INTERNATIONAL AMMUNITION TECHNICAL GUIDELINES

IATG 06.60

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Works services (construction and repair)

UN SaferGuard
Securing ammunition, protecting lives

IATG 06.60:2021[E]

Warning

The International Ammunition Technical Guidelines (IATG) are subject to regular review and revision. This document is current with effect from the date shown on the cover page. To verify its status, users should consult www.un.org/disarmament/ammunition

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United Nations Office for Disarmament Affairs (UNODA)
United Nations Headquarters, New York, NY 10017, USA

E-mail: conventionalarms-unoda@un.org

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Foreword

Ageing, unstable and excess conventional ammunition stockpiles pose the dual risks of **accidental explosions at munition sites** and **diversion to illicit markets**.

The humanitarian impact of ammunition-storage-area explosions, particularly in populated areas, has resulted in death, injury, environmental damage, displacement and disruption of livelihoods in over 100 countries. Accidental ammunition warehouse detonations count among the heaviest explosions ever recorded.

Diversion from ammunition stockpiles has fuelled armed conflict, terrorism, organized crime and violence, and contributes to the manufacture of improvised explosive devices. Much of the ammunition circulating among armed non-State actors has been illicitly diverted from government forces.[1] In recognition of these dual threats of explosion and diversion, the General Assembly requested the United Nations to develop **guidelines for adequate ammunition management**.[2] Finalized in 2011, the International Ammunition Technical Guidelines (IATG) provide voluntary, practical, modular guidance to support national authorities (and other stakeholders) in safely and securely managing conventional ammunition stockpiles. The UN SaferGuard Programme was simultaneously established as the corresponding knowledge-management platform to oversee and disseminate the IATG.

The IATG also ensure that the United Nations entities consistently deliver high-quality advice and support – from mine action to counter-terrorism, from child protection to disarmament, from crime reduction to development.

The IATG consist of 12 volumes that provide practical guidance for 'through-life management' approach to ammunition management. The IATG can be applied at the guidelines' **basic, intermediate, or advanced levels**, making the IATG relevant for all situations by taking into account the diversity in capacities and resources available. Interested States and other stakeholders can **utilize the IATG for the development of national standards and standing operating procedures**.

The IATG are reviewed and updated at a minimum every five years, to reflect evolving ammunition stockpile-management norms and practices, and to incorporate changes due to changing international regulations and requirements. The review is undertaken by the UN SaferGuard Technical Review Board composed of national technical experts with the support of a corresponding Strategic Coordination Group comprised of expert organizations applying the IATG in practice.

The latest version of each IATG module can be found at www.un.org/disarmament/ammunition.

[1] S/2008/258.

[2] See also the urgent need to address poorly-maintained stockpiles as formulated by the United Nations Secretary-General in his Agenda for Disarmament, *Securing Our Common Future* (2018).

Introduction

Explosives safety requires that all personnel, including contractors' personnel who are involved in working in an explosives area, are tightly controlled for their own safety and the safety of others. Adequate risk control measures and procedures must be put in place in order to identify and minimise any risk. This IATG module provides guidance on how to carry out these control procedures.

Works services (construction and repair)

1 Scope

This IATG module will describe the procedures for the control of personnel involved in the construction, repair and maintenance of explosives facilities. The control systems apply to establishment staff members and contractors alike.

2 Normative references

A list of normative references is given in Annex A. These documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

A further list of informative references is given in Annex B in the form of a bibliography, which lists documents that contain additional information related to the contents of this IATG module.

3 Terms and definitions

For the purposes of this module the following terms and definitions, as well as the more comprehensive list given in IATG 01.40 *Glossary of terms, definitions and abbreviations,* shall apply.

The term ‘explosives facility’ refers to *an area containing one or more potential explosion sites.*

The term 'national technical authority' refers to *the government department(s), organisation(s) or institution(s) charged with the regulation, management, co-ordination and operation of conventional ammunition storage and handling activities.*

The term ‘works services’ refers to *the construction, repair or maintenance work done by organisations or staff, usually civilian, who are not an integral part of the ammunition storage unit.*

In all modules of the International Ammunition Technical Guidelines, the words 'shall', 'should', 'may' and 'can' are used to express provisions in accordance with their usage in ISO standards.

a) **'shall' indicates a requirement**: It is used to indicate requirements strictly to be followed in order to conform to the document and from which no deviation is permitted.

b) **'should' indicates a recommendation**: It is used to indicate that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others, or that a certain course of action is preferred but not necessarily required, or that (in the negative form, 'should not') a certain possibility or course of action is deprecated but not prohibited.

c) **'may' indicates permission**: It is used to indicate a course of action permissible within the limits of the document.

d) **‘can’ indicates possibility and capability**: It is used for statements of possibility and capability, whether material, physical or casual.

4 Specific responsibilities (LEVEL 2)

Specific responsibilities for individuals referred to in this IATG module are given below. They are important because they directly affect the health and safety aspects of this IATG module.

4.1 Contractor

For the purpose of this IATG module a 'contractor' shall be regarded as *a person or persons, company or any other organisation entering into a business agreement for the performance of works services or the supply of goods, with the agreement being legally enforceable*.

However, this definition excludes:

a) personnel working outside of the national authority/establishment legal boundary;

b) personnel who are only in the establishment for a short period of time such as postal delivery staff; and

c) any contractors working in the storage, processing and transportation of military explosives who should be controlled by other regulations.

