MODULAR SMALL-ARMS-CONTROL IMPLEMENTATION COMPENDIUM

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Weapons: Destruction

The Modular **Small-arms-control** Implementation Compendium
MOSAIC
Good practices for safer societies.

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Foreword

What is MOSAIC?

MOSAIC translates into practice the objectives of key global agreements aiming to prevent the illicit trade, destabilizing accumulation and misuse of small arms and light weapons, including:

- the Programme of Action on the illicit trade in small arms and light weapons
- the International Tracing Instrument
- the Firearms Protocol supplementing the UN Convention against Transnational Organized Crime
- the Arms Trade Treaty.

MOSAIC modules are based on good practices, codes of conduct and standard operating procedures that have been developed at (sub-)regional levels. They were developed by the UN, benefitting from the very best technical advice from experts around the world.

MOSAIC is a completely voluntary toolkit.

MOSAIC supports the achievement of the Sustainable Development Goals, including Goal 16 to promote peaceful, just and inclusive societies and its target 16.4 that includes a significant reduction in illicit arms flows.

Who developed MOSAIC?

Governments often call upon the UN system to provide advice and support on issues related to small arms and light weapons control — including on legislative, programmatic and operational matters.

UN agencies decided that the best way to ensure that the United Nations as a whole could consistently deliver high-quality advice and support in response to such requests, was to develop international guidance on small arms and light weapons control, similar to the standards the UN developed in the areas of mine action (International Mine Action Standards – IMAS); disarmament, demobilization and reintegration (Integrated DDR Standards – IDDRS); and ammunition (International Ammunition Technical Guidelines – IATG).

The compendium is the result of a decade of coordinated work within the UN system, involving 24 partner entities with expertise ranging from development and weapons management to gender and public health. An external expert reference group of over 300 specialists, from NGOs to industry, completed the sturdy process of establishing each module.

Who can use MOSAIC?

MOSAIC can be used by any government or organization. Properly basing small-arms control endeavours on MOSAIC modules, reduces the risk of weapons falling into the hands of criminals, armed groups, terrorists and others who would misuse them.

MOSAIC. Good practices for safer societies.

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Introduction

The destruction of illicit and surplus small arms and light weapons constitutes an important element of a comprehensive small arms and light weapons control programme. Destruction is an effective method of reducing the actual number of weapons on the illicit market, as well as the potential supply of weapons to the illicit market. Destruction, in contrast to other methods of disposal such as sale or gift, ensures that small arms and light weapons will not find their way (back) into the illicit market and can thus build confidence in overall efforts to prevent, combat and eradicate their illicit trade.

A weapons destruction programme can involve the destruction of weapons relinquished by the civilian population as part of a weapons collection programme (see MOSAIC 05.40), recovered in crime or identified as being surplus to the requirements of the armed services of a State (see MOSAIC 05.20).

The success of a small arms and light weapons control programme is directly related to the means by which weapons are ultimately disposed of. Programmes that decide upon the final disposal of weapons on an ad hoc basis often find that shortfalls in finance and resources can hamper the destruction process and thereby damage confidence in the programme, as well as in future programmes.

Prior agreement by all parties that collected, recovered or surplus weapons will be disposed of through destruction builds confidence in a small arms and light weapons control programme and can be as important to its success as the political will to initiate the programme in the first place; or the methodology used in recovering weapons or identifying them as surplus.

Weapons destroyed after being collected in a post-conflict setting can send a clear message that war is over and can bring hope to those who are seeking to re-build their lives. Weapons destroyed after being recovered in crime can never again find their way into the hands of criminals. Weapons destroyed after being identified as surplus to national requirements can result in reduced costs to the State associated with their long-term storage, management and security.

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Destruction: Weapons

1 Scope

This document provides guidance on the planning and safe execution of small arms and light weapons destruction activities, as well as on the recovery, recycling and reuse of materials derived from the destruction process.

It is applicable in situations where destruction has been chosen as the method of disposal of small arms and light weapons, including those that have been relinquished as part of a weapons collection programme, recovered in crime or identified as surplus to the requirements of the armed services of a State.

This document does not cover the destruction of small arms or light weapons ammunition. For guidance on the destruction of conventional ammunition, see the International Ammunition Technical Guidelines (IATG 10.10, *Demilitarization and Destruction and Logistic Disposal of Conventional Ammunition*).[1]

2 Normative references

The following referenced documents are indispensable for the application 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.

MOSAIC 01.20, Glossary of terms, definitions and abbreviations

MOSAIC 04.30, Raising awareness of the need for small arms and light weapons control

MOSAIC 05.20, Stockpile management: Weapons

MOSAIC 05.30, Marking and recordkeeping

ISO/IEC Guide 51:1999, Safety aspects – Guidelines for their inclusion in standards

3 Terms and definitions

For the purposes of this document, the terms and definitions given in MOSAIC 01.20, *Glossary of terms, definitions and abbreviations*, and the following apply.

[1] https://unsaferguard.org/

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In all MOSAIC modules, the words 'shall', 'should', 'may' and 'can' are used to express provisions in accordance with their usage in International Organization for Standardization (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 nor 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 United Nations Framework

4.1 General

This document provides practical guidance on the implementation of commitments related to the destruction of small arms and light weapons that are contained in United Nations multilateral instruments related to small arms and light weapons control.

