# III. The export control regimes

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The main multilateral export control regimes—the Australia Group (AG), the Missile Technology Control Regime (MTCR), the Nuclear Suppliers Group (NSG) and the Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-use Goods and Technologies (Wassenaar Arrangement, WA)—coordinate trade controls on goods and technologies that have uses in connection with chemical, biological, nuclear and conventional weapons (see table 10.3). All four politically binding agreements operate by consensus and are implemented through national laws. They also serve an important information-exchange function since they provide a framework in which policy, licensing, enforcement, technical and intelligence officers can meet. Beyond their membership, the regimes have an important norm-setting function with regard to control lists and practices, as many non-participating states have decided to adhere to them voluntarily.

As in previous years, commonalities among the regimes centred around keeping pace with technical developments and illegal procurement efforts; and the inherent tension between seeking to globalize international control standards while keeping regime discussions within a manageable number of governments to ensure functionality and confidentiality. One step forward in effectively addressing technological change was the increase in inter-regime engagement on this issue. An additional complication in recent years has arisen from the increase in geopolitical tensions, which has also affected the regimes. Finally, the difficulty in finding governments to chair these regimes on a voluntary basis resulted in the MTCR missing its plenary, as it did in 2010. To avoid this problem in future, the chairs for the next two periods were agreed on in 2018.

#### The Australia Group

The 43 AG participants seek to 'minimise the risk of assisting chemical and biological weapon (CBW) proliferation' by 'harmonising participating countries' national export control licensing measures'.2 First established in response to the use of chemical weapons in the 1980-88 Iran-Iraq War, the AG has since expanded its coverage from chemical weapons and relevant production equipment and technology to include biological weapons and the

<sup>&</sup>lt;sup>1</sup> For brief descriptions and lists of the participating states in each of these regimes see annex B, section III, in this volume.

<sup>&</sup>lt;sup>2</sup> Australia Group, 'The Australia Group: An introduction', [n.d.]; and Australia Group, 'Objectives of the Group', [n.d.].

**Table 10.3.** The four multilateral export control regimes

Regime (Year established)	Scope	No. of participants (as of 31 Dec. 2018)	2018 plenary chair	2018 plenary
Australia Group (1985)	Equipment, materials, technology and software that could contribute to chemical and biological weapons activities	43	Australia	7–8 June, Paris, France
Missile Technology Control Regime (1987)	Unmanned aerial vehicles capable of delivering weapons of mass destruction	35	_a	_a
Nuclear Suppliers Group (1974)	Nuclear and nuclear-related materials, software and technology	$48^b$	Latvia	14–15 June, Jürmala, Latvia
Wassenaar Arrangement (1995)	Conventional arms and dual- use items and technologies	42	United Kingdom	5–6 Dec., Vienna, Austria

<sup>&</sup>lt;sup>a</sup> The MTCR did not identify a new chair for the period 2018–19 due to a lack of state volunteers for the position. As the incoming chair traditionally hosts the annual plenary, no official plenary took place in 2018. The outgoing co-chairs, Ireland and Iceland, continued to fulfil their roles until the December 2018 Reinforced Point of Contact Meeting in Paris.

Sources: Australia Group; Missile Technology Control Regime; Nuclear Supplier Group; and Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-use Goods and Technologies.

equipment, materials and technology that can be used for their development, production and use. The AG's control lists are continuously updated based on consensus decisions by the members of the group.

The 2018 AG plenary expressed concern over the use of chemical weapons in Syria, Iraq, the United Kingdom and Malaysia.<sup>3</sup>

<sup>&</sup>lt;sup>b</sup> In addition, the European Union and the chair of the Zangger Committee are permanent observers of the Nuclear Suppliers Group.

<sup>&</sup>lt;sup>3</sup> Australia Group, 'Statement by Australia Group participants on chemical weapons', 8 June 2018.

The AG participants took note of a presentation by the UK regarding the attack on two Russian citizens in Salisbury in March 2018, which resulted in the later death of a British citizen as well as the report on the subsequent Technical Assistance Visit to the UK conducted by the Organisation for the Prohibition of Chemical Weapons (OPCW).<sup>4</sup> In this context, the participants discussed novichok agents—the type of nerve agent used in the attack in Salisbury—and their precursors, and agreed that further discussions on this topic should take place before the 2019 plenary.

