13 March 2013

Advice concerning ammunition marking

1 Introduction: why mark ammunition?

In recent decades, national as well as international initiatives have been taken with a view to combating the unlawful trade in small arms. Most attention in this context has been concentrated on controlling the trade in small arms themselves, with much less focus on the ammunition for these weapons. Nonetheless, it can be argued that ammunition constitutes the deadliest component of small arms. It is not only the supply and availability of the weapons themselves, but clearly also that of ammunition for these weapons that contributes to the escalation, continuation and intensification of armed conflicts and armed crime.[1] More attention thus needs to be paid to the question of ammunition in international debates on arms control. A variety of issues are involved, such as safe and secure storage and the transport of stocks of ammunition. By analogy with the marking of small arms e.g. with a serial number, discussion is now also focusing on the marking of ammunition.

In early 2013, the question of ammunition was also placed on the Belgian parliamentary agenda. In February 2013 a draft for legislation was submitted in the Senate containing an amendment to the Weapons Act of 8 June 2006, aimed at introducing obligatory ammunition marking. In particular, the proposal stipulates that all ammunition manufactured in or imported to Belgium must be provided "with marking on the bottom or case of the cartridge." The marking must include the following information: a mark that identifies the manufacturing company, production for military or civilian use, the year of manufacture, a lot number, and an identification number for each package of the smallest quantity sold (Article 3). The proposal also specifies that all ammunition manufactured in or imported to Belgium must be registered in a Central Arms Register (Article 2 of the draft).[2] This proposal tightens up the existing European and national legislation on ammunition, and goes further than current marking practices. Currently, a lot number is generally only applied to the packaging units and not to the cartridges. Furthermore, the draft stipulates that not only lot numbers, but also a unique code for the smallest packaged quantity must be marked on the cartridges.

Generally speaking, ammunition marking[i] entails the application of markings either on the individual cartridges or on their packaging. These markings contain crucial information for identifying the ammunition. Ammunition marking serves several purposes. First, it enables correct classification and registration by manufacturers and end-users so that the storage, transport, use and quality control of ammunition can take place under secure conditions. Secondly, marking makes it possible to trace and map out transfers of ammunition from one user to another. Tracing involves reconstructing the route that the ammunition took after its manufacture and first transfer. This of course depends on correct registration of the marked ammunition, as well as of the transfers. Tracing ammunition is of particular importance when

[i] In this note, we only discuss munition for small arms. While the term munition also concerns cartridges for larger weapon systems like MANPADs and large calibre cannons, in the context of this note we use the term ammunition to indicate munition for small arms.

ammunition is found in conflict areas or at the scene of a crime. Tracing is then required, for example, to investigate at which point the ammunition - having been legally manufactured and initially legally traded - was diverted to the illegal circuit. Information gained from the markings on the ammunition provides the starting point.[3] It is this second objective - tracing illicitly diverted ammunition – that is important in the context of the legislation proposal.

Up to the present, most of the key information for tracing ammunition has been found on its packaging because - until recently - marking technologies imposed limitations on what could be marked directly on the cartridges (see below). The boxes and packaging used for ammunition, which carry information (for instance) about the manufacturer, the calibre, the year of manufacture and the lot number, therefore play an important role. Generally speaking, if ammunition is stored or found in sealed packages, it can very probably be traced. The problems start when the cartridges are taken out of the boxes and are found without packaging, for instance at the scene of a crime. In fact, cartridges generally have insufficient markings to enable identification and tracing. The consequences of this scenario have put the more extensive marking of individual cartridges onto the agenda of debates about arms control.

For a proper understanding of these debates, it is useful to draw a distinction between the monitoring and tracing of ammunition as they apply in the international and in the national environment, respectively. Internationally, the debate on ammunition marking focuses on the possibilities of countering the illicit trading of ammunition to war and conflict areas. In the national environment, ammunition marking is seen as a tool in the fight against illicit firearms trafficking and small arms crime. In other words, it is about combating illicit diversion or the leakage of ammunition from the legal to the illegal domain and the illicit use of ammunition, for instance in armed robberies or murders. In some instances, marking, registration and tracing ammunition is even viewed as a tool of the criminal justice system. The objective is then to prosecute persons who use ammunition in their criminal activities or who divert ammunition to the unlawful domain. Ammunition can be illicitly diverted, traded and smuggled in several ways: transfers of ammunition engineered by states in order to support foreign regimes or combatant groups; the so-called 'ant trade' (smuggling small-scale amounts of ammunition which, taken together, may be responsible for large-scale flows); large-scale black market transfers that occur in the unlawful environment; and trade in the grey area whereby ammunition is diverted from the legal to the illegal sphere.[4] This last form of diversion takes place on a large scale, for instance, in countries where ammunition stocks for the army and police are poorly secured, and where ammunition can be easily stolen by criminal or armed organizations or sold illicitly by corrupt government officials.[5] But diversion can also occur through dealers who falsify their records, or private individuals who sell legally purchased ammunition to persons from the criminal world. Once ammunition has been purchased legally by private individuals it is not registered further and thus cannot be traced (see below).[6]

