

Rebuilding Trust through Verification Reinstatement in the INF, An Opportunity for Improving U.S.-Russia Relations

The 1987 Intermediate-range Nuclear Forces (INF) Treaty has recently reemerged in the news as the United States has repeatedly expressed concern of apparent Russian violation of the agreement. The accusations levied by the U.S. have dated back to the Obama administration but the most recent violation occurred under the nascent Trump administration in February 2017, when Russia was reported by the New York Times to have deployed a battalion of SSC-8 missiles. As U.S. Secretary of State Rex Tillerson returns from his first visit to Russia on behalf of the U.S. government, it is likely the future of the INF and U.S.-Russia bilateral arms control initiatives were among a host of other issues up for discussion.

While the prospects for U.S.-Russia cooperation on an entirely new bilateral arms control agreement to replace the 2010 New Strategic Arms Reduction Treaty (New START) seem to be dim with tensions between the United States and Russia having risen to their highest level in several decades, the INF framework provides a new window of opportunity for rebuilding trust and reinvigorating cooperation on a subset of the two party's bilateral arms control undertakings.

The INF accord was the first agreement of its kind to eliminate an entire class of nuclear weapons by requiring both the United States and the Soviet Union to destroy and permanently forswear all nuclear and conventional ground-launched ballistic and cruise missiles with ranges of 500 to 5,500 kilometres. Under this protocol the United States committed to eliminating its Pershing II, Pershing IA, and Pershing IB ballistic missiles and BGM-109G

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cruise missiles. Similarly the Soviet Union agreed to destroy its SS-20, SS-4, SS-5, SS-12, and SS-23 ballistic missiles and SSC-X-4 cruise missiles. While the recently deployed SSC-8 missile is technically a new class of cruise missile, if its maximum range has been estimated correctly by experts (approximately 2,400 km), such missiles and their development would technically be prohibited under the agreement.

In addition to the INF Treaty being the first of its kind to eliminate an entire class of nuclear weapons, it was also the first treaty of its kind to include extensive verification and monitoring mechanisms, including on-site verification (with provisions for challenge inspections) and continuous portal monitoring of missile assembly plants. Despite the indefinite status of the treaty itself, most of these verification measures expired in May 2001 and the U.S. portal monitoring of the Votkinsk plant expired with the 2009 expiration of the Strategic Arms Reduction Treaty (START). However unilateral verification through the national technical means (NTM) surveillance system has continued.

Though there have been occasional accusations of violations from both sides since the INF entered into force, the international community has witnessed a recent uptick in suspected violations. Starting as early as 2013, when the SSC-8 missiles were in development and in their testing phase, the Obama administration sought to rollback and correct Russian violations but to no avail. Subsequent reports from the U.S. Department of State in 2014, 2015, and 2016 stated “the Russian Federation is in violation of its obligations under the INF Treaty not to possess, produce, or flight test a ground-launched cruise missile with a range capability of 500 km to 5,500 kilometres, or to possess or produce launchers of such missiles,” with the 2016 report calling special attention to Russia’s new SSC-8 cruise missile. Meanwhile Russia has also levied its own accusations of compliance failure against the U.S. As noted by the U.S. Congressional Research Service, Russia has specifically listed, “(1) the use of intermediate-range missiles as targets during tests of U.S. missile defence systems; (2) the use of drones as weapons delivery vehicles; and (3) the planned deployment of missile defence interceptors on land in the Navy’s MK-41 missile launchers,” as its main grievances.

The disbanding of the original verification mechanisms included with the treaty has left an obvious gap in the ability for the U.S. and Russia to continue the progress initially made on the disarmament process agreed to upon signing of the accord. Arguably if such measures had been left in place it would have been easier for both sides to uncover and evaluate potential actions of non-compliance such as the ones being currently raised. A lack of such provisions has now placed both sides in the more difficult position of attempting to reverse one another’s projects, which is understandably met with resistance following the amount of financial investment and labour that has been sunk into such projects. Additionally, a failure to make use of the Special Verification Commission (SVC), which serves as the official implementing body of the treaty and legally binds each party to participate when convened, to address concerns from their outset has not alleviated matters. The first meeting of the SVC in thirteen years was only recently convened, in November 2016.

However, in spite of the weak state of the treaty and Russia’s recent deployment of its new missiles, both sides should pause hasty decision-making on military response options or treaty withdrawal, as either action would openly invite the other side to disavow its promise of restraint in response. Rather, as the untested Trump administration works to articulate its policy for its response to these violations, both sides could capitalize on the opening this current lack of a policy provides to build on the existing framework within the INF to improve the current status quo and begin further dialogue on U.S.-Russia arms control initiatives.

One such way that this could be done is by either the United States or Russia calling for a reconvening of the SVC forum to restart the dialogue on the above mentioned issues of concern. Similar to the November 2016 meeting of the Commission, the SVC could invite the participation of other allies and neighbours, which Russia has cited as a primary source of its security concerns as they have undertaken developments of their own intermediate-range systems. Such an action could also have the added benefit of rebuilding the confidence of other members of the international community, such as NATO partners and other nuclear weapons states such as China, which have historically been cut out from the stability benefits accrued under these bilateral negotiations.

