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The MTCR at 30

Ideas to Strengthen the Missile Technology Control Norm

The Missile Technology Control Regime (MTCR) was established in 1987 to limit the proliferation of unmanned ballistic missile technology and delivery vehicles, setting guidelines for export controls on systems, software, technologies and services. In 2017, the MTCR has existed for 30 years and can look back on a mixed record. This Clingendael Policy Brief offers a critical analysis of the MTCR and argues that members should seriously consider enhancing and deepening their Regime. The Paper offers seven policy options with concrete suggestions on how the MTCR may be formalized and even work towards a stronger convention, including a more robust institutional basis and verification mechanisms.

1. Background

The MTCR was established in 1987 to limit the proliferation of unmanned ballistic missile technology and delivery vehicles, setting guidelines for export controls on systems, software, technologies and services. The MTCR is an “informal political understanding” and does not promulgate legally binding obligations. In 2017, the MTCR has existed for 30 years and can look back on a mixed record. On the plus side, the MTCR has expanded (in 1993) to include all WMD, and has built in a new focus on terrorism (in 2002). It has also expanded its membership (from seven to 35). On the other hand, the MTCR has not kept several countries of concern (including Iran, North Korea, Pakistan and Syria) from advancing their missile programs. It also faces the challenge that advanced missile technology has truly gone global, spreading to countries with weak export control regimes and a lax political culture with regard to WMD non-

proliferation. Moreover, new advances in (missile and drone) technology raise questions about the practical possibility (and even strategic significance) of maintaining an export control regime based on physical restrictions (such as customs and border protection).

The MTCR is not in crisis mode. Still, as a voluntary regime comprised of a limited group of countries lacking a solid institutional base and verification mechanisms, the MTCR has its limitations. This Policy Brief starts with a brief overview of the main challenges facing the MTCR. Two key questions will be addressed and answered with practical recommendations:

- How have “new” initiatives (such as the Hague Code of Conduct Against Ballistic Missile Proliferation [2002]; United Nations Security Council Resolution 1540 [2004]; and the Joint Declaration for the Export and Subsequent Use of Armed or Strike-Enabled UAS [2016]) affected the MTCR?

- How can the MTCR be upgraded to adapt to changing (economic, technological and strategic) circumstances, and what lessons can be drawn from other relevant non-proliferation treaties, regimes, initiatives, etc.?

This Policy Brief concludes with reflections on the (academic and political) discussions on the possible ways to formalize the MTCR and work towards a stronger convention, including a more robust institutional basis and verification mechanisms. The main aim of this Policy Brief is to offer a critical analysis of the MTCR as a regime, and to provide practical ideas to maintain and/or strengthen the current missile technology control norm.

2. The MTCR at 30 – Time to Take Stock

In 1987, the MTCR was set up as a voluntary arrangement among like-minded countries wishing to prevent missile proliferation. Between 1983 and 1987, the United States negotiated the MTCR with its G7 partners¹, and on 16 April 1987 these seven states announced the Regime's formation. At its core, the MTCR consists of guidelines and an associated Annex with member states honoring their commitments to the Regime by the application of national export control laws and regulations. The MTCR has no secretariat. Instead, the Regime has a central point of contact (PoC) made available by the French Ministry of Foreign Affairs (in Paris) which supports all official communication between Partners, as well as with third countries. This PoC also administers and facilitates access to Regime data, including agreements and procedures.

Three decades later, it is a good time to take stock. MTCR advocates credit the Regime with slowing missile proliferation by making missile development both economically and

politically costly ventures. The MTCR has also provided form and structure for missile non-proliferation by identifying issues and countries of (common) concern, facilitating information sharing, coordinating national (export control) policies and buying time for other, perhaps (even) more effective strategies to be formulated. Critics have suggested that the MTCR has done little to stop missile proliferation and has limited potential to do so in the future. These critical arguments will be addressed in the next sections dealing with new initiatives to “fix” the MTCR's shortcomings.

Since 1987, the MTCR has made several important adjustments. In 1993, it adopted revised Guidelines to include restraint in the export of missiles and related technology if they were intended to be used for the delivery of WMD. In 1994, a significant improvement to the Regime was made when member countries agreed to a so-called “no undercut” policy on license denials. This prohibits an exporting country from undercutting another member's export denial unless the export control authorities of both countries first consult each other. In 2002, the MTCR included a new focus on terrorism. Over the years, MTCR members have regularly modified the definitions of (for example) cruise missile “range” and “payload”, closing perceived systemic loopholes. Adjustment has also come by way of enlarging MTCR membership from the initial seven to today's 35 member countries. In order for a country to join, all current MTCR members have to agree that a newcomer fulfils the Regime's formal terms and conditions.