The drive for marking ammunition is part of the struggle against these forms of international and domestic trafficking in firearms and ammunition and small arms crime. The proposal to amend the Belgian Weapons Act is targeted at the international as well as domestic environment, in particular by subjecting the *manufacture* of ammunition in Belgium - and thus

also exports - as well as *imports* of ammunition to the marking obligation. Further, the proposal aims explicitly to build a bridge between the logic of control in both environments by highlighting "the schizophrenic situation in which a government is aware of the negative economic impact of a liberal arms market for the internal market in the form of shooting accidents, or the disruption of society by armed violence, while for exports it is mainly the positive effects on employment and the trade balance that count."[7]

Finally, it is important to distinguish the various perspectives and arguments found in the debates on ammunition marking. Generally speaking, the challenge is approached from two perspectives: political and economic. From a political standpoint, the proponents of stricter controls on ammunition argue that the improved tracking of trade flows will lead to greater market transparency, reinforcement of the struggle against illicit firearms trafficking, and increased answerability of states for their trade and licensing policy as well as their policy on storage and safeguarding of ammunition. On the other side, it has been observed that implementing stricter controls on ammunition would demand a substantial administrative effort, for instance in terms of the registration of markings and transfers of ammunition. Economic arguments are adduced by governments as well as by industries. From an industrial perspective the focus is on the cost of marking. Ammunition is a relatively inexpensive product and the market reacts very quickly to minimal price changes, such as would flow from adjusting current production processes to meet marking obligations. Because of the impact on their competitive position, ammunition companies currently follow a simple logic regarding whether or not to mark ammunition (as well as on the specific markings they apply to cartridges - see below): manufacturers only apply those markings that the customer requests and pays for. In addition to the political perspective, the debate also needs to be viewed in terms of a cost-benefit rationale. The question then is whether the necessary investments, for instance in administrative capacities, will be outweighed by the benefits that improved tracing of illicit ammunition brings.[8]

Finally in this debate, it is important to note that an extensive practice of ammunition marking already exists. There is also a (limited) degree of regulation. It makes sense to ask first what marking practices and regulations already exist with regard to ammunition, before we go on to analyse in detail the innovations and obligations contained in the legislative proposal - and the technical possibilities for realizing them as cost-effectively as possible - and to identify a few critical issues.

2 Existing marking practices and regulations concerning ammunition

There is currently no global regulation about ammunition marking and tracing. Specific measures with regard to ammunition control, and ammunition marking in particular, are excluded from most international arms control instruments. As a result, existing practices and regulations concerning ammunition marking are developed at the regional or national level. Today there are in fact a number of practices and agreements concerning ammunition marking.

For instance, many states apply technical and safety standards when purchasing ammunition for their armed forces. These standards affect, inter alia, the markings that manufacturers must apply to packaging and cartridges. Many manufacturers already mark the packaging and cartridges in a way that lets them identify the year of manufacture and the calibre.[9] In this note, we focus in particular on markings that are applied to the cartridges themselves. We shall first explain a number of existing marking practices, then look briefly at regulations already developed with regard to ammunition marking.

Today, the vast majority of manufactured ammunition cartridges are marked in one way or another. Most markings are applied by means of stamps on the bottom of the cartridge cases. Because of limited space and the limitations of stamping technology (see below), at present there is minimal information marked on the cases. It currently includes a code that identifies the manufacturer, the year of manufacture and the calibre. The objectives of marking differ somewhat depending on whether it applies to the military or civilian sector of the market. From a military perspective, these markings mainly serve to make storage management, transport, and the operational use of ammunition as efficient and safe as possible. On the civilian market, markings serve mainly to identify the ammunition correctly and to guarantee its quality and safety.[10]