In such discussions it would be possible to not only have each side re-affirm their commitment to the treaty, but also to update and build upon the existing framework of the treaty's limitations and provisions in order to address the emergence of new destabilizing nuclear and non-nuclear technologies, such as unmanned aerial vehicles and interceptors, which have been of particular concern to Moscow.

Additionally, there is also the opportunity for both sides to reinstate expired mechanisms and/or impose updated verification and monitoring mechanisms to oversee the dismantlement of agreed upon technologies. Such provisions would improve transparency between the two parties and among third party observers participating in the forum. The current use of solely national technical means of verification – satellite and infrared monitoring – has been useful in detecting violations, but has fallen short of providing adequate lead time to run interference as previously highlighted. Therefore it would behoove both parties to give serious consideration to reinstating previously agreed to verification and monitoring instruments or to develop an entirely new verification system.

One such model to follow could be the provisions agreed upon in the 2010 New START agreement, where in addition to not intentionally denying or encrypting NTM data, each side engages in a continuous reciprocal exchange of data on their forces as well as their delivery capabilities. New START also has provisions for short notice on-site inspections, which when combined with a reinstatement of the elimination and close out inspections formerly implemented in the INF agreement and a reset on baseline inspections, could provide sufficient measures for verifying each side's compliance.

To continue to help with confidence building between both the U.S and Russia and the international community, the modified agreement could break from tradition by bringing in the International Atomic Energy Agency (IAEA) to carry out the on-site verification inspections. Such a step would assist in rebuilding trust between the two treaty parties while also allowing members of the international community to reap the benefits of increased transparency, thereby promoting stability throughout the international system as a whole.

Such negotiations will not be easy to undertake, particularly as they will be attempting to address longstanding disputes that cannot easily be undone overnight. Even if an agreement can be struck, the process of weapons dismantlement is a multi-year undertaking that will require continued patience on all sides. There is also the added difficulty of balancing these negotiations with other discussions that will need to be had regarding the future of New START, which is set to expire in 2021 and will need to be put on the Trump administration's second term agenda if it plans to be a two-term presidency, as well as other issues of international importance such as the conflict in Syria.

However, in order to prevent the total unraveling of the INF agreement, it will be necessary to confront these challenges and attempt to re-establish a productive working relationship between these historical adversaries that both they and the international community can have faith in. In a time characterized by mistrust, similar to the time that the INF Treaty was originally signed, it may be necessary to look to past mechanisms and take steps such as the reinstatement and modification of verification measures in order to rebuild the trust that has been lost.

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Be careful what you wish for: the nuclear ban

By *Andreas Persbo*

On 23 December 2016, the United Nation's General Assembly adopted resolution 258 on 'Taking forward multilateral disarmament negotiations.' The document contains four important decisions, all aiming to establish and support a diplomatic conference to 'negotiate a legally binding instrument to prohibit nuclear weapons, leading towards their total elimination.' While 113 states voted for the resolution's adoption, 35 countries voted against it, and 13 abstained.

The 'ban conference' will meet in New York. The first session was held during 27-31 March 2017 while a second meeting will come together during 15 June to 7 July 2017. The General Assembly will 'assess progress' and 'decide the way forward' during its 72nd session, later this year.

The conference has caused considerable discomfort amongst predominantly Western governments. In Europe, for instance, only seven states voted for the resolution, namely Austria, Cyprus, Estonia, Ireland, Italy, Sweden, and FYR Macedonia. Other European governments voted against or abstained. Is this uneasiness justified?

At the time of writing, it is not clear what the 'ban treaty' will prohibit. States voiced a broad range of preferences at the March session of the conference. What is clear, however, is that the agreement would need to be compatible with obligations under the 1968 Nuclear Non-Proliferation Treaty ('NPT'), the 1996 Comprehensive Nuclear Test Ban Treaty ('CTBT') as well as individual countries' nuclear weapon free zone ('NWFZ') commitments. Negotiating complementarity is likely to be complicated, as NWFZ-obligations vary. Indeed, those countries under stringent commitments—such as the 40 African nations party to the 1996 African Nuclear-Weapon-Free Zone Treaty ('Pelindaba Treaty')—would be

unlikely to go below the requirements set out in that agreement. Likewise, those countries not party to such zone commitments may be unwilling to raise their level of legal obligation significantly.

Indeed, the commitments under the 1967 Treaty for the Prohibition of Nuclear Weapons in Latin America and the Caribbean (the 'Treaty of Tlatelolco') are likely to constitute the lowest common denominator for the negotiators. If correct, this assumption leads to some interesting consequences, as the Treaty of Tlatelolco is implicitly recognised in the NPT (this is evident, as Tlatelolco pre-dates the NPT). Article VII of the NPT makes clear that it does not affect 'the right of any group of States to conclude regional treaties' to 'assure the total absence of nuclear weapons in their respective territories.' There has been no critical examination so far as to how the proposed 'ban treaty' relates to Article VII of the NPT. Indeed, it is hard to see how a 'ban treaty' would 'undermine' the NPT, should it come out as a geographically expanded Treaty of Tlatelolco.