4.2 UN Programme of Action

In the United Nations Programme of Action to Prevent, Combat and Eradicate the Illicit Trade in Small Arms and Light Weapons in All Its Aspects (UN Programme of Action), all UN Member States commit themselves

a) “To establish, or designate as appropriate, national coordination agencies or bodies and institutional infrastructure responsible for policy guidance, research and monitoring of efforts to prevent, combat and eradicate the illicit trade in small arms and light weapons in all its aspects. This should include […] destruction of small arms and light weapons” (section II, paragraph 4);

b) “To ensure that all confiscated, seized or collected small arms and light weapons are destroyed, subject to any legal constraints associated with the preparation of criminal prosecutions, unless another form of disposition or use has been officially authorized and provided that such weapons have been duly marked and registered” (section II, paragraph 16);

c) “To regularly review, as appropriate, subject to the respective constitutional and legal systems of States, the stocks of small arms and light weapons held by armed forces, police and other authorized bodies and to ensure that such stocks declared by competent national authorities to be surplus to requirements are clearly identified, that programmes for the responsible disposal, preferably through destruction, of such stocks are established and implemented and that such stocks are adequately safeguarded until disposal” (section II, paragraph 18);

d) “To destroy surplus small arms and light weapons designated for destruction […]” (section II, paragraph 19);

e) “To develop and implement, including in conflict and post-conflict situations, public awareness and confidence-building programmes on the problems and consequences of the illicit trade in small arms and light weapons in all its aspects, including, where appropriate, the public

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destruction of surplus weapons […], if possible, in cooperation with civil society and non-governmental organizations, with a view to eradicating the illicit trade in small arms and light weapons" (section II, paragraph 20);

f) "To develop and implement, where possible, effective disarmament, demobilization and reintegration programmes, including the effective […] destruction of small arms and light weapons, particularly in post-conflict situations, unless another form of disposition or use has been duly authorized and such weapons have been marked and the alternate form of disposition or use has been recorded, and to include, where applicable, specific provisions for these programmes in peace agreements" (section II, paragraph 21);

g) "To make public national laws, regulations and procedures that impact on the prevention, combating and eradicating of the illicit trade in small arms and light weapons in all its aspects and to submit, on a voluntary basis, to relevant regional and international organizations and in accordance with their national practices, information on, inter alia, (a) small arms and light weapons confiscated or destroyed within their jurisdiction […]" (section II, paragraph 23);

h) "With a view to facilitating implementation of the Programme of Action, States and international and regional organizations should seriously consider assisting interested States, upon request, in building capacities in areas including the […] destruction of small arms and light weapons […]" (section III, paragraph 6);

i) "Upon request, States and appropriate international or regional organizations in a position to do so should provide assistance in the destruction or other responsible disposal of surplus stocks or unmarked or inadequately marked small arms and light weapons" (section III, paragraph 14);

4.3 UN Firearms Protocol

States party to the Protocol against the Illicit Manufacturing of and Trafficking in Firearms, Their Parts and Components and Ammunition, supplementing the United Nations Convention against Transnational Organized Crime (UN Firearms Protocol) are required to

a) "adopt, within their domestic legal systems, such measures as may be necessary to prevent illicitly manufactured and trafficked firearms, parts and components and ammunition from falling into the hands of unauthorized persons by seizing and destroying such firearms, their parts and components and ammunition unless other disposal has been officially authorized, provided that the firearms have been marked and the methods of disposal of those firearms and ammunition have been recorded" (Article 6.2);

4.4 International Tracing Instrument

In the International Instrument to Enable States to Identify and Trace, in a Timely and Reliable Manner, Illicit Small Arms and Light Weapons (International Tracing Instrument), all UN Member States commit themselves to

a) "ensure, that all illicit small arms and light weapons that are found on their territory are uniquely marked and recorded, or destroyed, as soon as possible. Pending such marking, and recording in accordance with section IV of this instrument, or destruction, these small arms and light weapons will be securely stored" (paragraph 9).

5 General Principles

Destruction shall be the preferred method of disposal of small arms and light weapons that have been

a) relinquished as part of a weapons collection programme;

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b) recovered in crime;

c) otherwise designated as illicit; or

d) identified as being surplus to the requirements of the armed services of a State;

Destruction shall render small arms and light weapons, as well as their associated components, permanently inoperable.

Weapons destruction should form an integral part of a broader small arms and light weapons control programme. Adequate financing of the entire destruction process should be secured at the outset of a destruction programme.

In situations in which weapons are to be immediately destroyed as part of a formal disarmament process in a post-conflict environment, all stakeholders in the process shall agree that collected weapons will be destroyed.

6 Planning

6.1 Planning sequence

The following sequence, which is explained in detail below, should be followed when planning the destruction of small arms or light weapons:

a) establish the type and quantity of weapons to be destroyed;

b) obtain formal authorization for destruction from the appropriate government authority, including authorization for a public destruction ceremony, if one is foreseen;

c) consider the environmental impact of the planned destruction (see Annex B, Table B.2);

d) select an appropriate destruction location;

e) examine and select the most suitable destruction method (see Clause 7.5 and Annex B);

f) develop a formal risk management process (see Annex A);

g) consider recovery, recycling and reuse options for the resultant scrap metal;

h) establish the financial costs of destruction;

i) develop a security plan;

j) develop a safety plan;

k) develop Standard Operating Procedures;

l) develop a media plan as part of a small arms and light weapons awareness programme (usually relevant only in post-conflict and other fragile settings); and

m) invite international observers (usually relevant only in post-conflict and other fragile settings).

6.2 Information requirements

Data on the type and quantity of weapons to be destroyed shall be compiled from the weapons accounting system in use. This data is needed to support the decision-making process regarding the most appropriate destruction method, logistical requirements and required funding.

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6.3 Destruction authority

Formal authority for destruction shall be obtained from the competent government authority, which should certify that the weapons are no longer required as evidence in criminal proceedings and are free from the judicial process.