Manufacturers mark cartridges on their own initiative as well as upon express request from customers (such as armed forces and law enforcement services). First, manufacturers themselves have an interest in a certain degree of marking. For instance, the marking of packaging is useful for guaranteeing quality and enabling effective safety control. The systematic recording of information about production lots and the ability to identify them quickly by means of marking allows manufacturers to set up internal tracing mechanisms, so that any defective or potentially dangerous lots can easily be identified, tracked and recalled.[11] Secondly, various organizations and countries have formalized the markings on military ammunition into standards that manufacturers are obliged to apply. The NATO member states, for instance, have concluded several 'standardization agreements' (STANAGs) among themselves. These require inter alia that not only the manufacturer, year of manufacture and the calibre are stamped on cartridges, but also a specific NATO mark. NATO does not require that a lot number is marked on cartridges.[12] (A lot number refers to a specific 'batch' of ammunition. Ammunition companies divide their production into lots or batches so that all components of a certain batch of ammunition are manufactured under similar conditions and with uniform components. It can thus be expected that ammunition from the same lot will function in a similar way). A number of countries do require that lot numbers are marked on cartridges manufactured for their armed forces or law enforcement services. One oft-cited example is Brazil, where a 'disarmament law' came into force in 2003. Brazil was facing the problem of large amounts of ammunition from army and police stocks being diverted to the criminal environment. The law therefore stipulates that all cartridges manufactured for the army and police shall be marked with a lot number. Ammunition lot numbers are further linked with the specific army and police units to which they are delivered. It is thus possible, in the event that illicitly diverted ammunition is discovered in a criminal context, to find out from which stock this ammunition derives.[13]

As mentioned above, there are currently few if any global regulations on ammunition control. The United Nations Firearms Protocol from 2001 (in full, the *Protocol Against the Illicit Manufacturing of and Trafficking in Firearms, Their Parts and Components and Ammunition*) includes, as can be gathered from the title, ammunition in its scope. The Protocol does not however include any stipulations on marking of ammunition, though it does so in regard to small arms. There have been few if any regulatory initiatives taken in the international community since 2001 regarding control of small arms ammunition.[14]

At the regional level, initiatives for the control of ammunition have been taken in various quarters. In its efforts to combat illicit arms trade, the Organization of American States (OAS) since the 1990s has focussed also on ammunition, i.a. by investigating the tracing potential of marked cartridges. In Europe there is the Firearms Directive (91/477, amended in 2008), Article 4 of which specifies that "Member States shall ensure that each elementary package of complete ammunition is marked so as to provide the name of the manufacturer, the identification batch (lot) number, the calibre and the type of ammunition." To this is added that the Member States may choose to adapt the stipulations of the Treaty of 1 July 1969 regarding mutual recognition of hallmarks on handguns. In this Treaty, the Member States of the *Commission Internationale Permanente pour l'Epreuve des Armes à Feu Portatives* (CIP)[i], established in 1914, made agreements on ammunition manufactured for the non-state market, for instance for activities such as recreational shooting and hunting. The main concern of the CIP is the safety of small arms and ammunition. In this framework, directives were also adopted on cartridge marking and ammunition packaging: for instance, indicating the calibre of the cartridges and the lot number on the packaging. The basic principle of these provisions is to give users information enabling them to identify the ammunition, for instance if it does not function properly. Markings enable the users to communicate with the manufacturer, while the manufacturer can set up an investigation into possible defects in a certain production lot.[15]

At the Belgian level, stipulations about ammunition are included in the Weapons Act of 8 June 2006. However, the existing provisions do not concern ammunition marking. Without going into details, the Weapons Act (Article 22) states that ammunition may not be transferred to persons without a gun permit. The implementing decrees further stipulate that certified arms dealers are required to keep records in which they register transfers of small arms and ammunition. As concerns ammunition, the requirement is for a record "in the form of Model C […] in which ammunition for the (small arms subject to a licence obligation) which they receive, manufacture, keep in their possession or transfer" must be registered.[16] Operators of shooting ranges may also sell ammunition or make it available, in the amounts needed for immediate use, to persons who are entitled to make use of the shooting range. These transfers are not registered.[17] In the Flemish Region, which is responsible for controlling trade in arms and defence-related equipment, the control of transfers, imports and exports of ammunition is

[i] As of 2008, the following countries were members of the CIP: Austria, Belgium, Chile, the Czech Republic, Finland, France, Germany, Hungary, Italy, Russia, Slovakia, Spain, the United Arab Emirates and the United Kingdom.

regulated by the Arms Trade Decree of 15 June 2012.[18] When applying for a licence for transfers, imports or exports of ammunition, the following details among others must be indicated on the application form: the category (recreational ammunition, hunting ammunition, cases, primers, propellant...); the brand, the model and the name of the manufacturer; the calibre; the serial number; the year of manufacture; a goods code; and the quantity.[19]