Moreover, there are signs that the proposed agreement may work to strengthen the NPT. Some governments pointed to the need for the International Atomic Energy Agency (IAEA) as well as the Comprehensive Nuclear Test Ban Treaty Organization (CTBTO) to be engaged in the deliberations, as observers. Western European governments—Sweden in particular—have emphasised how the so-called Additional Protocol should become the new treaty's verification standard. The prevalence of IAEA safeguards—and the overall importance of verification—came across in several statements to the March meeting. Paradoxically to some observers of the proceedings, Iran came out strongly for the need to think carefully about verification arrangements, should the treaty ultimately be one relevant for the total elimination of nuclear weapons—Iran, of course, having had its run-ins with the IAEA safeguards regime over the last decade.



Quotes

Where the conference goes in June is anyone's guess. One thing is clear, however: should governments want to include some verification arrangement amongst the proposed treaty's obligations, a longer and significantly more complex negotiating session will be required. There is a trade-off to be had: explicitly recognising the Additional Protocol as the new safeguards standard amongst the ban's 110-120 supporting governments would increase its allure to the Nuclear Weapon States, as well as European governments. However, it could erode support amongst some Middle Eastern governments—who then would suddenly find a real national security stake in the negotiations. A similar dynamic would come into play should the ban treaty explicitly recognise the CTBT's valuable norm against nuclear weapons testing; this could be problematic to those governments that have—for one reason or another—elected not to ratify the test-ban treaty.

The countries participating in the ban treaty negotiations, as well as supporting non-governmental organisations, need to consider what their objectives are more carefully. The proposed agreement's security benefits would be questionable, should it come out as a 'Tlatelolco-light' (a mild prohibition without significant verification). By contrast, assuming stronger verification commitments amongst the already disarmed would send a signal that the participating states are ready to make additional sacrifices to achieve what still must be their desired end goal, namely 'a world without nuclear weapons.'

'In the United States, born and periodically reborn out of the repeated recognition and rejection of the age-old lie that some people are meant to take dominion over others, truth is as vital a part of the civic, social and intellectual culture as justice and liberty. Our civilization is premised on the conviction that such a thing as truth exists, that it is knowable, that it is verifiable, that it exists independently of authority or popularity and that at some point — and preferably sooner rather than later — it will prevail. [...] [Trump] has made himself the stooge, the mark, for every crazy blogger, political quack, racial theorist, foreign leader or nutcase peddling a story that he might repackage to his benefit as a tweet, an appointment, an executive order or a policy. He is a stranger to the concept of verification, the insistence on evidence and the standards of proof that apply in a courtroom or a medical lab — and that ought to prevail in the White House.'

Los Angeles Times' harsh editorial on 'Why Trump Lies', 3 April 2017, highlighting the need for verification in international relations as well as domestic politics.

'We will not negotiate our way back to the negotiating table with North Korea. We will not reward their violations of past resolutions. We will not reward their bad behaviour with talks. We will only engage in talks with North Korea when they exhibit a good-faith commitment to abiding by the Security Council resolutions and their past promises to end their nuclear programs. And that is why we must have full and complete compliance by every country to the resolutions that have been enacted by this body in the past — no relaxation in the vigorous implementation of sanctions. Any failure to take action diminishes your vote for these resolutions of the past, and diminishes your vote for future resolutions, and it devalues your seat at this Council. We must have full, complete compliance by all members of the Council.'

US Secretary of State Tillerson's message to the UN Security Council on the importance of compliance with sanctions. Passblue, 28 April 2017.



The curious case of Kim Jong-nam and Malaysia's CWC legislation

By Scott Spence

On 13 February, Kim Jong-nam, the half-brother of North Korean leader Kim Jong-un, was apparently assassinated by two women in Kuala Lumpur's international airport while returning to Macau where he lived in exile. The suspects, from Indonesia and Viet Nam, are in custody and face murder charges in Malaysia for allegedly spreading chemicals on his face, which in combination produced a fatal dose of the nerve agent VX. North Korea denied that it was behind the attack and a diplomatic row between Malaysia and North Korea eased on 31 March when North Korean suspects and the body of Mr Jong-nam were returned to North Korea in exchange for nine Malaysia citizens blocked from leaving the country.

I briefly review how the Malaysian authorities can enforce their Chemical Weapons Convention Act 2005 (Act 641) (hereinafter CWC Act) to investigate, prosecute and punish what appears to have been a chemical weapon attack on their territory. For starters, Malaysia has correctly defined a chemical weapon in Section 3 of the CWC Act to include "...toxic chemicals, except where intended for purposes not prohibited under the Convention as long as the types and quantities are consistent with such purposes". The act of smearing toxic chemicals on Mr Jong-nam's face to produce the fatal nerve agent VX is certainly not permitted by the Chemical Weapons Convention, and the suspects should face charges of acquiring, possessing, and using a chemical weapon under Section 18 of the CWC Act. If convicted, they face up to thirty years prison time, a fine of one million ringgit (approximately \$226,000) or both.