6.4 Destruction technology and techniques

Annex B presents an overview of technology and techniques that can be used to destroy small arms and light weapons. The following factors should be taken into consideration when choosing between them:

a) the type of weapons to be destroyed;

b) the quantity of weapons to be destroyed;

c) time constraints associated with the destruction process (e.g. externally imposed deadlines);

d) financial considerations;

e) human resources and destruction technology available locally;

f) security and safety considerations;

g) infrastructure available for the transport of weapons;

h) and environmental impact.

6.5 Risk management

6.5.1 Primary hazards

The destruction of small arms and light weapons can be a hazardous activity. Primary hazards – or potential sources of harm – include

a) loaded small arms and light weapons (see Clause 6.8.2 on guidance for safe weapons handling);

b) extreme heat (e.g. during burning and smelting);

c) toxic fumes;

d) power tools and machines used to cut, crush, shred, etc.; and

e) flying fragments of metal (e.g. as a result of crushing, shredding, cutting with a rotary blade, etc.).

These hazards can be increased by

f) inadequately trained destruction personnel; and

g) unsafe procedures during

    1) transportation;

    2) storage; and

    3) physical destruction.

Such hazards present significant but manageable risks (understood as the probability of harm multiplied by the severity of harm).

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6.5.2 Risk assessment

A formal risk assessment shall be conducted during the planning phase. A risk assessment shall:

a) identify and analyse hazards and estimate the risks they pose through the systematic use of available information (i.e., entail a risk analysis); and

b) determine whether a tolerable level of risk has been achieved (i.e., entail a risk evaluation).

The risk assessment should take into account:

b) primary hazards entailed when destroying small arms and light weapons; and

c) factors that can increase hazards during small arms and light weapons destruction (see Clause 6.5.1)

If the risk assessment finds that the actual level of risk is above the level of tolerable risk, action shall be taken to reduce the level of risk before commencing the destruction of any small arms and light weapons (see Clause 6.5.3).

Even when risk reduction activities have diminished risk to a tolerable level, residual risk may remain. All reasonable efforts shall be made to achieve the lowest possible level of residual risk.

6.5.3 Risk reduction

Methods of reducing the risks associated with the destruction of weapons shall include

a) the development and use of standard operating procedures that reflect safe work practices (see Clause 6.10);

b) adequate training for destruction staff on following the standard operating procedures;

c) effective management and supervision of staff;

d) the use of destruction equipment with inherently safe design; and

e) the use of appropriate personal protective equipment.

6.5.4 Further guidance

Annex A contains further guidance on risk management.

6.6 Destruction location

An appropriate destruction location shall be selected. This may be either a permanent destruction facility, a mobile destruction system or another suitable location, depending on logistics and the method of destruction selected (see Clause 7.56.4 and Annex B).

In order to reduce security requirements, the weapons should be destroyed as close as possible to the point of storage or collection.

6.7 Funding requirements

The financial costs of destruction shall be determined and funds should be secured to cover these costs before the commencement of the small arms and light weapons control programme within which the destruction programme is embedded.

The costs of destruction vary widely and are dependent upon the type and quantity of weapons to be destroyed, as well as on the method of destruction chosen. The Destruction Planning Software that

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accompanies this document is an estimation tool that compares various destruction options in terms of their requirements in terms of time and human and financial resources.

Governments that authorize the destruction of small arms or light weapons should provide the funding necessary for doing so. If a government is unable to do so, international cooperation and assistance (financial and technical) should be sought. In such cases, the government that authorizes the destruction should provide a portion of the necessary financial resources (e.g. from its defence/security budget), in accordance with its capacity.

Donors that respond to requests to provide financial support to small arms and light weapons destruction activities should ensure that the destruction costs quoted are realistic and fair when compared with comparable destruction programmes in the same region. In order to ensure this, donors may refer to databases of typical weapon destruction costs that are maintained in some regions.

EXAMPLE THE South Eastern and Eastern Europe Clearing House for the Control of Small Arms and Light Weapons (SEESAC) maintains a database of weapon destruction costs in its region.

Destruction costs may be partly offset by the value of resultant scrap metal (see Clause 8.2).

NOTE Industrial smelters will usually destroy weapons free of charge if they are allowed to keep the resultant molten metal. This is normally a fair exchange.

6.8 Safety

Safety during the destruction of small arms and light weapons shall be the first priority. A safety plan shall be developed and incorporated into the standard operating procedures for the destruction process (see Clause 6.10). The safety plan shall include the following elements:

6.8.1 Occupational health

Destruction staff shall be adequately trained in the safe use of the destruction equipment to be used.

The appropriate safety and occupational health measures shall be used, reflecting the destruction equipment used. This includes the use of appropriate personal protective equipment (e.g. helmets, goggles, hearing protection, gloves, etc).

The destruction location shall be equipped with an adequate number of first aid kits, which shall be prominently displayed.

An adequate number of destruction staff shall be trained in basic first aid, with a focus on treating the types of injuries that may be expected in light of the destruction equipment being used.

6.8.2 Weapons handling

Safety procedures shall be developed for removing weapons from a container prior to physical destruction. Staff shall be trained on these safety procedures and shall follow them. The normal safety procedure for handling a small arm or light weapon is as follows:

a) keep the weapon pointed in a safe direction at all times;

b) engage the safety device, if present;

c) remove the magazine, if present;

d) open the action; and

e) ensure that no ammunition is present in the chamber(s).

Alternatively, appropriately qualified staff may check the safety of weapons prior to loading them into a sealed container for transport to the destruction location. In such cases, a Certificate of Safety shall

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accompany the sealed container to the point of destruction and the integrity of the seal shall be verified before the container is opened.