3 New control mechanisms and regulations

Proposals for tighter regulation of ammunition marking and registration vary according to the objectives one wishes to achieve with tracing. A first objective of ammunition tracing can be to identify and combat the illicit diversion of ammunition from the stocks of state actors, particularly when the aim is to stop diversion in a context of armed conflict. The obligatory, and suitably detailed, marking of ammunition purchased by government services can meet this objective. A second objective may be to make international trade flows as transparent as possible and to track and combat illicit diversion, for instance when this violates the conditions of licensing and end-user certificates. The obligatory marking of ammunition that is destined for export and subject to export licensing can meet this objective. A third, more comprehensive rationale focuses on tracing transfers of ammunition also in the non-state, domestic market. The objective here is to combat illicit diversion and use of ammunition in a criminal context by being able to identify when ammunition is diverted from the lawful to the unlawful sphere. Such comprehensive tracing requires that each step in the lawful course of ammunition transfers can be reliably identified. In practice, this means that ammunition manufactured for the non-state, domestic market must also be marked. In this context it it is worth considering whether a differentiated system of marking could be useful. Such a system of marking regulations would take account of the fact that certain types of ammunition, for instance shotgun shells used by hunters, are not used or significantly less often used for criminal purposes, and therefore need less comprehensive options for registration and tracing.

In the light of discussion over the feasibility of these proposals, Holger Anders has noted that significant progress could already be made if standards were agreed for marking ammunition that is purchased by state actors. These standards would not necessarily make tracing possible in all situations, but would help considerably in the fight against illicit trade in ammunition by limiting leakage from state stocks.[20] Other proposals, including those in the present legislative draft, go further and call for obligatory marking of all manufactured and imported ammunition. As concerns the specific information to be marked, it is generally proposed to affix markings to individual cartridges that refer to specific production lots. In a few instances, the requirement is to mark a code referring not only to a lot number, but also to the smallest packaged unit of ammunition.

The proposal to mark individual cartridges reflects the recognition of some specific problems confronting the effort to control ammunition transfer. Firstly, there is the obvious point that it is difficult to trace cartridges that are not marked (or that only indicate a manufacturer, year of

manufacture and calibre) once they are removed from the packaging. In cases where individual cartridges are found separated from their packaging, tracing is only possible if there are markings that link the cartridges to specific production lots and trade transfers. This identification and tracing is important for tracing defect ammunition as well as taking it out of circulation. When cartridges are found in a context that points to illicit use or illicit transfers, the chances of successful tracing are also seriously reduced if only the manufacturer, the year of manufacture and the calibre are marked. This problem applies especially in areas of war and violent conflict, but it also obstructs the tracing of (organized) small arms crime and illicit firearms trafficking.[21] To put it another way: the chances of tracing illicitly traded ammunition are worse in situations where transfers are not registered in a style that links the markings on cartridges to specific production lots, transfers and recipients. This is why an effort is being made made, i.a. in the legislative proposal submitted in the Senate, to apply as many cartridge markings as possible – thus allowing identification not only of the calibre, the manufacturer and the year of manufacture, but also the production lot.

A second problem is that the lot number as such is usually not enough to follow the tracks of illicitly traded and diverted ammunition. Marking lot numbers on cartridges increases the chance of successful tracing only if a certain lot is delivered to one customer, and if no other transfers of ammunition from that lot occurred after the first delivery. Without being able to link the lot number on the found cartridges to one customer, it is not possible to fix unambiguously the last legitimate owner of the ammunition. In this case, the only realistic way that ammunition markings can help in a tracing investigation is to create a shortlist of possible sources of diversion. This problem applies particularly to ammunition sold on the non-state market. One lot of ammunition can in fact contain up to 500,000 cartridges. These are packaged, depending on the calibre, in quantities of 20 to 50 individual cartridges. This means that one production lot of ammunition can be packaged in 10,000 or more identically marked packaging units. Since individual users only purchase a number of boxes of ammunition each time, ammunition from one lot can thus end up in the hands of thousands of individual gun owners. As all these packages refer to the same production lot, it is impossible to reliably trace the chain of transfer and identify the last lawful owner when the ammunition is found in the unlawful environment. The draft legislation submitted in the Senate acknowledges this issue and therefore calls not only for marking the lot number on individual cartridges, but also “a package identification number for the smallest unit sold” (Article 3 of the proposal). Provided the transfers of ammunition marked in this way are registered correctly, this provision would make it possible to trace all cartridges that are found in illicit contexts, and to determine when they were diverted from the legal to the illegal sphere.

