Controlling ballistic missile proliferation

Assessing complementarity between the HCoC, MTCR and UNSCR 1540

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The Hague Code of Conduct against Ballistic Missile Proliferation, the Missile Technology Control Regime and United Nations Security Council Resolution 1540 each contribute to the international regime for the non-proliferation of ballistic missiles. The three instruments aim at controlling both horizontal and vertical proliferation. However, the complementarity of the three instruments in fulfilling their roles in supply-side and demand-side non-proliferation, particularly in the areas of export controls and transparency and confidence-building measures, has not been sufficiently explored.

Several gaps remain in the universalisation and acceptance of the instruments, their coverage, and the comprehensiveness of the standards they establish, which limits their degree of complementarity. The three instruments should strengthen the implementation of their provisions, institutional linkages and improve their interactions. Cross-cutting themes and challenges, such as hypersonic missiles, could help demonstrate convergences, complementarity and avenues for cooperation and synergies.

HCoC
The Hague Code of Conduct

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CONTENTS

Introduction

The international missile non-proliferation regime is in a dire state. The acquisition of missiles and the required technology by more states and non-state groups which did not previously have them—commonly referred to as horizontal proliferation—continues. At the same time, most missile possessor states practice vertical proliferation, which describes the quantitative expansion or modernisation of arsenals and the development of new missile types.[1] In particular, the acquisition of increasingly sophisticated missiles by a growing number of states and non-state actors in several regions of the world, as well as the development of new missile technologies and the modernisation of existing stockpiles by major powers, creates uncertainty and fuels regional and international instability. At least 31 states have acquired ballistic missiles, at least 12 possess space launch capabilities and many more supply components and technology towards ballistic missile and space launch programmes.[2] Several non-state actors have acquired missiles, as recent uses of missiles in Yemen and against Saudi Arabia have demonstrated.[3] Iranian and North Korean missile developments continue despite the imposition of severe sanctions regimes. The demise of the Intermediate-range Nuclear Forces (INF) Treaty—which banned an entire class of missiles—removed restrictions on arsenals of the United States of America (USA), the Russian Federation (Russia) and several other Soviet successor states, spurring fears of new military build-ups in Europe and other regions.[4] In addition, Russia, the USA, the People's Republic of China (China) and several other states, including France, are undertaking the development of hypersonic missile technology, creating perceptions of new vulnerabilities.[5] These developments increase related potentially destabilising activities, including the use of missiles in ongoing conflicts, the frequency of missile flight tests, a potential widening of the use spectrum of missiles, nuclear and conventional entanglement and the demand for and in turn proliferation of missile technology. In light of these developments and in the absence of a strong norm or treaty banning or regulating all or certain types of missiles, strengthening the existing non-proliferation architecture and its remaining instruments is ever more important.

The Hague Code of Conduct against Ballistic Missile Proliferation (Hague Code of Conduct, HCoC), the Missile Technology Control Regime (MTCR) and United Nations Security Council Resolution (UNSCR) 1540

1. Victor Sidel, 'Vertical nuclear proliferation,' *Medicine, Conflict and Survival*, vol. 23, no. 4, 2007, p. 250.

2. Kelsey Davenport, 'Worldwide Ballistic Missile Inventories', *Arms Control Association Fact Sheets*, December 2017, <https://www.armscontrol.org/factsheets/missiles>.

3. Jean Masson, 'Les missiles des Houthis: prolifération balistique et groupes armés non-étatiques' [The Houthis' missiles: ballistic missile proliferation and armed non-state groups], *Recherches & Documents*, no. 11/2018, FRS, December 2018.

4. On the demise of the INF treaty, see Ian Anthony, 'European Security after the INF Treaty,' *Survival*, vol. 59, no. 6, December 2017/January 2018, pp. 61-76; Ulrich Kühn, 'Between a rock and a hard place: Europe in a post-INF world,' *The Nonproliferation Review*, vol. 26, nos. 1-2, 2019, pp. 155-166.

5. Douglas Barrie, 'Unstable at speed: hypersonics and arms control,' *Military Balance Blog*, IISS, 18th October 2019.

are three key non-proliferation instruments that seek to address the challenges posed by missile proliferation. The MTCR and UNSCR 1540 are export control instruments that provide a framework for creating standards and control measures for the trade in missile systems and relevant goods and technologies. They are however often only considered for their roles in enabling technology denial, while their other roles such as creating transparency among supplier states, including on licence denials and detected procurement attempts and diversion, are often neglected. The HCoC is the only multilateral agreement covering missiles open to all states, but it is frequently criticised for its limited scope and effectiveness. By fulfilling its role as a transparency and confidence-building instrument that commits states to responsible conduct and information sharing, it nonetheless seeks to ease tensions and perceptions of insecurity and help states refrain from destabilising arms races. As the only demand-side non-proliferation instrument for missiles, it occupies a key position in the current missile non-proliferation architecture—despite its weaknesses.[6]

Through their different functions, each of these three instruments serves to address both horizontal and vertical proliferation of ballistic missiles, mainly by strengthening export controls and implementing transparency and confidence-building measures. However, their complementarity remains poorly explored. At a time of severe crisis in traditional arms control approaches, there is a need for more in -depth consideration of these three instruments' respective contributions to missile non-proliferation.[7] This paper therefore explores to what extent HCoC, MTCR, and UNSCR 1540 are complementary in addressing both horizontal and vertical proliferation of ballistic missiles by means of export controls and transparency and confidence-building measures.

Exhibit of Iranian missiles (mock-ups), Fars New Agency

The paper mainly focuses on ballistic missiles, rather than on all types of missile systems. A ballistic missile is understood to be an 'unmanned, actively guided, rocket-propelled vehicle that can be fired [...] along a ballistic (or parabolic) trajectory.'[8] Ballistic missiles remain the delivery system of choice for nuclear weapons and they are also associated with the delivery of chemical and biological weapons. As such, ballistic missile proliferation is intrinsically linked to the threat posed by chemical, biological and nuclear (CBN) weapons to international

6. Mark Smith, 'The HCoC: Current challenges and future possibilities,' *HCoC Research Papers*, no. 1, 2014, pp. 6–7.

7. Łukasz Kulesa, 'The crisis of nuclear arms control and its impact on European security,' *Non-Proliferation and Disarmament Paper*, EUNPDC, no. 66, January 2020.

8. Aaron Karp, *Ballistic Missile Proliferation: The Politics and Technics*, Oxford University Press, Oxford, 1996, p. 4.

peace and security. The entanglement of modern conventionally armed ballistic missiles and those carrying CBN weapons—in the absence of arms control agreements creating the necessary transparency, for example through mutual access and inspections—further contributes to crisis instability and increases miscalculation risks.[9] The limited ability to defend against ballistic missiles, even for those states with advanced missile defence systems, increases states' perception of vulnerability, often resulting in potentially destabilising arms build-ups. There is also a 'dual-use dilemma' affecting missile technology. Similar technologies are employed both in ballistic missiles and in civilian space launch rockets. States' right to acquire technology for the latter purpose in order to exercise their rights to the peaceful uses of outer space is explicitly permitted in relevant international treaties. As such, it is more difficult to distinguish legitimate trade and technology transfers from those fuelling a weapons programme. For this reason, the HCoC also seeks to address states' space launch capabilities and policies. While cruise missiles are associated with some of the same risks as ballistic missiles, they are currently not covered by the HCoC.[10] The reasons for this, and the need for an expansion of the coverage of the HCoC to include cruise missiles has been discussed by other authors and is beyond the scope of this paper.[11]

First, this paper outlines the existing non-proliferation architecture on ballistic missiles by discussing the origins and scope of the HCoC, MTCR and UNSCR 1540. The second part of the paper analyses the roles of the three instruments in seeking to address both horizontal and vertical proliferation of ballistic missiles by means of export controls and transparency and confidence building. It further discusses their complementarity and interactions in fulfilling these roles. Then, it develops recommendations on strengthening the HCoC, MTCR and UNSCR 1540, improving complementarity and enhancing their cooperation. Finally, it briefly draws conclusions on the complementarity of HCoC, MTCR and UNSCR 1540 as tools for ballistic missile non-proliferation.

The existing non-proliferation and export control regime on ballistic missiles: Origins and scope

In the area of ballistic missiles, the existing architecture of non-proliferation and export control instruments is composed of a range of treaties, legally binding and non-binding UN Security Council resolutions, export control regimes, politically binding agreements, codes of conduct and other bilateral arrangements. However, there is 'no universal norm, treaty or agreement

9. Stéphane Delory, 'Ballistic missiles and conventional strike weapons: Adapting the HCoC to address the dissemination of conventional ballistic missiles,' *HCoC Research Papers*, no. 6, January 2020; Ulrich Kühn, op. cit.