As in previous years, the participants reflected on the situation in Syria and the continued use of chemical weapons in the ongoing war. They called on the Syrian Government 'to fully declare and completely destroy its chemical weapons program pursuant to its obligations under the [1992 Chemical Weapons Convention (CWC)]'. The participants agreed on several amendments to the 'Syria Specific Control List'.6

AG participants reiterated their concerns about the chemical and biological weapons capabilities of the Democratic People's Republic of Korea (DPRK, or North Korea), specifically in response to the killing of Kim Jong Nam at a Malaysian airport in February 2017 using the nerve agent VX.7 The participants welcomed the convening of a Special Session of the Conference of States Parties to the CWC in The Hague on 26-27 June 2018 to discuss stronger measures to uphold commitments under the CWC and strengthen the OPCW.8 In addition, the plenary was briefed on the International Partnership Against Impunity for the Use of Chemical Weapons.9

AG participants issued a separate consensus statement reiterating the above-mentioned concerns and specifically condemning the attack on 7 April 2018 in Douma, Syria; the assassination of Kim Jong Nam; and the actions of states (without naming them) that enable or prevent other states that have used chemical weapons from being held accountable.<sup>10</sup>

The AG continued its engagement with non-participating states by convening another regional dialogue meeting, following the AG dialogue meeting with Latin American countries in 2017, which had been deemed a success.11 The AG intersessional meeting in London on 7-9 March 2018 held

<sup>&</sup>lt;sup>4</sup> See chapter 8, section II, this volume.

<sup>&</sup>lt;sup>5</sup> Australia Group, 'Statement by the chair of the 2018 Australia Group Plenary', 8 June 2018. For a summary and other details of the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction (Chemical Weapons Convention or CWC) see annex A, section I, in this volume. On chemical weapon use in Syria see also chapter 8, section I, in this volume.

<sup>&</sup>lt;sup>6</sup> Australia Group, 'Statement by the chair of the 2018 Australia Group Plenary' (note 5).

<sup>&</sup>lt;sup>7</sup> Hart, J., 'Allegations of use of chemical weapons in Iraq and by North Korea', SIPRI Yearbook 2018,

<sup>&</sup>lt;sup>8</sup> See chapter 8, section III, this volume.

<sup>&</sup>lt;sup>9</sup> See chapter 8, section III, this volume.

<sup>&</sup>lt;sup>10</sup> Australia Group (note 3).

<sup>&</sup>lt;sup>11</sup> Bauer, S. et al., 'The export control regimes', SIPRI Yearbook 2018, pp. 424-36.

the first-ever AG dialogue meeting for countries in Africa. AG participants agreed to follow up with partners from previous dialogues and reiterated the call for states to adopt the AG's guidance and control lists and use them as a model of international best practice. <sup>12</sup> The AG conducted outreach visits to Malaysia, Serbia and Pakistan. Participants highlighted the importance of outreach to industry and academia, particularly in the light of rapid advances in science and technology.

In 2018, as in 2017, technical discussions in the AG focused on emerging technologies, the exploitation of cyberspace and intangible technology transfers. Participants shared approaches to keeping up with rapid technological changes and preventing proliferation to non-state actors, including terrorists. No revisions of the AG control lists were published in 2018.

India joined the AG on 19 January 2018 after consensus was reached intersessionally.  $^{14}$  No other new participants were admitted into the group in 2018. The applications of Kazakhstan and Serbia are still pending.  $^{15}$ 

## The Missile Technology Control Regime

The MTCR seeks to prevent the proliferation of missiles and other unmanned delivery systems for chemical, biological and nuclear weapons. It was created in 1987 to prevent the proliferation of nuclear weapons by controlling the export of goods and technologies related to missiles capable of carrying nuclear weapons. The scope of controls subsequently expanded from missiles (ballistic and cruise missiles) to include all types of unmanned aerial vehicle (UAV), and from missiles and UAVs with the capability to deliver nuclear weapons to include those capable of delivering biological and chemical weapons. Since its inception, membership has grown from 7 to 35 states. Three states—Estonia, Kazakhstan and Latvia—have unilaterally declared their adherence to the guidelines and control lists of the MTCR.