6.8.3 Action in the event of accidents

A plan shall be developed on actions to be taken in the event of accidents occurring during the destruction process (‘action on accidents’). The detailed ‘action on accidents’ plan shall be commensurate with the injury potential of the destruction equipment being used. The ‘action on accidents’ plan shall provide for

a) on-site first aid and medical care of accident victims;

b) medical evacuation (see Clause 6.8.4);

c) the immediate cessation of destruction operations as a result of certain types of accidents;

d) reporting and investigation accidents; and

e) learning from accidents and taking action to prevent their re-occurrence.

6.8.4 Medical evacuation

A medical evacuation plan shall be developed that ensures that a victim of a serious accident can

a) reach a medical facility with the capacity to treat penetrating trauma within one hour of an accident occurring; and

b) receive appropriate medical care while being transported to the medical facility.

Mobile medical facilities may be used in remote destruction locations.

6.9 Security

In order to minimize the risk of theft, loss or diversion, small arms and light weapons shall be secured during all stages of the destruction process. A security plan shall be developed to ensure the physical security of weapons during their

a) transport to the destruction location; and

b) storage at the destruction location while awaiting destruction.

NOTE For guidance, see MOSAIC 05.20, *Stockpile management: Weapons*.

6.10 Standard Operating Procedures

Standard Operating Procedures shall be developed for all phases of the destruction process. They shall encompass

a) the safety plan (see Clause 6.8), including

    1) safe weapons handling,

    2) required personal protective equipment,

    3) safe operation of the destruction equipment,

    4) action in the event of accidents, and

    5) medical evacuation;

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b) the security plan (see Clause 6.9); and

c) weapons accounting (see Clause 7.4);

6.11 Transparency, awareness-raising and confidence-building

6.11.1 General

Small arms and light weapons earmarked for destruction should be destroyed in a transparent manner; i.e. in a manner whereby the destruction can be verified by independent observers. The transparency of weapons destruction can be used to support

a) confidence- and security-building between States (e.g. in the context of a formal peace agreement, disarmament process or of stockpile surplus reduction); or

b) the engagement of societies in post-conflict peacebuilding or community security initiatives (e.g. in the context of destroying weapons relinquished during a weapons collection programme);

6.11.2 Media coverage

In order to promote transparency, awareness-raising and confidence-building, the Media should be invited to cover the destruction of weapons if this takes place in the context of

a) a formal peace agreement or disarmament process; or

b) a weapons collection programme.

The Media may be invited to cover the destruction of weapons if this takes place in the context of normal stockpile management by State authorities, since this can be a useful regional and international confidence-building measure.

6.11.3 Media plan

A media plan should be developed with the aim of

a) enhancing the transparency of the destruction process;

b) raising awareness of the need for small arms and light weapons control (see MOSAIC 04.30); and

c) building confidence in the small arms and light weapons control programme of which the destruction process forms a part.

NOTE If destruction operations are taking place during a weapons collection programme, media coverage of weapons being destroyed can build the confidence of local communities in the collection process and encourage other to relinquish weapons (see MOSAIC 05.40, *Voluntary collection of small arms and light weapons*).

6.11.4 Independent observers

In addition to media representatives, other independent observers should be invited to observe the destruction of weapons in the context of formal peace agreements, disarmament processes or weapons collection programmes and may be invited to observe the destruction of weapons in the context of normal stockpile management by State authorities. Such independent observers may include representatives of

a) national and local government agencies;

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b) foreign governments supporting the destruction process financially;

c) other foreign governments with a diplomatic presence in the country;

d) regional and international organisations;

e) civil society; and

f) the private sector.

6.11.5 Destruction ceremonies

Small arms and light weapons relinquished in the context of weapons collection programmes conducted in post-conflict or other fragile settings should be destroyed in public ceremonies close to the areas in which they were collected (see MOSAIC 05.40, *Voluntary collection of small arms and light weapons*).

Public destruction ceremonies can have tremendous symbolic power and help build public confidence in small arms and light weapons control efforts and broader security building initiatives. Destruction ceremonies conducted during weapons collection programmes can encourage more people to hand in weapons.

Authorization to hold public destruction ceremonies shall be obtained from a competent government authority and a safety plan shall be developed in accordance with Clause 6.8.

7 Physical destruction

7.1 Destruction sequence

The following sequence, explained in more detail below, should be followed during the physical destruction of weapons:

a) pre-processing operations, which may include weapons accounting (see Clause 7.4) if it is not practicable or desirable to do this at the destruction location;

b) transport of weapons to the destruction location;

c) weapons accounting (if not already done during pre-processing operations);

d) physical destruction of weapons;

e) monitoring and verification of the destruction operation;

f) creation and maintenance of destruction records; and

g) safe and environmentally benign disposal, including through recycling and reuse, of scrap arisings.

7.2 Pre-processing operations

Pre-processing operations may be conducted on weapons prior to their final destruction. These may include

a) normal safety precautions (see Clause 6.8.2);

b) weapons accounting (if not practicable or desirable to do this at the destruction location);

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c) removal of weapon accessories, such as sights, silencers, bayonets, etc.;

NOTE Accessories should be destroyed separately from the weapon.

d) removal of weapon furniture (e.g. plastic or wooden grips, stocks, butts, etc.);

NOTE Weapons to be destroyed by smelting may require the removal of plastic to ensure higher quality scrap metal; or the removal of wood as a safety precaution during smelting.

e) removal of weapon springs prior to cutting; and/or

f) deformation of weapons in one destruction process prior to their movement to the final destruction process.

NOTE Some States require that weapons be deformed or cut prior to smelting. In effect the initial phase of destruction is then classified as a pre-processing operation.

