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Planning Ahead: A Blueprint to a Middle East WMD-Free Zone

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Planning Ahead: A Blueprint to Negotiate and Implement a Weapon-of-Mass-Destruction-Free Zone in the Middle East
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PLANNING AHEAD

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Glossary

ABACC	Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials
ACRS	Arms Control and Regional Security
AFCONE	African Commission on Nuclear Energy
BWC	Biological and Toxin Weapons Convention
BWFZ	biological-weapon-free zone
CANWFZ	Central Asia Nuclear-Weapon-Free Zone
CBMs	confidence-building measures
CSA	Comprehensive Safeguards Agreement
CSBM	confidence- and security-building measures
CTBT	Comprehensive Nuclear-Test-Ban Treaty
CTBTO	Comprehensive Nuclear-Test-Ban Treaty Organization
CWC	Chemical Weapons Convention
CWFZ	chemical-weapon-free zone
DoP	declaration of principles
DSFZ	delivery-system-free zone
Euratom	European Atomic Energy Community
GPC	general purpose criterion
HCOC	Hague Code of Conduct against Ballistic Missile Proliferation
HEU	highly enriched uranium
IAEA	International Atomic Energy Agency
ISU	Implementation Support Unit
LAS	League of Arab States
MECIDS	Middle East Consortium on Infectious Disease Surveillance
MTCR	Missile Technology Control Regime
NATO	North Atlantic Treaty Organization
NFU	no-first-use
NNWS	non-nuclear weapon state
NPR	Nuclear Posture Review
NPT	Treaty on the Non-Proliferation of Nuclear Weapons
NWFZ	nuclear-weapon-free zone
NWS	nuclear weapon states
OAU	Organization of African Unity
OPANAL	Agency for the Prohibition of Nuclear Weapons in Latin America and the Caribbean
OPCW	Organisation for the Prohibition of Chemical Weapons
PLNS	pre- and post-launch notification system
PMD	possible military dimensions
PSA	positive security assurances
SEANWFZ	Southeast Asian Nuclear-Weapon-Free-Zone
SESAME	Synchrotron-light for Experimental Science and Applications for the Middle East
SNC	Syrian National Coalition
SQP	significant quantities protocol
UAE	United Arab Emirates
WMDFZ	weapon-of-mass-destruction-free zone

Executive Summary

Freeing the Middle East from all weapons of mass destruction (WMD) and establishing a weapon-of-mass-destruction-free zone (WMDFZ) is a concept that originated many decades ago. Although this idea has existed for more than forty years, surprisingly little thought has been given to how it can be realistically implemented. Currently, there remain significant gaps regarding core concepts of the WMDFZ (the "Zone") negotiations and implementation within the Middle East and internationally. The James Martin Center for Nonproliferation Studies offers this report in an effort to address these gaps with regard to the planned WMDFZ Middle East Conference, negotiation process, and the subsequent establishment of such a Zone by identifying the legal, technical, and organizational elements required to support the Zone negotiations and implementation.

Creating a WMDFZ is a very tall order; not only has one never been created before, but also all existing nuclear-weapon-free zones (NWFZs) formalized an already existing situation—the absence of nuclear weapons in their region. The WMDFZ, by contrast, is aimed at reversing the status quo by dismantling existing WMD capabilities and programs in a region that is suspected of hosting all three categories of WMD. Moreover, the region suffers from deep-rooted conflicts and mistrust, and many areas are undergoing considerable social and political change. The increasing influence of non-state actors on states' affairs in the region is another complicating factor. Additionally, while there are regional and international regimes and organizations charged with verifying the peaceful nature of nuclear energy programs and chemical industries (all of which could inform the WMDFZ negotiators), there are no comparable mechanisms to cover nuclear and biological weapons dismantlement, verify sensitive activities for biological programs, nor sufficiently regulate WMD delivery systems—all of which are mandated under the Middle East WMDFZ.

The report offers a number of constructive suggestions that could engender significant progress on the issue, even while the current political impasse precludes states' ability to make political commitments or convene the WMDFZ Conference prior to the 2015 NPT Review Conference. For instance, states can **create a Group of Experts** to discuss legal, technical, and organizational issues essential to negotiating and implementing the Zone. Many of the issues identified in this report should be discussed first within regional states in a comprehensive interagency process, not just to formulate national positions on the issues, but also to clarify their declared, undeclared, known, or unknown WMD capabilities.

The regional experts group could also consider key **legal aspects** such as the negotiation mandate, scope, rules of procedures, and delineation of the Zone. This would include identifying options for issues such as: what weapon systems would be prohibited under the Zone (i.e., only nuclear, biological and chemical weapons and their delivery systems, or also radiological); what should be states obligations under the Zone; are there areas where agreement already exists; and in what ways existing NWFZs and no-first-use agreements could apply to the Middle East.

On the **technical aspects**, the report offers ideas and highlights issues on how to implement WMD weapons and programs disarmament and create an "effectively verifiable" verification mechanism. The report identifies sets of lessons learned from the five NWFZs, previous WMD dismantlement

experiences such as South Africa, Libya, and Syria, and existing regional verification organizations such as ABACC and Euratom. Importantly, it is essential for the political and technical experts to work hand-in-hand to ensure that the politically desirable falls within the realm of the technically feasible. This includes examining what are the verification lessons from past cases of WMD disarmament and dismantlement, to what extent will states be required to declare past or existing WMD programs, how can negotiators address the strategic linkages in the region between acquisition and dismantlement of chemical and nuclear weapons; and how and by whom will verification of dismantlement and compliance be conducted.

On the **organizational level**, the experts' group could define how broadly or narrowly issues concerning the Zone will be defined. While the Zone may be defined narrowly to address the proliferation of WMD in the region, it is important to note that not one of the existing NWFZs exists in the absence of a regional architecture and agreed upon principles for cooperation and security. The experts' group may want to address the underlying causes for regional WMD acquisition, as well as to adopt a set of principles regarding arms control and regional security that would govern relations among states in the region. To assist overcoming the prevailing mistrust, the group should also discuss the role of confidence-building measures (CBMs) as part of the Zone negotiation and implementation, and identify relevant unconventional and conventional CBMs to be implemented as part of the Zone.

The group could also recommend whether there is a need to establish a regional organization to ensure implementation of the treaty, address compliance and enforcement issues, and promote the peaceful applications of nuclear, biological, and chemical technologies. Given the prevailing reality of the region where non-state actors have tried to acquire WMD capabilities, targeted strategic infrastructure, and have gained control over significant territories (including where WMDs are located), the group could address how the Zone provisions would tackle this emerging threat.

If regional states are unwilling to commit experts to the process, an alternative route is to establish the dialogue as a track-two or track-one-and-a-half process. Because of the unique political and geo-strategic circumstances of the region, nongovernmental experts have played a critical role by providing the only forum for regional dialogue on arms control and nonproliferation in the Middle East since 1995, thus having much to offer in laying the foundations for an eventual WMDFZ.

Introduction

Freeing the Middle East from all weapons of mass destruction (WMD) and establishing a weapon-of-mass-destruction-free zone (WMDFZ) are ideas that originated many decades ago. Nevertheless, significant gaps regarding core concepts of the zone negotiations and implementation exist both within the Middle East and internationally. The objective of this report is to address this gap with regard to the planned WMDFZ Middle East Conference, negotiation process, and the subsequent establishment of such a zone by identifying the legal, technical, and institutional elements required to support the zone negotiations and implementation.

Creating a WMDFZ is a very tall order; not only has the world never negotiated one before, but all existing nuclear-weapon-free zones (NWFZs) sought only to formalize an already existing situation—the absence of nuclear weapons in the region. The WMDFZ, by contrast, is aimed at reversing the status quo by dismantling existing WMD capabilities and programs. Additionally, while there are regional and international regimes and organizations charged with verifying NWFZs and the peaceful nature of nuclear energy programs and chemical industries (both of which could inform the WMDFZ negotiators), there is no comparable setup or processes to cover WMD dismantlement, sensitive activities for biological programs, nor WMD delivery systems—all of which are mandated under the conceptual Middle East WMDFZ.

The report identifies an array of issues that the zone negotiators would have to address prior to and during the negotiations, and offers a range of options as possible solutions. These options described throughout the paper as possible solutions are based on lessons learned from past regional and international mechanisms and offer potential starting points for discussion. These options should be considered by regional states in conjunction with the specific circumstances of the Middle East and the WMDFZ objectives, keeping in mind—and avoiding prejudging—these measures' functions and objectives within the other regimes.

The paper is aimed at providing a blueprint to the negotiators at the stage that parties are willing and interested in seriously negotiating the WMDFZ (the "Zone"). So far, even launching the process has proven a daunting challenge. This report decidedly does not cover the strategic and political aspects related to launching Middle East WMDFZ negotiations, such as the conditions, prospects, or feasibility of its establishment, as those have been covered at length by many other experts and government officials. The topics and options identified in this report offer the WMDFZ negotiators and implementers a template or a blueprint to constructively prepare for the negotiations process at national, regional, and international levels. The topics covered here do not appear in order of importance, as different weight is given to different issues by different states. Nor are issues covered in order of core versus procedural issues, since some will have to be addressed in parallel, or even during the "pre-negotiations" stage.

There is no doubt that if and when such negotiations commence, it will be a complicated and long process. The region suffers from deep-rooted tensions and mistrust. It is currently under considerable social and political flux, and is characterized by multiple, overlapping security challenges: the Middle East

hosts the only suspected undeclared nuclear weapon state; four out of the five nuclear noncompliance cases referred by the International Atomic Energy Agency (IAEA) to the United Nations Security Council (UNSC); sites of all confirmed chemical weapon use since 1945; suspected chemical and biological arsenals; and non-state actors with demonstrated interest in acquiring WMD. Yet, the idea of segregating the operational issues from the current political discussions and impasse has been inspired by the successful negotiation experience of the Comprehensive Nuclear-Test-Ban Treaty (CTBT). Experts met regularly for seventeen years in order to develop a viable verification regime to detect nuclear tests while the diplomats slowly worked out thorny political issues. When the treaty negotiators finally overcame the political obstacles in 1996, the preparatory work to operationalize the treaty was ready. Similarly, during the CWC negotiations, many practical exercises and mock inspections were conducted to inform the negotiation process and allow for a more rapid operational implementation startup. With this report, states in the region, as well as nongovernmental experts, can start preparing the foundations for the negotiations and implementation of a Middle East WMDFZ.

Background

The idea to establish the Middle East as a WMDFZ evolved over the last four decades. It was first formalized with Iran and Egypt's cosponsored resolution during the 1974 United Nations General Assembly (UNGA) to create a nuclear-weapon-free Zone (NWFZ).[1] Since 1980, the UNGA has annually adopted a separate, negotiated Israeli-Egyptian resolution without a vote. However, the adopted esolutionhas offered differing visions by regional states of the modalities (sequence, speed and conditions) required to implement the resolution.[2] In 1990, President Hosni Mubarak of Egypt proposed to expand upon the NWFZ idea and establish a WMDFZ in the Middle East. Known as the Mubarak Initiative, the proposal called for the prohibition of all WMD in the Middle East, urging all states in the region to make equal and reciprocal commitments in this regard. The initiative also noted that verification measures and modalities should be established "to ascertain full compliance of all states of the region with the full scope of the prohibitions without exceptions."[3]

At the end of the Gulf War in 1991, the UNSC adopted UN Security Council Resolution (UNSCR) 687, which established the UN Special Commission on Iraq (UNSCOM) with the mandate to eliminate Iraq's WMDs and ballistic missiles. UNSCR 687 further established the link between missiles and WMD by endorsing the goal of "a zone free from weapons of mass destruction and all missiles for their delivery" in the Middle East.[4]

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[1] United Nations General Assembly (UNGA), Establishment of a Nuclear Weapon Free Zone in the Region of the Middle East, A/RES/3263(XXIX), December 9, 1974, <http://daccess-dds-ny.un.org/doc/RESOLUTION/GEN/NR0/738/65/IMG/NR073865.pdf?OpenElement>.

[2] UNGA, "The Establishment of A Nuclear-Weapon-Free Zone in the Region of the Middle East," UNGA Resolution 35/147, <http://www.un.org/documents/ga/res/35/a35r147e.pdf>.

[3] Letter from the Permanent Representative of Egypt to the United Nations addressed to the Secretary-General, A/45/219 (S/21252), April 18, 1990, <https://disarmament-library.un.org/UNODA/Library.nsf/16ca34e7129f6fe08525755c00525c61/098cdd497a502f8b852575660068ce04/$FILE/A-45-219-S-21252.pdf>.

[4] United Nations Security Council (UNSC), Resolution 687, S/RES/687 (1991), April 8, 1991, <www.un.org/Depts/unmovic/documents/687.pdf>.

From 1992 to 1994, the Arms Control and Regional Security (ACRS) working group, one of five multilateral groups formed shortly following the October 1991 Madrid Middle East Peace conference, discussed for the first time on a regional basis arms control issues, including the establishment of a WMDFZ. Due to various issues (but mainly the disagreement between Egypt and Israel on the nuclear issue), the group has not met formally since 1995.

The 1995 Review and Extension Conference of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) adopted a resolution calling for "the establishment of an effectively verifiable Middle East zone free of weapons of mass destruction, nuclear, chemical and biological, and their delivery systems."[5] The 2010 NPT Review Conference adopted a consensus document containing an Action Plan. In the consensus document, state parties agreed to convene a conference in 2012 "on the establishment of a Middle East zone free of nuclear weapons and all other weapons of mass destruction, on the basis of arrangements freely arrived at by the states of the region, and with the full support and engagement of the nuclear-weapon states" and to appoint a facilitator and a host country in consultation with regional states.[6]

In 2011, regional states designated Finland as the Middle East WMDFZ Conference (the Conference) host country and Ambassador Jaakko Laajava, Finnish Under-Secretary of State, as the facilitator. Since October 2011, Laajava consulted tirelessly with states in the region, the NPT depositaries and co-sponsors of the 1995 Middle East Resolution (Russia, the United Kingdom, and the United States), international organizations, and civil society about the mandated Conference. However, in November 2012, due to divergent views about the Conference agenda and desired outcomes, the co-conveners (Ambassador Laajava, the United Nations Secretary-General (UNSG), and the NPT depositaries) announced separately the postponement of the Conference, which had been tentatively scheduled for December 2012, with no new date.

Following the Conference postponement, Ambassador Laajava succeeded in convening consultations with all regional states and the co-conveners to discuss the Conference modalities, agenda, and other relevant elements. As of February 2015, five such meetings have taken place in Switzerland. For the first time ever, representatives from all relevant regional actors, including representatives from Israel, the twenty-two member League of Arab States (LAS), and occasionally Iran, discussed the Zone face-to-face. Nevertheless, it is not clear if previous points of divergence could be bridged any time soon.

It has become widely expected, however, that if and when the planned Middle East WMDFZ conference takes place, it should set out a process for the establishment of a zone rather than being

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[5] 1995 NPT Conference Resolution on the Middle East, NPT/CONF.1995/32 (Part I), Annex 1, <www.un.org/disarmament/WMD/Nuclear/1995-NPT/pdf/Resolution_MiddleEast.pdf>.

[6] 2010 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Part I, Conclusions and recommendations for follow-on actions, NPT/CONF.2010/50 (Vol. I)*, April 2010, <http://npviennacourse.files.wordpress.com/2012/02/final-document-2010-npt-recommendations-and-coclusions.pdf>.

a one-off event. Surprisingly, despite numerous publications, speeches, and strong opinions about the topic, there is little understanding or formulation of how such a process should be organized and what it would involve. To date, no WMDFZ is established anywhere in the world, thus there is no readily available model or past experience with a WMDFZ to inform what its negotiations and establishment could entail. Additionally, while there are regional and international regimes and organizations charged with verifying NWFZs, the peaceful nature of nuclear energy programs and chemical industries, which could inform the designers of the WMDFZ, there is no comparable setup or processes to cover sensitive activities for biological programs nor WMD delivery systems – all of which are mandated under the Middle East WMDFZ.

1. The Pre-Negotiation Stage

Many of the issues related to organizing the negotiations will have to be discussed in the pre-negotiation phase, as they will have direct impact on the substantive negotiations. Issues to discuss in the pre-negotiating phase include defining the objective of the negotiation in a way that provides an agreement on the principles and objectives of the negotiations as well as the strategy to achieve those, e.g., how the negotiations would be conducted, who should be invited, etc. The parties must also make physical arrangements for negotiations, such as setting a time and a location, identifying participants, or even deciding who will sit where. Many of these issues are currently discussed through Ambassador Laajava's consultations.

1.1. The Negotiations Mandate

An important pre-negotiations topic is based on which mandate the negotiations would be established and who will issue it. The NPT 2010 Action Plan created such a mandate, but Israel maintains that the mandate is too narrow and, as a non-NPT member, it is not bound by it. Moreover, a mandate from the NPT Review Conference would pertain only to the NPT and nuclear issues while the other weapon systems are governed by other treaties, with different membership, and their own review cycles.

The current consultations led by Laajava aim at bridging, among other issues, the mandate of the Conference and the follow-up WMDFZ negotiations process. Other examples, such as the mandates of existing NWFZs, can inform the Zone negotiators. Many of the negotiations on the five treaties establishing NWFZs in populated areas—namely the Treaty of Tlatelolco (Latin America and the Caribbean, 1967), the Treaty of Rarotonga (South Pacific, 1985), the Treaty of Bangkok (Southeast Asia, 1995), the Treaty of Pelindaba (Africa, 1996), and the Treaty of Semipalatinsk (Central Asia, 2006)—originated from regional organizations or several states from within the region which then established an expert group to negotiate a draft treaty. In the Pelindaba example, the Organization of African Unity (OAU) issued the Declaration on the De-nuclearization of Africa, which was subsequently endorsed by the UNGA. The OAU and the UN established afterward a Joint Group of Experts to draft a treaty creating a NWFZ in Africa. The group first met in Addis Ababa in April 1991. Thereafter the group met several times at various African venues. The experts were able to adopt the first complete draft text in 1994. The final treaty text was completed at a joint meeting of experts in

Johannesburg and Pelindaba in May and June 1995, and was approved by African heads of state in June 1995. The treaty was approved by the UNGA in 1995.

Similarly, the South Pacific Nuclear-Free Zone idea was discussed at the fourteenth meeting of the South Pacific Forum held at Canberra in August 1983. A year later, in August 1984, the forum endorsed a set of principles proposed by Australia as a basis for a zone, and appointed a working group of officials to prepare the text of a treaty. In addition to the agreed set of principles, the working group studied and drew on the provisions of existing international agreements. By June 1985, the working group succeeded in preparing a draft treaty. The draft was adopted at the fifteenth meeting of the South Pacific Forum in Rarotonga in August 1985. The Treaty entered into force on December 11, 1986, with the deposit of the eighth instrument of ratification.[7]

1.2. Rules of Procedures

The rules of procedures are basically the guide for how a negotiation will be conducted and how decisions will be made in the formal process. At the same time, negotiations tend to involve a combination of formal and informal mechanisms, and quite often the crucial decisions are made through the informal mechanisms. Nonetheless, what happens in the main forum is what counts in terms of negotiating the final text of a treaty.[8] Issues related to the rules of procedure that must be discussed in the pre-negotiations phase include who will lead the treaty negotiations, the structure of the negotiations, and decision-making process.

Deciding on the chairperson to lead and oversee the negotiation process is a crucial decision. Not only does such a person need to be agreeable and credible among all regional states parties, he or she should also be a gifted negotiator and well versed in regional politics. Options include a representative from the host country, the UNSG, special representative of the UNSG, or a prominent diplomat, from inside or outside of the region. For example, in the case of the Treaty of Semipalatinsk, at the request of the states concerned, the meetings were chaired by the director of the UN Regional Centre for Peace and Disarmament in Asia and the Pacific, Tsutomu Ishiguri. The UN Regional Center, located in Kathmandu, Nepal, provided the Central Asian states with technical and substantive assistance, and acted as a broker for resolving differences and overcoming impasses during the negotiations.[9]

The chairperson, in consultation with the regional states, would decide how to put all the discussed issues together. One common method is a rolling, or a chairperson's, text. In both cases, the paragraphs or topics not yet agreed upon are bracketed, indicating the need for further discussion. An additional

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[7] Caroline Millar, "Regional Non-Proliferation Arrangements: Rarotonga," presented at IAEA/OPANAL Seminar *Safeguards: Verifying Compliance with Non-Proliferation Commitments*, Kingston, Jamaica, April 25-26, 1996, <www.opanal.org/Articles/Jamaica/jam-Millar.htm >.

[8] Andrew Serdy, "Negotiating Treaties in the Global Environment," Canadian Department of Foreign Affairs and Trade, November 17, 2004, <www.dfat.gov.au/treaties/workshops/serdy.html>.

[9] Tsutomu Ishiguri, "The Central Asian Nuclear Weapon Free Zone, Lessons Learned for the Helsinki Process," Policy Brief No 41, Academic Peace Orchestra Middle East, Peace Research Institute Frankfurt, September 2014, p. 2.

question the negotiators would have to address is how to handle the negotiation process itself—setting up sub-committees, expert groups, a group of "Friends of the Chair," representing the main (or groups of) negotiating parties, and which topics would be discussed.

A few other options exist for organizing the negotiations—the "road map" approach, which consists of sequential steps by states party; the relatively more flexible "framework" approach; or the "basket approach," a parallel approach to the issues. For example, the ACRS negotiations were organized by plenary sessions (six were held), and between these plenaries, a number of intersessional activities took place. A coordination (steering) group was established with representatives from key delegations to coordinate the multilateral talks and sets dates and venues for the various working groups. The committee received reports of the working groups, confirmed their decisions, and set priorities for the allocation of resources. The steering committee also discussed broader issues such as the overall vision of the future of the region and the integration of the individual working groups work. ACRS intersessional activities were largely organized into two "baskets," operational and conceptual. The conceptual basket dealt with longer-term questions, including threat perceptions, visions of a future regional security order, and how to deal with the region's WMD problem. The operational basket concentrated on the negotiation of specific confidence-building measures (CBMs). These were often based on measures that had been adopted in other regional contexts, although considerable effort was made to adapt them to the realities of the Middle East.[10] Since the baskets are separate from one another, the lack of progress in one does not necessarily impede progress in others.[11] The ACRS experience, however, has left some parties, especially Egypt, frustrated that what they perceive as a core issue (i.e. Israel's nuclear capabilities) has not progressed at the same pace as what they consider peripheral issues (i.e. CBMs), and they therefore insist upon putting this issue up front in any future negotiations.[12] If the Zone negotiators decide to work in working groups, or "baskets," a decision must be made in the pre-negotiations on who would lead each of the working groups, which topics they will cover, and the members of the coordination committee.

With regard to how negotiations would be structured, it is worth mentioning that the NPT 2010 Action Plan emphasized "the requirement of maintaining parallel progress, in substance and timing, in the process leading to achieving total and complete elimination of all weapons of mass destruction in the region, nuclear, chemical and biological."[13] A comprehensive way under which all four weapons systems are tackled simultaneously would solve the dilemma for those in the region who possess WMD and see them as serving as a deterrent against other regional states' WMD. Some states also choose not to join a specific nonproliferation treaty as a bargaining chip for influencing decisions by other regional

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[10] Peter Jones, "The Arms Control and Regional Security Working Group: Still Relevant to the Middle East?," in Harald Müller and Daniel Müller (eds.,) *WMD Arms Control in the Middle East: Prospects, Obstacles and Options* (Ashgate, February 2015), p. 92.

[11] Sinan Ülgen, "Some Reflections on Confidence-building Measures in the Middle East," in Müller and Müller, eds., *WMD Arms Control in the Middle East*, pp. 284-86.

[12] See for example, Nabil Fahmy, "The regional Security Environment and Basic Principles for the Relations of the Members of the Zone", in Müller and Müller, eds., *WMD Arms Control in the Middle East*.

[13] 2010 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Part I, Conclusions and recommendations for follow-on actions, NPT/CONF.2010/50 (Vol. I)*, April 2010, <http://npviennacourse.files.wordpress.com/2012/02/final-document-2010-npt-recommendations-and-coclusions.pdf>.

actors regarding joining arms control treaties or dismantling their WMD arsenal. For example, Egypt has refused to adopt any additional nonproliferation or disarmament measures until Israel joins the NPT as a non-nuclear weapon state (NNWS).[14] On the other hand, it is unclear how the negotiators can control the pace of each topic without holding progress on one issue hostage for progress on other issues.

When discussing the issue of which working group or basket will cover which topic, it is worth mentioning that the facilitator of the WMDFZ Middle East Conference suggested that negotiations would take place in three working groups that meet "in parallel and balanced way." The three will cover: (1) the properties of the Zone, (2) verification and compliance issues, and (3) regional security, arms control, and confidence-building measures.[15] A related issue is where and how to discuss the "delivery system" aspect of the Zone. One option is to incorporate the issue of delivery systems in each of three separate working groups covering one category of WMD each (namely, nuclear, chemical, and biological). Another is to create a "stand-alone" group for delivery systems.[16]

Another issue to consider is how to address problems that are relevant only to a number of states (or are subregional) but not to the entire region. One strategy to address this issue is what Peter Jones, currently with the University of Ottawa, coined the "geometry variable," namely, devising a package of arrangements, some of which would be for the entire region and others for specific sub-regions or group of states.[17] Under such an approach, also mentioned by Prince Turki Al-Faisal of Saudi Arabia, the process would include an interlocking set of region-wide and sub-regional dialogues and arrangements.[18] In this context, the dialogues can be inclusive with a seat at the table for all who wish to participate.[19]

The rules of the decision-making process will also have to be considered in the pre-negotiations phase. Will it be governed by consensus or majority-based rule? In multilateral negotiations, it is generally preferable to adopt a consensus-based system. A consensus in such instances does not reflect positive agreement by all; rather, it is the absence of a formal objection.[20] The challenge with consensus is that it ostensibly gives any one state the right to derail or impede the process (for what it may perceive as crucial security interest). On the other hand, once an agreement is reached, consensus leads to the

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[14] Nabil Fahmy, "The Middle East Nuclear Paradigm and Prospects," Paper prepared for the International Commission on Nuclear Nonproliferation and Disarmament, Regional Meeting, Cairo, September 2009.

[15] Elaine M. Grossman, "Mideast Talks Held on WMD-Free Zone Prior to Ramadan Break, Global Security Newswire, July 11, 2014, <www.nti.org/gsn/article/mideast-talks-held-wmd-free-zone-prior-ramadan-break>.

[16] Carlo Trezza, "The Issue of 'Delivery Systems' in a Middle East Zone Free of Weapons of Mass Destruction," in Müller and Müller, eds., *WMD Arms Control in the Middle East*, pp. 217-18.

[17] Peter Jones, "Towards a Regional Security Regime for the Middle East: Issues and Options," Stockholm International Peace Research Institute, 1998, pp. 25-26, <http://books.sipri.org/files/misc/SIPRI98Jones.pdf>.

[18] HRH Prince Turki Al Faisal, "A Political Plan for a Weapons of Mass Destruction-Free Zone (WMDFZ) in the Middle East," Belfer Center for Science and International Affairs, Harvard Kennedy School, July 9, 2013, <http://belfercenter.hks.harvard.edu/files/Turki_Final_1.pdf>.

[19] Peter Jones, "The Arms Control and Regional Security Working Group: Still Relevant to the Middle East?," in Müller and Müller, eds., *WMD Arms Control in the Middle East*, pp. 97-98.

[20] Andrew Serdy, "Negotiating Treaties in the Global Environment," Canadian Department of Foreign Affairs and Trade, November 17, 2004, <https://www.dfat.gov.au/treaties/workshops/serdy.html>.

adoption of a very strong and credible regional statement. Majority rule is easier to achieve during the negotiations, but it could create a final product that may be less-than-desirable by all, causing some states to opt out. Also, given the automatic majority the Arab states have when they vote as a bloc, majority-based decision making may discourage non-Arab states, such as Israel and Iran, from entering the negotiations.

Decisions to be Made:

- Who should issue the invitations and under which capacity?
- Will decisions be adopted by majority or consensus?
- How, and by whom, will negotiators be organized?

1.3. Issuing the Invitations

Sir Harold George Nicolson, an English diplomat, wrote that the first two problems every international negotiation faces is "Who is to issue the invitations?" and "Who is to be invited?"[21] With regard to the Middle East WMDFZ Conference, one option discussed is for the invitations to be issued by the Finnish foreign minister on behalf of the host state, facilitator, and co-conveners. However, since the Middle East WMDFZ Conference and the Zone negotiations may take place at different places and times—and with different mandates—this option does not necessarily address both of Nicolson's questions sufficiently.

Options for who issues the invitations for the Zone negotiations could include the foreign minister of the host state, an eminent individual or individuals, several states (within or outside the region), an international organization, or the UNSG.

1.4. Deciding on Invitees and Delineating the Zone

Before the official negotiations start, there are two major decisions that would need to be made: who should be invited to negotiate the future Zone, and the geographical delineation of the Zone. While not necessarily identical, the decisions are closely interrelated. One way to address both decisions is to see them as identical issues, namely, whoever is expected to be a member of the Zone should also be invited to the negotiations.

The current working assumption by the conference facilitator is that the LAS,[22] Iran, and Israel would be invited to the Middle East WMDFZ Conference. While this is the current working assumption, several factors should inform the discussion of who would be invited to negotiate the Zone.

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[21] Harold Nicolson, *The Congress of Vienna: A Study in Allied Unity: 1812-1822* (New York: Harcourt, Brace and Company, 1946), p. 134.

[22] Members of the League of Arab States (LAS) include Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria (the Bashar regime was suspended in 2011, the Syrian National Coalition currently occupies the Syrian seat at the LAS), Tunisia, United Arab Emirates and Yemen.

First, there is no agreed or recognized political geographic perimeter of the Middle East.[23] Negotiators should consider avoiding the 1990s ACRS precedent that excluded some regional states from the negotiations process. Participation in the ACRS working group, the only official regional arms control negotiations so far, had a limited criteria: whether the state participated in the 1990s peace process. As a result, Iran, Iraq, and Libya were not invited while Syria and Lebanon were, though they did not participate. Such a limited definition of invitees (and, by extension, participants) could have had serious repercussions on the ACRS process had it succeeded, as these three states (as well as Syria) were suspected or later even proven to possess WMD capabilities or programs. Their subsequent absence from the negotiation table would have made them reluctant subscribers to any formula agreed upon by other regional states. This demonstrated a fundamental flaw in the credibility of the process (and an agreement, should one have been produced), since many regional states felt threatened by these suspected or confirmed WMD programs.

The UN and the IAEA suggested different approaches to the Zone delineation in their reports. A 1989 IAEA study on the Zone defines the region as including "the area extending from the Libyan Arab Jamahiriya in the west, to the Islamic Republic of Iran in the east, and from Syria in the north to the People's Democratic Republic of Yemen in the south."[24] The 1990 UN study divided the region into core and peripheral states. Core states included the Middle Eastern states involved in the Arab-Israeli conflict plus Iran. The peripheral states were those states in the region that could be involved in the establishment of the Zone, but not necessarily from the beginning.[25] The UNSG report included the member states of the LAS, Iran, and Israel. Most, if not all, formulas exclude Turkey, Cyprus, Malta, Afghanistan, and Pakistan.

It is worth mentioning that some states on the African continent are covered by the Treaty of Pelindaba, also known as the African NWFZ, which geographically partly overlaps with the Middle East WMDFZ, particularly the North African states. Such an overlap could create a challenge in case of conflicting requirements between the two zones.

Second, whether Turkey is part of the future zone or not needs clarity. Turkey participated in ACRS as an observer and mentor, not a member, nor does it take part in Laajava's consultations. The assumption, therefore, is that Turkey is not going to be part of the WMDFZ. While Turkey is an active participant in Middle East politics, a key player in shaping regional security and relevant to the zone deliberations, it considers the Middle East to be the source of its security concerns and seeks to fulfill its security needs through its North Atlantic Treaty Organization (NATO) membership and the

[23] Many books and scholarly articles have been written about the challenges related to defining the Middle East as a region. The most conservative definition limits the Middle East to the countries bound by Egypt to the West, the Arab Peninsula to the South, and at most Iran to the East. A more expansive view of the Middle East, or the Greater Middle East, would stretch the region to Mauritania in West Africa and all the countries of North Africa that are members of the Arab League; eastward, it would go as far as Pakistan. See for example, Michael Bonine, Abbas Amanat, Michael Gasper.,, eds., *Is There a Middle East?: The Evolution of a Geopolitical Concept* (Stanford, CA: Stanford University Press: Stanford, 2012).

[24] IAEA, "Modalities of Application of Agency Safeguards in The Middle East," GC(XXXIII)/ 887, August 29, 1989, <www.iaea.org/About/Policy/GC/GC33/GC33Documents/English/gc33-887_en.pdf>.

[25] UNGA, "Effective and Verifiable Measures which Would Facilitate the Establishment of a Nuclear-Weapon-Free Zone in the Middle East," pp. 20-22.

extended nuclear deterrence it provides. While states in the Middle East may want to include Turkey in the Zone, Turkey has made it clear that, as a NATO member, it would support cooperative security frameworks in the Middle East, but it would not be a party to any binding regional security structure or confidence and security-building measures (CSBM).[26] In case Turkey is added to the process and becomes party to the Zone, all NATO nuclear weapons will have to be withdrawn from its territory. Ankara has traditionally supported maintaining the weapons on its territory as a guarantee of its defense. According to some Turkish experts, removal of the nuclear weapons could only take place if all other non-nuclear weapon states in Europe also agreed to the removal of such weapons stationed on their territory.[27]

Third, if the formula of member states of the LAS, Iran, and Israel is adopted, one of the issues to resolve is who will represent Syria, Palestine, Libya, and Yemen. With regard to Syria, LAS suspended the Bashar al Assad regime in 2011. While the Syrian National Coalition (SNC) currently occupies Syria's seat in the LAS, there are both political and legal complications for the SNC to represent Syria in the Zone negotiations. Politically, the SNC has little knowledge and expertise and probably no control over the Syria's WMD weapons and programs. Therefore, its ability to negotiate on behalf of the Syrian government is limited at best. Legally, unless SNC became the legal inherent successor of the Assad regime and its WMD programs, it would lack the authority to sign or ratify an agreement on behalf of Syria. According to the Vienna Convention on the Law of Treaties, a treaty needs to be signed by one of three specified authorities, namely the head of state, head of government, or minister for foreign affairs.[28]

The working assumption by the facilitator of the Middle East WMDFZ Conference is to invite those that represent the relevant state at the United Nations. In the case of Syria, it remains the Assad regime. However, the Assad regime's commitment to the Zone idea may be problematic at best. This stems from recent accusations that it violated UNSCR 2118 and the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction (CWC) by not declaring components and facilities related to chemical weapons,[29] as well as conducting chlorine attacks "systematically and repeatedly."[30]

By now, although Syria has declared on the items referred above (claiming the two canisters actually came from the rebels) and neither the UNSG investigation mechanism nor the OPCW

[26] Nilsu Goren, "Lessons Learned: The Turkish Role in Arms Control and Regional Security Talks in the Middle East," in Chen Kane and Egle Murauskaite, (eds). *Regional Security Dialogue in the Middle East* (UK: Routledge, 2014), p. 132.