Any contractor regularly engaged in activities within an explosives area should be classed as explosives area support workers.

4.2 Explosives area support workers (EASW)

EASW do not physically work on explosives but are located in their vicinity on a regular or occasional basis as part of their job. Similarly, establishment staff such as security guards should also be classed as EASW. To this end, these groups should receive specific training in order to carry out their tasks safely.[3]

4.3 Head of the establishment and post holder duties (LEVEL 1)

The Head of Establishment, in this particular IATG module, shall be responsible for overall safety in the establishment, including assessing risks, composing safety cases, and control and protection of establishment and contractors' staff and any visitors. The post holder may delegate some of these duties to a nominated, competent staff member but the post holder still retains ultimate responsibility. The duties listed below are not exhaustive but rather indicate the level of control required to ensure that a safe system of work is in place and that a safe working environment is maintained.

4.3.1 Site plan

The head of the establishment shall be responsible for the initial production and updating of two copies of a site plan showing all licensed potential explosion sites (PES) and their inhabited building distances (IBD). The post holder should keep one copy and give the other to the appropriate national authority property management organisation and its contracting staff.

This highlights the need to protect and control contractors inside the IBD. This in turn minimises the risks to the contractors and the possibility of their activities hazarding the explosives in a PES by highlighting the requirement early in the contract tendering process.

4.3.2 Explosives licenses

If necessary, the head of establishment should apply to the national technical authority for non-standard explosives licences or letters of authority to cover the period of any work being undertaken in the establishment.

[3] See IATG 06.10 *Control of explosives facilities*.

4.3.3 Safety briefing and permits to work (LEVEL 2)

The head of establishment shall be responsible for the provision of explosives safety briefs on the PES and areas being worked on. An example of such a brief is at Annex C.

The head of establishment shall also be responsible for the issuing of permits to work (PTW). This document should be drafted and then submitted to the head of the establishment or appointed representative (see Clause 4.3). The document should specify the tools and other equipment that the contractor needs to use and should also detail exactly what work is required. An example is at Annex D and a suggested national authority checklist is at Annex E. This PTW shall be withdrawn immediately if its conditions are not complied with or when explosives safety has been compromised.

4.3.4 Other duties

Other duties of the head of establishment should include:

a) providing the contractor and contractor's staff with any information or advice necessary to ensure that explosives safety is not compromised; and

b) assessing if any monitoring of contractor's staff is required and arranging this monitoring. If necessary, a safety monitor should be appointed and provided with specific written terms of reference (TOR). The task of the monitor is explained in para 4.4.

4.4 Role of the safety monitor (LEVEL 1)

The safety monitor shall be a competent person and should be appointed by the head of the establishment or the appointed representative. The safety monitor should be familiar with working in the area being worked on in order to provide the contractor and contractor's staff with any information or advice deemed necessary to ensure explosives safety. Advice should be sought from the head of the establishment or the appointed representative if the monitor feels that safety or security is threatened. The monitor shall not enter into dispute with the contractor or the staff but refer them up the chain of command.

The monitor shall:

a) make sure that he or she is recognised by all of the contractor's staff;

b) ensure that contractor's staff comply with all safety precautions detailed in the PTW;

c) report immediately to the head of the establishment or the appointed representative any activity by contractor's staff that may compromise explosives safety;

d) initiate evacuation procedures for contractor's staff in the event of a hazardous incident;

e) gather contractor's staff at the designated muster point and report any missing persons to the emergency services and to the head of the establishment or appointed representative; and

f) obtain guidance from the head of the establishment or appointed representative if he or she is unsure of any aspect of his or her duties.

5 Major works (LEVEL 2)

New projects or major modifications in or near explosives facilities may affect both storage and processing capabilities by compromising their explosives licences. This may result in the necessity to relocate stocks and a relicensing operation in order to identify the new explosive licence limits.[4] The term 'major works' encompasses any repair, refurbishment, modification or new construction activities that cannot be classed as minor works (see Clause 6).

5.1 Risk assessment

Three categories of risk are associated with major works in an explosives facility and they should be based on quantity distances and the location of contractor's staff. These distances are classified as:

a) outside the IBD of a PES;

b) between the IBD and the public traffic route distance (PTRD). For Hazard Division (HD) 1.1 this is recommended to be $14.8Q^{1/3}$ or the applicable minimum from a PES; and

c) within the PTRD. For HD 1.1 this is recommended to be $14.8Q^{1/3}$ or the applicable minimum from a PES.

The IBD or PTRD shall be calculated based on the actual net explosive quantity (NEQ) expected to be present in the PES during the period of work.

5.1.1 Outside the IBD

Contractor's staff outside the IBD of a storage PES may work without any restrictions being placed upon them.

5.1.2 Between the IBD ($22Q^{1/3}$) and the PTRD ($14.8Q^{1/3}$)

If contract staff need to work in this area, then the building NEQ should be reduced to a minimum. However, if this is not reasonably practicable then the number of staff and the task duration shall be kept to a minimum.