7.3 Transport of weapons

Weapons shall be transported to the destruction location in accordance with MOSAIC 05.20, *Stockpile management: Weapons*.

7.4 Weapons accounting

7.4.1 Information to be recorded

Weapons accounting shall be conducted in accordance with Clause 6 of MOSAIC 05.30, *Marking and recordkeeping*.

At a minimum, the following information on each destroyed weapon shall be recorded in an appropriate database:

a) make;

b) model;

c) calibre;

d) serial number;

e) location of markings;

f) name of manufacturer;

g) country of manufacture;

h) country of import (if the weapon bears an import mark);

i) date of destruction;

j) location of destruction; and

k) agency/organisation carrying out the destruction.

7.4.2 Maintenance of records

Destruction records shall be maintained by

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a) a competent authority of the State (e.g. the National Authority on small arms and light weapons); and

b) the organisation that carried out the destruction.

Destruction records shall be maintained for at least 20 years and should be maintained indefinitely.

7.5 Physical destruction

7.5.1 General

Weapons shall be destroyed in such a way as to render them permanently inoperable. This shall include rendering permanently inoperable

a) the frame or receiver;

b) the barrel; and

c) the slide, cylinder, bolt or breech block.

For weapons destroyed by cutting, a single cut, properly placed, can render inoperable one, more or all of the components set out in (a)-(c) above.

7.6 Monitoring and verification of destruction

The destruction of small arms and light weapons should be monitored and verified by a competent national authority.

8 Recovery, recycling and reuse

8.1 General

The destruction of small arms and light weapons produces waste materials such as metal, wood and plastic. A range of options is available for recovering, recycling and reusing such materials that can generate revenue and produce objects with practical, artistic and symbolic value.

8.2 Scrap metal

Scrap metal resulting from the destruction of small arms and light weapons may be sold and the proceeds used, for example, to offset the costs of destruction.

NOTE Prices for various types of scrap metal vary by country as well as by dealer or recycling facility and also depend on the grade of the metal. This makes it difficult to estimate accurately the cost recovery that can be expected from the sale of scrap metal following the destruction of small arms and light weapons. The London Metal Exchange average official and settlement prices for pure metal can be used as a general guide since these prices act as one of the major aligning factors for the global market in scrap metal.

8.3 Practical, artistic and symbolic uses

Scrap metal from destroyed small arms and light weapons can be converted into objects with practical applications, artistic value and symbolic meaning. Such objects can

a) bring practical benefits (e.g. construction materials, household implements, etc.);

b) raise awareness of the need for small arms and light weapons control;

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c) support future small arms and light weapons control initiatives;

d) support post-conflict reconciliation and reintegration processes; and

e) symbolically express a desire to leave conflict and violence behind in order to move towards peace and development.

Table 1 provides examples from around the world of how destroyed small arms and light weapons have found practical, artistic and symbolic uses.

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Table 1 – Practical, artistic and symbolic uses of destroyed small arms and light weapons

Country	Object	Image
Albania	Inspection covers[2]	
Uganda	Reinforcing building rods[3]	
Honduras	Cooking utensils[6]	

[2] Photo credit: Adrian Wilkinson.

[3] Photo credit: Ian Ruddock.

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Country	Object	Image
Cambodia	Furniture[4]	
Colombia	Musical instruments[5]	
Bulgaria	Fixed sculpture[6]	

[4] Photo credit: The Peace Art Project Cambodia – http://sashaconstable.co.uk/projects/peace-art.

[5] See www.un.org/disarmament/education/Movies/ak47_guitar.

[6] Photo credit: South Eastern and Eastern Europe Clearinghouse for the Control of Small Arms and Light Weapons (SEESAC).

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Country	Object	Image
Canada	Mobile sculpture[7]	
Costa Rica	Memorial[6]	

8.4 Museums

Small arms and light weapons that have been rendered permanently inoperable, in particular of types that are rare or that otherwise have historical significance, may be sold or donated to museums.

[7] Photo credit: The Gun Sculpture – http://www.gunsculpture.com.

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9 Annex A
(normative)

Risk management

A.1 Scope

This Annex provides guidance on risk management and its application to weapons destruction programmes.

A critical element of destruction planning should be the implementation of a robust, effective and integrated risk management system in accordance with ISO Guide 51, *Safety aspects – Guidelines for their inclusion in standards*. This system should cover both organizational and destruction processes.

A.2 Background

The aim of weapons destruction programmes is the safe, effective and efficient destruction of collected or stockpiled small arms and light weapons. The primary hazards inherent in the destruction process have been outlined in Clause 6.5.1.

Weapons destruction programmes shall aim to avoid all accidents during the destruction process. The objective of risk management is to promote a culture in which the destruction organization seeks to achieve this by

a) developing and applying appropriate management procedures;

b) training destruction staff and managers and continually improving their skills; and

c) implementing safe, effective and efficient operational procedures.

This annex aims to integrate effective risk management into the international standard to which it is attached, so that compliance with the standard will automatically mean that elements of the risk management process are being followed. This should be supported by the development of formal risk assessments.

A.3 The concept of safety

Safety is achieved by reducing risk to a tolerable level, which is defined by MOSAIC as tolerable risk. There can be no absolute safety; the risk that will always remain is known as residual risk.

Therefore, in the context of weapons destruction, the physical destruction process can never be absolutely safe; it can only be relatively safe. This is an inevitable fact. It does not mean that all efforts to ensure safety should not be made. It just means that we cannot prove, with 100% confidence, that absolute safety is being achieved. The risk and quality management systems recommended in MOSAIC aim to be as close to that 100% ideal confidence level as is realistically possible, whilst allowing destruction organizations to determine what is the tolerable risk that they are prepared to accept in their particular environments.

