



Verifying a WMD/DVs Free Zone in the Middle East Concepts and Challenges

Benjamin J. Bonin, Edward M. Ifft, Roberta Mulas, and Hartwig Spitzer
in Cooperation with Khaled AbdelHamid, Nisreen Al Hmoud,
Ephraim Asculai, Christian Charlier, David Friedman, Olli Heinonen,
Dorte Hühnert, Tariq Rauf, Ibrahim Said, and Jean-Pascal Zanders

The final consensus document of the 2010 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) called for “a conference in 2012, to be attended by all States of the Middle East, on the establishment of a Middle East zone free of nuclear weapons and all other weapons of mass destruction.”¹ While Helsinki was selected as location and the Finnish Ambassador Jaakko Laajava was appointed facilitator, political dynamics prevented the Middle East Conference (MEC) on a zone free of weapons of mass destruction (WMD) and their delivery vehicles (DVs) from taking place in 2012. Assuming the MEC is to be convened, questions remain as to whether all parties in the region will elect to attend, and what items will be on the agenda. Additionally, there is a lack of consensus on what might constitute a successful outcome of the conference. However, irrespective of what the detailed proceedings will look like, verification will be a key issue in making a WMD/DVs Free Zone in the Middle East a reality.

The Goal: An Effectively Verifiable WMD/DVs Free Zone in the Middle East

The call for a Middle East zonal disarmament agreement dates to the 1970s, when the governments of Egypt and Iran first proposed a regional zone free of nuclear weapons; the scope was expanded to include all WMD and DVs in the 1990s, and – at least in principle – all countries in the region have expressed support for such

a zone. The final document of the 1995 NPT Review and Extension Conference further called upon “all States in the Middle East to take practical steps in appropriate forums aimed at making progress towards, inter alia, the establishment of an *effectively verifiable* Middle East zone free of weapons of mass destruction, nuclear, chemical and biological, and their delivery systems”² (emphasis added). The 1995 Resolution was cited in the 2010 NPT Review Conference final document, and its terms of reference are likely to receive attention in Helsinki.³

Among the challenging topics facing the conference participants and Ambassador Laajava is the question of what constitutes an ‘effectively verifiable’ Middle East zone free of weapons of mass destruction. Indeed, there is no existing precedent for a comprehensive, let alone verifiable, regional zone free of all three kinds of WMD as well as DVs. Nuclear weapon free zones (NWFZs) have been implemented in certain regions providing an illustrative precedent on the nuclear front. Although regional mechanisms exist in some cases for adjudicating compliance disputes, their verification is largely accomplished through the existing safeguards framework of the International Atomic Energy Agency (IAEA). However, in the Middle East it remains an open question as to what the verification requirements of a prospective WMD/DVs Free Zone will be, and what mechanisms will be required to meet the unique needs of a region marked by ongoing confrontation, distrust, and militarized conflicts.

Abstract

There is no direct precedent for what constitutes an ‘effectively verifiable’ zone free of all weapons of mass destruction (WMD) and their delivery vehicles (DVs), as has been called for by the international community in the Middle East. However, the prospective parties to such a zone can draw on a wealth of existing experience and techniques developed through implementation of existing bilateral, multilateral, and global arms control and disarmament treaties.

This POLICY BRIEF outlines key arms control verification concepts, their practical application under existing treaties, and the associated verification challenges likely to be encountered in the context of a WMD/DVs Free Zone in the Middle East. While the challenges may appear daunting, we share the opinion that the subject of verification may actually offer unique opportunities for regional dialogue, exchange, and even confidence building. ■

This POLICY BRIEF builds on the contributions of the participants of an ACADEMIC PEACE ORCHESTRA MIDDLE EAST workshop held in Alghero, Sardinia, from May 23-25, 2012. The working group on verification has been generously funded by the Foreign Ministry of Norway.

The views expressed in this POLICY BRIEF are solely those of the authors in their private capacity and do not necessarily represent the views of the entities the authors are associated with.

» This POLICY BRIEF provides an overview of key arms control and disarmament verification concepts, the practical application of those concepts under existing treaties, and the associated verification challenges likely to be encountered in the implementation of a WMD/DVs Free Zone in the Middle East.«

This POLICY BRIEF provides an overview of key arms control and disarmament verification concepts, the practical application of those concepts under existing treaties, and the associated verification challenges likely to be encountered in the implementation of a WMD/DVs Free Zone in the Middle East. As the first output of a broader Track II research project, this issue aims at identifying essential verification principles for a zone. Subsequent POLICY BRIEFS will address the lessons learned from verification experience under existing arms control treaties, and the opportunities that might exist for near-term confidence building and cooperation in the Middle East.

The Diversity of Perspectives on Verification

The term ‘verification’ lacks an international consensus definition, although most existing definitions contain common elements. A study by the United Nations Institute for Disarmament Research (UNIDIR) and the Verification Research, Training and Information Centre (VERTIC) defines verification as the “[p]rocess of gathering, interpreting, and using information to make a judgment about parties’ compliance or non-compliance with an agreement.”⁴ Another United Nations study defines the term as the “collection, collation, and analysis of information in order to make a judgment as to whether a party is complying with its obligations.”⁵ These definitions emphasize verification as a process leading to a determination of compliance; the steps in that process are intentionally vague, as are the means by which evidence is collected.

Additional studies have defined verification as the “monitoring of treaty-limited items and activities, as well as assessing compliance on the basis of monitoring and other relevant information,”⁶ and the “action of demonstrating compliance with treaty obligations by means of evidence or information gathered by a variety of technical and institutional means.”⁷ These definitions – while similar to those of UNIDIR and the UN – place additional emphasis on the important role of information and the means by which it is collected.

As it was developed by a respected international research institution with the Middle East in mind, this paper takes

the UNIDIR definition as its point of reference, while acknowledging the diversity of perspectives on verification. As discussed in the following, the process and instruments of verification can take many forms – minimally or maximally intrusive, unilateral or multilateral – and they vary widely in terms of technical complexity. The form that verification takes depends on the purpose of the treaty or agreement being implemented, the unique verification requirements associated with the weapon system being controlled or eliminated, the individual requirements of the negotiating parties, and the measures ultimately deemed to be mutually acceptable.

