

# Limiting the Unintended Consequences of Unmanned Air System Proliferation

by Dennis M. Gormley

US policymakers have come to rely on precision conventional strike systems—most notably, unmanned air vehicles (UAVs), including single-use cruise missiles and, more recently and controversially, reusable armed drones—for what one policy expert has artfully termed “discrete military operations,” or single or several attacks conducted over a brief span of time.<sup>1</sup> Surely the cost and casualty implications of more substantial commitments of military forces for major combat operations or lengthy counterinsurgency campaigns explain why policymakers have become accustomed to such UAV employment. The most controversial use of armed drones includes targeted assassination strikes against al Qaeda or al Qaeda-affiliated leadership figures, as well as groups of foot soldiers, in Pakistan, Yemen, Somalia, and possibly the Philippines. Although important questions remain about the legal implications of lethal operations in sovereign nations, and the extent to which such strikes create more terrorists than they kill, this article examines two equaling consequential and interrelated challenges resulting from our growing fascination with and dependence on UAVs: dampening widespread UAV proliferation and creating stronger global norms governing their spread and use.<sup>2</sup>

## MISPERCEPTIONS ABOUT UAVS

Associating UAV systems with the notion of discrete military operations is surely an appropriate and inevitable phenomenon. Nonetheless, viewed in the context of extant mechanisms to deal with unwanted missile proliferation, fostering such a perception clouds the alternative reality that UAVs are also ideal platforms for delivery of weapons of mass destruction (WMD), in some cases, decidedly so when compared with ballistic missile delivery. For example, extensive modeling and simulation has demonstrated that, compared with ballistic missiles, cruise missiles are more effective in delivering chemical or biological agents (conservatively enlarging the lethal area for biological attacks by a factor of ten).<sup>3</sup> This reality explains why UAVs, including cruise missiles, target drones, and armed and unarmed reconnaissance drones, together with ballistic missiles, jointly share center stage in

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the 1987 Missile Technology Control Regime (MTCR), which is a voluntary association of countries, 34 at present, that have agreed upon common goals about the non-proliferation of missile systems capable of WMD delivery. The MTCR's

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remit is accomplished through coordinating national export licensing procedures to forestall the unfettered spread of both complete systems and an extensive list of controlled technology items.<sup>4</sup> Yet, despite the equal treatment on paper that UAVs and ballistic missiles receive under the MTCR's guidelines and controls, the regime has been more effective in constraining the spread of ballistic missiles than UAVs. This is because of uneven implementation of existing MTCR controls and virtually non-existent norms governing UAV proliferation.

The consequences of these developments for UAV proliferation are both telling and potentially dangerous. Although ballistic missile proliferation has gained worrisome vertical momentum of late (India, Iran, North Korea, and Pakistan all have developed new medium-range ballistic missiles between 1,000 and 3,000 kilometers in range), the horizontal spread of ballistic missiles has been reasonably constrained. Indeed, due largely to US-Soviet arms control treaties during the Cold War, overall trends show a significant net decrease in worldwide ballistic missile arsenals.<sup>5</sup> By contrast, cruise missile and UAV proliferation shows dangerous signs of vertical and horizontal spread.

Starting in the 1960s, short-range anti-ship cruise missiles (roughly 75,000) spread to over 70 countries. Yet, more sophisticated and much longer-range cruise missiles for attacks against land targets remained largely in the hands of a few industrial nations, principally the United States and Russia. Beginning in 2004, however, land-attack cruise missiles began to spread across the Middle East, South Asia, and Northeast Asia. What's more, China's unveiling of 25 different UAV models at an air show in late 2010 demonstrates that today's overwhelming US advantage in military drones is by no means a permanent condition. As the fascination with drone use grows, along with their widespread availability and perceived utility for not just reconnaissance but also armed use, the danger increases that countries will emulate the US practice of employing armed drones across borders not just to attack foreign enemies but also their own citizenry. Thus, while a cruise missile arms race is already well underway, drones appear likely to follow.<sup>6</sup>

### **CRUISE MISSILE AND UAV PROLIFERATION: A PRÉCIS**

Beginning in the early 1990s, analysts foresaw the widespread proliferation of land-attack cruise missiles by the end of the decade, comparable to the spread of anti-ship cruise missiles in the 1960s across the developing world. But it was not until 2004 that strong signs emerged that cruise missiles for land-attack missions were

about to spread widely.<sup>7</sup> Since that time, an alarming number of countries have tested or announced new cruise missile programs, and 70 countries now own drones, most currently unarmed, but not for long.<sup>8</sup>

