Missiles matter

Christophe Carle

Missiles are to WMD arms control as ammunition is to small arms and light weapons. In both cases, a crucial component of weapon systems finds itself relegated or altogether ignored in negotiations, arrangements and treaties. In the field of weapons of mass destruction (WMD), it is the explosives and other warheads that get all the attention, whereas cartridges and bullets (the "warheads" for guns) are the poor relations of small arms and light weapons (SALW). Yet missiles do matter to international security in a variety of ways, which this article illustrates with some current issues and trends relating to missiles.

Perhaps the single greatest obstacle to missile control is the sheer diversity of existing missile systems. A shoulder-fired anti-tank or anti-aircraft device weighing less than 10kg, measuring just over a metre and with a range of a couple of kilometres is a missile, but so is an intercontinental ground-to-ground rocket weighing over 100 tons, measuring over 20m in height and capable of delivering multiple nuclear warheads to ranges of over 10,000km. If only for this reason, the very idea of addressing missiles in all their aspects can only have very limited value, and only at preliminary phases, before more focused discussions or negotiations.

The most developed international instrument addressing missiles is the Hague Code of Conduct (HCOC).[1] The HCOC binds its members to curbing the proliferation of ballistic missiles capable of delivering WMD. Its transparency and confidence-building measures are limited, yet worthwhile, provided they are demonstrably and reliably implemented—which is certainly not yet the case. The HCOC's membership—which can only be voluntary—would also require expansion to a number of important countries that have as yet shown no intention of joining. Given these difficulties, and those that were involved in the elaboration of the HCOC's text, the prospect of any more ambitious missile control measures is poor in the current and foreseeable environment.

When the HCOC was in gestation, it was commonly observed that the draft international code of conduct (as it was then) was a way to forestall the deployment of active missile defences. To some extent, the same held true for the Russian Federation's efforts to voluntarily control missile proliferation through transparency measures—the Global Control System for the Non-proliferation of Missiles and Missile Technology (GCS). The situation was sometimes portrayed as if there were two alternative, and opposing, ways of tackling missile threats: missile defences being the military–technical option, and the code of conduct or GCS the diplomatic arms control option.

Christophe Carle is a specialist in arms control, with particular interest in missiles. He served as consultant to the Panels of Governmental Experts on missiles established in 2001 and 2004, he took part in the 2006 General Assembly study of The Issue of Missiles in All its Aspects, and was Deputy Director of UNIDIR between 1996 and 2006.

In practice, both missile defences and the HCOC (though not the GCS) have come into existence—with at best questionable impacts on missile acquisition, transfer, development, threats and use; in short, on dealing with the security problems caused or aggravated by missiles of various sorts.

In fact, missile improvements by existing possessors, efforts by others to acquire missiles and the use of missiles in warfare have all continued apace. The development of missile defences themselves is accelerating and, most important, spreading internationally; more countries are making progress in areas such as solid-fuel propulsion, more are also seeking to acquire or develop their own cruise missiles or both, and very short-range missiles have emerged as potent threats, especially when in the hands of non-state actors.

Two of the most recent missile-related issues, missile tests by the Democratic People's Republic of Korea (DPRK) in early July 2006 and the intensive use by Hezbollah of short-range unguided rockets in the conflict with Israel in August 2006, illustrate the continued and manifold relevance of missiles—their acquisition, transfer, development and use—to international security.

Missile testing and development

Missile tests are not always deemed newsworthy: it depends on who conducts them, as well as on the politico-strategic circumstances and message conveyed explicitly or implicitly by those who test.

Most often, test launches by major powers are roundly ignored. Exceptions to this can take two forms: one, when the test is used to display a new, and preferably successful, capability (as in Russian testing of manoeuvrable re-entry ballistic missiles or, on a few occasions, the United States' interceptor missiles); the second exception is tests that are averred or deemed to have failed (for example, the United States' interceptor missiles, on a number of occasions).

As Peter Hayes notes,[2] no attention outside the most specialized circles was paid to the United States' test of a Minuteman III missile on 14 June 2006. Less than a month later, however, on 5 July 2006, the DPRK's testing, with mixed results, of a Taepodong-2 and other missiles was the only international news item to rival coverage of the FIFA World Cup.

A mere four days later, on 9 July 2006, India's test of an Agni-3 drew very little attention or comment. This was to be expected, as India has successfully secured a seat in the Very Important Power lounge and even managed to acquire a willing sponsor, and can now hold a missile test if it so pleases. Admittedly, India does observe missile etiquette, and gives good neighbourly prior notice when it plans a missile party.