The Processes and Instruments of Verification

Declarations

As the definitions above suggest, verification determinations are ultimately made at the political level, fed by information and technical data. Under most agreements, states submit initial declarations, or statements of the status or progress of a party’s compliance with the provisions of the treaty. Under the NPT, states submit declarations of nuclear material holdings in nuclear facilities regulated by the treaty. Similarly, with the Chemical Weapons Convention (CWC) states agreed to declare relevant materials and facilities, as well as any former or current chemical weapon stockpiles and activities.

Declarations are usually updated on a periodic basis, in line with the requirements of the treaty and the progress of states parties in meeting their obligations. They may be supplemented under some agreements by additional data exchanges and notifications, intended to promote transparency and increase confidence that member states are acting in good faith with the terms of the agreement.⁸

Monitoring

Under an arms control agreement with verification provisions, treaty-limited items are subject to monitoring, or the means by which information is collected for verification purposes. Monitoring can take a variety of forms, again dependent on the context of the agreement being implemented. For example, under the Comprehensive Nuclear Test Ban Treaty



(CTBT), seismic, hydroacoustic, radio-nuclide, and infrasound sensors are used to monitor for signs of a treaty-prohibited nuclear explosion. Under the U.S.-Soviet Intermediate-Range Nuclear Forces (INF) Treaty, human inspectors and sensors were placed at the entrance/exit portals of U.S. and Soviet missile production facilities to monitor traffic and ensure that treaty-limited objects did not leave the premises.⁹

Monitoring may be either on-site or remote. On-site monitoring generally implies that human and/or technical control assets are located at a site requiring monitoring under the terms of the agreement. The portal monitoring under INF is a good example of on-site verification procedures. The IAEA also utilizes such procedures, including tamper-proof cameras designed to record activities around safeguarded nuclear materials, facilities, and processes. Remote monitoring involves the collection of information at a distance, sometimes outside the sovereign bounds of the country being monitored, and sometimes with remotely operated sensors prepositioned in-country. The global network of sensors used in the CTBT is a good illustration.

National technical means (NTMs) have proved important instruments of U.S.-Russia arms control verification. NTMs including satellites, signals intelligence, and other non-intrusive means of remote information collection are used by both sides to confirm that deployed forces are in line with one another's declarations. Under early arms control agreements like the U.S.-Soviet Strategic Arms Limitation Talks (SALT), national technical means were in fact the only tools of monitoring compliance acceptable to both parties. Indeed, the basic terms and constraints of the treaty were negotiated with this in mind. The means of verification were not a post-hoc addendum, but rather a fundamental consideration conditioning the extent of arms limitations possible under the agreement.¹⁰

Inspections

It was only under later agreements like INF and the Strategic Arms Reduction Treaty (START) that more intrusive, on-site monitoring provisions were added to supplement the information gathered by NTMs. This included the use of



Benjamin J. Bonin is a Research Associate at Sandia National Laboratories. He holds an MA in Political Science and is a PhD candidate at the University of New Mexico. His research interests include proliferation challenges in the Middle East, the implications of global nuclear energy expansion, and U.S. foreign policy on non-proliferation and arms control. Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.



Edward M. Ifft is an Adjunct Professor in the Security Studies Program at Georgetown University's Walsh School of Foreign Service. He is a retired member of the Senior Executive Service as well as a Foreign Affairs Officer at the U.S. State Department. Over the past 40 years, he has been involved in negotiating and implementing many of the key arms control agreements, including both the SALT and START treaties. Mr. Ifft holds a PhD in Physics from Ohio State University.



Roberta Mulas is an Erasmus Mundus GEM and a PhD candidate at the University of Warwick. She has been a Graduate Research Assistant at the Peace Research Institute Frankfurt (PRIF) and on the staff of the ACADEMIC PEACE ORCHESTRA MIDDLE EAST. She holds an MA in International Relations from the University of Bologna. Her research interests include nuclear non-proliferation and disarmament, regional denuclearization agreements, and Middle East security policy.



Hartwig Spitzer is a Professor Emeritus for Physics at Hamburg University. He has been a Visiting Scholar at Stanford University, CA, and established the Center for Science and International Security (CENSIS) at the University of Hamburg. He has organized several international workshops on the verification of arms control treaties and disarmament questions, issues he also worked on as head of the CENSIS project 'Physical principles in remote sensing and applications for arms control verification and environmental monitoring'.



Khaled AbdelHamid is a career diplomat, currently the Special Assistant to the Executive Secretary of the CTBTO in Vienna. He has served in various capacities in the Egyptian Ministry of Foreign Affairs, including Egypt's Embassies/Permanent Missions to Vienna, Amman, Geneva, and Brussels. He works on the nexus between Nuclear Weapon Free Zones and the Comprehensive Nuclear Test Ban Treaty. He holds an MA in Political Science from the American University in Cairo.



Nisreen Al Hmoud is the Director of the Center for Excellence in Biosafety, Biosecurity and Biotechnology at the Royal Scientific Society (RSS) of Jordan. She is a member of the National Biosafety Committee, the National Committee for Science and Technology Ethics, the Task Force on the Technical Dimensions of a WMD Free Zone in the Middle East, and had been the President of the Biosafety and Biosecurity International Consortium (BBIC) steering Committee between May 2010 and July 2012. She holds a PhD in Microbiology from the University of Abertay Dundee, Scotland.