In the Middle East, Iran is the most active new entrant into the cruise missile and UAV club.<sup>9</sup> Iran's new land-attack and anti-ship cruise missiles, which appear to be derivatives of Chinese systems, include the 350-kilometer-range Raad, which appears to come in both land-attack and anti-ship versions. Two other anti-ship cruise missiles—Nur and Ghader—are strikingly similar to the Chinese C-802 cruise missile. Iran's soon-to-be unveiled Meshkat land-attack cruise missile, were it to demonstrate its claimed 2,000-kilometer range, could threaten Israel and some NATO countries.<sup>10</sup> Iran also has tested a 1,000-kilometer-range armed drone, called Karrar, probably derived from a South African drone. In the UAV pipeline are at least two more long-range, 1,000 and 2,000 kilometer, high-altitude drones, which Iranian officials say they can arm. All of these UAV/cruise missile developments compliment Iran's increasing ballistic missile arsenal and together make it more difficult for Israeli missile defenses, built primarily to handle ballistic missile threats, to cope with both ballistic and cruise/UAV systems at once.

As a senior Israeli defense industry official said at Israel's multinational ballistic missile defense conference in 2010, "The pace of [cruise] missile development [in Iran] is much faster than that of the solutions."<sup>11</sup> Iran has also furnished Hezbollah with its own UAVs and anti-ship cruise missiles. Hezbollah armed and employed the UAVs during the 2006 war in Lebanon, with little effect, while one cruise missile managed to severely damage an Israeli ship, killing four sailors.

In South Asia, both India and Pakistan are deploying new land-attack cruise missiles for delivery of nuclear and conventional payloads. India began first, in the late 1990s, by collaborating with Russia in the development of the 290-kilometer-range Brahmos supersonic cruise missile. India has expansive plans to deploy Brahmos cruise missiles as land-attack systems that support army and air force needs and as anti-ship systems on ships and submarines. The India-Russia joint program, Brahmos Aerospace, anticipates producing 1,000 cruise missiles for India's service needs, and another 1,000 for future export. India's cruise missile ambitions do not end here; they have already deployed Russian 3-M-14E land-attack cruise missiles, with a range of 300 kilometers, on five Russian-furnished Kilo-class submarines, and at least two new land-attack cruise missiles, one subsonic, the other supersonic, are underway, both with ranges to 1,000 kilometers. Pakistan, for its part, surprised India when it tested its ground-launched Babur land-attack cruise missile, with a range of 700 kilometers, in 2005, followed by the air-launched Raad, with a range of 350 kilometers, in 2007. Although Pakistan asserts that these missiles are entirely indigenously developed, China likely had a hand in their development. In the meantime, both Pakistan and India are acquiring UAVs, at first primarily to satisfy monitoring developments along the line-of-control in Kashmir. But India now seems interested in arming such systems, while Pakistan has pressed the United States, unsuccessfully so far, to provide them with Predator drones.

In Northeast Asia, China first tested, in 2004, the ground-launched DH-10 land-attack cruise missile with a range of 1,500-2,000 kilometers. Shortly thereafter China tested the air-launched YJ-63, with a range of 500 kilometers. The DH-10 is worrisome for several reasons, not least because China has already deployed over 1,000 conventionally armed ballistic missiles facing Taiwan. What worries US defense planners most, however, is that the DH-10 possesses sufficient range to strike critically important U.S. airfields in the region. Taiwan, too, has turned to cruise missiles in an attempt to deter Chinese threats. It first tested its HF-2E land-attack cruise missile in 2005 and since that time has sought to extend its range from 600 to at least 1,000 kilometers, to threaten Shanghai, and potentially 2,000 kilometers, so that Beijing comes within the missile's range. Plans originally called for as many as 500 HF-2E cruise missiles, but it remains uncertain how many missiles Taiwan eventually will deploy.

Not to be outdone by other states in the region, South Korea announced on the heels of North Korea's nuclear test in 2006 that it had underway four new land-attack cruise missiles possessing ranges between 500 and 1,500 kilometers. The South Korean press subsequently leaked that not only all of North Korea would be at risk from such missiles, but Tokyo and Beijing, too. Even Japan, whose constitution repudiates war and offensive forces, is thinking about acquiring land-attack cruise missiles after first contemplating but then dropping the idea of developing a ballistic missile for preemptive strikes against adversary ballistic missiles.