Criticism has focused on three elements of the MTCR. *First*, the MTCR is often depicted as a discriminatory club of (mainly) Western countries, geared towards maintaining a *de facto* missile cartel. Critical outsiders therefore liken the MTCR to the Nuclear Non-Proliferation Treaty (NPT), which is also based on (nuclear) “haves” and “have nots”. This stands in sharp contrast to the Chemical Weapons Convention (CWC), which commits all states parties “never under any circumstances” to develop and produce chemical weapons or to transfer them to anyone. *Second*, the MTCR is

¹ The founding G7 countries consist of Canada, France, Germany, Italy, Japan, the United Kingdom and the United States.

considered to be inherently unverifiable as a result of the dual-use nature of much of its regulated technology. This criticism has become more pronounced due to the surge in drones. Other than through the application of national export control laws, verification is non-existent. Moreover, violations of MTCR Guidelines are rarely punished. Officially, no system of peer pressure or naming-and-shaming is in place, although breaching MTCR Guidelines will inevitably harm a member country's reputation within the Regime. And *third*, many key missile producers (such as China, Iran, North Korea and Pakistan) remain outside the MTCR and the Regime offers little in the way of incentives to these "outsiders".

Much of this criticism is shrugged off (by academics and well as policymakers) with the platitude that the MTCR is "as good as it gets", or that it is either the MTCR (with all its limitations) or nothing at all. Before considering more structural (and profound) options for MTCR reform, the next section examines why the missile technology control norm is under pressure, offering a concise overview of the academic and political debate. This will be followed by a section discussing the impact of three initiatives aimed at complementing, strengthening and/or upgrading the missile technology control norm.

3. Preserving and Strengthening the Missile Control Norm

The fact that the MTCR has remained largely unchanged for three decades can be considered an achievement (showing its usefulness and tenacity), as well as a reminder that the Regime now unavoidably faces serious challenges. Transport and communication costs have decreased across the world, and trade among developing nations (so-called "South-South trade") more than tripled in the period 1980–2015. Trade hubs across the world (such as Singapore, Nigeria and Panama) have become critical nodes in a dynamic and complex global value chain (GVC). Since these international trade flows now comprise a booming and global market for missile-

related technologies, the MTCR faces significant challenges. This is especially the case since new proliferation threats have emerged from non-state actors (notably terrorist organizations) making use of the weakest (export control) link in the GVC.

Today, drone proliferation particularly threatens to undermine the MTCR, mainly since the Regime purports to control drones (traditional parameters such as range and payload apply), but with limited success. Israel, which remains outside the MTCR, accounts for more than half of global drone exports. Moreover, the onset of so-called "Intangible Transfer of Technology" (ITT), which includes electronic transfer through email attachments and cloud computing, poses daunting new challenges to traditional strategic export control arrangements. The proliferation implications of Additive Manufacturing (AM), as well as the rise of nanotechnologies, have yet to be fully grasped. Against this rapidly changing, disconcerting backdrop, existential questions arise about the MTCR's overall effectiveness and relevance. But the key question remains how the MTCR can preserve and even strengthen the existing missile technology control norm.

It should be acknowledged that the MTCR's internal set-up – giving rise to political impasses – is at least partially to blame here. Three problems present themselves. *First*, the MTCR's growing membership has made it hard to take decisions on the basis of consensus, both on the exact nature of the threat (including which countries are of proliferation concern) and on the required regular revisions of its guidelines. The MTCR's Equipment, Software, and Technology Annex is the cornerstone of the Regime's work and is kept up to date by the MTCR Technical Experts Meeting (TEM). In 1987, when the MTCR was established, the seven founding members implicitly agreed on the countries of concern. Over time, the MTCR has changed from a small club of "like-minded" countries with shared (or at least overlapping) security concerns to an eclectic group with widely diverging economic, political and strategic interests. More than once, countries may have joined the MTCR to ensure their entry into the

space launch market and to gain full access to Western technologies. Whether this is true or not, broader membership may have detracted from the MTCR's willingness and ability to adjust quickly and focus on emerging challenges. Since the MTCR is not tasked with singling out countries meriting extra attention, there is no mechanism in place to fix this problem. With the MTCR gradually taking in more members (India joined in 2016), disagreements are likely to mount. The resulting policy stalemate erodes the Regime's capacity to anticipate and adapt to technological change.

