTs follows the same procedure as laid down in [paragraph 10.21](#).

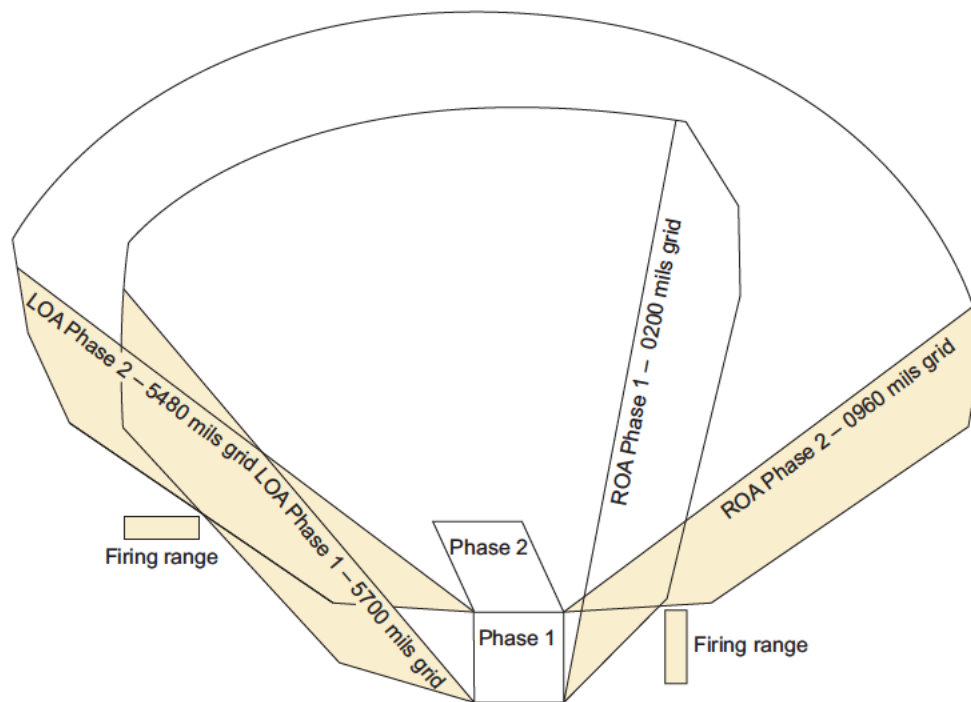
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Figure 10–15: Example multi-movement box exercise with firing ranges in use restriction

Split movement box (parallel bearings)

10.32 The situation may arise where the area allocated to the exercise planner has a restriction on either the LOA or ROA only. This may hinder the achievement of the exercise aim and limit overall training value.

10.33 To overcome this problem, the planner may reach a point at some stage along the movement box where the restriction will no longer apply, thereby widening that arc. The following two methods can be used to determine when the restriction no longer applies:

- a. The ADA template can be slid along the right edge (in the case of the example shown in Figure 10–16) of the movement box until the edge of the ADA template is clear of the restriction. At that point, a line is drawn across the movement box so that it is parallel to the start line and finish line. The template is then applied as normal to determine the new ROA for Phase 2, which is subsequently applied to the top of the movement box to achieve parallel bearings. The extreme arc is then transcribed from the top of the box to join up with the original danger area.
- b. An easier method is to use a straight edge to determine where the restriction ends and apply the template on top of that.

10.34 There is no requirement to carry out the procedure for the other side (LOA), as this remains without restrictions throughout the exercise.

10.35 When conducting split-movement-box exercises, targets for Phase 2 right or LOA, as applicable, are not to be exposed or engaged until firers cross the start line for that phase.

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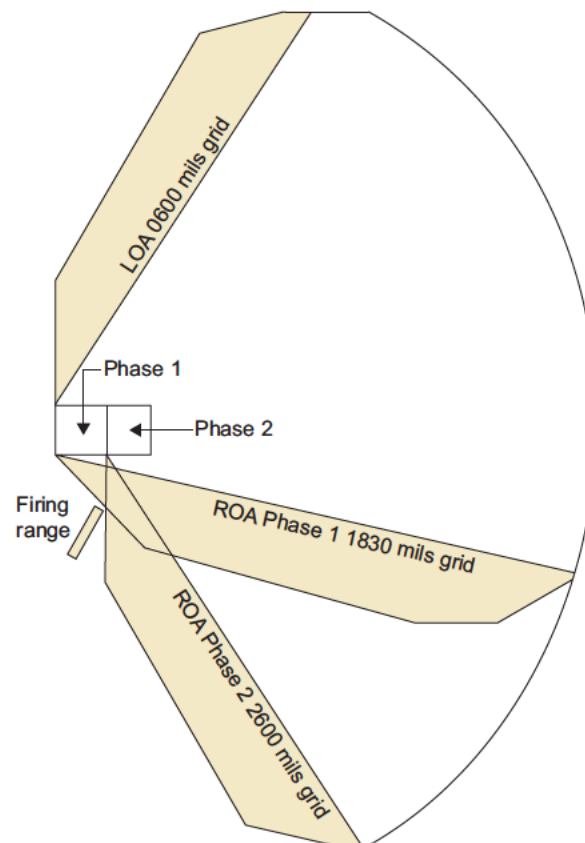


Figure 10–16: Example split-movement-box exercise with firing ranges in use restriction

Section 10-6. Submission, approval and amendment

Submission

10.36 An RDAST (see [Figure 10–17](#) for example), must include:

- a. the outline RDA trace of the practice
- b. at least three fiducial points
- c. the grid bearings marked on the arcs of fire (where applicable) or the position of fixed arc markers
- d. outline of other weapons systems employed inside the RDAST
- e. a range details box containing:
 - (1) the name of the exercise
 - (2) reference to the map used and its scale (and individual RDAST identifier, if required)
 - (3) the date and time of the practice
 - (4) the eight-figure grid references of the FP, line or area (abbreviations may be used); for example, SL represents 'start line' and FL represents 'finish line' for each phase where necessary
 - (5) for traces using fixed arc markers, the eight-figure grid reference for the LOA and ROA markers
 - (6) the plotted eight-figure grid references of any OHF platforms, flanking fire guns and weapons effects bunkers that are positioned outside the movement area, with their lines of fire expressed as grid bearings
 - (7) the ammunition natures involved, the QE permitted for each, the ricochet area used and any safety restrictions
 - (8) the dispersion/human error angle used

- (9) the author's name and signature, and the date of construction
- (10) the name and signature of approved person in accordance with [paragraph 3.11e](#), and the date of checking
- (11) the approving authority's name and signature, and the date
- (12) the trace number (issued by the range authority/control).

10.37 To calculate the RDAST for an exercise, the correct ADA template for the scale of the map must be applied from every firing position to every target position, and at all stages it must remain within the allocated live firing area.

WARNING

Failure to correctly calculate the RDAST could endanger the lives of personnel.

10.38 Completion of a range instruction and an RA are required in accordance with [Chapter 4](#) when an RDA safety trace is submitted.



Approval

10.39 Once the overall RDAST has been prepared by the OIC Practice¹ and then checked by a qualified member² (SRA or AFV IG³), it is to be approved by the unit CO or their delegate, or an independent sub-unit OC (in either case not below the rank of MAJ [E]), and submitted to the relevant Range Control for gross error checking and deconfliction with other range users. RDASTs are not to be submitted via facsimile machine due to the potential for transmission to cause shrinkage or distortion. A copy of the RDAST pre-submissions list (see [Annex B](#)) for use by the trace reviewer.

10.40 Copies of traces made by using a heat transfer method on photocopying machines are to be checked against the master copy for correct size. Where practicable, traces should be transported flat to avoid stretching or shrinkage from rolling. Traces are not to be folded.

WARNING

The trace reviewer must check the RDAST (produced by either manual or electronic means) to ensure that the appropriate RDA template has been applied and confirmation of bearings and safety angles are as per the checklist. Failure to comply with this directive may result in serious injury or death.

10.41 Electronic production. RDASTs produced by electronic means (ie, TASMIS, SAF-Foresight, Microsoft PowerPoint or other electronic programs) are approved for use, but are to be checked and authorised as described in this publication prior to submission to Range Control. An electronic signature on the RDAST is also acceptable.

Amendments

10.42 Should there be a requirement for the user to amend an RDAST or range details after submission to the Range Control, the information is to be re-checked and then approved by the unit CO or their delegate, or an independent sub-unit OC (in either case not below the rank of MAJ [E]), prior to resubmission to Range Control.

10.43 Range Control is to check the RDAST against the map and give approval subject to the overall safe use of the whole range area. If Range Control requires major amendments of any RDAST, or there are changes to safety appointments on the range detail, the original is to be returned to the unit for amendment or cancellation. The new or amended RDAST and/or range detail is then to be approved by the unit CO or their delegate, or an independent sub-unit OC (in either case not below the rank of MAJ [E]).

10.44 Range Control may make minor amendments to an RDAST submitted to them by restricting arcs to deconflict with other range users. The DPRAC/OIC Practice must be notified of any changes.

Annexes:

- A. [Mounted traces](#)
- B. [Manoeuvre Range pre-submission checklist](#)

-
1. During major exercises where a DPRAC has been appointed and OIC Practice is sourced outside the unit, brigade and so on, it may not be possible for all OIC Practices to develop their own RDAST(s). RDASTs may be developed centrally under control of the DPRAC/CSO. Where this occurs, the OIC Practices, as well as complying with the regulations contained in this publication, are to review the RDAST in detail, be briefed on the RDAST as it relates to the exercise, and conduct a thorough reconnaissance and walk-through with their SS prior to commencing the practice.
 2. Where a suitably trained and current Permanent Basic range qualified OIC Practice has been appointed to conduct a CCS/combat shooting practice where a user-designed RDAST is to be applied (to the Permanent Basic range), the appointing authority is to direct a Manoeuvre range qualified member to prepare the RDAST.
 3. The AFV IG may check RDASTs for all AFV and non-AFV RDAST. RAA IGs may also check Mortar RDA safety templates. SRA may check all small arms templates and other non-small arms templates that they are either qualified on or have been authorised by the authorising officer for the activity to check (including mortars).

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Annex A to Chapter 10

Mounted traces

Use of the direct fire template from static firing points

1. The direct fire template is used as follows:
 - a. Where there is a single gun and point target, the direct fire template is used performing the following steps (see [Figure 10–18](#)):
 - (1) *Step 1.* Identify the FP and target grid locations.
 - (2) *Step 2.* Place the weapon template weapon location on the FP and orientate the line of fire over the target location.
 - (3) *Step 3.* Draw a line around the weapon template and annotate the resultant trace with the information shown in [Table 10–1](#).
 - b. Where there is a single gun and area or a moving target, the template is used performing the following steps (see [Figure 10–18](#) and [Figure 10–19](#)):
 - (1) *Step 1.* Identify the FP and area or moving target grid locations. Nominate an LOA and ROA.
 - (2) *Step 2.* Place the weapon template weapon location on the FP and orientate the line of fire over the extremes of the area of the moving target zone. Swing the template through the arc thus formed.
 - (3) *Step 3.* Draw a line around the resultant area and annotate the trace with the information shown in [Table 10–1](#).

Table 10–1: Example of construction of a template

<i>Templates are to be annotated with the following data:</i>		
1.	Scale:	1:50 000 (scale of the map)
2.	Weapons:	eg, Gun 120 mm M256
3.	Ammunition:	eg, TPCSDS-T
4.	Ricochet distance:	Column (f), Table 9–1
5.	Ricochet width:	Hard
6.	Safety distance:	Normal
7.	Constructed by:	WO2 B.ST LEONE (OIC qualified for the weapon employed)
8.	Checked by:	WO1 D.BARLOW (OIC qualified for the weapon employed)
9.	Date of construction:	DD MM YY
10.	Signature:	Person who constructed template
11.	Signature:	Person who checked template

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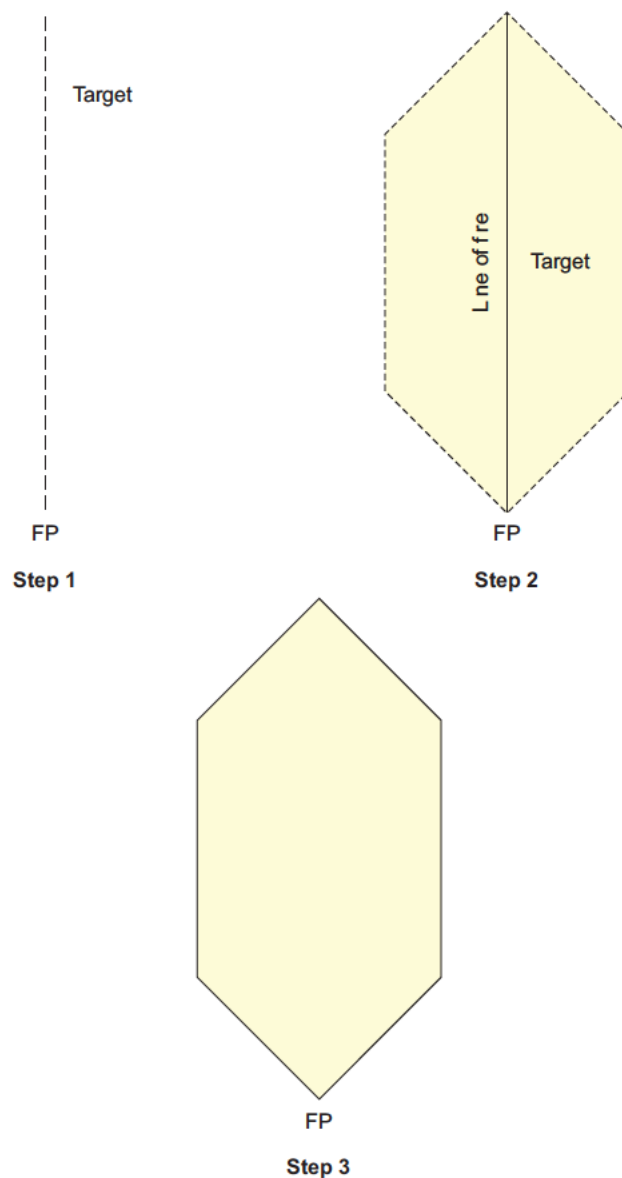


Figure 10–18: Single gun and point target

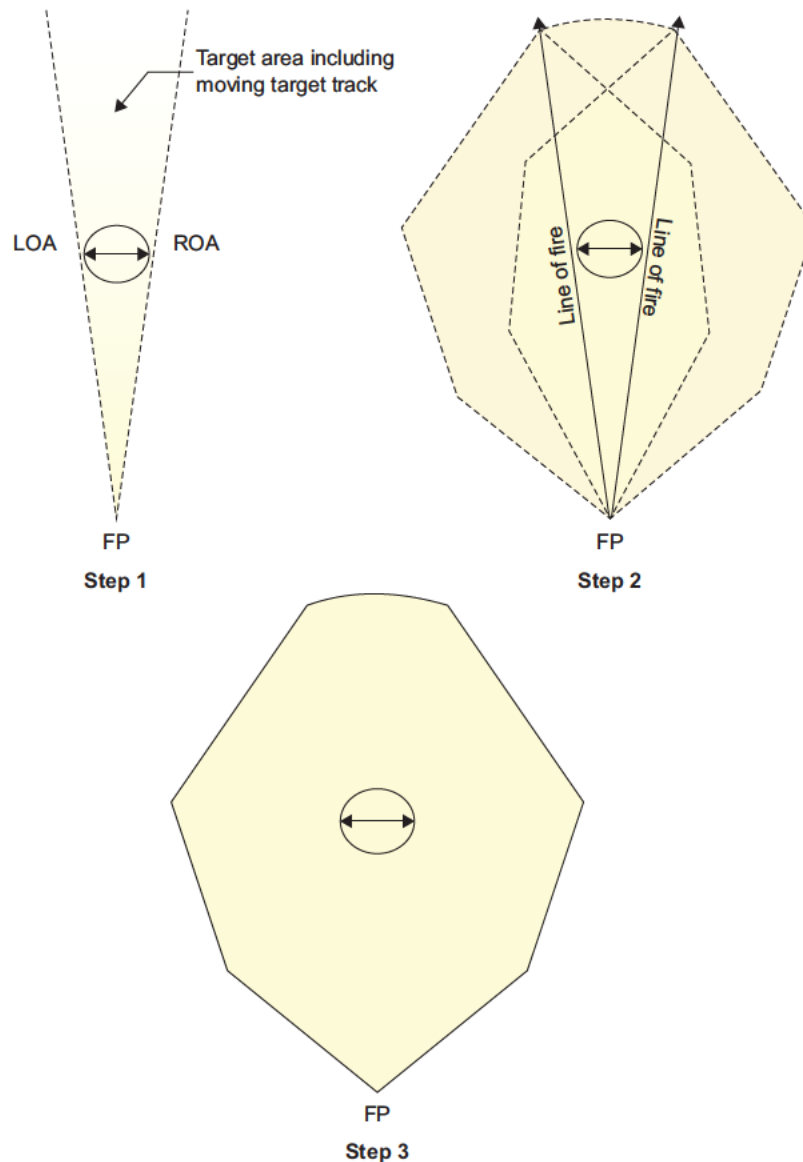


Figure 10-19: Single gun and area and moving target

- c. Where there is more than one gun and area or moving target, the template to be used is constructed by performing the following steps (see [Figure 10-20](#)):
 - (1) *Step 1.* Identify the left and right of the FP and the area or moving target grid locations. Nominate an LOA and ROA.
 - (2) *Step 2.* Place the weapon template weapon location on the left of the FP and orientate the line of fire over the extremes of the area or moving target zone. Swing the template through the arc thus formed.
 - (3) *Step 3.* Place the weapon template weapon location on the right of the FP and orientate the line of fire over the extremes of the area of moving target zone. Swing the template through the arc thus formed.
 - (4) *Step 4.* Ensure that the weapon template is swung through the complete arc from every point along each FP. Draw a line around the resultant area and annotate the trace with the relevant information (see example data in [Table 10-1](#) and [Figure 10-23](#)).
- d. If range space allows, the trace may be squared off for ease of drawing.

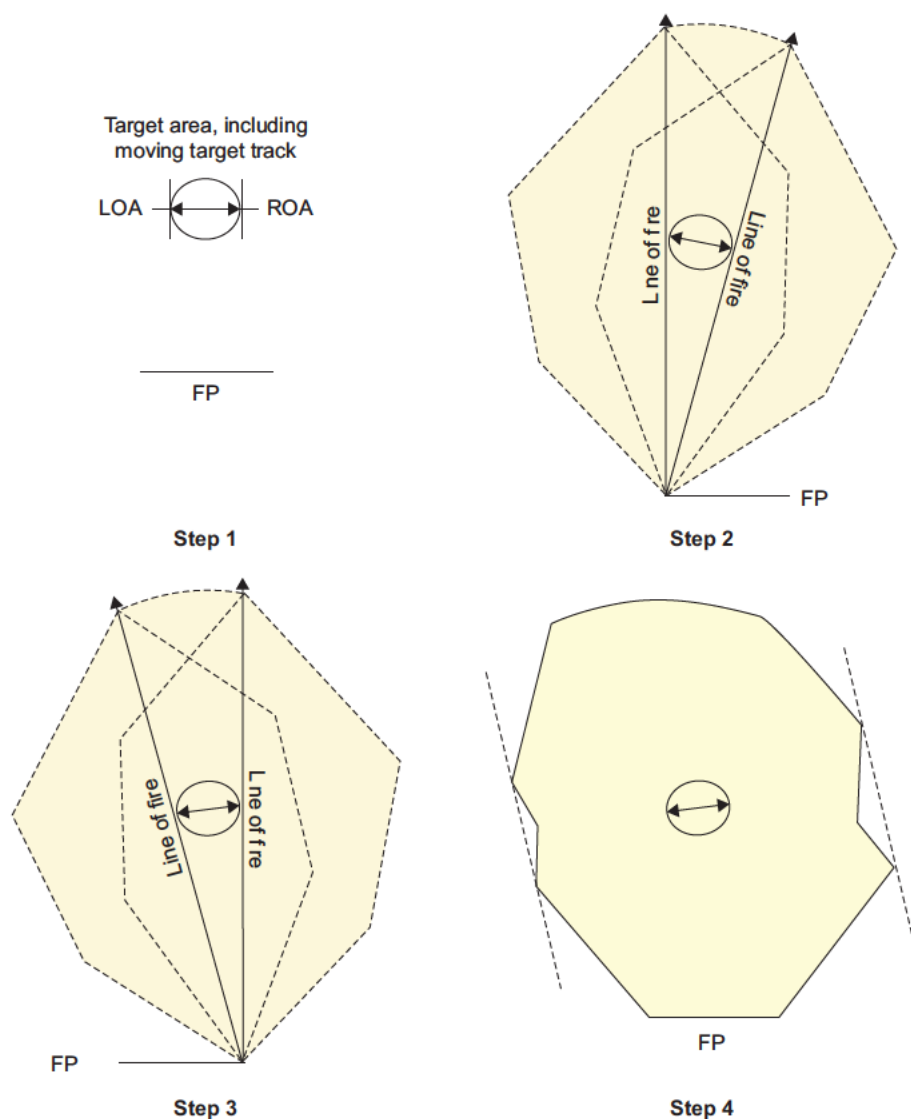


Figure 10-20: More than one gun and area and moving target

2. The templates shown in the figures are for non-fragmentation ammunition. The same steps are followed for explosive ammunition. The ground burst normal and reduced lines on the template can cut the firing line. The 800 mil line cannot cut the firing line.
3. The area directly behind the entire length of the firing line is outside the ground danger area (see [Figure 10-21](#)).

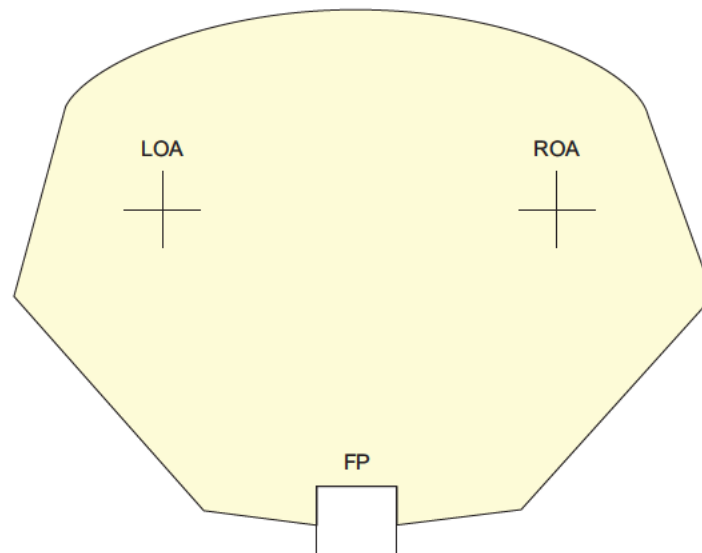
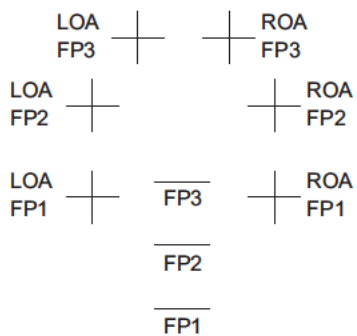


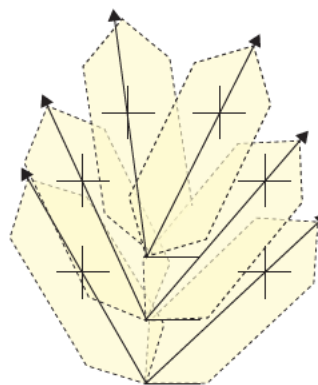
Figure 10–21: Area to the rear of the firing point using explosive ammunition

Use of the direct fire templates for mobile practices

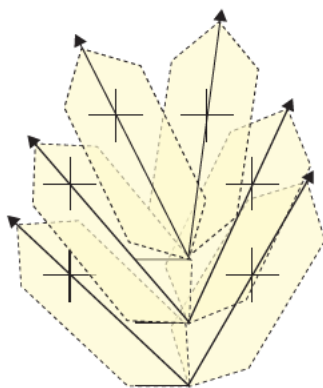
4. There are two methods of constructing safety traces for mobile practices, as follows:
 - a. *Firing lines.* To construct a safety trace using firing lines, the following steps are performed (see [Figure 10–22](#)):
 - (1) *Step 1.* Identify the FP and area or moving target grid locations. Nominate an LOA and ROA for each firing line selected. (The number of firing lines selected is determined by the OIC Practice to meet their training objectives.)
 - (2) *Step 2.* Place the weapon template weapon location on the left of each FP and orientate the line of fire over the extremes of arc for each FP. Swing the template through each arc thus formed.
 - (3) *Step 3.* Place the weapon template weapon location on the right of each FP and orientate the line of fire over the extremes of arc for each FP. Swing the template through each arc thus formed.
 - (4) *Step 4.* Ensure that the weapon template is swung through the complete arc from every point along each FP. Draw a line around the resultant area and annotate the trace with the information shown in [Table 10–1](#) and [Figure 10–23](#).



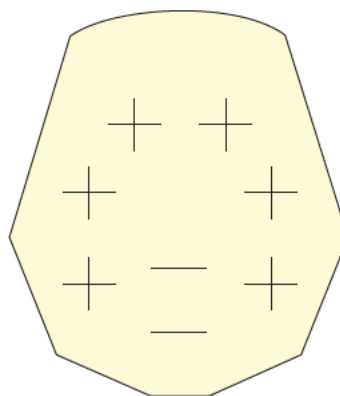
Step 1



Step 2



Step 3



Step 4

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s33(a)(ii)

- b. *Manoeuvre box.* To construct a safety trace using a manoeuvre box, the following steps are performed (see Figure 10–24):
- (1) *Step 1.* Identify the grid locations for the extremities of the manoeuvre box selected. Nominate either a single set of LOA and ROA for the box or a set of bearings for the line of fire.
 - (2) *Step 2.* Place the weapon template weapon location on the perimeter of the selected manoeuvre box. Orientate the line of fire over the respective LOA and ROA or along the nominated bearing. Ensure that the weapon location is moved along all points of the manoeuvre box perimeter.
 - (3) *Step 3.* Ensure that the weapon template is swung through the complete arc from every point along the manoeuvre box perimeter. Draw a line around the resultant area and annotate the trace with the information shown in Table 10–1 (see Figure 10–25).