The DPRK, on the other hand, nurtures its status as a rebellious gatecrasher, seeking self-justification in adversity. Pyongyang claims that "it would be quite foolish to notify Washington and Tokyo of the missile launches in advance, given that the US, which is technically at war with the DPRK, has threatened ... that it would intercept the latter's missile in collusion with Japan".[3]

If prior notification were all that was needed to defuse tensions surrounding the DPRK's missile tests, the answer would be easy: sign the HCOC. One of the paradoxes of the DPRK's behaviour is that this would apparently be an easy thing to do. It would seem cost-free to Pyongyang, and indeed rather advantageous. Despite the HCOC's stipulation that "(i)mplementation of the above Confidence Building Measures does not serve as justification for the programmes to which these Confidence Building Measures apply", subscribing to the code and providing a succinct yearly statement of ballistic missile and space launch policy, as well as filing pre-launch notifications (PLNs) with the HCOC Point of Contact in Vienna of ballistic missile tests or space vehicle launches, would actually have some form of

legitimizing impact on the DPRK's missile activities. It would formally put the DPRK in better standing than India, which has not adopted the code.

This would not be significantly onerous. All the HCOC's provisions are strictly voluntary for all signatories, and at least some of the signatories' reports provided to the Point of Contact seem rather succinct and generic. Moreover, the transparency measures that PLNs involve might not even be all that important, since preparations for ballistic missile test launches (especially for missiles of the liquid-fuelled variety) can be—and have been—detected in advance by national means.

At face value, such unwillingness to subscribe to the HCOC could appear paradoxical, but in fact it is not. It becomes much more readily explicable when it is acknowledged that the DPRK's objective is not to defuse the tensions surrounding missile launches, but to manipulate them—ramping them up or alleviating them when it chooses. The aim is not to make the DPRK's missiles and missile programmes consensually acceptable. It is not to assuage worries that a missile visibly readied for a test flight might—who knows—be equipped with something other than a dummy warhead, whether nuclear or not. The guiding thread is the use of missiles and their flight-testing in a broader strategy of sowing discord among significant neighbours and extra-regional powers for the sake of Pyongyang's twin priorities: regime security and nuclear weapons. As everyone now knows, the DPRK's follow-on decision was not whether or not to test such or such missile, but whether and when to test a nuclear explosive device. That is now history. The next steps will also be designed to divide opinion and confuse near-neighbour strategies. Unless coherence and determination are cemented among key states in the region and in the Security Council, the next steps could indeed be even more explosive. Far more than in the Persian Gulf, the gravest and most immediate challenge to global nuclear non-proliferation lies in North-East Asia, where the single most critical factor will remain the continued nuclear self-restraint of Japan, the Republic of Korea and Taiwan.

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Missile testing, however, is not the sole preserve of the DPRK or Iran. The tests conducted by many states clearly show that the missile sector is anything but moribund.

In the United States, Minuteman III intercontinental ballistic missiles (ICBMs) have been fired in tests on at least 11 separate occasions from June 2004 to September 2006 over distances of 6,500km to over 8,000km between Vandenberg Air Force Base in California and the Kwajalein Missile Range in the Marshall Islands.

Tests of the Standard Missile-3 (SM-3) and Standard Missile-2 (SM-2) took place on at least six occasions in the same period. These are interceptor missiles, so each intercept test also involves the launching of a target ballistic missile. Eight such intercept tests have been held to date.

Similarly, flight tests of various versions of Patriot missile interceptors (PAC-3 and Patriot Guidance Enhanced Missiles) usually involve the "ripple firing" of two interceptors against two ballistic missiles simulating an attack, adding up to four missiles in each test. The target missiles are usually PAAT (Patriot-as-a-Target, older Patriot missiles modified to represent a short-range incoming ballistic missile). Tests of this nature were held at least six times between June 2004 and June 2006. One such test, on 18 November 2004, involved some six missiles in the air simultaneously. In another instance, in early September 2004, Patriots were fired at both a short-range ballistic missile and at a cruise missile.

In the framework of missile defence research and development, the ballistic missiles acting as targets are also test-fired on their own, as in the test of an orbital long-range target missile from the Pacific Missile Range Facility in Hawaii on 28 April 2006, or of a long-range Strategic Target System (STARS) rocket from the Kodiak Launch Complex on Kodiak Island in Alaska on 23 February 2006. A medium-range target missile, the Castor IVB target vehicle, also underwent a test flight on 4 August 2005. On 6 October 2004, the Missile Defense Agency launched a suborbital rocket to test the tracking abilities of missile defence systems.