Second, political and diplomatic enthusiasm to keep the MTCR relevant is modest, at best. During the Cold War, national security concerns normally overruled economic considerations. Today, security no longer trumps trade, particularly where dual-use goods and technologies are concerned. In a global and competitive economy, maintaining (export control) sovereignty over (often dual-use) goods and technologies is often costly (in time and effort), and may come at the expense of market share. In many cases, MTCR members have held back from exporting drones and dual-use technologies, only to see third countries (notably China) stepping in to fill the void. The strict implementation of MTCR guidelines by its members has not stopped, or even significantly delayed and hampered, proliferation. As a result, global control over Category II items (which could contribute to a delivery system) is declining, since transfers by third countries are not accompanied by the robust end-use assurances that are demanded by MTCR members. The shifting policy debate on drone exports illustrates the MTCR's predicament. The US now links drone transfers to a set of "principles for proper use" (see below) which, linked with training and on-site follow-up "inspections", would at least shape emerging norms for the responsible use of drones. The MTCR's reluctance to engage in this debate implies that the Regime remains behind the curve, which does it no good.

Third, the MTCR has yet to develop an effective strategy to raise international industry awareness, which has made *de facto*

compliance with (missile-related) export control problematic. Information sharing among members obviously takes place, notably at regular Information Exchange Meetings (IEM) where members discuss a wide range of issues (from proliferation trends to the challenges posed by ITT). However, outreach to industry, academia and civil society remains a concern of Regime members only, and hence lacks focus as well as coordination. As a result, there is much room for improvement to increase the public and policy community's awareness of the MTCR's objectives as well as the regular revisions of export control provisions. This problem is certainly not unique to the MTCR. Other non-proliferation arrangements such as the Wassenaar Arrangement (WA), the Australia Group (AG) and the Nuclear Suppliers Group (NSG) similarly do not include a duty to share and disseminate information, and hence lack the capacity to do so. As a result, identifying sensitive dual-use acquisition efforts of suspected third parties is often delayed and is not yet receiving the attention it deserves. The fact that this problem is well-known and widespread does not make it less acute. Sharing information on end-users could also encourage a long-overdue process to create consensus on a list of "countries of concern", and to ensure that licensing decisions among Regime members are based on similar information and consistent criteria.

These three problems are clearly interrelated, and may not be easily fixed, since the MTCR remains an informal and consensus-based arrangement. Several "new" initiatives highlight the MTCR's shortcomings and offer clear reminders that a more major overhaul of the Regime seems inevitable to preserve the missile technology control norm.

4. The Impact of "New" Initiatives: Band-Aids or Upgrades?

This section examines the following three initiatives and their impact on the MTCR: (1) The Hague Code of Conduct (2002); (2) UNSCR 1540 (2004); (3) the Joint Declaration (2016).

The Hague Code of Conduct. The Hague Code came into effect on 25 November 2002 and aims to strengthen efforts to curb ballistic missile proliferation worldwide, thereby supplementing (but not supplanting) the MTCR. The Hague Code is a consensual and (near) universal instrument based on voluntary implementation of a set of general principles, modest commitments, and limited confidence-building measures. It is administered collectively by all 138 subscribing states. It is a reflection of the widely-shared belief that “soft law” and multilateralism remain useful tools to curb WMD proliferation. The Hague Code’s institutional framework is minimal: its decision-making body (the “Regular Meeting”) normally convenes annually for two days in Vienna (Austria) in May and is chaired on a rotating basis. During the run-up to the Hague Code, three options were discussed: (1) a UN-controlled organization; (2) an independent (and relatively robust) organization like the Organization for the Prohibition of Chemical Weapons (OPCW) which implements the CWC; and (3) a minimal regime with a “point of contact” (like the MTCR). This minimal option proved to be the highest attainable.

Proponents of the Hague Code suggest that it complements the MTCR, offering synergies by linking the MTCR’s supply-side approach to the Hague Code’s multilateral demand-side component. The Hague Code was supposed to strengthen the demand-side norm of missile non-proliferation, thereby boosting the legitimacy (and hence efficacy) of the MTCR’s supply-side approach. On the positive side, both regimes are flexible and (relatively) non-confrontational ways to deal with missile proliferation, providing countries with two important fora to discuss issues of shared concern and common approaches towards controlled missile technologies. The downside of having two arrangements is that it may drain already limited (financial and diplomatic) resources or may even dilute the MTCR’s purpose. The Code has been criticized for being “weak” and “overly cautious”, indicating that the lowest common denominator has proven to be very low indeed. These critics emphasize that even with membership into three figures, the Hague Code has failed to attract the

major (ballistic missile) outliers to join, and that its substance has remained unchanged. The Hague Code has thereby not lived up to the expectations of (some of) its founding members who regarded the Code as a first step towards a global, multilateral regime on ballistic missile possession.

The Hague Code has struggled for relevance since its inception, partly because its text was drafted within the MTCR process, which did not add to its legitimacy and hence its wide acceptance. The fact that the Hague Code’s own members were not willing to fulfill their obligations to report missile policies and launches may explain why the Code has not lived up to initial expectations. Attempts to bring the Hague Code closer to the UN system have been under way for some time. The Code could strengthen the MTCR by vigorously working toward universalization on two accounts: full (global) membership, as well as widening the Code’s (technological) scope to include any missile that can carry WMD, including cruise missiles. More ambitiously, the Code could even go as far as including conventionally armed missiles.