A dangerous handmaiden accompanying the spread of land-attack cruise missiles is their linkage to newly cast preemptive strike doctrines. Roughly six months prior to the invasion of Iraq, the George W. Bush administration issued its new national security strategy of preemption. The doctrine moved US policy away from deterrence and containment toward attacking enemies before they could attack the United States, and was clearly evident in the US decision to invade Iraq eight months later. The usual suspects, including Russia, North Korea, and Israel, cited US preemption doctrine as either the justification for their own actions, as with Israel's 2003 attack of a terrorist camp in Syria, or a privilege they too could execute, such as Russia and North Korea. But what became evident was that several states that announced new cruise missile programs linked them specifically to new preemptive strike doctrines. The most demonstrative included India's new offensive strategy called "Cold Start," involving the capacity to launch blitzkrieg-style attacks across the line of control in Kashmir; Taiwan's creation of a "preventive self-defense" strike option featuring their newly announced HF-2E land-attack cruise missile; and South Korea's rolling out of a new defense plan featuring preemptive use of "surgical strike" weapons, i.e. cruise missiles, which occurred in the immediate aftermath of leaking the existence of four new cruise missile programs.<sup>12</sup>

By no means do single-use cruise missiles represent the only non-ballistic missile proliferation threat. Virtually all analysts believe that the global spread of both unarmed and armed UAVs will only expand exponentially in the years to come.

Today, the United States dominates the skies by virtue of its voracious appetite for military UAVs, totaling over 7,500 in use today. This represents a huge lead over prospective adversaries, both quantitatively and qualitatively, but such an advantage is not destined to remain intact.

According to the Teal Group, which monitors aerospace markets, global spending on UAV research and procurement is expected to exceed over \$94 billion over the next decade.<sup>13</sup> Seventy countries have reportedly developed or purchased UAVs,<sup>14</sup> with Israel acting as the primary source of sales around the globe. The Obama administration has sought to expand sales of armed and unarmed drones to its allies, but Congress has been reluctant to open the floodgates because of concerns about liberalizing MTCR controls on UAVs and its probable consequences for unwanted proliferation.<sup>15</sup> Industry pressure to alter MTCR UAV controls is longstanding, with the logic being that if the United States does not satisfy the growing requirement for UAVs, other states will develop their own or will turn to Israel or other UAV developers.<sup>16</sup> Of greatest concern are the intentions of China, where arms manufacturers had on display 25 new UAV models at the Zhuhai Air Show in late 2010. Chinese aerospace officials have expressed particular interest in armed drone sales, not least because they perceive opportunity flowing from US reluctance to sell armed drones broadly to interested states. As one Chinese aerospace official remarked in July 2011 to the *Washington Post*, “The United States doesn’t export many attack drones, so we’re taking advantage of that hole in the market.”<sup>17</sup>

What are the consequences of wide-scale UAV proliferation? As multiple use UAVs spread as widely as land-attack cruise missiles, defending against both types of unmanned systems will become problematic at best. Indeed, even today, US cruise missile defenses remain barely capable of dealing with low numbers of threats, even in the aftermath of the 2003 war with Iraq. Then, Iraq’s ballistic missile threats were successfully handled by American Patriot missile defenses, but the missile defenses failed altogether to detect or shoot down any of the five primitive cruise missiles Iraq surprisingly employed against coalition forces. And changes in Patriot’s rules of engagement—required because such units were asked to defend against both high-angle ballistic missiles and low-flying cruise missiles—contributed to Patriots downing two friendly aircraft and the loss of three crewmembers. The fact that American missile defenses performed so poorly in defending against low-flying cruise missiles resonated widely. In the aftermath of the 2003 war, virtually every state that embraced deploying cruise missiles chose to state repeatedly that this class of delivery systems was nearly impossible to defend against.<sup>18</sup>

One brief illustration foretells just how significant the unconstrained growth of UAVs could be. In early 2012, military reports from the Persian Gulf indicated that Iranian UAVs had harassed the ground-based air defenses of the US Army and its regional allies by employing swarms of UAVs, reportedly of “Chinese design or origin.”<sup>19</sup> Swarms of UAVs were able to take advantage of these radars’ limited coverage by flying low or around them. On one occasion they were not identified

correctly because of their slow speed or small radar cross return. It is not surprising to see Iran employing such tactics, as China's emphasizes exploiting the huge cost

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difference between "tidal waves" of cheap cruise missiles or UAVs and far more expensive air defense systems.<sup>20</sup>