Ephraim Asculai is a Senior Research Fellow at the Institute for National Security Studies (INSS) in Tel Aviv, Israel. He worked at the Israel Atomic Energy Commission (IAEC) for over 40 years and for the IAEA in Vienna on issues of radiation protection of the public. Mr. Asculai later became involved in the deliberations leading to the conclusion of the CTBT. He has published several papers dealing with non-proliferation in general and the Middle East in particular. He holds a PhD from Hebrew University, Jerusalem.

on-site inspections, another information-gathering tool employed under the terms of certain agreements. Under INF and the START agreements, U.S. and Russian inspectors were permitted a defined quota of reciprocal site visits, conducted to confirm that deployed assets on each side were within permissible bounds. Inspections were also conducted to verify the conversion, dismantlement, or elimination of treaty-limited items. Furthermore, on-site inspections are an important verification tool under many multilateral agreements including the NPT, the CWC, and the Treaty on Conventional Forces in Europe (CFE). Depending on the agreement, these inspections may be regularly scheduled or short-notice. The inspections may be conducted as a matter of routine, or in some cases at the behest of a state party that suspects violation of the agreement – a so-called ‘challenge inspection.’¹¹

Implementation

As the aforementioned examples suggest, the employment of monitoring and other verification means may be accomplished unilaterally – as in the case of NTMs – or multilaterally, generally carried out by an implementing body created under the agreement. Examples include:

- the International Atomic Energy Agency which conducts safeguards inspections for verification of NPT compliance;
- the Organisation for the Prohibition of Chemical Weapons (OPCW) which conducts verification under the CWC; and
- the Comprehensive Test Ban Treaty Organization (CTBTO), which will implement test-ban verification measures once the CTBT enters into force.

In addition to conducting monitoring and inspection activities, these organizations – usually funded by member state contributions – may also perform additional functions, including the development and evaluation of new monitoring technologies and the conduct of exercises, conferences, or other activities in support of the agreement.

Monitoring and inspection activities involve the gathering of information to make a technically based judgment regarding compliance. Materials are

either accounted for or unaccounted for; deployed weapon systems either conform or do not conform to initial declarations; signs of an atomic explosion are either detected or not detected. However, the technical conclusions of verification and monitoring do not always constitute the last word regarding compliance. Information may be ambiguous or incomplete, states parties may dispute technical determinations, or subsequent actions may need to be taken in response to confirmed non-compliance.

Compliance

These issues are generally handled by a compliance body, whose role is to adjudicate and (ideally) resolve compliance issues. In the case of bilateral (like INF or START) or more limited-membership multilateral treaties, the compliance body is relatively simple. It comprises representatives from each of the states parties that meet regularly to discuss compliance determinations, arbitrate disputes, and even negotiate changes to verification protocols if necessary. In the case of multilateral treaties, a more complex executive body may be required to serve these purposes. Examples are the IAEA Board of Governors and the OPCW Conference of the States Parties and its Executive Council. As voting bodies they are subject to formal rules of procedure, according to which representatives from member states adjudicate compliance issues and decide on major changes to the administrative, technical, or political implementation of the agreement. These bodies tend to be more political in nature, and are the fora for many of the challenges and dilemmas of arms control verification.¹²

Verification Challenges and the Middle East Context

As noted in the introduction, no precedent for verification of a regional zone free of WMD/DVs exists. Moreover, the Middle East presents a number of unique challenges and dilemmas for arms control verification, some of which will very likely emerge during the deliberations. That said, historical experience with existing agreements offers illustrative lessons learned which can inform the adoption and extension of proven verification means, or the development of new approaches for the region if required. Although comprehensive verification is

»Historical experience with existing agreements offers illustrative lessons learned which can inform the adoption and extension of proven verification means, or the development of new approaches if required.«



lacking in the Middle East, nuclear and chemical materials are regularly verified and monitored almost everywhere and participation to the multilateral treaties against WMD is wide-spread.

Compliance in the Context of a WMD/DVs Free Zone

From the beginning of the negotiation process on, parties to an arms control or disarmament agreement must define what weapons and/or activities are limited, prohibited, or otherwise constrained. However, ascertaining compliance or non-compliance with these constraints is not as simple as it sounds, particularly when it comes to the peaceful applications of dual-use technologies. The issue is evident in the ongoing regional and international debates surrounding Iran's centrifuge-based uranium enrichment program. While the Iranian government insists that its fuel-cycle activities are consistent with its rights and obligations under the NPT, other governments contend that Tehran has not met its safeguards obligations, and furthermore that the enrichment program has a military dimension.

The nuclear fuel cycle looms large in discussions on compliance in a prospective WMD/DVs Free Zone. It is sometimes overlooked by regional parties that similar – if not even more complex – issues are presented by peaceful uses of biological and chemical technologies. Nuclear energy and research activities are confined to a subset of countries in the region, tend to be government enterprises with a relatively large footprint, and cannot be easily dispersed across a large number of small facilities. Dual-use biological and chemical capabilities, however, are far more commonplace across the academic, private, and public health sectors of most (if not all) Middle Eastern states. Research takes place in universities, government institutions, and businesses at facilities both large and small. This creates serious challenges in defining and determining compliance, as evidenced by experience under existing disarmament treaties.

Under the Biological Weapons Convention (BWC), parties agree to never develop, produce, stockpile or otherwise acquire or retain biological weapons and their means of delivery. While the statement is simple, the reality of compliance is



Christian Charlier is a former Section Head for Operations at the Department of Safeguards of the International Atomic Energy Agency. He graduated from the Institute of Nuclear Science, Brussels, and the Pennsylvania State University with an MSc in Nuclear Engineering. In 1981 he joined the IAEA as a safeguards inspector and has worked there for more than 30 years. He commands detailed knowledge about safeguards in all types of nuclear facilities in the nuclear fuel cycle.



David Friedman is a Senior Research Fellow at the Institute for National Security Studies (INSS) in Tel Aviv. For nearly 25 years, he served in the Israel Defense Forces and the Ministry of Defense, mainly in the Research and Development Directorate. His research focuses on non-conventional terrorism, with particular attention to strategies for confronting bioterrorism and the prevention of the proliferation of biological weapons to terrorist groups. He holds a PhD in Life Sciences from the Weizmann Institute of Science, Rehovot, Israel.



Olli Heinonen is a Senior Fellow at Harvard Kennedy School's Belfer Center for Science and International Affairs. He served 27 years at the International Atomic Energy Agency where he was Head of the Department of Safeguards and led the Agency's efforts to identify and dismantle nuclear proliferation networks. Mr. Heinonen led teams of international investigators to examine nuclear programs of concern and took part in verification processes around the world.