Critics of these proposals argue that because of the enormous amounts of ammunition produced every year, it will take substantial investments to establish and maintain the necessary administrative tools for registering the various steps in the line of transfer. Further, critics make the point that marking ammunition cartridges in this way not only creates technical difficulties, but will make manufacturing costs rise substantially because the manufacture of ammunition will be slowed down and the production machinery must be updated. It is right that considerations of technical limitation and the administrative and economic costs of marking and

registering ammunition should play an important part in debates on the control of ammunition transfers. But it is useful to set this discussion in the perspective of technology advances in recent years. The introduction of marking techniques using laser technology, for instance, seems to offer an alternative for some of the limitations inherent in older techniques.

4 Technical possibilities

While the content of the markings applied to cartridges today is diverse (see above), the method used most often for applying the markings is stamping. This technique entails applying marks by means of stamps on the bottom or the side of the cartridge cases. These markings are applied in the first stage of the production process when the cases are manufactured and before the case is equipped with other components such as the primer, the propellant and the projectile (see Annex 1 for an overview of the components of a cartridge). An additional problem is that the various components - case, primer, propellant and projectile - are not necessarily made by the same manufacturer, which makes the marking notably of lot numbers difficult. If a lot number must be marked on the cases, then a stamp has to be applied on the production line at the start of production of a lot of cartridges. This stamp can include various elements, such as the year of manufacture and the calibre, but also the lot number of a certain production lot. At the end of each production series bearing the same number (e.g. lot number), the production line must be stopped. After any remaining cases are removed from the line, the stamp must be replaced before a new production lot is started. When no lot number is marked on the cases, obviously the production line does not have to be stopped when production of a new lot begins. The cases are then only marked with the data from the manufacturer, the year of manufacture and the calibre, and can be used for various production lots during a certain year without running into the problem that cartridges with different markings could end up in ammunition boxes with different markings. It often happens that, at the start of a year, a manufacturer produces several hundred thousand or millions of empty cases in order to use them for assembling finished cartridges over the course of the year. The use of such pre-fabricated cases in the manufacture of various production lots is typical of the manufacture of ammunition for non-state markets. This production method is the most cost-efficient and flexible when production is not tied to certain demands from the customer, for instance with regard to markings.[22]

In sum, the point is that applying markings by stamps happens at the very start of the ammunition assembly process, while packaging of the finished cartridges in various ammunition units happens at the end of the production chain. The implications are significant when it comes to stamping unique identification codes on cartridges destined for the non-state market. As mentioned above, detailed tracing of ammunition would require the cartridges in each box of - for instance - 50 cartridges or less to receive a unique code. This would not only mean that the pre-fabrication of empty cartridges at the start of the year would be impossible, but also that the production and assembly process would have to be stopped repeatedly and often. This would of course significantly increase production costs. The authors of the proposed legislation

in the Senate are aware of this issue, and therefore enquire whether it is possible with current technology "to manufacture complete bullets that are provided with an identification number that is in accordance with the identification number of the packaging, so that it is then possible to trace the origin through registration from the manufacturer via the retail selling points down to the consumer."

In response to this question the proposers of the draft themselves refer to a few recent technological innovations in ammunition marking.[23] In particular, ammunition manufacturers have started using use laser techniques to apply markings. A pioneer in this innovation is the Brazilian arms manufacturer *Companhia Brasileira de Cartuchos* (CBC). Confronted with the entry into force of the aforementioned Brazilian Weapons Act (which requires manufacturers to mark cartridges with a lot number and to register the individual batches of ammunition delivered to specific government services), CBC went in search of cost-efficient marking and registration techniques. The result was the use of computer-guided laser technology for marking cartridges. This technique means that the cases are no longer stamped at the beginning of the assembly of cartridges, but that the marks can be applied at the end of assembly, just before the cartridges are packed into boxes. Specifically, the marks are engraved on the case by means of laser beams, for instance in the groove just above the edge of the case. When marking, there is no physical contact between the engraving apparatus and the ammunition. The laser machines should be able to mark 240 cartridges per minute.[24] Thanks to laser technology, it becomes feasible to mark individual cartridges in such a way that they can be accurately identified and linked to small packaging units.[25]

5 A number of points of interest

With the recent technological innovations, the possibilities for marking, registration and tracing of ammunition seem to have increased substantially. This is naturally important for the debates on tightening regulations for ammunition marking. It has implications for the debate at international level on the control of ammunition and on marking in particular. The legislative proposal submitted in the Senate has also brought the issue on to the parliamentary agenda in Belgium. In order to place these debates in the right perspective, in this section we will end with a few more special points of interest.