Terrorist interest in cheap UAVs and model aircraft is known, although it is important to note that much less sophisticated options are much more likely to remain the chief way in which terrorist groups undertake attacks.<sup>21</sup> This year, a 26-year old physics graduate of Northeastern University, Rezwan Ferdaus, a US citizen, plead guilty to attempting to supply materials to al Qaeda and seeking

to attack the US Capitol and Pentagon using a remote-controlled model airplane two meters in length guided by GPS signals and capable of a speed of up to 160 kilometers-per-hour. Ferdaus started thinking about an attack in 2010 after falling prey to Jihadist websites and a subsequent FBI sting operation. Whether or not such a plan would have succeeded seems dubious on the surface, but this is not the first evidence of terrorist interest in such a tactic.<sup>22</sup>

### **DEALING WITH WEAK UAV CONTROLS AND NORMS**

A number of factors have already kick-started the spread of cruise missiles and seem destined to facilitate the same for reusable UAVs, including those that are armed. Compared with cruise missiles and UAVs, ballistic missiles have always dominated American political and military discourse about missile threats to the United States. To be sure, once the Soviet Union achieved the capacity to threaten American soil in 1959, the capability and cost of defending against such a threat rapidly became a central political and technical debate among specialists and politicians alike. When the MTCR was launched in 1987, the spread of ballistic missiles was of much greater concern than cruise missile proliferation. Indeed, the regime's authors found that delineating export controls for cruise missiles and UAVs was more challenging than doing so for ballistic missile technologies. Nevertheless, the MTCR covered *both* ballistic and UAV systems, cruise and reusable UAVs, from the outset, giving most attention over to so-called Category I systems, capable of delivering a payload of 500 kilograms to a range of at least 300 kilometers.<sup>23</sup> And perhaps most important of all, regime members agreed in 1993 to create a new provision, Item 19 of the technology annex, covering complete systems with ranges of at least 300 kilometers even if they only carry small payloads. This reflected the MTCR's expanded mandate to address not just nuclear but also chemical and biological weapons whose payloads could conceivably produce mass effects despite substantially lighter payloads than 500 kilograms. Chiefly, regime members had cruise

missiles and UAVs in mind in devising this addition to the MTCR, which clearly reflected that UAVs were not only capable of precise conventional but also WMD delivery as well.<sup>24</sup>

However much the MTCR membership strove to give equal attention to both ballistic and UAV systems in the first decade of the regime's existence, unevenness in dealing with cruise missiles and UAVs became more prominent in the late 1990s. The decision by the French and British governments to sell the jointly produced Black Shahine land-attack cruise missile to the United Arab Emirates, in spite of US diplomatic protests to the contrary, signaled that the uncertain way the MTCR then dealt with determining the true range of cruise missiles could provide cover for otherwise precedent-setting circumstances. Of great concern was the precedent such a sale might have on the future behavior of other regime members, such as Russia, or adherents to the MTCR's guidelines, such as China. So too was the sale of such advanced cruise missiles that possessed an extraordinarily low radar cross section and stealthy aerodynamic design, making them difficult to defend against. Thus, the Black Shahine's sale augured a future in which the very characteristics that inspired the MTCR in the first place—difficulty of defense, short warning, and shock effect—were not only becoming available via ballistic missiles but also through cruise missiles as well.

French and British behavior with the Black Shahine sale was not the only illustration of effectively assuming a different view about the impact of cruise missiles and UAVs spreading compared with ballistic missile proliferation. Washington, in its long, drawn out negotiations with Seoul prior to South Korea's admission as an MTCR member in March 2001, urged a cap of 300 kilometers for the range and 500 kilograms for the payload of Seoul's future ballistic missile programs. This surely was consistent with Washington's longstanding quest to forestall an Asian arms race in missiles. But the deal struck with Seoul proved to accomplish precisely the opposite with respect to cruise missile proliferation. Whereas Seoul was urged only to conduct "research" on a 500 kilometer-range ballistic missile, they were provided a generally free hand in regard to land-attack cruise missiles. Washington's view was that Seoul could proceed with a cruise missile of 500 kilometers range as long as the payload remained under 500 kilograms. However, Seoul's interpretation proved decidedly more liberal. They promptly embarked on four new land-attack cruise missile programs, with ranges of 500 to 1,500 kilometers—ample enough, as one South Korean press account noted, to target not only Pyongyang, but China and Japan, too.<sup>25</sup> Here again, this differentiation conveyed the impression that the consequences of cruise missile/UAV proliferation were not nearly as important as those surrounding the spread of ballistic missiles.