Annex F is a list of tables detailing the number of contractor's staff and the task duration that should be allowed. It also provides an explanation of the scaled distance concept and its application to various circumstances. The head of the establishment may accept the risk of personnel working within this distance if:

a) the PES and its contents are inspected for explosives safety by a competent person before contractor's staff are allowed within the IBD of the PES;

b) this check is carried out every working day while contractor's staff are on-site;

c) all buildings accessed during the previous day are inspected and a record of these inspections is kept;

d) the PES contains only properly qualified explosives or in-service munitions;

e) handling and processing of explosives at the PES is kept to as low as reasonably practicable during the time that contractor's staff are on site;

f) an explosives safety brief is given and a permit to work system is in place (see below); and

g) a monitoring system is in place prior to the commencement of work (see below).

[4] See IATG 02.20 *Quantity and separation distances*.

5.1.3 Within the PTRD

This situation presents a higher risk level and the numbers of contractor's staff, scaled distance and task duration as described in Annex E shall be important factors in determining risk acceptance.

Where reasonably practicable, the PES should be emptied, the NEQ reduced, or stocks moved to store less hazardous natures in that particular PES. Should the number of contractors and the task duration fall within the tables at Annex E then the head of the establishment may accept the risk after fully assessing the risks in a safety case and ensuring that the risk is as low as is reasonably practical (ALARP)[5]. Multiple groups of contractors however should require the use of the tables at Annex G.

5.1.3.1 Contractors staff numbers outside those permitted by Annex C tables

Should the number of contractors or task length be outside the scope of the appropriate table in Annex F then the national technical authority shall be consulted, and they should order a quantitative risk assessment (QRA). The IATG software package will assist in this process.

The safety case produced by the establishment should outline the need for the proposed work to be undertaken, how the work will be carried out and the ALARP measures that will be introduced and enforced. If the national authority is satisfied that the risk is tolerable and ALARP they should issue a comprehensive and conditional letter of authority detailing the basis for its approval. The maximum number of contractor's staff permitted at the work site should be specified.

5.1.3.2 Specific ALARP measures

The routine handling of explosives within the PTRD of the contractor's site should not be permitted if reasonably practicable. However, if this proves not to be the case then all PES within 270m minimum distance of an active contractor area should cease all work and remain closed. All movement of explosives should be re-routed as far away from the contractor's site as is reasonably practicable.

5.1.3.3 Quantitative risk assessment (QRA) [7]

A QRA should be carried out before any major work is undertaken and where large numbers of contractor's staff are to be employed within the PTRD of a PES. The societal risk should be the major influencing factor in the QRA. If a QRA study already exists, it may be possible to extrapolate the societal risk calculations and a completely new QRA should not be necessary. The QRA should take note of all the workers in the area, including those engaged in routine operations and maintenance and all PES that contribute to the risk. It is vitally important that the QRA should be based on the maximum NEQs that will be present during the contract period as the use of authorised limits may present a greater risk than actually exists.

6 Minor Works (LEVEL 1)

These can be defined as those tasks that are not major works but are routinely carried out, such as electrical testing, grass cutting and so forth. This work should ideally be carried out when no explosives activities such as movements or processing are being undertaken but this is often impractical. However, routine maintenance work should be temporarily suspended at times when explosives activities are briefly raised to a significantly higher level than is the norm.

[5] See IATG 02.10 *Introduction to risk management principles and processes*.

6.1 One–off tasks

However, there may be occasions when work of a minor one-off nature, involving contractors other than those already regularly on-site, is necessary. It is often not possible or practicable to train these personnel and therefore the head of the establishment or his or her appointed and nominated representative may allow them to work but should ensure that:

a) the number of the contractor's staff exposed to explosives is set at the absolute minimum;

b) the work being undertaken should not take more than five working days;

c) the work is not hot i.e. it does not involve the generation of heat or sparks within a PES;

d) a risk assessment is carried out and the work is perceived as presenting an insignificant risk to the PES contents;

e) it is not reasonably practicable to conduct the work while the PES is empty; and

f) the risks to contractor's staff are shown to be as low as is reasonably practicable (ALARP).

6.2 Staff numbers and length of task

The total number of EASW and contractor's staff employed on minor works should be carefully monitored and controlled in order to minimise the total numbers exposed to a single potential explosives event. If a task is planned to take longer than 5 days then the national authority should be consulted to ascertain if the work is covered within the spirit of the arrangements at Clause 6.1 or if the work should be re-classified as major works.

7 Additional safety requirements

Before work commences the head of the establishment or appointed representative shall ensure that the contractor and contractor's staff have been given an explosives safety brief (including an explanation of demarcated work areas) and possess a valid and authorised PTW. In the case of routine work these documents should form part of the establishment's standing operational procedures (SOP).

7.1 Working in an Explosive Storage Area (ESA) (LEVEL 1)

The following conditions shall apply when contractor's staff work inside an ESA but not actually on or within a PES:

A) work areas shall be clearly defined on a suitable site map;

B) the handling, movement and processing of explosives in the site shall be reduced to a minimum;

C) contractor's work should be stopped during high levels of explosives activities and the contractor's staff should, if appropriate, leave the explosives area;

D) if electrical equipment which does meet the requirements of IATG 05.40 *Safety standards for electrical installations,* or vehicles or MHE do not meet the requirements of IATG 05.50 *Vehicles and mechanical handling equipment (MHE) in explosives facilities*, additional firefighting precautions advised by the establishment fire officer should be imposed; and

E) all waste and flammable products shall be quickly moved outside the ESA and shall be a minimum of 25m from any PES.