The other interesting question arising out of this case is: how did the women get the VX to begin with? VX is a Schedule 1 chemical in the Chemical Weapons Convention and access to it must be highly restricted in States Parties. Under Section

21 of the CWC Act, it is forbidden in Malaysia to produce, acquire, retain, transfer or use VX except for research, medical, pharmaceutical or protective purposes and these activities must be authorised by the National Authority for the Convention. So not only could the suspects be charged with using a chemical weapon, they could also be charged with engaging in unauthorised activities with a Schedule 1 toxic chemical, and possibly doing so in connection with North Korea, a State not Party to the Convention. If convicted for these charges, they could face up to seven years prison, a fine of 150,000 ringgit (approximately \$34,000) or both. In addition, the suspects in this case would be well-advised to tell the truth about their involvement with the VX and Mr Jong-nam's death: under Section 56 of the CWC Act, it is an offence to provide false or misleading information related to enforcement of the Act to National Inspectors (charged with enforcing the Act) or police officers. Though the CWC Act does not specify whether the Malaysian courts can exercise jurisdiction over any of these offences, it is fair to say that the offences are drafted in such a way that they are prosecutable for having taken place in Malaysian territory and regardless of the nationality of the suspects.

Malaysia has a National Authority for the Chemical Weapons Convention, which was established under Section 6 of the CWC Act. It was no doubt useful in this case that the Authority includes officials representing foreign affairs (given the link to North Korea), internal security and the police. It is also no surprise that the Authority has already presented a report on the use of a chemical weapon to the Organisation for the Prohibition of Chemical Weapons, a power they have under Section 7(d) of the CWC Act: "...providing the Organization and other State Parties with relevant information in fulfilment of Malaysia's obligations under the Convention".

Under Section 44 of the CWC Act, National Inspectors, police officers above the rank of Inspector and Senior Customs Officers are empowered to investigate offences involving chemical weapons. This section was surely triggered after the

assassination of Mr Jong-nam because it purportedly involved a restricted nerve agent. These same officials are also empowered under the Act to search and seize without a warrant under certain conditions (Section 45) and access computerized data (Section 46). We may never know, however, the extent to which these powers were exercised. Moreover, if the suspects are convicted, they will have to pay the Malaysian government the costs associated with maintaining custody of items found and associated with the assassination, for example, any VX residue or receptacle, package, conveyance or other article in which the nerve agent was stored, kept or found. This could be very expensive indeed given how lethal and persistent the chemical is.

Fortunately, in this international thriller of a case, Malaysia has high quality, enforceable legislation to implement the Chemical Weapons Convention, and it is evident that they are using it. The same cannot be said, however, for several of Malaysia's neighbours that have yet to implement the Convention in their domestic legal systems; they would have had a tough time investigating, prosecuting or punishing the suspects for chemical weapons activities. And what if the suspects had used, for example, anthrax, which is a biological agent, instead of VX to assassinate Mr Jong-nam? Malaysian officials have been working on a bill for several years now which would, among other matters, punish the acquisition, possession or use of a biological weapon. However, Malaysia's investigators and prosecutors may not have all the tools they would like at their disposal in the event of a biological weapons attack until this bill becomes law. The point here is not to single Malaysia out, rather it is to emphasise that it is incumbent on all States Parties, to the Chemical Weapons Convention as well as to the Biological Weapons Convention, to adopt without further delay effective legislation to punish the sorts of criminal behaviour we recently witnessed in Kuala Lumpur. VERTIC goes into detail on how far we still have to go to implement the Biological Weapons Convention at the national level, in our BWC report on national implementing legislation which was presented to the Eighth Review Conference last November.

Resourcing the Biological Weapons Convention

By Scott Spence

The Financial Resources Management Service (FRMS) of the United Nations Office at Geneva (UNOG) released a document on 30 April 2017, available on the UNOG website, giving the status of State Party contributions to the Biological Weapons Convention (BWC), Convention on Cluster Munitions (CCM), Convention on Certain Conventional Weapons (CCW) and Anti Personnel Landmine Convention (OTW). The FRMS does not mince words when it confirms that "if all contributions are not received by the time the UN has to make payments for conference costs, the UN will be unable to host those conferences". This includes the sole meeting scheduled in 2017 for the BWC, the Meeting of States Parties (MSP) during 4-8 December. Annex I of the document breaks down each State Party's status of contributions to the different disarmament treaties collectively while Annexes II, III, IV and V break them down among the BWC, CCM, CCW and OTW. The results of this analysis are startling and, presumably, they were facilitated by new accountability and transparency measures arising from implementation of the UN's new enterprise resource planning software, UMOJA, which has replaced legacy systems and paper-based processes across the UN system.

For the BWC, including its meetings and Implementation Support Unit (ISU), the results are mixed. The net cash balance for 2000-2016 (invoices issued to States Parties for previous years' conferences but not yet paid) is a negative balance of \$331,817.97. On the other hand, assessed contributions for 2017 still due from States Parties show a positive balance of \$217,473.61 as overpayments have offset unpaid contributions. The key figures for the scheduled MSP in December, however, are how much cash is available to the UN this year for the BWC (\$995,155.64) and how much of that is already restricted for legal commitments, such as ISU salaries (\$850,300.00). This leaves uncommitted cash available of \$144,855.64 for the MSP. The problem, however, is that during the Eighth Review Conference the States Parties had

already set a budget for the MSP of \$208,100 leaving a shortfall of \$63,244.36. It is unlikely then that the meeting will take place if the UN has not received the outstanding \$63,244.36 by the time it must make payments for conference costs such as translation of documents and assignment of interpreters. It is therefore vital that outstanding contributions from 2001 through 2017 are paid without delay. Annexes I and II provide the outstanding balances due for the BWC, if any, for each State Party.