Dorte Hühnert is a Research Assistant at the Peace Research Institute Frankfurt (PRIF) and on the staff of the ACADEMIC PEACE ORCHESTRA MIDDLE EAST. She holds a BA in Politics and Economics from the University of Münster and is currently enrolled in the master program International Studies/Peace and Conflict Studies at Goethe University, Frankfurt. Her research interests include disarmament of WMD, the transitioning process in Afghanistan, and security policy in the Middle East.



Tariq Rauf was Head of Verification and Security Policy Coordination at the IAEA in Vienna. He was Director of the International Organizations and Nonproliferation Project of the Center for Nonproliferation Studies (CNS) at the Monterey Institute of International Studies. Prior to October 1995, Mr. Rauf served as Non-proliferation Expert at the Office of the Ambassador for Disarmament, Department of Foreign Affairs and International Trade, Canada, and was a member of the Canadian delegation to the 1995 NPT Review and Extension Conference.



Ibrahim Said is the Second Secretary at the Permanent Mission of Egypt to the League of Arab States in Cairo. Mr. Said is a career diplomat also working in the Office for Disarmament and Non-proliferation Affairs of the Egyptian Ministry of Foreign Affairs. He has been a Visiting Scholar at the Technical Non-proliferation and Disarmament Project of the United Kingdom-Norway Initiative in Oslo and a Visiting Fellow at the James Martin Center for Nonproliferation Studies (CNS) in Monterey, California.



Jean-Pascal Zanders is a Senior Research Fellow at the European Union Institute for Security Studies (EUISS) in Paris. His research areas cover disarmament and non-proliferation of chemical, biological and nuclear weapons as well as space policy. He has been the Project Leader of the Chemical and Biological Warfare Project at SIPRI and Director of the Bio Weapons Prevention Project. Mr. Zanders has published extensively on chemical and biological weapon issues. He holds a PhD in Political Sciences from the Free University of Brussels.

»The purpose of verification is not to provide irrefutable proof of compliance or non-compliance. Rather, it is an exercise in confidence building, seeking to provide parties with enough reassurance that militarily significant cheating is not taking place.«

far more complex. The treaty defines a biological weapon as “[m]icrobial or other biological agents, or toxins whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes.”¹³ The wording of this definition implicitly acknowledges that many biological research activities and technologies are inherently dual-use, with potential applications in both the civil arena and in the development of biological weapons. The BWC guarantees its parties the right to peaceful uses of biological agents and associated technologies, including cooperation and technology transfers between signatory states. Observers contend that the dividing line between peaceful and non-peaceful research in the bio-sciences can be quite blurry, and is largely a matter of intention – which cannot necessarily be ascertained through objective technical means. The complexity of ascertaining compliance with the BWC is in part what has prevented the states parties from reaching agreement on a verification regime for the treaty.¹⁴

The Chemical Weapons Convention is another interesting case study. The text of the treaty similarly prohibits the development, production, and stockpiling of chemical weapons. Moreover, it essentially defines *any* toxic chemical or related development and production activity as prohibited, except in those cases explicitly permitted under the terms of the treaty. The CWC has a three-tiered schedule of prohibited chemicals; each tier corresponds with gradually increased restrictions on use and transfer, depending on the balance between the risk a toxic chemical poses to the objectives of the CWC and the commercial interests. Schedule 1 chemicals pose the highest risk and their production for commercial purposes is therefore completely prohibited. The CWC essentially determined that they are single use, i.e. no other purpose than being a chemical weapon. Compliance is ascertained through detailed verification provisions that allow for routine inspections, on-site monitoring, and even challenge inspections instigated by member states (though a challenge inspection has yet to be invoked). In many regards, the treaty is seen as a success story from the standpoint of compliance and verification. However, all states parties agree that the treaty – which was drafted in the

scientific and technical context of the 1990s – is facing challenges in keeping pace with contemporary advancements in chemistry. Sophisticated chemical research is increasingly diffuse and in some cases merging with other fields, including biology. It remains to be seen what this diffusion and cross-fertilization means for existing definitions of compliance and the associated tools of verification, which to this point have tended to focus on large-scale industrial operations, as opposed to more numerous small-scale research enterprises.

The Middle East states will ultimately have to decide what compliance means in the context of a WMD/DVs Free Zone and to what degree the definition mirrors existing treaties. Noting that currently all but three states from the region are party to the BWC and CWC, a certain standard of compliance has already been accepted. In addition, parties to an arms control or disarmament agreement must also decide who will ultimately have the final say in judging compliance or non-compliance. Individual states will always make their own determinations regarding the compliance of other signatories to an agreement. However, compliance bodies provide the forum by which disputes regarding these determinations are ultimately aired and – in principle – resolved through an agreed process. One approach in a Middle East WMD/DVs Free Zone could be to leave determination up to the bodies under existing arms control and disarmament regimes. However, certain parties to a prospective zone have indicated a lack of trust in these existing bodies, positing the region will need its own institutions for handling compliance issues. Ambiguity exists as to how such a body would be organized, how it would function by contrast to the bodies currently in place, and what the implications of its decisions would be – particularly following determinations of non-compliance.

Achieving ‘Effective’ Verification

When discussing arms control and disarmament, the notion that ‘it is impossible to prove a negative’ is often cited; it is much simpler to prove that something exists than to prove it does not. It is one thing to verify – to the satisfaction of all parties – that a treaty-limited item exists at a particular location; it is another thing to convince parties that relevant capabilities



are not being hidden elsewhere. Few experts contend that any verification regime can provide 100 percent assurance that cheating is not taking place; there always exists some scenario, however complex or outlandish, by which a country could conceal prohibited capabilities or activities from monitoring and inspection.

The purpose of verification is not to provide irrefutable proof of compliance or non-compliance. Rather, it is an exercise in confidence building, seeking to provide parties with enough reassurance that *militarily significant* cheating is not taking place, and to offer some measure of early warning regarding non-compliant activities (either intentional or unintentional). What is militarily significant will have to be determined by the negotiating party and is highly dependent on a variety of factors changing over time such as the materials subject to prohibition and the current political situation.

