

First Meeting of the Open-Ended Technical Expert Group (OETEG) on developments in small arms and light weapons manufacturing, technology, and design

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Panel 3: International cooperation and assistance: sharing expertise and good practices to address challenges and opportunities presented by developments in the manufacturing, technology and design of small arms and light weapons.

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Mr. Chair, distinguished delegates, I thank you for the opportunity to be part of this maiden edition of the Open-Ended Technical Expert Group (OETEG) on New Technology on SALW.

According to the International Telecommunication Union report (2024), 93 per cent of the population in high-income countries uses the Internet, approaching universality. This contrasts starkly with the situation in low-income countries, where only 27 per cent of the population is online¹. (This is the reflection of the technological gap between the two groups of States- high-come and low-income) and this is the context within which the topic-International Cooperation and Assistance would be situated.

Technological advancement in the 21st century is equally affecting the production and control of SALW.

Additive manufacturing technology, such as three-dimensional (3D) printing, can now be used to manufacture SALW. The printing machine reads the design from a 3D-printable file and lays down successive layers of liquid, powder, paper, or sheet material to build the model from a series of cross sections. These layers are joined or automatically fused to create the final shape.

Computer numerical control (CNC) milling technology is a form of *subtractive* manufacturing which enables the manufacture of custom-made SALW with metals. Parts and components are created by removing material from a solid block of metal. Computer-aided design (CAD) software creates digital blueprints (in 2D and 3D), while Computer-aided manufacturing (CAM) software uses the CAD design to generate machine instructions for CNC machinery to physically create the parts and components.

Additionally, the broad range of operational requirements faced by armed forces and security agencies has driven the development of modular designs for military-specification rifles. Modern assault rifles can now be built around a central component—typically the upper receiver—to which various interchangeable parts may be attached. That enables different configurations to be tailored for specific functions or mission requirements.²

These developments include the adoption of unconventional materials, such as polymers, as well as increasingly modular weapon configurations and technologies relevant for the marking, record-keeping, and tracing of SALW. Such innovations include laser engraving, microstamping, and automated systems for data collection, information management, and tracking, as well as for the delivery and positioning of weapons. Plastics and polymers have increasingly substituted metal in the manufacture of SALW frames and receivers. These materials offer several benefits including:

¹ <https://www.itu.int/itu-d/reports/statistics/2024/11/10/ff24-internet-use/>

² <https://iansa.org/emerging-technologies-affecting-small-arms-and-light-weapons-controls-may-2026/>

1. reduced production costs,
2. production of lighter weight weapons,
3. weapons produced through these methods have improved resistance to moisture,
4. Weapons have greater ergonomic flexibility, and
5. enhanced thermal insulation properties.

However, the use of such materials could hinder marking and tracing of SALW.

Paragraph 10 of the International Tracing Instrument prescribes the application of a unique marking to essential or structural component of the weapon, such as the frame and/or receiver, and encourages the marking of other parts of the weapon, such as the barrel and/or slide or cylinder. The design of such configurations may lead to increased risks of misidentification but may contribute to more effective tracing.

Implications for marking

Markings placed directly on polymer frames and receivers, unlike those applied to metal components, fail to meet the ITI requirements that markings should be durable, and recoverable to the greatest extent technically feasible.

Marking solutions for polymer materials that could meet the ITI requirements are: laser marking or micropercussion (or dot peen stamping).

Implications for tracing

Weapons produced by these new technologies provide increased risk of misidentification: Modular weapons can be fitted with different components, including from other weapons, which means that the marking of those configurations;

- a) could result in different serial numbers appearing on different parts of the same weapon, and
- b) given the possibility to change a weapon's calibre.

Mr. Chair, distinguished Delegates, that change can result in the same serial number being associated with two or more different calibres.

Laser technology for marking

Laser technology can be used for marking a large spectrum of SALW parts and components, including very small parts and components. The surface of such objects is marked through burning by oxidization.

Implications for the implementation of the ITI

Laser markings can be erased more easily. Obliterated laser engravings are more difficult to recover. Nevertheless, relief polishing and reflected light stereomicroscopy can, in certain cases, successfully reveal obliterated serial numbers originally marked by laser.

But here is the big question, how many states would have resources and the technical capacity to recover such erased markings?