7.2 Working on or in a PES (LEVEL 1)

The following additional safety measures should be enacted:

a) all explosives except for those in HD 1.4 in their approved packaging shall be removed from the PES if reasonably practicable; but

b) explosives from compatibility groups (CG) A, H, J, K or L, detonators in CG B, bulk propellant charges in CG C, or bulk explosives in CG D shall be removed from any PES to be worked on or in;

c) areas within the PES in which the contractor's staff will work shall be demarcated by a barrier, hazard warning tape or similar means;

d) walls, fixtures and fittings, etc, that require repair shall be inspected and cleaned if necessary, to ensure that no explosives contamination is present. This shall be carried out before the commencement of work;

e) the handling, movement or processing of explosives within the PES shall be forbidden and work of this nature at adjacent PES be reduced to ALARP levels;

f) activity in the PES which could generate flammable or explosive vapours or dust is to be prohibited; and

g) before any electrical work is undertaken on any PES electrical system, including replacement of light bulbs, the main electrical supply to the building shall be isolated.[6]

[6] See IATG 05.40 *Safety standards for electrical installations*.

Annex A
(normative)
References

The following normative documents contain provisions, which, through reference in this text, constitute provisions of this module. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this module are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO maintain registers of currently valid ISO or EN:

a) IATG 01.40 *Glossary of terms, definitions and abbreviations*. UNODA;

b) IATG 01.50 *UN Explosive hazard classification system and codes*. UNODA;

c) IATG 02.10 *Introduction to risk management principles and processes.* UNODA;

d) IATG 02.20 *Quantity and separation distances*. UNODA;

e) IATG 02.30 *Licensing of explosives facilities*. UNODA;

f) IATG 05.40 *Safety standards for electrical installations*. UNODA;

g) IATG 05.50 *Vehicles and mechanical handling equipment (MHE) in explosives facilities.* UNODA; and

h) IATG 06.10 *Control of explosives facilities*. UNODA.

The latest version/edition of these references should be used. The UN Office for Disarmament Affairs (UNODA) holds copies of all references[7] used in this guideline and these can be found at: www.un.org/disarmament/un-saferguard/references. A register of the latest version/edition of the International Ammunition Technical Guidelines is maintained by UNODA, and can be read on the IATG website: www.un.org/disarmament/ammunition. National authorities, employers and other interested bodies and organisations should obtain copies before commencing conventional ammunition stockpile management programmes.

[7] Where copyright permits.

Annex B
(informative)
References

The following informative documents contain provisions, which should also be consulted to provide further background information to the contents of this guideline:[8]

a) AASTP-1, Edition B, Version 1. *NATO Guidelines for the Storage of Military Ammunition and Explosives.* NATO Promulgation Organization (NSO). December 2015. http://nso.nato.int/nso/nsdd/listpromulg.html; and

b) DSA03.OME part 2 provides for the safe storage and processing of Ordnance, Munitions and Explosives (OME). UK MOD. November 2020.

The latest version/edition of these references should be used. The UN Office for Disarmament Affairs (UNODA) holds copies of all references[9] used in this guideline and these can be found at: www.un.org/disarmament/un-saferguard/references. A register of the latest version/edition of the International Ammunition Technical Guidelines is maintained by UNODA, and can be read on the IATG website: www.un.org/disarmament/ammunition. National authorities, employers and other interested bodies and organisations should obtain copies before commencing conventional ammunition stockpile management programmes.

[8] Data from many of these publications has been used to develop this IATG.

[9] Where copyright permits.

Annex C
(informative)
Explosives safety brief format

This brief format is for guidance only and other information may need to be included. It is suggested that a brief is produced for each PES and held centrally for issue to contractors and also be held by duty staff for issue to contractors for out-of-hours emergencies.

C.1 Introduction

The work that you have been authorised to undertake is within or near a building containing explosives. You and your employees shall therefore take heed of the following information and instructions.

C.2 Health, safety and environmental concerns

You will receive a separate brief on these topics.

C.3 Explosives Hazard

In the unlikely event of a hazardous incident involving explosives occurring there will be a risk from blast, fragments, radiant heat either individually or in a combination. An explosion may cause severe structural damage and its effects would be proportionate to the amount of explosives involved in the incident.

These effects are limited by the amount of explosives the facilities are licensed to hold but injury and death are possible consequences of an explosive event. Heavy debris may be projected from the building in which the explosion occurs, and the propagation of fire is highly likely. Persons other than those directly working with explosives may be involved. However, it must be emphasised that as a consequence of the limitations placed upon your activities there is a very low probability of any hazardous incident occurring involving explosives. Some working methods adopted by a contractor may increase the risk of an explosion and restrictions will be in place to minimise these risks to a tolerable level.

The nearest Potential Explosion Site to your work area is ....., and it has a separation distance of ..... metres.

Before you begin work, you are to obtain a Permit-to-Work. In addition, you, the Contractor shall ensure that all of your employees to be used on this task have received an Explosives Safety Brief before work at the site commences.

In the event of an incident, (Establishment).....has a disaster plan which will be implemented. Personnel trained in firefighting, rescue and medical facilities are available in the establishment.