Moreover, there are significant political and logistical limitations to the extent, complexity, and intrusiveness of a verification regime. This issue is particularly acute where it comes to on-site inspection. Physical inspection of facilities can be a complex process, particularly when the items being inspected are in proximity to military assets, industrial activities, or other sensitive enterprises where non-treaty relevant information needs to be protected. Parties to an agreement often develop detailed managed access protocols designed to allow inspectors appropriate access to treaty-limited items, while at the same time preventing unauthorized access to sensitive information outside the scope of the agreement. The process by which inspectors enter a country, proceed to relevant sites, conduct their activities, and report on results requires careful scripting, not to mention logistical preparation and resourcing. It is imperative that both inspectors as well as hosts clearly understand their roles and responsibilities. Beginning with INF and continuing with the START treaties, the United States and Russia succeeded in developing and implementing effective, mutually agreeable managed access procedures for conducting on-the-ground inspections of treaty-limited articles. International agreements like the CWC and IAEA safeguards also have managed access protocols that guide the conduct of hosts and inspectors. Many times

Instruments of Verification and Their Definitions

Verification based on the UNIDIR definition can be understood as the “[p]rocess of gathering, interpreting, and using information to make a judgment about parties’ compliance or non-compliance with an agreement” (see p. 2). However, verification is not only supposed to prove compliance but also functions as a confidence-building measure. Therefore, various procedures and instruments have been developed in order to standardize verification techniques which are explained in essence in the following.

Under most agreements, states submit initial **declarations**, or statements of the status or progress of a party’s compliance with the provisions of the treaty. They may be supplemented by additional data exchanges and notifications, intended to promote transparency and increase confidence between the parties.

Under an arms control agreement with verification provisions, treaty-limited items are subject to **monitoring**, or the means by which information is collected for verification purposes. Monitoring can take a variety of forms, dependent on the context of the agreement being implemented. **On-site monitoring** generally implies that human and/or technical control assets are located at a site requiring monitoring under the terms of the agreement. **Remote monitoring** involves the collection of information at a distance, sometimes outside the sovereign bounds of the country being monitored, and sometimes with remotely operated sensors prepositioned in-country.

(On-site) inspections are visits by certified inspectors conducted to verify the conversion, dismantlement, or elimination of treaty-limited items. Depending on the agreement, these inspections may be regularly scheduled or short-notice. The inspections may be conducted as a matter of routine, or in some cases at the behest of a state party that suspects violation of the agreement – a so-called ‘challenge inspection.’

The employment of monitoring and other verification means may be carried out by an **implementing body** created under the agreement. In addition to conducting monitoring and inspection activities, these organizations may also develop and evaluate new monitoring technologies as well as conduct exercises, conferences, or other activities in support of the agreement.

The role of a **compliance body** is to adjudicate and (ideally) resolve compliance issues. It usually comprises representatives from each of the states parties that meet regularly to discuss compliance determinations, arbitrate disputes, and even negotiate changes to verification protocols if necessary. For larger international treaties, a more complex executive body may be required to serve these purposes, including formal rules of procedure according to which representatives from member states adjudicate compliance issues and decide on major changes to the administrative, technical, or political implementation of the agreement.

these protocols – which often require adjustment following from practical experience – are negotiated in an ad hoc fashion after the agreement has been signed and verification activities are implemented.¹⁵

The emergence of the IAEA Additional Protocol (AP) illustrates how the requirements and intrusiveness of verification can evolve over time. The NPT originally required that signatory states accept IAEA safeguards on declared nuclear materials and facilities. These comprehensive safeguards agreements (CSAs) remain the baseline standard by which

NPT compliance is verified. However, following revelations regarding covert nuclear activities in Iraq discovered after the 1991 Gulf War, it became apparent that the IAEA would benefit from additional authority to conduct inquiries and inspection into suspected activities at undeclared facilities. This motivated development of the model Additional Protocol, which is an addendum to safeguards agreements that afford the IAEA greater latitude to conduct inspections outside of declared facilities and employ new inspection techniques. However, the AP is only voluntary and not all NPT signatories have been willing to accept additional intrusiveness beyond their core safeguards obligations.¹⁶

The present-day Middle East starkly illustrates the tension between meeting the demands of effective verification, while at the same time respecting sovereign boundaries and national security sensitivities. In recent years, both Iran and Syria have been reticent to allow the IAEA access to certain sites of interest, citing their right to protect national security information and only allow access to treaty-relevant sites and items. However, there are concerns on the part of the IAEA and other international actors that some of these sites may be concealing ongoing or former militarily significant nuclear activities. Neither Iran nor Syria has currently the AP in force; indeed, many NPT parties in the Middle East remain outside the protocol.

One of the central challenges facing the negotiators of a Middle East WMD/DVs Free Zone will be how to balance the competing demands of providing effective verification while respecting national sovereignty. Certain prospective parties to such a zone have indicated dissatisfaction with verification measures under existing treaties, and in particular their shortcomings in detecting undeclared activities. It is suggested by some that non-routine challenge inspections, presently invoked in only exceptional circumstances under existing treaties, will need to be the norm in a Middle East zone. Whether or not all prospective parties to a zone would be willing to accept such a regime remains to be seen. Moreover, questions loom as to how such inspections would be administered, whether through existing treaty implementing bodies or through

a regional inspectorate: what rights would be afforded to inspected parties to refuse access or shroud sensitive items? Would there be limits on the number of non-routine inspections a party must accept in a given year? Who would assume the costs?

Resources and Capacities for Verification

As suggested, certain types of verification activities can be resource-intensive, requiring access to appropriate expertise, technology, and logistical support. Inspectors must be trained to inspect; hosts must be prepared to host. The accuracy, reliability, and sustainability of technical monitoring assets must be ensured.