Another way differentiation is practiced occurs when MTCR members declare a "rare exception" to the MTCR's guidelines concerning the "presumption of denial"—that is, the expectation that member countries will ban exports of a particular item in the case of Category I missiles and other Category I items.<sup>26</sup> The

United States, for example, has sold Tomahawk cruise missiles to the United Kingdom, while Russia is involved in a co-development program with India on the Brahmos cruise missile, which India intends to employ as both a nuclear and conventional delivery system. France and Britain's willingness to sell not only the Black Shahine cruise missile to the UAE in 1998 and then again to Saudi Arabia in 2009 were probably "justified" using the rare exception provision.<sup>27</sup> And although the Brahmos is not technically a Category I system on the basis of its 290 kilometer range and 300 kilogram payload, because India intends to use it as a dual-capable system, including a nuclear payload, the same presumption of denial applies to missile systems of any range and payload if there is persuasive evidence that they are intended for use as a WMD delivery system.<sup>28</sup> Besides the unfortunate precedent such behavior might engender with other states, the differentiation between how ballistic and UAV systems are handled makes objecting to undesired missile proliferation elsewhere more problematic.

Washington's differentiation between ballistic and UAV systems reached its peak in 2002 when the MTCR membership launched the Hague Code of Conduct against Ballistic Missile Proliferation. The Hague Code now has 134 nations subscribed to its normative principles, but they only relate to ballistic, not UAV systems.<sup>29</sup> By leaving out UAVs and cruise missiles, the Code fostered an unfortunate notion about acceptable and unacceptable missile proliferation. That is, by not including cruise missiles and UAVs in its remit, the Hague Code created a lasting impression that although curbing the spread of ballistic missiles was in the best interests of peace and regional stability, the unbridled spread of cruise missiles and UAVs somehow would have substantially less undesirable consequences. A decade after the Hague was launched, today's dangerous signs of cruise missile and UAV proliferation would suggest that leaving the latter class of missiles out of the code was patently shortsighted.

Weak international norms related to cruise missiles have affected India's behavior with respect to both confidence-building measures and its presumed access to foreign cruise missile technology.<sup>30</sup> The Hague Code urges its members to implement pre-launch notifications, an idea that New Delhi has cooperatively pursued—to a point—with Pakistan. Islamabad sought from the outset of discussions with India to include both ballistic and cruise missiles in the agreement. But India balked at including cruise missiles, perhaps because at the time, in August 2005, only India had tested a cruise missile, the jointly developed Brahmos with Russia. Less than a week after the tentative agreement was reached, Pakistan surprised India when it launched the Babur land-attack cruise missile. By April of 2006, after Pakistan had successfully conducted its second cruise missile test, India expressed interest in including cruise missiles in the joint notification accord, but this time Pakistan said no. To date, cruise missiles remain outside this otherwise important regional achievement. In the meantime, both India and Pakistan have added new land-attack cruise missile designs to their growing arsenals, signaling a dangerous regional arms race between two nuclear-armed enemies.

Normative differentiation between ballistic and cruise missiles also seems evident in India's desire to obtain cruise missile technologies for extending the range of their existing cruise missiles. When Pakistan surprised India with the launch of a cruise missile possessing a range of 700 kilometers in 2005—over double the range of India's Brahmos—it prompted calls in the Indian press to extend the range of Brahmos at least to match Pakistan's cruise missile, and much farther, if possible. The accounts noted that such range extension would dictate access to restricted technologies from Russia, an MTCR member state who was constrained in principle not to provide such technology. Nevertheless, the Indian press averred that obtaining such technologies was feasible because the Brahmos cruise missile, unlike India's ballistic missile, was not subject to the same level of international scrutiny. Japan, for its part, also employed the logic of weak norms, when, after shelving plans for studying a requirement for acquiring ballistic missiles for preemptive strikes in 2004, they turned instead to examining land-attack cruise missiles, because they anticipated fewer obstacles to obtaining cruise missiles.<sup>31</sup>

### RECOMMENDATIONS TO IMPROVE GLOBAL NORMS AND PROLIFERATION CONTROLS

Four recommendations seem imperative to bring the proliferation of cruise missiles and UAVs—particularly armed ones—under some degree of improved control. Absent such or similar braking measures, the continued proliferation of these systems is destined to engender unwanted instability in Northeast Asia, South Asia, and the Middle East as well as to threaten the premier US capacity to project power globally. It is high time that we drop the notion that cruise missiles and UAVs are exclusively weapons of low collateral damage and high discrimination. Such a myopic view blinds us to the fact that several states have plans to employ cruise missiles as nuclear delivery systems and that this class of missiles is far better suited than ballistic missiles to deliver biological and chemical payloads. What is more, the inherent modularity of cruise missiles and UAVs means that they can be launched from concealed positions near their intended target on land; or brought on freighters, naval vessels, or submarines to positions where they could strike anywhere, including US targets, all without providing the return-address signature that ballistic missiles do.<sup>32</sup>