The ultimate objective of the control of arms trade and the tracing of ammunition is to combat illicit trade in ammunition and small arms crime, and to bring prosecutions where possible. Nevertheless, as already mentioned above, there is also the question of economic costs arising from regulations that would require all ammunition manufactured in or imported into Belgium to be provided with certain markings. From the dealers' perspective, it will probably be pointed out that the ammunition currently available on the international market is not yet marked with identification numbers for the smallest packaging units and thus, certainly in a first phase, this type of ammunition would have to be ordered direct from ammunition companies. The smaller the internal market, the smaller also will be the chance of easily obtaining ammunition in the

international market that satisfies national regulations. Dealers and private buyers will point to the price increases that are therefore bound to follow from the introduction of a stricter control regime, so long as the size of the market is not taken into account. Ammunition companies in turn will probably bring up the additional cost burdens and impacts of the proposals on their competitive position and production. On the other hand, proponents of stricter controls on ammunition argue that we may expect an increasing number of international agreements on ammunition to be concluded in future. In this connection, the authors of the legislation proposal argue that it "therefore seems logical that people should proactively prepare for the reconversion that will have to take place in the transition from mass production of ammunition to controlled production of ammunition with higher added value." As seen by the supporters of stricter ammunition controls, present debates make clear above all that the question of marking individual cartridges must be placed not only on the national agenda, but also on the European and international agendas. This approach not only makes possible the accurate tracing of ammunition on a larger scale, but should also improve economic feasibility.

As mentioned several times above, the accurate tracing of ammunition depends not only on sufficiently detailed marking, but also on the correct and careful registration of transfers of marked ammunition. If the legislation proposal is put into practice, this would first of all imply that the government services responsible for small arms control must adapt their registration instruments to the new situation. Article 2 of the legislation proposal includes the stipulation that “all ammunition that is manufactured in or imported into Belgium must be registered in a Central Arms Register." The Central Arms Register is managed by the Federal Police. But registration methods will probably need to be further refined also on the regional level, where for instance the Flemish Strategic Arms Control Unit already requests rather detailed information from applicants for licences for the transfer and imports and exports of ammunition.

Secondly, for certified arms dealers who already have to record transfers of ammunition in their registers, not much is likely to change - except for more extensive registration of the smallest packaging units. It should be noted that the current C Models for arms dealers' registers will need adjustment so as to leave space for listing the number of the smallest packaging unit.[i]

Thirdly, for private customers and users of ammunition, registration methods will need to change at least if the legislature wants the whole trail of ammunition transfer to be traceable right up to the last lawful owner. Currently, the only thing recorded is the point at which private individuals obtain ammunition from certified arms traders, since the dealers have to enter the transfer of ammunition in their registers. But private individuals also occasionally transfer ammunition to other private individuals. This is legally permissible as long as the person to whom the ammunition is transferred has a permit for the weapon with which the cartridges will

[i] More generally in this context, the question also arises whether or not it is opportune to introduce electronic registers, on condition of course that these are well-secured and can be consulted by the competent government services (see also Nils Duquet & Maarten Van Alstein (2011), *Vuurwapens. Handel, bezit en gebruik*, Leuven & Den Haag: Acco, p. 105.

be fired. Further, gun users can also obtain certain amounts of ammunition from certified shooting ranges. Both types of transfers - between private individuals and at shooting ranges - are currently not registered anywhere. This also explains why some investigators claim that the re-sale of ammunition by private individuals to the criminal environment is a source of illicit diversion of ammunition.[26] In a perspective of more accurate ammunition tracing as presented in the legislative proposal, methods and instruments for registering these private transfers of ammunition need to be considered. This is certainly important if the government wishes to use marking as a tool of criminal prosecution for diversion and illicit use of ammunition. In that case, with a view to evidential value, the registration of transfers definitely needs careful handling. All of this would call for an investment in administrative capacity and in the functioning of existing registration instruments (e.g. the Central Arms Register).