Conversely, interceptor missiles also get flight-tested on their own on occasions, as was the case with the Ground-based Interceptor (GBI) missile on 14 December 2005, or of a Terminal High Altitude Area Defense (THAAD) missile on 22 November 2005.

Tests carried out in the United States can also involve interceptors developed in international cooperation and, apparently, target ballistic missiles of foreign origin. Thus the test on 29 July 2004, near Los Angeles, of the Arrow missile defence system jointly developed by the United States and Israel involved the use as target of a Scud ballistic missile reportedly confiscated from Iraq.

The Russian Federation has carried out some 27 ballistic missile test launches between June 2004 and September 2006. Of these, 7 were ground-launched ICBMs and 11 were submarine-launched ballistic missiles (SLBMs). Tests of shorter-range ballistic missiles, of air-launched cruise missiles for conventional warheads, of target missiles for missile defence development and anti-ballistic missile interceptors (such as the S-300 tested in August 2006), were also carried out in that period. Air defence missiles with an increased capability against cruise missiles were also tested (such as the Pechora-2M). The majority of ICBM tests involve warheads designed to be manoeuvrable during re-entry, with the explicitly stated aim of defeating missile defence systems.

China appears to have conducted considerably fewer long-range ballistic missile tests, with three firings of ground-launched ICBMs (DF-21 and DF-31) and two of SLBMs (the JL-2 with a range of some 8,000km), again during June 2004–September 2006. Unconfirmed reports, however, indicate a far greater number of tests of ballistic missiles with shorter ranges of up to 600km. China is also testing the S-300 anti-aircraft and anti-missile system imported from the Russian Federation, and is working on its own versions for local production.

In the same time span of June 2004–September 2006, India has performed about a dozen missile tests involving various versions of the Agni and Prithvi missiles. This figure does not include tests of the shorter-range surface-to-air Akash and Trishul systems, which may be developed for some anti-missile capabilities. The Dhanush, a naval version of the Prithvi nuclear-capable ballistic missile, which may well form the basis for a submarine-launched ballistic missile, was tested two or three times. In another notable development, testing also continued of the Brahmos supersonic cruise missile developed jointly with the Russian Federation.

Also in the same period, Pakistan conducted tests of its Hatf-2 (Abdali), Hatf-3 (Ghaznavi), Hatf-4 (Shaheen-1), Hatf-5 (Ghauri) and Hatf-6 (Shaheen-2) on nine occasions, three of which were for the solid-fuelled, 2,000km-range Shaheen-2. A newer missile tested by Pakistan is the Hatf-7 (Babur) nuclear-capable cruise missile. Tests to date have taken place in August 2005 and March 2006.

The number of missile tests actually carried out by Iran is more difficult to estimate, owing to some of the unverifiable claims made for some of the missiles in question, such as the "sonar evading" or "radar evading" missiles supposedly capable of hitting several targets simultaneously, which were launched in early April 2006. On the other hand, the Shahab-3 ballistic missile, with a range of some 2,000km, appears quite clearly to have been tested three times during June 2004–September 2006. Iran is also occasionally reported to be carrying out static engine tests for various ballistic missiles.

Other countries have also tested various missiles in recent months. For example, Syria fired three Scuds or Scud variants in June 2005, and in the same month Taiwan tested a 500km Hsiung Feng cruise missile, as well as two Patriot PAC-2 interceptors in military exercises held in July 2006. Israel performed an intercept of a target missile using its most recent Arrow-2 anti-missile in December 2005 from a military base near Tel Aviv.

From a broad survey of missile-related activities around the world in the last few years, a number of fairly clear current trends emerge.

- Research and development on ballistic missiles, far from abating, continues intensively.
- A significant proportion of intermediate to advanced ballistic missile development focuses on two main objectives: devising warheads or re-entry vehicles capable of defeating missile defence systems; and mastering the difficulties of ballistic missile launch from submerged submarines.
- An increasing number of countries are developing cruise missiles—for both conventional and nuclear delivery—on their own instead of seeking to procure them from abroad.
- An increasing number of countries are moving from liquid-fuelled to solid-fuelled ballistic missiles, which do not require lengthy pre-launch fuelling procedures.
- The pace of work on missile defence systems is increasing, with greater resources and broadening international political and industrial cooperation.
- Missile defence systems are being developed both for the producers' own use and with export markets in mind, and are being deployed.
- For more advanced countries, in the first instance the United States, improvements in guidance and accuracy are opening up the possibility for long-range ballistic missiles to be designed and used not just for nuclear strikes, but for conventional ones as well.