Microelectronics and Smart Components

Technologies such as barcodes, radio-frequency identification (RFID), and biometric systems—including fingerprint recognition—fall within the broader category of automatic identification and data collection technologies. These technologies are considered useful tools to enhance effective stockpile management and prevent diversion of SALW.

Barcodes

A barcode encodes information in a visual pattern that a machine can read and store.

Radio frequency identification (RFID)

Radio frequency identification technology has two main components: a tag or label, embedded in the weapon, and a separate reader. The data stored on the tags is transmitted to the reader and stored in a database.

Micro-stamping for marking

Micro-marks are made by stamping, and it can potentially prevent or reduce illicit trading because such marks are not easily detectable for those wishing to erase them. Moreover, by micro-marking the firing pin of a weapon, an imprint can be made on each fired cartridge that could aid forensic evidence collection for criminal investigations.

Implications for marking, record-keeping, and tracing

Micro-marking of parts and components may considerably enhance record-keeping and traceability.

For instance, when applied to the firing pin, microstamping technology makes it possible to identify a firearm solely from a recovered cartridge casing, without requiring physical access to the weapon itself.³

International Cooperation and Assistance

Indeed, new technology offers both opportunities and challenges which opportunities need to be harnessed collectively and the challenges dealt with collaboratively if the fight against SALW proliferation is to be won in the face of the ever rapidly developing technology.

Nations and regional blocs do not have to operate in silos if progress is to be made in the fight against the ills of new technology and if the benefits are to be reaped collectively.

Already, Automated Prohibition Item Detection Systems (APIDS) are generating conversation about their efficiency in the handling of large volumes of baggage and parcels complimenting human efforts at extremely busy airports and other terminals, at the same time there is the fear of the system being developed on inadequate data. It is in such situations that international cooperation and assistance need to be initiated, where the system is built on data sets from all the regions of the world so that when it is deployed it can function effectively everywhere.

Our call is that international cooperation and assistance should start from the initial developmental stages of new technology to carry the unique circumstances of all the possible future users on board.

Capacity building

Capacity building must be explored by States working with civil society in the in the following areas.

1. Legal/legislative reform that embraces new technology in their existing laws to enable the effective utilization of technology and efficient control SALW, their parts, and components manufactured by new technology is required in most developing countries.
2. Capacity enhancement for regulatory Agencies in the areas of standardization and certification of new technology must be explored. In most developing countries, competent national authorities need capacity enhancement on new technologies to keep up with the speed of technological development to be able regulate and certify technology that is either being sold to them or being developed in their countries. (We are all as strong as the weakest link)
3. Building capacity for customs, police, and national authorities on good practices across the world would enhance effective detection, arrest, and successful prosecution in less capacitated states.
4. Access to seizure and ballistic databases to enhance effective and efficient tracing.

³ Ibid.

Many of the developing countries are still grappling with the reality of Artificial Intelligence (AI) let alone developing capabilities for the AI regulations. These are the areas where international cooperation and assistance is immediately required, because criminals are selling blueprints for 3D printing of small arms online- both in the dark web and through open sites and many states have no regulatory capability or the legal framework to deal with such menace.

If we are to collectively benefit from the opportunities offered by technology and to fight their negative effects on SALW proliferation, then the barriers of technological transfer in this area must be removed.

It is an understatement to say that there is a huge technology gap between high income countries and low-income countries, and obviously the scale tilt in favor of the developed countries.

Progress in balancing the scale of technological development would mean the removal of existing barriers if international cooperation and assistance is to benefit all.

Barriers of;

- a) High cost of the technology that enhances the ability of states to detect modular and polymer weapons, as well as technology that improves marking and tracing.
- b) Restrictive access to new technology that assists in the detection and control of weapons manufactured by new technology needs to be removed as part of international cooperation assistance.

Developing countries also have a responsibility to;

- a) create enabling environments that allow for the improvement in investment climate to attract innovative firms or allow existing ones to grow.
- b) Invest in enabling technology and basic infrastructure such as improved telecommunication, Internet of Things (IoT) and reliable electricity.
- c) Improved technical education that emphasizes new technology across all levels- and this can no longer be a wish but a reality.

Mr. Chair, distinguished delegates, if we are to make progress in the full and effective utilization of the positives that new technology has to offer and deal with the ills to ensure a safe and secure world, then it mustn't be about how fast we move forward as individual countries, but about making sure that everyone moves forward together.