10. Mark Smith, op.cit.

11. See e.g. Stéphane Delory, Emmanuelle Maitre, and Jean Masson, 'Opening HCoC to cruise missiles: A proposal to overcome political hurdles,' *HCOC Research Paper*, no. 5, February 2019; Dennis Gormley, *Missile Contagion: Cruise Missile Proliferation and the Threat to International Security*, Annapolis, Naval Institute Press, 2010.

governing the development, testing, production, acquisition, possession, transfer, deployment or use of missiles.'[12] The major US-Russian bilateral arms control treaties have often taken centre-stage in discussions on how to effectively limit the risks created by ballistic missiles, particularly as delivery systems of nuclear weapons. However, bilateral and multilateral arms control are widely perceived as being in crisis.[13] It is thus particularly important to strengthen those instruments that have often received less attention but continue to be key supporting pillars in addressing horizontal and vertical proliferation, namely (i) export controls, and (ii) transparency and confidence-building measures. This paper focuses on three instruments addressing ballistic missile proliferation: the Missile Technology Control Regime, the Hague Code of Conduct, and United Nations Security Council Resolution 1540 (Figure 1). The Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies (Wassenaar Arrangement, WA) is also briefly discussed as it covers missile and missile-related exports.

The MTCR is a politically binding arrangement created by an exclusive group of missile technology supplier states that coordinate export control policies, maintain control lists and share information on acquisition attempts.[14] Despite its limited membership (Figure 1), the MTCR effectively sets the international standard on export controls on missile technology and has in many ways shaped what is considered legitimate trade in this area.[15] The HCoC—which developed out of the MTCR—remains the only multilateral instrument addressing ballistic missiles that is open to all states. The HCoC plays a dual role as a demand side non-proliferation instrument, strengthening the norm against destabilising proliferation and use of ballistic missiles, and as a transparency and confidence-building measure on missile launches and policy.[16] UNSCR 1540 is a binding UN Security Council resolution that creates a set of obligations for all states to adopt appropriate legislation and national controls—including export controls—to prevent the proliferation and trafficking of CBN weapons and their means of delivery and related materials.[17] As such, UNSCR 1540 is the main instrument that has broadened the traditionally state-centric supply-side non-proliferation approach of export controls to address proliferation to and by non-state actors.

12. 'The issue of missiles in all its aspects,' Report of the Secretary-General, A/63/176, United Nations General Assembly, 28th July 2008.

13. See e.g. Götz Neuneck, 'The Deep Crisis of Nuclear Arms Control and Disarmament: The State of Play and the Challenges,' *Journal for Peace and Nuclear Disarmament,* vol. 2, no. 2, December 2019, pp. 431-452.

14. Missile Technology Control Regime, 'Objectives of the MTCR,' [n.d.], <https://mtcr.info/deutsch-ziele/>.

15. Leonard Spector, 'The Missile Technology Control Regime and Shifting Proliferation Challenges,' Arms Control Association, April 2018, <https://www.armscontrol.org/taxonomy/term/69/25?page=36>.

16. Leonard Spector, 'The Missile Technology Control Regime and Shifting Proliferation Challenges,' Arms Control Association, April 2018, <https://www.armscontrol.org/taxonomy/term/69/25?page=36>.

17. 1540 Committee, '1540 Fact Sheet,' [n.d.], <https://www.un.org/en/sc/1540/1540-fact-sheet.shtml>.

Instrument (Year established)	Type of instrument	Scope	No. of members / parties (as of 10th March 2020)
Missile Technology Control Regime (1987)	Multilateral export control regime	Rockets and unmanned aerial vehicles capable of delivering weapons of mass destruction	35
Wassenaar Arrangement (1996)	Multilateral export control regime	Conventional arms and dual -use items and technologies	42
Hague Code of Conduct on Ballistic Missile Proliferation (2002)	Transparency and confidence-building instru-ment	Ballistic missiles and space launch vehicles	143
United Nations Security Council Resolution 1540 (2004)	Binding UN Security Council resolution	Proliferation of CBN weap-ons and their delivery sys-tems to non-state actors	193

Figure 1. Selected major non-proliferation instruments in the area of ballistic missiles

The following sub-sections discuss the origins and scope of the HCoC, MTCR and UNSCR 1540 to establish the necessary basis for discussing their roles and complementarity. This paper mentions other non-proliferation instruments and confidence-building measures in the area of ballistic missiles and discusses their positions vis-à-vis the HCoC, MTCR and UNSCR 1540. With the exception of the WA, their origins and scope are not discussed and elaborating on them is beyond the scope of this paper.

Export controls: The Missile Technology Control Regime

The MTCR was created in 1987 by the Group of Seven (G7) largest industrialized states to help prevent the proliferation of nuclear weapons.[18] The goal of the MTCR was to place controls on the transfer of missiles defined as capable of delivering nuclear weapons as well as their related equipment, material and technology.[19] Partners—the MTCR term for regime members—agreed that the proliferation of such delivery systems posed a threat to international peace and security. While initially only aimed at missiles capable of delivering nuclear weapons, the MTCR expanded its coverage in 1992 to include ballistic and cruise missiles and all unmanned aerial vehicles capable of

18. The G7 are Canada, France, Germany, Italy, Japan, the United Kingdom and the USA.

19. Missile Technology Control Regime, 'Frequently Asked Questions (FAQs),' [n.d.], <http://mtcr.info/frequently-asked-questions-faqs/>.

delivering CBN weapons.[20] The MTCR covers any such system 'capable of delivering a payload of at least 500 kg to a range of at least 300 km', or destined to be used to deliver CBN weapons.[21] The harmonisation of export control policies agreed among the partners is laid down in the MTCR Guidelines, defining the objectives of the MTCR and guidance on implementation for partners and other voluntary adherents.[22]

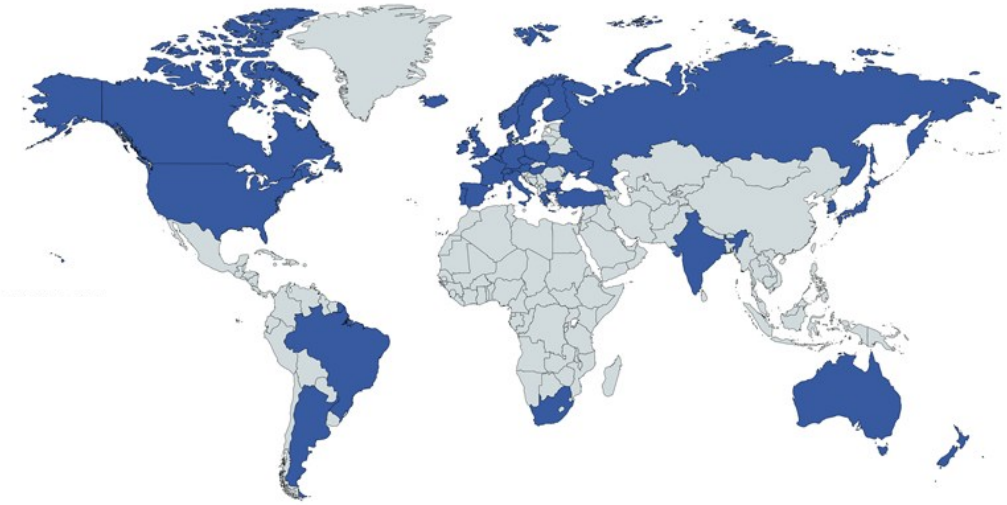


Figure 2. Map of MTCR Partners

Over the years, the MTCR has increased its membership from the initial seven partners to 35 partners (Figure 2). Three states have officially declared adherence to its guidelines and control lists and several others have at different times made statements to this extent.[23] However, it remains an exclusive group of states that only admits partners by consensus and based on a set of strict criteria. The criteria include the sustained commitment of the candidate state to non-proliferation, the adequacy of its export control and enforcement system and whether admitting it would strengthen non-proliferation efforts.[24] Notably, many major technology possessor and supplier states currently remain outside of the MTCR, including China, Egypt, Israel, Iran, North Korea and

20. Ibid.

21. Missile Technology Control Regime, 'Guidelines for Sensitive Missile-relevant Transfers,' [n.d.], <https://mtcr.info/guidelines-for-sensitive-missile-relevant-transfers/>; Missile Technology Control Regime, 'Equipment, Software and Technology Annex,' MTCR/TEM/2019/Annex, 11th October 2019, <https://mtcr.info/wordpress/wp-content/uploads/2019/10/MTCR-TEM-Technical_Annex_2019-10-11-1.pdf>.

22. Missile Technology Control Regime, 'Guidelines,' op. cit.

23. The three states are Estonia, Kazakhstan and Latvia. Missile Technology Control Regime, 'Partners,' [n.d.], <https://mtcr.info/partners/>.