[27] Sinan Ülgen, "Turkey and the Bomb," Carnegie Nuclear Policy Paper (February 2012), <http://carnegieendowment.org/files/turkey_bomb.pdf>.

[28] Article 7 in the Vienna Convention on the Law of Treaties, May 23, 1969.

[29] OPCW, "Update on Syrian Chemical Weapons and the Fact-Finding Mission into Alleged Chlorine Gas Attack," May 22, 2014, <www.opcw.org/news/article/update-on-syrian-chemical-weapons-destruction-and-the-fact-finding-mission-into-alleged-chlorine-gas>.

[30] OPCW, "Executive Council Discusses Findings of Fact-Finding Mission," September 26, 2014, <www.opcw.org/news/article/executive-council-discusses-findings-of-fact-finding-mission>, and Anthony Deutsch, "Syria reveals more chemical weapons facilities to watchdog – sources," Reuters, Sep. 17, 2014, <www.reuters.com/article/2014/09/17/us-syria-crisis-chemicalweapons-exclusiv-idUSKBN0HC1GA20140917>.

attributed the sarin and chlorine attacks to the Assad regime (it was intentionally excluded from the UNSG investigation mandate), most intelligence agencies and experts have little doubt that the regime was the perpetrator of the attacks.[31] The question of Palestinian representation should be easier to resolve. While Palestine is not recognized as a state by the United Nations, during ACRS it participated as a full member, it is a full member of the LAS and was granted observer status with "additional rights" in the UNGA, which allows it to cosponsor draft resolutions on Middle East issues. Who will represent Libya and Yemen in the negotiations is less clear, given the turmoil in both countries.

Fourth, with regard to delineating the Zone, it is worth examining different approaches adopted by other treaties for defining the geographical boundaries of its application. The Treaty of Semipalatinsk names each state party to the treaty. The Treaty of Pelindaba, on the other hand, stipulates the application of the treaty to the territories of state parties within the zone; Annex I contains a map which delineates the primary territorial zone. The Tlatelolco and Rarotonga treaties define their zone's territory in detail using latitudes and longitudes. Because of issues concerning sea coverage of the zone, the Bangkok Treaty does not include a map of the zone. Consequently, the NWS claim they cannot sign the treaty's associated protocols since they are uncertain of the zone's delineation and therefore their obligations under the protocols.[32] With regard to disputed territories, the Treaty on Conventional Armed Forces in Europe provides a useful example by keeping a clause of ambiguity in reference to the port of Mersin ("and thence to the sea") which avoids a clear decision on whether the port is included or excluded due to territorial disagreements between Greece and Turkey.

Fifth, an additional issue the negotiators may discuss is the possibility to expand the Zone in the future. Such a provision does not exist in any of the current NWFZs, but one of the Treaty of Semipalatinsk drafts had included a provision that the treaty would be open to "states having common borders" with the proposed zone, provided the treaty is amended (required consent of all parties to the treaty) to include the new state. Due to the NWS objection to the provision, arguing the zone of application of the treaty should be well defined and not open ended, the provision was excluded from the final text.[33] If the Middle East

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[31] See: White House, "Government Assessment of the Syrian Government's Use of Chemical Weapons on August 21, 2013," August 30, 2013, <www.whitehouse.gov/the-press-office/2013/08/30/government-assessment-syrian-government-s-use-chemical-weapons-august-21>; UK Joint Intelligence Committee, "Syria: Reported Chemical Weapons Use," August 29, 2013, <www.gov.uk/government/uploads/system/uploads/attachment_data?file?235094/Jp_115_JD_PM_Syria_Reported_Chemical_Weapon_Use_with_annex.pdf>; Human Rights Watch, "Syria: Strong Evidence Government Used Chemicals as a Weapon," May 13, 2014, <www.hrw.org/news/2014/05/13/syria-strong-evidence-government-used-chemicals-weapon>; Eliot Higgins, "Attempts to Blame the Syrian Opposition for the August 21st Sarin Attacks Continue One Year On," Bellingcat Blog, August 20, 2014, <www.bellingcat.com/news/mena/2014/08/20/attempts-to-blame-the-syrian-opposition-for-the-august-21st-sarin-attacks-continue-one-year-on/>; and Uzi Rubin, "CW attack in Syria: faulty intelligence or faulty conclusions?," Arms Control and Regional Security for the Middle East, March 7, 2014, <www.middleeast-armscontrol.com/2014/03/07/cw-attack-in-syria-faulty-intelligence-or-faulty-conclusions/>.

[32] Derek de Jong and Raymond Froklage, "Regional Nuclear Weapon Free Zones," Compliance Briefing Note, Canadian Centre for Treaty Compliance, Feb. 2, 2010, <http://carleton.ca/npsia/wp-content/uploads/compliance_nwfz.pdf>.

[33] Scott Parrish and William C. Potter, "Central Asian States Establish Nuclear-Weapon-Free-Zone Despite U.S. Opposition," CNS Research Story, September 8, 2006, <http://cns.miis.edu/stories/060905.htm>.

zone negotiators decide to include the option to expand membership and geographical delineation in the future, it could address the NWS concerns by including a requirement that the expansion decision would have to be adopted by consensus by all state parties to the treaty and protocols.

Decisons to be Made:

- Who should be invited to negotiate the future Zone?
- On which states' territory would the future Zone apply?
- What is the geographical delineation of the Zone?
- Will Turkey be part of the zone? If not, will it be given a special status in the negotiations and/or the treaty?
- Should the agreement include an option for membership expansion, and if yes, what should be the approval process?

1.5. The Role of Out-of-Region States

The role of out-of-region powers is another issue to be decided relatively early. It is customary to invite international organizations and outside-the-region member states as observers, partners, or under a different title. "Observer" status is based on the UN practice that includes the right to attend open meetings, to make statements, and to submit documents. Observers do not have the right of introducing substantive proposals or procedural motions, raising point of order, circulating communications as official documents, or exercising the right of reply.[34] The rules of procedure adopted by the negotiators could spell out any other restrictions or rights granted to outside the region states. For example, during the Rarotonga Treaty negotiations, Canada, China, France, the European Union, Japan, South Korea, the United Kingdom, and the United States functioned as "partners."[35]

Another consideration regarding out-of-region players is if they will play a specific role to support the negotiation process. Specific out-of-region powers could be asked to facilitate and support the process. These potential roles could extend to the Middle East Conference facilitator and host state (Finland), the co-conveners (United States, United Kingdom, and Russia), "extra-regional" states, and international organizations. For example, during ACRS, the United States and the Soviet Union (later Russia) were the co-chairs/co-gavel holders of the working group. As such, they negotiated and facilitated the rules of procedures, agendas, and decisions made by the working group. They also nominated several states to serve as "mentors." Canada was a mentor on identified maritime measures, the Netherlands on communications, and Turkey for exchange of military information and pre-notification of certain military activities. The United States and Russia co-mentored the long-term objectives, declaratory measures, and verification discussions of the working group.[36]

[34] Robbie Sabel, "Procedure at International Conferences: A Study of the Rules of Procedure at the UN and at Inter-Governmental Conferences," (Cambridge; New York: Cambridge University Press), 2006, p. 53.

[35] France was one of the dialogue partners, but its status was suspended in 1995 in protest of its nuclear tests in Mururoa, and restored in 1996. South Pacific Nuclear-Free Zone (SPNFZ) Treaty of Rarotonga, NTI, <www.nti.org/treaties-and-regimes/south-pacific-nuclear-free-zone-spnfz-treaty-rarotonga/>.

[36] Bruce Jentleson, "The Middle East Arms Control and Regional Security (ACRS) Talks: Progress, Problems, and Prospects," IGCC Policy Paper, no. 26 (Berkeley, CA: University of California, IGCC), 1996.

If the Zone will include legally binding requirements from extra-regional states (such as protocols), their input and buy-in to the process is paramount. Also, if financial support and security guarantees are expected from specific extra-regional states, early consultations with them would be highly advisable. As reflected by the chairman of the Commission of the Bangkok Treaty, one of the problems they encountered when they drew up the protocol of that NWFZ treaty was that they did not involve the NWS. "Reflecting on our problem and learning from [the Association of Southeast Asian Nations's] experience … engagement with NWS is very important in order to ensure that the Protocol will not be amended and [the NWS] will confidently submit the Protocol to their Parliament for the internal ratification process."[37]

At the same time, care needs to be given not only to the out-of-region powers' role, but also to their numbers so they would not overwhelm the process. The extra-regional participants in ACRS outnumbered the regional participants three to one.[38] Along the same lines, it is advisable that states of the region take a very active leadership role in negotiating and implementing the Zone. Regional involvement and long-term commitment will be a critical indicator of the region's maturity to address regional security threats cooperatively and its likelihood to succeed.[39]

Decisons to be Made:

- What would be the role of the facilitator, co-conveners, "extra-regional" states, and international organizations in the Zone negotiations and implementation?
- Should specific roles in the negotiations be assigned? Which? To whom?
- What will be the role of existing international organizations and nonproliferation regimes?

2. The Legal Framework

It is assumed that the Middle East WMDFZ Conference would commence a negotiation process on the Zone's establishment and implementation. International law does not dictate particular rules for treaty negotiations, but negotiators are not immune from addressing legal and organizational questions related to the process. At the onset of the Zone negotiations' commencement, the issue of what the negotiations seek to produce would have to be addressed.

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[37] Ildar Shigabutdinov, "Elements of SEANWFZ," presented at IAEA Forum on the Creation of the Nuclear Weapon Free Zone in the Middle East, Vienna, November 24, 2011, <www.iaea.org/sites/default/files/seanwfz211111.pdf>.

[38] Peter Jones, "The Regional Security Architecture and Other Confidence-building Measures," in Müller and Müller, eds., *WMD Arms Control in the Middle East*, p. 95.

[39] Chen Kane, "Conclusion" in Regional Security Dialogue in the Middle East: Changes, Challenges and Opportunities (UCLA Center for Middle East Development, 2014; and Peter Jones, "The Regional Security Architecture and Other Confidence Building Measures," presented at EU Non-Proliferation Consortium second seminar to promote Confidence Building, Brussels, November, 5-6 2012, <www.nonproliferation.eu/documents/backgroundpapers/jones.pdf>.

2.1. The Legal Framework of the Negotiations

One of the decisions the negotiators may wish to agree upon early in the process is the legal framework of the negotiations. The five treaties establishing NWFZs were negotiated as internationally legally binding treaties.[40] The treaties and their associated protocols (signed by the NWS), were registered as treaties pursuant to Article 102 of the UN Charter. Also, UNGA resolution 3472 B (XXX), which defines the concept of a NWFZ, stipulates that NWFZ negotiators should aim to negotiate a treaty or convention.[41]

In the rare case the Zone negotiators do not intend to have their agreement governed by international law, the agreement would not be considered a "treaty" for the purpose of international law, regardless of how much of a "commitment" an agreement might express.[42] For example, in December 1991, the states of the Andean Group—Bolivia, Colombia, Ecuador, Peru, and Venezuela—signed the "Cartagena Declaration on Renunciation of Weapons of Mass Destruction," which expressed—in a political, non-legally binding way—the determination of its signatories to renounce chemical weapons thereby creating a de facto WMD-free zone in Latin America and the Caribbean.[43] Deciding on the final product (a treaty under Article 102 of the UN Charter or another kind of agreement) would influence who can negotiate it.

Decisons to be Made:

- Would the negotiated arrangement be an internationally legally binding treaty?
- Would regional members register the negotiated document and its associated protocols as a treaty pursuant to Article 102 of the UN Charter?

2.2. Other Covered Territories

Beyond land holdings, negotiators would have to agree on what defines "territory" for the Zone. The basic territory covered by all existing NWFZs includes internal waters, territorial seas, archipelagic waters, airspace, and the seabed and subsoil beneath. The Treaty of Tlatelolco defines the zone's territory to "include the territorial sea, air space and any other space over which the State exercises sovereignty in accordance with its own legislation," whereas the Treaty of Rarotonga defines the zone's territory to include "internal waters, territorial sea and archipelagic waters, the seabed and subsoil beneath, the land territory and the airspace above them."

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[40] Four additional treaties established NWFZs in unpopulated areas covering the Antarctic, seabed, moon and other celestial bodies, and outer space.

[41] UN General Assembly Resolution 3472 (XXX), Dec. 11, 1975, <www.un.org/en/ga/search/view_doc.asp?symbol=A/RES/3472(XXX)&Lang=E&Area=RESOLUTION>.

[42] Shabtai Rosenne, *Developments in the Law of Treaties, 1945-86* (Cambridge: Cambridge University Press, 1989), p. 87.

[43] Cartagena Declaration on Weapons of Mass Destruction, December 1991, <www.iaea.org/sites/default/files/publications/documents/infcircs/1992/infcirc0398.pdfhttp://www.iaea.org/sites/default/files/publications/documents/infcircs/1992/infcirc0398.pdf>.

Some have suggested including continental shelves and exclusive economic zones. However, maritime boundaries, the status of seas, and imposing limitations beyond the territorial waters of zonal states have been very contentious proposals and considered central obstacles to NWS ratification of the protocols that accompany NWFZ treaties.[44]

The UN Convention on the Law of the Sea gives all states of the world, including major maritime states and their naval vessels, access to the Middle East sea areas. While the CWC and the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction (BWC) already prohibit the transit of these weapons, the NWS have refused to limit their navigation rights of their ships and aircrafts that might be carrying nuclear weapons. Additionally, since Egypt is not a state party to the CWC, it is not bound by the transfer clause. While Israel has not ratified the CWC, as a signatory, it is obliged to refrain from acts that would defeat the object and purpose of the treaty (Egypt is similarly obliged as a signatory to the BWC). Adding a WMD transfer prohibition to the Zone treaty, or requiring Egyptian and Israeli ratification of the CWC and BWC, respectively, could address this gap.

The Pelindaba Treaty provides that the boundaries of the African NWFZ correspond with the outer border of the territorial sea of the parties.[45] The Latin American and South East Asian zones both delineate a zone boundary beyond the territory of individual member states, however each treaty still permits the transit of nuclear weapons through the zone. The Treaty of Tlatelolco extends into the Pacific and Atlantic Oceans, but the NWS, citing their freedom at sea, assert that this does not apply to their ships and aircraft that might be carrying nuclear weapons (for additional discussion on the protocols, see 2.3.12). The South Pacific NWFZ also encompasses ocean areas, but the main provisions of the treaty only applies to the waters under the sovereignty of the contracting parties and the airspace above them. Therefore, while the treaty stipulates that not only the land and territorial waters of Southeast Asia are to be denuclearized, but also the exclusive economic zone and continental shelf (corresponding to 200 miles from the coast), it seems that only the prohibition of waste dumping applies to those spaces.[46] The treaty is ambiguous as far as the transit of vessels carrying nuclear weapons is concerned, a provision that was considered too restrictive by the NWS that have not ratified the protocols.[47]

As a result, some recommend avoiding inclusion of or restricting transit rights beyond the members' territorial waters to respect freedom of navigation and to avoid NWS objection for ratifying the

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[44] Müller, Melamud, and Péczeli, "From Nuclear Weapons to WMD: The Development and Added Value of the WMD-Free Zone Concept."

[45] Marco Roscini, "International Law, Nuclear Weapon-Free Zones and the Proposed Zone Free of Weapons of Mass Destruction in The Middle East," in Grø Nystuen, Stuart Casey-Maslen and Annie Golden Bersagel, eds., *Nuclear Weapons Under International Law* (Cambridge: Cambridge University Press, 2014).

[46] Ibid., pp. 321-46.

[47] Roberta Mulas, "Nuclear Weapon Free Zones and the Nuclear Powers, Lessons for a WMD/DVs Free Zone in the Middle East," Policy Brief No. 5, Academic Peace Orchestra Middle East, Peace Research Institute Frankfurt, December 2011, <http://www.hsfk.de/fileadmin/downloads/Policy_Brief_No_5_webversion.pdf>.

protocols.[48] Such a decision would imply the regional states' acceptance of the right of foreign ships and aircraft to possibly carry nuclear weapons to transit in the sea beyond their jurisdiction as well as in the international straits in the region (e.g. Gibraltar, Bab al Mandab, Gubal, Tiran, and Hormuz), the Suez Canal, and Caspian Sea. Since several states in the region have not ratified the CWC and/or the BWC—and are therefore not bound by them[49]—it may be advisable for the Zone agreement to prohibit transfer of all WMD.

It is worth mentioning that the Suez Canal, according to the 1888 Constantinople Convention, should be open "in time of war as in time of peace, to every vessel of commerce or of war, without distinction of flag." The Suez Canal is also covered in the African NWFZ, and France stated when it signed Protocol III that the treaty "shall in no way impair the principle of free passage through the canal, both in time of war and in peacetime." With regard to the Caspian Sea, due to unresolved claims on the Caspian Sea by the five states bordering it, the Semipalatinsk Treaty excluded the sea from the treaty, and included only the shoreline, which is not in contention.

Decisons to be Made:

- Which territory/ies beyond land would be included under the Zone?
- Will territories beyond the territorial waters of zonal states be included in the zone and, if yes, which restrictions would apply to them?

2.3. Treaty Components

Relatively early in the process, the negotiators would probably need to discuss how to structure the negotiated treaty or agreement. One option includes a short preamble stating the shared vision of the Middle East as a WMD-free zone, treaty objectives, and prohibitions, followed by detailed verification protocols and CBMs. The following sections examine the most common treaty components the Zone negotiators should consider.

2.3.1. Definitions

One of the issues the negotiators would have to consider is whether to include definitions in the negotiated agreement. On one hand, definitions provide a basic overview of the key terms, and facilitate a general understanding by clarifying ambiguities of their scope and objectives as related to the specific treaty and functions of the Zone. On the other hand, definitions may limit the scope of the treaty and make it less flexible and dynamic to counter emerging threats.

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[48] Thomas Markram, "Case Study: History and Applicable Lessons," presented at Capacity-Building Workshop for mid-level Diplomats in support of the Helsinki Conference on a Middle East WMD Free Zone, Brussels, June 18-19, 2014, <www.nonproliferation.eu/documents/wmdfz-workshop/pelindaba.pdf>.

[49] As of February 2015, Israel, has signed but not ratified the CWC, and two states, Egypt and South Sudan have neither signed nor ratified the treaty; three states from the region have signed but not ratified the BWC: Egypt, Somalia, and Syria. Three states from the region have neither signed nor ratified the BWC: Comoros, Djibouti, and Israel.

If the negotiators decide to include definitions in the treaty, they could base them upon several existing definitions such as *chemical* and *biological weapons* as well as *delivery systems*. These definitions were concluded while negotiating other international treaties and therefore can be adopted "as is." Alternatively, Zone negotiators could adapt these pre-existing definitions or even develop their own unique definitions suited to the Zone. There are no formal or agreed international treaties that include definitions of *WMD* or *nuclear weapons*.

WMD

Although the 2010 NPT Action Plan describes the conference to be convened in 2012 on the establishment of a Middle East zone "free of nuclear weapons and all other weapons of mass destruction,"[50] there is in fact no formal or agreed legal definition to WMD, and existing definitions vary in scope. In fact, within the US government alone, nearly twenty alternative definitions for WMD are used, and this does not count additional definitions used by international organizations or treaties, which brings the number of used definitions to over fifty.[51] The original definition of WMD, as presented by the 1948 UN Commission for Conventional Armaments, defines WMD as "atomic explosive weapons, radioactive material weapons, lethal chemical and biological weapons, and any weapons developed in the future which have characteristics comparable in destructive effect to those of the atomic bomb or other weapons mentioned above."[52] The Zone negotiators will have to decide whether to define WMD as weapon-based (covering nuclear, biological, and chemical weapons, or expanding the category to include also radiological weapons) or effect-based. If the latter, WMD could be defined as those that cause massive destruction or kill large numbers of people, including not just chemical, biological, radiological, and nuclear weapons, but others that cause massive disruption, such as those used in cyberattacks.[53] Lastly, while delivery systems are not considered WMD, they are expected to be included within the Zone mandate.

WMDFZ

While there is no agreed definition of a WMDFZ, it is possible to expand upon the NWFZ definition adopted by the UNGA Resolution 3472. According to the resolution, a NWFZ is any zone for which a convention establishes a "statute of total absence of nuclear weapons" and where "an international system of verification and control" is established to guarantee parties' compliance.[54] Additionally, several resolutions could inform the WMDFZ definition. For example, the 1995 NPT RevCon

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[50] 2010 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Part I, Conclusions and recommendations for follow-on actions, NPT/CONF.2010/50 (Vol. I)*, April 2010, <http://npviennacourse.files.wordpress.com/2012/02/final-document-2010-npt-recommendations-and-coclusions.pdf>.

[51] For extensive discussion on the various WMD definitions, see W. Seth Carus, "Defining 'Weapons of Mass Destruction'," Occasional Paper 8 (National Defense University Press: Washington, D.C.), January 2012, <http://ndupress.ndu.edu/Portals/68/Documents/occasional/cswmd/CSWMD_OccationalPaper-8.pdf>.

[52] See UN Commission for Conventional Armaments, S/C.3/32/Rev.1, August 12, 1948.

[53] Carus, "Defining 'Weapons of Mass Destruction'."

[54] UN General Assembly Resolution 3472 (XXX), Dec. 11, 1975, <www.un.org/en/ga/search/view_doc.asp?symbol=A/RES/3472(XXX)&Lang=E&Area=RESOLUTION>.

describes the establishment of "an effectively verifiable Middle East zone free of weapons of mass destruction, nuclear, chemical and biological, and their delivery systems."[55]

Nuclear Weapon

Nuclear weapons are not defined in the NPT. The NWFZ treaties adopted two distinct definitions to nuclear weapons. According to the Article 5 of the Treaty of Tlatelolco, which preceded the NPT, "a nuclear weapon is any device which is capable of releasing nuclear energy in any uncontrolled manner and which has a group of characteristics that are appropriate for use for warlike purposes." This definition leaves ambiguity on whether nuclear explosive devices for peaceful purposes are admissible. The Rarotonga, Pelindaba, and Semipalatinsk treaties adopted a broader definition under which the notion of a "nuclear explosive device" is used. The devices must be "explosive," e.g., capable of releasing a considerable amount of nuclear energy in a very short time and in an uncontrolled manner. This excludes conventional and experimental nuclear reactors, reprocessed nuclear material, and depleted uranium ammunitions, which do not cause an uncontrolled blast or heat wave.[56]

The Rarotonga, Bangkok, Pelindaba, and Semipalatinsk treaties specify that the definition of a nuclear weapon or a nuclear explosive device does not include the means, transport, or delivery of such a device "if separate from and not an indivisible part thereof."[57] Noted Egyptian diplomat Nabil Fahmy and verification expert Patricia Lewis suggested a definition of nuclear weapons for the Zone that covers "any weapon or other nuclear explosive device capable of releasing nuclear energy, including in unassembled or partly assembled forms. In order to minimize any confusion, the treaty should not make a distinction between nuclear weapons and nuclear explosive devices in terms of rights and obligations."[58]

Station

According to the Semipalatinsk Treaty, "station" means "to deploy, emplace, implant, install, stockpile or store." The Semipalatinsk Treaty goes further than the Rarotonga and Pelindaba treaties and prohibits the transport of nuclear weapons by any means within the entire zone, which includes the continental shelves and exclusive economic zones of the states' parties. The Treaty of Rarotonga limits its prohibition of transport of nuclear weapons to land and inland waters.[59]

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[55] 1995 NPT Conference Resolution on the Middle East, text available from <www.un.org/disarmament/WMD/Nuclear/1995-NPT/pdf/Resolution_MiddleEast.pdf>.

[56] Marco Roscini, "International Law, Nuclear Weapon-Free Zones and the Proposed Zone Free of Weapons of Mass Destruction in The Middle East," in Nystuen, Casey-Maslen and Bersagel, eds., *Nuclear Weapons Under International Law*.

[57] Lionel Yee Woon Chin, "Nuclear weapon-free zones: a comparative analysis of the basic undertakings in the SEANWFZ Treaty and their geographical scope of application," *Singapore Journal of International & Comparative Law*, 1988, pp. 177-78.

[58] Nabil Fahmy and Patricia Lewis, "Possible elements of an NWFZ treaty in the Middle East," United Nations Institute for Disarmament Research (UNIDIR), no. 2, 2011, p. 42, <http://nwp.ilpi.org/wp-content/uploads/2011/10/Possible-elements-of-an-NWFZ-in-the-Middle-East1.pdf>.

[59] Helle Winge Laursen, "An Introduction to the Issue of Nuclear Weapons in Southeast Asia," ILPI Nuclear Weapons Project, Background Paper No. 3, June 2013, <http://nwp.ilpi.org/wp-content/uploads/2013/06/BP03-13_ASEAN_WEB.pdf>.

The definitions of chemical and biological weapon, under the CWC and BWC, respectively, are based on the general purpose criterion, or GPC. The GPC approach does not ban the technologies per se, but rather all specific weapon-related purposes and activities to which they may be applied, thus leaving legitimate civilian, defensive, and protective activities unaffected. As such, the GPC is comprehensive and covers all past, present, and future technologies that can be used for weapons purposes, as well as address dual-use ambiguities.[60]

Chemical Weapons
Chemical weapons, according to the CWC, are defined as the following, together or separately:

> (a) Toxic chemicals and their precursors, except where intended for purposes not prohibited under this Convention, as long as the types and quantities are consistent with such purposes;
> (b) Munitions and devices, specifically designed to cause death or other harm through the toxic properties of those toxic chemicals specified in subparagraph (a), which would be released as a result of the employment of such munitions and devices;
> (c) Any equipment specifically designed for use directly in connection with the employment of munitions and devices specified in subparagraph (b).[61]

This definition covers everything, from tear gas to VX and includes industrial toxicants and off-the-shelf poisons.

Biological Weapons
Biological weapons, according to the BWC, are defined as:

> (a) Microbial 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;
> (b) Weapons, equipment or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict.[62]

This definition covers everything, from salmonella and pepper spray to anthrax.

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[60] Jean Pascal Zanders, "Verification Where to Start? How To Start?" presented at The Middle East Zone Free of Nuclear Weapons and Other Weapons of Mass Destruction: Prospects and Challenges workshop, Geneva, June 25, 2014, <www.the-trench.org/wp-content/uploads/2013/07/20140625-GVA-ME-Free-Zone-verification.pdf>; and Jean Pascal Zanders, "Biological and Chemical Weapons and the Prospective Disarmament Process in the Middle East," in Müller and Müller, eds., *WMD Arms Control in the Middle East*, p. 153.

[61] Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction, Geneva, September 3, 1992, <www.opcw.org/index.php?eID=dam_frontend_push&docID=6357>.

[62] Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction, 1972, <www.un.org/disarmament/WMD/Bio/pdf/Text_of_the_Convention.pdf>.

Radiological Weapons

If the Zone's scope includes a ban on radiological weapons, this category, too, would require an agreed definition.

There are two main types of radiological weapons: radiological exposure device (RED) and radiological dispersal device (RDD). A RED is a sealed radioactive source that is used to externally irradiate a single person or group of people, with the intention of generating deterministic radiation damage.[63] RDD, also known as "dirty bombs," consist of radioactive material combined with conventional explosives. RDD are designed to use explosive force to disperse the radioactive material over a large area. Of the WMD, radiological weapons could be the most accessible for terrorist groups.

Although there are several international arrangements on safety and security of radiological materials, they are not comprehensive nor legally binding, and regional adherence to them is sporadic, at best. And while radiological weapons could be the most accessible weapon of mass destruction for terrorist groups (although no regional actor is suspected to possess radiological weapons in their national security strategy or arsenal),[64] radiological weapons do not create the same mass killing as the other three categories of weapons. These weapons are not included in the NPT RevCon Middle East resolution 1995 nor in the 2010 Final Document. An alternative way to cover these weapons in the Zone could be for regional states to adopt a code of conduct to secure radiological materials, or specific CBMs (for additional discussion see 4.4.3).[65]

Weaponization

There is also no agreed definition of what constitutes WMD weaponization, or in which stage of the development it starts. In fact, there is a long legal and technical debate about the issue whether the NPT prohibits weaponization as well as related research and development (R&D).[66] It is worth mentioning that R&D weaponization activities are prohibited in the Pelindaba Treaty, which geographically will partly overlap with a future Middle Eastern zone (and therefore the Zone probably cannot include more permissive prohibitions than those included in Pelindaba). The issue of defining when weaponization

[63] Andre Richardt et al.,, eds., *CBRN Protection: Managing the Threat of Chemical, Biological, Radioactive Weapons*, pp. 159-160.

[64] Nilsu Gören and Aviv Melamud, "A Middle East Regional Arrangement on Securing Radiological Agents as a CSBM: A Common Interest in Preventing Radiological Terrorism," in Müller and Müller (eds.,) *WMD Arms Control in the Middle East: Prospects, Obstacles and Options*, p. 131, 136, and Mark Fitzpatrick, "Promoting Nuclear Safety and Nuclear Security in the Middle East Region," in Müller and Müller, eds., *WMD Arms Control in the Middle East*, p. 145.

[65] Ibid.

[66] Some experts argue that as long as fissile materials are not involved, "such weapons research is not against the letter of the law. Even running computer simulations of nuclear bombs would be consistent with the (rather lax) requirements of the nuclear Non-Proliferation Treaty and those of the IAEA nuclear safeguards agreement." See Yousaf Butt, "The IAEA Can't Guarantee Any Nuclear Program is Peaceful," Reuters, January 8, 2015, <http://blogs.reuters.com/great-debate/2015/01/08/the-iaea-cant-guarantee-any-nuclear-program-is-peaceful-2/>; and Daniel Joyner, *International Law and The Proliferation of Weapons of Mass Destruction* (Oxford, 2009). For opposing interpretation see George Bunn and Roland M. Timerbaev, "Nuclear Verification Under the NPT: What Should it Cover—How Far May it Go?," Programme for Promoting Nuclear Non-Proliferation Study 5, Mountbatten Centre for International Studies, University of Southampton, April 1994, and Laura Rockwood, "The IAEA's State-Level Concept and the Law of Unintended Consequences, *Arms Control Today*, September 2014, <www.armscontrol.org/act/2014_09/Features/The-IAEAs-State-Level-Concept-and-the-Law-of-Unintended-Consequences>.

starts is even more complex with regard to R&D activities in the biological and chemical arena, since R&D activities could be used both for defensive programs (the CWC and BWC prohibit development, not research) or offensive programs, prohibited under these treaties. Negotiators of the Zone will have to decide whether to add a weaponization definition and whether it will specify which activities are prohibited, or to adopt a general purpose criteria to weaponization. They could also leave the issue vague but risk undermining the treaty's efficacy via political controversies over noncompliance.[67]

Delivery Systems

UNSCR 1540, adopted in April of 2004, which requires all states to "adopt and enforce appropriate effective laws which prohibit any non-State actor to manufacture, acquire, possess, develop, transport, transfer or use nuclear, chemical or biological weapons and their means of delivery." The resolution goes on to define "means of delivery"(for the purpose of the resolution only) as "missiles, rockets and other unmanned systems capable of delivering nuclear, chemical, or biological weapons that are specially designed for such use."[68] Some experts argue that the Zone should prohibit any and all delivery vehicles that are capable of carrying a WMD payload, including terrestrial, naval, and atmospheric means of delivery.[69] In principle, many conventional weapons (e.g., shells, grenades, mines) and any aircraft, unmanned aerial vehicles, or missile with a range of 70 kilometers or more can carry a WMD warhead.[70] Nevertheless, both the Missile Technology Control Regime (MTCR) and UNSCR 1540 exclude manned systems (i.e. aircraft piloted by human beings) since—although they are perfectly capable of delivering WMDs—they are broadly used worldwide for, primarily, conventional military and non-weapon delivery missions.[71]

Non-State Actors

UNSCR 1540 defines (for the purpose of the resolution only) "non-state actor" as an "individual or entity, not acting under the lawful authority of any State in conducting activities which come within the scope of this resolution."[72]

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[67] For example, there is a long ongoing debate within the nuclear nonproliferation community whether Iran's suspected nuclear weapoinzation activities constitute noncompliance with its safeguards agreement or the NPT. See Daniel Joyner, "Iran's Nuclear Program and the Legal Mandate of the IAEA," *Jurist*, November 9, 2011, <http://jurist.org/forum/2011/11/dan-joyner-iaea-report.php>; Rockwood, "The IAEA's State-Level Concept and the Law of Unintended Consequences;" and Daniel Joyner, "A Response to Laura Rockwood," Arms Control Law Blog, September 14, 2014, <http://armscontrollaw.com/2014/09/14/a-response-to-laura-rockwood/>.

[68] United Nations Security Council Resolution 1540, S/RES/1540, April 28, 2004, <www.un.org/en/ga/search/view_doc.asp?symbol=S/RES/1540%20(2004)>.

[69] Mohamed I. Shaker, "Key Elements of a WMD-free Zone in the Middle East," in Paolo Foradori and Martin B. Malin,, eds., "A WMD-Free Zone in the Middle East: Regional Perspectives," Discussion Paper 2013-09, Belfer Center for Science and International Affairs, November 1, 2013, <http://belfercenter.ksg.harvard.edu/files/dp_2013-09.pdf>.