In 2018 no official plenary meeting of the MTCR was held because no country had volunteered to assume the rotating chair, which traditionally hosts the plenary meeting, for the period 2018/19. The outgoing co-chairs, Ireland and Iceland, continued to fulfil the duties of the chair until the Reinforced Point of Contact Meeting in Paris in December 2018. Beyond the plenary not taking place, the impact of the absence of an MTCR chair remains to be seen.

<sup>&</sup>lt;sup>12</sup> Australia Group (note 5).

<sup>&</sup>lt;sup>13</sup> Australia Group (note 5). On adapting controls to emerging technologies see Brockmann, K., Bauer, S. and Boulanin, V., *Bio Plus X: Arms Control and the Convergence of Biology and Emerging Technologies* (SIPRI: Stockholm, Mar. 2019).

 $<sup>^{14}</sup>$  Australia Group, 'India joins the Australia Group', Press release, 19 Jan. 2018; and Bauer et al. (note  $^{11}$ ).

<sup>&</sup>lt;sup>15</sup> German Federal Foreign Office, 'Federal Foreign Office on India joining the Australia Group', Press release, 19 Jan. 2018.

<sup>&</sup>lt;sup>16</sup> Missile Technology Control Regime, 'Frequently asked questions (FAQs)', [n.d.].

Other meetings were held as planned, including an information-exchange meeting in October 2018 hosted by the Permanent Mission of Japan to the International Organizations in Vienna.<sup>17</sup> A technical experts' meeting was hosted by the Swiss Government in Basel in November 2018. This meeting conducted a regular review of the MTCR control list and agreed on a small number of changes to the control text. 18 These changes included the addition of controls on detonation engines, which had previously not been covered. 19 There are no indications that the initiative by the United States to move UAVs with a maximum speed below 650 kilometres/hour to category II was able to achieve consensus among the MTCR partner states. This change would make it easier for the United States to compete for exports in the military drone market with China and Israel, which are not MTCR partners.<sup>20</sup> In reaction to the failure to identify a chair for the current period, the partners agreed that New Zealand will assume the chair for the period 2019/20 and Austria for 2020/21.21

The outgoing co-chairs undertook outreach visits to non-members in 2018: to Pakistan in March and to Jordan and Israel in July.<sup>22</sup> A technical outreach meeting took place in conjunction with a technical experts' meeting in Revkjavik, Iceland, on 19-23 March 2018.23 In addition, the co-chairs made a presentation at the annual Asian Export Control Seminar in Tokyo on 27 February 2018, raising the continued concern about 'global missile proliferation activities, in particular ongoing missile programmes in the Middle East, Northeast Asia, and South Asia, and the risk that these could lead to proliferation elsewhere'.24

The Hague Code of Conduct against Ballistic Missile Proliferation

The MTCR is complemented by the Hague Code of Conduct, which was established within the MTCR in 2002 and has since developed into a separate transparency and confidence-building instrument concerning ballistic

<sup>&</sup>lt;sup>17</sup> Representative of a MTCR partner state, Correspondence with author, 17 Dec. 2018.

<sup>&</sup>lt;sup>18</sup> Missile Technology Control Regime, 'Report by the chair of the Technical Experts Meeting: Update of MTCR Annex', 19 Dec. 2018.

<sup>&</sup>lt;sup>19</sup> Missile Technology Control Regime, 'Equipment, software and technology annex', MTCR/ TEM/2018/Annex, 30 Nov. 2018, item 3.A.2.

<sup>&</sup>lt;sup>20</sup> Mehta, A., 'US to push new rules for drone agreement in November', *Defense News*, 11 Sep. 2018; and Bauer et al. (note 11), pp. 428-29.

<sup>&</sup>lt;sup>21</sup> Peters, W., New Zealand Minister for Disarmament and Arms Control, 'NZ to chair Missile Technology Control Regime', Statement, New Zealand Government, 13 Dec. 2018.

<sup>&</sup>lt;sup>22</sup> Missile Technology Control Regime, 'Report by the MTCR co-chairs: Outreach visit to Pakistan', 19 Dec. 2018; Missile Technology Control Regime, 'Report by the MTCR co-chairs: Outreach visit to Jordan', 19 Dec. 2018; and Missile Technology Control Regime, 'Report by the MTCR co-chairs: Outreach visit to Israel', 19 Dec. 2018.