In some cases, the provision of resources and development of verification capacities is entrusted to the states party to the agreement. In preparation for implementation of the INF Treaty, the United States and the Soviet Union conducted extensive exercises and technical demonstrations, both unilaterally and in cooperation. In the United States, a mockup of the portal monitoring facility at Votkinsk was constructed for the purposes of testing and demonstrating monitoring approaches; Soviet officials were eventually invited to this facility to better understand what techniques the American inspectors would be applying in their country.¹⁷ The experience, techniques, and capacities developed under INF would later be used to inform verification under the START treaties, which expanded the scope of verification to many more sites and weapon systems. However, the resources required for verification may pose problems to the participants. Notably, the 2010 New START Treaty significantly lowered the quota of inspections each party must be willing to accept, at least in part as a cost-saving measure.¹⁸

In the case of broader international treaties like the NPT, CWC, and CTBT, many of the resources and capacities for verification are entrusted to the multilateral implementing bodies. For example, the IAEA – funded by contributions from member states – is responsible for developing and maintaining the expertise and technology required for safeguards implementation. The agency trains and employs inspectors, conducts

»One of the central challenges facing the negotiators of a Middle East WMD/DVs Free Zone will be how to balance the competing demands of providing effective verification while respecting national sovereignty.«



research into new monitoring techniques, and has in-house capacities for analysis of safeguards information. These capacities are essential given the numerous verification requirements facing the IAEA. Hundreds of nuclear energy, research, and industrial facilities worldwide are subject to safeguards monitoring and inspection. Since the agency's current mandate is to conduct these inspections in a non-discriminatory manner, there are limits on its ability to more narrowly focus resources on specific states or facilities. Some observers have expressed concern regarding whether or not the Agency's resources can continue to meet verification requirements, particularly if there is significant growth in nuclear energy infrastructure worldwide.¹⁹

The resources and capacities for verification are particularly salient when Middle East states begin exploring the options for implementing a WMD/DVs Free Zone. The region is not entirely devoid of verification experience; many countries are subject to inspections and accounting requirements under existing global disarmament treaties. Most of the region is indeed already covered by the IAEA and OPCW monitoring. Some – like Israel and Egypt through the Sinai disengagement accords – even have limited experience with implementing bilateral or regional arms control measures. However, discussions suggest that most prospective parties to a zone have comparatively little experience or domestic capacities that could support a comprehensive WMD/DVs Free Zone, particularly one with region-specific verification requirements.

Moreover, there are considerable asymmetries in the capabilities of countries to individually develop such capacities. When the United States and Soviet Union entered into discussions on arms control in the late 1960s and early 1980s, both sides brought considerable resources for verification to the negotiating table including financial resources, political and scientific experts, national technical means, and experience in conducting sophisticated surveillance and monitoring. The prospective negotiating parties to a WMD/DVs Free Zone in the Middle East enjoy no such parity. Only a handful of countries have access to national technical means that could support regional monitoring of an agreement. Relevant technical capacities

in the biological, chemical, and nuclear sciences are not evenly distributed. Even political expertise is wanting in many cases; the region, with the exception of a handful of states, tends to be disengaged from participation in global arms control fora like the UN Conference on Disarmament or treaty review processes. Even more fundamentally, the financial, human, and technical resources needed for capacity development must compete with spending priorities in other areas of defense, social welfare, and development.

The Role of Transparency

Transparency, or the openness of information, is another factor to be taken into account when considering a verification regime. Some measure of transparency is inherently implied through verification; parties to an agreement must be willing to make declarations, submit to monitoring, and provide information as needed to support determinations of compliance. Certain transparency measures may even be built into the terms of an agreement. For example, under every verified bilateral U.S.-Russia arms control treaty since SALT I, treaty language has mandated that the parties not interfere with national technical means (insomuch as they are conducted in a manner consistent with international law) through deliberate concealment of treaty-limited items. Under the START treaties, bombers were required to be displayed (i.e. not in hangars) upon request (within a treaty-specified quota) for satellite overflights; similarly, road-mobile missiles had to be made visible (i.e. not garaged) for counting. Prior to New START, certain telemetry data broadcast during missile tests had to be unencrypted so observing parties could verify that the missile being tested operated within treaty-specified limits.²⁰

In certain cases, transparency may even be utilized as a confidence-building measure (CBM) to at least partially serve the ends of verification. This approach is well exemplified by the BWC. As noted earlier, the states parties to that treaty have been thus far unable to reach agreement on a verification regime. At the 1986 Second Review Conference, the parties did agree to a set of politically, yet not legally binding confidence-building measures, which have since been amended and expanded. Under these

»The region is not entirely devoid of verification experience; many countries are subject to inspections and accounting requirements under existing global disarmament treaties.«

CBMs, states have committed themselves to participate in data exchanges on treaty-relevant research centers, national biological defense programs, infectious disease outbreaks, legislation, vaccine facilities, and even declarations of past offensive biological warfare activities. Not all parties to the treaty participate in these CBMs, and even those states that do so do not always share data on a regular basis. However, the CBMs at least provide a structured process by which transparency can be pursued by interested parties, and allows states to demonstrate some measure of compliance with the agreement.²¹

»As veterans of previous arms control negotiations can attest, consensus is only reached through sustained dialogue and exchange.«

It goes without saying that the present day Middle East faces a serious transparency deficit, severely complicating the prospects for an effectively verifiable zone free of WMD/DVs. Military capabilities are carefully guarded on all sides as sensitive state secrets; data exchanges and site visits are rare even among closely allied states. The acquisition, testing, and deployment of sensitive technologies and strategic weapon systems in particular tend to take place under a cloak of secrecy; by contrast to the Cold War, overt demonstrations of capability are arguably the exception, rather than the norm. This is not to suggest that the current lack of transparency is an insurmountable obstacle to verification. Indeed, early U.S.-Soviet agreements like the Anti-Ballistic Missile and SALT treaties were implemented under conditions of extreme secrecy on both sides; however, this secrecy limited the menu of verification options available. Only over time, after extended dialogue and political shifts in both countries, did more intrusive measures coupled with greater transparency become viable. This is a potentially important lesson for the Middle East. A verification regime is not built overnight, and in some cases may require multiple iterations over time before satisfying the demands of all parties. Moreover, a truly effective regime requires some minimal foundation of trust, built up through reciprocal gestures of good faith indicating that states can and will abide by the terms of an agreement.