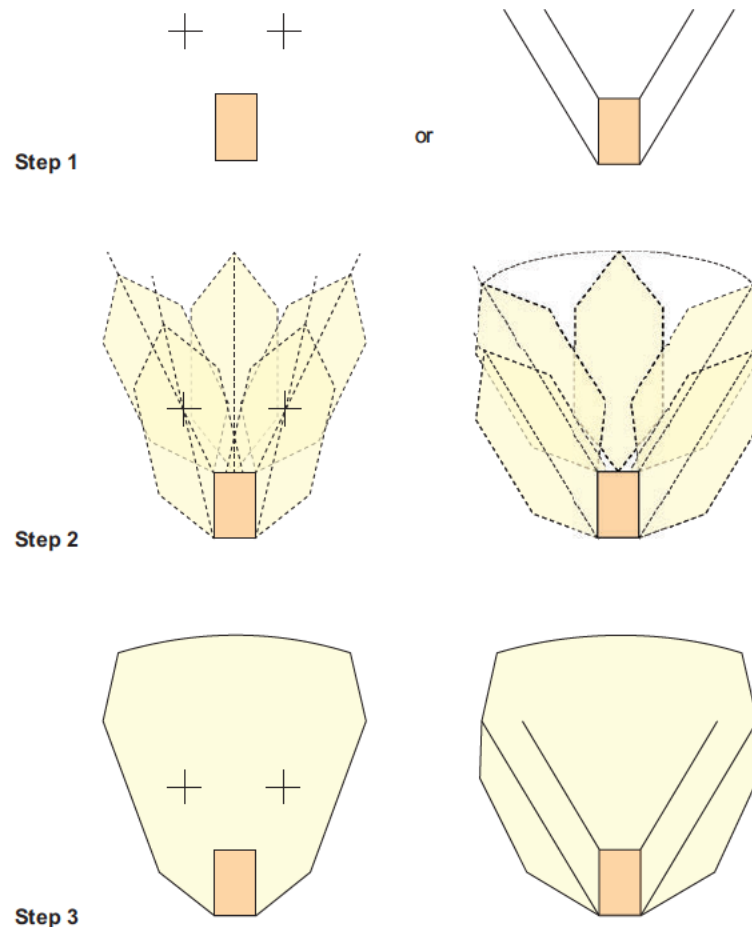


Figure 10–24: Safety trace using a manoeuvre box

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MAP: OIC Pract ce	Ser es R852, COBAR Range Area Spec a , Ed, 1:25 000									
	CAPT B.J. Wa ton				SO AFV:		LT A.F. East ey			
Day and date	Durat on of fr ng		Locat on of		AFV (number and type)	Ammun t on	Max mum danger height (above mean sea eve)	Restr cted impact area	Danger area	
	From	To	AFV	OP						
Monday 15 June 20	0630	2300	256140	258143	4 x MBT	DS-T APERS Smoke	3 500 ft	ALPHA: 220 130 220 140 230 442 230 134	AFV FFTS Standard TRACE 1	
(S gnature) B. J. Wa ton (OIC Pract ce) CAPT (Rank)	(S gnature) I.M. Boss (the W ng Sen or Instruct or or Unt CO) (Rank) SI (Gunnery/Tact cs) W ng or CO (Date)									

Figure 10–26: Worked example of range details

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Annex B to Chapter 10

Manoeuvre Range pre-submission checklist

Serial	Manoeuvre range pre-submission checklist	Check
Trace:		
1.	Three fiducial points GIPs on separate eastings and northings?	
2.	Ensured no firing over any restrictions, OOB areas or areas not allocated to me?	
3.	All grid references checked and accurate?	
4.	Correct templates and human error angles used for all weapon systems?	
5.	All bearings checked and accurate?	
6.	No bearings are back bearings?	
7.	FFG bearing is more than 200 mils from the limit of troop movement?	
8.	The WDA template fits inside the curve when applied from the edge of the firing area?	
9.	Accuracy of the WDA template application along the left and right of arc is correct?	
10.	Template has not been applied beyond the working line?	
11.	RDA curve is not too large and impacting on range space?	
12.	Dotted lines used to indicate where OHF/FFG/EFG/cross the main trace?	
13.	Solid line used when OHF/FFG/EFG/grenade/claymore traces protrude outside the main trace?	
14.	Checked all trace lines have been joined correctly leaving no gaps?	
15.	The template does not encroach on internal range boundaries/infrastructure or external range boundaries IAW TASO?	
Information box:		
16.	Correct exercise name?	
17.	Correct map information?	
18.	Checked all grids correspond to those plotted?	
19.	Correct human error angle details?	
20.	Correct ammunition natures and designations including demolition stores and relevant QE?	
21.	Correct OHF/FFG/EFG grids?	
22.	Name and rank detailed?	
23.	Date and time of use entered?	
24.	Date compiled entered?	
25.	Information box signed?	
26.	Entered SRA approval and date?	
27.	Entered Range Control approval, date and trace number?	
Note: If you can answer 'yes' to all of the above questions then your trace is ready for submission.		

Chapter 11

Conduct of range activities

Range Clearance

SAFETY FIRST

Before each period of instruction is commenced. The Instructor will ensure that rifles, drill cartridges, and pouches are inspected. He will also, demonstrate the safety of his equipment to his squad.

Under no circumstances will the 'safety inspection be omitted. It should, therefore. Develop Into an instinctive routine on the part of all personnel concerned at all times.

MUSKETRY SMALL BOOK for the AIF, 1916

In recent years there has been a noticeable increase in small arms ammunition incidences, with ammunition being discovered during the conduct of equipment clearance of participants and vehicles prior to and post activities.

These events have led to ammunition contamination with the potential to cause an incident involving injury or death.

These events have increased during training due to lax adherence to doctrine and procedures coupled with poor supervision. This in part could be due to a variety of causes including fatigue and rushed post activity administration, with participants not being correctly inspected prior to and post weapon training or range practices.

The following will ensure these incidents are reduced, all participants are to be given the opportunity and take responsibility to check/clear their personal issued field equipment, prior to any supervised clearance.

Vehicle crew/drivers are to only stow ammunition in approved/allocated locations IAW, DRTM, SOVO's and SOPs, regardless of vehicle type/task.

OICs are to brief all SSs and emphasize that thorough inspections of personal equipment/vehicles is to be conducted.

OICs are to supervise initial inspection onto and off the range and SS/NCOs are to conduct a thorough visual and physical inspection of equipment at the beginning and completion of any range or weapon training activity.



LOOK AND FEEL

All clearances are to be conducted IAW [Annex B to Chapter 11](#). Remember, allow sufficient time to be given to participants prior to inspections to clear their own equipment.



DON'T FORGET THE DUMP POUCH

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Section 11-1. Introduction

11.1 Safety is a command and individual responsibility. For all activities conducted on a training area, commanders are to ensure that a range/training area safety brief is provided to all personnel under their control immediately on their entering the training area. Commanders are to ensure that the following applies for all live firing activities, the OIC Practice is to conduct confirmation of the following:

- a. all safety personnel are qualified, current, competent and appointed in writing
- b. all personnel involved in the activity are appropriately qualified, adequately trained and able to safely participate in the activity
- c. all activities are conducted safely and comply with appropriate joint-Service and single-Service doctrine and safety publications
- d. there is strict adherence to all drills, orders and range discipline
- e. personnel responsible for the safe conduct of training are independent of the activity, with no other responsibilities except for the supervision of safe practices, unless permitted by this publication
- f. there is positive control of movement of personnel on the range.

11.2 Checking doctrine. As close as is reasonably practicable to the conduct of any range activity, the OIC Practice and SSs (and the DRPAC, DSO/CSO if appointed) are to confirm that the range safety and weapons doctrine they will apply for their range activity is current and up to date. They are to confirm this by checking Doctrine Online¹ – to ensure that the range safety and weapon publications used are the latest published version – and the *LRS Branch SharePoint site*² – to confirm if there are any recent updates not yet published in the relevant publication (check the TASO from TASMIS is current). If updates, changes and restrictions are noted, they are to be applied and the necessary adjustments implemented prior to and during the activity. These adjustments may require the OIC Practice to arrange additional training and briefings to all safety staff and participants including but not limited to the training of staff/operators in the new drills and procedures, equipment, restrictions in the use of equipment and ammunition. All participants are also to be briefed on any updates or changes as appropriate.

11.3 This chapter contains information to enable personnel to conduct activities efficiently. Throughout an activity, risk is to be managed to meet changing circumstances. Changes to the risk management plan may need to be endorsed by the appropriate authority.

11.4 The OIC Practice is to ensure that, at a minimum, they have the following documentation (including any amendments) with them on the range during the conduct of any range practice:

- a. the appropriate weapon publication
- b. the TASO and range detail
- c. the range instruction, if applicable
- d. this publication
- e. the applicable LWP-G 7-3 series publication³
- f. the *eDEOP 101, Department of Defence Explosives Regulations*
- g. *EMEI Weapon A 229-1, Issue 3, Inspection of Small Arms, Inspection after Suspected Negligent Discharge* (in accordance with [Section 12-4](#))
- h. the HSP (not all ranges have an instruction, in accordance with [Section 6-2](#))

Section 11-2. Implementation phase

11.5 The implementation phase includes pre-activity deployment, activity conduct and immediate post-activity actions. Immediate post-activity actions include:

- a. the debrief

1. <http://drnet.defence.gov.au/ARMY/Doctrine-Online/Pages/Home.aspx>

2. <http://drnet/Army/LRS/LRS/Pages/adf-land-range-safety.aspx>

3. From LWP-G 7-3-1, *Australian Defence Force Range Orders (Dismounted)* to LWP-G 7-3-7, *Australian Defence Force Range Orders (Army Aviation)*.

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- b. range clearance
- c. damage control
- d. EO disposal.

11.6 Advance party. The OIC Practice should command the advance party as the advance party conducts tasks the OIC Practice is responsible to complete. The tasks a typical advance party will undertake (including TASO mandated tasks) are:

- a. Report to Range Control and sign for the range.
- b. Brief SS, coaches, medical assistants, ammunition SS, sentries (see [Annex A](#)) and target operators on the practice(s) to be conducted in accordance with the format given in [Annex B](#) and as appropriate to specific Permanent or Manoeuvre ranges.
- c. Conduct any mandated practical revision and/or revision, as required.
- d. Post sentries.
- e. Ensure that a range clearance is conducted to ensure that no personnel or vehicles are in the danger area.
- f. Establish and test communications (communications as required by TASO are to be available and operational during all range practices).
- g. Ensure that all flags or lamps are correctly positioned.
- h. Prepare the FP and target area as appropriate, removing any ricochet-inducing material forward of the FP (see [Table 9–1](#)).
- i. Set up ammunition points.
- j. Lay out stores.
- k. Conduct rehearsals (including butts parties) as appropriate.
- l. Prepare administrative facilities as appropriate.
- m. Ensure that safety briefs to staff are conducted in accordance with the format given in [Annex A](#) and in the relevant range chapter.

11.7 Main body. On arrival the main body must be organised quickly and efficiently. The following is also to occur:

- a. Carry out an inspection of weapons and equipment as detailed in [Annex B](#).
- b. Issue the safety brief (including mandated briefs) and the activity conduct brief, including the aim, scope and objectives to be achieved.
- c. Organise firing details as appropriate.
- d. If necessary, conduct the WHT.
- e. Prepare the weapons for firing.
- f. Firing details not scheduled to fire early should commence a concurrent activity as soon as possible, which should continue for the duration of the practice.

11.8 Briefing. After safety precautions have been carried out, the OIC Practice is to move the firers to the rear of the FP and proceed as follows:

- a. Brief all firers on the aim and scope of the practices to be conducted during the period they are on the range. The OIC Practice is to refer to the appropriate range briefing aide-memoire for the range/range category in use (including any TASO-specific items).
- b. Divide the firers into details or nominated firing orders.
- c. Brief firers on the rates of fire allowed during this practice in accordance with the relevant weapon publication (the OIC Practice is to add relevant rates of fire from the relevant weapon publication).
- d. Brief all firers in the first detail, and others subsequently, on the format of the first practice, including the rates of fire for all weapon systems used in the practice in accordance with the relevant weapon publication (the OIC Practice is to add relevant rates of fire from the relevant weapon publication).

- e. Indicate to all firers the waiting area for concurrent training for the first practice and ensure that all personnel except the first firing detail move to that area. An additional detail may remain ready behind the mound (fixed ranges only) if the practice is to be only short.
- f. Ensure that staff make a final check on the serviceability of all weapons and see that all necessary adjustments to weapons have been made before firing.
- g. Ensure that hearing protection is issued and worn by all those on or in the vicinity of the FP.
- h. State the actions on casualties and the casevac plan.

11.9 Pre-commencement tasks. Prior to the commencement of the activity, staff are to ensure that the following is carried out:

- a. all necessary adjustments are made and a final check of weapon serviceability is conducted
- b. PPE and hearing and eye protection, as applicable, is issued and correctly worn by all personnel on or in the vicinity of the FP
- c. equipment, including pistol holster, is correctly attached and fitted including confirmation that the holstered pistol does not point into the leg or body, and the lanyard does not interfere with pistol when holstering. (Equipment is to be checked to confirm that all points of modular lightweight load carrying equipment rows for pouches holding weapons or ammunition are used and fitted correctly.)
- d. on order of the OIC Practice ammunition is collected from the ammunition point by the waiting detail, and is placed in magazines and/or secured in pouches in accordance with [Chapter 7](#)
- e. conduct casevac rehearsal
- f. obtain permission to commence range practice.

11.10 Coaches. When employed, coaches should be positioned on the FP and conduct coaching briefs with the firer before, during and after firing.

11.11 Firing point. Only personnel authorised by the OIC Practice are to move onto the FP at any time. The next firing detail may be positioned behind the FP while waiting to fire. Once weapons and equipment are prepared for the activity, the OIC Practice will order the first detail onto the FP. Weapons are only to be loaded on the order of the OIC Practice.

11.12 Changing details. When the OIC Practice is satisfied that all weapons have been inspected and are clear, the detail is ordered to leave the FP and the details are changed. The detail that has just fired is to hand in any unexpended ammunition. Another detail should then move to the FP to await their turn to fire. This procedure continues until the practice is complete.

11.13 Mixing ammunition. Ball and drill rounds are not to be mixed, except to create stoppages during live firing. The mixing of ball and drill rounds is only to occur on Permanent ranges with approval from the unit CO/IOC. The precautions described in [Chapter 7](#) are to be observed.

11.14 Conclusion of the practice. When firing has been completed, the OIC Practice is to ensure that the following activities are carried out:

- a. account for, and return of, all ammunition and explosive stores
- b. return and dispose of stores in accordance with approved procedures
- c. clean up the FP and, if necessary, the target area
- d. collect sentries
- e. check and pack stores
- f. inspect the range
- g. issue the standard warning on ammunition and range produce in accordance with [Annex B](#)
- h. inspect weapons, vehicles and equipment in accordance with [Annex B](#)
- i. debrief participants on fixes and sustains
- j. issue scores
- k. close down communications

- I. report to the Range Control staff, inform them of any problems (including fire) and hand back the range.

WARNING

The range activity is not completed until ammunition is safely returned to the provider/supply chain. The OIC Practice is to allocate sufficient time and personnel to complete all post-activity ammunition return requirements including repackaging of EO, FFE inspection and certification, and compilation of return paperwork. The unsafe return of ammunition may result in injury to personnel within the logistics chain.

Section 11-3. Post-exercise phase

11.15 The post-exercise phase includes analysis and evaluation, post-activity reporting, and capturing lessons identified.

11.16 On return to the unit, complete all remaining administrative tasks, including the submission of a post-activity report if required.

Annexes:

- A. [Example orders for sentries](#)
- B. [Inspections](#)

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Annex A to Chapter 11

Example orders for sentries

1. These orders are an example only and are the minimum requirement for briefing sentries. The OIC Practice is to refer to local range safety orders for the range they are using, and modify these orders to reflect local TASO sentry orders.
2. You are sentry on Post No. ... at ... range.
3. You are positioned at this point as a safety requirement to restrict access to the RDA and to provide an early warning to the OIC Practice of any incursion into the danger area. The area you are to pay particular attention to is ... [indicate and describe area].
4. The OIC Practice is ... [name and rank] and is located at ... [position] which is ... [direction and distance].

Safety instructions

5. You are to display a red flag by day and a red light source by night on top of the flagpole at your post.
6. You are to remain alert and in contact with the control station on the range safety net (see [Appendix 1](#)) at all times until closed down. Should communications fail, you are to remain at your post until physically contacted by the OIC Practice or a member of the range safety staff. You are to stop all people and vehicles approaching your post and inform them that they may not enter the range or danger area until you have re-established communications and obtained permission for them to do so from the OIC Practice.
7. You are to stop all vehicles and people approaching your post from ... [direction]... and inform them that live firing is in progress.
8. You are to point out the danger area to them before allowing them to proceed and inform them that it is safe to remain on the road but they must not leave the road to the left (or right) for the next ... kilometres until they reach Sentry Post No. ... at GR
9. You are to inform any person wishing to enter the danger area that they are not permitted to do so while live firing is in progress. In any case, no person is to be permitted to enter the area unless clearance has been given by the OIC Practice. You are to seek such permission from the OIC Practice.
10. Should any person disregard this warning or should you see any persons entering the area without clearance, you are to contact the OIC Practice immediately and inform them of the circumstances.
11. You are to keep a lookout for any aircraft in the area and, should an aircraft approach the danger area at a height that appears to be below ... [air clearance height] ... metres, you are to warn the OIC Practice immediately.
12. Should you be confronted with a situation not specifically detailed in these orders, you are to contact the OIC Practice immediately.

General points

13. While you are a sentry, you are to conduct yourself in a soldierly manner, remain correctly dressed at all times, pay the correct compliments to all officers, and act and speak in a civil manner to all civilians approaching your post.
14. You are to remain alert and in the immediate vicinity of your post until properly relieved by the OIC Practice or an authorised representative.
15. You are to keep the area about your post clean and tidy at all times. In particular:
 - a. latrines are to be kept hygienic
 - b. all rubbish is to be removed at the completion of your duty.
16. You are to take proper care of the equipment issued to you for use at your post.
17. No live timber is to be cut or defaced in any way.

18. If you are given permission to light a fire, you must ensure that an area of at least 2 m around the fire is cleared of all combustible material. The fire is to be extinguished before you retire or leave your post, unless properly relieved.

Date: *(Signed)*

Appendix:

1. [Example range safety net diagram](#)

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Appendix 1 to Annex A to Chapter 11

Example range safety net diagram

- Figure 11–1 shows an example of a range safety net diagram.

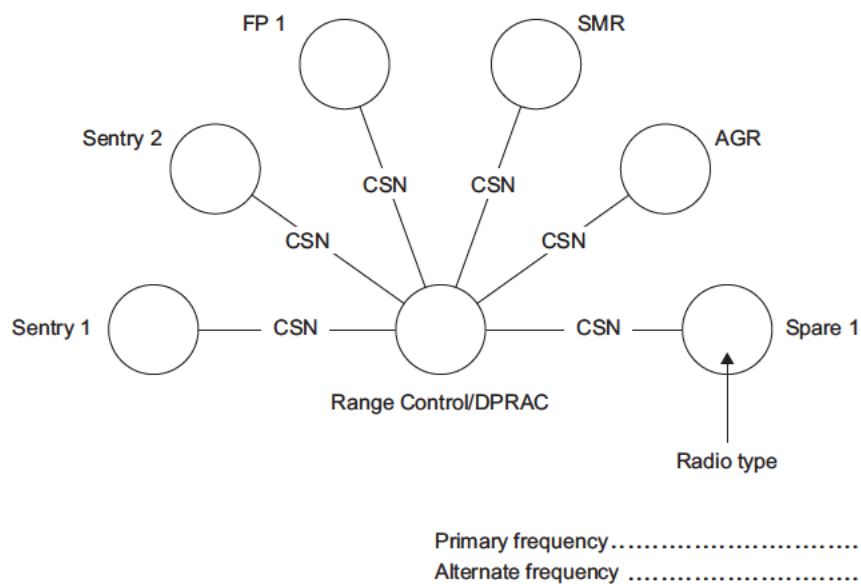


Figure 11–1: Example safety net diagram

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Annex B to Chapter 11

Inspections

Clearances before the conduct of the activity

1. Personnel involved in any activity using weapons or ammunition are to ensure that only webbing and equipment authorised for use within their current organisation is used. Specified carriage and operational PPE is defined as any item used by an individual for the carriage of ammunition, EO and pyrotechnics approved for use to carry ammunition or weapons and issued for the individual's mission-specific use. It does not include the belt, harness or other pouches attached or suspended from the equipment used for the carriage of items such as rations, maps, compasses and binoculars. It also includes body armour, combat helmets and ocular protection equipment that has been issued to protect personnel for the mission or task being undertaken. Issued eyewear is to meet the provisions of *AN/NZS 1337.1: Personal eye protection - Eye and face protectors for occupational applications*.

2. An activity includes any weapon-training activity, including a WHT or the WTSS. Prior to any activity the following is to occur:

- a. clearances of weapons and equipment
- b. checking on the wearing of specified carriage and operational protective equipment.

3. The OIC Practice is to ensure that the following occurs prior to the activity commencing:

- a. Participants are to be given sufficient time to conduct an inspection of their equipment to ensure that no ammunition, EO or pyrotechnics are present, and that the equipment to be used for the carriage of ammunition, EO, pyrotechnics or weapons is issued and unmodified. Should participants have other protective equipment such as body armour, a combat helmet or eye protection, they are to check it to ensure that it is issued and unmodified.

- b. Weapons are to be cleared in accordance with [paragraph 11](#).

- c. Prior to conducting clearances of equipment, all members are to be given the following warning:

'During the conduct of this activity it is prohibited for you to use any non-issue or modified issued equipment for the carriage of ammunition, explosive ordnance, pyrotechnics or weapons. It is also prohibited to use any non-issue or modified issued body armour, combat helmet or eye protection'.

- d. After the warning has been issued the OIC Practice is to have an inspection of all magazines and equipment carried out to ensure that personnel are not carrying any ammunition, EO, pyrotechnics or produce; and that they are only using issued and unmodified equipment designed for the carriage of the ammunition, EO, pyrotechnics (to be issued) or weapons, and only using issued and unmodified body armour, combat helmets and/or ocular protection equipment. The inspection of equipment is to be comprehensive and detailed and, at a minimum, is to include a visual and physical check of all equipment to be used.

4. If laser devices are to be employed, they must be inspected to ensure that the laser is in the OFF position and caps fitted.

5. Equipment assembly is checked for correct setup and connection. Holsters are to be checked to confirm that the holster does not point in towards the leg or body (including when holstered), and that the lanyard is connected to the pistol and SCE and will not foul the holster at any time (carriage/holstering/drawing).

6. The OIC Practice is to ensure that all participants make the following declaration during the inspection:

'I understand and I am compliant with these requirements'.

Clearances after the conduct of the activity

7. Personnel involved in any activity using weapons or ammunition, including any weapon - training activity (eg, a WHT or the WTSS), have a number of responsibilities regarding the clearances of weapons and equipment at the conclusion of that training.

8. Officer-in-Charge Practice. The OIC Practice is to ensure the following actions are conducted at the conclusion of an activity:

- a. Participants are to be given sufficient time to conduct an inspection of their own equipment and/or vehicles to ensure that no ammunition, EO or pyrotechnics are present and batteries have been removed from lasers.
- b. Prior to the final inspection, all personnel are to be given the following warning:
'You are hereby warned that it an offence for ammunition or range produce to be retained in private possession after any activity. If you have any ammunition or range produce in your possession, declare it to me now'. [pause] 'If you find any ammunition or range produce in your equipment at a later time, report it immediately to your superior. If ammunition or range produce is discovered in your possession after you leave this activity, you will be liable to prosecution. you have been warned.'
- c. After the warning has been issued, an inspection of all weapons, magazines, equipment and vehicles to which the participants have had access to is to be carried out to ensure that weapons are unloaded and that personnel, equipment and vehicles do not contain ammunition or range produce. The inspection of equipment is to be comprehensive and detailed and, at a minimum, is to include a visual and physical check of all equipment and vehicles used for the carriage of ammunition, EO, pyrotechnics or weapons and batteries have been removed from lasers. It should be noted that the warning and declaration are intended for activities that involve ammunition or range produce.
- d. If the activity does not involve ammunition or range produce, the warning and declaration are not required if the OIC/commander of the activity is certain that troops have had no access to ammunition and/or range produce that may be present in the training area (brass/smoke grenades, etc).

9. Inspecting personnel. The personnel directed by the OIC Practice to conduct the inspection are to ensure that the inspection they conduct is comprehensive and detailed and that the person whom they are inspecting makes the required declaration.

10. Participants. Participants in the activity are to personally conduct an inspection of their own equipment and vehicles (if a driver/vehicle commander) to ensure that no ammunition, EO or pyrotechnics are present prior to being formally inspected by the range safety staff. As their equipment is inspected, they are to make the following declaration:

'I have no ammunition or range produce in my possession'.

Inspection of weapons

11. During weapons inspections there are to be no personnel in front of weapons. Inspections are to occur in accordance with the relevant weapons publication as follows:

- a. *Weapons.* Weapons are to be inspected before leaving the range. This inspection is to include any laser devices used.
- b. *Inspection procedure.* When being inspected, weapons are to be pointed in a safe direction.
- c. *Inspect weapons.* All weapons are to be in the UNLOADED condition and lasers are to have the batteries removed prior to the order 'INSPECT WEAPONS'.

Chapter 12

Incident management, reporting and investigation

Section 12-1. Introduction

12.1 Incident management in Defence includes the reporting of workplace injuries, illnesses, incidents and accidents known as events. An EO incident may end up being reported as a WHS or security incident. For the purpose of this publication the following definitions are made:

- a. *Event*. The term event is either a result of an error or violation that has occurred during a range practice.
- b. *Error*. An error is where an individual's planned sequence of mental or physical activities fails to achieve its intended outcomes and this failure is attributed to a chance occurrence that has led to a near miss or dangerous incident, minor/serious injury, or a fatality. Example: a soldier has tripped over a rabbit hole (that was not identified as a risk), they fall and, as a consequence, fire a round outside the RDA.
- c. *Violation*. A violation is where an organisation's safety procedure has not been followed and there has been an omission in the planning, training, or conduct and so on that leads to a near miss or dangerous event, minor/serious injury, or a fatality. Example: a soldier fires a round outside the RDA before the safety staff can stop the individual from doing so.

Explosive ordnance incident

12.2 All EO incidents that occur either within or outside Australia and involve EO that is in the possession or under the control of Defence or is used in a Defence activity are to be reported in accordance with the relevant Defence policies, instructions and external agency requirements. In this context, an EO incident includes the following circumstances:

- a. *Explosive ordnance accident*. An EO-related accident is an unplanned or unexpected event or series of events involving EO and which results or could have resulted in death, injury, occupational illness, or damage to or loss of equipment or property, or damage to the environment.
- b. *Explosive ordnance malfunction*. An EO malfunction is a failure in an item of ammunition or EO to function as expected when fired, launched, or otherwise activated, or when explosive components function during a non-functioning test. For purposes of clarity, malfunctions do not include incidents resulting from negligence, malpractices or involvement in other situations, such as vehicle accidents or fires. Malfunctions include abnormal or premature functioning of an item of ammunition or EO as a result of normal use, handling, maintenance, storage and transport that does not result in an EO accident.
- c. *Explosive ordnance defect*. An EO defect is any fault in the make up or marking that may cause a failure in the performance; or any deterioration or damage to the physical state of the ammunition or EO or its container.

Work health and safety incidents

12.3 Fatality. A fatality is reported to Comcare and Defence.

12.4 Dangerous incident. In a range environment, a dangerous incident is an incident that exposes a worker or any other person to a serious risk to a person's health or safety emanating from an immediate or imminent exposure to an uncontrolled implosion, explosion or fire. In all cases, an objective assessment must be made with respect to the immediacy and was there an imminent threat to a person or persons, taking into consideration, distances of the person from the actual threat. A dangerous incident is reported to both Comcare and Defence (see the *Defence Safety Manual*).

12.5 Serious injury. A serious injury event includes either admission to hospital as an inpatient or immediate treatment for serious (life-changing) events, such as: gunshot wound, significant fragmentation injuries, loss of consciousness, burns requiring critical or intensive care, de-gloving, or scalping. A serious injury is reported to both Comcare and Defence (see *Defence Safety Manual*).

12.6 Minor injury. A minor injury event includes all other injuries that do not meet the definition of serious injury. A minor injury is only reported to Defence.

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12.7 Near miss. A near miss is an event that does not result in serious injury or fatality, and the exposure to a threat is neither immediate nor imminent. In a range environment, this includes but not limited to, any blank or ball ammunition negligent or unauthorised discharge where there was no risk of a person being engaged (struck), a dropped grenade in the Static Grenade range where the SS moved the soldier out of the bay and no injuries were received. A near miss is only reported to Defence.