<sup>&</sup>lt;sup>23</sup> O'Reilly, B. and Vestmann, B., MTCR co-chairs, Statement during the 25th Asian Export Control Seminar, 27 Feb. 2018.

<sup>&</sup>lt;sup>24</sup> O'Reilly and Vestmann (note 23).

missile proliferation.<sup>25</sup> Subscribing states commit to provide pre-launch notifications of launches and test flights of ballistic missiles and space-launch vehicles (SLVs), as well as annual declarations of their official policies and planned launches of ballistic missiles and SLVs.

The 17th annual meeting on the HCOC took place in Vienna on 28–29 May 2018, with delegations from 72 of the 139 subscribing states in attendance. Sweden assumed the chair for the period 2018/19, taking over from Poland. The Swedish chair outlined the main objectives as advancing the 'universalization' of the HCOC and 'full implementation of all its aspects', as well as promoting a resolution reaffirming the role of the HCOC in the First Committee of the United Nations General Assembly. 27

On 5 December 2018 the General Assembly adopted Resolution 73/49 with the strongest support since the first such resolution was introduced in 2008. The resolution recognized the role of the HCOC and encouraged more states to subscribe to the code and to take further steps to address ballistic missile proliferation.<sup>28</sup>

Several outreach activities were carried out during Sweden's tenure as chair, such as regional seminars in the Caribbean, South Asia and West Africa. Efforts to strengthen the implementation of the HCOC have also been made through informal consultations among subscribing states.

### The Nuclear Suppliers Group

The NSG aims to prevent the proliferation of nuclear weapons by controlling transfers of nuclear and nuclear-related material, equipment, software and technology. In 2018 Latvia took over as chair of the NSG and hosted the 28th plenary. The consultative group and the technical experts group continued to be chaired by Mexico and Sweden, respectively. The chair of the information exchange meeting was handed over to the USA.<sup>29</sup>

In the 2018 plenary, participating governments discussed developments in and regarding North Korea and 'noted with encouragement' the inter-Korean and North Korean–US summits.<sup>30</sup> However, they also reiterated their adherence to the nuclear weapon-related UN Security Council resolutions

<sup>&</sup>lt;sup>25</sup> Hague Code of Conduct, 'What is HCOC?', Jan. 2019.

 $<sup>^{26}</sup>$  Hague Code of Conduct, '17th regular meeting of the subscribing states to the Hague Code of Conduct against Ballistic Missile Proliferation', Press release.

<sup>&</sup>lt;sup>27</sup> Hague Code of Conduct (note 26).

<sup>&</sup>lt;sup>28</sup> United Nations, General Assembly, 'The Hague Code of Conduct against Ballistic Missile Proliferation', Resolution 73/49, 12 Dec. 2018.

<sup>&</sup>lt;sup>29</sup> Nuclear Suppliers Group, 'Organisation', [n.d.].

<sup>&</sup>lt;sup>30</sup> On North Korean–US nuclear diplomacy, see chapter 7, section I, in this volume.

on North Korea.<sup>31</sup> Among other things, these call on North Korea to end in a 'complete, verifiable and irreversible manner' its nuclear weapons and nuclear programmes and they prohibit the supply of all controlled items to North Korea.<sup>32</sup> The NSG plenary also addressed the Joint Comprehensive Plan of Action (JCPOA) in respect of Iran and confirmed its commitment to UN Security Council Resolution 2231, which endorsed the agreement.<sup>33</sup> Since the 2017 plenary, participating states have received briefings from the coordinator of the working group on the procurement channel established under the JCPOA and expressed an interest in further briefings.<sup>34</sup>

During the plenary, the NSG agreed on updates to its control lists, which are regularly adjusted by the participating governments to keep them up to date with commercial and technological developments.<sup>35</sup> On outreach, participating governments noted positively recent initiatives involving industry representatives and welcomed future ones, as well as the revision of the NSG website. The plenary was also an opportunity to share information on national approaches to awareness-raising, targeting not only industry but also academic and research institutions. The NSG held an industry outreach event with the World Association of Nuclear Operators and the World Nuclear Association on 10 April 2018.36

In 2018 participating governments continued to discuss the possible impact of emerging technologies on non-proliferation efforts. In particular, the potential proliferation challenges posed by additive manufacturing continued to be a major topic of discussion within the NSG and technical dialogues on this issue were pursued with the WA and the MTCR.<sup>37</sup> Informal discussions also took place within the NSG on how certain technologies,