C.4 The head of the establishments' explosives safety representative

This establishment staff member will brief you on the location of the explosives facilities and the safety procedures to be adopted should there be an incident. In addition, the explosives safety representative will be responsible for liaising on all safety matters between the work site manager or foreman and the establishment. The explosives safety representative shall have access to the work site as and when required and may immediately suspend all work if it is considered that the safety of the work site or any explosives is being jeopardised.

C.5 Safety Monitor

A safety monitor may be appointed to escort and observe you. This is to ensure your working practices do not increase the risk to, or from, any explosives. The monitor will report any situations or activity considered to compromise explosives safety. In the unlikely event of a hazardous incident occurring, the monitor will take responsibility for initiating evacuation procedures.

C.6 Permits to Work (PTW)

Before starting any work, you should be in possession of a PTW. If you do not have a permit, no working is allowed.

C.7 Work Site Access

The site where you will be working is within an explosives facility and therefore the following additional safety restrictions will apply:

A) Everyone entering the explosives facility shall be in possession of a current pass issued by

……

B) Each person entering an explosives area will be issued with a disc or tag. These are used as a control measure so that, in the event of an incident, the number of personnel in the area is known. They shall be retained by and on the person to whom they are issued and returned to the issuing point when leaving.
C) Prohibited articles such as cigarettes, tobacco or any other smoking material, or any form of ignition, are not to be taken into the area. Radio transmitters including portable telephones and pagers or any battery-operated equipment are not normally permitted within the area without special authority.
D) All persons and vehicles are liable to be searched on entering or leaving the area.
E) Only the tools and appliances authorised on the PTW are allowed in the area.
F) Refuelling of vehicles or other equipment in the area is not permitted unless specific authorisation has been given by the explosives safety representative.
G) Only the minimum repairs, authorised by the explosives safety representative, to a defective vehicle or appliance to enable that vehicle or appliance to be moved outside the area are permitted.
H) All personnel are to be briefed on the fire regulations and precautions that are to be observed.

C.8 Contractor's responsibilities

You, the contractor, shall be responsible for the following:

A) Ensuring that the work is completed and the work site vacated in the minimum reasonable practical time and in any case before the date stipulated on the PTW. Only the numbers of personnel stipulated on the PTW are permitted to be at the work site at any one time.
B) Ensuring that all waste and flammable products are promptly removed to an area which is outside the explosives area or/and at least 25 metres from any explosives facility or any other distance stipulated by the explosives safety representative.
C) Providing the explosives safety representative with all appropriate health and safety information relevant to the contract work.
D) Detailing to the explosives safety representative all of the work procedures that will be adopted and the tools and equipment that will be required.
E) Providing a list of individually named contractor's staff on site each working day to the explosives safety representative.
F) Informing your employees of any conditions of work, including safety procedures imposed by the contract and the PTW.

C.9 Emergency services

If you require emergency assistance you must:

DIAL FOR POLICE, FIRE AND MEDICAL EMERGENCY ASSISTANCE. The telephone number is …….

C.10 Evacuation Procedure

In the unlikely event of a hazardous incident involving explosives, you and your employees are to evacuate the site to the designated assembly area, which is.....

Your monitor or the explosives safety representative will co-ordinate the evacuation and take a roll call to establish if any personnel are missing; details of any missing personnel shall be reported to the emergency services. You and your employees shall comply with any instructions given by the monitor, the explosives safety representative, or the emergency services.

C.11 Conclusion

The above requirements are laid down for the safety of personnel and property and it is essential that they are understood and complied with. Furthermore, it is pointed out that it is a condition of contract that establishment regulations shall be fully complied with.

Any queries regarding the content of this statement should be addressed to..... or the explosives safety representative who may be contacted at building no ..... or on telephone no .....

Annex D
(informative)
Permit to work (PTW) – suggested format

PERMIT TO WORK **IATG Form 06.60**

Serial Number	
Date	

This Permit-To-Work (PTW) shall only be issued by persons nominated and certified as competent to carry out that function and when the job detailed in Parts 1 and 2 is to be carried out within the Inhabited Building Distance (IBD) or notional IBD of buildings/areas containing explosives. All personnel operating under a PTW shall satisfy themselves that it has been properly issued by a nominated competent person before commencing the task to which it refers.

PART 1 - SITE DETAILS

Establishment	
Site / Section / Location	

This PTW relates only to work in the following area and within the time period stated.

Building Numbers	
System / Equipment (if any)	
Valid (From – To)	

PART 2 - TASK TO BE CARRIED OUT

Describe the task or activity	
Time Period (From – To)	

PART 3 - CROSS REFERENCED PERMITS TO WORK

The following PTWs run concurrent with, or are relevant to this task:

PTW Ser No	Cancel (Date/Time)	Manager's Name	Manager's Signature

PART 4 - TOOLS AND EQUIPMENT

List all tools and equipment authorised for use during the task:

Tools	
Equipment	

PART 5 - HAZARD IDENTIFICATION

Identify all hazards involved with this task. Use a continuation sheet if required.