24. Ibid.

Pakistan.[25]

The MTCR control list—the 'Equipment, Software and Technology Annex'—divides list items in two categories. Category I items include 'complete rocket systems' and 'unmanned air vehicle systems' (UAVs) with a range and payload equal to or above the 300 km/500 kg threshold, 'production facilities for such systems,' and 'major sub-systems including rocket stages, re-entry vehicles, rocket engines, guidance systems and warhead mechanisms.'[26] The MTCR partners commit to applying the greatest restraint to transfers of Category I items, which in practice means exercising a 'strong presumption of denial' for export licence applications. Category II covers other complete rocket systems and UAVs with a range of at least 300 km not covered by Category I and a range of dual-use equipment, materials and technologies.[27] Category II items are also covered by licensing requirements, but they are not subject to a 'presumption of denial'. The MTCR partners exchange information on licence denials and procurement attempts, as well as insights on trends in proliferation networks' operational methodology. In addition, the partners' licensing and enforcement experts exchange best practices while technical experts discuss technological developments, and update and maintain the MTCR control list. The MTCR explicitly does not provide for any preferential treatment of other MTCR partners in licensing decisions nor obligations to supply missile technology to them. Partners are however bound by a so-called 'no-undercut' policy, according to which states have to 'consult each other before considering exporting an item on the list that has been notified as denied by another Partner.'[28]

The Wassenaar Arrangement

The Wassenaar Arrangement (WA) was created in 1996 as the successor to the Cold War era Co-ordinating Committee for Multilateral Export Controls (COCOM).[29] The WA seeks to prevent 'destabilising accumulations' of conventional weapons and dual-use goods that would endanger international peace and security.[30] The number of states participating in the WA has expanded from 33 states at its inception to 42 participating states in March 2020.[31] It is a politically binding arrangement to increase transparency and responsibility in the transfer of conventional weapons and

25. Notably, both China and Israel have made statements as to their adherence to the MTCR control lists and guidelines in the past. However, following the introduction of a more formalised process for declaring adherence to the MTCR, neither has chosen to reinforce their statement in this way. Particularly China has a mixed record on past missile technology transfers. Chin-Hao Huang, '"Bridging the gap": Analysis of China's export controls against international standards,' *Final Project Report to the Foreign and Commonwealth Office Counter-Proliferation Programme,* 25th May 2012, pp. 6–8. .

26. Missile Technology Control Regime, 'MTCR Guidelines and the Equipment, Software and Technology Annex,' op. cit.

27. Ibid.

28. Missile Technology Control Regime, 'Frequently Asked Questions,' op. cit.

29. Wassenaar Arrangement, 'About us,' Updated 22nd January 2020, <https://www.wassenaar.org/about-us/>.

30. Ibid.

31. The Wassenaar Arrangement refers to its members as 'participating states'.

dual-use goods and technologies.[32] The MTCR is the main export control regime concerned with missiles and related technology. However, the WA also covers conventional missiles, propulsion systems as well as specially designed testing and production equipment on its munitions list and a range of relevant goods, technologies and equipment for development, production and testing of missiles on its list of dual-use goods and technologies. In contrast to the MTCR, the WA does not provide for an agreed presumption of denial of certain transfers of ballistic missiles and related technologies and equipment. Information sharing within the regime, including the sharing of licences granted and denied for transfers to non-participating states, nevertheless builds confidence and provides transparency among participating states. The licensing requirements applied to items on the WA control lists—even without a presumption of denial—still provide for an additional level of scrutiny on key missile technologies and conventionally armed ballistic missiles.

Transparency, confidence building and responsible conduct: The Hague Code of Conduct

The Hague Code of Conduct against Ballistic Missile Proliferation, initially referred to as the International Code of Conduct, was originally proposed and discussed within the MTCR. Following negotiations with a wider group of states, it was signed in The Hague and entered into force in November 2002.[33] The HCoC is a politically binding agreement that seeks to prevent both horizontal and vertical proliferation of ballistic missiles by committing its subscribers to exercise restraint in the development, testing and deployment of ballistic missiles and related ballistic missile technologies. The HCoC does not ban the possession of and trade in ballistic missiles and ballistic missile technology, but calls on states 'where possible, to reduce national holdings of such missiles, in the interest of global and regional peace and security.'[34] It is limited to ballistic missiles 'capable of delivering weapons of mass destruction' and space launch vehicles (SLVs) but does not define them further in terms of their capabilities and technical parameters.

Since its drafting within the MTCR process, the HCoC has operated independently, with the Austrian Foreign Ministry operating as the Executive Secretariat and Immediate Central Contact (ICC) providing administrative functions and supporting the rotating Chair.[35] The number of subscribing states has grown from 93 at its inception to 143 in March 2020. In contrast to the MTCR and WA, which have an exclusive membership that can only be expanded by consensus decisions of all members, the HCoC is seeking universalisation and any state can join by depositing their

32. Ibid.

33. Hague Code of Conduct, 'What is HCOC?,' January 2019, <https://www.hcoc.at/?tab=what_is_hcoc&page=description_of_hcoc>.

34. United Nations General Assembly, 'International Code of Conduct against Ballistic Missile Proliferation,' A/57/724, 6th February 2003.

35. Federal Ministry for European and International Affairs, 'HCOC – ICC/Executive Secretariat,' 2020, <www.bmeia.gv.at/en/european-foreign-policy/disarmament/hcoc-iccexecutive-secretariat/>.

subscription with the Executive Secretariat.[36] While many possessors and thus potential suppliers of missiles and missile technology subscribe to the HCoC—including the USA, India, Japan, Russia, South Korea, Turkey and all EU member states—many other possessors and some missile aspirants do not subscribe to it, including Algeria, China, Egypt, Iran, North Korea, Pakistan, Saudi Arabia and Syria.[37]

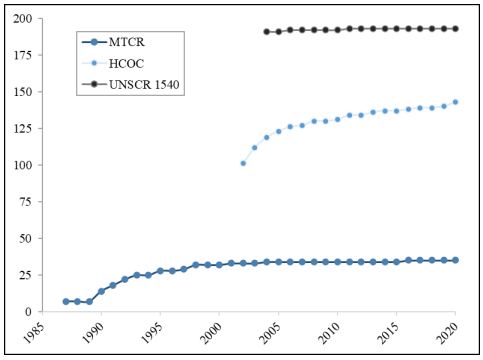


Figure 3. MTCR and HCoC membership and number of states bound by UNSCR 1540, 1987–2020.

States subscribing to the HCoC resolve to implement three main provisions that constitute transparency and confidence-building measures. These include (i) submitting annual declarations about national ballistic missile programmes and policies, including launch sites, and launches in the preceding year, (ii) submitting annual declarations about national SLV programmes and policies, including launch sites, and launches in the preceding year, and (iii) exchanging pre-launch notifications (PLNs) on their ballistic missile and SLV launches and test flights.[38] There is however no agreed definition of what constitutes a ballistic missile or SLV launch that would trigger the obligation to file a PLN, which continues to cause disagreements among HCoC members.[39] The reports on national policies and PLNs are confidential and only shared with subscribing states.[40]

The HCoC also makes an explicit reference to the international frameworks to govern peaceful uses of outer space, as subscribing states confirm their commitment to the Space Benefits Declaration and their resolve to 'ratify, accede to or otherwise abide by' a list of three other treaties and conventions concerning outer space.[41]

36. Hague Code of Conduct, 'How to join HCOC?,' November 2018, <https://www.hcoc.at/?tab=what_is_hcoc&page=how_to_join_hcoc>.

37. Hague Code of Conduct, 'List of HCoC subscribing states,' February 2020, <https://www.hcoc.at/?tab=subscribing_states&page=subscribing_states>; Nicolas Kasprzyk, Emmanuelle Maitre, Xavier Pasco, and Noel Stott, 'The Hague Code of Conduct against Ballistic Missile Proliferation: Relevance to African states,' *Policy Brief*, ISS, September 2016, p. 7; Katarzyna Kubiak, 'Missile control: It's not rocket science,' *Global Security Policy Brief*, European Leadership Network, London, June 2019, p. 6.

38. Hague Code of Conduct, 'How to join HCoC,' op. cit.

39. HCoC ICC/Executive Secretariat, '18th HCoC Annual Regular Meeting: Chairperson's Summary/ Plenary Decisions,' HCoC (19)016, June 2019.

40. Sibylle Bauer and Kolja Brockmann, 'The Proliferation Security Initiative and UN Security Council Resolution 1540' in *Literature review for the Policy and Operations Evaluations Department of the Dutch Ministry of Foreign Affairs*, IOB, The Hague, August 2017, pp. 74–77.

41. The three treaties and conventions mentioned in the HCoC are the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (1967), the Convention on International Liability for Damage Caused by Space Objects (1972), and the Convention on Registration of Objects Launched into Outer Space (1975).