A.4 Risk management

A.4.1 Components of risk management

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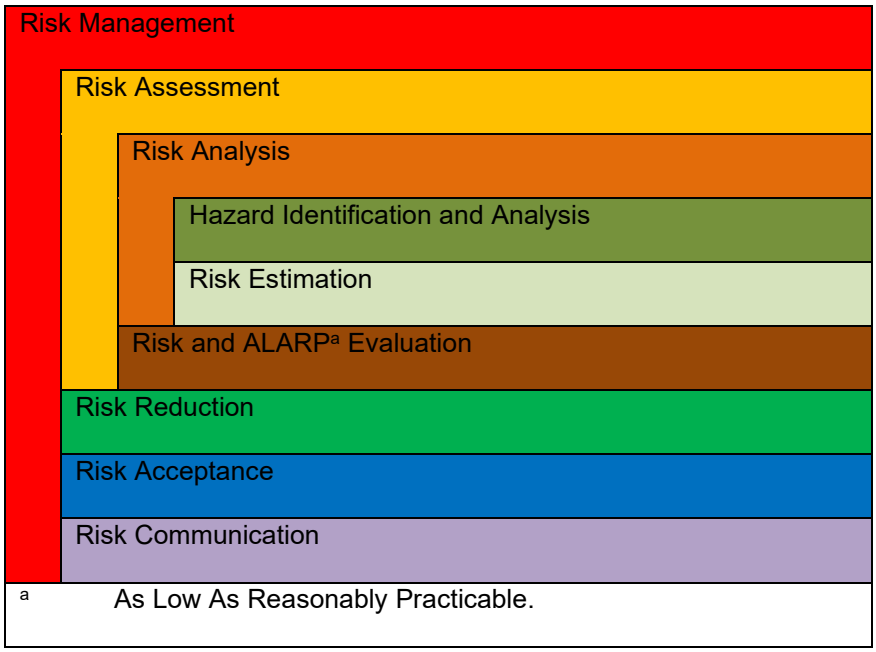
The concept of risk management is sometimes misunderstood. Common misconceptions include, for example, the relationship between risk assessment and risk analysis. The following matrix identifies the relationship between the different components of risk management that shall be used in the MOSAIC series of standards:

Table A.1 – Risk Management Matrix



A.4.2 Determining tolerable risk

Tolerable risk is determined by the search for absolute safety contrasted against factors such as:

a) the primary destruction hazards set out in Clause 6.5.1;

b) available resources;

c) the conventions of the society in which destruction operations are taking place; and

d) cost effectiveness.

It follows that there is therefore a need to continually review the tolerable risk that underpins the concept behind weapons destruction operations in a particular environment.

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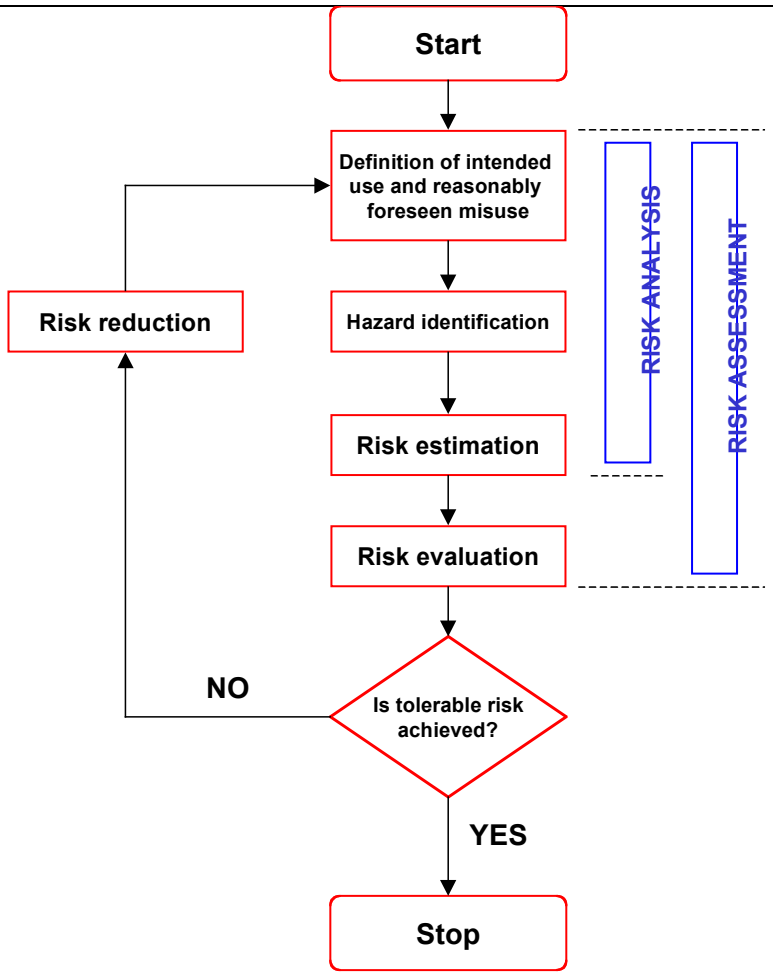
A.4.3 Risk assessment and reduction

Tolerable risk is achieved through the iterative process of risk assessment (risk analysis and risk evaluation) and risk reduction.

Table A.2 – Risk Management Process [a]



[a] Derived from ISO/IEC Guide 51:1999, Safety aspects – Guidelines for their inclusion in standards.