12.8 Where ambiguity exists, contact LRS Branch and/or the safety adviser in formations to assist in the classification of an event.

Section 12-2. Incident management

12.9 The process to ensure the appropriate steps are taken to provide initial action at an incident scene and to ensure the preservation of the scene is known by the mnemonic REACT, which stands for:

- a. **R** = review the situation
- b. **E** = evaluate the scene
- c. **A** = assist victims
- d. **C** = control and preserve the scene
- e. **T** = take notes and report the incident.

12.10 Under REACT, the OIC Practice is to take command, conduct an appreciation of the incident, and direct actions to bring the scene under control.

12.11 Casualties. It is critical that appropriate treatment and evacuation is provided for casualties in order to achieve the best healthcare outcomes for personnel. Further details are contained within [Chapter 6](#).

12.12 Incident scene preservation. The preservation of an incident scene and any potential evidence it contains is critical to the conduct of any subsequent review, inquiry or investigation to determine the cause of the incident. No attempt is to be made to alter or remove evidence from the scene other than to make the immediate area safe and to treat injured personnel. Operational and other considerations including safety of life may not allow for appropriate or in some cases any preservation of an incident scene.

12.13 ADF service police receive specialist training in the securing and preservation of incident scenes, and would, in the normal course, be responsible for such action. However, circumstances may exist where other Defence members may be required to perform this function until the service police attends.

12.14 *eDEOP 101, Department of Defence Explosives Regulations* [Regulation 1.3] provides a checklist for the management of an EO incident scene. Where a negligent discharge is suspected, then the weapon is to be preserved in accordance with the procedures of *EMEI Weapon A 229-1, Issue 3, Inspection of Small Arms, Inspection after Suspected Negligent Discharge*.

12.15 Any incident that occurs is to be reported and actioned in accordance with *eDEOP 101, Department of Defence Explosives Regulations* [Regulation 1.3] and/or the relevant Army Standing Instructions. Depending on the type and severity of the incident, a number of agencies may need to be informed. The following organisations are those that may require reporting through EO incidents:

- a. Range Control
- b. the chain of command
- c. JLC through EO services (Sentinel)
- d. Joint MP
- e. the ADF WHS Adviser Small Arms (through LRS Branch by email or telephone)
- f. Comcare (Sentinel)
- g. CASG (AC446 Report on Defective or Unsatisfactory Materiel [RODUM] - Land)
- h. Defence Radiation Safety Environment
- i. Defence Security Agency (XP188 Security Incident Report).

12.16 Incident management flowchart. The actions to be taken in the event of specific incidents are listed in [Annex A](#) to [Annex D](#) and must be read in-conjunction with the *eDEOP 101, Department of Defence Explosives Regulations* [Annex A], these are as follows:

- a. [Annex A](#) – EO accident involving a fatality, serious injury or dangerous incident
- b. [Annex B](#) – EO incident involving an EO malfunction or EO defect
- c. [Annex C](#) – EO accident involving a minor injury and/or near miss
- d. [Annex D](#) – near miss (not EO incident).

Section 12-3. Incident investigation

12.17 When a reportable incident occurs, at a minimum, a fact finding/investigation is conducted to identify root causes and ensure that an incident of the same type does not occur again. An investigation may be a review into poor ammunition performance or a higher level inquiry into a dangerous incident, serious injury or death. The *Defence Incident Scene Initial Action and Preservation Manual* provides direction into the requirements for and conduct of investigations. Personnel appointed to conduct fact finding should be qualified in the weapon system/range practice. Where the fact finding officer is not qualified, they are to have access to a suitably qualified and independent person to provide assistance.

12.18 [Annex E](#) contains the questions that will assist a fact-finding officer to perform their duties.

12.19 In order to identify trends and improve doctrine and weapon handling drills, COMDT CATC, as the ADF WHS Adviser Small Arms, is to be forwarded a copy of the following documents, by the quickest available means immediately upon completion, to enable an analysis of the incident to occur:

- a. a Sentinel Work Health and Safety Event Investigation Report
- b. a fact-finding report or the findings of an administrative investigation
- c. a police investigation
- d. an ATO investigation or a commission of inquiry, as applicable.

Section 12-4. Defence explosive ordnance procedures

12.20 As Regulation 1.3 of the *eDEOP 101 Department of Defence Explosives Regulations* is continually updated, it is the responsibility of the OIC Practice to ensure that the current issue of *eDEOP 101, Department of Defence Explosives Regulations* [Regulation 1.3] is available in hard copy and/or electronic copy at the range prior to commencement of the practice. The OIC Practice must check that the current instruction is in place.

12.21 *EMEI Weapon A 229-1, Issue 3, Inspection of Small Arms, Inspection after Suspected Negligent Discharge* is also to be copied and made available in hard copy and/or electronic copy at the range prior to the commencement of any range practice.

Section 12-5. Authority to recommence training after an incident

12.22 Where a reportable incident occurs during the conduct of any range practice the OIC Practice is to cease the practice¹ and, at a minimum, undertake fact finding to determine the cause (if possible) and the likelihood of the incident reoccurring. The OIC Practice/DPRAC/CSO is then to apply the necessary controls (including prescribed) to manage the risk of reoccurrence prior to recommencing the practice.

12.23 Range incidents are managed in accordance with the requirements of notifiable incidents. The authority to recommence the practice is in accordance with the MRM (or single-Service equivalent) risk tolerance matrix. Where a high-impact incident (eg, death or serious injury) has occurred, the practice is unlikely to recommence as the scene is required to be preserved until released by Comcare. Range practices, where incidents have been proven to be a result of inappropriate application of the controls outlined in this publication, TASO, weapon publications may recommence once the reporting procedures outlined in this publication have been followed.

1. May not be required for every 'reportable to Defence' incident. The OIC Practice is to make that assessment.

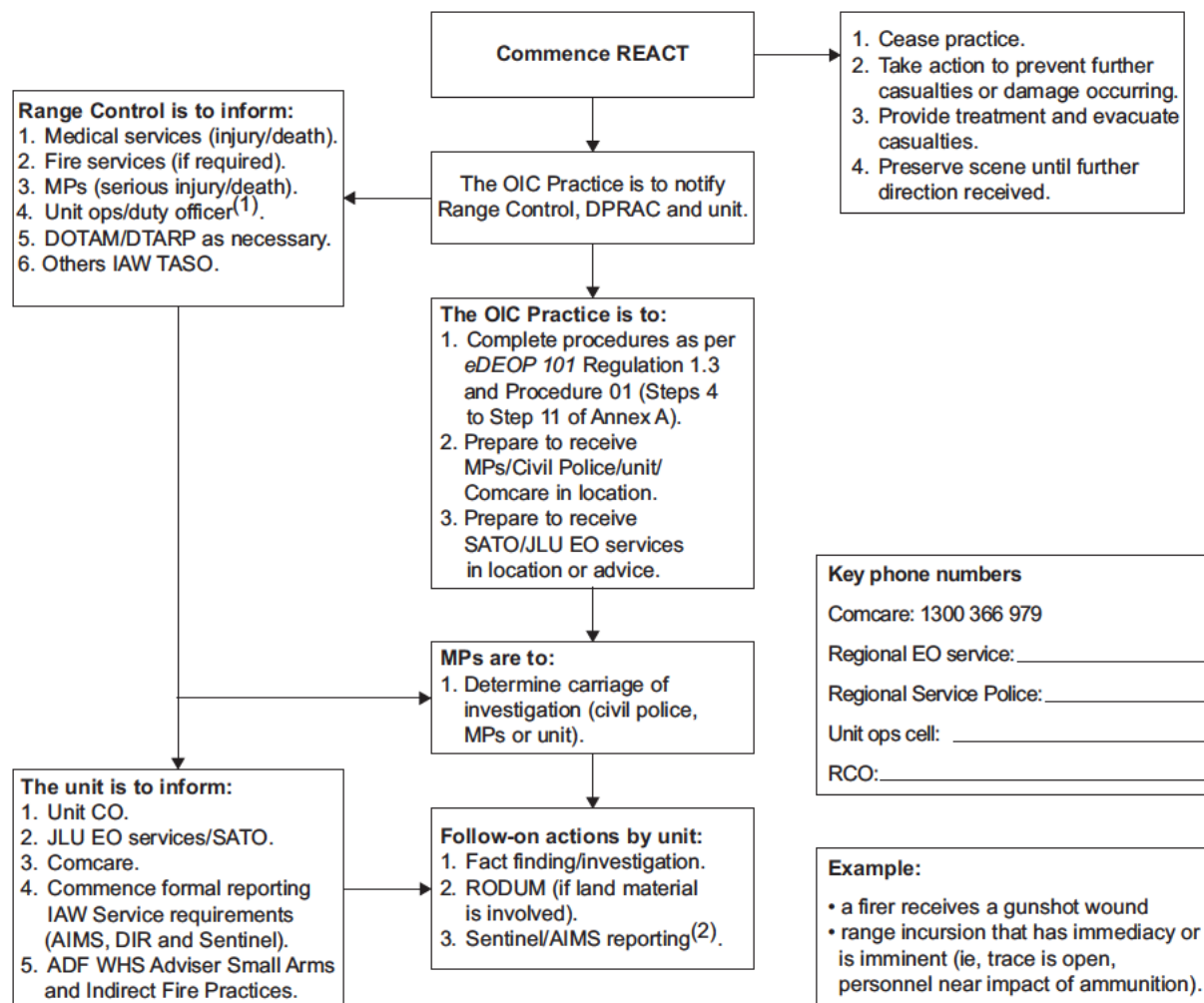
Annexes:

- A. Explosive ordnance accident involving a fatality, serious injury or dangerous incident
- B. Explosive ordnance incident Involving an explosive ordnance malfunction or explosive ordnance defect
- C. Explosive ordnance accident involving a minor injury and/or near miss
- D. Near miss (not an explosive ordnance incident)
- E. Questions to assist fact finding

Annex A to Chapter 12

Explosive ordnance accident involving a fatality, serious injury or dangerous incident

1. Figure 12–1 shows an accident management flowchart for a fatality, serious injury or dangerous incident.



Note:

1. If the OIC Practice does not have comms back to unit then Range Control is to provide assistance.
2. Sentinel report must be finalised and submitted to Comcare within 48 hr of initial notification. Written notification occurs prior to the Sentinel investigation process occurring.

Figure 12–1: Accident involving a fatality, serious injury or dangerous incident

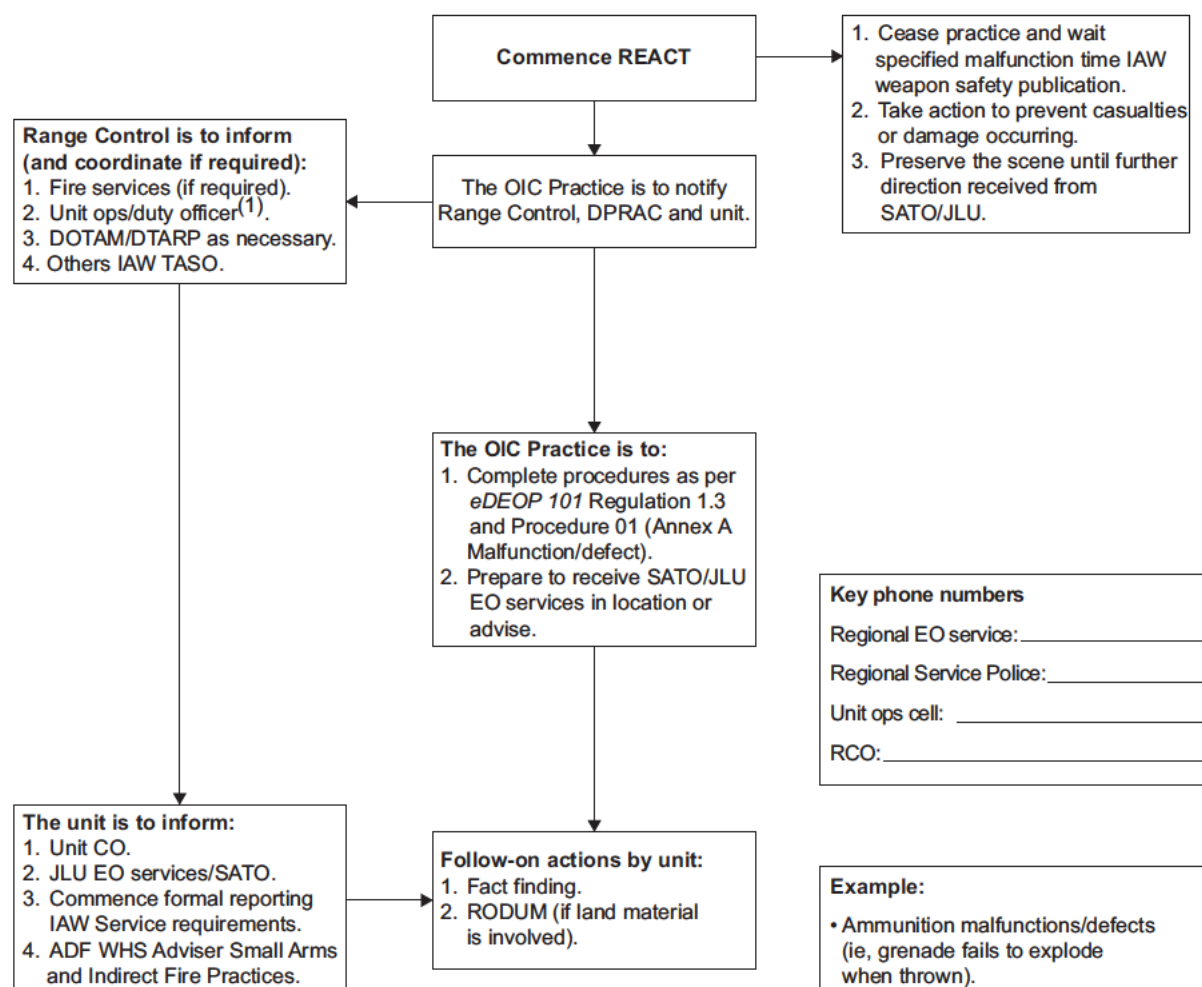
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Annex B to Chapter 12

Explosive ordnance incident involving an explosive ordnance malfunction or explosive ordnance defect

1. Figure 12–2 shows an incident flowchart for an EO incidents involving an EO malfunction or EO defect.



Note:

1. If the OIC Practice does not have comms back to unit, then Range Control is to provide assistance.

Figure 12–2: Explosive ordnance incident involving an explosive ordnance malfunction or explosive ordnance defect

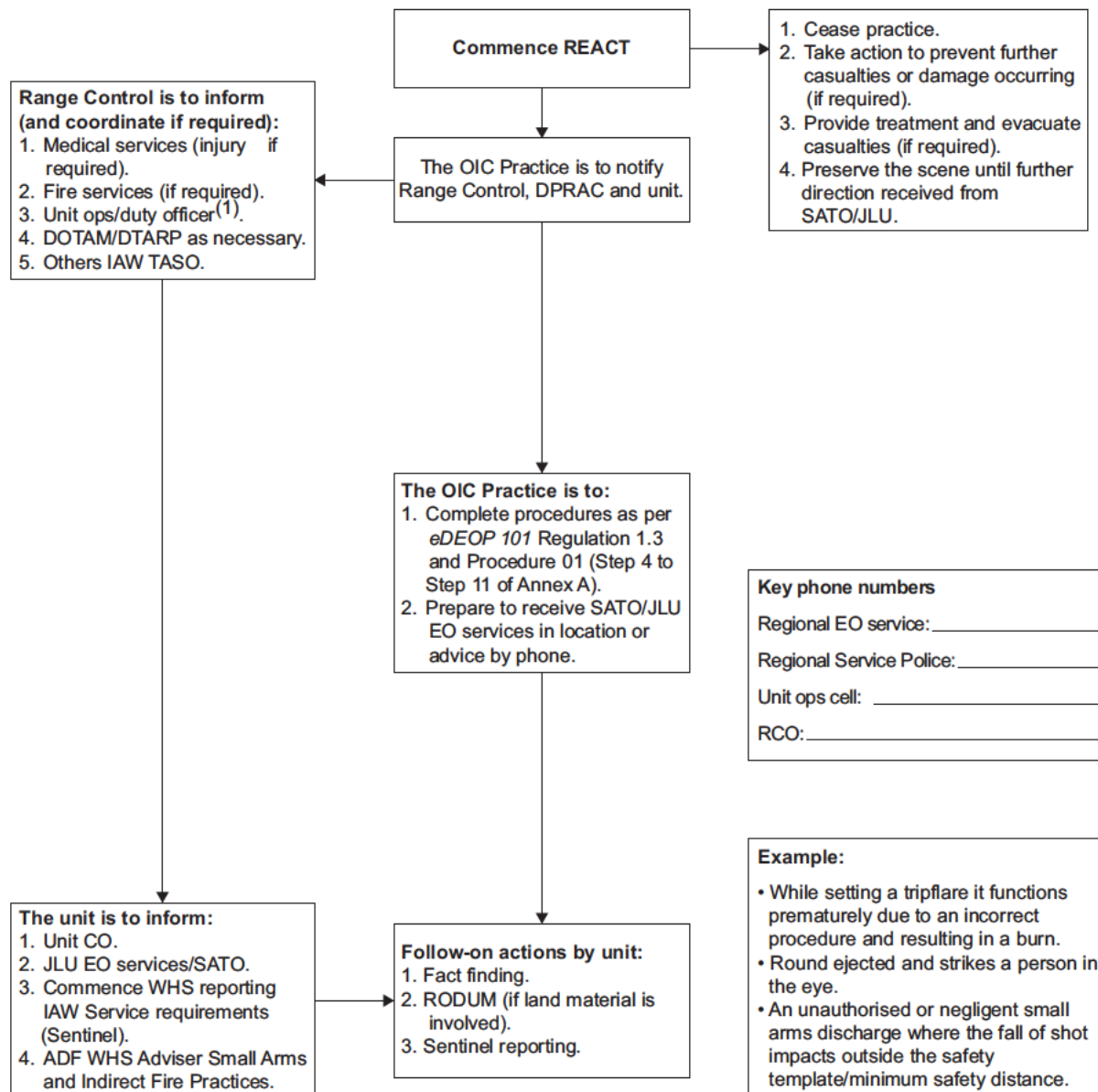
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Annex C to Chapter 12

Explosive ordnance accident involving a minor injury and/or near miss

1. Figure 12–3 shows an accident flowchart for an EO accident involving a minor injury and a near miss.



Note:

1. If the OIC Practice does not have comms back to unit, then Range Control is to provide assistance.

Figure 12–3: Explosive ordnance accident involving a minor injury and a near miss

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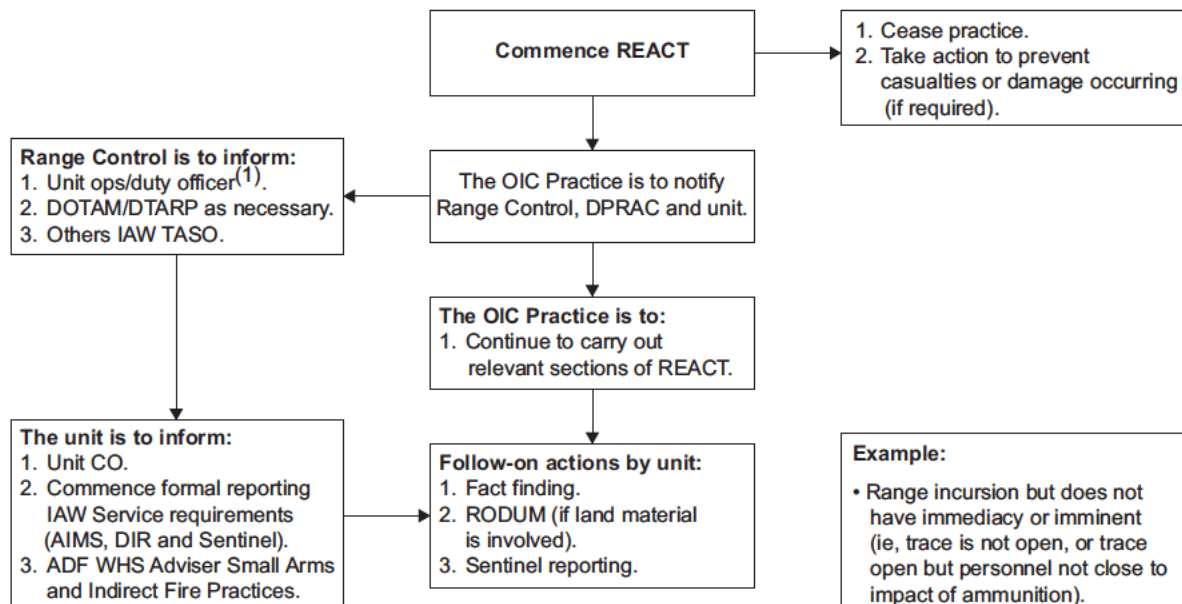
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Annex D to Chapter 12

Near miss (not an explosive ordnance incident)

1. Figure 12–4 shows an incident flowchart for a near miss (not an EO incident).



Note:

1. If the OIC Practice does not have comms back to unit, then Range Control is to provide assistance.

Figure 12–4: Near miss (not an explosive ordnance incident)

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Annex E to Chapter 12

Questions to assist fact finding

1. The following questions should be considered and, as necessary, applied in the cause of a range incident fact finding. Not all questions may need to be addressed by the unit:
 - a. What was the range practice being conducted and what were the expected outcomes (eg, mission rehearsal exercise, mission essential task lists)?
 - b. Location of the activity and the location of the incident site if different (eg, Puckapunyal Military Area, Area G). A sketch map or diagram may provide additional clarity.
 - c. Qualifications:
 - (1) Participants in the incident:
 - (a) Details relating to the qualification and experience of the participant(s). How long was the participant(s) qualified on that weapon/platform?
 - (b) Date and result of the soldier's last WHT.
 - (2) Safety staff:
 - (a) OIC, safety staff and range appointments qualifications including date of completion of annual recertification and general range experience.
 - (b) Were OIC Practices and safety staff given adequate time to prepare.
 - d. Training:
 - (1) Details of pre-range training conducted to develop exercise participants prior to the activity. For example, were all participants from the one section/platoon or was it a composite platoon for the activity? If so, were any mitigations developed to manage the integration of the section/platoon prior to the activity?
 - (2) A detailed outline of the progression of training undertaken and/or being undertaken prior to the incident.
 - (3) Were all authorisations in place; were any waivers requested for the activity?
 - e. Risk:
 - (1) What controls were being applied locally to minimise the risk of injury so far as reasonably practicable (rotation plans, sufficient numbers of and briefed safety staff, what walk-throughs or rehearsals were conducted)?
 - (2) Confirm (and be prepared to provide) the briefings received by firers and safety staff?
 - (3) Details of any reviews and/or changes made to activity risk controls following the incident to prevent recurrence.
 - f. Incident questions (answer as appropriate):
 - (1) whether or not the firer adhered to the correct firing drills when using their weapon
 - (2) whether or not the firer conducted the correct stoppage drills
 - (3) whether or not the safety staff allowed any unsafe practices to occur
 - (4) were there any distractions, such as concurrent activities, time pressures, safety staff shortfalls environmental factors?
 - (5) whether or not the actions of the safety staff and participants in the aftermath of the incident were appropriate
 - (6) whether or not any avoidable systemic issues contributed to this incident
 - g. In the event of a cook-off consider:
 - (1) heat loading

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- (2) rates of fire
- (3) length of fire
- (4) burst rate
- (5) barrel change
- (6) nature of the engagement (was it a standard live fire practice or as part of a Manoeuvre range activity. Be prepared to provide a copy of the WG002 Artillery Fire Plan if an artillery/mortar or DFSW activity was occurring.)
- (7) was the ammunition/weapon exposed to heat load from the sun?

Chapter 13

Integrated Mounted/Dismounted Live Fire range

Section 13-1. Introduction

13.1 This chapter provides the regulations necessary for the safe conduct of range practices on integrated Permanent and Manoeuvre ranges when AFV and non-AFV vehicles are employed with mounted and/or dismounted troops.

13.2 The purpose of Integrated ranges is to practise the expertise and procedures of combined arms in a live fire environment in order to achieve a combined mounted and dismounted effect for combat operations. The following are the outcomes of Integrated ranges:


- a. practise C2 of mounted and dismounted troops
- b. the safe fire and movement of vehicles and dismounted troops
- c. coordination of weapon effects to achieve the mission
- d. practise mounting and dismounting procedures for troops, including weapon clearance.

13.3 The use of Integrated ranges is a phased training continuum designed to progress from small unit activities such as a section with a vehicle to platoon and its integral vehicles, up to battlegroup level. Progression of training, in accordance with this publication, is to be adhered to.

Integrated terminology


13.4 Terminology used for an integrated Live Fire range practice includes:

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- e. *Blast- and splinter-proof cover.* This cover is described in detail in [Section 5-6](#).
- f. *Posting grenades.* The term 'posting' a grenade applies to the action of placing or dropping a grenade into a purpose-built bunker/trench. The special design and construction of the target bunker/trench ensures that the soldier is protected from the effects of the blast of their grenade. For more information refer to *LWP-G 7-3-1, Australian Defence Force Range Orders (Dismounted)* [Chapter 6].
- g. *Manoeuvre group.* A manoeuvre group is a group of one to six firers, or two or more platforms. Where a group subsequently divides, each element becomes a manoeuvre group in its own right. A manoeuvre group does not contain both vehicles and dismounted personnel. For example, when a section dismounts from a vehicle, an SO is required for dismounted personnel, and a separate SO is required for the vehicle.
- h. *Armoured fighting vehicle/non-armoured fighting vehicle safety officer.* The AFV/non-AFV SO is appointed to assist the OIC Practice in the conduct of AFV battle practices. An SO is to be appointed, in writing by the unit commander, for all practices that entail the use of AFVs or non-AFVs being used for the Integrated range practice. The AFV/non-AFV SO's responsibilities/duties include but are not restricted to:
- (1) assisting with the construction of the RDAST
 - (2) assisting in the development of the range instruction including the wording for the appointment of AFV CC/non-AFV CC/non-AFV SSs
 - (3) assisting with the development of the RA
 - (4) providing technical advice on the operation of AFV/non-AFV platforms, weapon systems and munitions
 - (5) providing guidance on safety considerations when using AFV/non-AFV platforms including safety distances for dismounted troops
 - (6) providing advice on the placement of AFV/non-AFV safety staff for the proposed range practice
 - (7) providing guidance on the positioning and requirements for the ammunition point and handling of AFV/non-AFV munitions
 - (8) delivering briefs to AFV/non-AFV participants and in accordance with *LWP-G 7-3-2, Australian Defence Force Range Orders (Mounted)*
 - (9) providing advice on the management on AFV/non-AFV incidents during the range practice
 - (10) clearing the AFV/non-AFV at the conclusion of the range practice.
- i. *Breaching charges.* Breaching charges are an explosive means of destroying obstacles and fortifications, as well as facilitating entry into a building or compound. They are constructed and used in accordance with *LWP-G 3-6-6, Demolitions*.

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13.5 Range appointments are detailed in [Annex E to Chapter 3](#).