Preventing supply to non-state actors: United Nations Security Council Resolution 1540

In the aftermath of the September 11, 2001 terrorist attacks and the uncovering of the A. Q. Khan illicit proliferation network in 2003, as well as subsequent revelations about the extent of its activities,[42] the US government started refocusing on threats posed by the involvement of non-state actors in the proliferation of weapons of mass destruction (WMD).[43] In a speech to the UN General Assembly in September 2003, then US President George W. Bush called for the UN Security Council to adopt a binding resolution on the prevention of WMD proliferation to non-state actors.[44] The following consultations within the UN Security Council resulted in an initial draft resolution submitted by Russia, an amended version of which was ultimately adopted as UNSCR 1540 under Chapter VII of the UN Charter in April 2004.[45] Chapter VII enables the UN Security Council to take binding decisions that oblige all states to implement specific measures.[46]

The adoption of UNSCR 1540 under Chapter VII was initially deemed controversial by some states and legal practitioners, questioning the legitimacy of the Security Council effectively assuming the role of an international legislator.[47] In the 15 years since its adoption, UNSCR 1540 proved instrumental in the wider adoption of export control regulations globally, including through numerous assistance and capacity building programmes that have subsequently been implemented. Initial concerns over the legitimacy of the resolution have largely waned.[48]

UNSCR 1540 has three main operational

42. Daniel Salisbury, Ian Stewart, and Andrea Viski, eds., *Preventing the Proliferation of WMDs: Measuring the Success of UN Security Council Resolution 1540*, Springer, Palgrave Pivot, 2018, pp. 3-6; Matthew Fuhrmann, 'Making 1540 Work: Achieving Universal Compliance with Nonproliferation Export Control Standards,' *World Affairs*, vol. 169, no. 3, winter 2007, p. 143.

43. WMD are generally understood to include chemical, biological, nuclear and radiological weapons. The term implies that these weapons are generally intended to harm or kill a large number of people. In the case of all but nuclear weapons, at least a significant part of weapons are limited to local or targeted effects which may not seek to achieve mass killing, but targeted killings or massive disruption instead. The term became particularly loaded in connection with the 2003 invasion of Iraq by a US-led coalition following accusations of Iraqi WMD development and possession that could never be substantiated. .

44. United Nations, General Assembly, 'Address by Mr George W. Bush, President of the United States of America,' A/58/PV.7, 23rd September 2003.

45. Olivia Bosch and Peter van Ham, eds., *Global Non-Proliferation and Counter-Terrorism: The Impact of UNSCR 1540*, Brookings Institution Press, Baltimore, 2007.

46. Chapter VII, Article 39 of the Charter of the United Nations specifically states: 'The Security Council shall determine the existence of any threat to the peace, breach of the peace, or act of aggression and shall make recommendations, or decide what measures shall be taken in accordance with Articles 41 and 42, to maintain or restore international peace and security.'

47. Daniel Salisbury, 'UNSCR 1540 Implementation: Challenges Past and Present', in Daniel Salisbury, Ian Stewart, and Andrea Viski, op. cit., p. 83-85; Christer Ahlström, 'United Nations Security Council Resolution 1540: nonproliferation by means of international legislation,' *SIPRI Yearbook 2007: Armaments, Disarmament and International Security*, Oxford University Press, Oxford, 2007, pp. 460–73.

48. Sibylle Bauer and Kolja Brockmann, op. cit., p. 76; Daniel Salisbury, op. cit., p. 89.

provisions in the form of decisions that create obligations for states to implement. The Security Council decided that all states shall (i) 'refrain from providing any form of support to non-State actors that attempt to develop, acquire, manufacture, possess, transport, transfer or use nuclear, chemical or biological weapons and their means of delivery;' (ii) 'adopt and enforce appropriate effective laws' which prohibit any non-state actor to engage in, participate in, assist or finance any of these proliferation activities, particularly for terrorist purposes; and (iii) 'take and enforce effective measures to establish domestic controls' to prevent the proliferation of nuclear, chemical, or biological weapons and their means of delivery, including by establishing appropriate controls over related materials.'[49] These domestic controls are further specified to include material accounting and security, physical protection, controls through law enforcement and export controls and transit, transhipment, proliferation financing and transport controls. However, the resolution does not provide for additional details on how these elements are to be implemented, leaving it largely up to states to interpret and determine the appropriate regulatory tools to implement them.[50]

The Security Council also decided to establish a subsidiary committee to the Security Council—the 1540 Committee—to examine and report on the implementation of the resolution.[51] The tasks of the Committee have since been expanded to function as a clearing house for requests and offers of assistance and capacity building for the implementation of the resolution.[52]

Security Council Members unanimously adopt resolution 1977 (2011) on 20 April 2011, extending the mandate of the 1540 Committee for 10 years. UN Photo/Devra Berkovitz

As the first binding resolution on all UN member states that addressed all CBN weapons, UNSCR 1540 proved to be innovative. In contrast, other non-proliferation treaties and export control regimes often operate in their own 'stove pipes' with limited interaction and only create obligations for their particular groups of members or partner states.[53] As a result,

49. United Nations Security Council, Security Council Resolution 1540, S/RES/1540, 28th April 2004.

50. Ian Stewart, 'Preventing WMD Proliferation: The Future of UNSCR 1540,' in Daniel Salisbury, Ian Stewart, and Andrea Viski, op. cit., p. 111; Sibylle Bauer and Kolja Brockmann, op. cit., p. 75.

51. The Committee is composed of representatives from the 15 members of the Security Council and is supported by a Group of Experts. The Group of Experts is currently composed of 9 members. For the current composition of the Committee and the Group of Experts see the 1540 Committee website <https://www.un.org/en/sc/1540/about-1540-committee/general-information.shtml>.

52. Daniel Salisbury, op. cit., p. 91.

53. Ian Anthony, 'Arms control and non-proliferation: the role of international organizations,' *SIPRI Yearbook 2005: Armaments, Disarmament and International Security*, Oxford University Press, Oxford, 2005, pp. 529–47.

UNSCR 1540 has been widely used—particularly in the context of export control outreach and capacity building—as a legal reference justifying the establishment of new export controls, increased engagement with relevant actors (including industry) and the adoption of export controls by all states. The impact of UNSCR 1540 has thus moved beyond the original purpose and wording of the resolution.[54]

The interplay of ballistic missile non-proliferation instruments: Roles and complementarity

HCoC, MTCR and UNSCR 1540 take on different roles in their pursuit of and contributions to the non-proliferation of ballistic missiles capable of delivering CBN weapons and the reduction of risks and instabilities caused by the development, production, testing, stockpiling and deployment of ballistic missiles. While each instrument is part of and contributes to the international non-proliferation architecture, they vary in their inclusiveness, aims and types of measures. The value they provide depends on their membership and its compliance with political agreements and legal obligations. The three instruments seek to curb horizontal and vertical proliferation of ballistic missiles using both supply-side and demand-side measures. The two main regulatory and policy tools they support are (i) export controls and (ii) transparency and confidence-building measures. A key question this paper therefore seeks to answer is to what extent HCoC, MTCR, and UNSCR 1540 are complementary in the areas of export controls and transparency and confidence building and are thus contributing to ballistic missile non-proliferation.

Being complementary generally describes things that 'are different but together form a useful or attractive combination of skills, qualities or physical features' and/or are 'mutually supplying each other's lack.'[55] Simply put; things that work well together. For the purpose of this paper, complementarity is therefore understood to describe the extent to which the three instruments fulfil their roles in ballistic missile non-proliferation and mutually strengthen each other. The following sub-sections thus discuss their roles in horizontal and vertical non-proliferation efforts, in particular in setting up and strengthening export controls and transparency and confidence-building measures. The final sub-section considers their interrelationship and interactions to improve understanding of their complementarity.

Horizontal and vertical non-proliferation of ballistic missiles

There is no international ban or non-proliferation treaty establishing a norm proscribing the acquisition, development, production, testing, transfer, deployment or stockpiling of ballistic missiles. States

54. Sibylle Bauer and Kolja Brockmann, op. cit., p. 76.

55. Oxford Learner's Dictionaries (online), 'Complementary,' Oxford University Press; Merriam-Webster Dictionaries (online), 'Complementary,' Merriam-Webster, Incorporated.

nevertheless seek to control the acquisition of ballistic missile capabilities by additional states and non-state actors. In addition, they also seek to influence the development of ballistic missile holdings and the behaviour of ballistic missile possessors.

Export controls and related measures ensuring compliance are the main supply-side non-proliferation instruments. They mainly address horizontal proliferation, as states use export controls to regulate the trade in ballistic missiles and goods and technologies required for ballistic missile programmes. As such, they seek to deny transfers of particularly destabilising missiles—defined by the MTCR by way of the 300 km/500 kg threshold, originally created to delineate requirements for delivering a nuclear weapon—and of key missile technology to additional states and any non-state actors which previously did not possess such technology. However, the application of export controls particularly on advanced production equipment, components and new technologies also addresses vertical proliferation by providing leverage against states seeking to expand or modernize their missile holdings or to introduce new missile types. Other mainly supply-side oriented measures targeting horizontal proliferation include targeted sanctions and agreements between groups of states on (maritime) interdiction principles, such as the Proliferation Security Initiative (PSI).[56]

To implement export control regulations, states impose licensing requirements and establish a legal basis for the possible denial of such transfers, enabling government oversight and scrutiny of the trade in controlled goods and technologies. While these regulatory frameworks provide tools to control and safeguard against transfers that could threaten international security and the security interests of states, licensing decisions—the decisions on the actual supply—always depend on a combination of different considerations, including political, economic, security and strategic interests. The harmonisation of control standards through the multilateral export control regimes has been a key factor in prioritising common international security and stability concerns. Harmonised controls generally contribute to maintaining a level playing field in terms of economic competition while prioritising regional and international security interests.[57] Export controls are however still regarded by some as exclusionary and discriminatory tools that perpetuate inequalities between technology 'haves' and 'have-nots' and protect economic advantages of developed states. The guidelines and control lists of

56. On the PSI see Aaron Dunne, 'The Proliferation Security Initiative: Legal Considerations and Operational Realities,' *SIPRI Policy Paper no. 36*, SIPRI, May 2013; Jacek Durkalec, 'The Proliferation Security Initiative: Evolution and future prospects,' *Non-Proliferation Papers*, no. 16, EUNPDC, June 2012; On non-proliferation sanctions see Nicholas Miller, 'The Secret Success of Nonproliferation Sanctions,' *International Organization*, vol. 68, no. 4, fall 2014, pp. 913–44.