<sup>&</sup>lt;sup>31</sup> Most recently, UN Security Council resolutions 2371, 5 Aug. 2017; 2375, 11 Sep. 2017; and 2397, 22 Dec. 2017. No UN sanctions-related Security Council resolution was adopted in 2018. For a summary of UN Security Council sanctions resolutions in response to North Korea's nuclear and ballistic missile tests see Kile, S. N., 'International non-proliferation sanctions against North Korea', SIPRI Yearbook 2018, pp. 386-88.

<sup>&</sup>lt;sup>32</sup> Nuclear Suppliers Group, 'Public statement of the 2018 NSG plenary', Jürmala, Latvia, 15 June

<sup>&</sup>lt;sup>33</sup> See chapter 7, section III, in this volume; and UN Security Council Resolution 2231, 20 July 2015.

<sup>&</sup>lt;sup>34</sup> Nuclear Suppliers Group (note 32).

<sup>35</sup> Nuclear Suppliers Group, 'NSG Part 1 and Part 2 Control Lists updated'.

<sup>&</sup>lt;sup>36</sup> Nuclear Suppliers Group (note 32).

<sup>&</sup>lt;sup>37</sup> Cándano, D., 'Export controls and emerging threats: A view from the Nuclear Suppliers Group', Intervention at the EU Export Control Forum, 13 Dec. 2018; and Griffiths, P., 'Role of the Wassenaar Arrangement in a rapidly changing technological environment', Defence Acquisition Programme Administration (DAPA), 5th International Defence Technology Security Conference, 20 June 2018, Seoul, South Korea. See also Bromley, M., Brockmann, K. and Maletta, G., 'Controls on intangible transfers of technology and additive manufacturing', SIPRI Yearbook 2018, pp. 437-47.

such as blockchain, cloud computing and artificial intelligence, could be used to improve the effectiveness of export controls.<sup>38</sup>

Finally, the NSG resumed discussions on the technical, legal and political aspects of the participation in the NSG of states that are not party to the 1968 Treaty on the Non-proliferation of Nuclear Weapons (Non-Proliferation Treaty, NPT).<sup>39</sup> This discussion had been initiated at the 26th NSG plenary after membership applications were submitted by India and Pakistan in 2016.<sup>40</sup> While India's relationship with the NSG was specifically addressed in the context of outreach-related discussions, the 2018 plenary registered no progress on either of the two membership applications.<sup>41</sup> Since the informal discussion on this issue in November 2017, the differing positions have persisted regarding possible membership criteria for non-NPT states.<sup>42</sup> There were no reports of any informal NSG meetings to discuss this issue in 2018.

Meanwhile, India continued to build diplomatic support for its membership application following the public endorsements already received from, among others, Russia and Italy in 2017.<sup>43</sup> In 2018 India gained the explicit endorsement of Japan, the Netherlands and Sweden.<sup>44</sup> Furthermore, on 3 August 2018 India was moved up to tier 1 of the US Department of Commerce Strategic Trade Authorization licence exception, known as STA-1 status.<sup>45</sup> This move was interpreted by the Indian media as a further sign of US support for India's NSG membership bid. STA-1 status allows India to import sensitive technology and military items from the USA, including 'materials related

<sup>&</sup>lt;sup>38</sup> Cándano (note 37). On these uses see Kaspersen, A. and King, C., 'Mitigating the challenges of nuclear risk while ensuring the benefits of technology', ed. V. Boulanin, *The Impact of Artificial Intelligence on Strategic Stability and Nuclear Risk*, vol. I, *Euro-Atlantic Perspectives* (SIPRI: Stockholm, May 2019).

<sup>&</sup>lt;sup>39</sup> For a summary and other details of the NPT see annex A, section I, in this volume.

<sup>&</sup>lt;sup>40</sup> Bauer et al. (note 11), pp. 431–33; and Bauer, S. and Maletta, G., 'The export control regimes', *SIPRI Yearbook 2017*, pp. 600–601.

<sup>&</sup>lt;sup>41</sup> Nuclear Suppliers Group (note 32).

<sup>&</sup>lt;sup>42</sup> Bauer et al. (note 11).