Progression of training

13.6 Integrated ranges are a culmination of training that uses both mounted and dismounted elements to achieve a combat effect. As such a methodology based on the principle of crawl-walk-run is to be used. Logical progression of training is to be used by personnel and range staff to ensure the best outcome. A checklist is provided in [Annex A](#) to assist in the planning of Integrated ranges. This is to be completed by the

activity planner for the CO. The following mandated steps are carried out prior to the conduct of interrogated ranges:

- a. confirm weapon qualifications of all personnel; confirm qualifications of personnel involved in vehicle manoeuvre
- b. dry training on the interoperability between mounted and dismounted personnel at section/single vehicle level (static and mobile)
- c. blank/NLTA training on the interoperability between mounted and dismounted personnel at section/single vehicle level (static and mobile)
- d. live training (ball) on the interoperability between mounted and dismounted personnel at section/single vehicle level
- e. dry training on the interoperability between mounted and dismounted personnel at platoon/multi-vehicle level (static and mobile)
- f. blank/NLTA training on the interoperability between mounted and dismounted personnel at platoon/multi-vehicle level (static and mobile)
- g. live training (ball) on the interoperability between mounted and dismounted personnel at platoon/multi-vehicle level
- h. dry training on the interoperability between mounted and dismounted personnel at company/multi-vehicle level (static and mobile)
- i. blank/NLTA training on the interoperability between mounted and dismounted personnel at company/multi-vehicle level (static and mobile)
- j. live training (ball) on the interoperability between mounted and dismounted personnel at company/multi-vehicle level
- k. dry training with combat enabling elements at company level
- l. live training with combat enablers at company level.

Permission to vary the progression of training

13.7 The CO of an ARA unit can give permission to vary the progression of training to facilitate best use of time and resources within their unit. A LTCOL (E) may waive dry training requirements at platoon level and below. BRIG (E) level endorsement is required at sub-unit level and above.

Section 13-2. Integrated range safety considerations

13.8 Range layout. Integrated Permanent Basic ranges have a maximum of two vehicles and two sections of participants, and Integrated Permanent Complex ranges have a maximum of four vehicles and a platoon of participants.

13.9 Range flags/lights. Range flags/lights are to be flown/displayed in accordance with [Annex A to Chapter 3](#).

13.10 Gunnery flags/lights. These are flags/lights that are flown/displayed from individual AFVs/non-AFVs in accordance with [Annex A to Chapter 3](#).

Night firing

13.11 The ratio of SSs to firers for night firing (including NFE) is detailed in [Chapter 5](#). The ratio of AFV/non-AFV SOs for night firing is as per *LWP-G 7-3-2, Australian Defence Force Range Orders (Mounted)*.

Integrated range safety considerations

13.12 The following safety considerations apply to integrated practices. They are to be applied in conjunction with those detailed in *LWP-G 7-3-1, Australian Defence Force Range Orders (Dismounted)*

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[Chapter 6]. In addition to completing the OIC checklist ([Annex B](#)), the OIC Practice is to confirm the following, as appropriate to the activity:

- a. prior to the practice:
 - (1) likely fire and movement bounds and their locations
 - (2) likely control positions
 - (3) confirm misfire pit(s) location
 - (4) limit of movement on the FP
 - (5) vehicle routes
 - (6) target triangulation and limits of engagement for each target, vehicle, weapon and ammunition type
 - (7) weapons zeroed/boresighted correctly
 - (8) that all vehicles have communications between themselves and any dismounted operators
 - (9) signals and communications procedures between vehicles and dismounted operators are known and practised
 - (10) brief all firers in accordance with *LWP-G 7-3-1, Australian Defence Force Range Orders (Dismounted)*, as required, plus any additional matters relating to the range practice to be undertaken.
- b. during the practice:
 - (1) firing is to cease if communications are interrupted/lost
 - (2) if a vehicle loses communication it is to stop, UNLOAD and raise the appropriate flag (operators in the vehicle are to UNLOAD also if at a different state of weapon readiness)
 - (3) no HE or RP grenades are to be thrown from any AFV/non-AFV; firing from the crew hatch position using IWs while static is permitted in accordance with the regulations contained in [Chapter 10](#) and *LWP-G 7-3-2, Australian Defence Force Range Orders (Mounted)*. When CS munitions are carried inside vehicles all personnel are to be issued with and trained in the use of the current in-service protective mask
 - (4) appropriate class hearing protection is to be worn for the employed weapon system(s) in accordance with the *Defence Safety Manual* [Volume 4]
 - (5) a staff walk-through, including verifying target triangulation and likely firing positions, is to occur before each activity
 - (6) where role players are employed during field firing to enhance realism, the following is to occur:
 - (a) The OIC Practice is to brief all role players in the safety and conduct of the practice, including a rehearsal of their individual roles.
 - (b) Role players are to attend all safety and firers' briefs, including the staff walk-through.
 - (c) Role players must approach the firers from the rear, gain the attention of the mounted and dismounted SSs and have the OIC Practice's permission to move into the RDA.

Armoured and non-armoured fighting vehicle safety distance to dismounted troops

13.13 No dismount is to be closer than 3 m to a moving AFV/non-AFV (this distance may increase in accordance with the main armament minimum safety distance). Additional safety requirements for M1A1s are detailed in [paragraph 13.25](#).

13.14 Dismounted firers are to be in line with the AFV/non-AFV gun trunnions when firing. Dismounted personnel are not to move forward of the gun trunnions when the AFV/non-AFV is firing. The movement of AFV/non-AFV and dismounted personnel is subject to the same principles as movement within sections. Gun trunnions are to be stipulated by the AFV/non-AFV SO for each platform. Additional safety requirements for M1A1s are detailed in [paragraph 13.25](#).

13.15 Engagement of targets is the AFV CC's/non-AFV weapon operator's responsibility, and though granted permission to fire; it is not an order to fire. The AFV CC and gunner/non-AFV weapon operator are

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to clearly identify their targets and are to ensure that the safety angle for the weapon in use is clear either side of the axis of the barrel before firing including QE.

13.16 Routes chosen are the responsibility of the AFV CC/commander of the non-AFV. The selected route is to ensure that the vehicle will not become unstable and will not enter the safety angle/distance of any other weapons firing on the range.

13.17 During manoeuvre practices the OIC Practice must be in a position to be able control the practice. The OIC Practice may be mounted or dismounted.

13.18 When there is insufficient room in the AFV/non-AFV for the dismounted SS, they are to be allocated a vehicle with appropriate mobility to enable the SS to be positioned to dismount and conduct their responsibilities as an SS during the range practice.

13.19 IWs carried inside the AFV/non-AFV must be in the LOAD or UNLOAD condition.

13.20 All weapons are to be returned to the LOAD/UNLOAD condition (including lasers) prior to entering/re-entering the AFV/non-AFV.

13.21 Night firing from static AFVs/non-AFVs with static dismounted operators, static AFVs/non-AFVs and moving dismounted operators or moving AFVs/non-AFVs and static operators, is permitted in accordance with the firing at night regulations in *LWP-G 7-3-1, Australian Defence Force Range Orders (Dismounted)* [Chapter 6]. There is to be sufficient separation of AFVs/non-AFVs and dismounted operators to ensure that the practice will remain safe. All firing arcs are to be proved safe prior to the activity and staked as appropriate. AFV/non-AFV arcs are not to be adjusted prior to or during the range activity. The vehicles are to carry both visible and NFE visible (if NFE is employed) light sources. Operators are to be marked with a different colour light source to the AFVs/non-AFVs and if targets are illuminated they are to have a different colour to both the AFVs/non-AFVs and dismounted operators.

13.22 Night manoeuvre practices involving AFVs/non-AFVs and dismounted personnel are to be authorised by the OSE.

13.23 Overhead and flanking fire is permitted in accordance with *LWP-G 7-3-1, Australian Defence Force Range Orders (Dismounted)* [Chapter 6] for dismounted weapons only. OHF from AFVs/non-AFVs is not permitted.

13.24 HE weapons not part of the AFV's/non-AFV's main armament are not to be fired from AFVs/non-AFVs, in accordance with *LWP-G 7-3-2, Australian Defence Force Range Orders (Mounted)*.

Additional safety considerations for the M1A1

13.25 In addition to the safety regulations already mentioned, the following safety precautions apply when the M1A1s are employed:

- a. Dismounted personnel within 50 m of an M1A1 firing 120 mm ammunition are to be no further forward than the rear of the tank. In addition to double hearing protection, they must also wear approved ballistic eye protection, body armour and a combat helmet.
- b. Dismounted personnel beyond 50 m but within 200 m of an M1A1 firing 120 mm ammunition are required to wear double hearing protection.
- c. Dismounted personnel beyond 200 m but within 704 m of an M1A1 firing 120 mm ammunition are required to wear single hearing protection.

13.26 The minimum engagement ranges for ammunition types must be adhered to when dismounted troops operate within 50 m of the M1A1.

The carriage of explosives in armoured fighting vehicles/non-armoured fighting vehicles

13.27 Carriage of service explosives in AFVs/non-AFVs may occur provided the following safety checks and actions are carried out:

- a. the charge and initiator are not connected when in the AFV/non-AFV
- b. charges and initiators are stored in separate purpose-built containers (ammunition boxes) and are secured in the AFV/non-AFV
- c. only qualified personnel handle charges and initiators
- d. when carried by an individual, charges and detonators are carried separate from each other.

Additional safety considerations for the M113AS4

13.28 In addition to the safety regulations already mentioned, the following safety precautions apply when the M113AS4 is employed:

- a. No dismounted operators are to be forward of the gun trunnions when the M113AS4 is firing.
- b. Firing of any weapon system from the cargo hatch is not permitted. This does not apply to the mortar variant.
- c. Regulations for firing IWs from the M113AS4 (CC's position) are in accordance with this publication.
- d. In-service smoke grenades may be thrown from the M113AS4 provided the safety requirements in *LWP-G 7-4-42, Grenades and Pyrotechnics* are adhered to.

Use of offensive support

13.29 The use of offensive support is authorised on Integrated range practices and is to be in accordance with *LWP-G 7-3-3, Australian Defence Force Range Order (Indirect Fire)*. Blast safety distances may be reduced in accordance with *LWP-G 7-3-3, Australian Defence Force Range Order (Indirect Fire)*; however, the risk of damage to AFV/non-AFV from fragmentation/concussion must be considered. Dismounted personnel and crews must be closed down when safety distances are reduced.

Annexes:

- A. [Integrated ranges planner's checklist](#)
- B. [Officer-in-Charge Practice aide-memoire – Integrated ranges](#)

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Annex A to Chapter 13

Integrated ranges planner's checklist

<i>Serial</i>	<i>Action</i>	<i>Yes/No/ N/A</i>	<i>Comment</i>
<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>
1.	Is this an Integrated Permanent Basic range?		
2.	Is this an Integrated Permanent Complex range?		
3.	Is this an Integrated Manoeuvre range?		
4.	Is the condition of the range and associated facilities suitable?		
5.	Where is the location of medical facilities?		
6.	Are there any restrictions on the use of the range (including the currency of TASO and environmental factors; fire season and the proximity to public roads)?		
7.	Are the communications requirements achievable?		
8.	What are the access routes and travelling times?		
9.	Are external support requirements identified?		
10.	Are sentry and work party requirements identified?		
11.	Are there any stores requirements?		
12.	What is the precise grid reference for field firing activities?		
12a.	What are the grids for the FPs?		
12b.	What are the grids for manoeuvre boxes?		
13.	Are there control facilities?		
14.	What are the target and impact sectors (including details of any range restrictions)?		
15.	Where are the briefing, training and administrative areas?		
16.	Where is the location of the ammunition point(s)?		

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<i>Serial</i>	<i>Action</i>	<i>Yes/No/ N/A</i>	<i>Comment</i>
<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>
17.	Are there any specific requirements for the type of range practice to be conducted?		
18.	Does this particular range practice diverge from the standard range practice as described in the range regulations?		
19.	Does the casevac/medical plan cover contingencies for this activity?		
20.	Is additional health support required for this range practice?		
	a. is AME required?		
	b. is a health support company/platoon required?		
21.	Is this a mobile practice?		
22.	Does this range practice involve the use of dismounted firers?		
23.	Are HE weapons being used?		
24.	Does this range practice involve the use of M1A1/CRV platforms?		
25.	Does this range practice involve the use of APC/IFV platforms?		
26.	Does this range practice involve the use of PMV/PMV-L platforms?		
27.	Does this range practice involve the use of SRV/Supacat platforms?		
28.	Does this range practice involve the use of other platforms? Describe.		
29.	Does this range practice involve the use of BNS/explosives?		
30.	Does this range practice involve the use of offensive support?		
31.	Does this range practice involve the use of manoeuvre support? Engineer assets?		
32.	Does this range practice involve the use of aviation assets?		
33.	Has SME advice been sought on the use of platforms/enablers?		
34.	Have rehearsals been planned for this activity?		

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<i>Serial</i>	<i>Action</i>	<i>Yes/No/ N/A</i>	<i>Comment</i>
<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>
35.	Have the participants conducted the required enabling activities prior to this activity (qualification practices, dry exercises, small team live fire activities)?		
Range appointments			
36.	OSE		PMKeyS No: Rank: Name:
37.	OCE		PMKeyS No: Rank: Name:
38.	DPRAC		PMKeyS No: Rank: Name:
39.	OIC		PMKeyS No: Rank: Name:
40.	SO		PMKeyS No: Rank: Name:
41.	SS		PMKeyS No: Rank: Name:
42.	Ammunition SS		PMKeyS No: Rank: Name: PMKeyS No: Rank: Name:
43.	BNS SS		PMKeyS No: Rank: Name:
44.	Offensive support SO		PMKeyS No: Rank: Name:

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Serial (a)	Action (b)	Yes/No/ N/A (c)	Comment (d)
45.	Aviation SO		PMKeyS No: Rank: Name:
46.	Manoeuvre support SO		PMKeyS No: Rank: Name:
47.	Are all range safety personnel qualified to conduct this range practice?		
Supporting requests			
48.	Have requests for the following been submitted:		
	a. ammunition		
	b. transport		
	c. assistance (coaches, armourer, work parties)		
	d. accommodation		
	e. rations and water		
	f. warning advertisements		
	g. the positioning and recovery of targetry and associated equipment		
	h. medical personnel and equipment		
	i. communications equipment		
	j. public address equipment		
	k. equipment for the destruction of UXO and a qualified DMEO operator		PMKeyS No: Rank: Name:
	l. firefighting equipment (including fire tender if required)		
	m. an indent for stores		
	n. PPE		
	o. orange flags and lights?		
Documents			
Have the following documents been produced, reviewed, signed and submitted:			
49.	Range instruction		
50.	Range details signed (as per local range SO)		

Serial (a)	Action (b)	Yes/No/ N/A (c)	Comment (d)
51.	RA		
52.	HSP		
53.	RDAST to include:		
	a. activity name		
	b. date(s) of activity		
	c. map edition used and scale		
	d. weapons to be used		
	e. ammunition types being used		
	f. arcs		
	g. firing line/manoeuvre boxes data		
	h. authority (what publication is used as a reference)		
	i. ricochet width		
	j. safety distance		
	k. safety restrictions		
	l. who produced the RDA?		PMKeyS No: Rank: Name:
	m. who checked the RDA?		PMKeyS No: Rank: Name:
	n. date constructed?		
54.	Range booking made?		
55.	Range deconflicted with other users?		
56.	Are waivers required for this activity?		
57.	Have the waivers been authorised?		PMKeyS No: Rank: Name: Appt:
58.	Has the CO/OC sighted and signed all documentation?		
All checks have been completed IAW this publication.			
PMKeyS:			
Rank:		Name:	

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<i>Serial</i>	<i>Action</i>	<i>Yes/No/ N/A</i>	<i>Comment</i>
<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>
Appointment:		Date:	
<i>Must be SGT (E) or above</i>			

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Annex B to Chapter 13

Officer-in-Charge Practice aide-memoire – Integrated ranges

1. The following is to be completed prior to the start of the practice.

<i>Serial</i>	<i>Action</i>	<i>Yes/No</i>	<i>Comments</i>
<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>
Preparation			
1.	Are you qualified on PMKeyS to run this range?		
2.	When was the last time you conducted this range as an OIC Practice?		Month: Year:
3.	Have you been assessed as an OIC Practice for this range?		
4.	Have you re-read the relevant publications for this activity?		
5.	Have you read the range instruction for this activity?		
6.	Have you been appointed in writing as the OIC Practice for this activity?		
7.	Have you checked the RDA for this activity?		
8.	Have you checked the target placement for this activity?		
9.	Have you signed for the range?		
10.	Have you or a representative attended the range conference?		
11.	Do you have a marked map with the RDA?		
12.	Do you have the required health support in place IAW the HSP?		
13.	Have you briefed the casevac plan to medical staff?		
14.	Have you conducted the casevac rehearsal?		
15.	Is the ammunition point set up and manned correctly?		
16.	Have you briefed the ammunition NCO?		
17.	Have you confirmed with AFV/non-AFV SO on the platform-specific requirements?		
18.	Have you confirmed the PPE required for activity?		

<i>Serial</i> (a)	<i>Action</i> (b)	<i>Yes/No</i> (c)	<i>Comments</i> (d)
19.	Have you prepared and rehearsed your safety briefs?		
20.	Do you have emergency phone numbers?		
21.	Are you expecting visitors:		
	a. Visitor parking area		
	b. Visitor spectator area		
	c. Who will give the safety brief to visitors?		
	d. Who will clear visitors prior to leaving?		
Prior to commencement			
22.	Are all safety staff qualified for this activity?		
23.	Has a staff walk-through been conducted (including identifying targets and likely firing positions)?		
24.	Are HE weapons being used?		
25.	Do you know where the gun trunnions are for each AFV/non-AFV?		
26.	Do you know what the exposure rates are for the HE weapons/AFVs you are using for this activity?		
27.	Has the misfire pit been identified/marked?		
28.	Is there sufficient safety staff for each manoeuvre group?		
29.	Have you briefed all personnel at the range activity?		
30.	Have you delivered the brief to firers?		
31.	Have you given the conduct brief?		
32.	Have you conducted rehearsals?		
33.	Have you established communications with Range Control?		
34.	Have you confirmed no personnel are downrange?		
35.	Have you requested permission to open the range?		
36.	Have you established communications with safety staff?		

<i>Serial</i> (a)	<i>Action</i> (b)	<i>Yes/No</i> (c)	<i>Comments</i> (d)
37.	Has a communications log been established to record key safety information and decisions?		
38.	Are you displaying correct flags and lights?		
Additional Notes:			
PMKeyS:			
Rank:		Name:	
OIC Practice:		Date:	
Post activity			
39.	Have you cleared all vehicles?		
40.	Have you cleared all personnel?		
41.	Have you prepared the ammunition point for return?		
42.	Have you disposed of malfunctioned ordnance?		
43.	Have you closed the range?		
44.	Have you confirmed the range is clear/clean?		
45.	Have you signed off the range?		
Were there any range incidents/hear misses?			
Are there any improvements you can identify?			



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Chapter 14

Joint or combined activities

Section 14-1. Introduction

14.1 ADF activities encompass the spectrum of capabilities and often include partner nations and or interagency participants. Accordingly, standards of training and range safety may differ significantly. As a result, the C2 of joint and interagency activities generally requires a high degree of coordination and understanding between participants.

14.2 This chapter provides the overarching safety structure for the conduct of joint and combined activities. This chapter should be read in conjunction with [Chapter 3](#), as a single unit activity may not follow the appointment process outlined in this chapter and may not require all of the appointments described in this chapter. Where this occurs the unit is to apply this chapter as a guide and need only apply the details and requirements necessary to ensure a safe practice. This chapter is also to be applied as appropriate for integrated range activities as described in [Chapter 13](#).

Section 14-2. Safety appointments

14.3 In addition to the safety appointments required for the conduct of specific practices, additional safety appointments are required for the conduct of combined arms or joint activities.

14.4 The following tables detail these requirements in accordance with *ATI 1-20/19 Army Training Management Framework*.

Table 14–1: Range levels

<i>Level</i>	<i>Force element size</i>	<i>Composition</i>
Level 4	Pl/Tp	Combined Arms
Level 5 (1)	CT	Combined Arms, Ground FE only
Level 5 (2)	CT	Combined Arms with AAVN or AMPHIB
Level 6	BG	Combined Arms
Level 7	Bde	Combined Arms
Level 8	Joint	Any activity involving Joint or Foreign FE

Table 14-2: Safety appointment required

Level	Officer scheduling the exercise	Officer scheduling the exercise	Officer scheduling the exercise	Director of Practice	Deputy Director of Practice	Director of Practice Safety Officer Air, Sea, Specialist Systems (as required)	Director of Practice Safety Officer foreign force element
Level 4	X	X		X			
Level 5 (1)	X	X		X		X	
Level 5 (2)	X	X	X	X	X	X	
Level 6	X	X	X	X	X	X	
Level 7	X	X	X	X	X	X	
Level 8	X	X	X	X	X	X	X

14.5 Officer scheduling the exercise. The OSE is responsible for issuing the initiating directive that orders the conduct of the activity or training. Initiating directives are required for exercise activities. The initiating directive is to identify the OCE, the appointment should include:

- a. any warnings or specific stipulations, conditions or limitations
- b. if necessary, authority to appoint CSO DPRAC and so on
- c. forces involved in the activity and their C2 arrangements/status
- d. risk management
- e. specific safety requirements
- f. evaluation and validation
- g. acknowledgement requirements.

14.6 Officer conducting the exercise. The OCE is responsible to the OSE for the conduct of all aspects of the exercise, including the planning and issue of all necessary instructions/orders. The OCE will allocate senior safety and range appointments in writing. The OCE is also to obtain environmental clearances for the exercise (the regional training area manager [RTAM] can advise on this process). Environmental restrictions, if any, will need to be identified early in the planning process, as they may impose severe restrictions on the design and conduct of the training activity.

14.7 Chief safety officer. For major activities in accordance with [Table 14–1](#) and [Table 14–2](#) the OCE will appoint a CSO to oversee all aspects of safety for the activity. The CSO is responsible to the OSE for the safe conduct of the exercise. Specific responsibilities include, but are not limited to:

- a. establishing a CSO safety command post (CP)
- b. producing exercise safety instructions
- c. conducting a risk management assessment for the exercise
- d. recording all safety incidents communicated between the CSO safety cell and subordinate safety staff
- e. ensuring that safety architecture is correct and subordinate appointments are fulfilling their responsibilities
- f. in conjunction with the RCO and DPRAC coordinating firefighting efforts within the exercise area (when required)
- g. if required, establishing and maintaining liaison with federal, state and local government emergency services to utilise their capabilities in emergency situations
- h. in conjunction with the OSE, reporting all notifiable incidents in accordance with current Defence Instructions and government legislation
- i. in conjunction with the DPRAC, providing a sitrep to the OSE on UXO, notifiable incidents, and any safety-related occurrence.

14.8 Chief safety officer daily briefs. The CSO is to conduct a daily coordination brief with the DPRAC, and operations and offensive support coordination staff. The aim of the briefing is to coordinate and resolve potential problem areas between activities for the next 24-hour period in each discrete range area prior to the DPRAC daily range conference. The briefing will also cover safety issues resulting from the previous 24-hour period.

14.9 Director of Practice. For activities where there is a requirement for safety coordination between unit exercises or range practices, or for safety coordination between OICs Practice when a unit conducts multiple practices, the OSE/appointing officer will appoint a DPRAC. The DPRAC is responsible for the coordination of range safety for all units and sub-units placed under their control. Unless directed otherwise the specific responsibilities include but are not limited to:

- a. perform the duties of the CSO when a CSO is not appointed
- b. conduct a range Co-ord meeting with all Safety Staff and stakeholders at least once every 24 hours to facilitate coordination and control of all aspects among range users
- c. issuing, in writing, DPRAC joint live firing activity orders (see [Annex A](#) for an example) and any detailed local instructions necessary for the safe conduct of any practice under DPRAC control

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- d. establishing a DPRAC safety cell as detailed in [paragraph 14.29](#). (A suggested template and layout is provided in [Annex D](#).)
- e. receive a thorough briefing from each OIC Practice on activities being conducted within their respective area(s) of responsibility
- f. confirm that the activity OICs and SS/SO are currently qualified, current and experienced to perform their allocated duties and that the live fire activities are authorised in the LRSMT
- g. record all safety incident related activities, including both blank or live fire, and any EO incidents including ammunition accounting discrepancies.
- h. at an agreed point in time, assume C2 and responsibility for the training area to be used from Range Control and then as appropriate authorise the opening and closing of ranges and range danger areas as well as terminating or suspending firing or training activities in the event of any potential hazard to personnel or equipment
- i. establish and maintain a DPRAC log of all events by time including all traces opened/closed, live fire actions, safety, movements and control action events
- j. rectifying unsafe activities within their area of responsibility, including amending the RDAST, and rescheduling or cancelling those activities which cannot be amended
- k. manage and coordinate any and all emergency evacuation or medical transfer requirements
- l. control the exercise/activity safety net and ensure that continuous communications are maintained between DPRAC and all safety appointments
- m. ensure that exercising units are aware of and comply with relevant and current safety instructions and orders
- n. conduct initial investigation into any breaches of range safety as soon as practicable in accordance with [Chapter 12](#)
- o. coordinate and control the movement of all personnel and vehicles inside the training area and ensure NOTAMs in place and active for the activity period
- p. reporting all notifiable incidents in accordance with current statutory requirements and Defence instructions
- q. record and report all identified UXOs by OICs to Range Control including planned actions
- r. coordinate and ensure clearance of all RDAs on completion of activity
- s. confirm all OIC Practices, or delegated person, have briefed and positioned their sentries and/or have established and checked unmanned sentry points on all access routes leading into impact areas and live fire danger areas
- t. Confirm all OICs provide required daily briefs for planned activities prior to the conduct of any activity.
- u. coordinate any supporting air traffic into and out of range airspace in conjunction with Range Control
- v. coordinate any supporting (assigned) surface vessel (Navy) asset entering a prescribed Fire Support Area in support of the activity for live fire events.

14.10 Example DPRAC joint live firing exercise orders are attached at [Annex A](#). The DPRAC checklist is attached as [Appendix 1](#) to Annex C.

14.11 The DPRAC is to convene a coordination safety brief for available safety staff, activity commanders or their representative (who must fully brief their OIC) at least once in a 24-hour period for the duration of the activity. This brief is to include an overview of the activity with details of all activities to be conducted and must include sufficient information to ensure the safe conduct of the activity and should include:

- a. a description of training completed in the preceding 24-hour period including location(s)
- b. observations on safety (including incidents) from the DPRAC then the OIC or representative
- c. a description of training in the next 24 hours. Each range must be briefed by the OIC or representative including location(s), timings (start and finish) times, start and finish points (if applicable) routes in and out, safe areas locations, actions on and communications plan
- d. the DPRAC describing key coordination between ranges and anticipated points of friction

- e. the location of the DPRAC/CSO and/or DSO
- f. the PACE plan
- g. actions on
- h. map rehearsals as required.

14.12 An example of a Daily Summary is included at [Annex E](#).

14.13 The DPRAC is also required to conduct assurance checks, in accordance with [paragraph 14.9f](#). DPRAC is also to conduct checks with safety staff and activity commanders by either attending in person or through appropriate delegate(s) selected range practices based upon risk to ensure that activities are being conducted safely and as planned. An appropriate delegate includes activity SME, or an experienced SNCO, WO, officer. Assurance checking in this context includes verifying:

- a. appointments are appropriate (from range instructions CO checklist) (usually completed prior to attendance at the specific range practice)
- b. TASO are complied with
- c. all safety appointments equipment etc is present and in good order
- d. progression of training as planned is completed
- e. rotation occurs in accordance with any range staff rotation plan
- f. range safety staff carry out their functions appropriately.

14.14 Deputy Director of Practice. For the conduct of complex exercises, the OCE may choose to appoint a number of Deputy Directors of Practices (DDPRACs) also in writing in the same instrument as appointment of the DPRAC. DDPRACs are responsible to the DPRAC for the coordination of the range practices that they have been appointed to oversee and control. The responsibilities of the DDPRAC are identical to those of the DPRAC. DDPRACs are to understudy the DPRAC and are to provide routine reports on progress or any issues.