The MTCR could benefit from a strengthened Hague Code, for example by starting a process to amend the text of the Code and by inviting both current members as well as outliers to (informally) discuss options and opportunities. Outliers could be asked under what circumstances they would be prepared to participate in a “Hague Code 2.0”. The MTCR should keep its distance from this process, mainly to ensure that a renewed Hague Code is not construed as a Western protectionist endeavor.

United Nations Security Council

Resolution 1540. On 28 April 2004, the United Nations Security Council (UNSC) unanimously adopted Resolution 1540 affirming that the proliferation of nuclear, chemical and biological weapons *and their means of delivery* constitutes a threat to international peace and security. UNSCR 1540 obliges all states to refrain from supporting non-state actors by any means in developing, acquiring, manufacturing, possessing, transporting, transferring or using WMD and their delivery systems.

It also imposes binding obligations on all states to adopt legislation to prevent WMD proliferation and their means of delivery and to establish appropriate domestic controls over related materials to prevent their illicit trafficking. Although the MTCR is not mentioned, UNSCR 1540 clearly strengthens the missile technology control norm and legitimizes efforts to coordinate effective strategic export control measures.

UNSCR 1540 defines “means of delivery” (in a footnote) as “missiles, rockets and other unmanned systems capable of delivering nuclear, chemical, or biological weapons that are specially designed for such use”. The Resolution also makes reference to “related materials”, which are defined (in a footnote) as “materials, equipment and technology covered by relevant multilateral treaties and arrangements, or included on national control lists”. These stipulations clearly suggest that UNSCR 1540 acknowledges the important role played by an “arrangement” like the MTCR, and therefore encourages the international community to support at least the objectives of existing regimes and initiatives to control “means of delivery” (like the MTCR, the WA, as well as the Hague Code). UNSCR 1540’s wording that it applies the means of delivery “specially designed” for use in WMD may be considered problematic, since this may exclude UAVs (which are clearly not designed solely for this purpose, but also for ISR [Intelligence, Surveillance and Reconnaissance] as well as civilian missions). Since the Resolution focuses on “non-state actors” (which in the post-9/11 context means terrorist organizations), it would be logical to assume that “means of delivery” (in this context) are expected to be somewhat rudimentary platforms rather than sophisticated ballistic or cruise missile technology.

Still, UNSCR 1540 has gone a long way in raising awareness among all UN member states of the dangers of WMD proliferation, including their means of delivery, and in drawing appropriate attention to domestic strategic export controls. The Resolution calls upon all states to present national reports to the 1540 Committee (of the UNSC), but lacks benchmarks for minimum

standards of export control legislation as well as the subsequent legislative implementation. Each state decides for itself how to implement these new obligations according to its national legislation, but UNSCR 1540 means that such legislation is now at least mandatory.

It was expected that the 1540 Committee could play some role in clarifying how the Resolution’s provisions (including on “means of delivery”) should be implemented, based on a clear and shared understanding by the international community as whole. The 1540 Committee was expected to function as a clearing house with considerable expertise, using the annual national reports to identify gaps in understanding as well as actual (national) strategic export control implementation. For a variety of reasons, this expectation has not been fulfilled to date. It is incumbent upon MTCR members to work towards strengthening the 1540 process and the 1540 Committee in particular (see below).

Joint Declaration for the Export and Subsequent Use of Armed or Strike-Enabled UAS. In August 2016, US officials presented details of a “Proposed Joint Declaration of Principles for the Export and Subsequent Use of Armed or Strike-Enabled Unmanned Aerial Systems (UAS)” during the Arms Trade Treaty (ATT) Review Conference in Geneva. The Joint Declaration seems to reaffirm the United States’ own Policy Guidance on the export of armed drones which was introduced in February 2015. The US now pushes this new Joint Declaration as a first step in a two-stage process to establish a new export control arrangement for the export and use of armed unmanned systems (i.e. drones). The document (officially published on 6 October 2016 and now having 49 signatories) lays out five key principles for international norms with regard to the export of UAVs: (1) the “applicability of International law”; (2) a dedication to following existing arms control laws; (3) taking “into account the potential recipient country’s history regarding adherence to international obligations and commitments”; (4) following “appropriate transparency measures”; and (5) a resolution to continue

discussions on how “these capabilities are transferred and used responsibly by all States”.