[70] Scheffran, J., Gopalaswamy, B., Gormley, D.M., Kubbig, B.W., Rubin, U. and Spitzer, H., "The Verification Challenge: Concepts, Requirements, and Technologies," in B.W. Kubbig and S.E. Fikenscher, eds., *Arms Control and Missile Proliferation in the Middle East*, (New York, NY: Routledge, 2012), pp. 149–66.

[71] Carlo Trezza, "Controlling Proliferation of WMD Delivery Means: Necessary Next Steps," European leadership Network, July 8, 2013, <www.europeanleadershipnetwork.org/controlling-proliferation-of-wmd-delivery-means-necessary-next-steps-_665.html>.

[72] United Nations Security Council Resolution 1540, S/RES/1540 (2004), <www.un.org/en/ga/search/view_doc.asp?symbol=S/RES/1540%20(2004)>.

Related Materials
UNSCR 1540 defines (for the purpose of the resolution only) "related materials" as "materials, equipment and technology covered by relevant multilateral treaties and arrangements, or included on national control lists, which could be used for the design, development, production or use of nuclear, chemical and biological weapons and their means of delivery."[73]

Disarmament and Dismantlement
In the literature, the two terms are usually used interchangeably. Nevertheless, the Zone negotiators may want to adopt the distinction that at least one publication offers between the two, referring to dismantlement of weapon programs in contrast to disarmament of the weapons themselves.[74]

2.3.2. Prohibitions and Obligations

The UNGA adopted a resolution defining NWFZs as agreements that institute an "effective prohibition of the development, manufacturing, control, possession, testing, stationing or transporting" of nuclear weapons within the zone region, by both the regional parties and the NWS.[75] As the future Zone should also include at least biological and chemical weapons as well as their delivery systems, there are some grey areas the negotiators may have to clarify in terms of what are states' obligations and prohibitions under the future Zone.

With regard to the nuclear weapon prohibitions, all existing NWFZs go beyond the NPT and include the prohibition on the development, possession, and testing of nuclear weapons (or nuclear explosive devices). Furthermore, deployment of nuclear weapons in the region by states outside it is prohibited. Only the Treaty of Pelindaba explicitly prohibits research on nuclear explosive devices, though both the Rarotonga and the Pelindaba treaties explicitly ban nuclear explosive devices in unassembled or partly assembled forms. Other prohibitions have been added as the treaties developed over time (see Table 1).

The African NWFZ bans the stationing by other states of "nuclear explosive devices" on the territories of the member states. The Treaty of Tlatlelolco is the only NWFZ treaty that prohibits nuclear weapons but allows the use of nuclear explosive devices for "peaceful purposes" under certain conditions. Subsequent NWFZ treaties to Tlatlelolco have not made that distinction. Peaceful nuclear explosions are explicitly banned under Article 1 of the CTBT, which prohibits any nuclear explosion. The Zone negotiators will have to discuss how far to define the nuclear weapon prohibition; some argue that weaponization does not occur unless fissile materials are involved, thus permitting R&D using computer simulations, which do not violate either the NPT or the IAEA safeguards agreement.[76]

[73] Ibid.

[74] Christine Wing and Fiona Simpson, *Detect, Dismantle, and Disarm: IAEA Verification, 1992-2005*, United States Institute of Peace Press, 2013, p. 2.

[75] "Establishment of nuclear-weapon-free zones on the basis of arrangements freely arrived at among the States of the region concerned", Annex 1, Report of the Disarmament Commission, United Nations General Assembly, 54th Session, UN A/54/42, 6 May 1999, paragraph 33.

[76] Yousaf Butt, "The IAEA Can't Guarantee Any Nuclear Program is Peaceful," Reuters, January 8, 2015, <http://blogs.reuters.com/great-debate/2015/01/08/the-iaea-cant-guarantee-any-nuclear-program-is-peaceful-2/>; and Daniel Joyner, *International Law and The Proliferation of Weapons of Mass Destruction* (Oxford, 2009).

The basic Zone undertakings could include the following:

- The non-possession, research, development, manufacture, stockpile, acquisition, control, testing, receiving or seeking assistance, production, deployment, installation, storage, station, or transport of prohibited weapons by any state within the geographical area of application of the Zone; and
- The non-use or non-threat of use of prohibited weapons throughout the Zone or against targets within the Zone.

Table 1: Prohibitions and Obligations under Existing NWFZs

	Treaty of Tlatelolco (Latin America and the Caribbean, 1967)	Treaty of Rarotonga (South Pacific, 1985)	Treaty of Bangkok (Southeast Asia, 1995)	Treaty of Pelindaba (Africa, 1996)	Treaty of Semipalatinsk (Central Asia, 2006)
Prohibitions					
Research				√	√
Development			√	√	√
Manufacture	√	√	√	√	√
Stockpile				√	√
Acquire	√	√	√	√	√
Possess	√	√	√	√	√
Control	√	√	√	√	√
Test	√	√	√	√	√
Receive	√				
Seek assistance		√	√	√	√
Receive assistance		√	√	√	√
Assist		√		√	√
Station		√	√	√	√
Waste dumping		√	√	√	√
Install	√				√
Storage	√				√
Transport			√		
Use	√		√		√
Armed attack against nuclear installations				√	√
Produce	√				√
Deploy	√				
Obligations					
Sign CSA	√	√	√	√	√
Establish effective material control system	√	√	√		

Sign AP					√
Establish effective standards of physical protection on materials, facilities and equipment				√	√
Rigorous safety assessment			√		
Early notification of nuclear accident			√		

A number of precedents that limit chemical or biological weapon proliferation and provide for their disarmament could inform the Zone negotiators. They span the global, regional, and bilateral levels.

Globally, the CWC prohibits the use, development, production, acquisition (by any other means), stockpiling, and transfer of chemical weapons. State parties to the CWC are obliged to completely dismantle existing chemical weapons stockpiles and their production facilities according to specified deadlines.[77] The BWC prohibits, under any circumstances, the acquisition or retention of biological weapons, and requires destroying or diverting to peaceful purposes biological weapons and associated resources. It further prohibits state parties from transferring, or in any way assisting, encouraging, or inducing any other states or organizations from acquiring or retaining biological weapons. Unlike the NPT and CWC, the BWC lacks a verification mechanism, undermining the ability of state parties to verify compliance. This could represent a challenge in the context of the establishment of the WMDFZ (for further discussion see 3.2.5).

Regional efforts to ban chemical weapons have been pursued since the 1930s, when Latin American states first suggested freeing their region from chemical weapons after the 1932–35 Chaco War between Bolivia and Paraguay.[78] Several regional initiatives subsequently emerged throughout Europe, the Mediterranean coast, Africa, Latin America, and South Asia. The most prominent proposal came from Europe following World War II. The cornerstone of the Central European Chemical-Weapon-Free

[77] Eight countries have declared so far under the CWC chemical weapons stockpiles: Albania, India, Iraq, Libya, Russia, South Korea, Syria, and the United States. Russia still has 8,000 metric tons of chemical weapons to destroy, and the United States has 2,800 metric tons. Libya has about 850 metric tons of precursor chemicals. Iraq continues to have an unknown quantity of chemical agents and precursor chemicals left in two large bunkers at the site in Fallujah known as al Muthanna. Sealed in the mid-1990s by UN inspectors, these bunkers were reportedly captured by the Islamic State militant group in June 2014. See Paul F. Walker, "Syrian Chemical Weapons Destruction: Taking Stock and Looking Ahead," *Arms Control Today*, December 2014, p. 10, <www.armscontrol.org/ACT/2014_12/Features/Syrian-Chemical-Weapons-Destruction-Taking-Stock-And-Looking-Ahead>.

[78] The proposal was implicitly mentioned in the final document of the 1936 Inter-American Conference for the Maintenance of Peace. See Müller, Melamud, and Péczeli, "From Nuclear Weapons to WMD: The Development and Added Value of the WMD-Free Zone Concept."

Zone (CWFZ) proposal, which was a complete ban on the manufacture and possession of chemical weapons, as well as a ban on having "such weapons stationed, manufactured or carried in transit on their territories by other states."[79] States that had chemical weapons stockpiles and stationed armed forces in the geographical scope of the zone were requested to free the area of these weapons, cease stationing and manufacturing these weapons in the zone, and ban exporting to and transiting the states within the proposed zone. While all regional CW-ban initiatives were abandoned after the conclusion of the CWC in 1993, they had led to common understandings and purpose, which contributed to the global CWC process. These early regional efforts can also inform the Zone negotiators if they choose to go beyond the CWC restrictions.

The bilateral US-Soviet agreement, officially known as the "Agreement on Destruction and Non-production of Chemical Weapons and on Measures to Facilitate the Multilateral Convention on Banning Chemical Weapons," was signed in 1990, prior to the adoption of the CWC.[80] The agreement required both states to begin destroying their chemical weapons before 1993, and to reduce stockpiles to no more than 5,000 agent tons each by the end of 2002. The accord also included a requirement that both sides halt chemical weapon production, exchange data on stockpile levels, and allow for on-site inspections to confirm chemical weapon destruction.[81] The agreement never entered into force due to the CWC, which opened for signature three years later.

Another regional initiative is the 1991 Mendoza Declaration between Argentina, Brazil, and Chile. Under the agreement, the three states agreed not to develop, produce, buy, stockpile, or use chemical and biological weapons, thus effectively establishing a CWFZ and Biological-Weapon-Free Zone (BWFZ) over nearly two thirds of the continent's territory.[82] Another joint declaration was signed in August 1992 by India and Pakistan, under which both states agreed not to develop, produce, or otherwise acquire or use chemical weapons, and not to assist, encourage, or induce anyone to engage in such activities. Neither of these declarations include a verification mechanism.

It is worth noting that none of the existing instruments explicitly prohibit research in the chemical and biological fields. Defensive research and assistance is identified as a non-prohibited purpose under the GPC in both conventions, though it should be noted that overlap between offensive weapons, defensive, and peaceful uses is significant.

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[79] Ralf Trapp, "Chemical Weapon Free Zones?", SIPRI Chemical & Biological Warfare Studies, No. 7 (Oxford University Press: Oxford, 1987), and Müller, Melamud, and Péczeli, "From Nuclear Weapons to WMD: The Development and Added Value of The WMD-Free Zone Concept."

[80] Agreement on Destruction and Non-production of Chemical Weapons and on Measures to Facilitate the Multilateral Convention on Banning Chemical Weapons (Soviet–US Chemical Weapons Agreement), signed June 1, 1990, <www.acq.osd.mil/tc/treaties/bda/text.htm>.

[81] Agreement Between the United States of America and the Union of Soviet Socialist Republics on Destruction and Non Production of Chemical Weapons and on Measures to Facilitate the Multilateral Convention on Banning Chemical Weapons, June 1, 1990, <www.acq.osd.mil/tc/treaties/bda/text.htm>.

[82] The Declaration of Mendoza, Mendoza, Argentina, September 5, 1991, <www.state.gov/p/wha/rls/70989.htm>.

Zone negotiators will have to discuss whether and how to limit WMD delivery systems. There are generally three approaches to controlling such systems: 1) the imposition of quantitative and, less frequently, qualitative constraints on missiles; 2) limitations on the way states deploy missiles and conduct operations; and 3) the elimination of entire categories of missile.[83] A delivery-system-free zone ideally would follow the third approach. Another option is to follow the example set by the 1991 UNSCR 687, which established the UNSCOM, mandated to verify the dismantlement of Iraq's nuclear, biological, chemical, and missile capabilities, specifically those with a range greater than 150 kilometers (although shorter range missiles have been used with chemical warheads)[84] and related major parts, as well as repair and production facilities.[85] Additionally, the three regional states that possess long-range ballistic missiles—Iran, Israel, and Saudi Arabia—may also agree to limit or ban deployment of ballistic missiles capable of flying more than 3,000 kilometers as part of a regional process.[86] Other possible limitations include de-targeting and de-alerting of missiles, limiting the ranges of missiles tested, moratoriums or bans on flight tests, redeployment, nondeployment (including the development of indigenous capabilities), and restraints, moratoriums, and bans on missile-related transfers.[87]

Bringing the issue of delivery systems into the future zone also raises questions regarding extra-regional as well as non-state actors. The three main exporters of weapons, delivery systems and missile defense systems are all extra-regional (the United States, Russia, and China); moreover, the delivery system issue has implications for NATO and its missile defense deployment. The negotiators will have to examine whether an agreement by these three players, including between them and with the regional players, would have to be concluded as part of the future zone if it includes delivery systems.

Another aspect the negotiators may consider is applying the prohibitions agreed upon in the Zone to non-state actors, a requirement all of them are bounded to by UNSCR 1540 adopted in 2004. The

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[83] Reuven Pedatzur, "The Missile Race in the Middle East: Is There a Way Out?", Moving Beyond Missile Defense, *INESAP Bulletin,* no. 18, September 2001, <www.nuclearfiles.org/menu/key-issues/nuclear-weapons/issues/arms-control-disarmament/nwfz/PDFs/middle_east2007.pdf>.

[84] See, for example, the discussion on the range of rockets used during the August 21 Goutha attack, in Rubin, "CW attack in Syria: faulty intelligence or faulty conclusions?" and Human Rights Watch, "Attack on Ghouta: Analysis of Alleged Use of Chemical Weapons in Syria," September 2, 2013, <www.hrw.org/sites/default/files/reports/syria_cw0913_web_1.pdf>.

[85] UN Security Council, Resolution 687, S/RES/687 (1991), April 8, 1991, <www.un.org/Depts/unmovic/documents/687.pdf>.

[86] According to Michael Elleman, such a measure will not impinge on the core security interests of any country in the region since no state would be asked to "relinquish its capacity to defend against or deter a regional rival, and few states in the Middle East face threats from outside the region (there are also US assets in the region that can be targeted). See Michael Elleman, "Banning Long-Range Missiles in the Middle East: A First Step for Regional Arms Control," *Arms Control Today*, 2012, <www.armscontrol.org/act/2012_05/Banning_Long-Range_Missiles_In_the_Middle_East_A_First_Step_For_Regional_Arms_Control>; and Nasser Hadian and Shani Hormozi, "A Middle East Free of Missiles and Weapons of Mass Destruction: An Iranian View," in Müller and Müller, eds., *WMD Arms Control in the Middle East*, p. 228.

[87] For a detailed list of additional measures and prohibitions identified in the delivery system area, see Bernd W. Kubbig, "Coping with Military Asymmetries in the Middle East: A Framework for Missile-related Confidence- and Security-building Measures," in Müller and Müller, eds., *WMD Arms Control in the Middle East*.

resolution requires all UN members to transpose the international obligations under the resolution into domestic law, thus extending the prohibition to any natural or legal person on its territory or any of its nationals working abroad, irrespective of whether they are party to the NPT, CWC, or BWC. Under the resolution, all UN members undertake three primary obligations to (1) refrain from providing any form of support to non-state actors seeking WMD and their means of delivery; (2) adopt and enforce effective national legislation to prohibit activities involving the proliferation of WMD and their means of delivery to non-state actors (in particular for terrorist purposes), as well as any attempts to engage in such activities, participate in them as an accomplice, assist, or finance them; and, (3) have and enforce effective measures to reduce the vulnerability of many legitimate activities to misuse in ways that would foster the proliferation of WMD and their means of delivery to non-state actors.[88]

2.3.3. Peaceful Activities

None of the existing treaties prohibit peaceful activities (i.e., nuclear research or power generation reactors, chemical and bio industry, as well as chemical and biological defensive programs). Aside from definitions of what is prohibited under the zone, the treaty could also identify permitted activities such as civilian uses of nuclear, chemical, and biological technologies, and require the adoption of best practices for safety and security for materials, facilities, and activities.

The Zone negotiators could also consider a multilateral/regional approach to nuclear, chemical, and biological peaceful applications. Under this topic, or during the CBM discussions, areas of potential cooperation on a regional or sub-regional basis such as safety and security, grid connection, or emergency response could also be identified. The Middle East Consortium on Infectious Disease Surveillance (MECIDS)[89] and the scientific cooperation by the Synchrotron-light for Experimental Science and Applications for the Middle East (SESAME)[90] are strong examples. Additionally, some of the existing NWFZs established organizations to promote the cooperation on the peaceful application of nuclear energy. The Treaty of Pelindaba, for example, established the African Commission on Nuclear Energy (AFCONE), which, in addition to ensuring treaty compliance, promotes regional cooperation in the peaceful use of nuclear energy.

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[88] UN Security Council Resolution 1540, S/RES/1540, April 28, 2004, <www.un.org/en/ga/search/view_doc.asp?symbol=S/RES/1540%20(2004)>.

[89] The Middle East Consortium on Infectious Disease Surveillance (MECIDS) is composed of public health experts and ministry of health officials from Israel, Jordan, and the Palestinian Authority. MECIDS facilitates cross-border cooperation in monitoring, preventing, and responding to health risks in Israel, Jordan, and Palestine. It provides a framework to increase epidemiology and laboratory capacity, conduct multinational research, harmonize best practices and share data and communication.

[90] The Jordanian based Synchrotron-light for Experimental Science and Applications for the Middle East (SESAME) is a cooperative venture by scientists and governments of the region. With researchers from Bahrain, Egypt, Iran, Israel, Jordan, and the Palestinian Authority, SESAME fosters scientific and technological excellence in the region by enabling world-class scientific research in subjects ranging from biology, archaeology, and medical sciences through basic properties of materials science, physics, chemistry, and life sciences.

A regional approach could be an attractive solution, especially if national enrichment and reprocessing, or defensive biological and chemical programs, are prohibited or significantly limited under the Zone (as noted, these are not prohibited under the NPT, CWC, or BWC). Regional arrangements can offer a solution for the challenge of balancing the delicate needs of proliferation resistance, national and energy security, public defense, economic development, knowledge transfer, and market compatibility.[91] Negotiators could consider different kinds of multinational arrangements: supply assurances, regional fuel banks, and multinational facilities.[92] A regional nuclear fuel cycle, in particular, would benefit the region by: (1) promoting regional relations and security; (2) enabling smaller and poorer countries to utilize otherwise economically untenable nuclear technology; and (3) being more cost effective than individualized nuclear energy industries.[93]

If negotiators agree upon a regional approach to any or all nuclear, biological, and chemical civilian applications, they would also have to discuss the eligibility, ownership, verification, governance, and management criteria of such an arrangement. For example, many of the existing multinational nuclear arrangements include some or all of the following criteria: NPT membership, a comprehensive safeguards agreement in force with the IAEA, ratification of the Additional Protocol, ratification of the Convention on Nuclear Safety and the Convention on the Physical Protection of Nuclear Materials, good standing with IAEA safeguards obligations, and renouncing intentions to pursue a domestic enrichment or reprocessing program. Under these criteria, only a few states in the region would be currently eligible for membership in such an arrangement.[94]

2.3.4. Transit and Station

The issue of transit is applicable mainly but not only to the nuclear realm. While chemical and biological weapons are completely prohibited under the CWC and BWC, the treaties are not in force for all regional states. Therefore, the Zone negotiators may want to include a prohibition on transit and stationing of WMD entirely, not just nuclear weapons.

As part of respecting the freedom of the seas, none of the existing NWFZ treaties prohibit the transit of nuclear weapons through the denuclearized zones. The decision on visits by foreign nuclear vessels to ports and travel through the territorial air and water of states in the region is left to each party's discretion. Had transit rights been completely prohibited by a zone treaty (rather than left to

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[91] For extensive discussion of the applicability of multilateral nuclear approaches to the Zone, see Giorgio Franceschini, "Peaceful Uses of Nuclear Energy in the Middle East: Multilateral Nuclear Approaches," in Müller and Müller, eds., *WMD Arms Control in the Middle East*.

[92] See IAEA, *Multilateral Approaches to the Nuclear Fuel Cycle, Expert Group Report to the Director General of the IAEA*, 2005, <www-pub.iaea.org/MTCD/publications/PDF/mna-2005_web.pdf>; and Yury Yudin, "Multilateralization of the Nuclear Fuel Cycle: Assessing the Existing Proposals," UNIDIR, 2009,<www.unidir.org/files/publications/pdfs/multilateralization-of-the-nuclear-fuel-cycle-assessing-the-existing-proposals-345.pdf>.

[93] Celia Reynolds, "Beyond Oil: Prospects for Multilateral Nuclear Energy Cooperation in the Middle East," ACSIS Conference Report, June 2009.

[94] Franceschini, "Peaceful Uses of Nuclear Energy in the Middle East: Multilateral Nuclear Approaches," p. 124.

the discretion of parties), the NWS would have been unlikely to cooperate with the zone and sign its protocols. For example, a dispute exists with the proposed African NWFZ over the inclusion of the Chagos Archipelago, which includes the US military base at Diego Garcia in the Indian Ocean. Neither the United States nor the United Kingdom recognizes Diego Garcia as being subject to the Pelindaba Treaty.[95] Another example is the CANWFZ treaty, which forbids the "possession of or control over" any nuclear explosive device, but parties are "free to resolve issues related to transit through [their] territory by air, land or water." Some NWS expressed their concerns to the Central Asian states over these "contradictory" provisions.[96]

The "transit" issue raises several questions relevant to the future Zone. First, states in the region may be unwilling to concede to a WMDFZ under which nuclear weapons would be near their borders or stationed within the zone. Negotiators would have to discuss whether to ban flights over their territories by nuclear-armed aircraft as well as the presence of nuclear-armed ships in the Persian Gulf, the Mediterranean Sea, and the Red Sea, at least. To address this issue, a dedicated discussion would have to take place with the NWS that have bases in the region to assess how amenable they are to such restrictions, and whether regional states that receive extended deterrence are comfortable to reinterpret it as only a conventional deterrence. For example, nuclear weapons are stationed on U.S. planes and ships based in the region as part of U.S. extended deterrence in the Gulf.

A second—and related—question remains over what to do with existing regional security commitments? During the Central Asia NWFZ negotiations, negotiators wrestled with this question as it related to the 1992 Tashkent Collective Security Treaty, the cornerstone of post-Soviet security arrangement between Russia and Central Asia, which obliged parties to render each other "all necessary assistance, including military assistance," in response to aggression.[97] Russia held that this provision allows the deployment of Russian nuclear weapons on the territory of the other parties if, after a joint decision, this was deemed necessary. While several of the Central Asian states proposed that the Semipalatinsk Treaty explicitly states that its provisions do not affect obligations under existing treaties and agreements, those which were not parties to the Tashkent Treaty at that time refused to accept such a proposal. The parties resolved the issue by incorporating two important provisions within the treaty. First, that the Semipalatinsk Treaty does not affect the rights and obligations under other international treaties. But, at the same time, the obligation to "take all necessary measures for effective implementations of the purposes and objectives of this Treaty in accordance with the main principles contained therein." As a result, the Central Asian denuclearized states party to the Tashkent Treaty still have the obligation to provide mutual military assistance in case of aggression, "but this assistance cannot include the acceptance of nuclear weapons on their territory."[98]

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[95] "Nuclear-Weapon-Free Zones (NWFZ) At a Glance," *Arms Control Today*, September 2012, <www.armscontrol.org/factsheets/nwfz>.

[96] Derek de Jong and Raymond Froklage, "Regional Nuclear Weapon-Free Zones," Compliance Briefing Note, Canadian Centre for Treaty Compliance, Feb. 2, 2010, <http://carleton.ca/npsia/wp-content/uploads/compliance_nwfz.pdf>.

[97] Treaty on Collective Security, May 15, 1992, <www.odkb.gov.ru/start/index_azbengl.htm>.

[98] Marco Roscini, "Something Old, Something New: The 2006 Semipalatinsk Treaty on a Nuclear Weapon-Free Zone in Central Asia," *Chinese Journal of International Law* 3 (2008), p. 599.

Lastly, negotiators may want to address time limits, to clearly delineate a long transit from stationing. This issue, however, has not been addressed in any of the other existing NWFZs, and should be done with close consultations with NWS.

2.3.5. Signature and Ratification

The first step to participate in a treaty is to sign it. The negotiators may decide to include in the final text under the signature provisions the place of signature, date of opening for signature, and period of signature. The negotiators would have to discuss whether the treaty would be open for signature only until a specified date or open for signature indefinitely. Negotiators would also want to consider whether to include who is expected to sign: is it all the states of the Zone or only states that participated in the negotiations process? This question may be especially relevant if not all the states delineated under the future Zone choose to participate in the negotiations. An additional issue is whether the agreement will be open to other states outside the delineated Zone, as a way to expand the Zone in the future.

Unless the treaty otherwise provides, a signatory does not become a party to a treaty through signature alone. A signature is an obligation by a state to refrain in good faith from acts that would defeat the object and purpose of the treaty.[99] The next step in treaty adoption is ratification, an international commitment of the state to be bound by the treaty obligations. The time between signature and ratification allows states to seek approval for the treaty at the domestic level and to enact any legislation necessary to implement the treaty domestically prior to undertaking the legal obligations under the treaty internationally. Depending on each state's constitutional provisions, a preliminary approval by the legislative branch may be required before it can deposit the instrument of ratification.[100] The Zone negotiators would have to consider whether to include specific limitations or conditions on ratification and whether there should be time limit within which a state is required to ratify a treaty once it has signed it.

2.3.6. Entry-Into-Force

The negotiators will have to consider how the Zone treaty would enter into force. Existing treaties use different formulas for entry-into-force. Some treaties (such as in the case of the CWC)[101] requires a fixed number of states to ratify before the treaty enters into force. Some treaties provide for other or additional conditions to be satisfied, such as a certain percentage, proportion, or category of states that must be among the consenters (such as in the CTBT).[102] The treaty may also provide for an additional time period to elapse after the required number of states have expressed their consent or certain conditions have been satisfied, such as, for example, the dismantlement of all WMD programs in the region.

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[99] Vienna Convention 1969, Article 18.

[100] United Nations, *Treaty Handbook* (2012), <https://treaties.un.org/doc/source/publications/THB/English.pdf>.

[101] The CWC provided that its entry into force was to occur at least two years after being opened for signature and only after 180 days had elapsed from the deposit of the 65th instrument of ratification.

[102] The CTBT will enter into force 180 days after the date of ratification by all states listed in Annex 2 (states with an active nuclear power or research programs).

While a treaty enters into force only when the specified conditions for entry-into-force are fulfilled, a treaty may also provide that, upon certain conditions having been met, it shall come into force provisionally. Some treaties include provisions that enable states to implement its obligations among themselves, without waiting for the particular set of ratifications required for its formal entry-into-force. For example, the Treaty of Tlatelolco specified that the full zone would not enter into force until it was ratified by all states within the zone. That did not occur until Cuba ratified the treaty in 2002. However, the treaty permitted individual states to waive that provision and declare themselves bound by the treaty, which many did, as early as 1968.

2.3.7. Duration

The existing NWFZ treaties provide for the treaty to remain in force indefinitely. A 1976 UN group of experts report, which established the criteria and guidelines for NWFZs (which was confirmed by the UN Disarmament Commission in 1999), set that treaties establishing NWFZs should be of unlimited duration. While these are guidelines and, as such, are not binding or exhaustive, giving the Zone agreement limited rather than indefinite duration would encourage hedging nuclear posture.[103] (For an additional discussion on hedging, see pp. 44 and 58.)

2.3.8. Withdrawal Clause

Each of the existing NWFZ treaties includes a withdrawal option for state parties. With the exception of the Treaty of Tlatelolco, which simply requires three months' advance notice before a withdrawal can take effect, all the other NWFZ treaties require a twelve-month advance notice for a state party to end its treaty obligations. In the Rarotonga and Bangkok treaties, a member state can trigger the right of withdrawal only in case of a breach of another party of a provision essential to the achievement of the objectives of the treaty. The treaties of Tlatelolco, Pelindaba, and Semipalatinsk allow withdrawal if a party "decides that extraordinary events, related to the subject matter of the threat, have jeopardized its supreme national interests."

None of the NWFZs have a mechanism to review a party's decision to withdraw or to assess a state party's statement that indeed "extraordinary events" jeopardizing its supreme national interests took place. Many states would object to such a provision, citing the sovereign nature of international law. Nevertheless, in the absence of such a mechanism, a treaty could lack effective deterrence against unjustified withdrawal.[104]

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[103] According to Ariel Levite, nuclear hedging refers to "a national strategy of maintaining, or at least appearing to maintain, a viable option for the relatively rapid acquisition of nuclear weapons, based on an indigenous technical capacity to produce them within a relatively short time frame ranging from several weeks to a few years." See Ariel E. Levite, "Never Say Never Again: Nuclear Reversal Revisited, *International Security* 27 (Winter 2002/03), p. 69.

[104] Nystuen, Casey-Maslen, Bersagel, eds., *Nuclear Weapons: Under International Law.*

2.3.9 Reservations

Negotiators will have to decide whether to allow reservations. The Vienna Convention stipulates that a state may, when signing, ratifying, accepting, approving, or acceding to a treaty, make a reservation to a treaty unless the treaty explicitly prohibits reservations, and as long as the reservation is not incompatible with the object and purpose of the treaty. No existing NWFZ treaty—nor the NPT, CWC, or BWC—allows for reservations.

2.3.10 Dispute Resolution

Zone negotiators will also have to decide how to address future disputes, as they pertain to the Zone. Some treaties contain elaborate dispute resolution provisions. When a dispute, controversy, or claim arises out of a treaty (due to a breach, error, fraud, performance issues, etc.), a dispute resolution provision becomes extremely important. Dispute resolution mechanisms could include negotiation, consultation, conciliation, use of good offices, panel procedures, arbitration, judicial settlement, or a reference to a dedicated regional or international organization, or the International Court of Justice.[105]

2.3.11 Amendments

Since all agreements—treaties included—are evolving processes, the ability to amend a treaty will be an important component. Many times practical experiences demonstrate that agreed provisions, especially those concerning verification, require adjustments. During the CWC negotiations (and afterward), states conducted mock inspections and field exercises to test concepts and operations. Conclusions and lessons learned fed into the CWC negotiations—and later, to the OPCW challenge inspection procedures. All existing NWFZs allow for amendments to be adopted by a two-thirds majority or consensus. Zone negotiators may also want to consider the CWC example of making a distinction between full amendments to the treaty articles—which require ratification by all state parties—and technical and procedural changes that could be adopted if no state party objects to them.

2.3.12 Protocols

Most of the existing NWFZs are intended to prevent nuclear weapons from being tested and/or stationed within their territories. Each of the existing NWFZs include protocols for the five NPT NWS to sign and ratify. These legally binding protocols call upon the NWS:

(1) To respect the zone, and refrain from violating its provisions.

(2) Not to use or threaten to use nuclear weapons against treaty state parties (also referred to as negative security assurances). This assurance is meant to protect the members of a NWFZ from the threat of nuclear weapons and negate the need for them to obtain such weapons.

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[105] United Nations Treaty Collection, *Treaty Handbook*.

Similarly, a Middle East WMDFZ treaty will likely include protocols. In a WMDFZ, these protocols could be extended to cover all WMDs. The protocols should commit the five NWS to uphold the treaty, agree not to use or threaten to use WMDs against any state parties to the treaty or any territory within the zone, and not to contribute to any act that constitutes a violation of the treaty or of the protocols. It should be noted that all the NWS already confirm their obligation to refrain from using chemical weapons when they ratified the CWC. The BWC does not prohibit use. Negotiators will have to contemplate how to incorporate chemical and biological weapons, as well as delivery systems in the protocols, if agreed upon. If the protocols go beyond the nuclear issue, the negotiators would also have to consider whether to ask other states, in addition the NWS, to commit to the protocols.

It should be noted that NWS' ratification of existing NWFZ protocols is mixed (see Annex 2). Since the NWS are reluctant to constrain their military options, sea navigations, or weaken commitments to allies, it seems there is a negative correlation between protocol ratification and their strength.[106] The stronger and more comprehensive the commitments are on the NWS through the protocols, the less inclined the NWS are to ratify them. Only the protocols to the Latin American treaty were ratified by all NWS. The South Pacific and African treaties were ratified by all NWS except the United States. No NWS has yet signed the protocols to the Bangkok Treaty because of concerns that it conflicts with the right of their ships and aircraft to have freedom of movement in international waters and airspace. All the NWS signed—but only France and the United Kingdom have ratified—the Semipalatinsk Treaty protocols. In 2011, US President Barack Obama submitted the two protocols to the Rarotonga and Pelindaba treaties to Congress for ratification, but prospects for ratification are dim.[107]

Further, when NWS have ratified the protocols, they occasionally added conditions under which they reserve the right to use nuclear weapons in certain scenarios against parties in the zone. For instance, the United States signed the protocol for the African NWFZ in April 1996 with a declaration that it would reserve the right to respond with all options (implying possible use of nuclear weapons), to a chemical or biological weapon attack by a member of the zone.

A separate discussion, therefore, would have to take place with the United States about its Nuclear Posture Review (NPR) and compatibility to the future Zone. The April 2010 NPR stated that the United States "will not use or threaten to use nuclear weapons against non-nuclear weapons states that are party to the Nuclear Non- Proliferation Treaty and in compliance with their nuclear non-proliferation obligations."[108] This covers all NNWS except for two: Iran and Syria, both of which are in the Middle East. Before the Zone could enter into force, questions over Iranian and Syrian noncompliance, as well as questions of the US NPR's compatibility with a Middle East zone, would have to be resolved.

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[106] Roberta Mulas, "Nuclear Weapon Free Zones and the Nuclear Powers, Lessons for a WMD/DVs Free Zone in the Middle East," Policy Brief No. 5, Academic Peace Orchestra Middle East, Peace Research Institute Frankfurt, December 2011, <www.hsfk.de/fileadmin/downloads/Policy_Brief_No_5_webversion.pdf>.

[107] Gaukhar Mukhatzhanova and Miles Pomper, "Obama Seeks Senate OK for Protocols to Two Nuclear-Weapon-Free Zone Treaties," May 6, 2011, <http://cns.miis.edu/stories/110506_obama_nwfz.htm>.

[108] US Nuclear Posture Review, April 2010, <www.defense.gov/npr/docs/2010%20Nuclear%20Posture%20Review%20Report.pdf>.