Conclusions and Recommendations

There is no easy answer as to what might constitute an ‘effectively verifiable’ zone

free of WMD/DVs in the Middle East. Moreover, consensus on this matter is unlikely to be reached at a single conference. As the literature and veterans of previous arms control negotiations can attest, consensus is only reached through sustained dialogue and exchange – something which needs to be improved in the region.

However, the issue of verification does offer potentially fruitful subject matter for a regional dialogue on a WMD/DVs Free Zone, including certain topics which can be tackled irrespective of agreement or disagreement on the broader political parameters. The CTBT offers a compelling case in point. For two decades prior to final negotiation of the treaty in the 1990s, the multinational Group of Scientific Experts (GSE) met to discuss and outline the elements of a test ban verification regime. Even absent a global political consensus, the GSE was able to reach agreement on the basic technical dimensions of the eventual International Monitoring System, generating technical reports and even conducting demonstrations. When states finally came to the negotiating table, much of the difficult technical preparatory work had already been accomplished.

As noted in the introduction, there is a current lack of consensus on what would constitute a successful outcome of the Conference. Various governments and observers suggest that the first gathering should at least initiate a longer term process of dialogue and negotiation. In this regard, discussions about verification matters in preparation of the envisaged conference may prove helpful in order to resolve technical issues beforehand, facilitating the political negotiations of a prospective treaty. The following observations and recommendations might be considered as the conference participants debate the parameters of such a process:

- The verification expectations of prospective parties to a WMD/DVs Free Zone in the Middle East are not well understood. Certain states have made stark political statements regarding verification over the past several decades, including criticisms regarding the efficacy of existing approaches and regimes. However, the region and wider international community would benefit from



a more focused and constructive dialogue on these issues, attempting to understand in greater technical and political detail the verification expectations, requirements, and concerns of all prospective parties to a zone. Such a conversation would illuminate not only major points of disagreement, but potentially also areas of convergence on which progress can be built.

- Middle East states should draw on the considerable body of experience and lessons learned from verification

regimes under previous and existing arms control treaties. A wealth of individuals, organizations, and institutional knowledge can support the region in better understanding and developing solutions for verification challenges. A clear understanding of the core concepts, terms of reference, challenges, and limits of arms control verification will be vital for all prospective parties. Notably, establishing this common basis of understanding does not require a political consensus on follow-up steps, but

Endnotes

1. Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons (2010) 'Final Document', Vol. 1. Online, available at <http://www.un.org/en/conf/npt/2010/> (March 24, 2013).
2. United Nations Office of Disarmament Affairs (1995) Resolution on the Middle East, 1995 NPT Review and Extension Conference. Online, available at http://www.un.org/disarmament/WMD/Nuclear/1995-NPT/pdf/Resolution_MiddleEast.pdf (April 8, 2013).
3. Patricia Lewis and William Potter (2011) 'The Long Journey toward a WMD-Free Middle East', *Arms Control Today*, 41(7): 8-14.
4. UNIDIR and VERTIC (2003) *Coming to Terms with Security: A Handbook on Verification and Compliance*, Geneva: UNIDIR, p. 130.
5. UNIDIR (2008) *Verification in all its aspects, including the role of the United Nations in the field of verification*, Disarmament Studies Series, No. 32, New York, NY: United Nations, p. 11.
6. Alan Krass (1985) *Verification: How Much is Enough?*, Stockholm: Stockholm International Peace Research Institute.
7. Joseph F. Pilat (2002) 'Verification and transparency: Relics or future requirements?', in Jeffrey A. Larsen (ed.) *Arms Control: Cooperative Security in a Changing Environment*, Boulder, CO: Lynne Rienner, 79-96.
8. Definition of declarations are adapted from UNIDIR and VERTIC (2003), p. 20.
9. For more information on the CTBT verification regime, see the website of the Preparatory Commission for the Comprehensive Nuclear Test Ban Treaty Organization at <http://www.ctbto.org/verification-regime/>. For more information on the INF verification regime, see the 'Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Elimination of their Intermediate and Shorter-Range Missiles (INF Treaty)'. Online, available at <http://cns.miis.edu/inventory/pdfs/inf.pdf> (April 10, 2013).
10. Definitions of on-site monitoring, remote monitoring, declarations, and national technical means adapted from UNIDIR and VERTIC 2003, pp. 18-22.
11. For further discussion of on-site inspections, see Edward Ifft et al. (2012) *On-Site Inspections: A Major Arms Control Verification Tool*, Geneva: Geneva Centre for Security Policy; Krass 1985, pp. 212-223; and George Rueckert (1998) *On-Site Inspection in Theory and Practice: A Primer on Modern Arms Control Regimes*, Westport, CT: Praeger.
12. UNIDIR and VERTIC (2003), pp. 34-43.
13. 'Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction'. Online, available at <http://www.opbw.org/convention/documents/btwc/text.pdf> (April 10, 2013).
14. For additional perspectives on compliance, verification, and the BWC, see Kirk Bansak (2011) 'Enhancing Compliance with an Evolving Treaty: A Task for an Improved BWC Intercessional Process', *Arms Control Today*, 41(5): 13-19 and Kenneth Ward (2004) 'The BWC Protocol: Mandate for Failure', *The Nonproliferation Review*, 11(2): 183-199.
15. Ifft et al. 2012, pp. 102-104.
16. Mark Hibbs (2012) 'The Unspectacular Future of the IAEA Additional Protocol'. Online, available at <http://carnegieendowment.org/2012/04/26/unspectacular-future-of-iaea-additional-protocol> (April 8, 2013). See also 'The Safeguards System of the International Atomic Energy Agency'. Online, available at http://www.iaea.org/OurWork/SV/Safeguards/documents/safeg_system.pdf (April 8, 2013).
17. On-site inspections experiences from the INF Treaty see Joseph Harahan (1993) *On-Site Inspections Under the INF Treaty: A History of the On-Site Inspection Agency and Treaty Implementation, 1988-1991*, Washington, D.C.: U.S. Government Printing Office; and John Russell (2001) *On-Site Inspections Under the INF Treaty: A Post-Mortem*, VERTIC Briefing Paper No. 1, London: VERTIC.
18. Rose Gottemoeller (2010) 'New START Verification: Remarks at the United States Institute of Peace', July 26. Online, available at <http://www.state.gov/t/avc/rls/145126.htm> (April 10, 2013).
19. Victor Bragin, John Carlson, and Russell Leslie (2001) 'Integrated Safeguards: Status and Trends', *The Nonproliferation Review*, 8(2):102-110; Mark Hibbs (2012) 'The Plan for IAEA Safeguards'. Online, available at <http://www.carnegieendowment.org/2012/11/20/plan-for-iaea-safeguards/ekyb> (April 10, 2013).
20. For discussion on transparency and its role in arms control, see UNIDIR and VERTIC 2003, pp. 5-6. For specifics on NTMs non-interference clauses under U.S.-Soviet and U.S.-Russia arms control treaties, see 'Inventory of International Nonproliferation Organizations & Regimes'. Online, available at <http://cns.miis.edu/inventory/treaties.htm> (April 10, 2013).
21. For more information on the CBMs of the BWC, see 'Disarmament: Building Confidence', The United Nations Office at Geneva. Online, available at <http://www.unog.ch/bwc/cbms> (April 10, 2013).