A specific challenge for tracing based on the marking of cartridges is that many recreational shooters reload cases after using them. After a cartridge has been fired, the case can actually be re-used to assemble a new cartridge. Many recreational shooters do this because they can shoot more accurately with cartridges they have put together themselves than with ammunition produced in a factory. The reloading of used cases presents a special challenge for the effectiveness of ammunition tracing. It is a practice that can also be followed by illicit users who wish to obstruct the tracing of the ammunition they use by collecting and reloading cases left behind by recreational shooters or hunters. There is then a risk that, without proof to the contrary, the last known lawful owner may be held responsible for the illicit diversion or even illicit use of the cartridges. Certainly if markings were to be used in the framework of criminal prosecution, a problem would arise over the evidential value of tracing on the basis of markings.[27]

Based on the current state of research, it is not known to what extent such reloading of cartridges occurs. For the time being, we have no clear image overall of the leakage of ammunition from the lawful to the criminal sphere, for instance through private arms licence holders who re-sell this ammunition illicitly.[28]

6 Advice

With reference to a legislative proposal submitted in the Belgian Senate for amending the Weapons Act of 8 June 2006, and in response to the growing attention being given to ammunition control in the international debate on arms trade, the Flemish Peace Institute postulates the following fundamental principles with regard to marking and tracing ammunition:

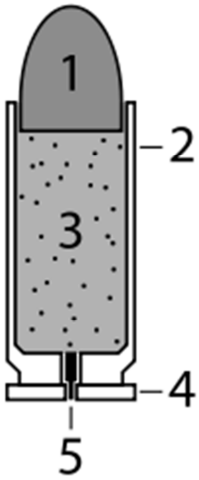
- Sufficiently detailed ammunition marking, of the packaging units as well as the cartridges themselves, is an important aid to tracing ammunition discovered in a context of violent conflict or armed crime. The current regulations, at national and European as well as international level, have not yet sufficiently regulated the question of cartridge marking.
- For accurate ammunition tracing, along with suitably detailed marking, the correct and careful recording of transfers of marked ammunition is also crucial.
- In order to arrive at a comprehensive marking and tracing system for ammunition, regulation at a European and international level is needed. Belgium can contribute to this process and play a leading role within it i.a. by taking legislative initiatives for ammunition marking.
- It is important to bear in mind the different perspectives in the debate about ammunition marking:
    - From a political perspective, it can be argued that more stringent control of ammunition will on the one hand lead to greater transparency of trade flows and help combat illicit trade, while on the other hand attention must be paid to the investments and administrative efforts required for stricter control;
    - Economically, arguments about the competitive position of manufacturers have a place in the debate because cartridge marking will entail additional costs. The impact on the domestic market for ammunition for civilian use is also important when considering the best choice of level to develop the control regime.

The Flemish Peace Institute advises the Flemish Parliament, the Belgian House and Senate, and the regional and federal authorities:

- to require that cartridges manufactured in Belgium are marked with information referring to a production lot number and an identification number of the smallest packaging unit. Despite the economic impact for manufacturers, this would make Belgian ammunition more traceable and would allow Belgium to assume a leading role at the European and international levels.
- to refine the registration methods for domestic and foreign trade in ammunition manufactured and marked in Belgium. Proper tracing of marked ammunition clearly depends on accurate recording of ammunition transfers.
- to regulate the marking of ammunition imported into Belgium only in the context of a European and/or international regulatory framework. Taking a unilateral Belgian initiative on this point would make too large an impact on the domestic market for ammunition for civilian use.

- to work for European regulation with regard to cartridge marking and the registration of ammunition transfers.
- to place the question of ammunition marking and tracing also on the international arms control agenda.

Annex 1: The components of an ammunition cartridge



(1) Projectile (2) Case (3) Propellant (4) Bottom (5) Primer

END NOTES

[1] Owen Greene (2006), "Introduction. Ammunition for Small Arms and Light Weapons: Understanding the Issues and Addressing the Challenges", in Stéphanie Pézard and Holger Anders (eds.), *Targeting Ammunition. A Primer*, Geneva: Small Arms Survey, p. 1.

[2] Patrick De Groote, Rik Torfs, Bert Anciaux, Huub Broers and Karl Vanlouwe, Legislation proposal of 8 June 2006 concerning the regulation of economic and individual activities with arms with regard to ammunition marking, Senate S. 5-1958 (www.senate.be).

[3] See Giacomo Persi Paoli (2011), *Ammunition Marking. Current Practices and Future Possibilities*, Geneva: Small Arms Survey Issue Brief 3, p. 1; Pierre Martinot and Ilhan Berkol (2008), *The Traceability of Ammunition*, Brussels: GRIP, report no. 9, p. 13; Pablo Dreyfus (2008), 'Conventional Ammunition Marking', in James Bevan (ed.), *Conventional Ammunition in Surplus. A Reference Guide*, Geneva: Small Arms Survey, p. 31-32; and Holger Anders (2006), 'Following the Lethal Trail: Identifying Sources of Illicit Ammunition', in Stéphanie Pézard and Anders Holger (eds.), *Targeting Ammunition. A Primer*, Geneva: Small Arms Survey, p. 207. For the specific practice of tracing ammunition, see Small Arms Survey (2008), Ammunition Tracing Kit: Protocols and Procedures for Recording Small-Calibre Ammunition (Geneva: Small Arms Survey).