The negotiators will also have to discuss whether to seek protocol ratification from other nuclear-capable states. It should be noted that no similar arrangements exist in other NWFZs where regional states sought assurances from any state other than the five NPT NWS. For example, due to their geographical proximity to the Middle East, the possibility of seeking assurances or guarantees from India and Pakistan should be considered and weighed with the implication that such an act would be a legal acknowledgment of their status as nuclear weapon states.[109] Another neighboring state, Turkey, hosts NATO tactical nuclear weapons on its territory. If the US maintains full control of the weapons, then theoretically US adherence to the protocol would cover these weapons. Nevertheless, given NATO's Article 5 commitment, the Zone negotiators may consider whether to ask NATO to join the protocol. Turkey would likely resist such a commitment since it would then limit NATO's nuclear guarantees to Turkey to threats that arise from outside the Zone only, or if a state within the Zone violated its Zone commitments.[110]

Others have suggested adding to the protocol a Positive Security Assurances (PSA) by the NWS that guarantees NWS "will act immediately" in the event of a nuclear attack on a non-nuclear weapon state party to the NPT.[111] It should be noted that none of the other NWFZ include PSA provisions, yet two UNSCRs already provide NNWS with PSA.[112] If the negotiators decided to include such a provision in the protocol, negotiators will have to address which aspect of such an undertaking will be different from the PSA provided under the UNSCRs. One option is to extend existing PSAs to all three kinds of WMD.

2.3.13. Depository

The negotiators would have to agree on a depository. The depository is responsible for ensuring the proper execution of the treaty and is under an obligation to act impartially in executing the performance of those duties, which include receiving ratification instruments, treaty amendments, registering the treaty and its protocols in accordance with the UN Charter, transmitting copies of the treaty to state parties, and dealing with withdrawal-related procedures.

The depository of a treaty can be any state, organization, or institution to which the custody of that treaty is entrusted. Options of depository include a state within the region, extraterritorial state(s), a regional or international organization, or the UNSG. Others suggested nominating the three

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[109] Mohamed I. Shaker, "The Main Elements of a WMD-free Zone in the Middle East," in Müller and Müller, eds., *WMD Arms Control in the Middle East*, p. 24.

[110] Pierre Goldschmidt, "Top-Down Approach to a Nuclear Weapons Free Zone in the Middle East," EU 2012 Non-Proliferation Consortium Seminar, November 5, 2012, <http://carnegieendowment.org/2012/11/05/top-down-approach-to-nuclear-weapons-free-zone-in-middle-east>.

[111] Sinan Ülgen, "Some Reflections on Confidence-building Measures in the Middle East," in Müller and Müller, eds., *WMD Arms Control in the Middle East*, p. 281.

[112] Under UNSCR 255 adopted in 1968, the NWS expressed their intention that they will provide or support immediate assistance to any NNWS party to the NPT that is a victim of an act or an object of a threat of aggression in which nuclear weapons are used. In 1995 under UNSCR 984 the NWS committed to act immediately to protect NNWS against attacks or threats of aggression in which nuclear weapons are used.

depositories of the NPT and BWC, as well as the 1995 Middle East Resolution and the WMDFZ Conference co-conveners (Russia, United States, and United Kingdom) as the treaty depository, but it is unclear if all regional states would agree. In the case of the Latin American, Southeast Asian, and Central Asian NWFZ treaties, a regional member was chosen as the treaty depository. In the cases of the African and South Pacific NWFZs, the secretary-generals of the Organization of African Unity and Pacific Islands Forum Secretariat, respectively, were chosen to serve as the treaty depository.

Decisions to be Made:

- Who will be asked to sign the protocol? Only the five declared NWS?
- Will the protocols or specific commitments be extended to India and Pakistan?
- Would NATO's tactical weapons be covered under the US protocol? How would NATO's extended deterrence to Turkey apply to the Zone?
- Would the Zone also include PSA commitments?
- Would the protocol cover only nuclear or all prohibited weapons?

3. The Technical Framework(s)

"Verification" is the process of gathering, compiling, and interpreting information to permit a judgment whether a party to an agreement is in compliance with its obligations. The objectives of verification are to deter noncompliance, detect if one took place, and build confidence among state parties that the agreement is being implemented effectively and fairly. The detection capabilities of a verification system depend on the objectives of the treaty, e.g., what states want to detect and what responses they are willing to consider after detecting a violation; capabilities of the monitoring system and the speed and skill with which data can be collected and analyzed—these are partially dependent on the resources allotted by the states and also the level of intrusiveness of the detection methods that the parties agree on.

The 1995 NPT Middle East resolution called for the establishment of an effectively verifiable Middle East WMDFZ. Not only is an "effectively verifiable" mechanism undefined, but there are no precedents for verification of some of the Zone's future components, namely biological weapons and delivery systems. Negotiators will have to define the verification objectives and requirements of the Zone and identify the mechanisms required to meet these.

Regional states will have to develop a clear understanding of the core concepts, terms of reference, challenges, and limits of the verification system, given that there is no precedent for a WMDFZ. The types and extent of prohibitions decided by the negotiators of the Zone would dictate the kind of verification regime required. In turn, the limitation of verification technologies may define what can be prohibited under the treaty. It is essential for the political and technical negotiators to work hand-in-hand to agree on the politically desirable within the realm of the technically feasible.

Whatever will be the agreed final prohibitions and scope of the Zone, the negotiators would have to develop at least four components related to the verification regime: (1) verification of dismantlement and disarmament, (2) verification of compliance, (3) compliance judgment authority, and (4) enforcement authority. The latter two components are more political than technical in nature and will be discussed in a later section.

3.1. Verification of WMD Dismantlement and Disarmament

There are only a few treaties with disarmament mechanisms that can inform the Zone negotiators. Given that states in the Middle East are suspected of possessing all three categories of WMD (as well as their delivery systems), the issue of disarmament would be both politically and strategically sensitive, and, at the same time, critical to the Zone creation.

Politically, the WMD disarmament issue in the region is complex because both the acquisition and dismantlement of chemical and nuclear weapons are linked. Several Middle Eastern states acquired chemical weapons as a response and equalizer to Israel's nuclear capabilities. Equally, Egypt insists that it cannot accept any more nonproliferation or disarmament obligations until Israel joins the NPT. The problem may go beyond these two states, since in the Middle East, nuclear, biological, and chemical weapon capacities are distributed unequally. Where the weapons exist, they perform dissimilar doctrinal functions or, alternatively, rivals assign similar doctrinal roles to different weapon categories without necessarily building a functional relationship between them. This thorny mix makes any political decision of simultaneous WMD dismantlement complicated, to say the least.[113]

Technically, Zone negotiators will have to consider at least three major questions related to WMD disarmament and dismantlement, which would dictate the nature of the verification system. The first issue is the extent to which states will be required to declare past or existing WMD programs. The second relates to the timing of the dismantlement process, and the last covers how the process will be conducted: unilaterally, regionally, or internationally.

3.1.1. Declarations

A very sensitive issue would be whether states with WMD capabilities need to declare their inventories and related activities, and whether such declarations would also cover delivery system inventories. For the purpose of treaty verification, any agreement usually requires baseline declarations. On one hand, each state would want the maximum information on its neighbors' WMD programs, and many may hold that such a declaration is necessary to confidently verify the absence of prohibited activities once the Zone is established. On the other hand, many states may refuse to provide such information if it self-implicates violations of their existing nonproliferation commitments or reveals sensitive security information. This is particularly a problem with the CWC and BWC, for which several possessor states declared non-possession. How to strike a balance between transparency and confidence would be a major issue for the negotiators to decide.

[113] Jean Pascal Zanders, "Biological and Chemical Weapons and the Prospective Disarmament Process in the Middle East," in Müller and Müller, eds., *WMD Arms Control in the Middle East*, p. 154.

Each of the three existing treaties (namely the NPT, BWC, and CWC) require declarations of past activities differently, since only the BWC and CWC are disarmament treaties, and only the latter includes a disarmament verification mechanism. Under the NPT, states that join as a non-weapon state and sign a CSA with the IAEA are not required to declare past activities or inventories, just existing stockpiles. Even under the more extensive Additional Protocol, a state is not required to declare information about historical activities. However, the IAEA may take environmental samples at all buildings on sites, which may detect the historical use of nuclear material, prompting the IAEA to request the state provide clarifications of the information for that site. The IAEA had revealed such undeclared activities in Egypt, and South Korea preemptively declared past activities just before its Additional Protocol went into force. Therefore, the Zone negotiators would have to take into account that if the nuclear component of verifying compliance includes the same level of measures as under the Additional Protocol, they may wish to include historical information regarding past use of nuclear material.[114]

In case declarations are included, in the nuclear realm, historical production could be checked using techniques of "nuclear archaeology." In the Israeli case, for example, this could include measurements of isotopic changes of certain trace elements in the permanent metal structures supporting the core of the Dimona reactor. These measurements could reveal the cumulative flow or "fluence" of neutrons through the core over the lifetime of the reactor, which would provide the basis for an estimate of the total production of plutonium in the reactor.[115]

Resolving the current investigation of Iran's so-called possible military dimensions (PMD) will also be instructive to the Zone negotiators regarding stockpiles and proscribed weapon-related declarations. On one side of the PMD debate, if the IAEA is supposed to verify Iran's compliance with its safeguards obligations, it needs to develop a baseline, which it can develop only after understanding the full scope of the program. In other words, a meaningful and robust verification regime that would allow the IAEA to provide assurances regarding the absence of undeclared nuclear material and activities cannot be created unless the IAEA knows what past prohibited activities took place, where they were conducted, and the people who were involved.[116] On the other side of the PMD debate are those that claim that concluding a political agreement is more significant than the technical details, and fully knowing Iran's past activities is not necessary for finalizing the political terms and developing an effective verification mechanism on Iran's current and future commitments.[117] While some in this camp

[114] IAEA, Guidance for States Implementing Comprehensive Safeguards Agreements and Additional Protocols, Services Series 21, Vienna, December 2014, p. 27, <www-pub.iaea.org/MTCD/Publications/PDF/SVS-21_web.pdf>.

[115] Frank N. von Hippel, Seyed Hossein Mousavian, Emad Kiyaei, Harold A. Feiveson, and Zia Mian, "Fissile Material Controls in the Middle East: Steps toward a Middle East Zone Free of Nuclear Weapons and all other Weapons of Mass Destruction," Research Report No. 11, International Panel on Fissile Materials, October 2013, <http://fissilematerials.org/library/rr11.pdf>.

[116] Olli Heinonen, "Olli Heinonen's Testimony on "Verifying Iran's Nuclear Compliance'," Testimony to United States House of Representatives, Committee on Foreign Affairs, Washington, June 10, 2014, <http://belfercenter.ksg.harvard.edu/publication/24303/olli_heinonens_testimony_on_verifying_irans_nuclear_compliance.html>.

[117] Jeffrey Lewis, "We Don't Want to See Iran's Full Monty," *Foreign Policy*, September 15, 2014, <http://foreignpolicy.com/2014/09/15/we-dont-want-to-see-irans-full-monty>.

suggest addressing the verification issue after the conclusion of the political agreement,[118] others claim that the issue is not part of the P5+1 negotiations, but an IAEA-Iran issue.[119] It safe to assume that WMD possessors in the region will look carefully on the concluded arrangements with Iran on the PMD issue, their intrusiveness and comprehensiveness and will try to follow suit. However, this can complicate the Zone negotiations. While it will be hard for the international community to demand from any regional WMD possessor more intrusive transparency measures than were required for Iran, it is doubtful that, under the Zone, anything less than full access and transparency would be acceptable and considered sufficient proof.

The CWC requires state parties to declare in writing to the Organisation for the Prohibition of Chemical Weapons (OPCW) on both current and past activities and materials. States are required to declare their:

- Chemical weapons stockpiles, chemical weapons production facilities, relevant chemical industry facilities, and other weapon-related information, which includes production facilities, laboratories and test sites designed, constructed, or used primarily for chemical weapons development since January 1, 1946;
- Relevant chemical industry facilities;
- "Old" chemical weapons on their territories (chemical weapons manufactured before 1925 or those produced between 1925 and 1946 (and are unusable) and "abandoned" chemical weapons;
- Plans for destroying weapons and facilities;
- All transfers or receipts of chemical weapons or chemical weapon-production equipment since January 1, 1946; and
- All riot control agents in their possession.[120]

The BWC prohibits the development, production, acquisition, transfer, retention, and stockpiling of biological and toxin weapons. It does not ban the use of biological weapons, but reaffirms the 1925 Geneva Protocol, which prohibits their use. It was the first international treaty outlawing an entire category of weapons. It requires destroying or diverting biological weapons and associated resources to peaceful purposes prior to joining. Under the BWC, states are not required to submit any declarations when joining the treaty. Member states are not required to declare stocks, only to destroy them or convert them to peaceful purposes. Nevertheless, under requisite CBMs adopted by subsequent BWC review conferences, state parties are required to submit information on past offensive programs, though some member states consider them political, not legal obligations. In fact, out of the 173 BWC member states, only seventy submitted their 2013 CBM forms.

It is worth mentioning that the requirement to declare inventories, especially defunct chemical and biological weapons, stockpiles and facilities could be a challenge for some states in the region. Many

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[118] Ariane Tabatabai, "Does it matter if Iran developed nuclear weapons at Parchin?," *Bulletin of the Atomic Scientists*, October 13, 2014, <http://thebulletin.org/does-it-matter-if-iran-developed-nuclear-weapons-parchin7726>.

[119] Mark Hibbs, "Deconstructing Sherman on PMD," Armscontrolwonk Blog, Feb. 19, 2014, <http://hibbs.armscontrolwonk.com/archive/2527/deconstructing-sherman-on-pmd>.

[120] "The Chemical Weapons Convention (CWC) at a Glance," Fact Sheets & Briefs, Arms Control Association, September 2013, <www.armscontrol.org/factsheets/cwcglance>.

of the programs when developed did not keep an effective or comprehensive material accounting and balance. It is possible that a government may be unaware whether they possess these weapons, how much, or where all of them are located. A number of states, including Australia and Albania, found additional undeclared chemical weapons in their territories after submitting their declarations when they joined the CWC. Aside from unknown weapons, it is not inconceivable that some part of the government is unaware of past programs. An honest interagency dialogue will have to take place to fully understand the extent of those programs and reconstruct their details. In fact, when India signed the CWC in 1993, the foreign ministry and military were unaware of their chemical weapons. Indian diplomats repeatedly denied India had such a program and declared it only in 1997.[121] Similarly, while Albania signed the treaty in 1993, it made its declaration only in March 2003, after the discovery, in December 2002, of 600 bulk containers of chemicals in an abandoned bunker. The material is believed to have been acquired by Communist leader Enver Hoxha in the mid-1970s, known only to the Albanian leader and his closest advisers. Hidden in one of Hoxha's bunkers, they were forgotten about after he died in 1985.[122]

3.1.2. Timing

The second question is related to the timing and the ways in which the WMD disarmament process will take place. While this may be included as part of the Zone treaty, member states should be ready to face regional WMD possessors taking unilateral actions for dismantling their programs prior or after joining the Zone, which would have direct implications for the verifiability of the Zone.

The negotiated parties would have to decide whether to include a provision requiring states to dismantle their capabilities prior to joining the Zone. On the nuclear front, for example, the existing NWFZs serve as nonproliferation rather than disarmament instruments. Aside from the Treaty of Pelindaba, NWFZs have thus far only been established in regions without nuclear-capable states confirming already existing reality. Only the treaty of Pelindaba includes a clause according to which each party should declare any capability for the manufacture of nuclear explosive devices; dismantle and destroy any nuclear devices manufactured prior to the treaty's entry-into-force; destroy or convert to peaceful uses any facilities used in the manufacture of nuclear explosive devices; and, to allow the IAEA to "verify the process of dismantling and destruction of the nuclear explosive devices, as well as the destruction or conversion of the facilities for their production." Many of these provisions were ignored by South Africa when the country dismantled its nuclear weapons prior to joining the treaty. Similarly, it can be expected that states possessing WMD capabilities in the region would decide whether to dismantle their capabilities prior to joining the treaty or afterward, and whether to declare them, or not.

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[121] Ashley J. Tellis, "India's Emerging Nuclear Posture: Between Recessed Deterrent and Ready Arsenal," RAND, 2008, <www.rand.org/content/dam/rand/pubs/monograph_reports/2008/MR1127part1.pdf>, pp. 369-71, and "Ex-Indian army chief wants military involvement in decision making," *Pakistan Today*, November 24, 2013, <www.pakistantoday.com.pk/2013/11/24/national/ex-indian-army-chief-wants-military-involvement-in-decision-making/>.

[122] Joby Warrick, "Albania's Chemical Cache Raises Fears About Others," *Washington Post*, January 10, 2005, <www.washingtonpost.com/wp-dyn/articles/A61698-2005Jan9.html>.

3.1.3. Dismantlement Process

There are two options for how states may disarm their WMD capabilities. One option is under external supervision (an international organization or/and ad hoc experts group), and the other is to disarm unilaterally before or after the Zone enters into force. Additionally, the disarming state would have to decide whether to decommission and dismantle its WMD facilities after shutdown, or convert them for peaceful uses and place them under safeguards.

In case of unilateral disarmament, states in the region may choose to follow the South African model. While many hold South Africa as the gold standard for disarmament and transparency, regional states will be better off if they fully understand the case and relevant lessons learned.

South Africa was the first, and, to date, only case of voluntary "roll back" of an operational nuclear arsenal. South Africa started developing its nuclear weapon program in the 1970s. It produced weapon-grade uranium and assembled six nuclear weapons. In 1990, President F.W. de Klerk appointed Professor Wynand Mouton as auditor, tasked with supervising the disarmament process. By July 1991, the South African government destroyed its six nuclear weapon devices. The destruction of hardware, design information, facilities, and over 12,000 documents, diskettes, and hard drives associated with the program took place as late as March 1993.[123] As such, South Africa carried out a unilateral dismantlement process.

On July 10, 1991, South Africa joined the NPT as a NNWS. In September 1991, it concluded a CSA with the IAEA.[124] Under the safeguards agreement, South Africa was not required to declare past activities or inventories, just existing stockpiles, and its initial declaration on facilities and nuclear material inventories did not (and did not have to) contain any reference to its dismantled nuclear weapon program.

The IAEA verification process started in 1991. To confirm South Africa's existing inventory declaration, the IAEA inspected South Africa's nuclear facilities (some of which were undeclared and part of the nuclear weapon program) and historical operating records, and performed consistency checks based on the physical and documentary evidence. During that time, the South African government used extensive cover stories and a deception plan to ensure that the IAEA

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[123] Jodi Lieberman, "Dismantling the South African Nuclear Weapons Program: Lessons Learned and Questions Unresolved," in Henry D. Sokolski (ed.), *Nuclear Weapons Materials Gone Missing: What Does History Teach?* United States Army War College, November 2014; and Stephen F. Burgess and Helen E. Purkitt, "The Rollback of South Africa's Chemical and Biological Warfare Program," USAF Counterproliferation Center Air War College, April 2001, <www.au.af.mil/au/awc/awcgate/cpc-pubs/southafrica.pdf>.

[124] For discussion why South Africa chose first to unilaterally dismantle its nuclear weapons, then join the NPT and only after that acknowledged the weapons existence, see Geoffrey Ronald Heald, "South Africa's Voluntary Relinquishment of its Nuclear Arsenal and Accession to the Treaty on the Non-Proliferation of Nuclear Weapons in terms of International Law," A dissertation submitted to the Faculty of Law, University of Witwatersrand, Johannesburg, August 2010, <http://wiredspace.wits.ac.za/jspui/bitstream/10539/10674/1/South_Africas_Voluntary_Nuclear_Relinquishment_HEALD.pdf>, and Mitchell Reiss, *Bridled Ambition: Why Countries Constrain Their Nuclear Capabilities* (Washington, DC: Woodrow Wilson Center Press, 1995), pp. 17-24.

was unaware of its past nuclear weapon program. According to Jodi Lieberman at the American Physical Society, "[Atomic Energy Corporation] employees were instructed to lie to inspectors about various undeclared facilities that the team observed while there."[125] The IAEA verification report submitted in September 1992 did not mention any indication of a weapon program. According to the report: "the team found no evidence that the list of facilities and locations outside facilities provided by South Africa in its initial report, as required by the safeguards agreement, was incomplete" and that "the team found no evidence that the inventory of nuclear material included in the initial report was incomplete." The inspection team did, however, note that the uranium-235 balances they had calculated for both the pilot enrichment plant and the semi-commercial enrichment plant showed "apparent discrepancies."[126]

In 1993, South Africa publicly admitted for the first time it possessed nuclear weapons. President de Klerk announced that South Africa had six nuclear devices that were dismantled with the weapon program. Following the announcement, South Africa agreed to IAEA inspections to verify the complete dismantlement of the weapon program.

South Africa implemented a policy of relative transparency by granting the IAEA additional access to relevant sites, documents, equipment, and people.[127] These transparency visits continued several years afterwards as an additional measure to build confidence and provide assurance of the complete dismantlement of the nuclear weapon program.[128] Nevertheless, when IAEA inspectors examined the remains of the South African weapon program and attempted to verify how much weapon-usable highly enriched uranium (HEU) had been produced, they were often stymied: the South African weapon program was based on an indigenous fuel cycle, had used both civilian and military installations, and did not keep measurements of unaccounted-for tails.[129] South Africa also refused to reveal the amount of HEU produced for weapons purposes, where it came from, and whether any of that technology or expertise was the result of outside assistance.[130]

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[125] Mitchell Reiss, *Bridled Ambition*, p. 23.

[126] IAEA, "The Denuclearization of Africa," GC(XXXVII)/1075, IAEA, September 9, 1993, p. 11, <www.iaea.org/About/Policy/GC/GC37/GC37Documents/English/gc37-1075_en.pdf>.

[127] South Africa did preserve some crucial documents such as de-Klerk's original dismantlement order, the operating and production records for the Y and Z plants, and Mouton's final report on the dismantlement. See Mitchell Reiss, *Bridled Ambition*, p. 19.

[128] Olli Heinonen, "The Middle Eastern Weapons of Mass Destruction Free Zone (WMDFZ) – Nuclear Verification," paper presented at the *Verification in the 21st Century – Technological, Political and Institutional Challenges and Opportunities*, Wilton Park, United Kingdom, July 16, 2012, <http://belfercenter.ksg.harvard.edu/publication/22193/middle_eastern_weapons_of_mass_destruction_free_zone_wmdfz_nuclear_verification.html>.

[129] The enrichment process separates gaseous uranium hexafluoride into two streams, one that is enriched to the required level, while the other stream is progressively depleted in U-235 and is called "tails,"' or simply depleted uranium. Inspections of tails could assist in determining whether a facility produced only LEU or also some HEU. Moreover, if all the tails from the enrichment process are available for inspection, this technique could be used to determine the total production of LEU and HEU. See Steve Feter, "Nuclear Archaeology: Verifying Declarations of Fissile- Material Production," *Science & Global Security* 3 (1993), p. 246.

[130] Jodi Lieberman, "Dismantling the South African Nuclear Weapons Program."

In order to confirm the complete dismantlement of the weapon program, the IAEA had to construct a baseline. The Agency used a "cradle-to-grave" approach of conducting extensive discussions and briefings with former staff personnel; reconciling the information with other information received by the IAEA from other member states; compared against dismantlement records kept by the South African authorities; and cross-checked against independent IAEA nuclear material verification results, facility designs, and environmental samples taken. It was a dynamic process of dialogue with South African authorities that defined what was needed for the verification process.[131]

After twenty-two inspection missions that encompassed 150 inspections, the IAEA concluded in September 1993 that the declared inventory was consistent with the declared production and usage data; but, the calculated isotopic balance indicated "apparent discrepancies" that could be a result of the lack of accurate accounting.[132] While South Africa concluded a CSA with the IAEA in 1991, and adopted the Additional Protocol in September 2002, only in 2010 was the IAEA able to draw a "broader conclusion" about South Africa's nuclear program under which it "found no indication of the diversion of declared nuclear material from peaceful nuclear activities and no indication of undeclared nuclear material or activities."[133]

South Africa's dismantlement of Project Coast, its biological and chemical weapons programs is an even more problematic example of unilateral disarmament. Project Coast was officially authorized in 1981, though they were built on previously existing programs. They were run by military front companies and labs to allow government deniability as well as ease of dual-use import. The chemical weapon program produced small quantities of blister agents like mustard, nerve (e.g., tabun, sarin, and VX), and military grade psycho-incapacitant BZ agents.[134]

In regard to its chemical weapons, President de Klerk ordered the cessation of the production of lethal agents in March 1990, but allowed the continued production of irritants and incapacitating weapons. In anticipation of joining the CWC, the minister of defense ordered the destruction of all incapacitating agents in January 1993. Nevertheless, some researchers point to documents confirming that in 1993, when South Africa signed the CWC, there was an intention to hide the production and stockpiling of CR (tear gas), which was not a violation of the CWC, since the treaty requires disclosure of riot control agents only after the entry-into-force of the Convention, in 1997.[135] In addition, under the CWC, state parties are required to declare to the OPCW their chemical weapon stockpiles and facilities, relevant chemical industry facilities, and other weapon-related information since 1946. While South Africa is required under the CWC to declare all activities

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131 Olli Heinonen, "Verifying the Dismantlement of South Africa's Nuclear Weapons Program."

132 IAEA, "The Denuclearization of Africa."

133 IAEA, "Safeguards Statement for 2010," <www.iaea.org/safeguards/documents/es2010.pdf>.

134 Truth and Reconciliation Commission (TRC), "Chemical and Biological Warfare Hearings," Cape Town, June 8-July 31, 1998, <www.justice.gov.za/trc/special/index.htm#cbw>.

135 Chandré Gould and Peter Folb, *Project Coast: Apartheid's Chemical and Biological Warfare Programme*, UNIDIR/2002/12, United Nations Institute for Disarmament Research, Geneva, Switzerland, 2002, p. 123, <www.unidir.org/files/publications/pdfs/project-coast-apartheid-s-chemical-and-biological-warfare-programme-296.pdf>.

since 1946 (but not weapon holdings if they were destroyed before entry-into-force), South Africa had not declared any chemical weapon inventories or related facilities. In 1997, trunks containing Project Coast documents were found at the home of one of the program associates.[136]

Reportedly, as part of the process of destroying the lethal agents and downsizing the program, scientists were asked to hand over their reports. Some of the reports were allegedly scanned and recorded on optical disks in 1991 before they were supposedly destroyed. The fate of the cultures produced in the program is unclear. According to Dr. Daan Goosen, the managing director of the lab responsible for biological and chemical weapon development, "there was little managerial oversight … when it was being closed down, and scientists simply helped themselves to cultures that they might want to use in future research."[137] Later on, Goosen and others associated with the bio weapon program attempted to sell remaining products from the program.[138]

With regard to its biological weapon program, Project Coast was a violation of South Africa's commitment to the BWC, which it signed in 1972 and which entered into force in 1975, six years prior to the official initiation of the program. Citing the voluntary CBMs in the BWC, South Africa declared, in 1993 and again in 1994, that it had no offensive biological weapon program prior to 1993. Since the treaty does not include a verification regime, there is no mechanism to verify South Africa's compliance with the treaty or the correctness or completeness of its CBM submissions. While official documents and statements claimed destruction took place in January 1993, other documents indicate that, despite the ministerial directive, the BW program management team decided to accelerate the program.[139] US and UK officials communicated to the South African government in 1993 and again in 1995 their concerns about the program and reservations with South Africa's declarations under the BWC, which they suspected omitted many aspects of the program, particularly regarding offensive uses, weaponization, and proliferation.[140] However, despite the details of the activities of Project Coast having been made public through the Truth and Reconciliation process, South Africa has not declared on any offensive biological research and development program as part of South Africa's BWC CBMs.[141]

Lessons learned from the South African WMD dismantlement include several important issues relevant for the Zone negotiations and implementation with regard to unilateral dismantlement. First, the process of disarmament and its verification, even when the state voluntarily made the decision to disarm, is

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136 Ibid.

137 "The South African Biological Weapons Program," in Mark Wheelis and Lajos Rózsa, *Deadly Cultures: Biological Weapons since 1945*, p. 207.

138 Joby Warrick and John Mintz, "South African scientist offers to sell FBI deadly bacteria," *The Age* (Pretoria) April 21, 2003, <www.theage.com.au/articles/2003/04/20/1050777164983.html>.

139 Chandré Gould and Peter Folb, "The South African Chemical and Biological Warfare Program: An Overview," *Nonproliferation Review* 3, Fall/Winter 2000, p. 19, <http://cns.miis.edu/npr/pdfs/73gould.pdf>.

140 Ibid.

141 Brian Rappert and Chandré Gould, "Biological Weapons Convention Confidence, the prohibition and learning from the past," ISS Paper 258, July 2014, <www.issafrica.org/uploads/Paper258.pdf>.

lengthy and interactive. In order to get to its September 1993 conclusion, the IAEA and South Africa went through numerous revisions, corrections, and resubmission of reports, declarations, scientific seminars, and visits.[142] Additionally, it took the IAEA over twenty years to issue a "broader conclusion" that there is no indication of diverted declared materials or of undeclared activities or materials.[143]

The second lesson relates to hedging. Because the process is long and complex, a disarming state may employ a "hedging" strategy until they are certain that the regional security situation no longer necessitates maintaining a WMD program. For example, after the dismantlement decision, de Klerk considered two options: to destroy half of each of the six devices before destroying the remaining halves, the speediest way to eliminate the arsenal, or; dismantle one entire device at a time, allowing South Africa to retain its nuclear deterrent until the last weapon was eliminated. De Klerk adopted the second option, which not only allowed South Africa to hold on its weapons as long as possible, but also to allow for him to work on the domestic political and psychological reorientation of the nuclear establishment and military away from the nuclear weapons.[144]Another hedging aspect is related to the latent capabilities a disarming state may retain. At the end of the dismantlement process, South Africa retained over 400-450 kilograms of HEU, as well as an active uranium mining and enrichment capabilities as part of its nuclear energy program.[145] With such capabilities, states could either "break out" or develop a clandestine nuclear weapon program relatively fast. It is unclear whether WMD possessors in the future Zone would be allowed to maintain such latent capacities, although they are permitted to do so under the existing treaties (for additional discussion on the issue see 3.2).

The third lesson is the limited capabilities under the BWC to verify state declarations and compliance. The BWC does not have a mechanism to verify South Africa's (or any other member state's) compliance, declarations correctness, or completeness. Still today, many aspects related to South Africa's biological weapons are unknown, such as whether the biological warfare agents were destroyed, what technical data from the program was captured on optical disks, and where those are.[146]

Even in the case of the CWC, the OPCW only verified that, currently, South Africa does not possess chemical weapons; it has not conducted any inquiry on its past activities or whether South Africa's declarations on past activities were complete or correct. The OPCW has the authority to verify only declared information (correctness, rather than completeness). In order to verify the latter, a special inspection must be requested by a CWC state party, a measure yet to be invoked.

A fourth relevant lesson is that no dismantlement process can ensure with 100 percent certainty the complete dismantlement of a WMD program. While IAEA inspectors claim they were able to reconcile fissile materials imbalances within an acceptable level of confidence, some experts

[142] Nathan E. Buscha and Joseph F. Pilat, "South African Rollback: Revisiting Monitoring and Verification Lessons after 20 Years," *Comparative Strategy* 33, 2014, p. 246.
[143] IAEA, "Safeguards Statement for 2010," <www.iaea.org/safeguards/documents/es2010.pdf>.
[144] Mitchell Reiss, *Bridled Ambition*, p. 18.
[145] Buscha and Pilat, "South African Rollback," p. 248.
[146] Chandré Gould, "Apartheid's Chemical and Biological Warfare Programme (1981–1995)."

calculated the discrepancy in the South Africa's case was equivalent to two bombs' worth of material, which could have been in the tails material—depleted uranium leftover from the enrichment process—or elsewhere.[147] Also, the fate of South Africa's chemical and biological weapons and associated materials of these programs remains unknown. Negotiators on a Middle East Zone need to agree on the level of confidence required for complete dismantlement, and if it is technically and politically feasible. To what degree would parties accept unexplained imbalances?

A fifth lesson is that even in the case of South Africa, which is considered the beacon of nuclear dismantlement transparency, many unknowns remain and the decision to "close the file" was more political than technical. Although South Africa deceived the IAEA for over a year—which could have raised significant questions about the state's real intentions—once the Agency perceived South Africa to be cooperating, they lowered the technical bar of proof.[148] The IAEA went beyond the technical facts to reach a conclusion that exceeded the collected technical evidence.[149] The IAEA's confidence in South Africa, despite its prior concealment and deception, was a result of the positive political course and domestic change it was undertaking, accompanied by greater transparency and cooperation. Iraq made very similar claims with regard to its unilateral chemical and biological weapons, documents, and equipment destruction, but in Iraq's case, the UNSCOM inspections viewed the Iraqi claims as insufficient proof of destruction, as UNSCOM did not believe the Iraqi government had decided to genuinely cooperate. One of the problems determining the completion of Iraq's WMD dismantlement was that the relevant UNSC resolutions did not specify how Iraq's disarmament would be determined, according to which standards, and by whom.[150] Regional parties in a future Zone will have to recognize that, while the verification of disarmament is a technical process, the determination of WMD disarmament is a political decision. It is unclear whether an international verification body would feel confidently able to make such a leap between technical findings to political conclusions, as was done in the case of South Africa. It is also unclear whether or how to set criteria for assessing "genuine" cooperation.

A sixth lesson relevant to the Zone is that, while the processes of verifying dismantlement and compliance are not the same, they are not exclusive, but rather interrelated. In fact, some claim the latter could not be fully achieved without the former and assurances that all (present and future) activities would remain peaceful require reconstructing and understanding the historical aspects of the weapon program.[151]

The seventh lesson is relevant to regional WMD possessors— much can be learned from the domestic decision-making process de Klerk enacted to decide which course of action to take for disarming the different WMD programs, sequences, timelines, dismantlement techniques, and the internal auditing mechanism.[152]

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[147] Thomas B. Cochran, "High-Enriched Uranium Production for South African Nuclear Weapons," *Science & Global Security* 4 (Winter 1993/94).