Hazard	Control Measure

PART 6 - PERSONNEL AND COMPETENCY

Details of personnel nominated to carry out the job:

Name	
Safety Personnel	
Supervisors	
Skill Level	
Safety Competency Required	

PART 7 - STATEMENT BY CONTRACTING OFFICIAL

The job indicated at Part 2 of this PTW is within the IBD or notional IBD of explosives facilities. As such, this PTW is to be passed to the establishment explosives safety representative for a full assessment of risk, disclosure of risk and safety brief as appropriate. **Work is not to commence until all sections of this PTW are completed and agreed.**

Name	
Signature	
Date	

PART 8 - STATEMENT BY EXPLOSIVES SAFETY REPRESENTATIVE

I have carried out a full risk assessment relating to the task identified in Part 2 of this PTW _____/_____. Control measures have been specified which are designed to ensure that safety of personnel is ensured and which must be observed throughout the full period of the task. Only the tools listed at Part 4 are authorised for use. In addition, a Safety Brief has been prepared for issue to the Job Supervisor.

The maximum number of contractors' staff permitted at any one time is:	
The task is to be completed by:	
A non-standard explosives licence	is/is not***** required.
A Letter of Authority	is/is not***** required.

Date of Authorisation	
Name	
Signature	
Date	
Tel	

PART 9 - STATEMENT BY THE JOB SUPERVISOR

I certify that the persons nominated at Part 6 of this PTW ____/____ are competent to undertake the work defined in the work method statement attached to this PTW and I understand that it is my responsibility to supervise the work through to its completion.

I am in possession of the Safety Brief relating to the task and I undertake to instruct each and every person identified at Part 6 of this PTW of the contents.

I understand that:

The maximum number of contractors' staff permitted at any one time is:	
As indicated at Part 2 and Part 8 of this PTW Work on this task is to cease by:	
No further work may be carried out, beyond that necessary to contain an emergency, until a new PTW has been authorised and issued.	

Name	
Signature	
Position Held	
Date	
Time	

PART 10 - AUTHORITY TO PROCEED BY EXPLOSIVES SAFETY REPRESENTATIVE or BUILDING CUSTODIAN

I declare that the workplace identified at Part 1 of this PTW _____/_____ has been made as safe as reasonably practicable by measures identified at Part 5 with reference to the listed hazards and their control measures, together with any additional limitations imposed by a non-standard explosives licence, Letter of Authority and/or the work method statement. I further declare that all other PTWs that relate to or interact with the work identified in this permit have been cross referenced at Part 3 of the respective PTWs.

I understand that if the task has not been completed within the time period defined in Part 2, no further activity can take place until a new PTW has been issued and authorised.

The safety monitor allocated to this task is:

Safety Monitor Name	
Tel	
Authority Name	
Signature	
Position Held	
Date	
Time	

PART 11 - SUSPENSION OF WORK CERTIFICATE - JOB SUPERVISOR

The task identified at Part 2 of this PTW _____/_____ has been suspended. Materials and equipment* have/have not been removed from the site. All personnel have left the work site and are accounted for. I understand that no access to the work site is permitted until a new PTW has been issued and that warning signs/barriers considered necessary have been posted.

Name	
Signature	
Position Held	
Date	
Time	

PART 12 - CONFIRMATION OF COMPLETION OF WORK BY THE JOB SUPERVISOR

I confirm that the task indicated at Part 2 of this PTW has been completed, that all tools equipment and personnel are removed from the site and that the site is safe and ready for normal activities to resume.

Name	
Signature	
Position Held	
Date	
Time	

PART 13 - CONFIRMATION OF THE WORK COMPLETION BY SITE MANAGER/BUILDING CUSTODIAN

* I confirm that the work indicated at Part 2 of this PTW ____/____ has been completed, all tool and contract personnel have left the site, and the site is safe and ready for normal activities to resume. This PTW is now cancelled.

* The work identified at Part 1 and 2 of this PTW ____/_____has been suspended. Before any further work can continue, a new PTW is to be issued.

Name	
Signature	
Position Held	
Date	
Time	

PART 14 - CERTIFICATE OF WORK TRANSFER IN CASE OF NON-COMPLETION OF A TASK. (To be completed by a competent person in the event Part 11 is endorsed)

I certify that the outstanding work remaining to complete the task identified at Part 2 has been transferred to PTW ____/____; and that no further work will be carried out until that PTW has been authorised.

Name	
Signature	
Position Held	
Date	
Time	

PART 15 - RECORD OF CROSS REFERENCED PTW CANCELLATIONS (To be signed only by a competent person)

All necessary actions arising from or associated with the PTW have been completed. This PTW is cancelled. The PTWs listed at Part 3 have been amended to reflect this cancellation.

Name	
Signature	
Position Held	
Date	
Time	

Annex E
(informative)
Permit to work (PTW) – suggested checklist

The purpose of this checklist is to assist national authority units to draw up appropriate PTW in line with their national legal requirements. Each permit is different and should be viewed as such – it is task specific and repetitive tasks should ideally form part of the establishment's standard operating procedures (SOPs).

E.1 General

A) Does the current permit procedure in force satisfy all of the legal requirements applying to the establishments' explosives facilities?

B) Are the types of work, jobs and areas where permits are required clearly defined and known to all concerned?

C) Is it clear to whom the permits apply?

D) Is it clearly laid down how permits shall be obtained for specific tasks?

E) Are the personnel who issue permits properly authorised and competent to undertaken the duties required of them?

E.2 Issuing procedures for PTW

A) Does the risk to contractor's employees from the explosives fall within the tolerable level as prescribed at Annex F?

B) Are the operations to be carried out permitted by national explosives regulations?