57. Kolja Brockmann, Challenges *to Multilateral Export Controls: The Case for Inter-regime Dialogue and Coordination*, SIPRI, Stockholm, December 2019, pp. 12–13.

the regimes do not reflect discriminatory practices and are seen by many states outside of the regimes as a common good and standard used when building and maintaining their domestic export control systems. However, a small number of states, including Iran, continues to associate the export control regimes and their guidelines with their more exclusionary legacy. Meanwhile, agreement on the need to limit proliferation to non-state actors is much wider. The expansion of the focus of export controls through UNSCR 1540 to this area has made this set of policy instruments more palatable to a larger group of states.

Soviet inspectors stand among dismantled Pershing II missiles, in accordance with the Intermediate-Range Nuclear Forces (INF) Treaty. January 1989. Credits: US Department of Defense

The use of transparency and confidence-building measures is the main demand-side instrument used to address ballistic missile proliferation.[58] The establishment of a basic set of confidence-building measures, as well as some—albeit limited—voluntary commitment to exercise the maximum possible restraint in ballistic missile development, production and use by the HCoC is particularly important in the absence of a strong universal norm proscribing missile possession or certain uses. As such, the HCoC is the only codified normative instrument on ballistic missile proliferation behaviour that could contribute to addressing the many demand factors driving horizontal and vertical proliferation.

Demand factors for the acquisition, development, production, modernisation and stockpiling of ballistic missiles include the perceived need for specific military capabilities, the ability to balance or counter specific military threats, certain deterrence missions, and symbolism and prestige.[59] Nevertheless, domestic economic implications, the military and the research and development enterprise often also function as drivers of demand. Institutional dynamics, as well as scientific, industrial and military bureaucracy can also contribute to such demand.

The implementation of HCoC confidence-building measures seeks to enable subscribing states to have access to more information about the missile-related behaviour and policies, for example, of regional adversaries. The perceptions of vulnerability and thus instability that can be induced by missile arsenals build-ups, the extension of their range or acquisition of more sophisticated types of missile systems can potentially be limited through increased transparency and other complementary arms control and disarmament measures.

58. Mark Smith op. cit., pp. 6–7.

59. Katarzyna Kubiak, op. cit.

Export controls: Regulating supply to curb horizontal proliferation

Export controls are a key instrument in supply-side non-proliferation. The significant proliferation of ballistic missiles, despite the existence of the MTCR and the coverage of missiles by the WA, is often provided as evidence for their purported lack of effectiveness. It is however important to recognise that export controls are not a sufficient non-proliferation measure by themselves and were never envisioned as such.[60] There is often only a limited understanding of the role and interplay of export controls with other instruments that are necessary for a comprehensive and effective non-proliferation system.[61] Export controls enable states to apply an additional layer of scrutiny to and if necessary, deny transfers of goods and technologies to other states. Export controls should however not be reduced to their technology denial role and cannot be expected to systematically prevent the acquisition or development, for example, of ballistic missiles by a state with even moderate resources and a dedicated programme to this end. Export controls can—if they are (a) well designed, (b) frequently updated and appropriately targeted and (c) effectively applied and enforced—reveal and delay acquisition attempts and increase their 'financial and diplomatic costs'.[62] This can either dissuade a state or non-state actor from its proliferation attempt—thus affecting their demand calculation—or it can enable states to leverage diplomacy, other policy tools, enforcement or coercive measures to help address a specific proliferation challenge.[63] In the case of a motivated actor that is willing to accept additional costs and international pressure, or one which benefits from the support and/or protection of one or multiple great powers, these kinds of measures may often be much less effective. Export controls are generally not a tool of economic statecraft. However, in combination with sanctions and embargoes they can nevertheless significantly impact a state's economy and trade and the ability to procure goods by a designated state or non-state actor.[64]

In the area of ballistic missiles, the MTCR fulfils many key functions in the export control system. It is the main forum for states to design new control list items, including appropriate technical parameters, which enable effective controls while at the same time limiting adverse effects. The

60. Daniel Joyner, 'Restructuring the multilateral export control regime system,' in Daniel Joyner, ed., *Non-proliferation Export Controls: Origins, Challenges, and Proposals for Strengthening*, Ashgate, Aldershot, 2006, p. 219.

61. Michael Beck and Seema Gahlaut, 'Creating a new multilateral export control regime,' Arms *Control Today*, April 2003.

62. Kolja Brockmann, op. cit, pp. 4-5; Lisa Koch, 'Frustration and delay: The secondary effects of supply-side proliferation controls,' *Security Studies*, vol. 28, no. 4, 2019, pp. 787-99.

63. Ian Anthony et al., 'Multilateral weapon-related export control measures,' *SIPRI Yearbook 1995: Armaments, Disarmament and International Security*, Oxford University Press, Oxford, 1995, pp. 622–30; Leonard Spector, op. cit.

64. Nicholas Miller, op. cit.

MTCR Technical Expert Meeting develops new list items and prepares updates on existing list items. However, despite this key function being fulfilled by the MTCR, transposition of list changes into national laws and effective enforcement of controls is inherently dependent on national procedures and capabilities. The MTCR partners represent the majority of states with significant economic stakes in the related industries, which enables them to help maintain a level playing field in terms of economic competition. Developing countries with relevant emerging industries outside of the MTCR are however largely kept from contributing. Significant challenges and to some extent discord can occur when non-members step in to supply states in response to procurements that regime members had previously rejected in line with regime guidelines. For example, the US has been seeking to change the parameters used for the threshold to Category I of the MTCR to be able to compete on UAV sales with China and Israel who remain outside of the MTCR.[65] While the WA applies a criterion on outside availability when considering new control list items, the MTCR does not.

UNSCR 1540 increased the legitimacy of dual-use export controls globally and thus beyond the membership of the multilateral export control regimes. Even prominent members of the Non-Aligned Movement that long opposed export controls categorically subsequently pursued their comprehensive development.[66] UNSCR 1540 increased the legitimacy of other important strategic trade control measures including controls on transit, transhipment, and brokering, which have become ever more important in the globalisation of supply chains (for example the use of transhipment through other states to conceal the true destination and end-user of a shipment).

Transparency and confidence-building measures: Reducing uncertainties and vertical proliferation

In the area of ballistic missiles, a whole range of bilateral agreements between the USA and the Soviet Union—later Russia—have introduced commitments, practices, dedicated infrastructure and political understandings to build confidence and provide for transparency.[67] India and Pakistan also entered into a similar bilateral

65. Sibylle Bauer et al., 'The export control regimes,' *SIPRI Yearbook 2018: Armaments, Disarmament and International Security*, Oxford University Press, Oxford, 2018, pp. 428–29.

66. Sibylle Bauer and Kolja Brockmann, op. cit., p. 76.

67. See 'Agreement on measures to reduce the risk of outbreak of nuclear war,' Signed in Washington on 30 September, 1971; 'Agreement Between The United States of America and The Union of Soviet Socialist Republics on the Establishment of Nuclear Risk Reduction Centers,' Entered into force September 15, 1987; 'Agreement Between The United States of America and The Union of Soviet Socialist Republics on Notifications of Launches of Intercontinental Ballistic Missiles and Submarine-Launched Ballistic Missiles,' Entered into Force May 31, 1988; 'Memorandum of Understanding on Notifications of Missile Launches,' Signed December 16, 2000.

agreement including mutual notification on certain types of ballistic missile launches using PLNs in 2005.[68] However, to date, the HCoC remains the only dedicated multilateral agreement seeking universalisation that establishes confidence-building measures and increases transparency in the area of ballistic missiles. In general, support for the HCoC seems strong as the number of subscribing states has slowly but steadily risen since its inception—currently counting 143 subscribing states. The UN GA routinely adopts the now biennial resolutions in support of the HCoC with a higher number of states voting in favour than the number of subscribing states—171 votes in favour in 2018. Despite this seemingly strong political support, the implementation of the HCoC provisions—particularly confidence-building measures, including PLNs—has at times faced difficulties and discussions over perceived discrepancies in states' implementation.[70]

The confidence-building measures established by the HCoC seek to play a key role in establishing transparency and reducing uncertainties, particularly those created by vertical proliferation. That being said, some states, including Algeria, have argued that the HCoC does not sufficiently and specifically address vertical proliferation issues.[71] Subscribing states create transparency about the general direction of developments and about the status of their missile and SLV programmes. If consistently and effectively implemented, this can enable states to better understand and interpret behaviours, procurement, testing and other activities another state is undertaking. In combination with HCoC subscribing states' declarations on national policies, it can contribute to reducing uncertainties that a state might otherwise seek to offset militarily, for example through its own missile development, increase of its stockpiles or range of its missiles. This conceptualisation builds on what the academic literature calls the 'security dilemma', according to which 'many of the means by which a state tries to increase its security decrease the security of others.'[72] The degree to which states feel threatened by the actions others take to increase their own security can be limited if states cooperate and disclose their aims and provide indications of what they seek to achieve. In cases where a missile programme and its objectives are known, other states can take this into account and work to prevent arms races through diplomatic engagement and other measures.