<sup>&</sup>lt;sup>43</sup> Bauer et al. (note 11); and Bauer and Maletta (note 40).

<sup>&</sup>lt;sup>44</sup> Swedish Government, 'Sweden-India joint action plan, agreed by Prime Minister Stefan Löfven and Prime Minister Narendra Modi', 17 Apr. 2018; Indian Ministry of External Affairs, 'India-Netherlands joint statement during visit of Prime Minister of Netherlands to India', 24 May 2018; and Japanese Ministry of Foreign Affairs, 'Japan-India vision statement', 29 Oct. 2018.

<sup>&</sup>lt;sup>45</sup> US Department of Commerce, Bureau of Industry and Security, 'US-India major defense partners: Implementation under the Export Administration Regulations of India's membership in the Wassenaar Arrangement and addition of India to Country Group A:5', Federal Register, vol. 83, no. 150 (3 Aug. 2018). See also US Department of Commerce, 'US Secretary of Commerce Wilbur Ross announces programs to increase US commercial engagement in the Indo-Pacific Region', Press release, 30 July 2018.

to nuclear power development', without exporters having to apply for an individual licence.<sup>46</sup> India is the 37th country to obtain this exception.

At the same time, nuclear trade with Pakistan was made more difficult in 2018. Ahead of the 2018 NSG plenary, the USA imposed sanctions on seven of Pakistan's nuclear companies, which were suspected of having links with illicit nuclear trade. This is believed to have set back Pakistan's ambition to ioin the NSG.47

#### The Wassenaar Arrangement

The WA promotes 'transparency and greater responsibility' regarding transfers of conventional arms and related dual-use items. More specifically, it seeks to prevent 'destabilising accumulations' of such items and their acquisition by terrorists. 48 The WA held its plenary on 5–6 December 2018 in Vienna, where it is usually hosted, with the UK holding the rotating chair. Greece assumed the chair of the plenary on 1 January 2019.49

As in previous years, the plenary continued to discuss 'technological change and market trends', and participating states acknowledged that 'further efforts' were needed to face these challenges.<sup>50</sup> A number of changes to the WA control lists were adopted during the plenary. Many of these were aimed at keeping pace with rapid technological advances, such as the introduction of new controls on quantum-resistant cryptography algorithms (i.e. cryptography that would be able to resist an attack by a quantum computer) and electromagnetic pulse (EMP)-resistant software (i.e. software that would be able to withstand an attack by an EMP). Both sets of technology are still in the development stage and represent the cutting-edge of what is possible in their respective fields.<sup>51</sup> Amendments also clarified existing controls in a range of areas, while easing controls on internet-of-things items as well as 'high-performance continuous-wave lasers' and 'infrared cameras'. In these

<sup>&</sup>lt;sup>46</sup> Press Trust of India (PTI), 'US: India fulfils all conditions, but out of Nuclear Suppliers Group due to China's veto', Times of India, 13 Sep. 2018; Pranhad Dai, S., 'US granting STA-1 status to India is a big rebuff to China', Economic Times, 1 Aug. 2018; and Luthra, P., 'What does STA-1 authorisation mean for Indo-US defence partnership', CNBC TV18, 6 Aug. 2018.

<sup>&</sup>lt;sup>47</sup> 'US sanctions Pakistani companies over nuclear trade', Reuters, 26 Mar. 2018.

<sup>&</sup>lt;sup>48</sup> Wassenaar Arrangement, 'Introduction', 7 Dec. 2018.

<sup>&</sup>lt;sup>49</sup> Wassenaar Arrangement, 'Statement issued by the Plenary chair on 2018 outcomes of the Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies', Vienna, 6 Dec. 2018.

<sup>&</sup>lt;sup>50</sup> Wassenaar Arrangement (note 49).