14.15 Director of Practice safety officers. DSOs are to be appointed in writing by unit commanders for specialist activities. These include an SO clearance diving team, SO parachute and SO SF. SOs are responsible to the CSO for specialist safety issues in accordance with corps or service doctrine.

14.16 Range safety officer (Air). The RSO (Air) is a safety position specific to the conduct of Air Weapon ranges (AWRs). The conduct of AWRs are detailed in *AAP 8600.01, RAAF Air Weapons Practices (Operations and Operational Requirements Manual)*. AWRs are not synonymous with AAAvn ranges. When non-AAAvn platforms conduct joint/combined range activities with Army units, the RSO (Air) is subordinate to the DPRAC, and responsible for the safe conduct of all elements of the practice by non-AAAvn aircraft. The range RSO (Air) is responsible for:

- a. Ensuring the delivery of air ordnance is conducted within the release parameters specified in the applicable air weapon safety trace for that activity, aircraft and ordnance type.
- b. Ensuring the weapon danger area is clear of all personnel, vehicles and equipment prior to authorising the release of air ordnance onto the specified target.
- c. Suspending or cancelling (aborting) the release of air ordnance when there is a possible hazard to the safety of personnel, vehicles or equipment.
- d. Satisfying all relevant Air Force and Navy safety requirements, and the regulations contained in Australian Air Force publications, flight manuals and technical orders relating to specific aircraft.

14.17 Range safety officer (naval surface fire support). The RSO naval surface fire support (NSFS) is responsible to the DPRAC for the safe conduct of Naval gun support practices. The RSO (NSFS) is responsible for:

- a. providing and maintaining appropriate NSFS safety communications
- b. coordinating all calls for fire employing NSFS assets
- c. cancelling or suspending firing in the event of any possible hazard to personnel and equipment
- d. satisfying all relevant RAN safety requirements and instruction
- e. providing feedback to NSFS units on fall of shot result.

14.18 Live Fire range safety officers. Additional SOs may be appointed by the OIC Practice (eg, mounted and dismounted) to aid in range safety, as detailed in [paragraph 13.4g](#). These SOs are in direct support of the relevant range OIC Practice.

14.19 Linkage between safety and joint fires and effects coordination centre. To ensure the effective coordination of live fire and manoeuvre (ground/air/sea) activities within an exercise area, the safety organisation should be independent of, but linked to by network architecture, the joint fires and effects coordination centre, where possible.

14.20 Responsibilities for the issue of range safety instructions. Where multiple weapon platforms are involved in any activity, the responsibility for the production and issue of RDASTs and RA for that platform remains with the person from the providing organisation as detailed in single-Service regulations.

14.21 Complete sets of range details and RDAST are to be approved by respective UCO/IOCs and a copy is to be provided to the DPRAC for checking. Following the DPRACs clearance and approval, the original range details and RDAST(s) are to be forwarded to Range Control in accordance with the requirements in [Chapter 4](#). Where it is not possible for individual OIC Practices to prepare their RDAST and or range detail, these are to be developed centrally under the direction of the DPRAC/CSO. Where this occurs, OIC Practices, as well as complying with the regulations contained in this publication, are to:

- a. review their RDAST and/or range detail
- b. be briefed in detail on the RDAST and/or range detail
- c. conduct a thorough handover takeover and reconnaissance with walk-through of their range prior to commencing the practice.

Section 14-3. Planning and conduct

14.22 The planning and conduct of joint and combined activities use the same process as described in [Chapter 4](#) and [Chapter 11](#). This section describes the additional factors that should be considered.

14.23 Safety logbooks. Safety logbooks which can be constructed and set out as deemed necessary are to be maintained by the following personnel:

- a. the DPRAC
- b. the DDPRAC
- c. the OIC Practice
- d. any additional SO such as the DSO, RSO (Air), RSO (NSFS), DSO Foreign FE.

14.24 These logbooks may take the form of a spreadsheet.

14.25 Adherence to operational procedures. A key aspect of a major exercise will be the conduct of joint and/or combined live fire activities, including artillery, mortars, direct fire weapons, NSFS and fixed-wing/rotary wing, offensive and close air support, and deep strike and battlefield air interdiction. Respective Australian (joint- and single-Service) training/safety publications detail the procedures to be followed during operations where joint offensive fire support is required. [Chapter 2](#) details the requirements when foreign forces are involved.

Discrete and specialist activities

14.26 Parallel to major activities being conducted within the exercise area, a number of largely discrete and specialist activities may be conducted such as SF; aerial fire support, mine countermeasures; and airborne, amphibious and logistic operations. When these activities occur, they must be coordinated with the DPRAC.

14.27 The DPRAC is to commence coordinating the safety aspects of each discrete and specialist activity prior to the unit/formation elements' deployment into the exercise area. The DPRAC will detail which lower safety agency the element is to contact, which safety communications are to be established for the activity and any restrictions that are placed on the activity. An SO is to be appointed for each of these activities. An SO will normally be the commander (or delegate) of the element undertaking the activity.

14.28 During the conduct of the activity, the coordination of discrete and specialist activities will be conducted by the DPRAC and the appropriate SO. These coordination activities will aim to resolve issues which may require modification of range details, traces, timings, and or locations(s).

Safety command posts

14.29 A safety CP is required to be established as a standalone capability that may be adjacent to but not part of the relevant tactical or exercise headquarters function. The DPRAC or CSO may require establishment of subordinate safety cells depending on the distances and complexity of live fire actions taking place. Once established, safety CPs are to maintain 24-hour operations in accordance with the tempo of the exercise for the duration of the activity. During live firing, safety CPs are to have at least a watchkeeper and a signaller on duty. CP personnel are to perform tasks as directed by the DPRAC and maintain a log and record of all events and actions by date-time group. A suggested layout for the safety CP is provided in [Annex D](#). The DPRAC CP must maintain the most current safety map detailing:

- a. formation sectors/boundaries
- b. the locations of units/formations
- c. the locations of safety CPs, superior and subordinate HQ, and aeromedical evacuation assets and medical facilities
- d. the locations of range sentries
- e. RDASTs currently open
- f. movement control traffic control points
- g. the locations of current safety-related incidents
- h. the locations of restricted areas.

14.30 Safety CPs are to have in their possession the following records/documents:

- a. range details/RDAST for their area of responsibility
- b. exercise safety and communications instructions
- c. current and endorsed range TASO
- d. current safety publications relevant to the activity
- e. rosters of all appointed subordinate safety staff and their associated ranges and RDAST(s).

14.31 Safety training. While there is no formal training for DPRAC the rank, qualification and experience of the DPRAC are to be commensurate with the complexity of the activity. To assist DPRAC a number of tools and products are available on the LRS SharePoint. It is highly recommended that all members on being tasked as DPRAC review these tools. Once appointed as DPRAC each member will also be required to successfully complete the LRSMT DPRAC just in time questionnaire.

14.32 Safety rehearsals. Prior to live firing during formation- and unit-level activities, rehearsals are to be conducted including a full practice of the medical evacuation procedures resulting from a worst-case scenario as identified in the RA.

14.33 Final range reconnaissance. During the conduct of safety training, the DPRAC is to conduct a final range reconnaissance with the DDPRAC if appointed and the OIC Practice(s). The reconnaissance is to include a confirmation of range details and the RDAST. For activities with many range practices distributed over a large area, it may not be possible for DPRAC to visit each range. Where this occurs, the DPRAC may deputise DDPRACs to conduct the reconnaissance with the relevant OIC Practice for the ranges that the DDPRACs are responsible for. However, the DPRAC is to visit as many ranges as practical and in particular those that carry higher risk.

Range amendments

14.34 The DPRAC is the authorising officer for all range amendments associated with an assigned activity. Any amendments to existing range details and traces to be made during the exercise are to be passed to the DPRAC in hard copy. Amendments are to be advised to the CSO, DDPRACs (as necessary), OIC Practice and RCO when approved.

14.35 Unit commanders are to check and approve the amendments for their particular units. These procedures will only apply to training areas under the DPRAC's control. The RCO is to confirm that the amended RDAST and/or amended range details are appropriate for use on the range facility and will not impact on other training area users who are not part of the DPRAC controlled activity.

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- A. Example Director of Practice joint or combined live firing exercise orders
- B. Director of Practice sync matrix
- C. Director of Practice checklist for the conduct of joint or combined activities
- D. Director of Practice safety command post layout
- E. Example daily range activity summary

Annex A to Chapter 14

Example Director of Practice joint or combined live firing exercise orders

References: TASO, LWP-Gs, FMs, IE Policy, CATC Waivers, LRS etc

Attendees:

(All pers required)

Situation

Topography

1. Ground brief: [general overview of TA and region – no need for OKOCA]
2. Training area sectors in use: [including go/no-go areas and restrictions]
3. Meteorology: [pertinent to exercise and periods of LF]

Participants

4. Tasks [by C/S]:
 - a. Trace submission requirements [changes, updates, naming conventions]
 - b. DPRAC LFX sync matrix [see [Annex B](#)]
 - c. Casevac rehearsal [schedule and requirements]
5. Orbat for the LFX and safety appointment requirement
6. General friendly SOM [overview and flow]
7. Live Fire practices that will be conducted during the LFX are [list per C/S]

Supporting staff

8. OIC Practice(s) as follows: [list]
9. Other key appointments (eg, DMEO operator): [list]
10. Health support: [list]

Questions?

Mission

11. State the mission of DPRAC and safety staff

Execution

12. Exercise intent [incl end state]
13. Control measures:
 - a. Traces (standard, requirements, delivery and type – hard/electronic/both)
 - b. All traces are to be vetted and deconflicted by DPRAC (in consultation with RCO if required) prior to acceptance
 - c. All traces to be requested to be opened/closed by OIC to DPRAC
 - d. DPRAC will authorise traces to be open once satisfied all conditions are met and inform RCO
14. **Confirmatory back brief.** All OICs or unit reps must attend a DPRAC confirmatory back brief and participate in the ROC walk-through following these orders. ROC will step through the DPRAC sync by C/S, by day.
15. **Risk management.** A process of risk identification must be conducted and steps taken to eliminate, or where this is not possible, minimise identified hazards and exploit opportunities so far as reasonably

practicable (SFARP). Part of this management is to identify all applicable orders, instructions and procedures (OIPs) pertinent to the activity. All activities are to be managed in accordance with *ASI - Military Risk Management* and AHQ Taskord 261/20 - Application of Military Risk Management.

- a. Unit OAs or as directed by the OSE or OCE will stipulate the risk management plan requirements for participants.
- b. DPRAC submission requirements include:
 - (1) RAS/ORM per unit
 - (2) unit duties/responsibilities POC list or delegations
 - (3) PEAR pre-task hazard assessment summary and any additional RAS points as required.

16. Officer-in-Charge brief to safety supervisor and fires. All OICs are to undertake a brief to SSs and firers and inform DPRAC when complete.

17. Rehearsals. All C/SS must conduct rehearsals in accordance with LWP-G 7-3 series. OICs are to confirm that requisite rehearsals have been completed to DPRAC prior to commencement of live firing.

18. Emergency stop signal. Emergency stop signal is XXXXX. Alternate emergency stop signal is xxxx

19. Casualty treatment. The OIC Practice is to manage and maintain situational awareness regarding the location and disposition of personnel within the activity area IOT facilitate timely casualty treatment and evacuation if required. Actions on (non- exhaustive):

- a. *Casualty – Pri 1 and Pri 2.* OIC to stop live firing, inform DPRAC via a wngo, DPRAC to order 'CHECK FIRING', OIC to send 9 liner to DPRAC, DPRAC coord casevac with SHO.
- b. *Casualty – Pri 3.* OIC to assess the casualty, seeking advice from Coy Integral Medic as required, to determine if practice needs to be stopped or not. OIC to inform DPRAC, OIC to coord medical assistance with Ground Comd.
- c. *Lost communications.* The following actions are to occur on lost comms:
 - (1) If an OIC cannot communicate with SS they are to stop the practice.
 - (2) The OIC is to inform DPRAC. If DPRAC and OIC cannot communicate, the DPRAC and/or the OIC is to order 'CHECK FIRING' and stop their practice.
 - (3) If the OICs cannot communicate with manoeuvre forces they are to apply 'CHECK FIRE' to their practices.
- d. *Unsafe practice.* If an unsafe practice occurs the OIC is to make an assessment whether to immediately stop the practice or correct the fault and continue with the practice, providing there are no injuries or casualties.
- e. *Emergency stop signal.* When the emergency stop signal has been activated, OIC and SS are to immediately cease all live fire engagements and troop movement. The OIC is to inform DPRAC who orders 'CHECK FIRING'. No further movement or live firing is to occur, unless authorised by DPRAC.
- f. *In case of outbreak of fire.* For outbreak of fire, the OIC is to inform DPRAC and an assessment is to be made with accurate sitrep of the condition of the fire. DPRAC will halt the practice if fire is a threat to life and equipment.
- g. *Unexploded ordnance.* If UXO are discovered during the conduct of the LFX, the OIC (most likely OIC Dismounted) is to ensure the UXO is clearly marked with a stick triangle and marking tape or paper. At the completion of the LFX, the OIC is to notify DPRAC of the UXO for later disposal.
- h. *Ammunition incident.* Stop the practice if required, SS to inform the OIC, OIC to inform DPRAC.
- i. *Breach of road sentry location.* Range Sentry informs DPRAC via safety net immediately.
- j. *Trace incursion observed or potential.* Observer to report to DPRAC/OIC direct and BPT intercept.

20. Incident management. Any reportable incident that occurs on the range is to be reported immediately to DPRAC. Any range incident is to be managed in accordance with *ASI(P), Part 12 - Miscellaneous Support and Management Policy* [Chapter 10, Management of Reportable Incidents] the *Defence Incident Scene Initial Action and Preservation Manual*, and [Chapter 12](#).

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21. Timings. The following is an example of key timings for an activity post the issuing of an LFX administration instruction and conduct of required lead up training:

- a. DPRAC LFX issues orders to OIC and SS – Written only D-14
- b. OIC back-briefs to DPRAC (DPRAC Rehearsal) – D-3
- c. 1st CASEVAC rehearsal O/O from D-2
- d. OIC deliver Range Brief to SS and firers – prior to commencing LFX D - 1
- e. Commencement of LFX. DPRAC opens trace – D
- f. Radio check with DPRAC – On hour, every hour from D
- g. DPRAC conduct daily briefs – From D for duration
- h. Completion of LFX DPRAC close trace.

22. Control measures. The following control measures will be used to coordinate and synchronise activities in the TA.

- a. *Opening of Ranges.* All traces are to be requested to be open by OIC to DPRAC in the following format.
 - (1) *'DPRAC THIS IS.....(C/S) REQUEST PERMISSION TO OPEN.....(TRACE SDZ/WDZ /SFA) FROM.....(FIRING POINT /MANOUVRE BOX) ALL RED FLAGS ARE POSITIONED, SENTRIES ARE POSTED AT.....(SENTRY POSTIONS) AND HAVE BEEN BRIEFED. A SAFETY BRIEF HAS BEEN CONDUCTED WITH FIRERS AND SAFETY STAFF. STARLIGHT IS ON THE POSITION AND COMMUNICATIONS WILL BE MAINTAINED. THIS CALL SIGN IS READY IN ALL ASPECTS TO COMMENCE THE PRACTICE.'*
 - (2) This will be read back in full by DPRAC CP.
- b. DPRAC will authorise traces to be open once satisfied that;
 - (1) Appropriate medical and safety staff and vehs are in posn to spt trace.
 - (2) DPRAC has communications with all required C/S.
 - (3) There is no unauthorised troop movements within the trace.
 - (4) The OIC has communication with their SS.
 - (5) The brief to SS and firers has been completed.
 - (6) The practice will be conducted safely.
- c. DPRAC will provide the following authorisation:
 - (1) *'.....(C/S) YOU ARE TO ENSURE RED FLAGS FLY THROUGHOUT LIVE FIRING, COMMUNICATIONS ARE TO BE MAINTAINED WITH THIS C/S AT ALL TIMES.(TRACE SDZ/ WDZ /SFA) IS OPEN TO C/S..... FROM.....(FIRING POINT/MAN BOX) AS AT.....H (TIME) AND YOU HAVE PERMISSION TO COMMENCE YOUR PRACTICE'*
 - (2) *OIC is to read back in full.*
- d. *Movement boxes.* Transition between movement boxes is controlled and must be authorized by DPRAC before crossing into the new box. Only one MB per manoeuvre C/S is to be open at any one time.
- e. Sentry points: Are to be manned IAW Range standing orders and controlled by DPRAC.

Administration and logistics

23. Dress and safety equipment:

- a. *Firers.* As per orders delivered by force element commanders. (any specific markings for safety?)
- b. *Safety supervisors/staff.* As per range brief given by OIC.

- c. *Officer-in-Charge*. As required by regulations with the addition of red sig ILLUM, internal comms with SS, and range safety comms with DPRAC.

24. Personal protective equipment. OIC & SS (SCE plates, helmets etc).

25. Ammunition:

- a. Ammunition to be fired. Natures per OIC is as follows: [list all natures of ammunition for each OIC including OIC and SS].
- b. All ammunition briefs, issuing and clearances are the participating unit's responsibility.

26. Medical plan (health service/ medical officer to deliver):

- a. location of medical asset and capability (Role 1, 2, 3)
- b. evacuation asset(s) by location including AME
- c. AME details (capacity, response time, management, release authority)
- d. casevac requirements 9-Line & AT(Z) MIST template, Pers Details (Zap) standard
- e. unit requirements (minimum standard by C/S)
- f. communications plan for medical.

27. HLS (landing zones): [list all – dedicated and non-dedicated]

- a. Landing zone requirements – dedicated, hasty and improvised. (incl marking)
- b. HLS Safety – Comms, Vehs, PPE, Marking/Indicating.

Command and signals

28. Range safety call signs: [List all C/S and Net C/S].

29. Succession of command:

- a. DPRAC
- b. DDPAC.

30. Signals. Frequencies are as follows:

- a. Comms Card to STARSN/TASNet using MilSpec (Harris 152) radios:
 - (1) Primary (freqs) – by sector / zone as applicable
 - (2) Alternate (freqs).
- b. Safety Net requirements (manning, usage, traffic and priority):
- c. Radios and batteries. Charge/exchange plan, alternate comms & tertiary comms plan.
- d. Net control diagram. The net control diagram is IAW the comms plan.

Safety Rehearsal of Concept – Safety Walk Through (ROC Walk) Loc and Time

Full safety ROC with all OICs and key appointments for the Ex.

Follows [Annex B](#) – DPRAC synch matrix

Time Check

Confirmatory orders

Questions?



Annex B to Chapter 14

Director of Practice sync matrix

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DPRAC AUGUST LFX SYNC MATRIX																										
				12 Aug D-1	13 Aug D-Day	14 Aug D+1	15 Aug D+2	16 Aug D+3	17 Aug D+4	18 Aug D+5	19 Aug D+6	20 Aug D+7	21 Aug D+8	22 Aug D+9	23 Aug D+10	24 Aug D+11	25 Aug D+12	26 Aug D+13	27 Aug D+14	28 Aug D+15	29 Aug D+16	30 Aug D+17	31 Aug D+18			
DPRAC EXAMPLE	Duration	0700	1200																							
	Area (Sector)	Mountain Sector																								
	Weapons	M777A2, EF88, MGS8																								
	Loc of FP	AFV FFTS/ GR 12345678																								
	Loc of OP (as applicable)	GR 12345678																								
	Loc of OIC	GR 12345678																								
	Activity (Nature)	Night CAS?																								
	Danger Height (AMSL)	123 Feet																								
	RDA/STA	STA Bravo																								
	C/S and Comms	Golf 2-0, Comd: 34.450, Admin: 34.650																								
C/S	Medical (Asset Type and C/S)	Golf Starlight, 34.650																								
	Duration																									
	Area (Sector)																									
	Weapons																									
	Loc of FP																									
	Loc of OP (as applicable)																									
	Loc of OIC																									
	Activity (Nature)																									
	Danger Height (AMSL)																									
	RDA/STA																									
	C/S and Comms																									
	Medical (Asset Type and C/S)																									



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Annex C to Chapter 14

Director of Practice checklist for the conduct of joint or combined activities

1. This checklist is to be filled as part of planning a joint / combined activity. It is design to be completed prior to deploying the DPRAC CP to ensure all compliance requirements are met before DPRAC confirmatory Orders.

Serial (a)	Serial (b)	Yes/No (c)
1.	In possession of the OCE-signed appointment	
2.	Confirm constraints and restraints	
3.	DPRAC cell manning confirmed, tailored to activity (DDPRAC signalers)	
4.	DPRAC CP Stores confirmed – suitable for task	
5.	In possession of and review range instruction, RA and RDAST for each activity	
6.	In possession of appropriate range and weapon publications	
7.	In possession of TASO	
8.	Conduct LRSMT audit to ensure safety staff are qualified, current and competent	
9.	Review each activity for safe conduct/has lead up training been sufficient Will progression of training occur if and as required (amend or cancel unsafe activities)?	
10.	Receive a thorough brief from the OIC Practice on the activity to be conducted including details on and check against DPRAC Sync Matrix: a. SOM b. safety staff c. rehearsals/walk-through d. targetry e. progression of training f. medical g. Sentry requirements	
11.	In possession of IM manual, WHS manual and CAs CCIRs / Playbook	
12.	Attended FPC(s)	
13.	Attended activity ROC drills	
14.	Coordinate a medical evacuation rehearsal prior to the conduct of an activity	
15.	Conducted / issued DPRAC Orders	
16.	Do you have appropriate log books IAW paragraph 14.23	
17.	Do you have a UXO/EO disposal register?	
18.	Do you have a master safety map?	

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<i>Serial</i> (a)	<i>Serial</i> (b)	<i>Yes/No</i> (c)
19.	Do you have a duty officer's log?	
20.	Do you have a safety incident register?	
21.	Perform the duties of the CSO if required	

Appendix:

1. Director of Practice activity checklists (pre-activity, during activity and post-activity)

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Appendix 1 to Annex C to Chapter 14

Director of Practice activity checklists (pre-activity, during activity and post-activity)

1. Prior to any live fire activity the DPRAC must ensure that all relevant steps have been taken in the following checklist that are applicable for the specific range practice that is occurring.
2. This checklist is designed to be completed in stages prior to each range opening each day of an activity. The checklist has been sequenced to allow portions to be answered 24hrs in advance post the Daily DPRAC conference for the next 24h period. [Table 14–3](#) should be answered immediately after the DPRAC conference for next 24h. [Table 14–4](#) is completed every time a unit requests to open a trace, and [Table 14–5](#) is completed on closure of each trace.

Table 14–3: Pre-activity checklist

Sequence	Instruction	Yes/No
1	Have you conducted the DPRAC daily brief?	
2	Have you receipted the range from Range Control for the day (traces and NOTAM)	
3	Does your HSP support the activity?	
4	Do you have all the relevant range standing orders?	
5	Do you have a current copy of applicable Range Safety doctrine?	
6	Do you have a copy of the approved range instructions, RDAs and HSPs?	
7	Do you have a copy of the RDAs and maps?	
8	Do you have a Master Events List for the activity?	
9	Do you have a personnel in/out register?	
10	Do you have a daily register of the availability and location of AME assets?	
11	Do you have a register of all air task orders received? (if applicable)	
12	Do you have a location board for all key personnel?	
13	Do you have the minimal medical on-site requirements for each range?	
14	Have all casevac rehearsals been conducted?	
15	Have you conducted walk-throughs with the safety staff for each range?	
16	Are the OICs for the activity qualified and current?	
17	Do the OICs and Sentries have appropriate flags and lights?	
DPRAC Signature:		
Date:		

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3. The DPRAC is to ensure that there is positive control over all aspects of range safety during the practice; [Table 14-4](#) may be used as a guide.

Table 14-4: Activity trace opening checklist

<i>Sequence</i>	<i>Instruction</i>	<i>Yes/No</i>
1	Are the OICs for the activity qualified and current?	
2	Have there been any last minute changes to the range instructions?	
3	Has deconfliction of activities occurred?	
4	Have the sentries been briefed and posted?	
5	Do you have a range opened/closed safety board that clearly articulates each range practice/activity?	
6	Have the unmanned sentry points been established and checked?	
7	Have you cleared the range?	
8	Have all appropriate briefs to firers and staff been given by the OICs?	
9	Do you have the minimal medical on-site requirements for each range?	
10	Have you opened the trace and issued permission to fire to the required ranges?	
11	Have you confirmed communications with all nets?	
12	Have you entered the opening of the trace into the DPRAC logbook?	

4. At the conclusion of the overall activity the DPRAC is responsible for the safe culmination of the practice; the following checklist (see [Table 14-5](#)) can be used as a guide.

Table 14-5: Post-activity checklist

<i>Sequence</i>	<i>Instruction</i>	<i>Yes/No</i>
1	Have all vehicles been cleared?	
2	Have all personnel been cleared?	
3	Has malfunctioned ordnance been disposed of or reported to Range Control?	
4	Have you closed the range?	
5	Have you confirmed the range is clear/clean?	
6	Have you signed off the range?	
7	Has all range damages been reported?	
8	Have all targets been removed?	
9	Have all admin areas been inspected?	

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Annex D to Chapter 14

Director of Practice safety command post layout

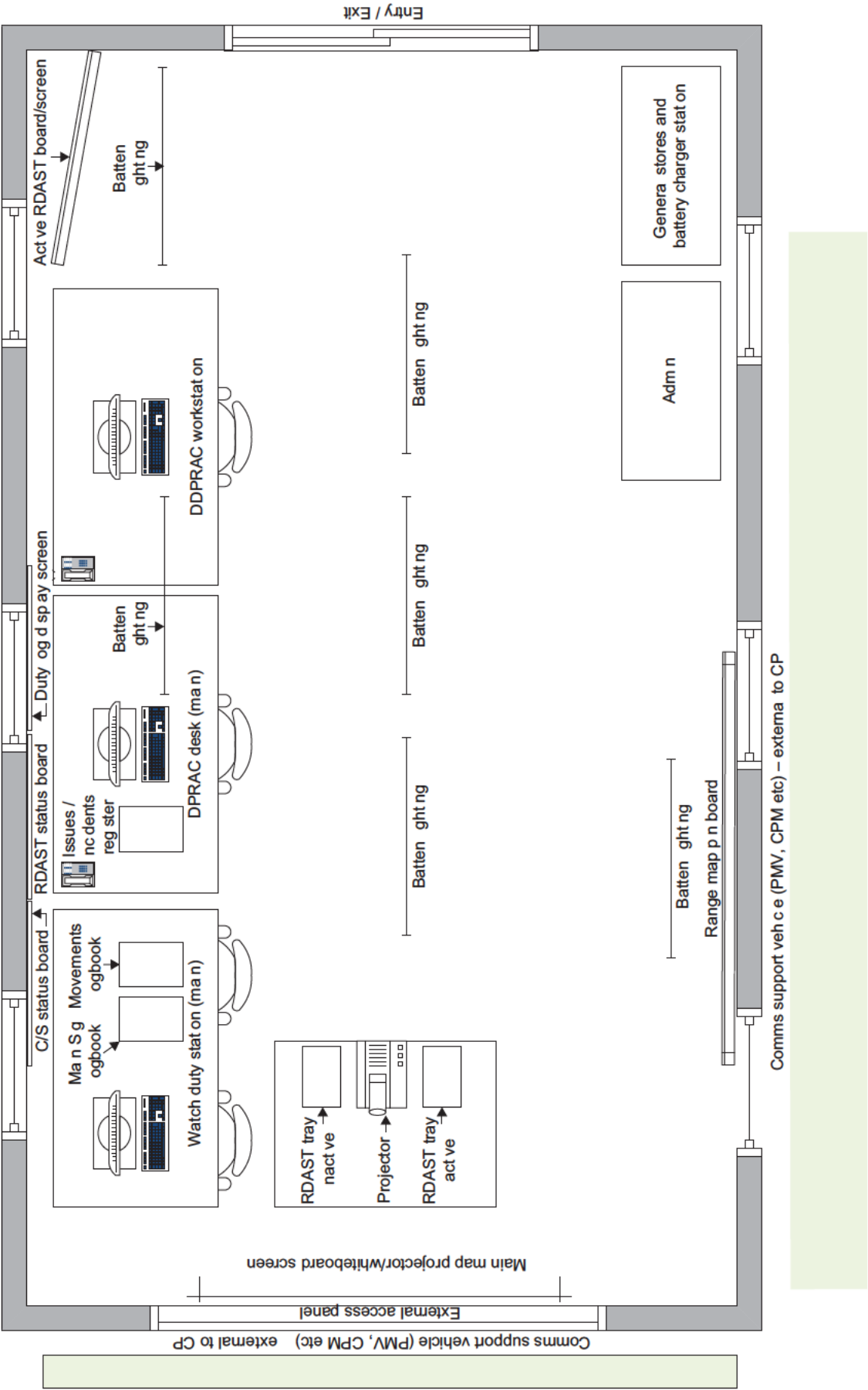


Figure 14-1: Director of Practice safety command post layout

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Annex E to Chapter 14

Example daily range activity summary

1. An electronic version of this example is available by selecting the [Example daily range activity summary](#) link.

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Chapter 15

Firing non-Defence service and historical weapons – test and evaluation

Section 15-1. Introduction

15.1 ADF in-service weapons and EO have been evaluated for safety and approved for use by authority of the *Land Material Safety Manual* and *eDEOP 101, Department of Defence Explosives Regulations* in order to conform with the Commonwealth's duty of care responsibilities to Defence personnel and the general public.