This initiative was billed as a first step towards a robust but voluntary Code of Conduct on UAVs for exporting *and* importing countries. In October 2016, it was planned to establish an international Working Group of all signatories, with a follow-up meeting scheduled for early 2017. With the new US Trump administration, the push towards a new UAV regime was put on hold: the follow-up meeting was postponed to June 2017 and has again been deferred without further notice. The Trump administration is currently preparing a White Paper (to be presented at the MTCR’s TEM in October 2017) making a case for a new approach to UAVs, which may include a shift of certain UAVs from Category I to Category II (see below; Option 4).²

If these initiatives come to fruition and if the Joint Declaration is developed into a mature UAV regime, this will have major implications for the MTCR. The MTCR’s current guidelines treat UAVs like missiles and draw no distinction between military or civilian use. Today’s drones now often resemble aircraft and other recoverable platforms that often serve non-military purposes (ranging from agriculture and border control to critical infrastructure protection). With the proposed Joint Declaration, new norms on drones exports are likely to be shaped on the basis of the US (February 2015) “Export Policy for Military Unmanned Aerial Systems”, which links drone transfers to a set of “principles for proper use”. These include abiding by international law, not using drones for unlawful domestic surveillance or use of force, etc. Most likely, this indicates that the US will start a process of reinterpreting existing MTCR guidelines, gradually clarifying the scope of legitimate and lawful use of drones. The current MTCR “strong presumption of denial” for drone exports will thus be challenged by a more eclectic (and

still vague) set of principles based on notions like “proper use” mainly focused on countries with a dubious humanitarian and security track record (see principle 3 of the Joint Declaration).

For this initiative to gain political traction, it will be essential that major (non-Western) UAV producers (such as Israel and China) sign up to the Joint Declaration on the understanding that this secures their seat at the table when future drone export standards are negotiated. Arguably, this initiative forces the MTCR to consider a long-overdue update on its guidelines and acknowledge that current-generation drones are more akin to aircraft than missiles. Such a future UAV regime would develop an export control arrangement based on a (near) global consensus on what amounts to “proper use” focused on a shortlist of “countries of concern”. As a result, this would also allow the MTCR to focus its energy and attention on this limited group of “countries of concern”, boosting the Regime’s effectiveness and credibility.

5. Towards a Missile Non-proliferation Treaty? The Hard Road Ahead

New approaches and fresh thinking are required to manage sensitive technology trade in a globalized economy and an uncertain international environment. The main message of this Policy Brief is that MTCR members should seriously consider enhancing and deepening their Regime. The author realizes all too well that some (if not most) ideas offered here are unlikely to be followed through since they may not be supported by all members. This concluding section offers a range of options, some of immediate relevance, others as more distant (but still laudable) goals that may inspire practicable change in the intermediate future. It remains up to the individual reader to decide which option falls in which category.

Option 1: Establish a Missile Technology Control Treaty. Formalizing the MTCR and converting the current informal arrangement

² See Bill Carey, “Under Trump Administration, U.S. Reviews Drone Export Policy”, *AIROnline.com* (31 August 2017).

into a (more) solid missile technology export control regime remains a pipedream. Still, it is a useful option to contemplate, since even partial steps towards this whole nine yards may be beneficial. The idea of developing a missile technology control *treaty* is hardly new, and may even be traced back to the late 1980s. So-called “Zero Ballistic Missiles” proposals were floated in the 1990s with the aim of delegitimizing ballistic missiles, turning them into a taboo (like chemical weapons). In June 1999, former Russian President Boris Yeltsin proposed a Global Control System for the Non-Proliferation of Missiles and Missile Technology (GCS), an initiative which proved unrealistic at the time. Still, the failed GCS initiative kick-started G7 countries into developing the Hague Code. Moving towards a Missile Technology Control Treaty (MTCT) today could shake things up in a similar manner.

Such an MTCT might copycat the best features from existing WMD non-proliferation regimes, and probably draw inspiration from the Chemical Weapons Convention, which has a strong verification system, a robust institutional base (the OPCW) and an active outreach program towards industry and academia. The MTCT should include new drone technology, setting up regional missile-free zones, flight-test bans and verification mechanisms. Such a Treaty would also include penalties for non-compliance by member states and other enforcement mechanisms. Information sharing would be improved, and would shift from a denial-based regime to a verification-based system. Such an initiative could be launched at the UN Conference on Disarmament (UNOG) in Geneva. It would offer an opportunity to fold the MTCR and the Hague Code together, based on the logic of combining existing supply- and demand-side arrangements. Such a comprehensive Treaty could envisage different tiers of membership, with different levels of access to technology commensurate with a member’s technological capacities, its willingness to accept greater responsibilities and/or different standards of export controls. It would also be an opportunity to expand membership towards key UAV producers (and exporters) who remain outside the MTCR (and WA), most notably Israel, China and Iran. The current criteria for entry into

the MTCR exclude countries that have engaged in past proliferation activities; a future MTCT could start with a clean slate and open up to current outliers. The political, diplomatic and practical hurdles for such an initiative would be huge and any treaty of this kind would take years to negotiate and implement. Arguably, the potential gains may outweigh the risks and possible drawbacks.