[148] Buscha and Pilat, "South African Rollback," p. 250.

[149] Ibid.

[150] Christine Wing and Fiona Simpson, *Detect, Dismantle, and Disarm: IAEA Verification, 1992-2005*, p. 30.

[151] Olli Heinonen, "Verifying the Dismantlement of South Africa's Nuclear Weapons Program."

[152] For additional information, see Mitchell Reiss, *Bridled Ambition*, pp. 17-19.

It would be advisable that if a state in the proposed Zone chooses to unilaterally disarm its WMD program, it should determine beforehand how to provide its neighbors and the international community with satisfactory evidence of the disarmament irreversibility and completeness. Different states would have different perceptions of what is considered "satisfactory," of course, and would depend on the history of the state dismantling its program and its relations with neighboring states. For such a process to succeed "according to the book," a state would have to leave meticulous records of the process and allow unfettered access to them, including personnel records, the program history, historical production records, and dismantlement files. Obviously, the process would be far more complex if a state does not want to reveal its production history and only allows for the verification of dismantled buildings or current activities and inventories.

Internationally Supervised Disarmament

The option of disarmament under international supervision would certainly be less politically controversial, but not less politically or technically complex. First, Zone negotiators (and each of the regional WMD possessors) will have to agree on the entity responsible for verifying the complete dismantlement of the program, including the protection of proliferation-sensitive information. While the standards and procedures of verification will be negotiated between the dismantled state and the verifying entity, these would also have to take into account what others would consider as satisfactory verification. It is worth mentioning that while the IAEA and the OPCW were involved in the dismantlement of nuclear and chemical weapons programs, ad hoc mechanisms were established in many of the past cases, heavily relying on weapons experts from possessor states. The ability of these organizations to verify dismantlement diminishes significantly if the process takes place unilaterally.

Another influencing aspect for deciding the dismantlement authority is who is capable of verifying WMD disarmament and protecting proliferation-sensitive information. Ensuring confidentiality would be a rigorous undertaking. It should be noted that, in contrast to the common notion, most if not all past cases of WMD dismantlement under international supervision involved mostly the possessor state destroying its own weapons, with relevant international experts observing the process and confirming the amounts and categories of weapon destroyed. In fact, while "supervised" WMD elimination missions have been taking place for over twenty years, many of these efforts have relied on ad hoc measures and arrangements with different degrees of confidence in achieving complete elimination.

The Soviet disintegration and the nuclear, biological, and chemical insecurity it produced, caught most by surprise, and spurred the creation of the US-led Nunn-Lugar Cooperative Threat Reduction program to assist Russia in dismantling and securing its WMD programs. The Security Council created UNSCOM and the IAEA Action Team after the defeat of Iraq in the 1991 Gulf War revealed the extent of its unconventional weapon programs.

Even Libya's agreement to disarm followed after years of negotiation with many unforeseen challenges. On December 19, 2003, Muammar Qaddafi announced his commitment to disclose

and dismantle all WMD programs in his country. In a letter to the UNSC, Libya reaffirmed its commitment to the BWC and NPT, agreed to abide by the Additional Protocol to the IAEA safeguards agreement, signaled its intention to accede to the CWC, and agreed to receive inspection teams to verify its new commitments. From the very outset of negotiations, Qaddafi requested the participation of international organizations to help verify and certify Libyan compliance and give it international legitimacy.[153]

The verification and dismantlement processes were carried out in three phases. Phase I focused on US and UK teams removing the most proliferation-sensitive materials and equipment from Libyan territory, which included warhead designs, uranium hexafluoride, centrifuges, SCUD-C missiles, and related parts for these sensitive technologies. In parallel, following the December 2003 announcement, a Libyan delegation informed the IAEA director general that, "Libya had been engaged for more than a decade in the development of a uranium enrichment capability." With Libya's consent, in December 2003 and January 2004, the IAEA director general and IAEA teams made several visits to eighteen locations and began the process of verifying Libya's previously undeclared nuclear materials, equipment, facilities, and activities.[154]

Phase II, which began in mid-February 2004, involved the dismantling, removal, or destruction of any remaining components of Libya's WMD programs. This stage reportedly involved much larger quantities of equipment, including the destruction of chemical munitions, the removal of SCUD-C missiles and launchers, further dismantling of the centrifuge program, and an agreement to remove 16 kilograms of HEU.[155] Destruction of Libya's chemical weapons took place in country (under the CWC, all declared chemical weapons must be destroyed in the country of origin). Libya declared 26 metric tons of sulphur mustard, 1,390 tons of raw, precursor chemicals, 3,563 unloaded aerial bombs, and three former chemical weapon production facilities. With assistance from the United States, Canada, Germany, and the OPCW, facilities to destroy the chemical weapons were created and Libyans were trained to use the equipment.[156]

Phase III, which ended mostly by September 2004, was "primarily a verification phase" to "determine whether Libya had truly eliminated its WMD programs."[157]

Under Qaddafi, Libya pledged to fulfill its destruction obligations by 2011. Due to the armed revolution that began in February 2011, chemical weapon destruction stopped. In October, a few months after the defeat of Qaddafi's regime, Libya's National Transitional Council announced that it had discovered

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[153] George J. Tenet, "The Worldwide Threat 2004: Challenges in a Changing Global Context," Testimony before the Senate Armed Services Committee (as prepared for delivery), March 9, 2004, <www.cia.gov/news-information/speeches-testimony/2004/tenet_testimony_03092004.html>.

[154] Nathan E. Busch and Joseph F. Pilat, "Disarming Libya? A reassessment after the Arab Spring," *International Affairs* 89, 2013, p. 455.

[155] Ibid.

[156] Anthony Deutsch, "Libya Asks Chemical Weapons Watchdog to Remove Stockpile," Reuters, Sep 23, 2014, <www.reuters.com/article/2014/09/23/us-libya-chemicalweapons-exclusive-idUSKCN0HI1GR20140923>.

[157] Busch and Pilat, "Disarming Libya?," p. 455.

an undeclared cache of chemical weapons, later confirmed by the OPCW to be mustard gas and associated artillery shells. By January 2014, Libya had destroyed all its declared armed munitions and "category 1" chemical weapons—mustard gas filled in artillery projectiles and aerial bombs.

Continued deterioration of security in the country made it impossible to safely continue the rest of the destruction work. While the OPCW planned for the destruction of chemical precursors (category 2 chemicals under the CWC) to start in 2014 and be completed by December 2016, in September 2014, Libya asked the OPCW, informally, to explore other options, such as shipping the stockpile of 850 tons of category 2 chemical precursors to be destroyed overseas.[158] Experts debate the feasibility of destroying these chemicals in Ruwagha, the southeastern Libyan site where they were scheduled to be destroyed, whilst the civil war continues in the country.[159]According to Ahmet Üzümcü, the OPCW director general, a decision to remove the materials from Libya will require a consensus among state parties. Such a discussion will take place if and when Libya submits an official request.[160]

The opportunity to eliminate Syria's chemical weapons also arose unexpectedly. The UNSC and the OPCW Executive Council endorsed a framework agreement negotiated between the United States and Russia. The UNSC and the OPCW Executive Council resolutions adopted in 2013, mandated the complete "… elimination of all [of Syria's] chemical weapons material and equipment in the first half of 2014." The resolution also confirmed Syria's accession to the CWC, and authorized experts from the OPCW and the United Nations to supervise the removal and destruction of its declared CW stockpile. When it acceded to the CWC, Syria declared an approximate 1,308 metric tons of CW, including sulfur mustard agents, precursors for the sarin nerve agent, and other chemicals.[161]

It should be noted that three parallel missions took place in Syria, each led by a different organization, objective, and mandate.[162] The allegations of chemical weapon use were investigated

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[158] Anthony Deutsch, "Libya Asks Chemical Weapons Watchdog to Remove Stockpile."

[159] According to Kenneth D. Ward from the US Department of State, there is a safe way to secure and later destroy the remaining material in Libya in their current location. Comment made at the 2014 Jonathan Tucker Conference on Chemical and Biological Arms, December 12, 2014, Carnegie Endowment for International Peace, Washington, DC, <www.armscontrol.org/events/2014-12-12/The-2014-Jonathan-Tucker-Conference-on-Chemical-and-Biological-Arms-Control. See also Anthony Deutsch, "Libya Asks Chemical Weapons Watchdog to Remove Stockpile."

[160] Jean-Pascal Zanders, "Üzümcü: After Syria I do not see any country able to use chemical weapons anymore," The *Trench*, November 17, 2014, <www.the-trench.org/uzumcu-interview/>.

[161] Syria declared approximately 1,040 tons of seven different warfare agents or chemicals used in the binary chemical weapon systems ("Category 1"); approximately 260 tons of thirteen different chemicals under Category 2; twelve Chemical Weapons Storage Facilities (CWSFs), and twenty-seven Chemical Weapons Production Facility (CWPF), see Dominique Anelli, "Removal and Destruction of Syrian Chemical Weapons," presented at the 2014 Jonathan Tucker Conference on Chemical and Biological Arms, December 12, 2014, Carnegie Endowment for International Peace, Washington, DC, <www.armscontrol.org/files/Panel2.1_Anelli_TuckerConference.pdf>; and Paul F. Walker, "Syrian Chemical Weapons Destruction: Taking Stock and Looking Ahead," *Arms Control Today*, December 2014, p. 11, <www.armscontrol.org/ACT/2014_12/Features/Syrian-Chemical-Weapons-Destruction-Taking-Stock-And-Looking-Ahead>.

[162] "Report of the United Nations Mission to Investigate Allegations of the Use of Chemical Weapons in the Syrian

under the UN Secretary-General's Mechanism for the Investigation of Alleged CBW Use. It took place based on Syria's request and its membership in the 1925 Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or other Gases, and of Bacteriological Methods of Warfare, also known as the Geneva Protocol. The investigation concluded that sarin was indeed used in the August 21, 2013, Ghouta attack (which took place while the team was investigating previous allegations), but the report does not identify who perpetrated the attack as it was not included purposely in their mandate. The UNSG mechanism published a follow-up report on other chemical weapon use allegations, and plans to return to Syria "as soon as it can" to complete its investigation and to prepare the final report.[163] Verifying the destruction of Syria's chemical weapons was a joint mission conducted by the United Nations and the OPCW, mandated by the US-Russia framework agreement, UNSCR 2118, the decision of the OPCW Executive Council, and the CWC (after Syria's accession). Lastly, the ongoing verification of Syrian compliance with the CWC (verifying its initial declaration as well as allegations of chlorine use) is conducted by the OPCW, as mandated by Syria's accession to the CWC.

The Syria case set many precedents; it was the first international disarmament mission to take place in a conflict zone with a parallel investigation into the alleged use of chemical weapons, as well as verifying dismantlement and compliance simultaneously. Additionally, while the CWC requires the destruction of all chemical weapon stockpiles within the possessor states close to the storage facility,[164] the ongoing civil war persuaded the Security Council and the OPCW Executive Council to suspend several of the CWC provisions and allow some of Syria's chemical weapons to be destroyed outside Syria. In their decisions to do so, the councils noted that this exception was due to the extraordinary circumstances required to safely destroy Syria's chemical weapons, but should not set a precedent.

As of February 2015, 98 percent of Syria's declared category 1 and 89 percent of its category 2 chemicals have been destroyed in four countries (Finland, Germany, the United Kingdom, and on a US vessel).[165] Nevertheless, two of the three missions are still underway. The OPCW continues verifying fourteen CW production facilities to be destroyed in 2015, reviews Syrian stockpile declaration discrepancies, and investigates alleged and ongoing chlorine attacks.[166]

While many of the lessons of unilateral destruction are also applicable to the supervised dismantlement verification process, the Syria and Libya examples provide additional important lessons learned relevant to the Zone. First, in both cases, the disarmament process was very fast, mainly in order to ensure the most dangerous materials and weapons were destroyed before the leaders could change their minds

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Arab Republic on the alleged use of chemical weapons in the Ghouta area of Damascus on 21 August 2013," September 16, 2013, <www.un.org/ga/search/view_doc.asp?symbol=S/2013/553>.

[163] UN Office for Disarmament Affairs, "Frequently Asked Questions about the United Nations Mission to Investigate the Allegations of the Use of Chemical Weapons in the Syrian Arab Republic."

[164] Walker, "Syrian Chemical Weapons Destruction: Taking Stock and Looking Ahead."

[165] Anelli, "Removal and Destruction of Syrian Chemical Weapons."

[166] See Jean-Pascal Zanders, "After 99 years, back to chlorine," The *Trench*, April 22, 2014, <www.the-trench.org/back-to-chlorine/>.

or security further deteriorate. Libya and Syria disclosed their clandestine programs, agreed to their destruction, and destroyed most of the lethal material within a single year.

Second, the ad hoc verification arrangements that were utilized in some aspects of the verification processes allowed for great flexibility, adaptability, and flexibility, and, moreover, facilitated the building of a political coalition that legitimized the process while allowing the best qualified experts to be recruited and perform the verification job. If provisions for the irreversibility and verifiable dismantlement of existing WMD programs will be included in the future Zone, the current IAEA and OPCW mandates are insufficient for the task. In the case of the IAEA, the CSA and Additional Protocol provisions are insufficient to address information such as historical production of nuclear material and dismantlement. Likewise, confidentiality undertakings would need to be more rigorous, given the proliferation sensitive information involved.[167] In the case of the OPCW, the agency mandate is to verify declared stocks, only. Any other suspicious activity not declared by the state can be verified only by challenge inspection request initiated by another state party.

A third lesson is that even under a seemingly cooperative and willing dismantlement process, such as in Libya, or under international scrutiny, such as in Syria, verification of dismantlement can never provide absolute certainty of the absence of WMD. The discovery of previously unknown weapons and facilities in Libya and Syria introduces uncertainty as to the true scale of their chemical weapon stockpiles. Their discovery also demonstrates that the disarmament process is complicated, not always linear, and should allow some setbacks. Some uncertainty will always exist with regard to undeclared materials or sites. In disarmament, there is always the question of how much uncertainty one is willing to accept. Such uncertainty usually is of relatively little strategic importance if accompanied with the belief that the political decision to disarm was genuine. However, regimes can change and if weapons remain, these may be useable under the new regime.

A fourth lesson is related to confidentiality. While it is possible to assume that, under international supervision, sensitive information about weapon designs will stay confidential, states can hardly expect that the details of the verification process and findings will not be leaked or published. While all the IAEA and OPCW verification reports are titled confidential, many of the IAEA safeguards reports have been leaked and are currently available online. The report includes descriptions of activities, material, and sites, as well as proscribed activities that many of the inspected states would rather not see published. The Zone negotiators would have to determine which information related to the dismantlement verification process is necessary to be publicly available to ensure transparency and credibility, but at the same time determine which information should be kept sealed and confidential, not only due to proliferation concerns, but also to allow the disarmed state to be forthcoming with the process. At the same time, it is hard to imagine in today's technologically advanced society and leaks-prone age that not much more than the most sensitive weapons design will be kept secret.

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[167] Heinonen, "The Middle Eastern Weapons of Mass Destruction Free Zone (WMDFZ) – Nuclear Verification."

Table 2: Verification of WMD Dismantlement

Country	Weapons	Unilateral disarmament	International disarmament (voluntary/ coercive)	International verification of disarmament
South Africa	Nuclear	√		IAEA
	Chemical	√		-
	Biological	√		-
Iraq (1990s)	Nuclear		√ (c)	IAEA AT
	Chemical	√		UNSCOM/ UNMOVIC[168]
	Biological	√		UNSCOM/ UNMOVIC
	Missiles		√ (c)	UNSCOM/ UNMOVIC
Libya	Nuclear		√ (v)	US+UK+IAEA
	Chemical		√ (v)	OPCW
	Missiles		√ (v)	US+UK
Syria	Chemical	√	√ (v/c)	OPCW + UN

3.2. Verification of Compliance

Verification of compliance will constitute the main mechanism to deter and detect noncompliance in a timely enough fashion so as to allow a political solution and create confidence, via transparency, that treaty objectives are being met. Given the prevailing mistrust in the region, it is important to note that verification arrangements, no matter how intrusive or comprehensive, do not create guarantees against violations. However, transparency and effective verification can give a considerable measure of confidence that such activities are not taking place or provide an early warning should they occur.

Before addressing the verification of each of the four proposed areas of prohibited weapons, negotiators would have to address some general verification concepts in addition to objectives and terms of reference that could be applicable across the four weapons categories. Usually, a verification system is aimed at detecting a militarily significant noncompliance. What constitutes "militarily significant" will have to be determined by the negotiators on each of the four prohibited weapon systems. It is worth mentioning that not all four areas of prohibitions are easily quantifiable to establish what constitute "militarily significant," a subjective term which highly depends on a country's threat perception, ability to respond in a timely manner, and level of comfort with potential change in the status quo.

[168] The UN Monitoring, Verification, and Inspections Commission, or UNMOVIC, was the successor to UNSCOM, established through UNSCR 1284 of 1999.

Negotiators will also have to identify and agree upon who will be entrusted with verifying the Zone. They may consider a variation on one of three models: relying on existing verification mechanisms, creating a regional verification mechanism, or establishing a hybrid of regional and international verification mechanism.

If the decision is to rely on existing mechanisms, negotiators would have to agree that the measures under existing international regimes (IAEA for the NPT, OPCW for the CWC), will be sufficient to achieve the materialization and verifiability of the WMD zone requirements and prohibitions and to establish mutual confidence within the region about the absence of clandestine WMD activities. Since none of the four existing WMD regimes enjoys the membership of all states in the Middle East, the Zone negotiators could adopt then-Egyptian Foreign Minister Nabil Fahmy's suggestion in a September 2013 speech at the UNGA that all relevant regional states deposit official letters to the UNSG, committing to join all relevant WMD treaties at some unspecified but simultaneous point in the future.[169] Such an approach will create region-wide membership in the NPT, CWC, and BWC. It also assumes that no verification would be conducted for biological weapons or delivery systems. In case such an approach is adopted, a discussion could take place on which other international measures could also be adopted by all countries in the region (for example, CTBT, 1925 Geneva Protocol, export controls, safety and security treaties) and how verification of disarmament and compliance with the biological weapons and delivery systems free zone would be implemented.

If the negotiators choose to adopt a regional verification mechanism, much would have to be created. In practice, none of the existing NWFZs use a region-based verification mechanism because verification and compliance by the regional states was not as much a central concern as was compliance by outside-of-region NWS; relying on an existing mechanism proved sufficient.[170] If a regional verification mechanism is envisioned, the Zone negotiators will have to address issues related to capacity and expertise within regional states, budget, governors, as well as its relationship with existing verification institutions to avoid duplication.[171]

Even in the case of a newly created regional verification mechanism, some aspects of the existing ones can be borrowed, relied, or expanded upon. The following next sections examine each of the four areas of weapons—nuclear, chemical, biological, and delivery systems as related to the future Zone as well as existing verifications regimes that can inform the architects of a regional verification mechanism.

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[169] Nabil Fahmy, "Address to the 68th Session of the UN General Assembly," <http://gadebate.un.org/sites/default/files/gastatements/68/EG_en.pdf>.

[170] The existing five NWFZs have been created in regions free of protracted antagonism where states had relatively untroubled mutual relations and deadly interstate conflict was largely absent. Müller and Müller (eds.,) *WMD Arms Control in the Middle East: Prospects, Obstacles and Options*, p. 3.

[171] For preliminary work on creating regional verification organization, see Fawzy H. Hammad and Adel M. Ali, "Principles of Establishing A Middle East Weapons of Mass Destruction Free Zone Monitoring and Verification System," UNIDIR, 2004.

3.2.1. Nuclear-weapon-free-zone

The proliferation of nuclear weapons in the Middle East has been a source of constant contention. Israel is suspected of having nuclear weapons since the 1960s, five states have had nuclear weapon programs, and two are in noncompliance with their safeguards agreements with the IAEA. There is only one nuclear power reactor operating in the region (in Iran) but a handful of others are in the process or planning to build nuclear energy programs, including enrichment capabilities.

The Zone negotiators will have to consider which organization should verify the nuclear aspect of the Zone. IAEA safeguards form the basis for all the five existing NWFZs. According to all existing NWFZ, each state party should adopt a CSA with the IAEA, which is responsible for verifying compliance with their obligation to use nuclear energy solely for peaceful purposes. Only the Central Asian NWFZ requires that states in the region also adopt the IAEA Additional Protocol.

If negotiators choose to rely on existing mechanisms, the IAEA CSA, code 3.1,[172] and the Additional Protocol could serve as the verification basis for the Middle East NWFZ component of the WMDFZ. The IAEA can draw a conclusion that NNWS declarations are correct and complete only if the Additional Protocol is in place. As of September 2014, all states in the region—except Israel, Djibouti, and Somalia—signed a CSA with the IAEA. Iran and Syria are in violation of their agreements, and only eight states have ratified the AP: the United Arab Emirates (UAE), Bahrain, Jordan, Kuwait, Iraq, Libya, and Mauritania (see Annex 4). The negotiators should take into account, however, that the IAEA is mainly an accounting agency, verifying that all declared materials are used exclusively for peaceful purposes and none are diverted for proscribed activities. While the IAEA mandate has been expanded to cover undeclared activities, its budget and experts are very limited in verifying weaponization activities.

If the IAEA will be chosen as the verification organization for the nuclear portion of the Zone, the negotiators will have to address the status of significant quantities protocols (SQPs) in the region. States with only very small quantities of nuclear material[173] and none in a nuclear facility,

[172] In 1992, the IAEA's Board of Governors revised Code 3.1 to require states to report new nuclear facilities: "as soon as the decision to construct or to authorize construction has been taken, whichever is earlier." See IAEA, "Subsidiary arrangement to the agreement between The Government of […] and the International Atomic Energy Agency for the application of safeguards in connection with the treaty on the non-proliferation of nuclear weapons," November 2, 2011, <www.iaea.org/OurWork/SV/Safeguards/documents/Online_Version_SG-FM-1170_--_Model_Subsidiary_Arrangement_Code_1-9.pdf, Code 3.1.2>.

[173] According to the IAEA CSA (INFCIRC/153), the quantities should be less than those set out in paragraph 37, which are: (a) 1 kilogram in total of special fissionable material, which may consist of one or more of the following: (i) plutonium; uranium with an enrichment of 20 percent and above, taken account of by multiplying its weight by its enrichment; (iii) uranium with an enrichment below 20 percent and above that of natural uranium, taken account of by multiplying its weight by five times the square of its enrichment; (b) 10 metric tons in total of natural uranium and depleted uranium with an enrichment above 0.5 percent; (c) 20 metric tons of depleted uranium with an enrichment of 0.5 percent or below; and (d) 20 metric tons of thorium; or such greater amounts as may be specified by the Board of Governors (nota bene the Board has not taken any decision to increase those amounts).

are allowed under the IAEA CSA to conclude an SQP, which holds in abeyance most of the operative provisions of the IAEA's verification tools. An SQP suspends the state's obligation to provide the IAEA with an initial report on nuclear material and facilities in the state and the IAEA's right to verify such information. SQPs contain requirements for the state to notify the IAEA sufficiently in advance if either of those conditions change.

In 2005, the IAEA adopted a revised SQP after concluding the inability of the IAEA to verify that the states actually met the eligibility criteria, which had constituted a serious loophole in the safeguards system. As a result, states may not qualify for an SQP if they have made the decision to construct a new nuclear facility. The IAEA has since been engaged in the process of amending existing SQPs for states that still qualify under the revised eligibility requirements, and rescinding those for states that do not. In the Middle East, one state (Morocco) has already had its SQP rescinded, twelve have an operative SQP in force, of which three concluded a modified SQP (Bahrain, Djibouti, Qatar), three amended their old SQPs (Kuwait, Lebanon, Mauritania), and six still have an old SQP (Jordan, Oman, Saudi Arabia, Sudan, United Arab Emirates, and Yemen).[174]

While none of the established NWFZ treaties created a regional verification mechanism, two distinct regional-based verification approaches exist that could inform the Zone negotiators: the European Atomic Energy Community (Euratom) and the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC).

Euratom was created in 1957 to coordinate its member states' nuclear energy research programs. Chapter VII of the Euratom Treaty and the implementation of Euratom Regulation No. 302/2005 constitute the legal basis of Euratom safeguards. It is worth noting that the treaty establishing Euratom does not forbid the production of nuclear weapons since two of its members, France and the United Kingdom, are NWS. Euratom's safeguards are comprehensive in the case of the EU's NNWS, but only apply to the civilian nuclear activities of its two NWS.[175]

The objective of Euratom safeguards is to ensure that nuclear material is not diverted from its intended use within the European Union. The Euratom safeguards system, which was established in 1957 and pre-dated the NPT and IAEA safeguards regime, has important components that are stronger and, at times, more comprehensive than even the Additional Protocol, which is something the Zone negotiators may want to consider.

The application of safeguards under the IAEA starts when the material is introduced to a facility. Under the Additional Protocol, states need to declare location, operational status and the estimated annual production capacity of uranium mines and concentration plants and thorium concentration plants, which remain outside safeguards unless the state is suspected of undeclared activities. Safeguards

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[174] Laura Rockwood, "Ensuring the Peaceful Uses of Nuclear Energy in the Middle East," in *Ensuring the Safety, Security and Peaceful Nature of Nuclear Energy in the Middle East* (to be published 2015).
[175] David Fischer, "Nuclear Safeguards: The First Step," *IAEA Bulletin* 49, 2007.

in Euratom system begin with the ore. Additionally, in contrast to the IAEA's limited access even under the Additional Protocol, Euratom inspectors have access rights at all times to all places, data, and persons dealing with materials, equipment, or facilities subject to safeguards in order to verify compliance. This right of access can be enforced by the EU Court of Justice, if necessary.

The Euratom treaty created a direct link between the European Atomic Energy Commission and those subject to the safeguards system (operators) at all stages (regulation, enforcement, and sanctions stages). All users of nuclear materials are obliged to report directly to the Commission. Member states are requested to support and facilitate the Commission's tasks. The Commission has the right to receive and analyze the operators' declarations on nuclear materials and facilities, and to perform on-site inspections in order to verify a report's correctness.[176] As a result, special fissile materials are under the exclusive authority of the Commission (rather than the state), and in the particular case of a chemical reprocessing plant, the operator is required to ask the Commission for approval of the process used. The Euratom mandate also includes sanctions in case of safeguards violations, ranging from a mere warning to withdrawal of materials.[177]

The Euratom safeguards inspectorate based in Luxembourg is an organization within the European Commission. In 2010, Euratom's 150 inspectors carried out more than 1,400 inspections (with about 4,000 person-days of inspection). The inspectors are supported by a technical support unit and a nuclear materials accountancy unit.[178]

It is worth noting that Euratom does not have the same requirements as IAEA safeguards for timeliness of detection (i.e. some Euratom inspections are less frequent). Further, inspectors may be assigned to inspect their own state, contrary to the practice of the IAEA, which is concerned about the potential pressures that could be put on inspectors working in their own country.[179] On the other hand, because Euratom inspectors are lifetime employees of the Commission, they may be more immune from home country pressure.

In 1973, the IAEA and Euratom agreed to amalgamate the two safeguards systems. This opened the way for Euratom's NNWS members to ratify the NPT in 1975. By doing so, Euratom's NNWS also renounced the right to acquire nuclear weapons and accepted joint verification of this commitment by Euratom and the IAEA. The coordination between the two agencies is undertaken by a Liaison Committee and technical working groups. The integration of the two safeguards operations expanded in 1992 by an agreement between the secretariats of the two organizations

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[176] Piotr Szymanski, "The EURATOM Regional Safeguards System," presented at IAEA Forum on a Middle East NWFZ, Vienna, Austria, November 21, 2011, <www.iaea.org/sites/default/files/euratom211111.pdf>.

[177] Ugo Miranda, "EURATOM Safeguards as a Multinational System," in International training course on nuclear materials accountability for safeguards purposes, Santa Fe, New Mexico, May 27, 1980, <www.osti.gov/scitech/servlets/purl/6947436-Lt9Er9/>.

[178] Szymanski, "The EURATOM Regional Safeguards System."

[179] John Carlson, "Possible Future Regional Safeguards Arrangements," Presentation to the Annual Meeting of the Institute of Nuclear Materials Management, Palm Desert, California, July 17-21, 2011.

"on a new partnership approach" to enhance effectiveness, efficiency, and coordination. In 2004, the European Union signed the Additional Protocol. While activities related to research and development and non-nuclear materials and equipment are outside Euratom's mandate, they are now covered by the Additional Protocol. Inspections today at the sites are conducted by a joint team consisting of both Euratom and IAEA inspectors. Each team reaches its safeguards conclusions and findings independently.

Another example of a tailored verification organization is ABACC. In July 1991, Argentina and Brazil signed an agreement for the exclusive peaceful use of nuclear energy. The two states also established a Common System of Accounting and Control and an agency to account and control the material, ABACC, a bi-national safeguards agency aimed at verifying that the nuclear materials existing in both states are being used exclusively for peaceful purposes. In December 1991, Argentina, Brazil, ABACC, and the IAEA signed a full scope safeguards agreement called the Quadripartite Agreement—similar to INFCIRC/153 model agreements—which was brought into force in March 1994. The Quadripartite Agreement also includes a protocol on cooperation between the IAEA and ABACC aiming at coordinating safeguards activities to avoid duplicate inspections by the two agencies.

The inspections are performed on a cross-national basis; Argentine inspectors carry out inspections in Brazil and vice-versa. The list of inspectors must be approved by ABACC Board Directorate (Commission). The inspectors do not work permanently for ABACC but are convoked by the Secretariat whenever necessary. The team of inspectors consists of seventy-three individuals, thirty-four of whom are Argentinian and thirty-nine of which Brazilian. Some of the inspectors work for the States' Systems of Accounting for and Control and some are experts in a particular type of facility, due to his/her routine job, and are thus usually selected for inspections in the relevant kind of facilities. The advantage of the ABACC system is not only in the inspector expertise with the specific facility or technology he or she responsible to inspect but also the responsibility of performing inspections in the name of his/ her country. Samples collected by the inspectors during the inspection are analyzed on a cross basis in laboratories in Argentina and Brazil. While inspectors in the field make the first evaluation, planning and evaluation officers are responsible for the final evaluation and for preparing the notification of the inspection results to the state.[180]

ABACC inspectors work in conjunction with the IAEA, though both states believe that much could still be done to optimize the implementation of safeguards to avoid duplication while still allowing each organization to reach independent conclusions.[181]

While neither Argentina nor Brazil adopted the Additional Protocol, they adopted some safeguards measures that go beyond the CSA. In 2006, Brazil and Argentina agreed to allow the

[180] M. Marzo, H. Lee Gonzales, M. C. L. Iskin, H. Vicens, "Regional Safeguards Arrangements: The Argentina-Brazil experience," IAEA-SM-346/113, <www.abacc.org.br/artigos_antigos/iaea-sm-346-113.pdf>.
[181] Ibid.

IAEA short notice random inspections at fuel fabrication facilities in both countries. Although no longer operational, the gaseous diffusion enrichment plant at Pilcaniyeu in Argentina is still under IAEA safeguards. The agency verifies that the facility does not operate and that the material inventory has not changed.

Brazil refused to sign the Additional Protocol, and is thought to be reluctant to do so in order to protect the origins of its centrifuge program and not limit its pursuit of nuclear propulsion technology. The IAEA reached a unique agreement on safeguarding Brazil's enrichment facilities in Resende and Aramar. Under the agreement, inspectors are allowed to have limited visual access to the cascades and compare what they see to a validated set of baseline photographs held by the operator under IAEA seal, though they are not permitted to remove visual information from the site. The compromise, which also allowed Brazil to shroud access to the bearings in the first cascade module, applies only to the first stage of operation at Resende. The agreement will be renegotiated and the casings redesigned to permit normal safeguards to apply at the full-capacity plant. At Aramar, environmental sampling is permitted only for cylinders and the feed and withdrawal stations. At Resende, environmental sampling is also allowed inside the cascade hall. All inspections are essentially unannounced with full access to feed and withdrawal stations and the results of destructive assay measurements. Non Destructive Assay (NDA)[182]inside the cascade halls is not considered in the approach at Resende; however, the IAEA has been permitted to take supplemental NDA measurements at Aramar to compensate for the lack of complete visual access.[183]

While both Euratom and ABACC models cannot be directly and fully imported to the Middle East, many aspects are relevant to the Zone. The first is the way in which regional parties can adopt measures that address their regional concerns. Regional arrangements like mutual verification, central control on materials, more comprehensive safeguards of the fuel cycle, etc., may all be measures the Zone negotiators may consider. Another important aspect is the cost and effort required to establish and implement such a regional mechanism. It should also be noted that many states in the region lack the expertise and experts to implement such measures. The negotiators should be ready to address these gaps within or in parallel to negotiating the agreement.

3.2.2. The Relationship between the Zone and the NPT

There are symbiotic relations between NWFZs and the NPT. While the concept of NWFZs preceded the NPT, Article VII of the NPT affirms the right of states to establish specified zones free of nuclear weapons. NWFZs go beyond the NPT in that they liberate an entire region from the presence of nuclear weapons by explicitly prohibiting nuclear weapons from specific territory, which is not explicitly prohibited by the NPT (under the NPT, NWS are allowed to

[182] Non-Destructive Assay (NDA) is a measurement technique of an item's nuclear material content without producing significant physical or chemical changes to the item.
[183] M. D. Laughter, "Profile of World Uranium Enrichment Programs—2009," Oak Ridge National Laboratory, ORNL/TM-2009/110, April 2009.

possess nuclear weapons and station them in NNWS territory).[184] As a regional arrangement negotiated by the states of the region, NWFZs are tailored to fit the particular needs and realities of a region. For example, the treaties of Tlatelolco, Pelindaba, Rarotonga, and Bangkok were negotiated with concerns mainly over nuclear deployment, testing, and dumping of nuclear waste. Their provisions, therefore, emphasize these aspects. In the case of the Middle East, all regional states except Israel are party to the NPT. It is fair to assume that disarmament of existing WMD stockpiles, ensuring compliance and early detection of suspected WMD programs, and enforcement would be the main motivations and concerns.