[4] Mike Bourne and Ilhan Berkol (2006), 'Deadly Diversions: Illicit Transfers of Ammunition for Small Arms and Light Weapons', in Stéphanie Pézard and Holger Anders (eds.), *op cit*, p. 99-131.

[5] James Bevan (2008), 'Conventional Ammunition Diversion', in James Bevan (red.), *Conventional Ammunition in Surplus. A Reference Guide*, Geneva: Small Arms Survey, p. 145-153.

[6] Marsha De Vries (2010), *Van 'the instrument of delivery' naar 'the actual agent of harm'. munitie in het Nederlandse criminele milieu*, Study at the request of the Police and Science Programme, p. 29-36.

[7] Patrick De Groote, Rik Torfs, Bert Anciaux, Huub Broers and Karl Vanlouwe, Legislation proposal of 8 June 2006 concerning the regulation of economic and individual activities with arms with regard to ammunition marking, Senate S. 5-1958 (www.senate.be).

[8] Giacomo Persi Paoli (2011), *Ammunition Marking. Current Practices and Future Possibilities*, Geneva: Small Arms Survey Issue Brief 3, p. 1 and 6.

[9] Holger Anders (2006), 'Following the Lethal Trail: Identifying Sources of Illicit Ammunition', in Stéphanie Pézard and Anders Holger (eds.), *Targeting Ammunition. A Primer*, Geneva: Small Arms Survey, p. 208-210.

[10] Giacomo Persi Paoli (2011), *op cit*, p. 2 and Holger Anders (2006), *op cit*, p. 207.
[11] Giacomo Persi Paoli (2011), *op cit*, p. 5-6.
[12] Pierre Martinot and Ilhan Berkol (2008), *The Traceability of Ammunition*, Brussels: Grip, report no. 9, p. 11-12.
[13] Pablo Dreyfus (2006), 'Crime and Ammunition Procurement: The Case of Brazil', in Stéphanie Pézard and Holger Anders (eds.), *Targeting Ammunition. A Primer*, Geneva: Small Arms Survey, p. 173-203.
[14] Owen Greene (2006), *op cit*, p. 7.
[15] Owen Greene (2006), *op cit*, p. 6; Holger Anders (2006), *op cit*, p. 209; and Giacomo Persi Paoli (2011), *op cit*, p. 4.
[16] Article 23 of the Royal Decree of 20 September 1991 for implementing the Weapons Act.
[17] Royal Decree of 13 July 2000 for determining the certification conditions for firing ranges.
[18] Act of 15 June 2012 concerning imports, exports, transit and transfer of defence-related products, other equipment for military use, law enforcement equipment, civil small arms, components and ammunition, *Belgian Official Journal*, 4 July 2012.
[19] See http://www.vlaanderen.be/int/artikel/civiele-vuurwapens-onderdelen-en-ammunition .
[20] Holger Anders (2006), *op cit*, p. 216-218.
[21] This paragraph is based on Giacomo Persi Paoli (2011), *op cit*, p. 8-9 and Holger Anders (2006), *op cit*, p. 215-222.
[22] Giacomo Persi Paoli (2011), *op cit*, p. 7 and Holger Anders (2006), *op cit*, p. 220-222.
[23] Patrick De Groote, Rik Torfs, Bert Anciaux, Huub Broers and Karl Vanlouwe, Legislation proposal of 8 June 2006 concerning the regulation of commercial and individual activities with arms with regard to ammunition marking, Senate S. 5-1958 (www.senate.be).
[24] Pierre Martinot and Ilhan Berkol (2008), *op cit*, p. 20-23.
[25] See Giacomo Persi Paoli (2011), *op cit*, p. 11; Pierre Martinot and Ilhan Berkol (2008), *op cit*, p. 20-23; Holger Anders (2006), *op cit*, p. 221-222; and James Bevan and Pablo Dreyfus, "Small Arms Ammunition Lot Marking", in Conventional Ammunition in Surplus. A Reference Guide, edited by. James Bevan (Geneva: Small Arms Survey, 2008), 157.
[26] See e.g. Marsha De Vries (2010), *Van "the instrument of delivery" naar "the actual agent of harm". ammunition in het Nederlandse criminele milieu*, Study at the request of the Police and Science Programme, p. 29-36.
[27] See e.b. Giacomo Persi Paoli (2011), *op cit*, p. 4.
[28] See Marsha De Vries (2010, *op cit*