Option 2: Harmonize Export Control Regimes. The range of export control regimes is daunting, from the WA to the NSG, the AG and the MTCR. The recent US initiative to gather signatories around a new Joint Declaration for the Export and Subsequent Use of Armed or Strike-Enabled UAS (see above) may well develop into a new regime. This clutter has caused confusion and detracts from the already limited political and diplomatic energy and commitment. Particularly in areas of rapid technological change (such as drones), it has proven hard to streamline export control regimes. The WA, for example, also applies to the export of dual-use systems used on UAVs, but not to some key enabling technologies. Globalization and the changing nature of the proliferation threat require the WA, the NSG, the AG and the MTCR to compare notes and work towards inter-regime dialogue. Governments that are party to one or more of these regimes may be encouraged to come together to discuss cross-cutting issues. Holding plenary meetings in one place at the same time could be considered as a first, tentative step in a negotiating process towards a new, more harmonized (if not centralized) regime. Co-location (Vienna or The Hague come to mind here) would not only be cost-effective, but would also offer an opportunity to endow these under-institutionalized regimes with professional staff. Harmonization could result in the development of best practices (most notably on enforcement), include a dispute resolution mechanism, provide a tiered list of end-users and develop verification mechanisms and technologies to ensure that end-users comply with “principles of proper use”. Such a harmonized regime would surely boost visibility in member states, inviting a higher level of attention from government as well as industry. An initiative to harmonize existing export control regimes could be billed as a

stepping stone towards the MTCT discussed as Option 1.

Option 3: Monitor and Verify Principles for Proper Use. Since the MTCR has to come to terms with the widening gap between its guidelines and evolving drone technology, steps may be taken to exclude UAVs altogether from the Regime's remit. Today, the MTCR does not openly discuss this problem. This could be fixed in one go were the MTCR to embrace the provisions of the Joint Declaration of Principles for the Export and Subsequent Use of Armed or Strike-Enabled UAS (2016; see above). The US Export Policy for Military UAS (2015; see above) stipulates that recipient states are "required to agree to end-use assurances as a condition of sale or transfer"; that "end-use monitoring and potential additional security conditions [are] required"; and that "all sales and transfers [are] to include agreements to principles for proper use". A renewed MTCR could piggyback on this document and agree upon a robust set of formal assurances combined with monitoring and (perhaps) verification mechanisms, as well as a set of formal commitments to principles for proper use (to be devised by Regime members collectively). Such a renewed MTCR would be as strong and credible as the monitoring and verification mechanisms it will set in place.

The US has already set its own principles for proper use, which may be subject to MTCR scrutiny and developed further. The US Export Policy for Military UAS closes with Washington's commitment to work "with other countries to adopt similar standards for the sale, transfer, and subsequent use for military UAS". These words are echoed in the Joint Declaration's commitment that signatories "are resolved to continue discussions on how these [UAV] capabilities are transferred and used responsibly by all states". The benefits of such an initiative would be obvious: by accepting the current US approach controlling drone technology, it would hope to obtain Washington's commitment to enforce a renewed MTCR based on robust monitoring and (perhaps even) verification. The logical next step would be to envisage how monitoring and verification could be implemented, and

what role a renewed MTCR should play. The options outlined above could become more realistic and attractive, depending on how Option 3 pans out.

Option 4: Make the MTCR Drone-Proof. Today, the MTCR still controls UAVs. However, the reality is that drone proliferation threatens to undermine the MTCR, eating away at its credibility and highlighting the Regime's reluctance (and inability) to adjust to changing technological circumstances. One way or the other, the MTCR has to be made "drone-proof". One option would be exempting drones (and related technologies) altogether from the MTCR's remit. This would imply sweeping change, and probably send the wrong message. A more judicious option would be setting reasonable and workable guidelines for drone exports going beyond Category I's "strong presumption of denial". In February 2012, the US Government Accountability Office (GAO) published a report on UAV proliferation referring to suggestions made by the US (as early as in 2005) to move (some) drones currently categorized under MTCR Category I into Category II. Category I drones include strategic UAVs capable of delivering a payload of at least 500 kilograms to a range of at least 300 kilometers. Given their strategic relevance, Category I drones are subject to "strong presumption of denial" and exports are therefore rare. Category II drones are considered less sensitive, and although national export controls obviously apply, member states have full autonomy to make licensing decisions. Adopting these US proposals would facilitate drone technology exports, whilst keeping them solidly based within the MTCR. At the time, these proposals were rejected by other members of the MTCR. Now, more than a decade later, drone proliferation has become inevitable and unmanageable. Revisiting these one-time US proposals may therefore be in order.