15.2 Non-ADF service, historical proof and trial weapons may not have undergone this approval process or may be operated outside approved parameters, where the technical integrity and safety of the operators cannot be guaranteed. However, there are occasions when non-ADF service weapons may be fired on Commonwealth range facilities. These include:

- a. Defence personnel employing non-ADF service weapons to facilitate pre-deployment training, weapon effects demonstrations, and/or demonstrations in support of public relations, historical or commemorative occasions, and approved Defence shooting associations and so on
- b. demonstrations conducted by an OEM or their agent, as detailed in [paragraph 15.15](#)
- c. visiting forces employing their in-service weapons
- d. the conduct of proof, trial, test and evaluation activities.

Section 15-2. Employment of non-service weapons by Defence personnel

15.3 Where there is a requirement for Defence personnel to fire any non-ADF service weapon, the weapons of other forces or historical weapons, the safety regulations contained in this section are to be followed.

15.4 The firing of non-ADF service or historical weapons by Defence personnel must be approved by one of the following:

- a. a formation commander (E) or above
- b. COMDT CATC
- c. SOCAUST
- d. COMD CTC
- e. the CO of an SF unit
- f. COMDT DSOTEC¹
- g. the CO of the JPEU
- h. Chief, Weapons System Division, DSTG
- i. Head, Land Systems Division, Land Domain
- j. Director of Engineering, Land Manoeuvre Systems
- k. the contingent commander, when overseas, or
- l. the commander of the relevant ADF cadet service, for 0.22 calibre bolt-action and air rifles only.

Manned firing authority

15.5 An MFA, if required, is to be issued in accordance with *DEOP 111, Technical Integrity of Explosive Ordnance* prior to the commencement of the activity. This is to ensure that the Commonwealth meets its duty

1. Defence Special Operations Training and Education Centre.

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of care responsibilities to the personnel undertaking the activity. An MFA is provided in the following circumstances:

- a. after a safety assessment has been conducted on objective safety and technical evidence that demonstrates that the weapon and ammunition will present a low level of risk to Defence personnel and the public
- b. for a specific period, for a specific weapon and EO combination, or for the conduct of a specific activity (should additional firing be required outside the time frame or scope of the provided MFA, a new MFA must be issued prior to firing taking place).

15.6 An MFA must be issued for the activity if personnel are required to hold, directly control or be positioned inside or on a vehicle from which the weapons are being fired.

15.7 An MFA is not required for the activity if a weapon is to be fired remotely (firing under precautions) from a fixed or trainable mount. However, adequate protection (eg, protected bunkers, armour plate and AFV) that will withstand failure of the munition or weapon must physically separate personnel from the weapon. TASO or the test or trial instruction must stipulate appropriate safety measures for these activities.

Section 15-3. Test and evaluation

15.8 Weapon or ammunition system test and evaluation activities include:

- a. research and development
- b. system comparisons
- c. technical evaluations
- d. operational and user evaluations
- e. design certification
- f. technical intelligence gathering
- g. investigations
- h. prototypes and concept demonstration
- i. proof or functional configuration compliance testing.

15.9 Weapon system test and evaluation activities are conducted in Australia by:

- a. authorised elements of Defence on behalf of the ADF
- b. other Commonwealth or state government agencies
- c. other nations, or
- d. Australian or international commercial entities.

15.10 The regulations in this section apply to all ADF-controlled test and evaluation facilities and ranges regardless of staffing (including ADF, APS and military staff, contractors, and other government or non-government agencies and/or personnel).

Regulations

15.11 The following paragraphs describe the regulations that apply to the conduct of test and evaluation activities.

15.12 Conducting agencies. Test and evaluation activities are conducted by the following Defence agencies:

- a. the Australian Defence Test and Evaluation Directorate
- b. the Land Engineering Agency
- c. the JPEU
- d. DSTG.

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15.13 Approving authorities. The approving authorities for the use of test and evaluation weapons and EO are as follows:

- a. Director-General, Test and Evaluation, Australian Defence Test and Evaluation Directorate
- b. Head, Land Systems Division, Land Domain
- c. Director of Engineering, Land Manoeuvre Systems
- d. Directorate Ordnance Safety
- e. CO JPEU, OC (MAJ [E]) P&EE Graytown and Port Wakefield
- f. Chief, Weapons System Division, DSTG
- g. Thales Australia's general manager manufacturing operations Benalla and Mulwala for their respective facilities (general manager must be qualified in accordance with ADF range doctrine to exercise this authority).

15.14 Issuing of initial weapon qualification. The ADF WHS Adviser Small Arms is the authority to appoint an SME for the purpose of issuing an initial weapon qualification for small arms weapons entering service. For weapons being evaluated and tested for introduction into service and/or proof testing, the COMDT CATC will approve a training LMP for the weapon(s) involved (usually the OEM's manual or, if one does not exist, other suitable reference material), and appoint appropriately trained person(s) as qualified based on their training and experience in the weapon systems being tested. Those who live fire the weapon are to have been trained and tested prior to live firing the weapon.

15.15 Original equipment manufacturer demonstrations. Live fire demonstrations conducted exclusively by an OEM are described in [Annex A to Chapter 2](#).

Weapons and explosive ordnance

15.16 Test and evaluation weapons or EO natures include:

- a. in-service Australian or foreign types
- b. captured, obsolete or historic types
- c. weapons or EO manufactured or modified specifically for proof, test or evaluation
- d. prototypes, developmental or experimental types, and technology demonstrators
- e. commercial off-the-shelf or military off-the-shelf types.

15.17 When in-service weapons using in-service ammunition natures are being used in tests or evaluations, range SSs² and weapon operators are to be qualified on those weapon systems, where an approved course is available, in accordance with instructions detailed in the appropriate weapon publication. Should they not be qualified on an in-service weapon or should qualification courses not be available and they are required to use that weapon, the procedure outlined in [paragraph 15.14](#) is to be adhered to. If the procedure in [paragraph 15.14](#) cannot be adhered to for any reason then a waiver is to be requested from the ADF WHS Adviser Small Arms, or relevant trade policy cell of CATC for the COMDT CATC's approval.

15.18 When testing HE and practice grenades (F series HE/PRAC grenades) using test rigs or remote firings, the requirement to throw F3 and F1 grenades 72 hours prior to a testing activity is waived if the staff involved are qualified and have operated remote firing devices/test rigs using the F1/F3 grenades within 12 months of the test being conducted. The OC P&EE Graytown (MAJ [E]) may extend the 12-month waiver period where they are satisfied that safety will not be compromised.

15.19 When a test or evaluation involves a weapon and/or ammunition nature not in ADF service, the procedures in [paragraph 15.14](#) apply.

Manned firing authority

15.20 An MFA is not required for the activity if a weapon is to be fired remotely from a fixed or trainable mount. However, adequate protection (eg, protected bunkers, armour plate and AFV) which will withstand failure of the munition or weapon must physically separate personnel from the weapon. TASO or the test or trial instruction must stipulate appropriate safety measures for these activities.

2. Range OIC Practices are to be, at a minimum, qualified in a like weapon in accordance with [paragraph 3.37](#). If no like weapon is available then they are to qualify on the weapon.

Ranges

15.21 Test and evaluation facilities are operated by designated Defence testing agencies (or contractors) for the performance and function testing of weapons and EO, often under unusual circumstances. They are generally purpose-designed for the performance of designated testing or experiments under scientifically repeatable conditions.

15.22 For the purposes of categorisation, permanent test and evaluation ranges are classified as:

- a. enclosed weapon test ranges, or
- b. open weapon test ranges.

15.23 An enclosed weapon test range is purpose-designed for a specific application, as required by the operating agency. It is generally constructed as an NDA³ range. Enclosed weapon test ranges will vary in length depending on the task for which they were designed.

15.24 An open weapon test range is generally constructed within a Defence practice area but may also be located within the premises of a Defence contractor.

Range appointments

15.25 Approving authorities are to appoint appropriately-qualified trials officers for the conduct of all test and evaluation activities. The range appointments required for the conduct of test and evaluation range practices are as follows:

- a. an OIC Practice (this is normally the Trials Officer/Firing Officer)
- b. at least one SS:
 - (1) when a requirement is identified by the RA conducted during the development of a test or trial instruction, or
 - (2) if at any time the OIC Practice deems it necessary.

15.26 Personnel posted to or employed within the organisations listed in [paragraph 15.12](#) who are required to fulfil range safety appointments specifically for the conduct of tests and evaluations of weapons and ammunition natures are to be appointed in writing by one of the authorities listed in [paragraph 15.13](#).

15.27 The appointing authority is to ensure that the member is suitably qualified and is competent to perform the required duties. They need not be appointed for each separate activity; for example, they may be appointed annually in unit ROs or an instrument of appointment which must have defined dates not longer than the term of the appointing authority.

15.28 In a case where an agency operates more than one separate sub-unit or facility, the day-to-day appointment authority may be delegated to the sub-unit/facility commander (not less than MAJ [E]) in accordance with normal organisational command delegation prerogative.

15.29 Personnel not posted to or employed within the organisations listed in [paragraph 15.12](#) who are required to fulfil a range safety appointment for a test or evaluation activity must be appointed in writing by an authority listed in [paragraph 15.13](#). Their appointment is limited to the scope and time frame of that activity. Their precise level and nature of training is to be determined by the appointing authority.

15.30 Combining appointments. The OIC Practice may combine the duties of the SS when there is only one firer and if the provisions of [paragraph 15.25b](#) do not apply.

Enclosed weapon test range safety precautions

15.31 Enclosed weapon test ranges are developed in a similar manner to that described in [Chapter 2](#) for purpose-designed ranges, except that the RTAM does not generally exercise control and is not necessarily directly involved in developing the specification. Instead, the design and construction is generally to the specification of the agency that operates the facility for its specific and specialist requirements.

15.32 Enclosed weapon test ranges comprise:

- a. one or more fully enclosed firing lanes
- b. an enclosed bullet trap or bullet stop butt

3. No danger area.

- c. FP(s) that may consist of mechanical remote-firing mountings, firing rests or FPs for manned firing
- d. applicable supporting control, storage or administration facilities.

15.33 Enclosed weapon test ranges are to have siting and safety boards conducted by the controlling organisation, as listed in [paragraph 15.13](#).

15.34 Range qualifications. Personnel appointed to fulfil range safety appointments on an enclosed small arms test range are to hold a Permanent Basic equivalent qualification.

15.35 Safety precautions. Compliance with [Chapter 5](#) is to be applied. The RA and associated trial instructions developed throughout trials planning is to identify and confirm required dress and PPE for each activity. Dress and PPE requirements may be amended by OC P&EE (MAJ [E]) if, protective measures in place mitigate the use of PPE and no requirement is identified by the RA, test procedures or work instructions created during the development of a test or trial instruction.

15.36 Weapons. Any weapon up to the maximum calibre, ammunition nature and firing rate approved for the facility by the TASO may be used on that range. Weapons may be positioned in a mechanical remote-firing mounting, in a firing rest or at a specified FP as directed by the OIC Practice or TASO. Weapon operators and safety staff are to be positioned appropriately, either behind cover and operating the weapon remotely or present and directly operating the weapon, depending on the assessed risk and in accordance with a formal test plan.

15.37 Targets. Targets, if required, are to be positioned in such a manner that no additional safety hazard is created to the weapon operator or range safety staff. Targets are to be positioned such that the projectile remains as near as possible to the centre of the firing lane, and are to be clear of walls, floors and ceilings.

15.38 Range fixtures and equipment. A range fixture or item of equipment is not to be positioned so as to provide an additional safety hazard to the weapon operator or range safety staff, or to be itself endangered during firing. It is desirable that range fixtures and equipment positioned forward of a FP are finished using high-visibility colouring or markings and are recessed where possible.

15.39 Access control. Physical access controls are to be accompanied by procedural processes that ensure the safety of personnel and deny unauthorised entry. Such controls are to be detailed in the TASO. The OIC Practice is to conduct an inspection of the range facility, including a physical check of all access controls and function testing, where appropriate and as detailed in the TASO, prior to commencing the practice. As there is usually no higher range controlling authority managing range access, range design will generally incorporate physical entry controls, including:

- a. red flags or lights
- b. lockable doors
- c. interlocks
- d. alarms
- e. warning signs.

15.40 Red flags/lights. A red flag or red flashing light is to remain hoisted or operating at the closest access to the FP throughout the practice. Additional red flags or lights may be required by the local TASO. Written and audible warnings to indicate that firing is in progress may also be used as specified by TASO.

15.41 Sentries. Sentries, if required by the TASO, are to be positioned.

15.42 Medical precautions. The health support requirements in [Chapter 6](#) are to be applied.

Open weapon test range safety precautions

15.43 Open weapon test ranges are purpose-designed Permanent ranges developed in a similar manner to that described in [Chapter 2](#). These ranges have siting and safety boards conducted by a controlling organisation, as listed in [paragraph 15.13](#). The open weapon test range comprises:

- a. one or more impact area, enclosed by one or more RDASts
- b. FP(s) that may consist of:
 - (1) mechanical remote-firing mountings
 - (2) firing rests, or

(3) FPs for ordnance, vehicles or manned firing

c. applicable supporting control, storage or administration facilities.

15.44 Range danger area. Depending on the ammunition natures to be fired, a fixed RDAST may be approved as part of the range safety board process. Where no ADF-approved ADA template exists for the weapon and EO combination to be fired, a template provided by the Land Engineering Agency is to be applied.

15.45 Range use. Open weapon test ranges are used for the purposes of operating small arms, vehicle-mounted or indirect fire weapons or ammunition, missiles, demolitions and pyrotechnics during test and evaluation activities. They are generally designed for firing weapons remotely or under specific safety precautions. No practices have been specified for these ranges. Range users will implement firing activities appropriate to their task; however, certain routine or repetitive tasks may have permanent instructions detailed.

15.46 Range qualifications. Personnel appointed to fulfil range safety appointments on an open weapon test range are to hold a Permanent Basic or Permanent Complex equivalent qualification appropriate to the weapon system, ammunition or EO to be used, or an appropriate platform-specific equivalent qualification for vehicle-mounted, ordnance or demolition practices. In addition, personnel are to have received:

- a. instruction in the operation of and specific safety precautions applicable to the range being operated
- b. an assessment as competent in performing the duties of the appointment.

15.47 Safety precautions. Compliance with [Chapter 5](#) is to be applied. General safety precautions may be amended by OC P&EE (MAJ [E]) if safety measures in place mitigate the safety precautions stipulated in [Chapter 5](#) and are required to accommodate a particular test in accordance with the RA, test procedures and work instructions created during the development of a test or trial instruction.

15.48 Red flags. A red flag (at night a red light) is to remain hoisted at the FP or range entrance throughout the practice. Additional red flags or lights may be required by the local TASO.

15.49 Sentries. Manned or unmanned sentry points may be required in accordance with the safety board, and in accordance with see [paragraph 15.43](#).

15.50 Weapons. Firers and safety staff are to be positioned appropriately, either behind cover and operating the weapon remotely or present and directly operating the weapon, depending on the assessed risk and in accordance with a formal risk mitigation conducted as part of the development of the test plan or trial instruction. Any weapon up to the maximum calibre, ammunition nature and firing rate approved for the facility by the TASO may be used on that range. Weapons may be positioned as follows:

- a. in or on a vehicle
- b. on a remote-firing mounting or firing rest, or
- c. at a specified FP as directed by the OIC Practice.

15.51 Targets. Targets, if required, are to be positioned in such a manner that no additional safety hazard is created to the weapon operator or range safety staff.

15.52 Range fixtures and equipment. A range fixture or item of equipment is not to be positioned so as to provide an additional safety hazard or to be itself endangered during firing.

15.53 Medical precautions. The medical precautions to be used for an open weapon test range are detailed in [Chapter 6](#).

Section 15-4. Armourer test firings

15.54 Armourers working in or for Defence may be military, APS employees or contractors.

15.55 Armourers are to be qualified on the weapon they are test firing in accordance with COMDT CATC-authorized weapon publications, noting that not all lessons need be taught (eg, strip and assemble, revision periods, and hold and aim) for the armourer to gain qualification to safely test fire a weapon, and training is to be focused on safe handling and firing of the weapon system.

15.56 All test firings are to be conducted in accordance with this publication and range TASO.

Section 15-5. Firing weapons with a current manned firing authority

15.57 Test and evaluation facilities will, at times, live fire weapon systems that have a current MFA. Where this occurs and the firing is not a test and evaluation activity that would require an additional MFA to be raised, there is no requirement to raise an MFA. Instances where an MFA is not required include but are not limited to:

- a. qualification training
- b. continuation training
- c. demonstrations
- d. new weapon configurations.

15.58 For a weapon system with a current MFA that will be live fired while handheld/hand-controlled, and a new MFA is not required for the practice to be fired, the regulations contained in this chapter do not apply except for those relating to:

- a. approving authorities
- b. qualifications
- c. safety appointments
- d. range-specific safety requirements.

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Chapter 16

Australian Defence Force watercraft practices

Section 16-1. Introduction

16.1 This chapter contains the information required for ADF watercraft to prepare and safely conduct close-range surface and small arms firings in designated exercise areas and in and around coastal areas in a littoral environment.

16.2 This chapter applies to vessels 25 m or less in length. OIC/SS qualifications are in [paragraph 16.5](#).

16.3 Rules applying to SOCOMD are contained within *LWP-G 7-3-1, Australian Defence Force Range Orders (Dismounted)* [Chapter 7] (limited access only).

16.4 Terminology relevant to this chapter. The following terms are used in this chapter:

- a. *Radar operator.* The radar operator is the person operating the radar and boat communications systems.
- b. *Vessel operator/commander.* The vessel operator/commander is in overall command of the craft and is responsible for the safe navigation and operation of the vessel/firing platform, crew and participants for the duration of the activity. The vessel operator/commander is also responsible to the OIC Practice for range clearance through electronic surveillance equipment employed on board the vessel, as applicable; and the employment of lookout(s) to ensure that no incursions to the maritime/range area occur and for reporting any such event to the OIC Practice.
- c. *Lookout(s).* The lookout(s) is responsible to the OIC Practice for visual range clearance to ensure that no incursions to the maritime/range area occur and for reporting any such event to the OIC Practice.
- d. *Exposed personnel.* This term refers to all personnel on the firing craft.
- e. *Foul range.* The foul range refers to any air, surface or sub-surface object that may enter the maritime range boundary for the exercise.

Section 16-2. Range safety appointments

Range qualification criteria

16.5 To hold safety appointments for ADF maritime range practices, personnel must meet the following criteria:

- a. OIC Practice:
 - (1) hold Manoeuvre range qualifications, or
 - (2) hold Permanent Basic range qualifications, P101477 Supervisor Safety Marine Range 12.7 mm and have completed Subject 4 SGT Supervisor Marine Course or Marine Terminal Officer Course.
- b. SS:
 - (1) hold Manoeuvre range qualifications, or
 - (2) hold Permanent Basic range qualifications, P101477 Supervisor Safety Marine Range 12.7 mm and have completed Subject 4 CPL RACT Marine Watercraft Commander.

Range appointments

16.6 Safety officer afloat. A safety officer afloat is to be appointed, in accordance with *SOVO, Volume 4 – Watercraft*, for every practice involving ADF watercraft. They may simultaneously perform the role of OIC Practice.

16.7 Officer-in-Charge Practice. An OIC Practice for an ADF maritime range practice must be qualified in accordance with this chapter and hold the minimum rank of SGT (E).

16.8 Safety officer ashore. A safety officer ashore is to be appointed, in accordance with SOVO, *Volume 4 – Watercraft*.

16.9 Safety supervisor. An SS for an ADF maritime range practice must be qualified in accordance with this chapter and hold the minimum rank of CPL (E), or LCPL (RA Inf only).

16.10 Ammunition safety supervisor. Ammunition SS are to be appointed in accordance with this publication.

16.11 Radar operator. A radar operator is to be appointed in accordance with this publication.

16.12 Lookout(s). Lookout(s) are appointed by the OIC Practice. The number of lookout(s) required will depend upon the size and layout of the vessel. A lookout(s) is to be briefed by the OIC Practice.

16.13 There is to be a minimum of one SS per manoeuvre group. For fixed weapon platforms on landing craft mechanised (Mk 8/LLC¹), one SS is to be appointed per weapon system.

Section 16-3. Preparation and planning

16.14 Chapter 4 describes the planning process for a range practice. This section describes the additional factors for practices involving ADF watercraft. The following planning considerations are specific to maritime range practices and are to be used in addition to those listed in *LWP-G 7-3-1, Australian Defence Force Range Orders (Dismounted)*.

16.15 Support arrangements. The OCE arranges external support, including:

- a. firing area allocation
- b. rendezvous with external assets/facilities
- c. air, sea and land targets, including communications
- d. target marking (if required).

16.16 Preparation. The aide-memoire provided in [Annex A](#) is to be used to assist in the preparation of ADF maritime practices. This aide-memoire is to be used in conjunction with the aide-memoire provided in *LWP-G 7-3-1, Australian Defence Force Range Orders (Dismounted)*.

16.17 Briefing. Safety briefs for maritime practices are contained in the aide-memoire provided in [Annex A](#).

Section 16-4. Safety precautions

16.18 Maritime range practices. Maritime range practices are deemed mobile practices, whether underway, underway not making way, or at anchor. This is due to the unpredictable movement of the vessel. The OIC Practice is to check the RDA safety template against navigational charts to ensure that the movement box is clear of any obstacles that will impede safe navigation up to the high-water mark. General safety precautions for maritime range practices are contained in [Annex B](#).

16.19 Anti-aircraft practices. Anti-aircraft (AA) practices are to be conducted in accordance with *LWP-G 7-3-1, Australian Defence Force Range Orders (Dismounted)*.

16.20 Small arms practices. The conduct of small arms practices is to be in accordance with *LWP-G 7-3-1, Australian Defence Force Range Orders (Dismounted)*. General safety rules for these practices are contained in [Annex C](#).

16.21 As with land, RDASTs exercise areas for watercraft have a finite boundary with a specified airspace in which danger to life, limb or property may occur. Whereas a fixed ADA template is used to develop the RDAST within a fixed area, a floating template (RDAST) with associated safety rules is used at sea. The template moves relative to the unit's movement through the water. The firing position is not fixed to a geographical line or position, as any point within the range boundary for the exercise area can be used as long as the safety template (RDAST) and subsequent fall of shot do not extend past the exercise area boundary (and the area is clear of personnel and infrastructure). The fluid movement of the firing position can alleviate an impending 'dangerous proximity to the line of fire' or 'foul range' by an alteration of course or speed, or a repositioning of the firing unit.

1. Landing helicopter dock ship landing craft.

16.22 A template design for firings at sea is provided in [Annex D](#).

Section 16-5. Environmental management

16.23 Environmental management procedures are promulgated to reduce the risk of adverse environmental impacts or to mitigate the consequences of any incidents that may occur. At no time do environmental management procedures take precedence over procedures or policies relating to:

- a. personnel safety
- b. public safety
- c. ship or aviation safety
- d. navigation safety
- e. WHS
- f. weapon safety.

Annexes:

- A. [Aide-memoire for Australian Defence Force watercraft practices](#)
- B. [Safety precautions for Australian Defence Force watercraft practices](#)
- C. [General safety rules – small arms practices](#)
- D. [Template design for Australian Defence Force maritime practices](#)

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Annex A to Chapter 16

Aide-memoire for Australian Defence Force watercraft practices

1. This aide-memoire is to be used as a guide only and does not preclude the need for the OIC Practice to apply the regulations contained within the relevant chapters of this publication.

2. **Information requirements.** Local authority TASO and any other relevant documents are to be consulted before commencing the detailed planning of a practice. Due to the information required for the planning of firings at sea, all planning and preparation for the firing is to be conducted prior to sailing and must contain details of:

- a. the positions of practice areas and air lanes, and the safety precautions specific to the practice area in use
- b. the availability and cooperation of civilian and military aircraft and surface vessels participating in the firing exercise
- c. the communication arrangements with vessels and aircraft providing targets and other units participating in the firing exercise
- d. the availability of shore training facilities
- e. ammunition supply and weapon inspection facilities
- f. repair facilities and the availability of technical assistance.

3. **Considerations.** Factors to be taken into consideration include:

- a. pre-firing checks
- b. other pre-firing tests/checks that may be warranted
- c. the ammunition allowance (quantities)
- d. the WHT and a check of SS qualifications
- e. the effect on the training/practice program
- f. lookout and radar SO safety requirements
- g. the types of runs required
- h. navigation records
- i. the communications log
- j. safety and the briefing of safety personnel
- k. the briefing of key personnel
- l. pre- and post-firing briefs
- m. the correct use of communications/C2 orders
- n. the passing of ranges and bearings
- o. pre-firing drills
- p. the adequacy of pre-firing training, considering the time since the last firing.

4. **Safety staff and participants.** The SS and participants are to be briefed in accordance with the relevant sections of the aide-memoire provided in *LWP-G 7-3-1, Australian Defence Force Range Orders (Dismounted)* [Annex A to Chapter 6].