Under the NPT and all NWFZs, states maintain their right to develop nuclear energy for peaceful purposes. Given the increased interest in nuclear energy in the Middle East,[185] but also the precedents of using nuclear energy programs as a cover for nuclear weapon programs, it is possible states in the region would decide to adopt additional restrictions on national nuclear energy programs to prevent future misuse or hedging.

In 1988, the UNSG published a "Study on Effective and Verifiable Measures which would facilitate the Establishment of a Nuclear-weapon-free Zone in the Middle East." While somewhat outdated, the UN study looked at the conditions surrounding the creation of NWFZs. The study made a number of recommendations, including a list of confidence-building measures. A 1989 IAEA Technical Study looked at various modalities for the application of safeguards on nuclear facilities in the Middle East as a necessary step to establishing a NWFZ.[186] The IAEA expanded on the 1989 document in 1992 and again in 2012 when it was submitted to the Middle East WMD Conference facilitator as a background document.[187]

The 1992 IAEA document identified three sets of measures regional states may consider, some of which go beyond the NPT:

> (1) Those precluding research and development on the possession, acquisition, manufacture, or stationing of nuclear weapons or nuclear explosive devices; (2) Those precluding research and development on the producing, importing, or stockpiling of weapon-usable materials (i.e. uranium enriched to 20 percent or more in uranium 235 and separated plutonium) and requiring the disclosure of all nuclear activities, including research and development, imports, exports, and production; and (3) Those requiring the application of safeguards to all nuclear material, installations, and relevant equipment and non-nuclear material.

[184] Müller, Melamud, and Péczeli, "From Nuclear Weapons to WMD: The Development and Added Value of the WMD-Free Zone Concept."

[185] "UN Study on Effective and Verifiable Measures Which Would Facilitate the Establishment of Nuclear-weapon-free Zone in the Middle East," 1991, <www.un.org/disarmament/HomePage/ODAPublications/DisarmamentStudySeries/PDF/SS-22.pdf>.

[186] IAEA, "Modalities of Application of Agency Safeguards in The Middle East."

[187] IAEA, "Application of IAEA Safeguards in the Middle East, Addendum," Report by the Director General, September13, 2013, GOV/2013/33/Add.1-GC(57)/10/Add.1, <www.iaea.org/About/Policy/GC/GC57/GC57Documents/English/gc57-10-add1_en.pdf>.

In case states in the region decide to adopt more restrictive measures than those allowed under the NPT, they will have to define these constraints as related to their rights under the NPT. In addition to the measures identified by the IAEA in 1992, measures could also include forgoing national enrichment and reprocessing capabilities, adoption of the Additional Protocol as condition of supply, creation of a regional nuclear fuel bank, the establishment of a regional enrichment facility, etc. In such a case, the region would have to develop a tailored verification mechanism since the current IAEA mandate does not cover such obligations.

In particular, the Zone negotiators would have to discuss whether enrichment and reprocessing activities, which are allowed under the NPT and the other existing NWFZs, would be allowed in the future Zone. In any case, a ban on research and development work related to nuclear weapons would be advisable, although complicated to verify.

If enrichment[188] and reprocessing[189] activities are allowed in the future Zone, the negotiators should be willing to leave existing capabilities intact, as long as they are under safeguards, and other states should be allowed to acquire these technologies in the future. The negotiators will also have to assess whether the IAEA's current mandate to verify compliance is sufficient. In fact, if the Zone allows enrichment and reprocessing in the region, negotiators would have to address the issue of latency or hedging, since such technologies inherently constitute a latent weapon capability.[190] Hedging can be addressed—not just by cooperative mechanisms such as a regional fuel bank or reprocessing and enrichment centers etc.—but also by rewarding those who completely renounce enrichment and reprocessing, such as with security guarantees.[191] Security guarantees can be given by one, or all of the NWSs, or by the UNSC.

The Zone negotiators may alternatively decide to cap enrichment and reprocessing capabilities at certain levels (limitation on the level of enrichment or the number of centrifuges based on their type and efficiency) or by certain criteria (how much enrich uranium can be "in state"). Specific ideas for such limitations could include: 1) limiting enrichment to less than 6 percent; 2) limiting the size of an enriched stockpile where it exists to "just-in-time" working stock; 3) not allowing retained enriched uranium in any other form, either in gaseous or oxide form;[192] and 4)

[188] Israel is suspected to have enrichment technology. Iran has centrifuge enrichment capabilities, the future size and type of which are being discussed through the P5+1 negotiations. Several states like Jordan and Saudi Arabia have indicated they may use enrichment technology for their future nuclear energy programs.

[189] Israel is suspected to have reprocessing technology, and Egypt and Iran have explored reprocessing on a laboratory scale. Arak, the heavy water reactor under construction in Iran, could be use for plutonium production. Syria's reactor, destroyed by Israel in 2007, was a copy of North Korea's plutonium production reactor.

[190] Ahmed Abdel Halim, "Middle East Regional Arms Control and Security," in Shai Feldman (ed.), "Confidence Building and Verification: Prospects in the Middle East," JCSS Study no. 25, 1994, p. 178.

[191] Peter Jones, "A WMD Free Zone Within a Broader Gulf and Middle East Security Architecture," Policy Analysis Papers, 2005, Geneva: Gulf Research Center, <http://mercury.ethz.ch/serviceengine/Files/ISN/14747/ipublicationdocument_singledocument/717fc985–99ec-4e84-a12e-cc43f215e442/en/2005–03_WMD+-+Peter+Jones+Digital.pdf>.

[192] von Hippel, Mousavian, Kiyaei, Feiveson, and Mian, "Fissile Material Controls in the Middle East: Steps toward a Middle East Zone Free of Nuclear Weapons and all other Weapons of Mass Destruction."

adopting additional safeguards measures beyond the IAEA current mandate. Additional safeguards measures could include accounting procedures for the production, assembly, and installation of key centrifuge components or continuous video monitoring of key points in enrichment facilities, such as the feed and withdrawal points. The existing IAEA safeguards regime would be insufficient to verify such restrictions without a separate verification mechanism and mandate.

In particular, verification on enrichment technologies could be a challenge. While airborne sensors could be used for detection of plutonium production at undeclared facilities, the remote detection of uranium enrichment, especially by centrifuges, is a much more complicated task. Centrifuge facilities are relatively small, highly flexible, easy to hide, and much less resource-intensive than alternative options.[193] They are particularly attractive because HEU is easier to handle and use in nuclear weapons than plutonium, and can be deployed for ostensibly peaceful purposes and then rapidly used to make fissile material for weapons without significant modification or delay. History suggests that under the existing safeguards measures, indigenous centrifuge programs can be built and kept secret for years, even decades.[194] If additional restrictions and verification measures are adopted, the Zone negotiators will have to agree on the organization and procedures to exercise them.

If enrichment and reprocessing activities are banned under the Zone, the negotiators should consider also including a ban on the use of plutonium as reactor fuel. Today, only states that reprocess their spent fuel use plutonium as a fuel.[195] To verify the absence of reprocessing activities and shutdown reprocessing facilities, verification could include remote detection. This could also include agreements to allow mutual over-flights of unarmed instrumented aircraft or drones to detect indications of clandestine nuclear facilities. The 1992 Open Skies Treaty between NATO and the Warsaw Pact could inform the Zone negotiators for such an arrangement. That treaty allowed forty-two over-flights a year over the United States and Russia/Belarus each, and a lesser number over other smaller countries (up to twelve per year). The sensors on the aircrafts of the Open Skies Treaty include optical, infrared, and synthetic aperture radar, but other sensors for collecting, processing, and analyzing air samples could be added by consensus.[196] If adopted, the Zone negotiators would have to agree on the organization to exercise such measures and—given the mistrust and fear of military strikes against nuclear facilities—whether regional countries or a third party would fly the airplanes.

A ban on the use of HEU should also be expanded to reactor fuel, in naval nuclear propulsion reactors,[197] and the thorium/uranium-233 fuel cycle. Currently, only three reactors in the region

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[193] R. Scott Kemp, "Centrifuges: A New Era for Nuclear Proliferation," June 5, 2012, <http://npolicy.org/article_file/Centrifuges-_A_new_era_for_nuclear_proliferation.pdf>.

[194] Ibid.

[195] von Hippel, Mousavian, Kiyaei, Feiveson, and Mian, "Fissile Material Controls in the Middle East."

[196] Ibid.

[197] Non-nuclear-weapon states are allowed to remove from safeguards nuclear material intended for non-proscribed military use, under arrangements to be agreed upon with the IAEA, for reasons such as nuclear propulsion for submarines. Some naval reactors operate with HEU fuel, increasing the possibility of a "legitimate" HEU production for this purpose, hence, an opportunity for diversion. See: Heinonen, "The Middle Eastern Weapons of Mass Destruction Free Zone."

are known to operate on HEU; the IRR-1[198] in Israel and the Miniature Neutron Source reactors in Iran and Syria.[199] As of January 2014, the Nuclear Threat Initiative estimated that Israel holds 34 kilograms of HEU, Iran 7 kilograms (all irradiated), and Syria 1 kilogram.[200] So far, only Iran expressed interest in considering nuclear propulsion for submarines. Converting the three HEU-fueled reactors from HEU to LEU and repatriating the HEU to its original supplier are technically straightforward tasks that have become the norm with HEU research reactors. In fact, Iraq and Turkey were cleared from HEU, and Israel has returned most of its US-originated HEU.[201]

Another possible option is that the Zone could ban national enrichment and reprocessing capabilities, but allow them under multinational control. In 2007, for example, Saudi Arabia, on behalf of the Gulf Cooperative Council, announced an offer to launch a regional enrichment consortium to establish an enrichment facility under the supervision of the IAEA in a neutral country, outside the region, for all users of enriched uranium in the Middle East. That proposal, however, has not gained any traction.[202]

Negotiations on a regional-based enrichment and reprocessing solution would have to address several issues. First, if states are required to refrain from domestic fuel making (or at least limited in their capacity), it could provoke problems related to energy security and supply assurances. Secondly, some states will expect to share technological know-how with their cooperating partners and thus advance in all stages of the fuel cycle. Remaining a simple recipient of nuclear technology may not be a satisfactory perspective for some states, as many of them associate nuclear prowess with modernity, development, and their chance to "catch up" with the industrialized world. Negotiators would also have to discuss the eligibility, ownership, verification, governance, and management criteria of such an arrangement. As mentioned above, many of the existing multinational nuclear arrangements include criteria under which only a few countries in the region would be currently eligible to enjoy the benefits of or be a member.[203]

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[198] Israel expects to shut down IRR-1 by 2017 or 2018. A shipment of spent HEU fuel from IRR-1 was returned to the United States in January 2010.

[199] The Miniature Neutron Source reactors in Iran and Syria contain only about 1 kilogram of HEU each. Both were supplied by China. A conversion plan for the Miniature Neutron Source reactors to operate on 12 percent LEU was launched in 2005 as a cooperative project between the IAEA, China, and the United States. Conversion of the reactors in Iran and Syria has been delayed, however, by the controversies over their nuclear programs and the civil war in Syria. See: von Hippel, Mousavian, Kiyaei, Feiveson, and Mian, "Fissile Material Controls in the Middle East."

[200] For the detailed estimates, see Nuclear Threat Initiative, "Civilian HEU: Who Has What," January 2014,<www.nti.org/media/pdfs/heu_who_has_what_1.pdf?_=1355442796>.

[201] The United States and Russia agreed in 2005 to provide LEU stocks for any US- or Russian-designed research reactor operating with HEU. Spent or remaining fresh HEU would be repatriated to its country of origin.

[202] Mark Fitzpatrick, "Drawing a Bright Redline: Forestalling Nuclear Proliferation in the Middle East," *Arms Control Today*, Jan/Feb 2009, <www.armscontrol.org/act/2009_01-02/Fitzpatrick>.

[203] Giorgio Franceschini, "Peaceful Uses of Nuclear Energy in the Middle East: Multilateral Nuclear Approaches," in Müller and Müller, eds., *WMD Arms Control in the Middle East.*

3.2.3. Chemical-weapon-free-zone

The proliferation and use of chemical weapons in the Middle East is a prevailing threat to the people of the region. Experts assess that, following the Syrian chemical weapons dismantlement, no Middle Eastern state appears to have significant or active chemical warfare capacity.[204] Nevertheless, at least six Middle East states have possessed, or are suspected of possessing chemical weapons— Egypt, Iran, Iraq, Israel, Syria, and Libya. Most of Iraq's chemical weapons were dismantled in the 1990s,[205] Iran declared it dismantled its program in the 1990s before it joined the CWC,[206] and most of Libya's chemical weapons were destroyed after Qaddafi renounced his country's WMD programs in 2003.[207] In addition, the region has witnessed at least four instances of chemical weapons use–by Egypt against Yemen in the 1960s during the Yemen civil war;[208] by Libya in Chad in the mid-1980s;[209] by Saddam Hussein in the 1980s during the Iraq-Iran War against Iran and the Kurdish population in Iraq;[210] and the allegations since 2013 that Bashar al-Assad used CW against the opposition forces in Syria during the ongoing civil war.[211] Many states in the region have developed extensive chemical defense programs and an advanced chemical industries with dual-use applications.

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[204] Jean Pascal Zanders, "Biological and Chemical Weapons and the Prospective Disarmament Process in the Middle East," p. 150.

[205] Between 2004 and 2011, US forces in Iraq found thousands of old chemical munitions in hidden caches and roadside bombs, remnants of Iraq's 1980s-era chemical weapon program. Since June 2014, the ruins of Muthanna State Establishment, the center of Iraqi chemical agent production in the 1980s where many chemical weapon incidents clustered, has been held by the Islamic State. In a letter sent to the United Nations, the Iraqi government said that about 2,500 corroded chemical rockets remained on the grounds, and that Iraqi officials had witnessed intruders looting equipment before militants shut down the surveillance cameras. See C.J. Chivers, "The Secret Casualties of Iraq's Abandoned Chemical Weapons," *New York Times*, Oct. 14, 2014, <www.nytimes.com/interactive/2014/10/14/world/middleeast/us-casualties-of-iraq-chemical-weapons.html?_r=0>.

[206] Iran declared to the OPCW it pursued a chemical weapon program during the last years of the Iran-Iraq war. In its initial declaration to the OPCW, Iran declared one chemical weapons production facility, which it destroyed before ratifying the CWC. OPCW inspectors confirmed that the facility had been disabled. Mohammad R. Alborzi, "Statement to the Third Session of the Conference of the States Parties of the Chemical Weapons Convention," November 16-20, 2000; "Islamic Republic of Iran: Destruction of CWPFs," Position Paper to the chemical weapons convention preparatory meeting, Oct. 15, 1993, PC-V/B/WP.4, and Islamic Republic of Iran: Declaration of Buried and Dumped Chemical Weapons, Oct. 28, 1996, PC-XV/B/WP.5.

[207] Libya still holds 850 metric tons of category 2 chemical precursors.

[208] Albert J. Mauroni, *Chemical and Biological Warfare: A Reference Handbook*, 2007, pp. 196-97.

[209] Libya is suspected to have used Iranian-supplied chemical weapons against military forces in Chad in 1986 and 1987. See Christopher M. Blanchard and Jim Zanotti, "Libya: Background and U.S. Relations," RL33142, Congressional Research Service, February 18, 2011, p. 30.

[210] Mauroni, *Chemical and Biological Warfare: A Reference Handbook*, pp. 198-201.

[211] United Nations, "Report of the United Nations Mission to Investigate Allegations of the Use of Chemical Weapons in the Syrian Arab Republic on the alleged use of chemical weapons in the Ghouta area of Damascus on 21 August 2013," September 16, 2013, <www.un.org/ga/search/view_doc.asp?symbol=S/2013/553>; OPCW, "Executive Council Discusses Findings of Fact-Finding Mission," September 26, 2014, <www.opcw.org/news/article/opcw-fact-finding-mission-compelling-confirmation-that-chlorine-gas-used-as-weapon-in-syria/>; OPCW Executive Council Decision, "Reports of the OPCW Fact-Finding Mission in Syria, "EC-M-48/DEC.1, February 4, 2015, <www.opcw.org/index.php?eID=dam_frontend_push&docID=18290>.

While there is no established regional CWFZ per se (some regions are chemical-weapon-free), there is at least one regional initiative that could inform Zone negotiators with regard to verification of compliance: the negotiated draft on a Central European CWFZ written by a group of experts, jointly established in 1984 by the East German Socialist Unity Party and West German Social Democratic Party. The core of the verification system, which had been discussed before the CWC negotiations, was based on national means of verification and domestic measures to implement the treaty obligations. The state parties were to exchange information and experience, but without an obligation to declare exact chemical weapons stockpiles at the initial stages of implementation. Beyond the national level, international verification mechanisms by a permanent international commission were also envisioned. Additionally, on-site inspections and challenge mechanisms were proposed, especially at the locations suspected of housing chemical weapons.[212]

3.2.4. The Relationship between the Zone and the CWC

Compliance with the CWC is monitored and verified by the OPCW. Given its experience regarding the verification of the dismantlement of chemical weapon programs, in particular in the Middle East (in Libya and Syria), as well as mandates and detailed procedures for conducting challenge inspections or investigations of alleged CW use against a member state, the organization can be valuable in verification discussions for the Zone.

The CWC is in force in all Middle East states except Egypt and Israel. Israel has signed but not ratified the treaty; Egypt has yet to do either. Syria acceded to the convention in October 2013 after the Ghouta attack, and declared its inventories to the join UN and OPCW mission, which then supervised the destruction of some in Syria and removed the rest to sea before destroying them in Europe, aboard the US ship MV Cape Ray and in the United States. Syria's compliance status with the CWC is still under debate. It is still updating its initial declaration after the discovery of undeclared materials and facilities, and the OPCW continues to investigate the use of chlorine "systematically and repeatedly" against opposition forces.[213]

The 1925 Geneva Protocol also prohibits the use of chemical and biological weapons by states. All Middle East states are parties to the Geneva Protocol, with the exception of Oman and the UAE.[214] The protocol does not have a verification mechanism. Nevertheless, the UN Secretary-General's investigative mechanism was mandated in 1980s with the authority to exercise fact-finding missions to ascertain alleged violations of the Geneva Protocol. The investigative mechanism therefore applies to both prohibitions of chemical and biological weapon use. The

[212] For a detailed account of the initiative, see Ralf Trapp, "Chemical Weapon Free Zones?," SIPRI Chemical & Biological Warfare Studies no. 7 (Oxford University Press: Oxford, 1987).
[213] OPCW, "Executive Council Discusses Findings of Fact-Finding Mission;" and OPCW Executive Council Decision, "Reports of the OPCW Fact-Finding Mission in Syria."
[214] The protocol does not cover internal or civil conflicts production, storage, or transfer of these weapons.

United Nations maintains its own rosters of national experts, and more recently signed bilateral memoranda of understanding with the OPCW and the World Health Organization (WHO) in order to be able to draw on the specific expertise and procedures available in both organizations.[215]

If the OPCW were to be used as the organization to verify compliance with the CWFZ aspect of the Zone, the negotiators will have to discuss at least four issues related to the verification mechanism which are not or only partly covered through the CWC and the OPCW. First, the frequency and nature of the challenge inspections would need to be discussed. The CWC verification mechanism is very intrusive upon government agencies, military installations, and civil industry. There is no right of refusal, with all types of on-site inspections having provisions for managed access. It is conceivable that with the current mistrust in the region, challenge inspections to establish compliance would be a routine rather than a rare case. This is also true since some states in the region have advanced chemical industry, R&D, and defense industries capable of diverting dual-use materials for weapons purposes. The issue of how often the verification organization will utilize a special inspection and who can initiate it is relevant also to the other WMDs covered by the Zone. The key benefits of these inspections are that they deter potential violators, increase confidence in states' compliance, and provide a tool to verify potential violation in timely fashion. However, current verification organizations (namely the IAEA and OPCW) have used these mechanisms extremely rarely. It should be noted that the mandate to invoke them is different in each organization; in the IAEA, the agency can request a special inspection, though under the CWC (and for the CTBTO), only a member state can request a special or on-site inspection in the case of suspected noncompliance. In fact, the IAEA used it only twice, in Romania and North Korea, and the OPCW has yet to use this measure, even in the Syrian case, where chlorine was used repeatedly after Syria signed the CWC. Several experts claim that since chlorine (and other toxicants, such as riot control agents or incapacitants) is not listed in one of the CWC schedules, it is not covered by the CWC, and therefore its use is not a violation of the treaty. Such a claim is incorrect under the general purpose criteria of the CWC.[216] The Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) cannot exercise an on-site inspection until the treaty enters into force.

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[215] Jean Pascal Zanders, "Biological and Chemical Weapons Verification Proposals for Transparency-enhancing and Confidence-building Measures," Policy Briefs No. 34, Academic Peace Orchestra Middle East, Peace Research Institute Frankfurt, October 2014, <www.the-trench.org/wp-content/uploads/2013/06/201410-APOME-ME-CBW-verification.pdf>.

[216] Under the CWC, a chemical weapon is "Any chemical which through its chemical action on life processes can cause death, temporary incapacitation or permanent harm to humans or animals." There are only four categories of purposes (Art. II, 9), under which a toxic chemical would not be considered a weapon:

(a) Industrial, agricultural, research, medical, pharmaceutical or other peaceful purposes;

(b) Protective purposes, namely those purposes directly related to protection against toxic chemicals and to protection against chemical weapons;

(c) Military purposes not connected with the use of chemical weapons and not dependent on the use of the toxic properties of chemicals as a method of warfare;

(d) Law enforcement including domestic riot control purposes.

The failure to use this tool has become self-reinforcing; the longer the provisions are not used, the more they are regarded as very politically controversial. As a result, the tool has an unnecessarily negative connotation. The IAEA and OPCW reinforce this by calling them "visits" or "fact-finding" missions when they use the tool informally to avoid the confrontational stigma of special or challenge inspections. While named differently, the approach demonstrated the utility of a non-contentious, cooperative approach to special inspections as an opportunity for the state to provide the international community clarifications and assurances through the verifying organization.[217]The downside of using it under a different title is the absence of recourse in case the issue has not been resolved or the country does not cooperate.

Some experts suggest that, in order for Zone verification to be effective given the prevailing mistrust among regional states, a verification mechanism would have to be geared toward conducting non-routine challenge inspections on a more regular basis, at least during the initial phase of the Zone implementation, until trust builds.[218] Raising the bar of evoking it and establishing high penalties for abusing it can reduce the probability of misusing this tool. For example, under the CWC and the CTBT, challenge and on-site inspections, respectively, can only be carried out upon the request by a state party. Zone negotiators would have to debate the advantages and disadvantages of placing the authority of special inspections with member states versus the verification body. According to the CWC and CTBT, the state party subjected to such an inspection cannot refuse it and it must provide full access to the inspection area. At the same time, in the case that an on-site or challenge inspection request turns out to be "frivolous or abusive," the requesting state party may be required to pay for the costs associated with the inspection, and—under the CTBT—also have its right to request another on-site inspection temporarily suspended, along with its right to serve on the Executive Council.[219] Of course, these measures can be adjusted as relevant to the Zone's specific needs and nature of the verification system.

Second, while the OPCW developed elaborate mechanisms to verify CW dismantlement, the verification tools needed to verify legitimate activities (industry, trade, etc.) are less developed in the case of trade and rarely implemented in the case of industry, compared to those for overseeing weapon destruction. For example, Euratom conducts 1,400 inspections per year, compared to a little more than 100 conducted by the OPCW a year. While parties to the CWC may develop these in the future, regional states may have to strengthen these measures to ensure compliance within the Zone.

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[217] John Carlson and Russell Leslie, "Special Inspections Revisited," paper presented at INMM 2005 symposium Phoenix, USA, July 2005, <www.dfat.gov.au/asno/publications/inmm2005_special_inspections.pdf>.

[218] See Office of Technology Assessment, Nuclear Safeguards and the International Atomic Energy Agency, Washington DC, April 1995; Carlson and Leslie, "Special Inspections Revisited;" and Pugwash Conferences, "First Steps of a Nuclear Dialogue in the Middle East," November 18, 2011, Helsinki, Finland, <http://pugwashconferences.files.wordpress.com/2013/12/201111_helsinki_wmdfz_finnishpugwash_report.pdf>.

[219] CTBTO, "The Final Verification Measure," <www.ctbto.org/verification-regime/on-site-inspection/the-final-verification-measure/>.

Another issue is assuring that regional CWC state parties in the region, which have had chemical weapons programs and declared them defunct (such as Iraq, Iran, Libya and Syria), are indeed in full compliance with their treaty obligations. Since it is not unconceivable that states in the region have violated treaties to which they are party, such violations may be discovered through the new verification mechanism. An amnesty process could be established under which state can "come clean" with their past activities with being penalized only minimally. Former US Ambassador Thomas Pickering described such a process as "a no fault" process. "You tell the truth, and the whole truth, there are no consequences. If you don't tell the truth, there are all conceivable consequences."[220] For such a measure to be adopted, discussions with existing international organizations responsible for verifying specific treaties will have to take place to ensure it does not erode the current nonproliferation regimes. One option is that the country will be under stricter verification process for a defined period. Adopting such a measure could allow regional states to come clean of their violations and allow them to declare a more credible baseline of facilities, activities, and inventories as part of the Zone.

Also, destruction of declared stockpiles should be completed. These include Libya's 850 metric tons of precursor chemicals, Iraq's unknown quantity of chemical agents and precursor chemicals left in two large bunkers at the chemical complex, al Muthanna (currently controlled by the Islamic State militant group), and the remainder of Syria's chemical program.[221]

A fifth aspect is the use or possession of chemical weapons by non-state actors in uncontrolled territories. While UNSCR 1540 requires all states to refrain from supporting non-state actors that attempt to acquire, use, or transfer WMD and their delivery systems, there is a growing prominence of non-state terrorist organizations in the region with the ability to seize control over large territories, people, and financial institutions. A case in point is the Islamic State in Iraq and Syria (ISIS), which seized uranium compounds from Iraq's Mosul University in 2014, as well as 2,500 chemical rockets filled with the nerve agent sarin, other chemical remnants, and some empty delivery mechanisms from al Muthanna.[222] Further, the Free Syrian Army gained control over the former Syrian nuclear reactor site, Al Kibar, which had been converted after 2009 to a missile base. While these materials did not provide ISIS with the capacities it sought—the uranium compounds at Mosul University were "low grade" and did not pose a significant security risk, the chemicals weapons in al Muthanna too old and contaminated to safely be used or moved,

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[220] Thomas Pickering, Remarks during panel on "Preventing a Nuclear-Armed Iran," at the Meeting the Next Challenges on Nuclear Nonproliferation and Disarmament Conference, Arms Control Association, June 4, 2012, <www.armscontrol.org/events/Join-ACA-June-4-Our-Annual-Meeting%20>.

[221] As of December 2014, the OPCW continues to verify fourteen chemical weapon production facilities in Syria, to be destroyed in 2015, and reviews discrepancies in the Syrian stockpile declaration, as well as investigates alleged and ongoing chlorine attacks, despite the CWC prohibition against them.

[222] Julian Borger, "The Mosul Mystery: The missing uranium and where it came from," *Guardian*, July 13, 2014, <www.theguardian.com/world/julian-borger-global-security-blog/2014/jul/13/iraq-nuclear-mosul-uranium-isis>, and Julian E. Barnes, "Sunni Extremists in Iraq Occupy Hussein's Chemical Weapons Facility," *Wall Street Journal*, June 19, 2014, <www.wsj.com/articles/sunni-extremists-in-iraq-occupy-saddams-chemical-weapons-facility-1403190600>.

and the Syrian reactor site destroyed—the trends show that non-state actors in the region are interested in WMD and capable of seizing control of important assets. Even more worrisome are allegations that ISIS, in its various incarnations, has used chlorine multiple times since 2006 in Iraq and Syria.[223] For further discussion on the Zone and non-state actors, see 4.4.2.

3.2.5. Biological-weapon-free-zone

It is unclear if there are biological weapons, active weapons programs, or any residual biological weapon programs in the region. No state openly admits to an offensive biological weapons program. Iraq's biological weapons were destroyed in the 1990s by UNSCOM. Nevertheless, some states in the region have the knowledge and infrastructure to develop and produce biological agents for offensive use within a modest time frame if there is a political decision to do so.[224] Additionally, while most experts doubt the current military utility of biological weapons in national security strategy, recent advances in biotechnology, if exploited, could become an attractive option for weapons purposes.[225]

There are currently no BWFZs per se that can inform the Zone negotiators on a verification mechanism to the BWFZ aspect of the Zone.[226] If Zone negotiators conclude that a verification mechanism will be required, they could look at past discussions within the BWC review process on the verification protocol. Even if negotiators reach an agreement on verifying the BWFZ, they would have to identify or establish a body that would have the requisite verification capabilities.

3.2.6. The Relationship between the Zone and the BWC

As of February 2015, three states from the region have signed but not ratified the BWC: Egypt, Somalia, and Syria. Three states from the region have neither signed nor ratified the treaty: Comoros, Djibouti, and Israel. It should be noted that the BWC does not directly prohibit biological weapon use (it is indirectly covered via reference to the 1925 Geneva Protocol). It also does not prohibit research. Therefore, the Zone negotiators will need to assess whether the regional agreement will explicitly cover such prohibitions and, if so, which verification mechanism should be used to ensure compliance.

The BWC does not include a mechanism to verify compliance or an international organization to implement the treaty. The BWC Implementation Support Unit (ISU) is a three-person unit

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[223] Jean Pascal Zanders, "Chlorine: A Weapon of Last Resort for ISIL?" The *Trench*, October 27, 2014, <www.the-trench.org/chlorine-isil/>; and Jean Pascal Zanders, "Chlorine: A Weapon of Last Resort for ISIL?" The *Trench*, February 18, 2015, <www.the-trench.org/chlorine-isil-2/>.

[224] Jean Pascal Zanders, "Biological and Chemical Weapons and the Prospective Disarmament Process in the Middle East," p. 150.

[225] Alexander Kelle, Kathryn Nixdorff, and Malcolm Dando, *Preventing a Biochemical Arms Race* (Stanford, CA: Stanford University Press), 2012.

[226] All the members of the European Union, and all the former Soviet states are party to the BWC, and as such their regions are in practice presumed to be free of all biological weapons.

created to: provide administrative support to meetings agreed to by the BWC review conferences; support the comprehensive implementation and universalization of the treaty; exchange confidence-building measures; create and run a database on requests for, and offers to provide, assistance; and support the implementation of the decisions and recommendations of the BWC Review Conferences.

The BWC provides for bi- and multilateral consultations to resolve any problem with its implementation and allows state parties to request the UNSC to investigate alleged breaches of the BWC (this provision has never been exercised). Any BWC state party can request the UNSC to investigate alleged biological weapon use. Additionally, any UN member state can request the UNSG to invoke its investigation mechanism in response to a suspected use of biological (or chemical) weapon.

The BWC review conferences have requested state parties provide, as a CBM, annual reports using agreed upon forms on specific activities related to the BWC, such as a declaration of past activities for offensive and/or defensive biological research and development programs. These measures are not intended as an instrument to ensure or verify compliance with the treaty, but state parties are encouraged to submit them in order to reduce uncertainty and increase transparency with regard to relevant state activities. While required under the BWC, only 70 out of the 173 states party submit the CBMs. The BWC ISU, which circulates these reports for the BWC review conferences, also reports annually on participation in this CBM process to BWC meetings. However, the ISU does not have the mandate to provide analysis, or evaluate the data submitted.[227] Thirteen states from the region have submitted the CBM form at least once: Bahrain, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Qatar, Saudi Arabia, Tunisia, UAE, and Yemen. Of these, seven states regularly submit the CBM forms: Iran, Iraq, Lebanon, Libya, Morocco, Qatar, and Tunisia. State parties are also requested to provide reports on their compliance with their obligations under the BWC at the quinquennial review. At the Seventh Review Conference in 2011, only two states from the region, Iran and Qatar, provided such reports.[228]

Additional information collected (but not evaluated) by the ISU pertains to laws, regulations, and other measures relevant to the implementation of the BWC. According to the BWC ISU database, as of November 2011, thirteen states from the region (Algeria, Egypt, Iraq, Iran, Israel, Jordan, Libya, Morocco, Oman, Qatar, Syria, Tunisia, and the UAE) adopted such measures.[229]

Zone negotiators could decide that the CBMs requested to be submitted under the BWC will be a requirement under the Zone. Additional CBMs could also include civil biodefense programs

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[227] David Friedman, "Towards WMDFZ in the Middle East: Biological Confidence-building Measures," in Müller and Müller, eds., *WMD Arms Control in the Middle East*, p. 178.

[228] BWC Implementation Support Unit, "Background documentation for the 2012 Conference on the establishment of a Middle East zone free of nuclear weapons and all other weapons of mass destruction," The Biological Weapons Convention and related activities (not published).

[229] See the BWC ISU National Implementation Database, <www.unog.ch/bwc/NID>.

and scientific and technological advances. The negotiators would also have to consider whether to publish the detailed reports (the BWC ISU published the reports) and whether and who will analyze and evaluate the national reports.

3.2.7. Delivery-system-free Zone

Of the thirty-five or so states in the world possessing missiles with ranges in excess of 150 km, more than a third are from the Middle East. The region also witnessed the most extensive use of ballistic and cruise missiles anywhere in the world since the end of World War II.[230] A total of six states in the region operate ballistic missiles and/or space launch vehicles. Unguided rockets are in the possession of most Middle Eastern states. Several states in the region also adopted a missile-centric defense policy.[231] Additionally, nongovernmental armed factions and radical organizations in the region rely on rockets as their primary strike force.[232]

Tackling the issue of a delivery-system-free zone is one of the most unexplored territories internationally as well as regionally. The Zone negotiators will have to decide how to define what is prohibited and how to verify this aspect of the Zone given that most, if not all delivery systems, can be used both for conventional and unconventional purposes and in principle, any aircraft, unmanned aerial vehicle, or missile with a range of 70 kilometers or more can carry a WMD warhead.[233]

Currently, there is no legally binding multilateral or regional instrument limiting the development, possession, deployment, or use of delivery systems for non-conventional ordnance. There are, however, several international and regional arrangements that can inform the Zone negotiators. The BWC and CWC, for example, prohibit equipment specifically designed for use with proscribed warfare agents. This includes warheads, bombs, spray tanks, rockets, and other dissemination devices, but not their carriers, such as ballistic missiles, aircraft, artillery guns, or rocket launchers.[234] Additionally, there are three international measures that address delivery systems: the UN Register of Conventional Arms, the MTCR, and the Hague Code of Conduct against Ballistic Missile Proliferation (HCOC).