The main benefit of this option is not systemic clarity. Instead, it is based on the simple acknowledgement that the current system opens the door to drone exporters who are not (officially) bound by MTCR rules. Although China has frequently claimed to abide by the Regime's provisions, its track record and export control standards tell a

different story. Israel, the world's largest drone exporter, has (like China) officially committed to compliance with the MTCR, but has yet to sign up to the Joint Declaration. Israel has only recently introduced a new MTCR-compliant drone (the new Heron TP-XP carries a 450-kilogram payload), which now makes Israeli UAVs even more accessible to interested countries. More than 90 states and non-state actors now possess drones and at least 16 countries have armed drones, with another 20 countries actively pursuing this option. The reality is that we are facing a drone-saturated world which is entirely beyond the control of the MTCR and its members.

Making the MTCR drone-proof would imply widening the export opportunities of all members, but on condition that the MTCR adopts new, strict and transparent guidelines on a new set of "Principles for Proper Use", preferably with at least a modicum of monitoring and/or verification to ensure end-user compliance (see Option 3). Transparency should go hand in hand with confidence-building measures for each individual sale, for example by providing detailed descriptions of each (armed) drone export in a member's annual report to the UN Register of Conventional Arms (which is not currently required). Collectively, MTCR could shape UAV export control norms and practices within the context of customary international law. This should also apply to how the use of armed drones (particularly for autonomous and semi-autonomous weapons systems) applies to international humanitarian law and self-defense law.

Option 5: Boost the Proliferation Security Initiative (PSI). Monitoring the spread of missile technology is essential, and setting up a verification mechanism would be desirable. However, it is also clear that the credibility of non-proliferation regimes remain highly contingent upon their effectiveness, rather than on good intentions. This is why the US Bush administration introduced the Proliferation Security Initiative (PSI) in March 2003. PSI aims to interdict shipments of WMD and related goods to terrorist groups and countries of proliferation concern. Initially, only ten countries joined the US. This number has

swelled over the years, with no fewer than 105 countries now having publicly committed to the PSI. The PSI's main selling point is that it is (politically and legally) embedded in UNSC Resolution 1540 and that it offers the requisite counter-proliferation "teeth" in case existing non-proliferation efforts fail. The PSI is actively engaged in outreach and communication, and conducts regular exercises (often maritime, but also gaming) to improve interaction among participants. The origin of the PSI can be traced back to December 2002, when US intelligence picked up a merchant ship departing from North Korea towards the Middle East. When the Spanish navy interdicted the ship in the Mediterranean, 15 complete Scud B missiles were discovered, as well as missile fuel oxidizer. Ever since, the PSI has been the last line of defense for controlling missile technology, and further North Korean missile shipments were interdicted in December 2009 and June 2011.

Much like the MTCR, the PSI is a political commitment lacking a coordinating secretariat. Still, a core of 21 states form the PSI's Operational Experts Group (OEG), which plays a leading role in increasing the PSI's effectiveness, including the development of the PSI Statement of Interdiction Principles. The PSI regularly meets at different levels, and in 2013 a set of four Joint Statements was endorsed mainly to enhance critical interdiction capabilities and practices. Progress on implementation was reviewed at the PSI Mid-Level Political Meeting in January 2016 (in Washington DC); a PSI High Level Political Meeting is scheduled for 2018 (hosted by France). Most states participating in the PSI's OEG are also MTCR members (Singapore being the only exception). MTCR members may consider using the upcoming PSI High Level Meeting to launch a new missile control and interdiction initiative, with a specific focus on North Korea and Iran. In July 2017, the Trump administration announced new US sanctions against North Korea intended to thwart its nuclear and missile programs, as well as mandatory penalties on firms involved in Iran's ballistic missile program. In September 2017, the UN Security Council unanimously adopted a US-drafted resolution to impose new sanctions on North Korea, in a swift

response to the recent nuclear test by North Korea and to Pyongyang's escalating series of test launches of increasingly sophisticated ballistic missiles (which could reach Europe and the United States). The MTCR may use this political momentum to clarify its relationship with PSI and to strengthen available missile-related interdiction capabilities and practices.

Option 6: Expand the MTCR's Relevance to ITT.