5. **Commanding officer/officer commanding an independent sub-unit.** The UCO/IOC is to be briefed on:

- a. the aim of the practice
- b. the intended ammunition expenditure
- c. the facilities required

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- d. safety requirements
 - e. tactical aspects of the exercise
 - f. pre-firing training and the preparations required
 - g. target recovery (if applicable)
 - h. the intentions for serials prior to and after the firing serial.
- 6. Vessel operator.** The vessel operator is to be briefed on:
- a. the aim of the practice
 - b. the intended ammunition expenditure
 - c. the facilities required
 - d. the safety requirements
 - e. tactical aspects of the exercise
 - f. pre-firing training and the preparations required
 - g. target recovery (if applicable)
 - h. the intentions for serials prior to and after the firing serial.
- 7.** The vessel operator is to determine, using the brief outlined in [paragraph 6](#), the best initial position, course and speed for the practice in relation to:
- a. good bearing and range discrimination for surface firing
 - b. the bearing of the sun
 - c. safety requirements for the command visual² and blind (electronic) SO.
- 8. Radar operator.** The radar operator is to be briefed on:
- a. a display of the surface picture
 - b. the communication circuits required
 - c. clear range requirements (command blind SO).
- 9. Aircraft controller.** The aircraft controller is briefed on:
- a. full details of the practice, including the type of aircraft control
 - b. the types of runs required
 - c. the procedure for aircraft joining and returning to base.
- 10. Lookouts.** The OIC Practice is to brief lookouts as follows:
- a. the aim of the practice, and safety and tactical aspects
 - b. target selection rules and weapon arcs
 - c. force formation, lookout policies and radar restrictions
 - d. reporting procedures.
- 11. External authorities.** The following external authorities are be briefed prior to sailing:
- a. Target towing vehicles/aircraft are briefed on:
 - (1) the exercise area, firing course and speed
 - (2) target marking (if required)
 - (3) the assistance required in reporting clear range
 - (4) the number of runs and method of conduct for the practice
 - (5) communications/signals.

2. This is a common nautical term for what can be seen by the naked eye or with binoculars.

- b. Consorts are to be provided with the briefs detailed in [paragraph 5](#) and [paragraph 6](#), and briefed on:
- (1) details of the practice
 - (2) the procedure in the event of vessel/equipment failure
 - (3) alternate plans in the event of practice conditions not being met (visibility, cloud base, etc)
 - (4) the conduct of last radar calibration/index error.

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Annex B to Chapter 16

Safety precautions for Australian Defence Force watercraft practices

1. Orders relating to the safe handling and operation of weapons and equipment are contained in the relevant publications. This annex details safety precautions specific to the conduct of maritime range practices.
2. **Personnel protective equipment requirements.** The following PPE requirements apply during maritime range practices:
 - a. Ballistic helmets and vests are to be worn by all personnel during the conduct of a range practice for calibres of 40 mm and above.
 - b. Protective clothing (full-length sleeve, trousers and boots) is to be worn by all exposed personnel.
 - c. Hearing protection and, where the RA details a requirement, approved protective eyewear compliant with *AS/NZS 1337.1: Personal eye protection - Eye and face protectors for occupational applications* is to be worn by all exposed personnel.
 - d. A current in-service life preserver vest (a 60B life preserver vest when wearing ballistic equipment or Service equivalent) is to be worn.

External safety

3. **Defence exercise areas.** The coordinates of gazetted practice areas are shown in the *Seafarers Handbook for Australian Waters*³ which is published in January each year. Temporary restricted areas may be imposed at various times. Temporary restricted areas will be given the widest possible dissemination to civil and military users.
4. **Control and restrictions.** Units conducting sea range practices are to liaise with the relevant range authority.
5. **Requests for exercise areas.** Requests for the use of Defence exercise areas are to be made to the local Range Control authority. Requests are to be submitted in accordance with range authority requirements.
6. **Firing outside prescribed areas (range boundaries).** No firing is to occur outside prescribed areas (range boundaries) unless authorised in accordance with Department of Defence procedures.
7. **Navigational warnings and notices to mariners.** Navigational warnings for all weapons practices are issued to the Australian Maritime Safety Authority. The authority disseminates warnings as a NOTMAR(s) via the coastal radio stations. These warnings are broadcast at scheduled times, 24 hours before and during each activation. The NOTMAR directs merchant vessels that find themselves in an area where a firing is in progress to maintain their course and speed. If prevented from doing so by the exigencies of navigation they are advised that it will assist the range authority if they endeavour to clear the area at the earliest possible moment. Ships cannot be ordered to leave the area. Not all merchant vessels have access to Australian NOTMARs prior to arrival at an Australian port.⁴

Aircraft safety procedure

8. Some ADF watercraft do not have the capability to conduct radar clear range for aircraft safety purposes. If the watercraft are in consort with naval units, and with prior approval, the naval unit (if capable) can conduct radar clearance on behalf of the firing vessel. Where this is not possible, lookout(s) provide this capability. 'Radar clear range' refers to the precautions taken by the firing unit to ensure that the relevant area is under adequate radar surveillance and that arrangements are made for fire to be withheld if necessary. 'Adequate radar surveillance' refers to the range and time of flight of the munitions fired being applied to the position and distance an intruding aircraft can travel during the time of flight.
9. For vessels without a height-finding radar capability, and therefore with no method of determining clear height as required by the safety rules, any aircraft sighted approaching or within the safety firing limits

3. Australian Hydrographic Service 2016, *Seafarers Handbook for Australian Waters*, 4th edn, Wollongong, NSW.

4. A 'securite' marine broadcast is a safety call providing navigational warnings to vessels in the area that firing is about to commence (or has commenced or finished), which is issued (1 hour and then 30 minutes) prior to firing commencing, then during and at the cessation of firing.

should be assumed to be below the required clear height. Firing may recommence once the aircraft has cleared the danger area.

10. When adequate radar surveillance cannot be assured (or is not available) and reliance is placed on visual lookouts, allowance is to be made for the high speed of modern aircraft (with approach speeds of up to 10 miles per minute) and the relative inadequacy of a binocular search for any aircraft. Accordingly, unless the practice is conducted in a gazetted practice area or in an area for which a NOTAM warning has been promulgated, firing under the clear range procedure is not to be carried out unless the following applies:

- a. the maximum trajectory height is less than 1000 ft⁵
- b. the visibility is adequate to ensure the safety of fast aircraft
- c. the cloud base is at least 2000 ft above the trajectory.

11. Although the onus is on the pilot of the aircraft (other than cooperating aircraft) to avoid flying in promulgated active danger areas, the conditions in [paragraph 10b](#) and [paragraph 10c](#) are to be applied to units not fitted with air surveillance radar, or not in company with a unit fitted with air surveillance radar. It must be assumed that any aircraft detected in dangerous proximity to the line of fire is below the maximum height or trajectory.

Surface safety procedure

12. Under both radar clear range and visual clear range procedures, firings may only be conducted when the area affected by the firing is clear of shipping, and firing will neither cause interference with public rights of navigation and fishing; nor for anchoring, grounding, walking or recreation, either ashore or afloat, in the firing areas that adjoin the coast. It is usual practice to post sentries when firing onto land and/or to conduct an inspection to ensure that the area is clear prior to firing.

13. Council by-laws. Certain practice and exercise areas have council by-laws that isolate the firing area from public use during firing to ensure the safety of the general public. Council by-laws do not remove the need for radar and visual clear range procedures. Practices in an area regulated by council by-laws must cease when the danger area is obstructed. It is the OIC Practice's responsibility to liaise with the council and comply with the local arrangements/agreements on procedures prior to and during firing (including the posting of sentries).

Exercises involving illumination and pyrotechnics

14. It is important that maritime and air authorities know when illumination and pyrotechnics are used to prevent false alarms and ensure that real emergencies are not neglected.

15. Units (or shore parties) planning to fire illumination or pyrotechnics within 40 NM of the coast are to inform the relevant agencies at least 72 hours beforehand. This is in addition to obtaining normal clearance.

Practice conduct

16. Pre-firing checks. The OIC Practice is to determine and advise the vessel operator of the minimum combination of essential checks that must be conducted before firing commences. The RA is to identify the pre-firing checks required. At a minimum, these checks are to include:

- a. confirm weapons being fired
- b. the qualifications of all safety staff
- c. confirm the pre-firing training plan
- d. confirm that a WHT has been conducted a maximum of two weeks prior to firing
- e. confirm the aircraft and/or vessels participating in the activity
- f. confirm that targetry and target-towing vessels are available as required
- g. confirm the requirements for the exercise area
- h. confirm that the RDAST has been prepared, checked and submitted to the approving authorities
- i. check and confirm airspace availability
- j. confirm that medical arrangements, including casevac, are appropriate

5. This does not include the air danger height for the munitions fired (see [Chapter 9](#)).

k. confirm that a foul weather plan has been developed and promulgated to all exercise participants.

17. Range clearance at the firing point. Prior to firing, the range is to be cleared by a visual lookout and radar (if fitted). The lookout is to be provided with binoculars and positioned where they can best observe the range and firing area. They are to be given no other duties and are to be fully briefed on their responsibilities by the OIC Practice, with particular emphasis on ceasefire procedures. They are to report to the SS (ensuring acknowledgement) if conditions prevent them from exercising their responsibilities. The lookout is to be rotated as required.

18. The range is to be cleared by radar and/or visual observation prior to firing and is to be monitored by radar and/or visual observation while firing. The radar, if fitted, is to be operated by a qualified radar operator. The radar operator is to plot any vessels coming within 10 NM of the range and is to pass information on course, speed and closest point of approach. They are to initiate cease firing procedures when any craft comes within 2 NM of the RDA. The radar operator is to maintain a plot of the firing craft's position and notify the OIC Practice if they are moving out of the range area. The radar operator is to report and receive acknowledgement from the OIC Practice if there is any malfunction of the radar equipment or any condition which prevents the radar operator from exercising their responsibilities.

19. Authority to fire. The authority to fire rests with the OIC Practice. The OIC Practice must give a verbal order to initiate firing.

20. Flags. The regulation red flag BRAVO is to be flown from the firing vessel(s) as follows:

- a. at the dip/half-mast – when on the range between runs, or prior to commencement of firing
- b. raised – to indicate that firing is about to or has commenced
- c. lowered – to indicate that firing is completed.

21. Responsibilities of the unit commanding officer/independent sub-unit officer commanding. The UCO/IOC is to direct that an appropriately qualified person supervises the conduct of all firing practices. The actual control of firing may be delegated to any suitable officer or SNCO consistent with training objectives, the weapon and individual skills.

22. During firing practices the OIC Practice is to ensure that:

- a. radar clear range is used where possible
- b. the clear range procedure is used if radar clear range is not possible
- c. neither persons nor property are endangered by the firings
- d. lookouts are posted for safety purposes, even when the radar clear range procedure is being used.

Safety personnel

23. Safety personnel are to be appointed in accordance with this annex.

24. Lookout. The lookout is to be positioned with an unobstructed view of the area in which the firing will be conducted. The lookout is responsible for:

- a. making a visual check of the RDA and reporting whether it is clear or foul, in accordance with the rules in force; ensuring that the SS has been informed of the visibility, the meteorological conditions, and any change occurring during the practice
- b. confirming the safety of any aircraft or vessels involved in the practices
- c. informing the OIC Practice of any breach of the RDA; this may include marine life, other vessels, aircraft, unidentified objects or personnel.

25. Preliminary checks. Prior to firing, the following checks are to be conducted by the OIC Practice and the vessel operator:

- a. Establish navigation safety limits.
- b. Promulgate firing limits and safety bearings for loaded weapons for AA practices.
- c. In AA practices, confirm that the aircraft and target parameters, altitude, speed and length of tow are safe for the intended firing plan.
- d. In surface firing, check that the target-towing vessel and target parameters, course, speed, inclination and length of tow are safe for the intended firing plan.

26. Safety check immediately prior to firing. The OIC Practice immediately prior to firing:

- a. confirms that the range area is clear of marine life, other vessels, aircraft, unidentified objects or personnel
- b. confirms that the radar is clear.

‘STOP STOP STOP!’ – safety

27. Emergencies, unsafe practices and stop signals. Should any emergency or unsafe practice occur on the range, firing is to cease immediately. The initial order for such a ceasefire may be given by any person giving the command ‘STOP STOP STOP!’. The SS or OIC Practice is immediately also to order ‘STOP STOP STOP!’, or initiate a predetermined action to signal ‘STOP!’. On that order or action to ‘STOP’, firers are to place SAFETY switches on their weapons at SAFE. Further actions required are detailed in [Chapter 5](#).

Clear range

28. In any circumstances where the OIC Practice cannot confirm clear range⁶ using organic sensors alone, the following additional safety measures are to be implemented:

- a. Securite messages are to be issued on VHF Channel 16.
- b. The OIC Practice should commence range clearance as soon as reasonably possible.
- c. A vessel acting under the direction of the OIC Practice may be used to confirm range clearance visually and by radar (prior to the arrival of the firing platform at the FP). These vessels should also be employed to contact smaller vessels by any means to clear the firing trace.

29. Firing is to cease if there is doubt as to the clearance of the RDA and is not to recommence until it has been confirmed clear.

6. ‘Clear range’ refers to range clearance en route to, and prior to, arrival at the FP.

Annex C to Chapter 16

General safety rules – small arms practices

1. This annex details the additional safety regulations for small arms live fire maritime practices.
2. The weapons permitted are current in-service weapons up to 12.7 mm and including 40 mm grenade launchers.
3. Firing is only to be conducted in designated exercise areas (this may include littoral areas or open waters) from ADF watercraft. SOCOMD live fire maritime practices are to be conducted under the regulations contained in *LWP-G 7-3-1, Australian Defence Force Range Orders (Dismounted)* [Chapter 7] (limited access only).
4. **Clear range.** The OIC Practice is responsible for ensuring that the RDA and air danger height are clear.
5. **Safety appointments.** Safety appointments for maritime practices are made in accordance with this publication.
6. **Small arms firing from sea to land.** The following mobile FP parallel bearing templates are to be applied when firing from sea to land with small arms:
 - a. mobile firing area unrestricted arcs
 - b. fixed arc markers, or
 - c. a split movement box (parallel bearing) for multi-phase exercises.

Considerations prior to and during firing

7. Targets are to be sited at ranges that use the characteristics of the weapon, sighting system and weapon mount, with consideration given to:
 - a. the firer's level of experience in firing from watercraft
 - b. the position of the watercraft to assist firers in keeping their weapon in a safe direction at all times
 - c. the speed of the vessel in relation to weather and the sea state.
8. **Watercraft practice flag procedures.** Flag procedures are described in [Annex B](#).

General safety precautions

9. In addition to the safety precautions provided in this publication, the following general safety precautions apply to small arms maritime practices:
 - a. OHF/flanking fire from vessels is not permitted.
 - b. The OIC Practice is to be located in a position to control the practice.
 - c. Where a landing involving live fire occurs, a non-firing run is to be conducted to determine the appropriate speed to allow for the most stable platform prior to the first firing run. The safety officer afloat is to monitor and inform the OIC Practice of changes to the sea state and the OIC Practice is to implement speed restrictions as required.
 - d. The OIC Practice is to have communications with all range safety appointments at all times.
 - e. The SSs are to be in a position to observe all firers during the conduct of the practice.
 - f. Firing is only permitted directly over the bow, sides and stern of the vessel; never from bow to stern, stern to bow, port to starboard or starboard to port.
 - g. Personnel on the FP are to wear an approved inflatable life jacket, approved eye protection and hearing protection. If a ballistic vest and helmet are worn, an appropriate life preserving vest (60B, or in-service equivalent) is also to be worn. Life jackets are to be external to ILCE.
 - h. Weapons are to be secured (to the person or vessel) during the conduct of the practice. Moving vessel templates are to be used at all times.
 - i. BNS may be incorporated into the practice.

-
- j. Swimmer scout contact drills may occur within the surf zone provided the water level is below waist height and the participant is stable when firing. A 600 mils safety angle is to be maintained at all times.
 - k. Transition from a waterborne practice to any other type of field firing practice occurs once the firer is clear of the water. The OIC Practice is to determine where the transition point occurs and is to ensure that it is briefed to all personnel.
 - l. Firing is not to take place:
 - (1) in Sea State 4 (1.25 m) or above, or
 - (2) in the surf zone, with the exception of swimmer scouts as per [paragraph 9j](#).

Annex D to Chapter 16

Template design for Australian Defence Force maritime practices

1. The range safety template for firing at sea is a virtual diagram of the danger area for a weapon firing a specific nature of ammunition. The range safety template is fixed to the line of fire and moves within the firing safety limits as the weapon is traversed.
2. For other than radar, all personnel involved in the firing have to visualise the template using relative bearings and estimated distance, as there are no markers or landmarks to assist in the determination of the firing arcs and boundaries. To this end, the AA, surface and ricochet templates are simple geometric shapes.
3. AA and surface templates are derived from:
 - a. the maximum range
 - b. the ricochet
 - c. the angle of fire (HEF or LEF).
4. **Surface danger area template.** The establishment of a firing sector to ensure that clear range and fall of shot are complied with requires development of the surface danger area template. A surface template is constructed as follows:
 - a. *Line of fire.* Draw a single centre-line which will indicate the line of fire (see Figure 16–1[a]). From FP (A), measure a distance in metres for the maximum range of the weapon (B).
 - b. *Dangerous proximity to the line of fire.* Determine the distance for the dangerous proximity to the line of fire. Draw two lines parallel to the line of fire using the scale width in metres at right angles to the line of fire (CD and EF) (see Figure 16–1[a]).
 - c. *Range.* Draw a line from the line of fire (B), dissecting the line DF (see Figure 16–1[a]).
 - d. *Blast danger area.* Apply the blast danger area to the template as required by extending lines CD and EF and drawing a line between D and F (see Figure 16–1[b]).

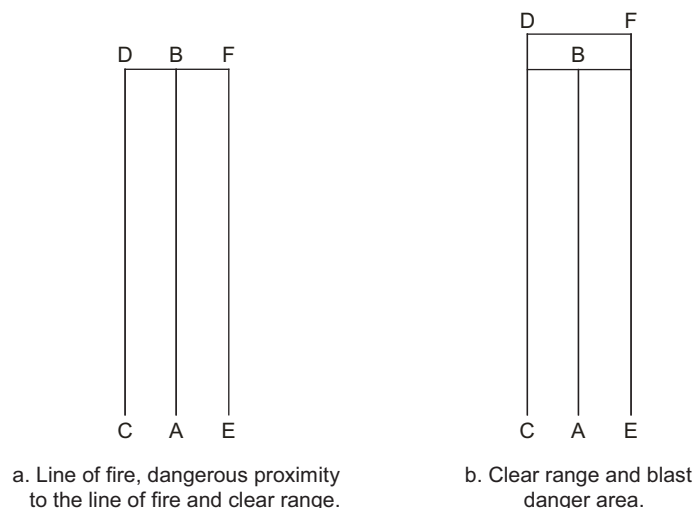


Figure 16–1: Example construction of a surface practice template

Ricochet danger area template

5. A ricochet danger area template (see Figure 16–2) is constructed as follows:
 - a. *Line of fire.* Draw a single centre-line which will indicate the line of fire (see Figure 16–2[a]). From FP (A), measure a distance for the maximum range of the weapon in metres (B).
 - b. *Ricochet angles.* Draw a line to the left and right from A at an angle of 800 mils (45°) (AC and AD) (see Figure 16–2[a]).

- c. *Ricochet boundaries.* Draw two lines parallel to AB at this ricochet distance to the left (EF) and right (GH) (see Figure 16–2[b]).
- d. *Range.* Draw an arc at maximum range from the line of fire (B), dissecting EF and GH (see Figure 16–2[b]).
- e. *Blast danger area.* Apply the blast danger area as detailed in Figure 16–2[c].
- f. *Complete ricochet template.* Remove excess links to achieve the completed ricochet template (see Figure 16–2[d]) and apply the template to the firing range.

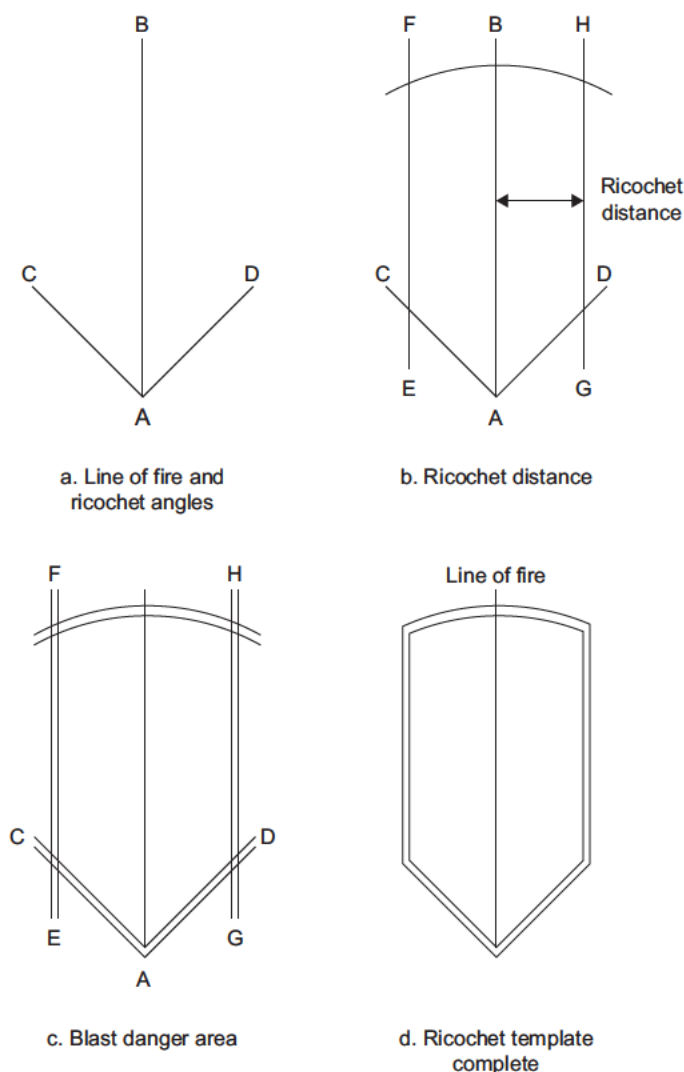


Figure 16–2: Example construction of a ricochet danger template

Application of templates

6. The line of fire is the centre-line of the template and is not rigid to a geographical position. Therefore templates are applied in a different manner from those for a land range.
7. During the conduct of the practice briefing, it must be stressed that the surface template will be briefed separately from the ricochet template and will not be depicted as an overlay; however, to illustrate how they work in conjunction with each other, Figure 16–3 shows the surface and ricochet templates overlaid.

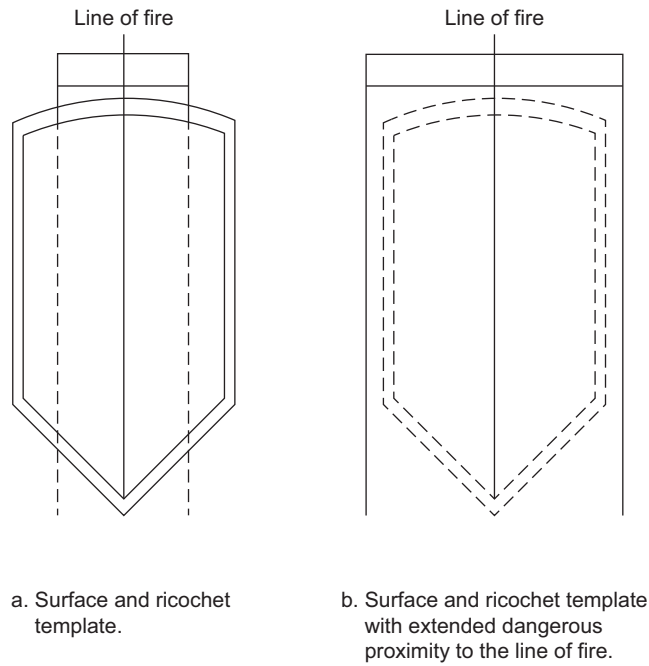


Figure 16-3: Example surface and ricochet template overlaid

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Chapter 17

Small arms maritime firings at sea

Section 17-1. Introduction

17.1 This chapter contains the information required for Navy, Army and Air Force to conduct small arms live firings at sea. These regulations cover all weapons less than 12.7 mm in calibre when conducting firings on RAN platforms.

17.2 This chapter applies to personnel posted to RAN ships and embarked forces on RAN ships greater than 25 m in length. All firings at sea involving 12.7 mm and larger calibre weapons, including Army units such as combat reconnaissance vehicle at sea on amphibious platforms, are to adhere to *ANP3319, RAN Firing Manual* and the relevant chapters of this publication. Where conflict exists, a Command Decision Summary is to apply.

17.3 Terminology relevant to this chapter. The following terms are used in this chapter:

- a. *Commanding officer.* The CO is in overall command of the vessel and responsible for the safe navigation and operation of the vessel/firing platform, crew and participants for the duration of the activity.
- b. *Gunnery officer.* The gunnery officer (GO) is the officer in overall command of the gunnery serial. This role may also be performed by the on watch principal warfare officer or air warfare officer.
- c. *Officer of the watch.* The officer of the watch (OOW) is the officer, as designated by the CO, who is in charge of the bridge at the time of firing and, as part of their role, monitors the radar for navigation and visual/blind range safety.
- d. *Officer-in-Charge Practice.* The OIC Practice is the officer responsible for the safe conduct of the serial in accordance with this publication.
- e. *Lookout(s).* The lookout(s) is responsible to the OIC Practice for visual range clearance to ensure that no incursions to the maritime/range area occur, and for reporting any such event to the OIC Practice.
- f. *Exposed personnel.* This term refers to all personnel on the FP.
- g. *Foul range.* The foul range is any air, surface or sub-surface object (ship, wildlife etc) that may enter the maritime range boundary for the exercise.
- h. *Safety supervisor.* The SS is responsible for the safety of their allocated firers and for the safe conduct of their tasks in accordance with the directives of the OIC Practice.

Section 17-2. Range appointments

Range qualification criteria

17.4 To hold safety appointments for maritime firings at sea, and to prepare and fire small arms firings in designated exercises and on the high seas, personnel must meet the requirements as per a Permanent Basic range.

Maritime Range appointments

17.5 Navigator/officer of the watch. The navigator/OOW is to monitor the ship's radar and maintain communication with the OIC Practice. If required, the OOW is to appoint an additional radar operator.

17.6 Lookout. The lookout(s) is appointed by the OOW. The number of lookouts required will depend on the size and layout of the vessel. The OIC Practice is to be satisfied that sufficient lookouts are briefed and posted to cover the visual surveillance requirements of the practice. Lookouts must be issued with serviceable in-service binoculars and be briefed on their search sector and reporting procedures in accordance with unit SOP and/or the range administrative instruction. Lookouts are to report immediately all sightings and suspected sightings to the OIC Practice.

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Section 17-3. Aide-memoire

17.7 An aide-memoire for maritime range practices is provided in [Annex A](#).

Section 17-4. Preparation and planning

17.8 Support arrangements. The support arrangements are as follows:

- a. firing area allocation
- b. rendezvous with external assets/facilities
- c. air, sea and land targets, including communications
- d. targets (if required).

17.9 Range instruction. The OIC Practice is to detail in writing all safety staff and include a brief explanation of the practice to be conducted. The CO, GO, principal warfare officer or air warfare officer are to be briefed on the range practice. Small arms firings are to be conducted in accordance with the *ANP4303, Royal Australian Navy Small Arms and Military Skills*.

17.10 Preparation. Preparation is essential for the conduct and safety of a firing at sea. The aide-memoire provided in [Annex A](#) is to be used to assist in the preparation of a maritime firing.

17.11 Briefing. The OIC Practice is to brief all safety staff and participants in accordance with the aide-memoire (see [Annex A](#)). The briefing is to include the safety rules specific to the weapon system(s) and the practice.

Section 17-5. Safety precautions

17.12 General safety precautions. All personnel performing visual, blind and gun safety duties must be briefed on the conduct of the practice and the conditions that are likely to affect their ability to carry out the tasks. General safety precautions are provided in [Annex B](#).

17.13 Maritime firings. Maritime firings are deemed mobile practices whether underway, underway not making way, or at anchor, due to the unpredictable movement of the vessel as a result of the sea state.