Within range? Missile control efforts and prospects

On the diplomatic arms control front, the only area in which significant progress has been made is the very particular case of man-portable air-defence systems (MANPADS).[4] Since the failed attempt to shoot down an Israeli airliner in Mombasa in 2002, a variety of initiatives have been undertaken to attempt to alleviate the severe threat that MANPADS can pose to civilian aviation.

There is broad agreement that MANPADS, widely disseminated in legitimate state armed forces around the world, have also been obtained by non-state actors in significant numbers, and not just since the disintegration of Iraq. Their relative ease of use—provided adequate basic instruction, which is broadly available—and ease of concealment, as well as the physical vulnerability of the approaches to many international airports, make further attempts on civilian aircraft highly probable.

Although likely to be illicitly disseminated in the order of thousands, the number of MANPADS involved is much smaller, for example, than that of automatic assault rifles outside of authorized hands. Therefore, measures of collaborative stockpile management—including the destruction of MANPADS deemed obsolete or in excess of current needs—are a distinctly positive achievement. The United States is the most active in this respect, through its various bilateral programmes that have resulted in the destruction of some 15,000 MANPADS in Africa, Asia, Europe and Latin America, and in the improved accounting and security of existing stocks. Australia conducts similar activities, albeit on a lesser scale. Mutual information and consultation on MANPADS and their transfers also exists among the members of the Commonwealth of Independent States.

Another important contribution are the rigorous measures adopted by the states participating in the Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-use Goods and Technologies. Almost identical regulations have been adopted by others, such as the member states of the Organization for Security and Co-operation in Europe (OSCE), and the challenge is now for these commitments to be implemented strictly and reliably by all concerned.

On a more general, declaratory level, MANPADS stand out as one topic on which the United Nations General Assembly has reached consensus, adopting resolution 60/77 of 8 December 2005.[5]

Taken together, these initiatives and others (usually regional) constitute a rare area of arms control where there actually exists some scope for concerted and effective action.

Indeed, there is the potential for fruitful complementarity by building on the overall consensus on the seriousness of the issue expressed in the United Nations General Assembly on the one hand, and on the tight measures initiated by the Wassenaar Arrangement on the other. The latter are specific but not universal, and need to be broadened; the former is universal, but unspecific, and needs to be deepened. If consensus in the General Assembly can provide a basis for broadening effective adherence to Wassenaar or equivalent standards, while at the same time practical stockpile management activities are also pursued, then arms control will at least have made some genuine contribution to alleviating the MANPADS threat.

Whether, in the best of cases, this is enough to forestall future MANPADS attacks and the resulting human and economic costs remains to be seen. But even if not, arms control practitioners would be able to say with some justification that they tried their best.

In other areas of missile-related security concerns, no such constructive patterns are at hand.

The challenge to Israel of the use of short-range rockets is not new, but it rose to unprecedented dimensions in the latest conflict. Hezbollah's firing of unguided Katyusha-derived rockets of various types seemed to be inspired more by the "war of the cities" between Iran and Iraq in the late 1980s than by the battlefield use against enemy combatant units for which such rockets were intended, and originally used, in the Second World War.

Missile defences such as Patriot or Arrow could not be effective against such rockets. They were developed to counter the threat from Scud or equivalent missiles with longer ranges, longer flight times and higher trajectories. Even if these problems could be addressed, cost issues would remain distinctly asymmetrical, given the price tag on every single Patriot or Arrow and the advantage to the attacker of firing cheap rockets by the dozen.

The Tactical High Energy Laser (THEL) system, collaboratively designed with the United States to counter just such rockets as the Katyushas, was not ready (either in its initial airborne or subsequent ground-based form) and development has been hampered over the last few years by technical as well as funding aspects.

Despite ongoing operational deployment, the United States' Ground-based Missile Defence (or GMD, the new name for what used to be called National Missile Defense) is not ready either. Interceptor missiles are in place in Alaska and California, discussions are in progress for the emplacement of further interceptors in one or two East European countries, and as indicated above, missile defence cooperation is ongoing with Israel, Japan and Taiwan, as well as within the North Atlantic Treaty Organisation. Missile defence developments by China and the Russian Federation continue, with India also showing increasing activity.