C) Have adequate firefighting arrangements been made?

D) Have the establishment's health, safety and environmental orders been given to and explained to the contractor?

E) Is there a clear system for requiring a stoppage of working and has it been explained to the contractor?

F) Does the permit procedure contain clear orders about how the task shall be controlled or stopped should a major or establishment emergency occur?

G) Does the permit specify clearly the work to be done?

H) Does the permit specify clearly to whom it is issued?

I) Must the recipients sign the permit or other document to show that they have read the permit and understood the conditions contained in it?

J) Does the procedure provide both for the recipient to retain the permit and for a record of 'live' permits to be maintained at the point of issue?

K) Does the permit specify clearly a time limit for expiry of the permit or for its renewal?

L) Does the permit specify clearly the building or geographical area to which work must be limited?

M) Is a 'hand back' signature required, as appropriate, when the task is complete?

N) Is there a system to review all permits at regular intervals?

O) Is there a checking system that ensures the requirements of the permits are being followed?

P) Is there an incident reporting procedure for reporting any occurrences that have arisen?

Q) Does the permit list the tools and equipment that may be used by the contractor and any conditions imposed upon their use?

R) Does the permit detail the procedure to be followed should explosives be discovered by a contractor?

S) Does the permit cover the special procedures and conditions of work to be used by the contractor if the contractor is working in or on a PES containing explosives or contaminated with explosives?

Annex F
(informative)
Number of contractors' staff permissible within the IBD of a PES

The information contained in this annex covers PES storage of Hazard Division (HD) 1.1, 1.2 and 1.3 and the number of contractors who may be permitted to work inside the IBD of the PES and the length of time work is permitted.

F.1 Scaled distance

In the tables, there is a column marked 'Scaled distance from the PES'. The calculation of scaled distance varies between HD and is based on the NEQ stored. Each column shows the scaled distance Net Explosive Quantity (NEQ) calculation to be used but for clarity they are:

A) HD 1.1 - $NEQ^{1/3}$

B) HD 1.2 - $NEQ^{0.18}$

C) HD 1.3 - $NEQ^{1/3}$

Scaled distance is defined as the actual distance divided by the NEQ calculation for the actual HD being stored e.g. for HD 1.1,

$$\text{scaled distance} = \frac{\text{actual distance}}{NEQ^{1/3}}$$

When using the tables, the following rules shall apply:

A) If calculating contract periods, round up to the nearest value in the tables.

B) For scaled distances, round down to nearest value in the tables.

F.2 Calculation examples

Example 1. A work site is located 100 m from a PES containing a NEQ of 10,000 kg of HD 1.1. The scaled distance is therefore

$$\frac{100}{(10{,}000)^{1/3}} = \frac{100}{21.54} = 4.64 \text{ and when rounded down} = \mathbf{4.5}$$

Table F.1 identifies that 10 people may be employed at the site for 4 months.

Example 2. A contractor wants to employ 8 people for 18 weeks on a site 100 m from a PES containing 10,000 kg HD 1.1. Table F.1 shows that 8 people employed for 18 weeks, which is 5 months when rounded up, provides a scaled distance of 4.5.

$$NEQ^{1/3} = \frac{\text{actual distance}}{\text{scaled distance}} = \frac{100}{4.5} = \mathbf{22.2}$$

The actual NEQ which should be stored should be no more than 22.2^3 which is 10,950 kg so if the NEQ of the PES does not exceed 10,950kg, the work may be authorised without reference to the national technical authority.

HAZARD DIVISION 1.1										
Scaled distance from PES ($NEQ^{1/3}$)	**Period of Contract / Work in Months**									
	12+	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**≤ 3**
14.5	75	90	105	120	130	140	150	200	250	300
14.0	65	72	99	105	114	123	132	175	217	260
13.5	55	68	70	90	98	106	114	150	184	220
13.0	45	57	66	75	82	89	96	125	151	180
12.5	35	46	50	60	66	72	88	100	118	140
12.0	30	35	43	45	50	55	60	74	87	100
11.5	26	30	36	39	43	48	53	66	78	90
11.0	22	26	30	33	36	41	45	58	69	80
10.5	18	22	25	27	29	34	37	49	60	70
10.0	15	17	19	21	24	27	30	40	50	60
9.5	14	15	19	19	22	25	28	37	46	56
9.0	13	14	15	17	20	23	26	35	42	52
8.5	12	13	14	16	18	21	24	32	39	48
8.0	11	12	13	15	17	19	22	29	36	44
7.5	10	11	12	14	16	18	20	26	33	40
7.0	8	9	10	12	14	15	16	21	27	36
6.6	6	8	8	10	11	12	13	17	21	32
6.0	5	6	7	8	9	9	10	13	16	20
5.5	5	6	6	7	8	8	9	11	14	16
5.0	4	5	5	6	6	7	8	10	12	13
4.5	4	4	4	5	5	6	7	8	10	10
≤ 4.0	3	3	3	4	4	5	5	6	8	10

Table F.1: Scaled distances and contract periods for HD 1.1.