The consequences of not holding the MSP in December are serious. Indeed, in a letter in March to the States Parties of the BWC, the Depositaries (Russia, the United Kingdom and the United States), underlined that “Without the prompt resolution of this issue, the structure and decisions agreed upon just a few months ago at the Eighth Review Conference will be in serious jeopardy”. The Eighth Review Conference agreed that the States Parties would use that meeting to “seek to make progress on issues of substance and process for the period before the next Review Conference, with a view to reaching consensus on an intersessional process”. In other words, if there is no MSP this year, the opportunity will probably be gone to agree an intersessional process until the next Review Conference in 2021 – a regrettable situation by any measure given how quickly the life sciences are changing and how important it is, more than ever, to maintain the norm against biological weapons and uphold the BWC and its principles. If they do meet in December as planned, the States Parties must urgently consider a sustainable solution to financing the BWC to ensure that this situation does not occur again and that the Convention is put on a secure financial footing.

Implementing UNSC sanctions on DPRK

By Angela Woodward

The United Nations sanctions regime against the Democratic People’s Republic of Korea (DPRK) is by far the most comprehensive of the 13 current regimes – in fact, of any sanctions regime in history. This regime addresses a wide range of activities and assets in an effort to halt, or at least signifi-

cantly impede, the country’s further development of nuclear weapons and ballistic missile technology and to coerce it back into negotiations on denuclearization.

The DPRK sanctions regime comprises six substantive Security Council resolutions, as well as procedural resolutions relating to monitoring and oversight. The first of these measures, Resolution 1718, adopted on 14 October 2006, instituted an arms embargo, import and export controls over certain goods, and an assets freeze and travel ban on persons involved in the country’s nuclear programme. It also established a subsidiary body of the Security Council charged with oversight of the DPRK sanctions regime (the “1718 Committee”). These measures were significantly expanded upon in subsequent resolutions in direct response to the DPRK’s further nuclear and ballistic missile tests: resolutions 1874 (2009), 2087 (2013), 2094 (2013), 2270 (2016), and 2321 (2016). The two resolutions adopted in 2016, in particular, went further than previous measures by targeting new sectoral areas in an attempt to immobilize the DPRK’s nuclear programme, once and for all, following the country’s testing ‘in violation and flagrant disregard’ of previous resolutions.

The current regime now includes a comprehensive arms embargo; financial measures including strict controls over financial services; measures concerning the disposal of prohibited items seized through interdiction; trade bans on luxury goods, fuel, coal and minerals; controls on dual-use nuclear and ballistic missile technology, including requirements for a ‘catch-all’ provision to cover trade relating to prohibited programmes; controls on specialist teaching and training, as well as scientific and technical cooperation; and restrictions on maritime transport connected to the DPRK regime and the supply of helicopters and vessels.

United Nations Member States have the complex task of giving effect to the many and variously detailed requirements of all of these resolutions and, pursuant to resolution 2321, have been called upon to ‘redouble their efforts’ and to cooperate with each other in doing so. They must also report to the 1718 Committee on their implementation activities

under the various resolutions (within 90 days, for resolution 2270). These reports are publicly available on the Committee's website.

The Security Council established a Panel of Experts under resolution 1874 (2009) to assist the 1718 Committee in its tasks and, with respect to sanctions implementation, to 'gather, examine and analyse information from States, relevant United Nations bodies and other interested parties regarding the implementation of the measures, and gather, examine and analyse information in particular, on incidents of non-compliance', to 'make recommendations on actions that the Council, Committee or Member States may consider to improve implementation of the measures' and to report to the 1718 Committee accordingly. The Panel's mandate has been extended through subsequent resolutions, most recently under resolution 2345 (2017) until 24 April 2018.

Notably, the Panel of Experts has prepared fact sheets, implementation assistance notices and guidelines for preparing and submitting national implementation reports, to assist States in implementing and reporting on the various measures in the DPRK sanctions regime. This is in response both to States' requests for technical implementation guidance and the need to reduce the possibility of loopholes developing in instances where States rely on their own imprecise or plain loose interpretation of resolution requirements.

Of no surprise to avid observers of States' efforts concerning national implementation of complex requirements in international legal instruments – such as ourselves here at VERTIC – domestic implementation of the DPRK sanctions and reporting of the same, has been somewhat suboptimal. The Panel of Experts noted in its most recent report on implementation of the sanctions resolutions, S/2017/150 dated 27 February 2017, covering the period 6 February 2016 to 1 February 2017, that while its outreach had improved the reporting rates, the number of non-reporting States remained 'significant' (only 76 States had submitted a report this period). While there had been 'some improvement' in the quality of some reports, States were encouraged 'to enhance

the level of detailed information in their reports, showing the extent to which their domestic legislation and practices address the measures contained in resolutions 2270 (2016) and 2321 (2016).' In other words, to demonstrate how they had complied with the sanctions resolutions.