A.4.4 Achieving tolerable risk

Methods of reducing to a tolerable level the risks associated with destroying small arms and light weapons are set out in Clause 6.5.3. In addition, the following procedure should be used to reduce risk to a tolerable level:

a) identify the likely participants (i.e. destruction staff, official observers, media, invited guests etc) in the weapons destruction process;

b) identify the intended use and assess the reasonably foreseeable misuse of the destruction procedure;

c) identify each hazard (including any hazardous situation and harmful event) arising in all stages of the process;

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d) estimate and evaluate the risk to each identified participant or group;

e) judge if that risk is tolerable (e.g. by comparison with other risks to the user and with what is acceptable to society);

f) if the risk is not tolerable, reduce the risk until it becomes tolerable.

When conducting the risk reduction process, the order of priority should be as follows;

g) inherently safe design of destruction equipment and standard operating procedures;

h) use of appropriate personal protective equipment;

i) clear and unambiguous information for all participants in the destruction process.

A.5 Conclusion

Quality is not a synonym for safety. The respective roles of quality management and risk management should not be confused. The success of weapons destruction operations depends on the integrated application of both quality management and risk management principles and procedures.

Management systems and destruction procedures should be appropriate, effective, efficient and safe. Using best practice in risk and quality management will result in significant improvements to weapons destruction operations.

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9.1 Annex B (informative)

Destruction technologies and techniques

Table B.1 – Summary of destruction technology and techniques

NOTE 1 This table lists destruction technologies and techniques in alphabetical order; not in order of effectiveness or efficiency.

NOTE 2 The Small arms and light weapons Destruction Planning software that accompanies this document should be used to help determine the most appropriate destruction technique or technology to be used. Experience has shown that some techniques or technologies are more efficient and cost-effective than others and have therefore been marked as 'recommended' in this matrix.

NOTE 3 Information on cutting efficiency, costs and environmental issues is included in Table B.2 below.

Technique or Technology (Field / Industrial)[a]	Explanation	Example	Advantages	Disadvantages
Burning (Field)	The destruction of SALW by Open Burning using kerosene.	Cambodia, Honduras, Mali, Nicaragua, Uganda	❑ Cheap and Simple. ❑ Highly visible and symbolic. ❑ Limited training requirements.	❑ Labour intensive. ❑ Environmental pollution. ❑ Not particularly efficient. ❑ Visual inspection essential, but difficult.
Cement (Field)	Cast weapons into cement blocks.	Costa Rica [a]	❑ Cheap and simple. ❑ Limited training period.	❑ Recovery possible, but very labour intensive to achieve. ❑ High landfill requirements. ❑ High transport requirements to landfill. ❑ Final accounting difficult.

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Technique or Technology (Field / Industrial)[a]	Explanation	Example	Advantages	Disadvantages
Crushing by armoured fighting vehicles (AFV) (Field)	The use of AFVs to run over and crush/deform the SALW.	Brazil, Honduras, Serbia	❑ Cheap and simple. ❑ Highly visible and symbolic. ❑ Limited training requirements.	❑ Not particularly efficient ❑ Visual inspection essential
Cutting (Bandsaw) (Field or Industrial)	The use of industrial bandsaws to cut SALW into unusable pieces.	--	❑ Limited training period. ❑ Simple.	❑ Labour intensive. ❑ Minimum of 3 cuts per weapon, dependent on type. ❑ Inefficient.
Cutting (Hydraulic shears) (Field or Industrial)	The use of hydraulic cutting and crushing systems. Recommended technique	Afghanistan, Burundi, DRC	❑ Limited training requirements. ❑ Technology readily available. ❑ High destruction rates possible using automation. ❑ Environmentally benign.	❑ Medium initial capital costs. ❑ Equipment requires transportation to affected country.
Cutting (Hydro abrasive technology) (Industrial)	The use of hydro abrasive cutting technology.	--	❑ Limited training requirements. ❑ Technology readily available. ❑ Medium destruction rates possible using automation.	❑ Medium initial capital costs. ❑ Equipment requires transportation to affected country. ❑ Not yet used for high destruction rates, only as concept demonstrators.

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Technique or Technology (Field / Industrial)[a]	Explanation	Example	Advantages	Disadvantages
Cutting (Oxy-acetylene or Plasma) (Field or Industrial)	The use of high temperature cutting technology to render the SALW inoperable. Recommended technique	Albania, Colombia	❑ Established and proven method. ❑ Cheap and simple. ❑ Limited training requirements. ❑ Equipment available worldwide. ❑ Maintenance free.	❑ Labour intensive. (One operative can process 40 weapons per hour). ❑ Risk of small functioning components (bolts etc) not being destroyed. ❑ Relies on supply of industrial gases.
Cutting (Rotating disc) (Field or Industrial)	The use of hand held rotating disc cutting systems. Recommended technique	Costa Rica, Honduras	❑ Limited training requirements. ❑ Technology readily available. ❑ High destruction rates possible using automation. ❑ Environmentally benign.	❑ Medium initial capital costs. ❑ Equipment requires transportation to affected country.
Deep Sea Dumping [c] (Industrial)	The dumping at sea in deep ocean trenches of SALW.	Costa Rica[8]	❑ Traditional technique. ❑ Efficient.	❑ Constraints of London Convention.[c)] ❑ Not supported by UN programmes.

[8] After cutting.