The 1991 United Nations Register of Conventional Arms invites all UN member states to report annually, on a voluntary basis, transfers (imports and exports) on seven categories of major conventional weapons: battle tanks, armored combat vehicles, large-caliber artillery systems, combat aircraft, attack helicopters, warships, missiles, and missile launchers. The main purpose of the

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[230] Waheguru Pal Singh Sidhu, "Lessons from Regional Approaches to Managing Missiles," *Disarmament Forum*, UNIDIR 2007, <www.unidir.org/files/publications/pdfs/missile-control-en-330.pdf>.

[231] Uzi Rubin, "Missiles and Other Means of Delivery in the Middle East;" and Nasser Hadian and Shani Hormozi, "A Middle East Free of Missiles and Weapons of Mass Destruction: An Iranian View," in Müller and Müller, eds., *WMD Arms Control in the Middle East*, pp. 219-30.

[232] Ibid.

[233] Scheffran, Gopalaswamy, Gormley, Kubbig, Rubin, and Spitzer, "The Verification Challenge."

[234] Zanders, "Biological and Chemical Weapons and the Prospective Disarmament Process in the Middle East," p. 153.

Register is "to prevent excessive and destabilizing accumulations of arms."[235] Although there is no legal obligation, and most UN members do not report, all states are expected to notify the United Nations under the Register of their missile and combat aircraft exports and imports. Most states of the region have never reported to the UN Register. The only Middle Eastern states that reported in the past on a somewhat regular basis are Israel (until 2011), Jordan (until 2007), and Turkey.[236]

Only one other region has adopted a regional register. The Organization of American States adopted in July 1999 the Inter-American Convention on Transparency in Conventional Weapons Acquisitions. Reporting is limited to the same weapons as those covered by the UN Register, but in contrast, it is a legally binding agreement and includes arms acquired through means other than imports. It requires reporting not only for the past year, but also reporting of all acquisitions within 90 days of their incorporation into the armed forces.[237]

A second international measure to control delivery systems is the MTCR. Established in 1992, the MTCR is a supplier regime that seeks to coordinate national export licensing efforts by adhering to common export policy guidelines (the MTCR Guidelines) applied to an integral common list of controlled items (the MTCR Equipment, Software and Technology Annex). The MTCR covers the proliferation of delivery systems of all the three types of WMD. It is applicable to certain complete rocket systems (ballistic missiles, space launch vehicles, and sounding rockets) and unmanned air vehicle (UAV) systems (to include cruise missiles, drones, UAVs, and remotely piloted vehicles).[238] Member states are requested to exercise restraint in the consideration of all transfers of items contained in the MTCR Annex, and consider all such transfers on a case-by-case basis. The greatest restraint is required for what are known as Category I items: rockets and UAVs capable of delivering a payload of at least 500 kg with a range of at least 300 km and on related equipment, software, and technology for such systems. Due to MTCR membership restrictions, in the Middle East, only Turkey is a member and Israel adheres to the MTCR Guidelines.

HCOC is an arrangement to prevent the proliferation of ballistic missiles. The HCOC calls for restraint in ballistic missile production, testing, deployment, and export; it does not ban these weapons. It also calls for information exchanges by states on their policies regarding ballistic missiles and space launch vehicles and pre-notification of their launches. Unlike the MTCR, HCOC membership is not restricted. From the Middle East, only Iraq, Jordan, Libya, Morocco, and Turkey are members of HCOC, and no regional state submits information under the exchange mechanism.

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[235] UNGA Resolution, General and Complete Disarmament L, Transparency in Armaments, A/RES/46/36, 65th plenary meeting, December 6, 1991, <www.un.org/Depts/ddar/Register/4636.html>.

[236] For details on regional member reporting, see the United Nations Register of Conventional Arms, <www.un-register.org/ReportingStatus/Nationalreports.aspx>.

[237] Siemon T. Wezeman, "The Future of the United Nations Register of Conventional Arms," SIPRI Policy Paper No. 4 (Stockholm International Peace Research Institute, 2003), p. 21.

[238] MTCR, "Objectives of the MTCR," <www.mtcr.info/english/objectives.html>.

All three regimes mentioned above are voluntary, supplier-based, lack a verification mechanism, cover only select delivery systems, and with very few members from the Middle East. In fact, only five regional states are part of HCOC, only one legislated its adherence to the MTCR, and only Turkey made a submission in 2013 to the UN Register.[239]

There are also several, relevant bilateral agreements that could inform the Zone negotiators. In 2000, the United States and Russia signed a memorandum of understanding on the notification of missile launches. The agreement established a Pre- and Post-Launch Notification System (PLNS) for launches of ballistic missiles and space launch vehicles, provided for the voluntary notification of satellites forced from orbit, and certain space experiments that could adversely affect the operation of early warning radars. The PLNS built upon a prior agreement between the United States and Russia on the Establishment of a Joint Warning Center for the Exchange of Information on Missile Launches and Early Warning, which provided for a Joint Data Exchange Center for sharing early warning information to be located in Moscow.[240] Once implemented bilaterally, the two sides intended to open the PLNS to the voluntary participation of other interested parties.

Another bilateral arrangement is the one signed by India and Pakistan in 2005. The pre-notification of flight testing of ballistic missiles agreement calls for each side to notify the other "no less than three days in advance of their commencement of a five day launch window within which it intends to undertake flight tests" and to "ensure that the test launch site(s) do not fall within 40 kms, and the planned impact area does not fall within 70 kms, of the International Boundary or the Line of Control."[241]

There have also been several attempts in the past to address the delivery system issue in the Middle East. US President George H.W. Bush's initiative of May 29, 1991, proposed a freeze on the acquisition, production, and testing of surface-to-surface ballistic missiles by states in the region, with a view to their ultimate elimination from national arsenals.[242] Suppliers were asked to step up efforts to coordinate export licensing for equipment, technology, and services that could be used to manufacture surface-to surface missiles, and export licenses would be provided only for peaceful end-uses.[243] During the ACRS negotiations, the issue of pre-notification of launches and other related transparency measures were discussed.

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[239] United Nations Register of Conventional Arms, Report of the Secretary-General, A/69/124, July 15, 2014, <www.un.org/ga/search/view_doc.asp?symbol=A/69/124>.

[240] US Department of State, "Memorandum of Understanding on Notifications of Missile Launches," December 16, 2000, <www.state.gov/t/avc/trty/187152.htm>.

[241] Agreement between the Republic of India and the Islamic Republic of Pakistan on Pre-Notification of Flight Testing of Ballistic Missiles, October 3, 2005, <www.stimson.org/research-pages/agreement-between-india-and-pakistan-on-pre-notification-of-flight-testing-of-ballistic-missiles/>.

[242] The proposal was part of a broader proposal intended to curb the spread of WMD and their delivery systems in the Middle East. The proposal also seeks to restrain destabilizing conventional arms build-ups in the region. See "White House Fact Sheet on the Middle East Arms Control Initiative," May 29, 1991, <www.presidency.ucsb.edu/ws/?pid=19637>.

[243] Ibid.

Other possible measures aimed at limiting the threat of delivery systems in the Middle East suggested forgoing or limiting certain modes of deployment that are considered particularly destabilizing, as well as introducing ceilings on deployed missile forces beyond the actors' current capabilities. With regard to the modernization and expansion of missile capabilities, some experts promoted a regional flight-test ban on longer-range ballistic missiles as an effective preventive measure. In the area of medium range ballistic missiles operations, it was suggested that all states in the region declare that its medium-range missiles are not permanently targeted at any specific neighbor and are not maintained on permanent, ready-to launch alert.[244]

If any limitation on delivery systems is agreed, the question of how verification is conducted and by whom would have to be addressed. While there are no global or regional agreements that include verification for delivery systems, bilateral agreements—like the Intermediate-range Nuclear Forces Treaty, the Strategic Arms Reduction Treaty, and the Strategic Arms Limitation Talks—can inform the Zone negotiators if they decide to develop a regional verification mechanism.[245]

Since some states in the region are unable to control their entire territories and weapon systems stationed therein, these systems—some of which are capable of carrying WMD—may be in the hands of non-state actors.[246] Whether these non-state actors would agree to disarm, hand their weapons systems to the government in their state, the supplying government, or join the negotiation table is yet to be seen. Consolidation of weapons into the hand of the governments would have to happen prior or as part to the delivery system-free zone negotiations. This is essential because a delivery system-free zone cannot be negotiated with and between governments that do not have full control of the weapons (or territory) they are negotiating.

The Zone negotiators may want to consider additional international measures as part of the Zone's requirements or to inform the verification tools of the Zone. These include the nuclear test ban and export controls.

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[244] Michael Elleman, Michael Haas, Oleg Shulga, and Christian Weidlich, "Preparing the Ground for Regional Arms Limitations - Operations, Deployment, and Testing of Medium-range Ballistic Missiles in the Israeli-Iranian-Saudi Triangle," Policy Briefs Nos. 23/24, Academic Peace Orchestra Middle East, Peace Research Institute Frankfurt, October 2013, <http://academicpeaceorchestra.com/download.php?downloadid=63>.

[245] See for example, Gamal M. Selim, *Global and Regional Approaches to Arms Control in the Middle East: A Critical Assessment from the Arab World* (Springer, 2013); Edward M. Ifft et al., "The Specific Verification Requirements of a WMD/DVs Free Zone in the Middle East Lessons Learned from Existing Arms Control and Disarmament Treaties," Policy Brief No 17, Academic Peace Orchestra Middle East, Peace Research Institute Frankfurt, July 2013, <http://academicpeaceorchestra.com/download.php?downloadid=61>; and Gloria Duffy, "Compliance with Arms Control Agreements: What to Look For," in Feldman (ed.), *Confidence-Building and Verification*, pp. 105-07.

[246] Dissemination does not require complex delivery systems. For example, the rockets and missiles Hezbollah possess in Lebanon can carry chemical weapons. The Lebanese government does not control the territories nor the weapons under Hezbollah's control. Similarly, the Iraqi government does not control Muthanna, where remnants of Saddam Hussein's chemical weapons are located, and the Syrian government claims it is not in control of the territories where several past chemical weapons production facilities are located.

3.2.8. The Zone and the Comprehensive Nuclear-Test-Ban Treaty

Under the CTBT, states agree to ban all nuclear explosions in all environments, for military or civilian purposes. While the CTBT is not often discussed as part of the future zone, it could be assumed that once the negotiators agree on prohibiting the development and testing of nuclear weapons, the CTBT would be in force, in practice. In fact, the Treaty of Semipalatinsk is the first of the NWFZ treaties to require its members to fully comply with the CTBT.[247]

However, using the CTBTO, the organization responsible to verify the CTBT, could be a challenge if the treaty is still not in force. In order to enter into force, the CTBT must be ratified by the eight remaining states listed in Annex 2 to the treaty (China, Egypt, India, Iran, Israel, North Korea, Pakistan, and the United States), three of which are in the Middle East. States in the region that have ratified the CTBT include Algeria, Bahrain, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Tunisia, and the UAE. Egypt, Iran, Israel, and Yemen have not yet ratified the treaty, while Saudi Arabia and Syria have not yet signed it.[248] The region also hosts several sites of the CTBT International Monitoring System (IMS) specified in Annex 1 of the treaty. As of March 2015, ten IMS facilities had been certified in the region. They include a primary seismic station in Iran (although Iran choose not to transfer information from this station),[249] two auxiliary seismic stations and a radionuclide laboratory in Israel, an auxiliary seismic station in Jordan, a radionuclide station in Kuwait, an auxiliary seismic station in Morocco, an auxiliary seismic station in Oman, and an infrasound and a primary seismic station in Tunisia. Nine more facilities (in Egypt, Iran, Libya, and Saudi Arabia) are yet to be constructed, certified, or transmit information to the CTBTO.

If the CTBT is still not in force when the Zone negotiations start, the negotiations would also have to discuss whether to implement a regional CTBT unrelated to the universality and entry-into-force of the CTBT. Also, discussions would have to address how a regional test-ban is verified and by whom. Would the CTBTO be in a position to do so and which specific arrangements would have to be negotiated with the CTBTO if it is chosen to become the verifying organization? A separate discussion with the CTBTO would have to take place to decide whether the organization is capable and has the authority to verify a regional test-ban even if the CTBT is not yet in force. On the political level, states in the Middle East will have to discuss whether they agree to adopt a regional test ban without the United States and China ratifying the CTBT.

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247 NTI, "Central Asia Nuclear-Weapon-Free-Zone (CANWFZ)," <www.nti.org/treaties-and-regimes/central-asia-nuclear-weapon-free-zone-canwz/>.

248 "Background document prepared by the provisional technical secretariat of the preparatory commission for the comprehensive nuclear-test -ban treaty organization for the 2012 conference on the establishment of a middle east zone free of nuclear weapons and all other weapons of mass destruction and their delivery systems." (not published)

249 Meri Lugo, "New CTBT Station Draws Iranian Rebuke," *Arms Control Today*, News Briefs, January 14, 2010, <www.armscontrol.org/print/4047>.

3.2.9. The Zone and Export Control Regimes

The Zone negotiators could decide to include the adoption of export controls as a requirement under the Zone. There are five major export control regimes: the Zangger Committee and the Nuclear Suppliers Group (NSG), which cover nuclear exports; the Australia Group, which covers biological and chemical exports; and the MTCR and the Wassenaar Arrangement, which cover dual-use technologies. All of these regimes are supplier-based (and therefore not open for membership by all states), and compliance with their decisions is voluntary.

While the existing NWFZs do not incorporate export control regimes, they do include basic requirements for exporting relevant goods. The Rarotonga, Bangkok, Pelindaba, and Central Asian NWFZ treaties include provisions requiring an IAEA CSA as a condition of supplying sources, special fissionable material, or equipment or material especially designed or prepared for the processing, use, or production of special fissionable material to a NNWS (some of the treaties, such as the Rarotonga Treaty, also require safeguards as a condition of supply to NWS). The Central Asian NWFZ is stricter and requires the conclusion of an Additional Protocol as a condition of supply to a NNWS.[250]

Some regional organizations adopted a regional approach to export controls that can inform the Zone negotiators. The European Union adopted in 1998 the European Union Code of Conduct on Arms Exports. The code established a notification and consultation mechanism for export license denials, including a transparency procedure, through the publication of the EU annual reports on arms exports. The code helped to harmonize national arms export control policies among EU members, and its principles and criteria have been officially adopted by other states outside the European Union.[251] The majority of states in the Association of Southeast Asian Nations (ASEAN), for example, have adopted export control processes consistent with those espoused by the four multilateral export control regimes and the EU control lists.[252]

4. The Institutional Framework

4.1. Compliance Judgment Authority

Monitoring and inspection activities involve the gathering of information with the objective to make a technicality-based judgment regarding compliance (materials are accounted or unaccounted

[250] IAEA, "Application of IAEA Safeguards in the Middle East, Addendum," Report by the Director General, September 13, 2013, GOV/2013/33/Add.1-GC(57)/10/Add.1, <www.iaea.org/About/Policy/GC/GC57/GC57Documents/English/gc57-10-add1_en.pdf>.

[251] EU External Action, "Arms Export Control," <www.eeas.europa.eu/non-proliferation-and-disarmament/arms-export-control/index_en.htm>.

[252] George Tan, "Export Controls in the ASEAN Region," 1540 Compass: Section Two, Regional and National Focus, <http://cits.uga.edu/uploads/1540compass/1540PDFs/compass2-05-tan.pdf>.

for; findings either conform to declarations or not; signs of proscribed activities are either detected or not).[253] However, the verification process does not always yield a conclusive or undisputed conclusion.

Information may be ambiguous or incomplete, state parties may dispute technical determinations, or subsequent actions may need to be taken in response to suspected violation. These issues are generally handled by a compliance body, the role of which is to adjudicate and (ideally) resolve compliance issues, as well as decide on major changes to the administrative, technical, or political implementation of the agreement.[254] The Zone negotiations will have to decide upon the body that will be empowered to make compliance decisions.

4.2. A Regional Organization?

The negotiators would have to consider not only whether to establish the first WMDFZ, but also the first pan-regional institution.[255] Currently there is no comprehensive regional organization in the Middle East aimed at regulating and establishing norms and rules among states in the region on security issues in general or WMD proliferation in particular. Decisions relevant to a regional organization include its mandate, membership, administrative composition (general conference, secretariat, staff, executive body etc.), how the various bodies will be elected and for how long, how representation will be decided, the organization's budget, rules of procedure, etc.

Several existing NWFZs established a regional political organization (some also established a technical organization to promote the peaceful applications of nuclear technology) to ensure implementation of the treaty and address compliance and enforcement issues. The Treaty of Tlatelolco, for example, established the inter-governmental Agency for the Prohibition of Nuclear Weapons in Latin America and the Caribbean (OPANAL) located in Mexico. OPANAL's bodies consist of a secretariat, general conference, and a council. The general conference convenes biennially to discuss the purposes, means, and procedures of the treaty. The council consists of five members who meet regularly every two months and in special meetings, when necessary. The members are elected to a four-year term. The secretariat consists of the secretary-general, who is the chief administrative officer of the agency, and the staff. The secretary-general is appointed for four years and may be re-elected to serve a single additional term.[256]

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[253] Benjamin J. Bonin at el., "Verifying a WMD/DVs Free Zone in the Middle East Concepts and Challenges," Policy Brief No 16, Academic Peace Orchestra Middle East, Peace Research Institute Frankfurt, April 2013, <academicpeaceorchestra.com/download.php?downloadid=56>.

[254] Ibid.

[255] Müller and Müller, "Introduction," in Müller and Müller (eds.,) *WMD Arms Control in the Middle East: Prospects, Obstacles and Options*, p. 1.

[256] Nuclear Threat Initiative, "Agency for the Prohibition of Nuclear Weapons in Latin America and the Caribbean (OPANAL)," <www.nti.org/treaties-and-regimes/agency-prohibition-nuclear-weapons-latin-america-and-caribbean-opanal/>.

The Pelindaba Treaty established AFCONE, which is based in Pretoria, South Africa. AFCONE is staffed by a chairman, vice-chairman, and an executive secretary. It meets annually although an extraordinary session may be convened to settle disputes. AFCONE is responsible for collating state parties' annual reports, review the application of peaceful nuclear activities and safeguards by the IAEA, bring into effect the complaints procedure, encourage regional and sub-regional cooperation, as well as promote international cooperation with extra-zonal states for the peaceful applications of nuclear science and technology.[257] AFCONE consists of twelve state parties that serve for a three-year term. AFCONE representatives are elected by the conference of state parties based on equitable regional representation and national development in nuclear science and technology.[258]

The Bangkok Treaty was preceded by the establishment of a regional organization, ASEAN, established in 1967 by five states (later expanded to ten) seeking to isolate the region from great-power rivalry and intervention. As such, the Bangkok Treaty does not have a permanent secretariat. Instead, it operates under the rotating secretariat/chairmanship among its ten members. Similarly, the Treaty of Rarotonga does not have a permanent organization. Any member state can request a meeting of the Consultative Committee to consider any matter relating to the treaty or to review its operation.

Table 3: NWFZs and Their Regional Organization

Regional Treaties	Regional Organizations
Treaty of Tlatelolco (Latin America)	OPANAL
Treaty of Rarotonga (South Pacific)	--
Treaty of Bangkok (Southeast Asia)	ASEAN
Treaty of Pelindaba (Africa)	AFCONE
Treaty of Semipalatinsk (Central Asia)	--

Many of the regional organizations mentioned above are entrusted with issues related to compliance with the NWFZ. In most, the executive bodies are entrusted with overseeing and reviewing the application of IAEA safeguards in their respective zones. The Treaty of Rarotonga establishes a Consultative Committee that would pursue a tiered approach to address complaints about noncompliance. This approach includes special inspections and, if necessary, a meeting of the South Pacific Forum on this issue. Through the complaints procedure, any Rarotonga member state can bring a complaint to the secretary-general of the South Pacific Forum and request that the Consultative Committee be convened to consider it. Before pursuing this venue, informal consultations by the member state initiating the complaint must give the state under suspicion reasonable opportunity to provide an explanation and resolve the matter. Complaints can only be generated by parties to the treaty and not by the secretary-general of the South Pacific Forum, who is the depository of the treaty.

[257] African Union, "African Commission on Nuclear Energy (AFCONE)," June 24, 2014, <www.peaceau.org/en/page/78-african-commission-on-nuclear-energy-afcone#sthash.Px9Jv2ai.dpuf>.

[258] African Union, "The Third Conference of States Parties to The African Nuclear-Weapon-Free Zone Treaty Opens Today in Addis Ababa," May 29, 2014, <www.peaceau.org/uploads/auc.com.pelindaba.29-05-2014-1-.pdf>.

If the issue is not resolved, after considering the evidence, the Consultative Committee may proceed with a challenge inspection. Decisions could be taken, failing consensus, by a two-thirds majority. The Committee would appoint three qualified inspectors to a special inspection team. No national of the states involved in the dispute can serve on the inspection team, although a representative of the state that complained may serve as an observer. The drafters purposely avoided placing the secretary-general in the situation of having to make contentious political judgments such as convening of the Consultative Committee or the appointment of the inspection team.[259]

Similarly, neither ASEAN's Executive Committee nor any ASEAN member has ever invoked the provisions of the Bangkok Treaty to ensure compliance with its terms. More specifically, no member has reported any "significant event," despite, for example, Myanmar's illicit nuclear cooperation with North Korea.[260] The Semipalatinsk Treaty does not provide for the establishment of an organization/commission to oversee implementation and compliance/verification. It does, however, provide for annual consultative meetings to review compliance, but no direct linkage exists between this function and IAEA safeguards.[261]

The Middle East Zone negotiators will have to decide who will be entrusted with the authority to make compliance decisions. These are political, rather than technical, questions, but will heavily influence the regime's efficiency and credibility. Decisions about compliance are always a blend of the technical and the political. Nevertheless, much about the composition of the compliance body would be determined by the choice for the verification bodies.

Three basic options are available. First, if the verifying bodies are existing international organizations, their adjudicating body (i.e., the Board of Governors in the case of nuclear weapons; the Executive Councils of the OPCW and CTBTO in the case of the chemical weapons and nuclear testing, respectively) could be assigned to also serve as the compliance bodies. However, it is unclear who could serve this function in the case of the biological weapons and delivery systems. Another problem is that those bodies do not represent regional states (in fact only two or three states from the region are usually represented in those executive bodies at any particular time), and they also do not adjudicate on compliance based on the zone's executive provisions, but with regard to their respective agreements (IAEA safeguards, CWC, and the CTBT). If the Zone's restrictions go beyond those treaties, the compliance decision-making process could prove to be problematic. Theoretically, a special unit

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[259] Caroline Millar, "Regional Non-Proliferation Arrangements."

[260] Myanmar's nuclear ambitions came under suspicion when it was revealed that it illicitly collaborated with North Korea to create the rudiments of a nuclear weapon program. Since coming to power in 2011, the nominally civilian-run government has worked to dispel those concerns, and in 2013, Myanmar adopted the IAEA Additional Protocol. See: "Myanmar Intends to Build 'Research' Atomic Reactors: Minister," *Global Security News*, July 23, 2014, <www.nti.org/gsn/article/myanmar-intends-build-research-atomic-reactors-minister>; and Mark Fitzpatrick, "CBMs in Southeast Asia," presented at Capacity-Building Workshop For Mid-Level Diplomats in Support of The Helsinki Conference on A Middle East WMD Free Zone, June 18-19, 2014, Brussels, Belgium, <www.nonproliferation.eu/documents/wmdfz-workshop/cbm-southeast-asia.pdf>.

[261] Nuclear Threat Initiative, "Central Asia Nuclear-Weapon-Free-Zone (CANWFZ)."

within these organizations could be established to verify the Zone provisions that exceed the existing mandate, but these are not simple or straightforward options to implement.

Several of the NWFZ treaties provide for a broader role for the IAEA, such as the possibility of participation in fact-finding missions or inspections in the event that there are questions about compliance.[262] Challenge inspections are authorized by the governing bodies designated by the NWFZ and carried out by the IAEA. These provisions have not been invoked to date.

The second option is a regional body with an executive council. The advantage of such a body is that each of the zone's regional states would be represented at one point or the other (depending on the election process) and its adjudication will be based on the Zone provisions. The challenge to establish such an organization—aside from the political challenges to establish such a wide regional body—is that the region currently does not have sufficient technical expertise required to run such a body effectively.

4.3. Enforcement

Enforcement has been the stepchild of the nonproliferation system since its inception. The paradox was coined by Fred Ikle's *Foreign Affairs* article "After Detection, What?". As verification expert Patricia Lewis identified: "without enforcement, the whole web of verification deterrence against the spectrum of possible infringement would have little meaning and the rule of law would be undermined."[263] If the objective of the verification system is to deter noncompliance, the absence of a credible, restorative response after noncompliance detection undermines the entire agreement.

Most of the existing NWFZs do not contain any enforcement mechanism should a member state transgress its zonal obligations. In case of noncompliance, most of the NWFZ executive bodies have the option to refer the noncompliance case to the UNSC. For example, OPANAL's executive organ, the General Conference, could take note of the case and decide to refer the case to the attention of the concerned party and make any recommendations it deems appropriate. It might also report the case to the UNSC, the UNGA, the Organization of American States, or the IAEA. Under the Rarotonga Treaty, if the Consultative Committee decides that a party is in breach of its obligations under the treaty, members of the South Pacific Forum—the supreme political body in the region—are to meet promptly to consider further action. The treaty leaves to the forum members to decide how the meeting would be convened and other relevant modalities. The treaty does not include any specific provision for engaging an external organization such as the IAEA or the UNSC in noncompliance and enforcement cases. To date, no complaint has ever been registered.[264]

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[262] IAEA, "Application of IAEA Safeguards in the Middle East."

[263] Patricia Lewis, "Verification, Compliance, and Enforcement," in George Perkovich and James M. Acton, eds., *Abolishing Nuclear Weapons: A Debate*, Carnegie Endowment for International Peace, 2009, <http://carnegieendowment.org/files/abolishing_nuclear_weapons_debate.pdf>.

[264] Caroline Millar, "Regional Non-Proliferation Arrangements: Rarotonga."

Even in existing international organizations, a finding of noncompliance does not always bring restorative action. For example, at the IAEA, once the Board of Governors finds a state to be in noncompliance with its safeguards agreement, the case is sent to the UNSC, which may or may not act upon it. Whether the state in question chooses to cooperate with the IAEA to bring its activities back into compliance depends on the violating country.

Sanctions are one method of enforcement that have had some success, though they are not currently built into any of the existing NWFZs. Instead, the UNSC may call on member states to implement sanctions against states they found to be in noncompliance (Iraq, Iran, North Korea, and Syria). Alternatively, other states may take it upon themselves to create multilateral or unilateral sanctions to try to compel the violating state back into compliance.

Another way to strengthen enforcement is to incorporate within the agreement a requirement to adopt the prohibitions into national law, such as a legislative resolution defining the WMDFZ status and criminalizing violations.

Given the mistrust in the region and past experiences with noncompliance, the Zone negotiators will have to identify not only the procedures for what happens in a case of noncompliance, but also how to devise an effective response that will not be held hostage to regional or UNSC politics. For example, many believe that Syria is in violation of UNSCR 2118 and its CWC obligations, due to the alleged use of chlorine. While Syria's commitments were adopted in UNSCR 2118 under Chapter VII of the UN Charter, Russia has opposed bringing the issue to debate in the UNSC, where such a violation should be addressed.[265] Due to Russian opposition, decisions adopted by the OPCW Executive Council and the UNSC in early 2015 condemn the use of chlorine in Syria as a violation of international law and call for the perpetrators to be held accountable, though they do not specify how to do so, nor does either resolution attribute the attack to the government forces.[266] Similarly, due to China's repeated threats to veto any strong measure against North Korea despite North Korea's decision to withdraw from the NPT and conduct several nuclear tests, the Council adopted only limited sanctions in 2006.[267] Some experts suggested some sort of automatic enforcement or a scale of reprisals for noncompliance. The Zone negotiators could consider such a process but will have to take into account that *realpolitik* and unique circumstances will always prevail in such fraught processes.[268]

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[265] "December 2014 Monthly Forecast: Syria," Security Council Report, November 26, 2014, <www.securitycouncilreport.org/monthly-forecast/2014-12/syria_14.php>.

[266] OPCW Executive Council, "Decision Reports of the OPCW Fact-Finding Mission in Syria"; and United Nations Seucrity Council Resolution, S/RES/2209 (2015), March 6, 2015, <www.un.org/en/ga/search/view_doc.asp?symbol=S/RES/2209%20(2015)>.

[267] Edith M. Lederer, "UN Imposes Limited Sanctions on N. Korea," Associated Press, July 16, 2006, <www.washingtonpost.com/wp-dyn/content/article/2006/07/15/AR2006071500538_pf.html>.

[268] Lewis, "Verification, Compliance, and Enforcement."

4.4. Scope

The Zone negotiators would have to consider the scope of the Zone arrangement. While the Zone negotiations may be defined narrowly to address the proliferation of WMD in the region, the negotiators may want to address the regional proliferation's underlying causes and emerging threats.

4.4.1 Regional Security Guiding Principles

The acquisition of WMD capabilities in the region do not take place in a vacuum, and without addressing threats and threat perceptions that led to their development, the basis of the agreement would be volatile. For that purpose, the negotiators would have to decide whether to adopt a set of principles regarding arms control and regional security that would govern relations among states in the region.

It is possible that some states will oppose discussing any measure that is not directly related to the Zone implementation, arguing that they are beyond the scope of the Zone negotiations. The breadth of the negotiations is one of the major sticking points in the ongoing consultations led by Laajava on convening the Middle East WMD Conference. Nevertheless, at least one expert warned that "if parties were to choose to refuse to consider such basic principles this would cast doubts on how seriously they take the objective of a zone free of nuclear weapons and free of all other weapons of mass destruction."[269]

Not one of the existing NWFZs exists in the absence of a regional architecture and agreed principles for cooperation and security. In fact, both in the Pelindaba and Bangkok treaties, regional organizations (AFRCON, ASEAN) are the ones responsible for implementing and enforcing the Zones. Europe adopted a formal, institutionalized set of principles, while Asia adopted an informal dialogue-based regime, and Latin America opted for a regime that combines features of the other two. There is no set way to develop regional security regimes, and each region adopted one based on the region's culture, history, and objectives.[270] It is doubtful that a WMDFZ could be sustainable in their absence.

Regional architecture and principles create a wider context of predictability and trust in regional relations. Such an architecture also provide states the opportunity to develop norms and mechanisms to manage their relations.[271] Naturally, Middle Eastern states can adopt different sets of principles and priorities based on the region's unique circumstances. The importance of discussing shared principles is in creating a normative structure under which states in the region would operate.

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[269] Harald Müller, "Basic Principles for a Process Leading to the Establishment of a Middle East Free of Weapons of Mass Destruction," in Müller and Müller, eds., *WMD Arms Control in the Middle East*, p. 48.

[270] Jones, "Towards a Regional Security Regime for the Middle East."

[271] Jones, "The Regional Security Architecture and Other Confidence-building Measures," p. 269.

There are multiple models the negotiations could rely upon or borrow from if needed, starting with the principles adopted in UN Charter through bilateral agreements such as: the US-Soviet 1972 agreement on Basic Principles of Relations;[272] regional agreements such as the Helsinki Final Act;[273] the Charter of the Organization of American States;[274] and the Association of South-East Asian Nations Zone of Peace, Friendship and Neutrality.[275] For example, the concept of "the ASEAN Way" was developed over time based on the ideas of noninterference, consensus, and peaceful settlement of disputes.[276] The European Decalogue or "Declaration on Principles Guiding Relations between Participating States" governs the behavior of states toward their citizens, as well as toward each other. These principles include: sovereign equality and respect for the rights inherent in sovereignty; refraining from the threat or use of force; inviolability of frontiers; territorial integrity of states; peaceful settlement of disputes; nonintervention in internal affairs; respect for human rights and fundamental freedoms; equal rights and self-determination of peoples; cooperation among states; and fulfillment in good faith of obligations under international law. The negotiators of the Rarotonga Treaty endorsed a set of principles proposed by Australia as the framework and basis for their zone. The principles included: the nonproliferation of nuclear weapons; the need to prevent the region from becoming a theater for superpower rivalry; the need to preserve, for all time, the peace and security the region enjoys; and the need to protect natural resources.[277]

The ACRS experience could also inform the Zone negotiators. In 1994, through ACRS, regional states negotiated the draft Declaration of Principles (DoP) and Statements of Intent on Arms Control and Regional Security, modeled on and inspired by the Helsinki Final Act of 1975 as well as the DoP between Israel and the Palestinian Liberation Organization in 1993.[278] The 1994 draft DoP included core principles for regional security relations, basic guidelines for the ACRS process, and statements of intent on major objectives, including CSBMs, conventional arms control; and establishing a zone free of all weapons of mass destruction.[279]

As part of the 1995 Barcelona Declaration among Mediterranean states, some Middle Eastern states adopted a declaratory CBM.[280] The declaration was an attempt by the EU to create a

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[272] Text of the "Basic Principles of Relations Between the United States of America and the Union of Soviet Socialist Republics," May 29, 1972,<www.presidency.ucsb.edu/ws/?pid=3438>.

[273] Conference on Security and Co-Operation in Europe, Final Act, Helsinki 1975, <www.osce.org/mc/39501?download=true>.

[274] Charter of the Organization of American States, Bogota, April 30, 1948, <www.oas.org/dil/treaties_A-41_Charter_of_the_Organization_of_American_States.pdf>.