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#### *Recommendation 1*

The US government needs to frame armed-drone policy in a carefully considered strategic context that more effectively articulates the principles that govern our actions. Largely because the CIA executes armed drone strikes under

non-battlefield circumstances, current government policy is shrouded in ambiguity. What the US says or does—no matter whether it is formally said or informally implied—will elicit unintended consequences. As we have seen, when the United States elevated preemption to become the strategic centerpiece of the administration's broadly articulated national security doctrine, many countries rushed to emulate that doctrine, including wrapping it around their newfound interest in cruise missiles. As drones proliferate widely, there is the danger that our use of armed drones will make it easier for others to use them for armed incursions into the sovereign territory of other states. Some Latin American states possessing drones have already called for a code of conduct that will prevent the arming of drones.<sup>33</sup> Much more care than is evident today needs to be expended on this challenge before we inadvertently foster an undesirable standard of international behavior for armed-drone use.

### *Recommendation 2*

The US government needs to take a leadership position on repairing the Hague Code of Conduct's shortsighted normative treatment of missile proliferation. Sentiment is growing for broadening the code's mandate to include cruise missiles and UAVs. Beginning in 2003, the 14-member independent Weapons of Mass Destruction Commission, chaired by Hans Blix, deliberated for more than two years to develop "realistic proposals aimed at the greatest possible reduction of the dangers of weapons of mass destruction."<sup>34</sup> On WMD delivery systems, the commissioners—including former US Secretary of Defense William J. Perry—unanimously recommended that "States subscribing to the Hague Code of Conduct should extend its scope to include cruise missiles and unmanned aerial vehicles." In a November 23, 2012 message to the 134 subscribing states of the Hague Code, on the occasion of the Code's tenth anniversary, UN Secretary-General Ban Ki-moon called for the inclusion of cruise missiles in the Code's mandate.<sup>35</sup> As Aaron Karp has wisely observed, "If it is to prosper, expanding the Hague Code of Conduct to include cruise missiles probably is inevitable, if only because so many governments want it."<sup>36</sup>

### *Recommendation 3*

With the United States in the lead, member states of the MTCR should strongly resist industry pressure to liberalize control provisions affecting the sale of UAVs, particularly those meeting the regime's Category I range and payload limits. At the same time, member states should refrain from using the "rare exception" clause of the MTCR to sell Category I cruise missiles and UAVs.<sup>37</sup> If such actions truly become unexceptional due to their frequency, the regime will eviscerate its *raison d'être*. As for armed drones, member states should refrain from arming other states' UAVs for fear of setting a precedent for others to emulate such action. Recently, the United States announced plans, beginning next year, to arm Italy's Reaper drones used currently in Afghanistan for reconnaissance alone. Given plans to withdraw

most of NATO's forces by the end of 2014, Italy's armed drones would have only marginal, if any, impact on Italy's or NATO's mission there, according to American officials.<sup>38</sup> Yet, setting the precedent of arming such drones is likely to make it easier for other states to argue the merits of doing the same. Spreading armed drones at a time when norms of international behavior are virtually nonexistent makes no sense. Finally, as a condition for Chinese membership in the MTCR, current member states should work closely with Beijing in ways that might foster increased transparency and improved enforcement of their export controls. On balance, it would be much better to have China operating from within the MTCR than as a mere adherent to regime's principles.

#### *Recommendation 4*

To alter the narrative appeal of cruise missiles and UAVs as difficult to defend against, potential proliferating states need to be disabused of the notion that cruise missile defense is impossible. The United States must alter the current poor state of its own cruise missile defenses by beginning to take a more evenhanded approach in its overall missile defense investments, which are severely oriented toward ballistic missile defenses. The consequences of employing even lightly armed conventional cruise missiles became apparent in the 2003 war with Iraq, when one undetected Iraqi cruise missile came perilously close to hitting a Marine encampment on the first day of combat. Unless and until America achieves some modicum of deterrent value from a more sensible balance in its missile defense investments, cruise missiles and UAVs will continue to spread widely to threaten US interests at home and abroad.

### Notes

<sup>1</sup> Micah Zenko, *Between Threats and War: U.S. Discrete Military Operations in the Post-Cold War World* (Stanford: Stanford University Press, 2010).