HAZARD DIVISION 1.2[10]										
Scaled distance from PES ($NEQ^{0.18}$)	**Period of Contract / Work in Months**									
	12+	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**≤ 3**
53	75	90	105	120	130	140	150	200	250	300
50	55	68	79	90	98	106	114	150	184	220
45	35	46	53	60	66	72	88	100	118	140
40	22	26	30	33	36	41	45	58	69	80
35	14	15	17	19	22	25	28	37	46	56
30	11	12	13	15	17	19	22	29	36	44
25	8	9	10	12	14	15	16	21	27	36
20	5	6	6	7	8	8	9	11	14	16
15	4	4	4	5	5	6	7	8	10	10
≤ 10	3	3	3	4	4	5	5	6	8	10

Table F.2: Scaled distances and contract periods for HD 1.2.

HAZARD DIVISION 1.3 (for larger scaled distances use Table 1)										
Scaled distance from PES ($NEQ^{1/3}$)	**Period of Contract / Work in Months**									
	12+	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**≤ 3**
4.3	75	90	105	120	130	140	150	200	250	300
4.0	55	68	79	90	98	106	114	150	184	220
3.5	26	30	35	39	43	48	53	66	78	90
3.0	15	17	19	21	24	27	30	40	50	60
2.5	12	13	14	16	18	21	24	32	39	48
2.0	6	8	8	10	11	12	13	17	21	32
≤ 1.0	3	3	3	4	4	5	5	6	8	10

Table F.3: Scaled distances and contract periods for HD 1.3.

[10] If arrangements can be made to evacuate safely, effectively and quickly all personnel at risk inside Scaled Distance 53 within a period not exceeding 15 minutes then the above guidelines may be waived by the head of the establishment.

Annex G
(informative)
Multiple groups, different scaled distances and multiple PES

G.1 Introduction

The following is a simple and straightforward method of calculating the effects of differing groups of workers working inside the Inhabited Building Distance (IBD) of a PES at the same time. In effect the equations work out the total of Contractor Exposed Months (CEM) subjected to a particular explosive hazard. As with a single group of contractors the scaled distance, the actual distance, the Net Explosive Quantity (NEQ) that is being stored and the Hazard Division (HD) being stored all affect the CEM. The NEQ calculations are HD based and are as follows:

A) HD 1.1 - $NEQ^{1/3}$

B) HD 1.2 - $NEQ^{0.18}$

C) HD 1.3 - $NEQ^{1/3}$

G.2 Example

Two different groups of contractors are exposed to a potential hazard by the same PES at the same time but at different Scaled Distances (SD). The total exposure to the PES must be a sum of the two sites personnel's exposure. The PES is filled with HD 1.1. Assume the two groups of contractors are working at different locations and at different distances from the PES. A conversion factor (CF) will be required to allow the two to be compared.

$$\text{Scaled Distance 1} = \frac{\text{Range 1}}{NEQ^{1/3}} \qquad \text{Scaled Distance 2} = \frac{\text{Range 2}}{NEQ^{1/3}}$$

In this example, we will assume SD1 to be 10 and SD 2 to be 7. To derive the CF, it will be necessary to work out two average constants that are the products (C_1 and C_2) of the duration of contract and maximum number of persons permitted to be exposed (Annex F, Table F.1 for HD 1.1). This is the maximum permissible 'contractor exposed months' (CEM). To do the calculation in 'contractor exposed weeks', multiply by 4.3.

No of months	**12+**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**≤ 3**
CEM	12x15 **=180**	11x17 **=187**	10x19 **=190**	9x21 **=189**	8x24 **=192**	7x27 **=189**	6x30 **=180**	5x40 **= 200**	4x50 **=200**	3x60 **=180**

$$C_1 = \frac{180 + 187 + 190 + 189 + 192 + 189 + 180 + 200 + 200 + 180}{10} = \frac{1887}{10}$$

C_1 = 189

No of months	**12+**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**≤ 3**
CEM	12x8 **=96**	11x9 **=99**	10x10 **=100**	9x12 **=108**	8x14 **=112**	7x15 **=105**	6x16 **=96**	5x21 **=105**	4x27 **=108**	3x36 **=108**

$$C_2 = \frac{96 + 99 + 100 + 108 + 112 + 105 + 96 + 105 + 108 + 108}{10} = \frac{1037}{10}$$

C_1 = 104

In order to compare or add together the CEMs at the SDs use the following equation:

$$\text{Total CEMs} = \text{CEM at SD 1} + \left(\text{CEMs at SD 2} \times \frac{189}{104}\right)$$

So the CF to compare CEMs at SD 2 with those at SD 1 is 1.82.

This system allows the comparison of personnel exposure at different SDs. However, the total CEM should not exceed that allowed by the respective tables at Annex F.

Amendment record

Management of IATG amendments

The IATG are subject to formal review on a five-yearly basis. This does not preclude amendments being made within these five-year periods for reasons of operational safety, efficacy and efficiency or for editorial purposes.

As amendments are made to this IATG module they will be given a number, and the date and general details of the amendment will be shown in the table below. The amendment will also be shown on the cover page of the IATG by the inclusion of the amendment number and date.

As the formal reviews of each the IATG module is completed, new editions will be issued. Amendments will be incorporated into the new edition and the amendment record table cleared. Recording of amendments will then start again until a further review is carried out.

The most recently amended, and thus extant, IATG module is posted on www.un.org/disarmament/ammunition

Number	Date	Amendment Details
0	01 Feb 15	Release of Edition 2 of IATG.
1	31 March 21	Release of Edition 3 of IATG.