<sup>&</sup>lt;sup>51</sup> See Mavroeidis, V., Vishi, K., Zych, M. D. and Jøsang, A., 'The impact of quantum computing on present cryptography', International Journal of Advanced Computer Science and Applications, vol. 9, no. 3 (2018), pp. 1-10; and Emanuelson, J., 'Getting prepared for an electromagnetic pulse attack or severe solar storm', Futurescience LLC, [n.d.].

cases, the performance thresholds were updated to take into consideration the increasing sophistication of goods available on the civil market.<sup>52</sup>

Among the new technologies of security concern that the WA lists, review process will continue to consider satellite components, artificial intelligence and 'advanced sensors and navigation equipment' for enhancing the autonomy of weapon systems and the 'robotization of the battlefield'.<sup>53</sup> In this framework, issues related to additive manufacturing will also continue to be addressed in the future, and the related technical dialogues with the MTCR and the NSG will continue to be pursued.<sup>54</sup>

During the 2018 plenary, participating states also updated the 'List of Advisory Questions for Industry'. The list was first drafted in 2013 and is intended to help companies identify situations in which 'suspicion should be raised and a contact with national export licensing authorities might be advisable'. <sup>55</sup> States also considered a number of proposals for new WA best practices guidelines and identified other existing guidelines to update, as appropriate, in 2019. <sup>56</sup> The WA best practices guidelines cover a broad range of topics in the field of export control implementation and are a key part of the WA's work on improving control standards among both WA participating states and non-participating states.

Relevant information on the work of the WA is shared with interested non-participating states through a dedicated outreach programme aimed, among other things, at encouraging voluntary adherence to the WA Control Lists and WA standards. These outreach activities include a post-plenary briefing and an enhanced technical briefing to discuss changes in the control list and facilitate the sharing of implementation experiences and practices among non-participating states. The enhanced technical briefing previously took place on an annual basis, but the WA Secretariat recently announced that it planned instead to have meetings every two years, with the next one due to take place in mid 2020.<sup>57</sup>

In 2018 the WA Secretariat's outreach activities included participation in the 25th Asian Export Control Seminar in Tokyo in February–March; the International Export Control Seminar in May, organized by Pakistan's Strategic Export Control Division, which marked the first WA visit to

<sup>&</sup>lt;sup>52</sup> Wassenaar Arrangement (note 49). For an overview of the changes to the WA control lists see Wassenaar Arrangement, 'Summary of changes: List of dual-use goods and technologies and munitions lists as per 6 December 2018'.

<sup>&</sup>lt;sup>53</sup> Griffiths (note 37); and Griffiths, P., 'The Wassenaar Arrangement: Recent developments', 25th Asian Export Control Seminar, 27 Feb.–1 Mar. 2018, Tokyo.

<sup>&</sup>lt;sup>54</sup> Griffiths (note 37).

 $<sup>^{55}</sup>$  Wassenaar Arrangement, 'List of advisory questions for industry', Adopted by the Plenary in 2003 as amended in 2018.

<sup>&</sup>lt;sup>56</sup> Wassenaar Arrangement (note 49); Wassenaar Arrangement (note 55).

<sup>&</sup>lt;sup>57</sup> Griffiths, P, 'Multilateral export control regimes: The Wassenaar Arrangement', 26th Asian Export Control Seminar, 26–28 Feb. 2018, Tokyo.

Islamabad; the 5th International Defence Technology Security Conference in the Republic of Korea (South Korea) in June; and the 13th SMi Annual Conference on Defence Exports in Rome in September.<sup>58</sup> These events were opportunities for the Secretariat to present the role and function of the WA and provide updates on recent developments. In recent years the WA Secretariat has also visited, by invitation, India, Israel, Singapore and Malaysia.59

Since the admission of India as the 42nd participating state at the end of 2017, no additional members have been admitted to the WA, although membership applications continue to be reviewed by participating states.<sup>60</sup>

<sup>&</sup>lt;sup>58</sup> Griffiths (note 53); Griffiths (note 37); Griffiths, P., 'Updates from the Wassenaar Arrangement', SMi, 13th Annual Conference, Defence Exports, 2018, Rome, 19-20 Sep. 2018; Griffiths, P., 'The Wassenaar Arrangement: Transparency and effectiveness in regulating transfers of conventional arms and dual-use goods and technologies', International Seminar on Strategic Export Controls, Islamabad, 9–10 May 2018; and Pakistani Ministry of Foreign Affairs, Strategic Export Control Division, SECDIV International Export Control Seminar, 9-10 May 2018, Islamabad.

<sup>&</sup>lt;sup>59</sup> Griffiths, 'The Wassenaar Arrangement' (note 58).

<sup>&</sup>lt;sup>60</sup> Wassenaar Arrangement (note 49).