[275] 1971 Zone of Peace, Freedom and Neutrality Declaration, Kuala Lumpur, Malaysia, November 27, 1971, <www.icnl.org/research/library/files/Transnational/zone.pdf>.

[276] Fitzpatrick, "CBMs in Southeast Asia."

[277] Caroline Millar, "Regional Non-Proliferation Arrangements: Rarotonga."

[278] For the ACRS DoP draft, see in Dalia Dassa Kaye, *Beyond the Handshake: Multilateral Cooperation in the Arab-Israeli Peace Process* (Colombia University Press, 2001), Annex C.

[279] Jentleson, "The Middle East Arms Control and Regional Security (ACRS) Talks: Progress, Problems, and Prospects."

[280] Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, the Palestinian Authority, Syria, and Tunisia signed the declaration.

comprehensive partnership with twelve states in the Southern Mediterranean. Principles addressed in the declaration include political dialogue and security, and economic, financial, social, and cultural cooperation. With regard to nonproliferation, the declaration included a commitment by the signatories to promote regional security, eliminate WMDs, and adhere to international and regional nuclear nonproliferation regimes, as well as arms control and disarmament agreements.[281]

The Zone negotiators could also consult preparatory work done by experts on possible regional principles. The studies conducted by regional and international experts identified principles such as prevention of war, crisis prevention and management, conflict resolution and reconciliation, and arms control and nonproliferation as necessary to govern relations among regional states.[282]

4.4.2 Non-State Actors

The traditional nonproliferation agreements, and especially NWFZs, are limited to state-run weapon programs; they do not cover non-state actor activities, such as acquisition or use of WMD by terrorist and criminal entities. These threats were not prominent at the time those treaties were negotiated. Given the prevailing reality of the region, where terrorist organizations and networks have tried to acquire WMD capabilities and have targeted strategic infrastructure,[283] and where many of these groups operate and also control significant territories, the Zone could not be effectively implemented unless governments could exercise effective control on the weapon systems located on their territories. To partly address the threat from non-state actors, the Zone negotiators could incorporate similar measures found in UNSCR 1540 and UNSCR 2118, as well as include a requirement for implementing national legislation, including criminal sanctions.

Additionally, the Zone provisions could incorporate a series of safety and security treaties and codes of conduct that address states' responsibilities to prevent non-state actor acquisition of WMD. Examples of such measures include the International Convention for the Suppression of Acts of Nuclear Terrorism, Code of Conduct on the Safety and Security of Radioactive Sources and the Supplementary Guidance on the Import and Export of Radioactive Sources, the Convention on the Physical Protection of Nuclear Material and its amendment, the Global Initiative to Combat Nuclear Terrorism, and the WHO 2005 International Health Regulations. The participation of Middle Eastern states in those international measures is lacking at best (see Annex 6).

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[281] Barcelona Declaration, Euro-Mediterranean Conference, November 27-28, 1995, <www.eeas.europa.eu/euromed/docs/bd_en.pdf>.

[282] See, for example, Jentleson, "The Middle East Arms Control and Regional Security (ACRS) Talks;" Jones, *Towards a Regional Security Regime for the Middle East*;" and Kane and Murauskaite, eds., R*egional Security Dialogue in the Middle East.*

[283] Key infrastructure in Egypt, Iraq, Jordan, Libya, Saudi Arabia, and Yemen have come under terrorist attack. See "Critical Infrastructure Protection: Strategies for securing gas pipeline infrastructure," Global Gas Transport, June 1, 2013, <www.globalgastransport.info/archive.php?id=12663>.

4.4.3. Confidence-Building Measures

CBMs are broadly defined as measures that address, prevent, or resolve uncertainties among states. Designed to prevent either intended or unwanted escalations of hostilities and to build mutual trust, CBMs can be formal, informal, unilateral, bilateral, or multilateral; military, or political; and can be state-to-state or non-governmental.[284] CBMs can also be used during negotiations for trade-offs and expansion on the core issues discussed. Zone negotiators could consider adopting CBMs as part of the Zone negotiating process in order to enhance trust, transparency, and predictability. CBMs can be helpful in giving credibility to—and conferring the seriousness of—the negotiators and their commitment to the process, as well as reduce misunderstandings during crisis situations and negotiation setbacks.

It is worth mentioning that there are differing views in the region of CBMs and their role. Some experts define CBMs across three functional categories—voluntary political CBMs, legally binding declarations, and technical CBMs—and as formal, intentionally negotiated, and consensually agreed-upon measures.[285] Others categorize them based on their objective: communication, constraint, transparency, or verification. Ideally, the Zone negotiators should aim for CBMs that will be taken jointly, but they can also be taken unilaterally, in a concerted manner, or bilaterally, if only several states are relevant for the measure. Depending on the stage of negotiations and trust among regional states, CBMs could be negotiated either directly among the states of the region or with the assistance of a mediator.

Negotiators would have to decide not only how to define and categorize CBMs, but also when to adopt them. CBMs can be adopted prior to the negotiation phase, during the negotiations as part of the process to enhance trust and "pave the difficult road towards a final agreement,"[286] or only after the agreement enters into force.

The region has some experience with negotiating, and to a lesser degree implementing, CBMs. CBMs and CSBMs were discussed during ACRS in five areas: declaratory measures, communications, maritime agreements, military information exchanges, and conflict prevention/regional security.[287] Although the entire package of CSBMs was never formally adopted (due to the agreement that all measures would be adopted at the end of the process), the progress that had been made in ACRS can inform the Zone negotiators, such as the CSBMs relating to maritime issues (e.g., conducting search and rescue and incidents at sea exercises), pre-notification of military exercises and military information exchange

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[284] "Confidence-Building Measures," <http://csis.org/programs/international-security-program/asia-division/cross-strait-security-initiative-/confidence-b>.

[285] See Fahmy, "The Regional Security Environment and Basic Principles for the Relations of the Members of the Zone;" Ahmed Abdel Halim, "Middle East Regional Arms Control and Security;" and Landau, "Assessing the Relevance of Nuclear CBMs to a WMD Arms Control Process in the Middle East Today," in Müller and Müller, eds., *WMD Arms Control in the Middle East*, pp. 30-31.

[286] Fahmy, "The Regional Security Environment and Basic Principles for the Relations of the Members of the Zone," p. 19.

[287] Landau, "Assessing the Relevance of Nuclear CBMs to a WMD Arms Control Process in the Middle East Today," pp. 30-31.

regarding military personnel, unclassified military documents, and military training and education, a regional communications network, and the setting up of three Regional Security Centers.[288]

However, the ACRS experience also made the notion of CBMs a loaded issue, which would influence any CBM discussion in future Zone negotiations.[289] During the ACRS negotiations, Israel supported CBMs as a necessary part of the process, but viewed them with caution, concerned that they could be a slippery slope toward nuclear disarmament without a comprehensive peace and reconciliation. On the other hand, the Arabs saw them as a process leading to Arab–Israeli political normalization, on which they refused to embark until Arab–Israeli peace was achieved. In practice, CBMs will have to be adopted as an integral part of the Zone's negotiation and implementation as well as a broader regional peace process.

The following is a list of possible CBMs that have been discussed in the past in the region, mentioned in the UNSG's 1990 report on a NWFZ in the Middle East, recommended by experts, or adopted through international, regional, or bilateral agreements such as those between India-Pakistan[290] and US-Soviet/Russia.[291] The list is not exclusive but aims at informing the discussion on the issue. The measures are divided by the weapon system involved, as well as an increasing degree of commitment:

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[288] See Michael D. Yaffe, "Promoting arms control and regional security in the Middle East," *Disarmament Forum*, No. 2, Spring 2001.

[289] See Fahmy, "The Regional Security Environment and Basic Principles for the Relations of the Members of the Zone," pp. 19-20.

[290] For a list of CBMs adopted by India and Pakistan, see </www.stimson.org/research-pages/confidence-building-measures-in-south-asia-/>.

[291] Ideas for some of the CBMs mentioned above are discussed in several chapters in Müller and Müller, eds., *WMD Arms Control in the Middle East*; especially Fahmy, "The Regional Security Environment and Basic Principles for the Relations of the Members of the Zone" and Emily B. Landau, "Assessing the Relevance of Nuclear CBMs to a WMD Arms Control Process in the Middle East Today;" as well as the chapters by Stéphane Delory, Carlo Trezza, Bernd W. Kubbig, Peter Jones, Nilsu Gören and Aviv Melamud, Mark Fitzpatrick, Una Becker-Jakob, and David Friedman. See also Grégoire Mallard, "Can The Euratom Treaty Inspire the Middle East?," *Nonproliferation Review* 15 (November 2008), <http://cns.miis.edu/npr/pdfs/153_mallard.pdf>; Miles A. Pomper and Cole J. Harvey, "Beyond Missile Defense: Alternative Means to Address Iran's Ballistic Missile Threat," *Arms Control Today*, 2010, <www.armscontrol.org/act/2010_10/Pomper-Harvey>; David Friedman, "Biological and Chemical Weapons Arms Control in the Middle East: Challenges and Opportunities for a WMD-Free Zone', *Nonproliferation Review* 19 (November 2012), pp. 401-11; Chen Kane, "Task Force Develops Recommendations on The Biological Weapons Dimensions of Implementing A Weapon-of-Mass-Destruction Free Zone in The Middle East," <http://cns.miis.edu/activities/pdfs/121214_bw_mideast_wmdfz.pdf>; Christian Weidlich et al., "Unmanned Aerial Vehicles - A Challenge to a WMD/DVs Free Zone in the Middle East," Policy Brief No. 8, Academic Peace Orchestra Middle East, Peace Research Institute Frankfurt, August 2012, <http://academicpeaceorchestra.com/download.php?downloadid=31>; and Marc Finaud and Anna Péczeli, "Modest Confidence- and Security-building Measures for the Middle East; No-first Use Declarations, Transparency Measures, and Communication Structures," Policy Brief No. 20, Academic Peace Orchestra Middle East, Peace Research Institute Frankfurt, July 2013, <http://academicpeaceorchestra.com/download.php?downloadid=83>.

Declaratory and General CBMs:

• Commitment to the pursuit of peace and security through collective security measures;
• Commitment to refrain from the acquisition, transfer, and use of all WMD;
• Commitment to work toward banishing all WMD from the region; preventing an arms race; a high degree of military transparency; and
• Commitment not to take any action that would impede progress toward achieving the WMDFZ objective.

Communications and information exchange:

• Establishing a regional communications network for the sharing of military notifications and other information relevant to the WMDFZ;[292]
• Establishing a "hotline" between regional capitals;
• Establishing a regional early warning system for accidents and incidents; and
• Sharing information on interests expressed by terrorist groups in WMD and radioactive materials.

Nuclear:

• Developing regional standards for the safe, secure, and transparent development of peaceful nuclear capabilities;
• Developing regional verification criteria and mechanism to implement a regional test-ban;
• Developing a regional agreement for assistance in the case of a nuclear accident;
• Developing regional standards for the safe and transparent handling of nuclear waste;
• Prohibiting attacks, directly or indirectly, against nuclear installations or facilities with an annual exchange of lists detailing the location of all nuclear-related facilities;
• Joining the nuclear safety and security conventions (e.g., the Convention on Early Notification of a Nuclear Accident, the Convention on Assistance in the Case of Nuclear Accident or Radiological Emergency, the Convention on Nuclear Safety, the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, the Code of Conduct on the Safety and Security of Radioactive Sources and the Supplementary Guidance on the Import and Export of Radioactive Sources, the Convention on the Physical Protection of Nuclear Material and its amendment, the International Convention for the Suppression of Acts of

[292] Apart from the bilateral, regional, and ACRS experiences, there is the multilateral/regional experience of the OSCE Communications Network. Established in 1990, the Network allows the fifty-seven states currently participating to exchange military information related to several arms control agreements and treaties (the Vienna Document, the Treaty on Conventional Armed Forces in Europe, the Treaty on Open Skies, and the Dayton Peace Accords). It provides them with a reliable, timely, and secure channel for transmitting military information.

Nuclear Terrorism, and the Global Initiative to Combat Nuclear Terrorism); and
• Establishing a Middle East Nuclear Regulators Association aimed at harmonizing nuclear safety and security procedures and basic requirements to operate nuclear facilities including verification or review mechanism.

Chemical:

• Developing standards for the peaceful operation of chemical industries in the region;
• Adopting a regional draft code of conduct;[293] and
• Cooperating in the field of environmental standards and protection.

Biological:

• Affirmation by regional states of their commitment to the non-use of biological weapons, a commitment to which they are legally bound under the Geneva Protocol and/or the BWC;
• Developing regional standards for the peaceful uses of biological science and technology (following Article X of the BWC);
• Developing and adopting a regional biosecurity and biosafety Code of Conduct for biological science and technology;
• Adopting the CBMs under the BWC as a requirement to be submitted on an annual basis;[294]
• Information-sharing exchange in areas beyond the BWC CBMs such as: national practices and policies regarding the safety and security of biological technology, laboratories, material and know-how, including awareness-raising about the potential for misuse of biology and biotechnology; relevant publications and scientific collaboration; national transfer controls; national legal steps taken to criminalize criminalization of dangerous or illegitimate biological activities;
• Developing and adopting codes of conduct for governing and regulating legitimate peaceful research in the biological sciences;
• Cooperating on developing national capacities in areas such as disease surveillance, detection and diagnosis; biosafety and biosecurity; education, training and awareness-raising; emergency response; and legal, regulatory and administrative measures (such as licensing, registration, customs, law enforcement, transport);

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[293] In 2012, a group of chemists from the Middle East developed a Code of Conduct for chemists. The group met in Amman, Jordan. The Code identifies best practices for chemical safety and security, environmental protection, and more. See David Albright, Mark Dubowitz, Orde Kittrie, Leonard Spector, and Michael Yaffe, "U.S. Nonproliferation Strategy for the Changing Middle East," January 2013, <http://isis-online.org/uploads/isis-reports/documents/FinalReport.pdf>, p. 88.

[294] Although the BWC CBMs were designed primarily as a vehicle for member states, states that were not party to the BWC have used them to submit information in the past. For example, Kyrgyzstan, which became an independent state in 1991, submitted a CBM in 1993 and did not accede to the BWC until 2004.

• Establishing regional cooperation for disease surveillance (both human and animal);
• Information exchanges regarding national disease surveillance, detection and response capacities; contingency plans for disease outbreaks (natural and deliberately induced); available assistance in cases of biological weapon attacks and/or severe disease outbreaks;
• Adopting and effectively implementing domestic legislation to correspond with legal obligations under the WHO 2005 International Health Regulations and UN Security Council Resolution 1540 (2004);[295]
• Organize regional and attend national biopreparedness exercises (e.g., Israel's Orange Flame);
• Data and information exchange and cooperation in legislation, regulation, and export control systems;
• A joint exercise for first responders focusing on optimal modalities for mitigating bio attacks in the region, including victim treatment and hospital care, decontamination of affected sites, and imposition of quarantine and other restrictions on travel;
• Developing a list of national contacts for bio emergencies;
• Expanding MECIDS to include more states and to be able to cover more agents.

Delivery Systems

• Adopting a declaration on restraints on missile procurement;
• Annual declarations of dual systems capable of delivering conventional and non-conventional arms such as missiles, combat aircraft, and large-caliber artillery holdings, exports, and imports;
• Pre-notification of flight tests and space rocket launches for civilian purposes (such as satellites);
• Pre-notifications of test launches and annual declarations of ballistic missile policies and doctrines;
• Exchanging information on ongoing or planned missile projects and activities in crisis situations through hotlines and data exchange centers;
• Declarations on the no-first-use of delivery vehicles;[296]

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[295] All Middle Eastern states are parties to the WHO International Health Regulations, and all have at least submitted initial reports to the 1540 Committee.

[296] A missile no-first-use policy at its core is a declaration by participating states that "they will not be the first to launch missiles onto each other's' territory." A minimum approach could be a no-first-use declaration limited to unconventional missiles (missiles capable of carrying WMD), complemented with a negative security assurance. Intermediate steps could extend the scope of the no-first-use policy to conventional missiles with a negative security assurance applied to both unconventional and conventional missiles. A maximum approach would include a declaration of unconditional no-first-use for both unconventional and conventional missiles against any state or any target category. China, India, and North Korea have declared a policy of no-first-use of nuclear weapons. Both China (1964) and India (1998) made their declarations immediately after their first successful military tests and maintain them despite some recent ambiguity about China's declaration. The Soviet Union also made a nuclear no-first-use declaration in 1982 but Russia withdrew it in 1993. In 2010, both the United States and the United Kingdom took some steps toward a no-first-use declaration, with assorted

- Joining HCOC or create a regional HCOC to include cruise missiles and UAVs;
- Reporting to UN Register of Conventional Arms;
- Placing older missiles in storage;
- Dismantling older missiles;
- Adopting de-alerting policies for parts of or entire ballistic missiles arsenals;[297]
- Limitations on missile ranges, payloads and numbers.

Radiological weapons and material:

- Setting up standards for radioactive materials export license systems, as well as national authorities for regulation of licenses, and identify updates for national legislation and standards for legislation;
- Designing mechanisms for regional information exchanges on techniques used for protection of radiological materials and recovery of orphan sources;
- Joint research and development projects on peaceful uses of radioactive materials;
- Developing measures to detect and secure radioactive materials that are outside regulatory control in order to counter smuggling;
- Formulate programs for capacity building through public education and awareness raising;
- Developing code of conduct on securing radiological materials, or a radiological materials-secured zone;
- Developing a regional strategy for emergency preparedness and response to RDDs and mitigation of their consequences;
- Share data about radioactive isotopes in the air; and
- Defining inspection procedures for border crossings and standardized equipment usage.

Conventional weapons:

- Establishing operational arrangements relating to force and weapons deployment (demilitarized buffer zones, early warning stations, aerial reconnaissance, missions and military liaison committees);
- Advance notice of troop movements above a pre-agreed level;
- Placing constraints on military exercises; and
- Aerial inspections to monitor compliance with force deployment limitations in restricted zones, to confirm data exchanges, and to provide early warning of potentially destabilizing activities.

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conditions and reservations. The Israeli announcement in the mid-1960s that "Israel will not be the first country to introduce nuclear weapons to the Middle East" is also considered by some as an indirect no-first-use declaration. Finaud and Péczeli, "Modest Confidence- and Security-Building Measures for the Middle East."

[297] Examples of de-alerting include both the Intermediate-range Nuclear Forces Treaty and the Strategic Arms Reduction Treaty, which feature de-alerting a number of WMD systems as the first step toward their elimination. France unilaterally and without any outside verification eliminated its entire ground-launched nuclear force component. Michael Elleman, Haas, Shulga, and Weidlich, "Preparing the Ground for Regional Arms Limitations."

4.5. Public Diplomacy and Civil Society

How public the process should be and how to deal with public diplomacy should be discussed among the Zone negotiators. This would be a delicate decision that may need to be revisited constantly prior, during, and after the negotiations. As a result of real, imagined, and perhaps even reflexive fear of the public reaction to any signs of normalization with Israel, negotiations during ACRS (and in fact in most of other bilateral and regional negotiations on security issues between Israel and its neighbors), had been based on a top-down approach. The process was kept largely out of the public eye.

The benefits of low profile or even secret negotiations arise from the political space they provide the leaders. Regional states could maintain an adversarial public posture while secretly seeking ways to de-escalate. Additionally, secrecy helps regional states better manage spoilers because the latter are ignorant of the existence or extent of the negotiations.[298] On the other hand, secrecy can easily come back to haunt the negotiators. For example, many Arab negotiators during ACRS had felt inhibited from taking any concrete or even symbolic steps of regional cooperation for fear that these might become public. They manifested a concern that such publicity would trigger an outcry and exacerbate an already fragile domestic scene.

Secrecy not only could prevent decision makers from making any progress, it could also detract from the perceived legitimacy of the negotiations. As a result, the process, content, and agreements produced could be considered illegitimate by some, making implementation challenging. Some conclude that, without adequate public support, an elite-driven process cannot be sustained,[299] as the parties are left without the space to prepare their constituents for an eventual agreement. More generally, they conclude that relations between the Middle Eastern parties cannot be restricted to diplomatic, let alone secret, dialogue between leaders.

At the same time, overly aggressive public discussion of such sensitive issues such as WMD and disarmament in the loaded atmosphere of the Middle East could alienate and put even more pressure on decision makers.[300] Additionally, negotiators may use leaks as part of their negotiating tactics, complicating an already very complex endeavor. Negotiators will have to carefully weigh the risks and opportunities in informing the public on the process and its details.

Relatedly, the issue of capacity in the region needs to be addressed. Even if regional states overcome the current political impasse and agree to embark on the Zone negotiations, there

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298 For an analysis of the benefits and risks associated with secret negotiations see, Anthony Wanis-St. John, "In Theory: Back-Channel Negotiation: International Bargaining in the Shadows," *Negotiation Journal* 22 (April 2006) <www.american.edu/sis/faculty/upload/Wanis-In-Theory-Back-Channel-Negotiation.pdf>.

299 Ariel (Eli) Levite, "Reflection on 'The Regional Security Environment and basic Principles for the Relations of the Members of the Zone'," presented at Second EU Consortium Middle East Seminar, Brussles, Belgium, November 2012, <www.nonproliferation.eu/documents/backgroundpapers/levite.pdf>.

300 Shlomo Brom, "The Middle East Regional Security Regime and CSBMs," in Müller and Müller, eds., *WMD Arms Control in the Middle East*, p. 247.

is limited sufficient expertise in the region to either negotiate or implement it. Most states of the region lack deep knowledge, appreciation, or understanding of the complexities involved with disarmament, nonproliferation, and verification. This deficit is prominent among decision makers, diplomats, and scientists, all of whom will have to be part of the negotiations process. Therefore, capacity-building activities among decision makers, diplomats, technical experts, member of parliaments, militaries, academics, journalists, emerging experts, and the public is necessary to build the cadre and the constituency for such a monumental regional process.

Conclusions

The objective of this report was to provide regional and international officials the foundations on which to start a constructive conversation on how to operationalize the idea of creating a WMDFZ in the Middle East. For a concept that existed for over forty years, surprisingly little thought has been given to how it can be practically implemented in the parameters of "an effectively verifiable Middle East zone free of weapons of mass destruction, nuclear, chemical and biological, and their delivery systems."

The 2015 NPT RevCon is obviously a looming event about which many in the region (and outside of it) are concerned, particularly in the absence of a convened WMDFZ Middle East Conference. However, whatever the results of the RevCon, the issue is not going to disappear and the only solution to the proliferation WMD in the region is the creation of a WMDFZ by regional states. As demonstrated throughout this report, much could and should be done before, during, and after the 2015 NPT Review Conference to promote this goal even in the absence of a political breakthrough in the consultations. In fact, many of the issues identified in this report should be discussed first domestically within regional states in a comprehensive interagency process, not just to formulate national positions on the issues, but also to clarify their WMD capabilities, declared and undeclared, known and unknown. Other topics such as the negotiation mandate, scope, rules of procedures, and delineation of the zone will have to be agreed upon by regional states as part of the pre-negotiations phase. While the delineation of the Zone seems to be a relatively easy topic, the others have been immeasurably hard to agree upon throughout Laajava's consultations.

Given the strategic and technical complexities related to the Zone, governments in the region could start thinking creatively about how to address the threat of WMD. The idea of segregating the operational issues from the current political discussions and impasse has been inspired by the successful negotiation experience of the CTBT Group of Scientific Experts, which met regularly for seventeen years in order to develop a viable verification regime to detect nuclear tests while the diplomats slowly worked out thorny political issues. When treaty negotiators finally overcame the political obstacles in 1996, the preparatory work on operationalizing the CTBT was ready. While states were very cautious to make any political commitments, they were willing to nominate experts to conduct joint research into monitoring technologies and data analysis methods for

the verification of a comprehensive test ban, identifying solutions to some problems that were considered unverifiable and flag those that were still not.

Much can—and needs to—be done in a similar way for the WMDFZ. A group of experts (officially nominated by regional governments) could be formed to discuss the issues mentioned throughout this paper. They could identify possible options or solutions and prepare recommendations. The group of experts could also identify where the negotiations need to begin: are there certain tasks that can be negotiated first? Are there areas that are already agreed upon? Other important issues that could be explored by the group of experts include: examining other regional NWFZ cases and their applicability to the Middle East; examining the verification objectives, requirements, standards and possible procedures to establish a verifiable WMDFZ; examining verification lessons from cases of WMD disarmament and dismantlement; examining no-first-use agreements and their applicability to the Middle East; exploring options for non-attack agreements on nuclear, chemical, and biological civilian facilities; identifying relevant unconventional and conventional CBMs and arms control measures; studying proposals made in other regional contexts for limitations on methods of WMD delivery systems such as missile test notification agreements and delivery system dismantlement. Importantly, especially on the technical issues, the experts could identify what is technically feasible.

If regional states are unwilling, politically, to commit experts to the process, an alternative route is to establish the dialogue as a track-two or track-one-and-a-half process. Whereas track-one diplomacy involves negotiations between government officials, track-two diplomacy involves dialogue with nongovernmental experts such as influential, retired government and military officials, academics, activists, civil society members, and individuals tackling specific issues that cannot be adequately addressed at the government-to-government level. Track-one-and-a-half diplomacy brings together government and nongovernmental officials, though it is understood that the government officials are participating in their personal capacity and not on behalf of their government.

It is worth remembering that because of the unique political and geo-strategic circumstances of the region, nongovernmental experts in the Middle East have had extensive first-hand experience dealing with arms control and nonproliferation issues. In fact, track-one-and-a-half and track-two negotiations have been the only fora for regular regional dialogue on arms control and non-proliferation issues since 1995, when ACRS was halted. In the absent of formal negotiations, regional, unofficial initiatives continue to promote a better understanding of threat perceptions, build relationships among security experts, officials and academics, and serve as a laboratory for new ideas. They also promote an environment, through the education of public opinion, which can make it safer for political leaders to take risks. Their achievements are more limited when there is no official ongoing track-one activities that they can feed into or complement, but several alternate track initiatives in the region became—or inspired—official agreements.

About the Author

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Annex 1: NWFZ Status of Ratification*

Region	Treaty	Opened for signature	Entry-into-force	Parties and signatories			Nuclear weapon states	
				Parties	Signatories	Non-signatories	Parties	Signatories
Latin America/ CaribbeanCaribbean	Treaty for the Prohibition of Nuclear Weapons in Latin America and the Caribbean (Treaty of Tlatelolco)	14 Feb. 1967	22 Apr. 1968	33	33	–	5	–
South Pacific	South Pacific Nuclear Free Zone Treaty (Treaty of Rarotonga)	6 Aug. 1985	11 Dec. 1986	13	13	3	4	1
South East Asia	Treaty on the Southeast Asia Nuclear Weapon-Free Zone (Treaty of Bangkok)	15 Dec. 1995	27 Mar. 1997	10	10	–	–	–
Africa	African Nuclear-Weapon-Free Zone Treaty (Treaty of Pelindaba)	11 Apr. 1996	15 July 2009	39	11	1	4	1
Central Asia	Treaty on a Nuclear-Weap-on-Free Zone in Central Asia (Treaty of Semipalatinsk)	8 Sep. 2006	21 Mar. 2009	5	5	–	2	3

*Figures for ratifications and signatories are as of February 1, 2015.

Annex 2: Status of Ratification of NWFZ by NWS*

	China	France	Russia	UK	US
Latin America and the Caribbean	√	√	√	√	√
South Pacific	√	√	√	√	-
South East Asia	-	-	-	--	
Africa	√	√	√	√	-
Central Asia	S	√	S	√	S

*Figures for ratifications and signatories are as of February 1, 2015.

Annex 3: Regional Proposals for Controlling Chemical Weapons

Year	Region	Comments
1936	Latin America	The Inter-American Conference for the Maintenance of Peace implicitly mentions the desire to free Latin America of chemical weapons
1982	Europe	The Palme Commission issues its final document, endorsing the establishment of a European CWFZ
1983	Central Europe	The member states of the Warsaw Treaty Organization express their support for a Central European CWFZ
1984	Latin America	The prime minister of Peru proposes a Latin American CWFZ
1985	Balkans	Romania and Bulgaria suggest the establishment of a Balkan CWFZ
	Northern Europe	Denmark advocates for a Northern CWFZ
	Central Europe	A group of experts established by the East German Socialist Unity Party and the West German Social Democratic Party agree practical details for the establishment of a Central European CWFZ
1991	Latin America	Argentina, Brazil and Chile sign the Mendoza Agreement on the non- possession of chemical and biological weapons
	Latin America	Bolivia, Colombia, Ecuador, Peru and Venezuela agree in the Cartagena Declaration to ban nuclear, biological, toxin and chemical weapons in their respective territories
1992	South Asia	India and Pakistan agreed not to develop, produce or acquire CW and to refrain from using them

Source: Ralf Trapp, "Chemical Weapon Free Zones?," SIPRI Chemical & Biological Warfare Studies no. 7 (Oxford University Press: Oxford, 1987).

Annex 4: Status of Adherence to Nuclear Safeguards Related Instruents in the Middle East

Country	IAEA Member	NPT	Safeguards Agreement	SQP	Additional Protocol
Algeria	1963	X	INFCIRC/531 - 1997		Approved 2004
Bahrain	2009	X	INFCIRC/767 - 2009	X[a]	2011
Comoros		X	INFCIRC/752 - 2009		2009
Djibouti		X	Signed 2010	X[b]	Signed 2010
Egypt	1957	X	INFCIRC/302 - 1982		
Iran	1958	X	INFCIRC/214 - 1974		Signed 2003
Iraq	1959	X	INFCIRC/172 - 1972		2012
Israel	1957		INFCIRC/248/Add.1 - 1975		
Jordan	1966	X	INFCIRC/258 -1978	X[c]	1998
Kuwait	1964	X	INFCIRC/607 - 2002	X[d]	2003
Lebanon	1961	X	INFCIRC/191 -1973	X[e]	
Libya	1963	X	INFCIRC/282 - 1980		2006
Mauritania	2004	X	INFCIRC/788 - 2009	X[f]	2009
Morocco[f]	1957	X	INFCIRC/228 - 1975	X[g]	2011
Oman	2009	X	INFCIRC/691 - 2006	X[h]	
Palestine[h]		Deposited		X[i]	
Qatar	1976	X	INFCIRC/747 - 2009	X[j]	
Saudi Arabia	1962	X	INFCIRC/746 - 2009	X[k]	
Somalia		X			
Sudan	1958	X	INFCIRC/245 - 1977	X[l]	
Syrian Arab Republic	1963	X	INFCIRC/407 - 1992		
Tunisia	1957	X	INFCIRC/381 - 1990		Signed 2005
Turkey	1957	X	INFCIRC/295 - 1981		2001
United Arab Emirates	1976	X	INFCIRC/622 - 2003	X[m]	2010

Source: Laura Rockwood, *Ensuring the Safety, Security and Peaceful Nature of Nuclear Energy in the Middle East: Ensuring the Peaceful Uses of Nuclear Energy* (to be published 2015).

[a] Modified SQP EIF with the CSA.
[b] Modified SQP approved with the CSA.
[c] Original SQP
[d] Amended original SQP in 2013.
[e] Amended original SQP in 2007.
[f] Amended original SQP in 2013.
[g] Morocco's CSA included an SQP when concluded in 1975, but Morocco rescinded the SQP in 2007.
[h] Original SQP.
[i] Palestine is identified by the IAEA as an "entity having received a standing invitation to participate as observer in the sessions and work of the General Conference and maintaining permanent observer mission in Vienna."
[j] Modified SQP EIF with the CSA.
[k] Original SQP.
[l] Original SQP
[m] Original SQP.

Annex 5: Adherence to Chemical and Biological Instruments in the Middle East*

Country	1925 Geneva Protocol	BWC	CWC
Algeria	+	+	+
Bahrain	+	+	+
Comoros	+	-	+
Djibouti	+	-	+
Egypt	+	S	-
Iran	+	+	+
Iraq	+	+	+
Israel	+	-	S
Jordan	+	+	+
Kuwait	+	+	+
Lebanon	+	+	+
Libya	+	+	+
Mauritania	+	+	+
Morocco	+	+	+
Oman	-	+	+
Palestine	+	-	-
Qatar	+	+	+
Saudi Arabia	+	+	+
Somalia	+	-	+
Sudan	+	+	+
Syrian Arab Republic	+	S	+
Tunisia	+	+	+
Turkey	+	+	+
United Arab Emirates	-	+	+

Ratified (+); signed (S); non-party (-)

Annex 6: Regional Membership in Nuclear Safety and Security Regimes*

Country	Convention on the Physical Protection of Nuclear Material	2005 Amendment to the Convention on the Physical Protection of Nuclear Material	International Convention for the Suppression of Acts of Nuclear Terrorism	Convention on Early Notification of a Nuclear Accident	Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency	Convention on Nuclear Safety	Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
Algeria	AN	R	AN	R	R	S, not R	
Bahrain	AN	AP	AN	AN		AN	
Djibouti	AN	R	R				
Egypt				R	R	S, not R	
Iran				R	R		
Iraq	AN			R	R		
Israel	R	R	S, not R	R	R	S, not R	
Jordan	AN	AP	S, not R	R	R	R	
Kuwait	AN		R	AN	AN	AN	
Lebanon	AN		R	R	R	R	S, not R
Libya	AN	R	R	AN	AN	AN	
Morocco	R		R	R	R	S, not R	R
Oman	AN			AN	AN	AN	AN
Qatar	AN		R	AN	AN		
Saudi Arabia	AN	AP	R	AN	AN	AN	AN
Syrian Arab Republic				S, not R	S, not R	S, not R	
Tunisia	AN	AP	AN	R	R	R	
Turkey	R		R	R	R	R	
United Arab Emirates	AN	AP	AN	AN	AN	AN	AN
Yemen	AN						

A=Approval; AP=Acceptance; AN=Accession; R=Ratification; S=Signature

Note: "Approval", "acceptance", "accession", "ratification", and "signature" mean a state is a member of a treaty.
"Signed, but not ratified" indicates support, but not membership to the treaty.

Source: Aaron Gluck and Miles Pomper, "Ensuring the Safety and Security of Nuclear Energy in the Middle East," (forthcoming, 2015).

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