The pre-launch notifications HCoC

68. Erin Creegan, 'India, Pakistan Sign Missile Notification Pact,' *Arms Control Today*, 1st November 2005.

69. United Nations General Assembly, 'The Hague Code of Conduct against Ballistic Missile Proliferation,' A/RES/73/49, 12th December 2018.

70. Mark Smith, op. cit., pp. 10–11; HCoC ICC/ Executive Secretariat, op. cit..

71. United Nations General Assembly, First Committee, Fifty-ninth session, 17th meeting, 26th October 2004, A/C.1/59/PV.17, p. 19. .

72. Robert Jervis, 'Cooperation under the Security Dilemma,' *World Politics*, vol. 30, no. 2, January 1978, pp. 169–70.

subscribing states commit to issuing are a very concrete confidence-building measure that seeks to prevent states from misinterpreting missile and SLV tests as potential attacks or as otherwise threatening them directly. This does not mean that missile tests may not nonetheless contribute to instability, as they can signal the ability to deploy and demonstrate military capabilities.

As discussed above, there is no voluntary disarmament obligation among the provisions of the HCoC, but merely a plea to consider reducing missile holdings where possible. While the confidence-building measures established under HCoC can contribute to the control of vertical proliferation, the HCoC does not explicitly seek to reverse vertical proliferation.

While the MTCR is not a traditional transparency and confidence-building instrument *per se*, the role of its information exchange function between partners and its increasing outreach efforts should not be disregarded. In particular, the sharing of detected procurement cases, the associated denials issued, and the 'no undercut' policy build mutual confidence between the partners in each others' practices and compliance with non-proliferation commitments. The regular exchanges among government officials in the MTCR's Licensing and Enforcement Experts Meeting (LEEM) also provide insights, an exchange of lessons learned and direct contacts and collaboration between officials. Such exchanges are particularly important in reducing the fear harboured by some States that their own restraint is nullified by other suppliers' willingness to ignore or assess consequences differently. These factors are most relevant for major supplier states, as reflected by the limited and exclusive membership of the MTCR. Yet, acceptance of the multilateral export control system by as many states as possible is required. This is particularly so given the manifold challenges inherent in detection and enforcement of export control violations, including the globalisation of supply chains and the risk emanating from the possibilities of outsourcing production, concealment of the destination of shipments through transhipment, the use of front companies and other means to obscure illicit trade. In the absence of transparency over the decision-making processes and engagement with non-members, states outside of the regimes could understandably have reservations about the guidelines and control lists. The regimes have made significant improvements in their transparency and engagement with non-member states and industry. However, the key information sharing functions remain exclusive to their members, both in the case of the MTCR and the WA. Notably, the rate and degree of information sharing by the MTCR partners—as by the WA participating states—at times has been quite low, thus diminishing their value for confidence building. The membership composition of the regimes and competition and adversarial relations between some members—for example, between the USA and Russia who are both members of the

MTCR and the WA—have been identified as one major reason for periods of limited information exchange.[73] Incidentally, many states have argued that the functionality of the regimes, and the information exchange function in particular, would further be diminished if the membership of the regimes were expanded or opened to all states.[74]

The Vulcain®2.1 on the PF50 test bench at ArianeGroup in Vernon. Credits: ArianeGroup/ Dominique Eskenazi

A baseline understanding of the active missile and SLV programmes in a specific state can also help inform the implementation of export controls. It provides additional information that can be used when taking licensing decisions and can help discover procurement attempts to undeclared programmes. For example, if a state's procurement activities to acquire certain goods and technologies do not line up with the requirements of its declared programmes, it can indicate undeclared programmes and enable states to take additional measures to curb or reduce the impact of such programmes on security and stability.

Complementarity of instruments and roles

In order to assess the complementarity between the the HCoC, MTCR and UNSCR 1540, this sub-section considers several specific areas where the interaction and interrelationship of the three instruments demonstrate how they mutually benefit each other, and their combination strengthens ballistic missile non-proliferation efforts. It considers the impact the three instruments have had on the legitimacy and the comprehensiveness of the export control system applied to ballistic missiles and the universalisation of memberships and promotion of common standards. It also addresses shortcomings in the effectiveness of the instruments and the impact these have on their complementarity. Finally, it considers possible opportunities created by these instruments to concertedly address current cross-cutting challenges and themes in missile non-proliferation, such as the development of hypersonic missile systems.

Legitimacy and comprehensiveness of ballistic missile export controls

UNSCR 1540 is widely recognised as having significantly increased the legitimacy of export, brokering, transit and transhipment

73. Kolja Brockmann, op. cit., p. 7.

74. Michael Beck and Scott Jones, 'The Once and Future Multilateral Export Control Regimes: Innovate or Die,' *Strategic Trade Review*, vol. 5, no. 8, winter/spring 2019, pp. 67-68; Kolja Brockmann, op. cit., pp. 9-11.

controls, thus involving many more countries beyond the supplier states. Export controls have since been accepted more readily as a key instrument for all states to contribute to the non-proliferation of CBN weapons and their delivery systems, including ballistic missiles.[75] The inclusion of delivery systems for CBN weapons in UNSCR 1540—albeit with limited definition—is particularly significant in terms of its complementarity with the MTCR as—for the first time—it provided an international legal reference which the MTCR could recall in order to legitimize it activities and objectives.[76] The HCoC also contributes to the legitimacy of non-proliferation measures against ballistic missiles, including export controls, as its growing membership and international support provide the closest to a norm-setting international instrument in the area of ballistic missiles that measures adopted to this end can reference.

The implementation of export controls and related measures is dependent on states adopting control lists defining goods and technologies the transfer of which warrants additional scrutiny and licensing. UNSCR 1540 created a requirement for states to adopt such control lists in their national legislation to meet their non-proliferation commitments.[77] While multilateral export control regimes, including the MTCR and WA, maintain, publish and periodically update their own control lists, UNSCR 1540 does not mention or refer to the regimes' control lists in any provision. However, its definition of 'related materials' refers to 'materials, equipment and technology covered by relevant multilateral treaties and arrangements', thus implicitly acknowledging the regimes' control lists.[78] This can in part be explained by the political sensitivities concerning the exclusive and confidential nature of the regimes and the fading objection to the regimes and their output by non-members and particularly by the Non-Aligned Movement and other developing states. The regime control lists have nevertheless had a significant impact beyond their membership, as some non-members declared their adherence to them or unilaterally adopted the regime control lists or an existing control list that unifies the regime control lists—for example the EU's dual-use control list—in one list. Thus, UNSCR 1540 has had a significant impact on the promotion of export control standards—including those on ballistic missiles—beyond the limited membership of the export control regimes.

UNSCR 1540 is also the main instrument that contributed to export controls by transcending the traditionally state-centric

75. Daniel Salisbury, Ian Stewart, and Andrea Viski, op. cit. p. 128; Sibylle Bauer and Kolja Brockmann, op. cit., p. 76.

76. Sibylle Bauer and Kolja Brockmann, op. cit., p. 75.

77. The resolution states that 'Acting under Article VII of the Charter of the United Nations [...] 6. Recognizes the utility in implementing this resolution of effective national control lists and calls upon all Member States, when necessary, to pursue at the earliest opportunity the development of such lists,' United Nations Security Council, Security Council Resolution 1540, S/RES/1540, 28th April 2004.

78. Sibylle Bauer and Kolja Brockmann, op. cit., p. 75.

supply-side approach to non-proliferation. Instead, it addressed the issue of proliferation—including of ballistic missiles—to non-state actors. The regimes have since all adapted their guidelines to include transfers to non-state actors and terrorists in particular. As such, it has significantly increased the comprehensiveness of export controls, in combination with the standards established by the MTCR, WA and the other regimes.