17.14 Small arms safety rules. The rules for small arms safety are detailed in [Annex C](#).

Section 17-6. Medical

17.15 Maritime medical governance. The medical requirements outlined in [Chapter 6](#) are to be adhered to for all maritime firings. Additionally the current Fleet Health Instruction¹ is the overarching document for all maritime firings and outlines additional medical requirements.

Section 17-7. Environmental management

17.16 Environmental management procedures are promulgated to reduce the risk of adverse environmental impacts or to mitigate the consequences of any incidents that may occur.

17.17 At no time do environmental management procedures take precedence over procedures or policies for safety:

- a. personnel safety
- b. public safety
- c. ship or aviation safety
- d. navigation safety
- e. WHS
- f. weapon safety.

1. <http://drnet/navy/FLD/FleetHealth/healthcareproviderdocumentation/Pages/Chapter-318-Fleet-Health-Instructions.aspx>

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Annexes:

- A. [Aide-memoire for small arms maritime firings](#)
- B. [Safety precautions for small arms maritime live firing practices](#)
- C. [Firing at sea safety rules](#)

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Annex A to Chapter 17

Aide-memoire for small arms maritime firings

1. This aide-memoire is to be used as a guide only and does not preclude the need for the OIC Practice to apply the regulations contained within the relevant chapters of this publication.
2. **Information requirements.** Planning and preparation for the firing must specify:
 - a. the positions of practice areas and air lanes, and the safety precautions specific to the practice area in use
 - b. the availability and cooperation of civilian and military aircraft and surface vessels participating in the firing exercise
 - c. the communication arrangements with vessels and aircraft providing targets and other units participating in the firing exercise.
3. **Considerations.** Factors to be considered are:
 - a. pre-firing checks
 - b. other pre-firing tests/checks that may be warranted
 - c. the ammunition allowance (quantities)
 - d. the WHT and a check of SS qualifications
 - e. the effect on the training/practice program
 - f. lookout and SS safety requirements
 - g. navigation records
 - h. the communications log
 - i. safety briefings are to be conducted for the CO, GO, navigating officer, OOW and all personnel participating in the activity in accordance with this publication
 - j. the correct use of communications
 - k. pre-firing drills
 - l. the adequacy of pre-firing training, considering the time since the last firing.
4. **Commanding officer.** The CO is to be briefed on:
 - a. the aim of the practice
 - b. the intended ammunition expenditure
 - c. the facilities required
 - d. safety requirements
 - e. tactical aspects of the exercise
 - f. pre-firing training and the preparations required
 - g. target recovery (if applicable)
 - h. the intentions for serials prior to and after the firing serial.
5. **Navigator/officer of the watch.** The navigator/OOW is to be briefed by the GO:
 - a. a display of the surface picture
 - b. the communication circuits required
 - c. clear range requirements (command blind SO).
6. **Lookouts.** The OOW is to brief lookouts as follows:
 - a. the aim of the practice, safety and tactical aspects

- b. target selection rules and weapon arcs
- c. force formation, lookout policies and radar restrictions
- d. reporting procedures.

Annex B to Chapter 17

Safety precautions for small arms maritime live firing practices

1. Orders relating to the safe handling and operation of weapons and equipment are provided in their relevant publications. Fleet units are to closely review and monitor the up-to-date version of the RA. Where there is doubt over a safety procedure, the ADF LRS Branch of CATC is to be contacted for advice.

External safety

2. External safety measures ensure the safe conduct of live firing practices with minimum risk to persons and property.

3. **Defence exercise areas.** The coordinates of gazetted practice areas are provided in the *Seafarers Handbook for Australian Waters*² which is published in January each year. Temporary restricted areas may be imposed at various times. Temporary restricted areas will be given the widest possible dissemination to civil and military user.

4. **Control and restrictions.** Units conducting sea range practices are to liaise with the relevant range authority.

5. **Requests for exercise areas.** Requests for the use of Defence exercise areas are to be made to the local Range Control authority. Requests are to be submitted in accordance with range authority requirements.

6. **Firing outside prescribed areas (range boundaries).** Firings planned to occur outside prescribed areas (range boundaries) are to be conducted in accordance with the *ANP3319, RAN Firing Manual*.

7. **Navigational warnings and notices to mariners.** Navigational warnings for all weapons practices are issued to the Australian Maritime Safety Authority. The authority then disseminates NOTMARs via coastal radio stations. These warnings are broadcast at scheduled times, 24 hours before and during each activation. The NOTMAR(s) directs merchant vessels that find themselves in an area where a firing is in progress are to maintain their course and speed. If prevented from doing so by the exigencies of navigation, they are advised that it will assist the range authority if they endeavour to clear the area at the earliest possible moment. Ships cannot be ordered to leave the area. Not all merchant vessels have access to Australian NOTMARs prior to arrival at an Australian port.³

Surface safety procedure

8. Under both radar clear range and visual clear range procedures, firings may only be conducted when the area affected by the firing is clear of shipping, and firing will neither cause interference with public rights of navigation and fishing; nor for anchoring, grounding, walking or recreation, either ashore or afloat, in the firing areas that adjoin the coast. It is usual practice to post sentries when firing onto land and/or to conduct an inspection to ensure that the area is clear prior to firing.

9. **Council by-laws.** Certain practice and exercise areas have council by-laws that isolate the firing area from public use during firing to ensure the safety of the general public. Council by-laws do not remove the need for radar and visual clear range procedures. Practices in an area regulated by council by-laws must cease when the danger area is obstructed. It is the CO's/GO's/OOW's responsibility to liaise with the council and comply with the local arrangements/agreements on procedures prior to and during firing (including the posting of sentries).

10. **Pre-firing checks.** Before the commencement of any practice, the following pre-firing checks are to be conducted:

- a. confirm weapons being fired
- b. check the qualifications of all safety staff
- c. confirm the pre-firing training plan
- d. confirm that a WHT has been conducted within 48 hours of firing

2. Australian Hydrographic Service 2016, *Seafarers Handbook for Australian Waters*, 4th edn, Wollongong, NSW.

3. A 'securite' marine broadcast is a safety call providing navigational warnings to vessels in the area that firing is about to commence (or has commenced or finished), which is issued (1 hour and then 30 minutes) prior to firing commencing, then during and at the cessation of firing.

- e. confirm the aircraft and/or vessels participating in the activity
- f. weapons are test-fired prior to the exercise, if required
- g. confirm that targetry and target-towing vessels are available
- h. confirm the requirements for the exercise area
- i. confirm that the RDAST has been prepared, checked and submitted to the approving authorities
- j. check and confirm airspace availability
- k. confirm that medical arrangements, including casevac, are appropriate
- l. confirm that a foul weather plan has been developed and agreed on.

11. Range clearance at the firing point. Prior to firing, the range is to be cleared by a visual lookout and radar. The lookout is to be provided with binoculars and positioned where they can best observe the range and firing area. They are to be given no other duties and are to be fully briefed on their responsibilities by the OIC Practice, with particular emphasis on ceasefire procedures. They are to report to the SS (ensuring acknowledgement) if conditions prevent them from exercising their responsibilities. The lookout is to be rotated every 60 minutes.

12. The range is to be cleared by radar and visual observation prior to firing and is to be monitored by radar⁴ and visual observation while firing. The radar is to be operated by a qualified radar operator. The radar operator is to plot any vessels coming within 10 NM of the range and is to pass information on course, speed and closest point of approach. They are to initiate cease firing procedures when any craft is about to enter the RDA. The radar operator is to maintain a plot of the firing craft's position and notify the OIC Practice if they are moving out of the range area. The radar operator is to report and receive acknowledgement from the SS if there is any malfunction of the radar equipment or any condition which prevents the radar operator from exercising their responsibilities.

13. Authority to fire. The authority to fire rests with the OIC Practice. The OIC Practice must give a verbal order to initiate firing.

14. Flags. The regulation red flag BRAVO is to be flown from the firing vessel(s) as follows:

- a. at the dip/half-mast – when on the range between runs or prior to commencement of firing
- b. raised – to indicate that firing is about to or has commenced
- c. lowered – to indicate that firing is completed.

15. Responsibilities of the unit commanding officer/independent sub-unit officer commanding, embarked forces. The UCO/IOC is to appoint a qualified OIC Practice and SS for each activity. During firing practices the OIC Practice is to ensure that:

- a. the radar clear range is used where possible
- b. the clear range procedure is used if radar clear range is not possible
- c. the lookouts are posted for safety purposes, even when the radar clear range procedure is being used.

Safety personnel

16. The instructions in the following paragraphs apply to all small arms live firings. When live firings are conducted, the OOW is to monitor the ship's radar (appoint an additional radar operator if required) and maintain communication with the OIC Practice and lookouts.

17. Lookout. The lookout is to be positioned with an unobstructed view of the area in which the firing will be conducted. The lookout is responsible for:

- a. making a visual check of the firing area and reporting whether it is clear or foul, in accordance with the rules in force; ensuring that the SS has been informed of the visibility, the meteorological conditions, and any change occurring during the practice
- b. confirming the safety of any aircraft or vessels involved in the practices

4. It may not always be possible to confirm range clearance with radar.

- c. checking fire if any visual sign, new contact or unexpected event is detected that indicates safety may be compromised.

Checks

18. Preliminary checks. Prior to firing, the following checks are to be conducted by the OOW/GO/OIC Practice:

- a. establish navigation safety limits
- b. establish a recommended firing bearing/arc based on precursory visual and radar checks.

19. Safety checks immediately prior to firing. The standard safety check procedure for safety staff is as follows:

- a. Confirm that the range area is clear of animals, civilians, civilian craft or other non-exercise vessels (visual clear).
- b. Confirm that the target has been identified.
- c. Confirm that weapons are pointing within arcs.
- d. Confirm that the radar is clear.
- e. Confirm that the weapons are ready to fire.

Conditions for opening fire

20. Firing is not to commence if there is any doubt as to the clearance of the range. If firing has commenced and cause for doubt arises the practice is to cease. Firing is only to recommence when the range has been confirmed clear. Clearance may be by visual or blind means.

21. Safe firing sectors/range danger area trace. A safe firing sector is an area that is clear of all personnel, surface craft/ships/vessels, aircraft and land (other than land designated for firings) within which the selected weapon(s) may be fired without fear of endangering persons or property.

22. Establishing a safe firing sector/range danger area trace. The degree of safety when firing within an established firing sector will depend on the following factors:

- a. *Area limits.* It is essential for the firing sector to be selected so that all shells fall within the geographical limits of the area in which the practice is authorised to be carried out.
- b. *Shipping and aircraft.* The firing sector selected should be clear of all non-exercise surface craft and aircraft at the start of and throughout a firing run.
- c. *Adjacent areas.* The activities of shipping and/or aircraft operating in adjacent areas should be known. Careful watch should be maintained to ensure that shipping and aircraft do not intrude undetected into the firing area.
- d. *Safety limits.* Ensure that safety limits are in accordance with those detailed in *ANP3319, RAN Firing Manual*. These imposed safety limits, which include limits due to weapon characteristics, must be used when a safe firing sector is being established. Weapon characteristics include the maximum range of weapons.

23. Weapon range limitations. Navigational and radar distances are measured in metres and, as such, all ranges passed are to be given in metres.

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Annex C to Chapter 17


Firing at sea safety rules

1. This annex is intended to be a guide for general safety information only. For full details of close-range weapons and small arms, and associated drills including additional safety information see the following publications:

- a. ANP3319, *RAN Firing Manual*
- b. ANP4303, *Royal Australian Navy Small Arms and Military Skills*.

2. **Small arms external safety.** The small arms external safety regulations cover all weapons less than 12.7 mm in calibre for an arc extending 45° either side of the line of fire from each FP to the range and safe height is to be used (see ANP3319, *RAN Firing Manual*).

s33(a)(ii)



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Australian Code for the Transport of Explosives by Road and Rail, 3rd edition

Australian Hydrographic Service 2016, *Seafarers Handbook for Australian Waters*, Fourth Edition, Wollongong, New South Wales

Australian Radiation Protection and Nuclear Safety Regulations 2018

Australian Standard 1319–1994: Safety signs for the occupational environment

Australian/New Zealand Standard 1269.3–2005: Occupational noise management - Hearing protector program

Australian/New Zealand Standard 1337.1–2010: Personal eye protection - Eye and face protectors for occupational applications

Australian/New Zealand Standard 1337.4–2011: Eye and face protection - Filters and eye protectors against laser radiation (laser eye-protectors)

Australian/New Zealand Standard International Electrotechnical Commission 60825.1–2014: Safety of laser products - Equipment classification and requirements

Australian/New Zealand Standard International Electrotechnical Commission 60825.14–2011: Safety of laser products - A user's guide

Defence Force Discipline Act 1982

Defence Regulation 2016

Department of Defence Explosives Regulations 1961

Explosives Act 1961

Explosives Transport Regulations 2002

National Standard for the Control of Inorganic Lead at Work (National Occupational Health and Safety Commission: 1012 [1994])

Work Health and Safety Regulations 2011

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Endmatter

Associated publications

1. This publication should be read in conjunction with other publications and documents, in particular:
 - a. *Air Force Security Manual*
 - b. *Army Standing Instruction – Military Risk Management*
 - c. *Army Standing Instruction (Personnel)*
 - d. *Australian Air Publication 8600.001, RAAF Air Weapons Practices (Operations and Operational Requirements Manual)*
 - e. *Australian Defence Force Publication 7.0.3, Exercise Planning and Conduct*
 - f. *Australian Defence Force Service Police Manual, Volume 4, Service Police Operational Safety*
 - g. *Australian Navy Publication 3319, RAN Firing Manual*
 - h. *Australian Navy Publication 4303, Royal Australian Navy Small Arms and Military Skills*
 - i. *Defence Explosive Ordnance Publication 111, Technical Integrity of Explosive Ordnance*
 - j. *Defence Incident Scene Initial Action and Preservation Manual*
 - k. *Defence Radiation Safety Manual*
 - l. *Defence Road Transport Manual*
 - m. *Defence Safety Manual*
 - n. *Defence Security Principles Framework*
 - o. *Defence Training Area Management Manual*
 - p. *Department of Defence Administrative Inquiries Manual*
 - q. *Electrical and Mechanical Engineering Instructions Weapon A 129-1, Weapons - General, Inspection and Examination Qualifications for Fitter Armament Tradespeople*
 - r. *Electrical and Mechanical Engineering Instructions Weapon A 229-1, Issue 3, Inspection of Small Arms, Inspection after Suspected Negligent Discharge*
 - s. *Electrical and Mechanical Engineering Instructions Weapon E 338, Issue 5, General Service Machine Gun, 7.62 mm MAG58, Equipment Inspection and Examination Data*
 - t. *electronic Defence Explosive Ordnance Publication 101, Department of Defence Explosives Regulations*
 - u. *Electronic Supply Chain Manual, Volume 4, Supply Management Process*
 - v. *Fleet Health Instruction (current)*
 - w. *Incident Reporting and Management Manual*
 - x. *Infantry Training, Volume 3, Ranges and Courses, Pamphlet 33, Range Construction, Instructions and Safety Precautions (All Arms)*
 - y. *Land Material Safety Manual*
 - z. *Land Warfare Doctrine 1-2, Health Support*
 - aa. *Land Warfare Procedures - Combat Service Support 4-1-7, Logistic Ammunition Disposal*
 - ab. *Land Warfare Procedures - General 3-6-6, Demolitions*
 - ac. *Land Warfare Procedures - General 3-9-6, Operations in Urban Environments (Developing Doctrine)*
 - ad. *Land Warfare Procedures - General 7-2-5, Conduct of Chemical, Biological, Radiological and Nuclear Training*
 - ae. *Land Warfare Procedures - General 7-3-1, Australian Defence Force Range Orders (Dismounted)*

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- af. *Land Warfare Procedures - General 7-3-2, Australian Defence Force Range Orders (Mounted)*
- ag. *Land Warfare Procedures - General 7-3-21, Small Arms Range Practices (to be published)*
- ah. *Land Warfare Procedures - General 7-3-3, Australian Defence Force Range Orders (Indirect Fire)*
- ai. *Land Warfare Procedures - General 7-3-4, Air and Missile Defence Range Orders*
- aj. *Land Warfare Procedures - General 7-3-5, Demolitions and Mines: Range Practices and Non-operational Tasks*
- ak. *Land Warfare Procedures - General 7-3-7, Australian Defence Force Range Orders (Army Aviation)*
- al. *Land Warfare Procedures - General 7-3-9, Disposal of Malfunctioned Explosive Ordnance*
- am. *Land Warfare Procedures - General 7-4-31, Light Direct Fire Support Weapon 66 mm M72A6*
- an. *Land Warfare Procedures - General 7-4-42, Grenades and Pyrotechnics*
- ao. *Land Warfare Procedures - General 7-4-50, Precision Targeting Technologies*
- ap. *Land Warfare Procedures - General 7-7-1, All Corps Individual Soldier Skills*
- aq. *Land Warfare Procedures - General 7-7-8, Train the Battle Shot*
- ar. *Records Management Policy Manual*
- as. *Standing Orders for Vehicle Operators, Volume 4 - Watercraft*
- at. United States Department of the Army, *Pamphlet 385-63, Range Safety, 2014.*

Land Publications Online

2. This and other doctrine publications are available via the Land Publications Online website located at: <http://drnet.defence.gov.au/ARMY/Doctrine-Online/Pages/Home.aspx>. Paper copies may be out of date. Land Publications Online is the authoritative source for current doctrine. Users are to ensure currency of all doctrine publications against the Land Publications Online library.

Gender

3. This publication has been prepared with gender-neutral language.

4. **Gender in military operations.** Australia and the Australian Defence Force leadership has mainstreamed gender in military operations as an important focus of global strategic efforts, whole-of-government commitments and military activities. Gender in military operations is explicitly included in the Joint Military Appreciation Process. Considering gender issues in all activities ensures a comprehensive approach to the human terrain and enhances mission effectiveness. *Australian Defence Force Writing Manual* provides additional guidance to commanders and staff.

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Glossary

1. The principal source for Australian Defence Force terms and definitions is the Australian Defence Glossary located at <http://adg.eas.defence.mil.au/adgms>. Terms and definitions contained within this publication are in accordance with the business rules, guidelines and conventions for the Australian Defence Glossary at the time of its release.

arc of fire

The segment of a circle through which fire may be directed from a position or weapon.

blank ammunition

A cartridge case or cloth bag containing propellant, normally gunpowder, without a projectile.

Note: Its function is to produce a loud noise on firing when used in training, signalling or salutes.

burst safety distance

The radius from the point of burst, within which a danger exists from blast, fragments and debris.

close combat shooting

Specific shooting techniques and drills employed to engage the adversary at close range.

direct fire

Fire directed at a target which is visible to the aimer.

explosive ordnance

All munitions containing explosives, nuclear fission or fusion materials or biological and chemical agents.

Notes:

1. This includes bombs and warheads; guided and ballistic missiles; artillery, mortar, rocket and small arms ammunition; all mines, torpedoes and depth charges, demolition charges; pyrotechnics; clusters and dispensers; cartridge and propellant actuated devices; electro-explosive devices; clandestine and improvised explosive devices; and all similar or related items or components explosive in nature.
2. Used as a generic term in the same sense as the term ammunition and explosives is used in the equivalent NATO AASTP-1.

field firing range

A range specifically designed to conduct practices for Stage 4 and Stage 5 of small arms training.

firing point

That geographical point on a range at which firing occurs

Note: This point may be a point on the ground for an individual weapon, a line along which a number of weapons are placed or an area, such as a movement box from within which one or more weapons may be moved and fired from different locations.

fixed arc markers

Markers placed to indicate the left and right-most limits within which a target may be engaged.

impact area

An area having designated boundaries within the limits of which all ordnance is to make contact with the ground.

indirect fire

Fire delivered at a target which cannot be seen by the aimer.

live ammunition

Ammunition containing explosives.

live fire

Any discharge, release, detonation or firing of ammunition and/or ordnance.

manoeuvre group

A group of one or more firers.

maximum range

The greatest distance a weapon can fire without consideration of dispersion.

minimum engagement distance

The least possible distance a firer can safely engage a target with a specified type of ammunition.

projectile

An object capable of being propelled by a force normally from a gun, and continuing in motion by virtue of its kinetic energy.

pyrotechnics

A mixture of chemicals which, when ignited, is capable of reacting exothermically to produce light, heat, smoke, sound or gas, and may be used to introduce a delay into a firing system because of its known burning time.

Note: The term excludes propellants and explosives.

range

Any area reserved and normally equipped for practice in weapons delivery and/or shooting at targets.

range instruction

An instruction, either standalone or part of another written or electronic document, that contains all the necessary information to safely conduct a range practice.

range produce

Ammunition packages, components, links, cartridge cases and so on, resulting from range practices or demolitions.

safe direction

The direction the barrel is pointing is such that, in the event that the weapon is discharged, it will not result in death, injury, and/or damage to equipment (including by ricochet/splashback).

small arms

All firearms, including automatic weapons, of less than 20 mm calibre such as shotguns, signal pistols and single-shot explosive ordnance disposal equipment.

Abbreviations

1. The principal source for Australian Defence Force abbreviations is the Australian Defence Glossary located at <http://adg.eas.defence.mil.au/adgms>. Abbreviations contained within this publication are in accordance with the business rules, guidelines and conventions for the Australian Defence Glossary at the time of its release. The following abbreviations are used throughout this publication; however, commonly used terms have been presented in their abbreviated format throughout the publication and have not been included in this list.

AA	anti-aircraft
AAAD	all arms air defence
ADA	ammunition danger area
AEL	accessible emission limit
AFV	armoured fighting vehicle
AGR	assault grenade range
AT	ammunition technician
ATL	Army training level
ATO	ammunition technical officer
BBDA	back blast danger area
BNS	battle noise simulation
CC	crew commander
CP	command post
CSO	chief safety officer
CTA	close training area
DDPRAC	Deputy Director of Practice
DFSW	direct fire support weapon
DMEO	disposal of malfunctioned explosive ordnance
DOWR	degrees of weapon readiness
DPRAC	Director of Practice
DRSAC	Directorate of Radiation Safety Assurance Committee
DSO	Director of Practice Safety Officer
EO	explosive ordnance
EOSC	explosive ordnance services contractor
EUO	emergency use only
FCS	fire control system
FFE	free from explosives
FHA	fault hazard area
FP	firing point
GO	gunnery officer
HEF	high elevation fire
HSP	health support plan
IG	instructor-in-gunnery
IW	individual weapon
LEF	low elevation fire
LFMX	live fire manoeuvre exercises
LHA	laser hazard area
LOA	left of arc
LSO	laser safety officer
LSO1	laser safety officer level 1
LSO2	laser safety officer level 2
LSP	laser safety paper
LSW	light support weapon
MBT	main battle tank
MDFSW	medium direct fire support weapon
MFA	manned firing authority
MG	machine gun
MPE	maximum permissible exposure
MRM	military risk management
MTR	marksmanship training range

NFE	night fighting equipment
NLTA	non-lethal training ammunition
NOHD	nominal ocular hazard distance
NOHDe	extended nominal ocular hazard distance
NOTAM	notice to airmen
NOTMAR	notice to mariners
NSFS	naval surface fire support
NVG	night vision goggles
OCE	officer conducting the exercise
OEM	original equipment manufacturer
OHF	overhead fire
OIC	officer-in-charge
OOW	officer of the watch
OPPO	opposite number
OSE	officer scheduling the exercise
OTR	operational theatre range
PMV	protected mobility vehicle
QE	quadrant elevation
QLF	qualified live fire
QSF	qualified simulation fire
RA	risk assessment
RCO	range control officer
RDA	range danger area
RDAST	range danger area safety trace
RFSG	Regional Force Surveillance Group
RFSU	regional force surveillance unit
RO	routine order
ROA	right of arc
RTAM	regional training area manager
RWS	remote weapon station
SCE	soldier combat ensemble
SFMG	sustained fire machine gun
SGR	standard grenade range
SME	subject matter expert
SNCO	senior non-commissioned officer
SO	safety officer
SRA	senior range adviser
SRSC	specified range safety check
SS	safety supervisor
TASMIS	Training Area Safety Management Information System
TASO	training area standing orders
UCO/IOC	unit commanding officer/independent sub-unit officer commanding
UDP	user designed practice
UO	urban operation
URM	unit resource manager
UXO	unexploded explosive ordnance
WHT	weapon handling test

2. The following abbreviations appear in tables and figures within the publication.

ADELE	Australian Defence Education and Learning Environment
ADFRQ	Australian Defence Force range qualification
ADG	Airfield Defence Guard
AIMTEST	advanced in-bore marksmanship training enhancement system for tanks
AME	aeromedical evacuation
AMPHIB	amphibious
AWC	Arctic Warfare Covert
AWMP	Arctic Warfare Magnum Precision
bde	brigade
BG	battlegroup

cat	category
CRV	combat reconnaissance vehicle
CS	combat shooting
CT	combat team
CVC	crewman vehicle communications
DOTAM	Directorate of Operations and Training Area Management
DTARP	Director Training Area Regulation and Policy
ECN	employment category number
EOR	electronic open range
FE	force element
FFA	field firing area
flex	flexible
FOW	family of weapons
GLA	grenade launcher attachment
GPMG	general purpose machine gun
GSMG	general support machine gun
HPS	high performance sniper
HW	heavy weapon
IA	immediate action
ICW	in coordination with
IFV	infantry fighting vehicle
IR	infrared
LRG	long range
LRPV	long range patrol vehicle
LWAGL	light weight automatic grenade launcher
mk	mark
MWS	modular weapon system
N/A	not applicable
OOC	officer of cadets
ops	operations
PAR	post-activity report
PI	product improvement
pl	platoon
PMV-L	protected mobility vehicle - light
PRD	permanent range detail
PWS	protected weapon station
QCB	quick change barrel
QE_{CRIT}	quadrant elevation critical
QE_{MAX}	quadrant elevation maximum
RAS	risk assessment summary
SATO	senior ammunition technical officer
SDR	section defence range
SG	shotgun
SOM	scheme of manoeuvre
SRV	surveillance and reconnaissance vehicle
subj	subject
TBA	to be advised
tp	troop
USP	unsuppressed

3. The following are common shortened forms or symbols for names of measurements used throughout this publication.

cal	calibre
dB	decibel
ga	gauge
gr	grain
ms	millisecond
nm	nanometre
NM	nautical mile

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4. The following are common shortened forms or symbols for names of chemicals and/or explosives used throughout this publication.

AP	armour piercing
APDS	armour piercing discarding sabot
APFSDS	armour piercing fin stabilising discarding sabot
APFSDS-T	armour-piercing fin stabilising discarding sabot-tracer
API-T	armour piercing incendiary with tracer
AP-S	armour piercing super
ASM	anti-structure munition
CS	o-chlorobenzylidene-malonitrile
CTR	close training round
DS	discarding sabot
FMJ	full metal jacket
HE	high explosive
HEAT	high explosive antitank
HEDP	high explosive dual purpose
HEI-T	high explosive incendiary with tracer
HESH	high explosive squash head
HPBT	hollow point boat tail
ILLUM	illumination
KEW	kinetic energy weapon
MPT-SD	multipurpose tracer-self destruct
PRAC	practice
RB-LV	rubber buckshot low velocity
RP	red phosphorus
SLAP	saboted light armour penetrator
SLAP-T	saboted light armour penetrator with tracer
SMK	smoke
SRTA	short range training ammunition
TP	target practice
TPCSDS-T	training practice cone stabilised discarding sabot with tracer
TPDS-T	target practice discarding sabot with tracer
TP-M	target practice - marking
TP-T	target practice with tracer
WP	white phosphorous

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