Existing strategic export control regimes and arrangements are poorly suited to the task of preventing the spread of intangible technology. Exports of ITT cannot be policed by tangible border controls. Governments lack the capacity (and knowledge) to monitor electronic transfers; *post hoc* verification is often impossible. This is especially worrisome since ITT may be combined with additive manufacturing (commonly known as 3D printing technology), which spreads the manufacturing base of strategic dual-use technologies across the globe. The impact of nanotechnology for proliferation and export controls is also yet to be fully grasped. The WA and NSG already control highly accurate and multi-axis machine tools, since these can be used to manufacture components with military and nuclear applications. The WA also controls technology and software, as does the MTCR. As a result, for most military equipment and controlled dual-use technologies, ITT-related controls already exist. The MTCR clearly prioritizes developments in this area, but may take this a step further and take the lead in developing widely shared ITT-related best practices.

The MTCR's TEM is best placed to do so, since it is the body which now proposes regular changes to the Regime's Equipment, Software, and Technology Annex. This may also include a rethink of the MTCR's commitment to control missiles capable of delivering WMD, and update this to so-called "Weapons of Mass Effect" (WME). WME also include high-power microwave weapons (HPM) and other directed-energy weapons (DEW), as well as hypersonic kinetic energy weapons. Just as NATO has been groundbreaking in devising the "rules of the road" for cyber warfare (in its 2012 Tallinn Manual), the MTCR may engage

with industry, academic and government experts to gain insights into the proliferation implications of ITT and cyberspace in general. Clearly, such an initiative would benefit other existing WMD non-proliferation regimes based on strategic export controls. Such a joint project would have the added advantage of opening up possibilities for harmonizing (or at least comparing notes) amongst export control regimes (see Option 2).

Option 7: Improve Outreach to Industry and Academia Through the 1540 Committee.

The MTCR may step up its efforts to reach out to stakeholders and relevant trading partners, contributing to an exchange of information, experience and best practices. Closer cooperation with the UN's 1540 Committee seems both logical and non-controversial. Both the European Union (EU) and the US have developed assistance programs to further the implementation of UNSCR 1540. The EU has worked through the United Nations Office for Disarmament Affairs (UNODA), which is responsible for providing the 1540 Committee and its experts with substantive and logistical support. The EU's "CBRN Risk Mitigation Centres of Excellence Initiative" (launched in 2010) has offered assistance to third countries in drafting national action plans. Since 2004, the EU has also invested in developing EU-P2P export control programs for dual-use items. The US has taken a similar approach and has, for example, supported a "regional UNSCR 1540 coordinator" position in several international, regional and sub-regional organizations. The US has also worked with UNODA to develop a Trust Fund for Global and Regional Disarmament Activities. This Trust Fund should finance projects specifically designed to further the implementation of UNSCR 1540; the US has already contributed US\$ 4.5 million to this Trust Fund and has encouraged other states to contribute as well.

The 1540 Committee conducted its second Comprehensive Review in 2016, focusing on four themes: monitoring implementation; assistance; international cooperation; and outreach. In a subsequent (and unanimously adopted) UNSC Resolution 2325, states were called upon to intensify their efforts to fulfill

their 1540 obligations and to give the 1540 Committee a mandate to focus its work on major gaps. This gap is particularly large in the area of missile technology, which has always remained of secondary interest within the 1540 process. The 100+-page 2016 1540 Comprehensive Review hardly pays any attention to missile technology, and the MTCR is mentioned only once in the text. It is clear that both UNODA and the 1540 Committee have to be given a significant boost, both politically and financially. The MTCR may call upon industry to support the implementation of strategic trade controls by contributing to the UNODA Trust Fund for Global and Regional Disarmament Activities. To date, this Trust Fund has been supported by voluntary contributions from the US, the United Kingdom, the EU, as well as Norway, Kazakhstan and New Zealand; the Carnegie Corporation is the only non-state actor supporting this initiative. Since 2012, an annual global Industry Outreach Conference on UNSCR 1540 has been organized, aimed at promoting cooperation between governments and industry to support the implementation of UNSCR 1540. This so-called “Wiesbaden Process” has developed into the most suitable platform to encourage more industry engagement. MTCR members may launch a new, well-funded initiative aimed at engaging industry in debates on how to apply appropriate trade controls and the (physical) protection of missile technology, especially in the light of the rise of new technologies (as discussed in Option 5). MTCR members may also encourage industry to contribute to UNODA’s Trust Fund, which should improve the 1540 Committee’s technical, human and financial resources.

Clearly, the seven options sketched out above need further deliberation and will have to be recalibrated in the light of rapidly changing technological, political and strategic realities. Much will depend on the choices that will be made by leading missile technology producers and exporters, notably the US. History indicates that a regime will only survive and thrive if it has continued to serve the core interests of its (key) members. Today, this implies that it will be incumbent upon the MTCR to take into account the

economic as well as security interests of its more powerful members. If the MTCR sticks to its current set-up, it will only be a matter of time before critical voices become more dominant. Since such a scenario should be avoided, it may encourage members to be both thoughtful and pragmatic, and to embrace necessary and practicable change.




Further Reading

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