On the issue of domestic legislative implementation of the sanctions, all of the Panel of Experts' nine recommendations in the report that were directed at Member States, concerning procedural means of implementing the sanctions, realistically require legislative implementation in order to be capable of enforcement.

Without effective legislative implementation of all the sanctions, by all Member States, the DPRK sanctions regime cannot hope to inhibit, let alone terminate, the DPRK's continued development of nuclear weapons and ballistic missile technology. Meanwhile, the DPRK's sanctions evasion tactics have become increasingly sophisticated to the point where, as Scott Snyder describes it, they have 'largely eviscerated the intent and impact of the UN sanctions resolutions'. As tensions in the region continue to grow, and alternative means of arresting the DPRK's nuclear programme come under consideration, the international community must continue to push for comprehensive legislative implementation and enforcement of the DPRK sanctions regime as a diplomatic route to resolve this crisis.



The rise of the drones

By Andreas Persbo

Drones are in the news, and YouTube is awash with stunning aerial video photography. But while many have highlighted the dangers these small devices pose for air traffic, few have considered their potential for verification and monitoring. A current article by James M. Oliver in the *Environmental Claims Journal* makes a compelling and well-written case for their use in environmental assessment and monitoring, but what are their further uses?

Drones, or more precisely 'small unmanned aerial systems' (sUAS), usually weigh 25 kilogrammes or less. The system's payload is what remains after one subtracts the weight of the airframe, engines, electronics and power supply. The evolution of drone technology and the reduction of the weight of sensors have allowed a greater assortment of sensing devices to be fitted to the airframe. Today, commercially available sensor technologies include Light Detection and Ranging (LiDAR), imagery, video, multi- and hyperspectral sensors, thermal and infrared sensors, magnetometers, gamma sensors, corona, and laser methane detection systems. In coming years, sUAS are also expected to be able to collect physical samples. Indeed, Los Alamos National Laboratory has already been examining a concept called 'MODCOPTER' (See *Trust & Verify* No. 141). It highlighted the potential use of the technology in nuclear safeguards as well as in the collection of samples from suspect nuclear test sites. The MODCOPTER system successfully collected samples through contact, by means of pinching objects and even grabbing them.

A sUAS can be controlled by a smartphone or a tablet. As it flies within visual range of the pilot, it would be able to travel around buildings or terrain. It could also be programmed to follow a course using high-end GPS sensors that allow independent flight along a preselected flight path; and this allows data to be collected in a documented, quan-

tifiable and, most importantly, repeatable way. The flight plan itself provides the location, altitude and path of the sUAV in the monitoring mission.

LiDAR is a remote sensing method that uses light in the form of a pulsed laser to measure ranges. The difference in light return times and wavelengths can be used to make highly detailed digital representations of the object measured. The applications are several, but for nuclear safeguards purposes as an example, a LiDAR-equipped drone could be very useful for scene change recognition at a nuclear site. This would, in particular, be of use in detecting underground structures. Of course, other sensors can be utilised for this purpose, such as GEM Systems airborne precision Potassium Magnetometer, which weighs in at about three kilogrammes. Such technology could, for instance, be used to identify underground cavities, such as those formed by a nuclear test explosion. Hyperspectral imaging is incredibly sensitive and could be applied by an organisation such as the Organisation for the Prohibition of Chemical Weapons (OPCW) when examining potential chemical weapons use.

Take another potential application. In 2010, some IAEA member states reported on a detailed theoretical study of the feasibility of wide-area environmental sampling (WAES) as a tool for the detection of undeclared enrichment or reprocessing operations (IAEA-STR 321). WAES often refers to the 'collection of environmental samples that were not targeted around a suspect facility or geographic location, but instead over regions containing much larger areas' (say 100,000 square kilometres). The group concluded that atmospheric sampling appeared to be 'the technique with the greatest detection probability per-sample' of all methods considered. They did conclude, however, that the cost of operating a fixed WAES network (modelled presumably on the CTBT's network of radionuclide stations) could be high. An inspection protocol through which inspectors are allowed to deploy a swarm of sUAV's to take both hyperspectral images, gamma measurements, and environmental samples,

could significantly drive down costs.

The application of sUAV technology looks increasingly appetising as the cost, size and weight of sensors continue to fall. A forward-looking feasibility study comprehensively assessing their use could be a net-benefit to the verification and monitoring community overall.

Further reading: James M. Oliver (2017), 'Current Status of the Use of Small Unmanned Aerial Systems for Environmental Monitoring', *Environmental Claims Journal*, 29:2, 159-170. See also Matteo Zerini, 'Monitoring of the Minsk Agreement' (Trust & Verify No. 154); Hartwig Spitzer 'Open Skies Update' (Trust & Verify No. 153); Alberto Muti, 'Los Alamos develops small drones for sample collection' (Trust & Verify No. 141); and David Keir, 'Robotics in nuclear disarmament verification?' (Trust & Verify No. 136).