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Technique or Technology (Field / Industrial)[a]	Explanation	Example	Advantages	Disadvantages
Detonation (Field)	The destruction of SALW by detonation using serviceable high explosives to induce sympathetic detonation.	Mozambique NATO SFOR	❑ Highly visible and symbolic. ❑ Destruction guaranteed if sufficient donor explosive used.	❑ Labour intensive. ❑ Environmental pollution. ❑ Requires highly trained personnel. ❑ Expensive in terms of donor explosive.
Shredding (Industrial)	The use of industrial metal shredding technology. Recommended technique	Canada, Germany, South Africa	❑ Highly efficient. ❑ Limited training requirements. ❑ Technology readily available. ❑ High destruction rates possible using automation. ❑ Environmentally benign.	❑ High initial capital costs. ❑ Equipment requires transportation to affected country.

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Technique or Technology (Field / Industrial)[a]	Explanation	Example	Advantages	Disadvantages
Smelting and Recycling (Industrial)	The use of industrial steel smelting facilities to melt down complete processed weapons. Recommended technique	Argentina, Australia, DRC, Montenegro, Serbia, Ukraine	❑ Limited training period. ❑ Simple. ❑ Cheap and efficient. ❑ Limited pre-processing. ❑ Minimal labour required. ❑ Highly visible and symbolic. ❑ Destruction guaranteed. ❑ Some costs recovered by sale of scrap.	❑ Requires suitable industrial facility. ❑ Limited pre-processing required.
Welding for Art	The use of weapons, with working parts removed or made inoperable, as part of a work of art.	Cambodia, Mozambique	❑ Highly visible and symbolic. ❑ Cost recovery through sale.	❑ Limited destruction rates. ❑ Requires talented staff. ❑ High pre-processing requirements.

a The technique is annotated as primarily a Field or Industrial technique.

b As part of a memorial.

c Deep sea dumping of weapons is not prohibited under the OSPAR Convention, the London Convention 1972 or the London Protocol 2006 on the dumping of waste at sea.

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Table B.2 – Summary of destruction costs and environmental factors

Technique or Technology (Field / Industrial)	Capital Costs	Operating Costs [a] (per weapon)	Environmental Concerns	Destruction Efficiency / Safety Concerns	Staff Skill Levels
Burning (Field)	Nil	Minimal (fuel and staff costs)	❑ Moderate and will be fuel dependent.	❑ Some weapons in the centre of the burning stack may not be destroyed if the burn stack is not correctly constructed.	❑ Low
Cement / Land burial (Field)	Minimal	Minimal (< US$ 1)	❑ Moderate as the concrete encased weapons require subsequent land burial.	❑ Low	❑ Low
Crushing by armoured fighting vehicles (AFV) (Field)	Minimal dependent on availability of AFV	Minimal (fuel and staff costs)	❑ Minimal	❑ Not a very efficient way of destruction as useable parts remain.	❑ Low
Cutting (Bandsaw) (Field or Industrial)	$400 – $1,000	Minimal (< US$ 5)	❑ Low ❑ Emissions from electrical generator.	❑ 120+ seconds per weapon. ❑ Saw operator at risk from industrial accident.	❑ Low

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Technique or Technology (Field / Industrial)	Capital Costs	Operating Costs [a] (per weapon)	Environmental Concerns	Destruction Efficiency / Safety Concerns	Staff Skill Levels
Cutting (Hydraulic shears) (Field or Industrial)	$25,000+	Minimal (< US$ 5)	❑ Low ❑ Emissions from electrical generator.	❑ 10 – 30 seconds per weapon. ❑ Operator at risk from industrial accident.	❑ Low
Cutting (Hydro abrasive technology) (Industrial)	$50,000+	Minimal (< US$ 5)	❑ Moderate. ❑ Emissions from electrical generator. ❑ Waste water treatment requirements.	❑ 120+ seconds per weapon. ❑ Operator at risk from industrial accident.	❑ Medium
Cutting (Oxy-acetylene or plasma) (Field or Industrial)	$1,000 - $5,000	Minimal (< US$ 2)	❑ Low ❑ Emissions from electrical generator. ❑ Gaseous products from cutting torch.	❑ 60+ seconds per weapon. ❑ Operator at risk from industrial accident and burns.	❑ Moderate
Cutting (Rotating disc) (Field or Industrial)	$200 – $5,000	Minimal (< US$ 2)	❑ Low ❑ Emissions from electric generator.	❑ 60+ seconds per weapon. ❑ Saw operator at risk from industrial accident.	❑ Low
Deep sea dumping [b] (Industrial)	Minimal	High (Shipping Costs)	❑ Banned by treaty.[b)]	❑ Very efficient as weapons difficult to recover.	❑ Moderate

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Technique or Technology (Field / Industrial)	Capital Costs	Operating Costs [a] (per weapon)	Environmental Concerns	Destruction Efficiency / Safety Concerns	Staff Skill Levels
Detonation (Field)	Low	High due to costs of explosives.	❑ Moderate due to the gaseous products of detonation.	❑ Moderate risk if EOD qualified staff used. ❑ High if non-EOD staff used.	❑ High (EOD Skills).
Shredding (Industrial)	Very High	Minimal (< $1)	❑ Low, if industrial system meets appropriate environmental standards.	❑ Very efficient. ❑ 1,000+ per hour	❑ Moderate.
Smelting and recycling (Industrial)	Very High	Minimal (< $1)	❑ Low, if industrial system meets appropriate environmental standards.	❑ Very efficient. ❑ 1,000+ per hour	❑ Moderate.
Welding for art	Nil	High (Artist Time)	❑ Nil	❑ Nil	❑ High.

a These are order of magnitude only, as staff costs have a significant influence and they will vary from region to region. The accompanying software can be used to estimate these costs more accurately.

b Deep sea dumping of weapons is prohibited under the OSPAR Convention, the London Convention 1972 or the London Protocol 2006 on the dumping of waste at sea for those nations that are States parties to the conventions and protocols.

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