Universalisation of membership

The increase in legitimacy of ballistic missile non-proliferation through the combination of the three instruments has also impacted the universalisation of their memberships and standards. The MTCR remains a relatively small group and there are no indications that consensus is building on a significant expansion of its membership. However, the number of voluntary adherents and states following its guidelines and control lists has increased, not least because of their inclusion in the outreach and capacity building efforts of the EU and many states. The HCoC's legacy as the product of a process originating within the exclusive circle of the MTCR partners has always been a complicating factor, particularly with regard to the universalisation of its membership. The impact of UNSCR 1540 has however considerably reduced this criticism and the growing number of subscribing states is a testament to this (Figure 3). Universalisation of the HCoC is still seen as one of its main objectives, as reiterated by almost every HCoC Chair in their public statements on assuming the chair and in the press releases of the annual meetings in recent years.[79] Much of the outreach to and engagement with non-subscribing states thus aims to attain a higher number of subscriptions, including by key missile possessors. This has proved to be inherently difficult and several states, such as Egypt and Iran, have been consistent in their rejection of the HCoC.[80] Universalising membership is an important factor for the normative impact of the HCoC. However, even HCoC proponents are conscious both of the low likelihood of having some states subscribing to the HCoC, and the risk that subscription by non-compliant states could threaten its functioning and normative power.

There are several examples of states with initial objections that have—for a variety of reasons—chosen to join the HCoC, or at least given up their objections and started to engage with it more constructively. For example, on its quest to join the ranks of the members of the multilateral export

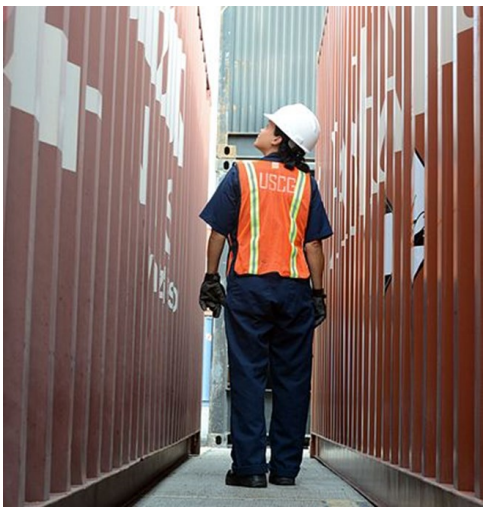
79. Hague Code of Conduct, 'Press Releases about HCoC,' June 2019, <https://www.hcoc.at/?tab=what_is_hcoc&page=press_releases>.

80. The objections put forward by Egypt include the limited scope of the HCoC and omission of cruise missiles, the lack of inclusiveness of the negotiations—including initially in the MTCR context—and a lack of elements promoting peaceful uses and assistance. Both Iran and Egypt have also argued that the regional security situation needs to be addressed first, implicitly referring to Israel's nuclear arsenal. Nicolas Kasprzyk et al., op. cit., p. 7; United Nations General Assembly, First Committee, Fifty-ninth session, 17th meeting, 26th October 2004, A/C.1/59/PV.17, p. 17.

control regimes—its ultimate goal being the acceptance into the circle of nuclear suppliers despite being a non-party to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT)—India sought to demonstrate its role as a responsible supplier and advocate of non-proliferation by joining all the regimes.[81] During its push to join the regimes in 2016, it also subscribed to the HCoC—which it had long opposed—in order to bolster its credentials on missile non-proliferation. UNSCR 1540 has reduced the opposition of other states, including Mexico, to the regimes and fostered constructive engagement with them.[82] For example, after joining the other multilateral export control regimes, Mexico stopped short of joining the MTCR and the HCoC, mainly due to initial objections and a subsequent lack of prioritisation of the area of ballistic missile proliferation.[83] To some extent, this reflects the low priority that HCoC is given by some states without missile ambitions. Outreach efforts focusing on the HCoC, as well as secondary effects from UNSCR 1540 and MTCR outreach programmes have nevertheless achieved a significant increase in membership by such states.

Limitations to compliance and enforcement

One of the fundamental issues the HCoC, MTCR and UNSCR 1540 face is the absence of clear definitions of what constitutes compliance and non-compliance, what procedures can be used to address non-compliance and ultimately if compliance can be enforced in a meaningful way. This is a particularly complicating factor for the complementarity of the three instruments, as it limits the confidence states can have in others' compliance and in the instruments fulfilling their stated objectives.



A container inspector at Coast Guard Sector Honolulu Oahu, January 2016. Credits: U.S. Coast Guard

The MTCR does not clearly define when or if the approval of certain transfers by members may constitute non-compliance and there is no enforcement mechanism. MTCR partners can bilaterally engage with

81. Rakesh Sood, 'India and Non-Proliferation Export Control Regimes,' *ORF Occasional Papers*, no. 150, April 2018.

82. Interview with a former Mexican government official, 13th December 2019.

83. See for example the statement by Mexico on the draft resolution to endorse the HCoC in 2004, A/C.1/59/PV.17, op. cit, p. 14.

non-compliant partners or 'name-and-shame' them by raising compliance issues during MTCR meetings.[84] However, there is no formal mechanism to prevent another member's transfers of missile systems and technology. Implementation and enforcement of the MTCR provisions occurs through national laws and at the discretion of each partner.[85]

Despite the legal obligations created by UNSCR 1540, there is no practical enforcement in cases of non-compliance.[86] The UN Security Council has the legal means to impose for example sanctions as punishment for non-compliance with resolutions adopted under Chapter VII. However, this is not practical in relation to the broad and non-specific way UNSCR 1540 formulates the obligations it imposes on states and the absence of a 'timeline or deadline for implementation.'[87]

The provisions of the HCoC are politically binding and are only defined to a very limited extent. One of the long-standing debates that has recently been reinvigorated by Germany concerns the question of what types of missile and SLV tests and launches constitute activities that require the submission of a PLN.[88] In addition, the quality of annual reports on missile and SLV programmes and policies, in terms of the level of detail they provide, is not specified beyond exemplary mentions of some specific elements, including the declaration of launch sites and facilities. This can limit mutual confidence if intelligence gathering and verification measures, as well as open source analyses, show to be inconsistent with a subscribing state's declarations and subscribing states therefore cannot rely on the state's consistent use of PLNs. This can increase the risk of miscalculation — which the HCOC's provisions are, in fact, designed to limit.

Each of the instruments lacks means to ensure compliance with its provisions, which in themselves would at least create the baseline for a comprehensive approach to ballistic missile non-proliferation. It is therefore important for each instrument to strengthen the implementation of its own provisions, particularly with regard to compliance and transparency, to limit existing weaknesses and strengthen effectiveness. The proper functioning and effectiveness of the instruments is a prerequisite for them to fulfil their roles and enable complementarity and more synergies.

Addressing cross-cutting themes and advances in missile technology

While the HCoC, MTCR and UNSCR 1540 are independent instruments aiming at specific aspects of ballistic missile non-proliferation, it is worth considering their complementarity in addressing current cross-cutting themes and challenges. These

84. Missile Technology Control Regime, 'Frequently Asked Questions,' op. cit.

85. Ibid.

86. Daniel Salisbury, op. cit., p. 85.

87. Daniel Salisbury, op. cit., pp. 85-86.

88. HCoC ICC/Executive Secretariat, op. cit.

include the expansion of the civilian space launch industry and the potential proliferation of tacit knowledge, as well as developments in automated production technologies, such as additive manufacturing.[89] As mentioned earlier, the development, testing and deployment of what is broadly classified as hypersonic missile systems is one such issue.

Many scholars and commentators have argued that the advent of new kinds of hypersonic missiles will significantly affect crisis stability and result in new arms race dynamics, particularly among states facing anti-ballistic missile defence systems deployed by adversaries.[90] Several underlying assumptions concerning the impact of new kinds of hypersonic missiles in these analyses are however at least questionable, including the need for novel missile technology to defeat missile defence systems. The development of this technology by several states is accompanied by a certain hype over the capabilities of such systems and it is too early to discern an arms race dynamic. However, the development, testing and deployment of such systems increases—albeit to a very limited extent—regional and international instabilities.[91] Particularly concerning are the unfolding competitive dynamics between a number of states developing, testing and—in the case of Russia—already deploying such missile systems that are affecting security perceptions and further call into question the already disputed utility of missile defence systems. It therefore raises the question of whether current developments in the area of hypersonic missiles and the resulting dynamics demonstrate the shortcomings of the missile non-proliferation architecture and if the pursuit of such technology by a growing number of states further weakens existing instruments.

UNSCR 1540 does not discuss new technological developments but is generally concerned with CBN weapons delivery systems. The role of hypersonic missiles as nuclear weapons delivery systems in some states means that the obligations established under UNSCR 1540 extend to such systems and the associated goods and technologies. The MTCR also does not distinguish the type of missile above the proscribed range/payload threshold in Category I and thus covers most hypersonic missile systems.[92] In addition, the coverage

89. Kolja Brockmann and Sibylle Bauer, '3D printing and missile technology controls,' *SIPRI Background Paper*, SIPRI, November 2017.

90. Several types of missiles have been able to reach hypersonic speeds (Mach 5 and higher) in the past, particularly intercontinental ballistic missiles (ICBMs). The term 'hypersonic missiles' is often used to describe several advanced types of missile systems, including hypersonic boost-glide systems and hypersonic cruise missiles. These systems generally distinguish themselves from older missiles through their higher manoeuvrability at hypersonic speeds. See Douglas Barrie, op. cit.; and Katarzyna Kubiak, op. cit.