<sup>2</sup> As noted in the first sentence of this article, UAVs include both single-use cruise missiles and armed drones, sometimes also called UAVs, which can be reused. At times, cruise missiles will be discussed separately from reusable UAVs or drones, but generally speaking it should be kept in mind that both cruise missiles and drones comprise UAVs as a class of delivery systems.

<sup>3</sup> Dennis M. Gormley, *Missile Contagion: Cruise Missile Proliferation and the Threat to International Security* (Annapolis, MD: Naval Institute Press, 2008), 107-108.

<sup>4</sup> For MTCR details, see <http://www.mtcr.info/english/index.html>.

<sup>5</sup> Joseph Cirincione, "The Declining Ballistic Missile Threat," Carnegie Endowment for International Peace, January 25, 2005, [http://www.carnegieendowment.org/static/npp/Declining\\_Ballistic\\_Missile\\_Threat\\_2005.pdf](http://www.carnegieendowment.org/static/npp/Declining_Ballistic_Missile_Threat_2005.pdf).

<sup>6</sup> Scott Shane, "Coming Soon: The Drone Arms Race," *New York Times*, October 8, 2011, <http://www.nytimes.com/2011/10/09/sunday-review/coming-soon-the-drone-arms-race.html?pagewanted=all>.

<sup>7</sup> See Gormley, *Missile Contagion*, 83-145 for an assessment of the chief factors shaping the belated emergence of land-attack cruise missiles.

<sup>8</sup> Peter Bergen and Jennifer Rowland, "A dangerous new world of drones," CNN, <http://www.cnn.com/2012/10/01/opinion/bergen-world-of-drones>.

<sup>9</sup> For more details on developments described in this section, see Gormley, *Missile Contagion*, 47-82 and Dennis M. Gormley, "Cruise Missiles and NATO Missile Defense: Under the Radar?" *Proliferation Papers*, No. 41 (Spring 2012), 25-42.

<sup>10</sup> Haaretz.com, September 9, 2012, <http://www.haaretz.com/news/middle-east/iran-military-official-says-tehran-set-to-unveil-long-range-cruise-missile-1.463713>.

<sup>11</sup> “Iran builds nuclear-capable cruise missile able to strike Israel from afar,” DEBKAFfile, May 5, 2010, <http://warsclerotic.wordpress.com/2010/05/11/iran-builds-nuclear-capable-cruise-missile-able-to-strike-israel-from-afar/>.

<sup>12</sup> Gormley, *Missile Contagion*, 123-145.

<sup>13</sup> Scott, “Coming Soon: The Drone Arms Race.” This figure includes \$9 billion for so-called UCAVs, or unmanned combat air vehicles. For an insightful treatment of future UCAV developments, see Norman Friedman, *Unmanned Combat Air Systems: A New Kind of Carrier Aviation* (Annapolis, MD: Naval Institute Press, 2010).

<sup>14</sup> Bergen and Rowland, “A dangerous new world of drones.”

<sup>15</sup> Adam Entous and Julian E. Barnes, “U.S. Pursues Sale of Armed Drones,” *Wall Street Journal*, December 15, 2011, <http://online.wsj.com/article/SB10001424052970204844504577098583174059746.html>.

<sup>16</sup> On industry pressure to change UAV controls, see IISS Strategic Comments, “The MTCR: Staying Relevant 25 Years On,” <http://www.iiss.org/publications/strategic-comments/past-issues/volume-18-2012/february/the-mtcr-staying-relevant-25-years-on/>.

<sup>17</sup> William Wan and Peter Finn, *Washington Post*, July 4, 2011, [http://www.washingtonpost.com/world/national-security/global-race-on-to-match-us-drone-capabilities/2011/06/30/gHQACWdmxH\\_story\\_1.html](http://www.washingtonpost.com/world/national-security/global-race-on-to-match-us-drone-capabilities/2011/06/30/gHQACWdmxH_story_1.html).

<sup>18</sup> For a detailed account, see Gormley, *Missile Contagion*, 107-122. For a recent account of the poor state of US cruise missile defenses, see Gormley, “Cruise Missiles and NATO Missile Defense: Under the Radar?” 45-58. On the challenges of dealing with UAV proliferation for US military forces, see Major Darin Gaub, “The Children Of Aphrodite: The Proliferation and Threat of Unmanned Aerial Vehicles in the Twenty-First Century,” Monograph, US Army Command and General Staff College, Fort Leavenworth, KS, 2011, <http://www.hsdl.org/?view&did=697903>.