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The fixation of systematic opponents of missile defence on the Anti-Ballistic Missile Treaty and their unqualifiedly dire predictions of what would happen upon its abrogation set the scene for their failure. When the treaty was scrapped and the sky failed to fall down, missile defence proponents could all too easily claim victory. The opposition's

other main argument (that a less than fully effective system would never be deployed and would be blocked by spending cuts) was equally misjudged.

Nevertheless, the proponents' argument for missile defence was just as naive. They claimed that strategic missile defences would be effective enough to yield not just a net security benefit by themselves, but also non-proliferation dividends, by demonstrating the military futility of acquiring offensive missiles and thus "discouraging" other countries from pursuing the development of ballistic missiles.

Missile defence and arms control

Missile defence, like it or not, is now a reality.[6] And it is expanding fast. Measured in terms of industrial, financial, scientific and political resources, missile defences are proliferating faster and with much greater momentum than ballistic missiles. Compare and contrast the likely scale of the DPRK's boastful but ramshackle ballistic missile programmes with the weight and dynamism of missile defence initiatives by several of the world's foremost economic and military powers, singly and together.

The resulting situation is the worst of both worlds: a GMD is being deployed with alacrity, if not with any certainty that it can protect the population of the United States or of its allies. Whatever its effectiveness, the very fact of its deployment is taken very seriously by those that are not allies (even though they may no longer, or not yet, be labelled as enemies).

No one can prove that the Russian Federation's development of missile defence-evading ballistic missile re-entry warheads or China's vigorous ICBM and SLBM modernization were triggered or hastened by GMD deployment. But it is a fact that GMD deployment has not prevented or otherwise "discouraged" these and other missile developments. In this respect, GMD is already failing.

It is a fact that GMD deployment has not prevented or otherwise "discouraged" missile developments.

Where GMD succeeds is in acting as a trendsetter. Countries other than US allies are developing their own missile defences, and these will sooner rather than later find their way into export markets. How certain are we that whatever balance may exist between, say, India and Pakistan, will be more secure when either or both have partially effective Patriot or S-300 or S-400-style missile defences of their own?

In addition, far from inhibiting missile development, fast-growing international cooperation on missile defences is boosting transfers of eminently dual-use capabilities, technologies, equipment and know-how. Whether in terms of detection, targeting, propulsion, guidance or aerodynamics, the ability to hit a missile with another missile or projectile is critically relevant to the conception and improvement of increasingly potent and accurate offensive missiles. It is commonly accepted that ballistic missile technology is highly similar to that of rocket-based space launch vehicles. To try and claim otherwise carries no credibility. No further proof of such dual use is needed than the frequent use in test flights of older-generation interceptors modified to mimic an offensive ballistic missile.

Strategic ballistic missile defences will not be rolled back before they improve, cost more money and spread further. Whether they function as advertised or not, they will be taken seriously by friends and foes alike. They already are. All that may be attempted is to blunt the sharper edges of misunderstanding and overreaction that can be prompted by current and future deployments.

The HCOC attempts to instil some confidence-building measures into the security perceptions and misperceptions engendered by ballistic missiles. Constructive—or damage-limiting—thought should now turn to confidence-building initiatives that might help to avoid the most threatening consequences of the advent of strategic anti-missile defences, whether regionally or globally. An unlikely thought, perhaps, but the alternative is considerably worse.

Notes

1. The Hague Code of Conduct (formerly the International Code of Conduct against Ballistic Missile Proliferation), adopted 25 November 2002, in UN document A/57/724, 6 February 2003.
2. Peter Hayes, 2006, "Stop Hyperventilating, Start Talking", *Policy Forum Online,* Nautilus Institute, 7 July, at <nautilus.org/fora/security/0654_Hayes.html>.
3. "DPRK Foreign Ministry Spokesman on Its Missile Launches", Korean Central News Agency, 6 July 2006, filed under 7 July 2006 at <www.kcna.co.jp>; also available with the Peter Hayes article, see note 2.
4. For more on MANPADS, see the article by James Bevan in this issue of *Disarmament Forum*.
5. UN General Assembly resolution 60/77 of 8 December 2005, UN document A/RES/60/77, 11 January 2006.
6. This reality was in fact apparent some time ago, and runs deeper than the predilections of any specific United States presidency: "Even as the outcome of the United States presidential elections remains unclear as of this writing, the United States will, at some point, deploy NMD in some shape." Christophe Carle, 2001, "Fighting Fire with Fire, Missiles against Missiles", *Disarmament Forum*, no. 1, p. 21, at <www.unidir.org/pdf/articles/pdf-art93.pdf>.