Quotes

'We struck a deal where we got 100 percent of the chemical weapons out' [of Syria] declared US Secretary of State John Kerry, in July 2014. However, *'Obama administration officials say that they always believed Mr. Assad might be withholding at least small chemical supplies, and that in public statements, Mr. Kerry and others tried to refer to the elimination of Syria's "declared" stocks, a nuance often lost in news reports. American officials repeatedly returned to the Organization for the Prohibition of Chemical Weapons with intelligence reports on remaining chemical stocks, pressing for further action. Despite the failure to completely eliminate Syria's chemical weapons, Obama administration officials and outside experts considered the program fundamentally a success. "We strongly believed it was better to get 1,300 tons of chemical weapons out of the hands of the Syrian regime, or let them fall into the hands of ISIL'* noted Jonathan Finer, Mr Kerry's chief of staff.

The New York Times' Scott Shane on 'Weren't Syria's chemical weapons destroyed? It's complicated', 7 April 2017.

An interesting issue is whether and how the [nuclear weapons ban] treaty could include an on-ramp for nuclear-armed states to eventually sign the treaty, perhaps with a provision requiring a nuclear-armed state to submit a schedule for elimination of its stockpiles with proposed verification measures. [...] Iran made a lengthy intervention to express concern about the need for strong verification measures to prevent countries from "cheating.'

Samantha Pitts-Kiefer's gleeful observation of the first negotiating session of the multilateral negotiations on a nuclear weapons ban treaty for the Nuclear Threat Initiative, 6 April 2017.

'Sweden remarked that a provision requiring states parties to enter into legally binding commitments with the IAEA similar to the Additional Protocol would be "a cost effective and non-duplicative form of verification." Sweden also proposed pursuing more comprehensive verification measures if and when nuclear weapons states join the treaty.'

Alicia Sanders-Zakre's blogging on the first negotiating session of the multilateral negotiations on a nuclear weapons ban treaty for the Arms Control Association, 29 March 2017.

'Iran says we shouldn't repeat the NPT. Prohibition without elimination and verification for us is just another NPT. #nuclearban'

Tweet by Andrea Berger, visiting Fellow at Kings College London, at the first negotiating session of the multilateral negotiations on a nuclear weapons ban treaty. @AndreaRBerger, 30 March 2017.



Director's reflections

By Andreas Persbo

On 4 April 2017, the rebel-held city of Idlib, in Northern Syria, was hit by a chemical weapons attack. The Turkish Health Ministry on 6 April 2017 identified the compound used to be Sarin, and 80 civilians perished, including many children. In response, the United States launched 59 Tomahawk cruise missiles at the government-controlled Al-Shayrat airfield, which it believed to have based aircraft involved in the attack.

Syria is, alongside 191 other states, a party to the Chemical Weapons Convention. The treaty entered into force, for Syria, on 14 October 2013. Its initial declaration to the Organisation for the Prohibition of Chemical Weapons (OPCW) on 24 October 2013 indicated that the country held approximately 1,300 metric tonnes of chemicals. The OPCW declared on 4 January 2016 that the destruction of that stockpile had been completed.

However, on 19 April 2017, the OPCW confirmed that Sarin had been used. This finding was based on tests on biomedical samples collected from three victims and analysed at two designated laboratories. Samples from another seven individuals undergoing treatment also indicated Sarin. This, quite naturally, casts doubt on the completeness of Syria's initial declaration. On 21 April, the United States Secretary of Defence, James Mattis, said that there could be 'no doubt in the international community's mind that Syria has retained chemical weapons in violation of its agreement and its statement that it had removed them all.' On 26 April, a French intelligence report concluded that Syrian government forces carried out the attack, and blamed the Russian Federation for trying to discredit the OPCW. Russia, for its part, denies these claims.

On 28 April, the OPCW Director-General maintained that the organisation was ready to investigate the event, should appropriate safety arrangements be in place. He said that the investigation—as previously—would not seek to assign blame for the attack, leaving that for the OPCW/United Nations' Joint Investigative Mechanism.

The human tragedy in Syria clearly illustrates first, how important it is to support verification regimes that aim to assess the completeness of a state's declaration, not simply its correctness. Second, it shows how valuable impartial investigation is. Without the verified facts, stakeholders are free to spin reality into something that fits their national narrative and interest. Something as important as abolishing chemical weapons, and then preventing their re-emergence, deserves better than this.

National Implementation Measures Programme

By Scott Spence

During this quarter, National Implementation Measures (NIM) programme staff prepared legislation surveys for the implementation of the Biological Weapons Convention (BWC) for three states, for the implementation of instruments for nuclear security for one state and for the Chemical Weapons Convention for two states.

On 23 January, NIM Senior Legal Officer Sonia Drobysz attended a conference on 'Towards a new arms race' in Paris, organised by the Nuclear Threat Initiative and the Initiative for Nuclear Disarmament.

From 24 January through 4 February, NIM Programme Director Scott Spence travelled to Central Asia for a series of meetings under the auspices of EU CBRN Centres of Excellence Project 53 (P53) on 'Strengthening the National Legal Framework and Provision of Specialised Training on Biosafety and Biosecurity in Central Asian Countries', for which VERTIC is a project partner. Scott participated and presented at: a National Kick-off Meeting in Ulaanbaatar, Mongolia; a P53 Meeting in Astana, Kazakhstan; a visit to a potential training biosafety/biosecurity facility in Almaty; a P53 Steering Group Meeting in Bishkek, Kyrgyzstan; and a Regional Kick-off Meeting also in Bishkek.