<sup>19</sup> Loren B. Thompson, “Iranian Unmanned Aircraft Signal New Threat,” Lexington Institute, February 17, 2012, <http://www.lexingtoninstitute.org/iranian-unmanned-aircraft-signal-new-threat?a=1&c=1171>.

<sup>20</sup> Chinese planners observe that due to comparatively low cost of cruise missiles, their use provides a 9:1 advantage over the cost of defending against them. See Gormley, *Missile Contagion*, 76-77.

<sup>21</sup> See Brian A. Jackson, et. al., *Evaluating Novel Threats to the Homeland: Unmanned Aerial Vehicles and Cruise Missiles* (Santa Monica, CA: RAND Corporation, 2008). For my own treatment, see Dennis M. Gormley, “Globalization and WMD Proliferation Networks: The Case of Unmanned Air Vehicles as Terrorist Weapons,” *Strategic Insights*, Vol. 5, No. 6 (July 2006).

<sup>22</sup> See Michael A. Gips, “A Remote Threat,” *Security Management*, Vol. 46, No. 10 (October 2002).

<sup>23</sup> For an early documented account of the MTCR, see Frederick J. Hollinger, “The Missile Technology Control Regime: A Major New Arms Control Achievement,” in Daniel Galick, ed., *World Military Expenditures and Arms Transfers 1987* (Washington, DC: US Arms Control and Disarmament Agency, 1988).

<sup>24</sup> See K. Scott McMahon and Dennis M. Gormley, *Controlling the Spread of Land-Attack Cruise Missiles* (Marina del Rey, CA: American Institute for Strategic Cooperation, 1995), chapter 3.

<sup>25</sup> Gormley, *Missile Contagion*, 79-80, 151-152, and 220 (n. 7).

<sup>26</sup> See paragraph 2 of the MTCR’s Guidelines for Sensitive Missile-Relevant Transfers for details at <http://www.mtcr.info/english/guidetext.htm>.

<sup>27</sup> See Arms Control Wonk, at <http://lewis.armscontrolwonk.com/archive/5127/saudi-storm-shadow-sale-confirmed>.

<sup>28</sup> Dennis M. Gormley, *Dealing with the Threat of Cruise Missiles*, Adelphi Paper 339 (Oxford: Oxford University Press, 2001), 79 (fig. 2).

<sup>29</sup> The Hague Code deals with state behavior, not with possession of ballistic missiles. For details on the Hague Code, see the Code’s website at <http://www.brmeia.gv.at/index.php?id=64664&L=1>.

<sup>30</sup> For a broader treatment, see Dennis M. Gormley, “Winning on Ballistic Missiles but Losing on Cruise,” *Arms Control Today*, Vol. 39, No. 10 (December 2009), 22-29.

<sup>31</sup> Author interview with Japanese defense officials, March 2005. Taiwan, too, has received mixed signals—some negative, others positive—from State Department and Pentagon officials about its own cruise missile program. See Gormley, *Missile Contagion*, 142.

<sup>32</sup> In 1996, at the behest of Congress, a non-governmental panel chaired by Robert Gates reviewed the underlying assumptions and conclusions of National Intelligence Estimate 95-19, “Emerging Missile Threats to North America During the Next 15 Years.” The panel concluded unanimously that “the Estimate did not give nearly enough attention to the potential for land-attack cruise missiles launched from within several hundred miles of US territory.” For the Gates panel’s unclassified report, see <http://www.fas.org/irp/threat/missile/oca961908.htm>.

<sup>33</sup> Nacha Cattani and Taylor Barnes, “Spread of drone programs in Latin America sparks calls for code of conduct,” *Christian Science Monitor*, April 20, 2011, <http://www.csmonitor.com/World/Americas/2011/0420/Spread-of-drone-programs-in-Latin-America->

sparks-calls-for-code-of-conduct.

<sup>34</sup> For a copy of the Commission report and a list of commissioners, see

<http://www.blixassociates.com/the-wmdc/>.

<sup>35</sup> See <http://www.un.org/News/Press/docs/2012/sgsm14669.doc.htm> for the Secretary-General's full message.

<sup>36</sup> Aaron Karp, "Going Ballistic? Reversing Missile Proliferation," *Arms Control Today*, June 2005, [www.armscontrol.org/act/2005\\_06/Karp](http://www.armscontrol.org/act/2005_06/Karp).

<sup>37</sup> Notably, membership in an alliance system does not automatically convey the right to receive Category I systems from a fellow ally and MTCR member state.

<sup>38</sup> Eric Schmitt, "U.S. Proposal Would Arm Italy's Drones," *New York Times*, May 29, 2012.