91. Andrew Reddie, 'Hypersonic missiles: Why the new "arms race" is going nowhere fast,' *Bulletin of the Atomic Scientists*, 13th January 2020.

92. United Nations Office for Disarmament Affairs, 'Hypersonic Weapons: A Challenge and Opportunity for Strategic Arms Control,' A Study Prepared on the Recommendation of the Secretary-General's Advisory Board on Disarmament Matters, 2019, p. 28.

by export controls of weapons systems and items with military end-uses is clearly established. The MTCR covers some dual-use technologies that can contribute to hypersonic missile programmes and the question of whether new controls may be necessary and desirable has been raised by the partners. Commitments under the HCoC cover at least the ballistic missile boosters used in boost-glide systems and any ballistic missiles used to deliver manoeuvrable re-entry vehicles.[93] The HCoC has however not explicitly discussed its coverage of boost-glide systems nor whether the PLN commitments extend to flight tests of hypersonic missile systems. The three instruments clearly establish at least a baseline of controls on hypersonic missile systems. The HCoC could potentially function as a forum to discuss and develop further non-proliferation and arms control measures aimed at hypersonic missiles.

Ways forward: Strengthening instruments, improving complementarity, and enhancing cooperation

A range of individual and combined measures could be taken by the HCoC, MTCR and UNSCR 1540 to improve their complementarity and thereby strengthen international ballistic missile non-proliferation, in particular by enhancing multilateral export controls and transparency and confidence-building measures.

- *Strengthen institutional linkages between the HCoC, MTCR and UNSCR 1540.*

UNSCR 1540 and to some extent the HCoC have had a legitimising effect on the MTCR. The MTCR increasingly interprets its role as—at least in part—a provider of a public good. Building on this, the three instruments should increase their alignment to enable more global harmonisation of export control standards in the area of ballistic missiles while strengthening the norms on non-proliferation and responsible conduct. Both the HCoC and the MTCR—through their current Chairs—could be involved in 1540 outreach activities. Contributions could take the form of presentations introducing the instruments and explaining their functions, as well as the benefits they provide to subscribers, adherents and even non-members, in a non-prescriptive way. This would provide an opportunity to explain and raise awareness of each instrument and explain how they can benefit states in the implementation of their UNSCR 1540 obligations and contribute to a comprehensive approach to ballistic missile proliferation.

- *Increase MTCR transparency.*

The partners should continue to increase the regime's transparency as well as the outreach and engagement conducted with other states and international organisations and bodies, including through engagement with the HCoC. This could strengthen both the legitimacy of the MTCR and its appeal as an acceptable standard for states to follow in their implementation of non-proliferation commitments and obligations

93. Ibid.

under the HCoC and UNSCR 1540. One initial—and somewhat symbolic—step could be the publication of new and revised good practices documents on export control implementation, which the MTCR has so far only shared among the partners. This could also strengthen the aspired role as a public good provider for global non-proliferation efforts—in addition to the continuous updating and publishing of the MTCR control list.

- *Use the UNSCR 1540 Comprehensive Review to strengthen the relationship with the HCoC*:

As part of the 2021 Comprehensive Review of the Status of Implementation of Resolution 1540, the 1540 Committee should consider engaging with the HCoC pursuant to the mandate of Working Group 3.[94] This would provide an opportunity to explore future engagement between the two bodies and establish the HCoC as a key reference codifying the norm against ballistic missile proliferation. This could both strengthen the standing of the ballistic missile related obligations under UNSCR 1540, while also increasing the legitimacy and standing of the HCoC.

- *Communicate and coordinate outreach and capacity building*:

There are several regions which are particularly struggling with missile proliferation while being underrepresented among HCoC subscribers and MTCR partners (for example, the Middle East and North Africa). As outlined above, each of the three instruments conducts outreach and/or facilitates capacity building. The HCoC Chair and ICC, the MTCR Chair and the 1540 Committee could discuss annual outreach priorities and potentially coordinate efforts to the extent possible to make optimal use of the degree of their complementarity and to explore synergies. This could both help to strengthen export control standards and to improve demand-side norms and responsible behaviour in light of missile-related regional instabilities. While active alignment of priorities and engagement of specific states will likely be difficult due to the different memberships and mandates, a basic level of mutual awareness could nevertheless be beneficial. In particular, it could provide an opportunity for those instruments able and willing to make reference to other's outreach and to position their own activities in relation to those conducted by the other two instruments. This could also take the form of coordinated back-to-back outreach events and side events organised at each other's public events and activities.

- *Engage with new missile arms control and non-proliferation initiatives*:

The HCoC, in particular through its Chair, should engage with new missile arms control initiatives, such as the 'Missile Dialogue Initiative' (MDI) spearheaded by Germany.[95] While the expansion of the HCoC's scope, qualitative improvements

94. 1540 Committee, 'Modalities Paper of 2021 Comprehensive Review of the Status of Implementation of Resolution 1540 (2004),' [n.d.], <https://www.un.org/en/sc/1540/documents/2021%20CR%20Modalities%20Paper.pdf>.

95. For more information on the initiative see: German Federal Foreign Office, 'Rethinking arms control: the Missile Dialogue Initiative,' 18th October 2019, <https://www.auswaertiges-amt.de/en/aussenpolitik/themen/abruestung/missile-dialogue-initiative/2258792>.

and clarifications of commitments have all proven difficult, it could nevertheless contribute with its experience in transparency and confidence building in the area of ballistic missiles. As such, it could both inform decisions and trajectories pursued within new missile arms control initiatives and at the same time benefit from the international expert community that for example the MDI is seeking to establish and strengthen.

- *Clarify the coverage of hypersonic missile systems by the HCoC*:

Develop a clear position on the coverage of hypersonic missile systems that include ballistic boost or delivery components—such as hypersonic glide vehicles relying on ballistic missile stages to carry them into a particular orbit or to a suborbital separation point—by the HCoC. Both in order to reduce the inflated perceptions of the impact of hypersonic missiles and to build confidence and transparency, states should commit to cover hypersonic missile development activities and particularly testing as part of their PLN and ballistic missile policy reporting commitments. This could also help reduce uncertainties over entanglement of nuclear and conventional weapons capabilities of deployed systems.

Conclusion

The Hague Code of Conduct, the Missile Technology Control Regime and UN Security Council Resolution 1540 each contribute to the international regime for the non-proliferation of ballistic missiles. The three instruments each play a role in controlling both horizontal and vertical proliferation. They complement each other in fulfilling their roles in supply-side and demand-side non-proliferation measures, particularly in the areas of export controls and transparency and confidence-building measures. However, several gaps remain in terms of the universalisation and acceptance of these instruments, their coverage and the comprehensiveness of the standards they establish, which limits their current degree of complementarity.

Going forward, each instrument needs to strengthen the implementation of its own provisions, particularly with regard to compliance and transparency, to limit existing weaknesses and cleavages. In addition, HCoC, MTCR and UNSCR 1540 should strengthen their institutional linkages and build synergies. They should seek to increase and improve interactions, take steps to reduce prior political sensitivities and use available mechanisms, for example the 2021 Comprehensive Review of UNSCR 1540, and cross-cutting themes and challenges, such as the advent of hypersonic missile systems, to demonstrate convergences, complementarity and avenues for cooperation and mutual benefits and reinforcement. □

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Previously published

HCoC Research Papers

'Ballistic missiles and conventional strike weapons: Adapting the HCoC to address the dissemination of conventional ballistic missiles,' *HCoC Research Paper,* Issue 6, by Stéphane Delory, Fondation pour la Recherche Stratégique, February 2020.

'Opening HCoC to cruise missiles: A proposal to overcome political hurdles,' *HCoC Research Paper*, Issue 5, by Stéphane Delory, Emmanuelle Maitre and Jean Masson, Fondation pour la Recherche Stratégique, February 2019.

'The role of intangible transfer of technology in the area of ballistic missiles – reinforcing the Hague Code of Conduct and the MTCR,' *HCoC Research Paper*, Issue 4, by Arnaud Idiart, Group French Export Compliance advisor, Airbus, July 2017.

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The HCoC: current challenges and future possibilities, *HCoC Research Paper*, Issue 1, By Dr Mark Smith, Defence & Security Programme, Wilton Park, 2014.

Papers can be downloaded on the https://www.nonproliferation.eu/hcoc/ website.

THE HAGUE CODE OF CONDUCT

The objective of the HCoC is to prevent and curb the proliferation of ballistic missiles systems capable of delivering weapons of mass destruction and related technologies. Although non-binding, the Code is the only universal instrument addressing this issue today. Multilateral instrument of political nature, it proposes a set of transparency and confidence-building measures. Subscribing States are committed not to proliferate ballistic missiles and to exercise the maximum degree of restraint possible regarding the development, the testing and the deployment of these systems.

The Fondation pour la Recherche Stratégique, with the support of the Council of the European Union, has been implementing activities which aim at promoting the implementation of the Code, contributing to its universal subscription, and offering a platform for conducting discussions on how to further enhance multilateral efforts against missile proliferation.

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