On 2 March, Scott attended a meeting with Jens Stoltenberg, 13th Secretary General of the North Atlantic Treaty Organization on 'Projecting stability beyond our borders', a Maison de la Paix event organised with the Geneva Centre for Security Policy.

Later in the month, Mr Spence travelled to Milan, Italy, to participate in the 7th Annual International Symposium on 'Biosecurity and Biosafety: Future Trends and Solutions' where he presented on the NIM Programme's report on national implementation of the BWC and online legislative assistance tool for the BWC, both of which were first presented to the Eighth Review Conference of the BWC last November.

On 29 March, Scott participated in a workshop in support of BWC Extended Assistance Programmes in Geneva, which brought together experts from European Union Member States, as well as United Nations entities, international organisations and other relevant stakeholders such as VERTIC, to discuss best practices and appropriate preparations for assistance activities to beneficiary countries. Scott spoke on best practices for successful assistance during the first session.

Verification and Monitoring

By Larry MacFaul

To start off the New Year, the Verification and Monitoring (VM) Programme continued its nuclear non-proliferation work focused on identifying and sharing useful examples of countries' nuclear safeguards implementation. At the end of March, Katherine Tager, Researcher, travelled to Yangon, Myanmar to attend a workshop involving participants from Cambodia, Lao PDR and Myanmar aimed at sharing experiences in implementing the IAEA Comprehensive Safeguards Agreement and Additional Protocol in Small Quantities Protocol states. The workshop was supported by the US National Nuclear Security Administration and included representation from the IAEA. Ms Tager presented on the 'International and National Legal Context of Safeguards'. The workshop took place over three days. Staff had carried out several legal surveys to inform this workshop and to strengthen our experience-sharing database on nuclear safeguards. The project is supported by the UK Foreign and Commonwealth Office.

In line with the programme's interest in biological weapons nonproliferation, Noel Stott, Senior Re-

searcher, attended an invitation-only seminar on 'The Eighth Review Conference of the Biological Weapons Convention: Where Next?' hosted by the Centre for the Study of Existential Risk, at the University of Cambridge, on 21 March 2017.

Deputy Executive Director, Angela Woodward, gave a presentation on biosafety and biosecurity in Asia-Pacific at the Council for Security Cooperation in the Asia-Pacific's (CSCAP) 3rd Meeting of the Study Group on Nonproliferation and Disarmament in the Asia Pacific, held in Auckland, New Zealand during 6-7 March 2017. At the request of the New Zealand Ministry of Foreign Affairs, she stayed on to provide an update on developments in nuclear disarmament verification at the ASEAN Regional Forum's Intersessional Meeting on Nonproliferation and Disarmament, on 8 March.

In April, the VM programme is hosting two workshops, one in Vienna, Austria in collaboration with the Vienna Center for Disarmament and Non-Proliferation, and one in Pretoria, South Africa. These meetings are held under our current project exploring the potential role of a group of scientific experts on nuclear disarmament verification, supported by the Norwegian Ministry of Foreign Affairs. Both workshops will take place over two days and will discuss with key stakeholders in each region the issues involved in disarmament verification and the utility of such a group. The team has also continued to conduct outreach under its project on supporting sustainability in nuclear security reporting, funded by the Nuclear Threat Initiative and the Netherlands Ministry of Foreign Affairs. Along with our partners, we are continuing to gather information in support of our work to investigate remote sensing equipment used under the Open Skies Treaty. This work is supported by the US Department of State.

VM is also pleased to announce that Tom Hobson, a PhD Candidate at the University of Bath's Centre for Technology and Warfare, will be collaborating with VERTIC over the coming months as a sponsored Science Fellow.

Grants and administration

By Mariama Gerard

Two new interns took up their positions at VERTIC in February 2017. Ana Grusa Golja is studying for an MSc in International Politics at the School of Oriental and African Studies (SOAS) and Madison Estes is taking an MA in Non-proliferation and International Security at Kings College London. Both interns are working on projects in the Verification and Monitoring programme.

VERTIC is delighted to welcome Cédric Apercé, who started work as a Legal Officer in the National Implementation Measures (NIM) programme on 20 April. Cédric previously worked for the British Red Cross and the International Committee of the Red Cross (ICRC) in Geneva.

VERTIC's landlord, Ethical Property Company, has confirmed that all tenants in Development House must vacate the building in mid-November. VERTIC has been located in this building, in the Old Street district, since 2004. VERTIC has chosen to move to EPC's new development in London, The Green House in Bethnal Green.

building trust through verification

VERTIC is an independent, not-for-profit, nongovernmental organisation. Our mission is to support the development, implementation and effectiveness of international agreements and related regional and national initiatives, with particular attention to issues of monitoring, review, legislation and verification. We conduct research, analysis and provide expert advice and information to governments and other stakeholders. We also provide support for capacity building, training, legislative assistance and cooperation.

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Mr Cedric Aperce, Legal Officer (France);
Ms Katherine Tajer, Researcher (United Kingdom);
Ms Mariama Gerard, Administrator (France);
Ms Madison Estes, Intern (United States);
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