**Further Reading**

- Allan Krass (1989) *The Verification Revolution*, Cambridge, MA: Union of Concerned Scientists.
- Ola Dahlman et al. (2011) *Detect and Deter: Can Countries Verify the Nuclear Test Ban?*, New York: Springer.
- UNIDIR and VERTIC (2003) *Coming to Terms with Security: A Handbook on Verification and Compliance*, Geneva: UNIDIR.
- UNIDIR (2008) *Verification in all its aspects, including the role of the United Nations in the field of verification*, Disarmament Studies Series, No. 32, New York, NY: United Nations.
- The Nonproliferation Review (2011) 'Special Issue: Global Perspectives on Re-envisioning the Biological Weapons Convention', 18(3).
- Jean-Pascal Zanders (ed.) (2013) *The future of the CWC in the post-destruction phase*, Report No. 15, Paris: European Union Institute for Security Studies.

merely a willingness to listen and to conduct a joint review.

- The topic of verification offers additional opportunity for technically focused dialogue and demonstrations that can be used to build connections between technical and scientific communities and help overcome transparency and trust deficits. In areas like managed access, data-sharing, and the application of monitoring technologies, it is possible to have a conversation on general principles and best practices without states necessarily having to expose sensitive national security information, let alone agree on the political parameters of a final agreement.
- Relating to all of the points above, the initiation of a truly constructive regional arms control dialogue is hindered by significant asymmetries in relevant technical and political expertise across the region. There is a great need for capacity development, building self-sustaining communities of arms control technology and policy experts – both governmental and

non-governmental – that might inform a more productive exchange of ideas. This is something that can be pursued both unilaterally and multilaterally, through both official and unofficial mechanisms, and ideally leveraging assistance from the international community. Again, the region should draw on the extensive body of existing arms control knowledge and resources as appropriate.

It is important to understand that arms control – including the development of verification regimes – is an iterative process. As existing experience demonstrates, verification measures evolve over time in response to changes in the strategic context, relations between states, domestic governance, and evolving technologies. Attempting to solve all problems at once is likely a recipe for failure. However, a more thoughtful and deliberative process, aimed at accomplishing mutually agreed objectives and benchmarks, may potentially create a framework for deeper cooperation and eventual agreement on a sustainable path towards a regional WMD/DVs Free Zone. ■

About the ACADEMIC PEACE ORCHESTRA MIDDLE EAST (APOME)

The ORCHESTRA is the follow-up project of the "Multilateral Study Group on the Establishment of a Missile Free Zone in the Middle East". The ACADEMIC PEACE ORCHESTRA MIDDLE EAST is a classical Track II initiative: it consists of some 100 experts – mainly from the Middle East/Gulf, one of the most conflict-ridden areas of the world. The ORCHESTRA is meeting regularly in working groups (CHAMBER ORCHESTRA UNITS) on specific topics in the context of a workshop cycle from 2011-2014. The main goal of this initiative is to shape the prospective Middle East Conference on the establishment of a zone free of weapons of mass destruction and their delivery vehicles agreed upon by the international community in May 2010.

For this reason, these experts develop ideas, concepts, and background information in a series of POLICY BRIEFS which are the results of intense discussions within the CHAMBER ORCHESTRA UNITS. In this framework, the broader normative Cooperative Security Concept will be further developed, embedded, and institutionalized in the region. At the same time, the ORCHESTRA meetings serve as venues for confidence building among the experts. The networking activities of PRIF's Project Group are documented by the ATLAS on Track II research activities in or about the Middle East/Gulf region.

Editor/Project Coordinator: Adj. Prof. Dr. Bernd W. Kubbig
Co-Editors: Hannah Broecker, MA, Mag. Michael Haas, MSc,
and Christian Weidlich, MA.
Peace Research Institute Frankfurt,
Baseler Straße 27-31, D-60329 Frankfurt am Main,
Phone: +49-69-95910436, Fax: +49-69-558481,
E-Mail: kubbig@hsfk.de,
Internet: www.academicpeaceorchestra.com



The views presented by the authors do not necessarily represent those of the project coordinator, editors, sponsors, or PRIF.
© 2013 ACADEMIC PEACE ORCHESTRA MIDDLE EAST.
All rights reserved.

Layout: Anke Maria Meyer

The Academic Peace Orchestra Middle East wishes to thank its generous sponsors, the Foreign Ministry of Norway, the Swiss Federal Department of Foreign Affairs, the Friedrich Ebert Foundation, and the Protestant Church of Hesse and Nassau.

