



# Possible Frameworks for Verification of a WMD/DVs Free Zone in the Middle East

## The Nuclear Dimension

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The Resolution on the Middle East adopted without vote at the 1995 Nuclear Non-Proliferation Treaty (NPT) Review and Extension Conference calling for the establishment of a zone in the Middle East<sup>1</sup> free of nuclear weapons, and all other weapons of mass destruction (WMD) and their delivery vehicles (DVs), was reaffirmed by the 2000 and 2010 NPT Review Conferences. The 2010 Conference mandated the Secretary-General of the United Nations and the co-sponsors of the 1995 Resolution,<sup>2</sup> in consultation with the states of the region, to convene a conference in 2012, to be attended by all states of the Middle East. The mandate was the establishment of a Middle East zone free of nuclear 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. The anticipated 2012 Conference was mandated to take the 1995 Resolution as its terms of reference.

It is essential to recognize that the 1995 Middle East Resolution, and its subsequent affirmation by all NPT states parties, envisages the establishment in the region of the Middle East a zone free of nuclear weapons, and free of other WMD and their DVs. This particular formulation was driven in light of recognition of the existence in force of the NPT, and of internationally accepted principles governing the establishment of Nuclear Weapon Free Zones (NWFZs). By 1995 two NWFZ treaties had been negotiated,<sup>3</sup> and another two were in the making.<sup>4</sup> By 2010, NWFZs were in existence in five populated regions of the world (see POLICY BRIEF No. 5).<sup>5</sup> There is no working model of a zone free of other weapons of mass

destruction and their delivery vehicles as it will need to be devised to cover biological and chemical weapons as well as delivery vehicles.<sup>6</sup> The 1972 Biological and Toxin Weapons Convention (BTWC) and the 1993 Chemical Weapons Convention (CWC) provide frameworks for the prohibition of these two categories of weapons of mass destruction. While the BTWC lacks a verification mechanism and organization, the implementation of the CWC is monitored and verified by the Organization for the Prohibition of Chemical Weapons (OPCW). The question of delivery vehicles is a virtual Pandora's Box of interpretations and definitions; however, the Missile Technology Control Regime (MTCR) and 1991 UN Security Council Resolution 687 provide useful definitions.<sup>7</sup>

Logically speaking, a WMD/DVs Free Zone should include three measures for the implementation of such a zone: (i) the prohibition and non-possession of nuclear, chemical, and biological weapons as well as their delivery system, by all zonal states; (ii) the non-deployment or non-stationing of prohibited weapons and items within the geographical zone of application, and, (iii) the non-use and non-threat of use of prohibited weapons and items against targets within the zone of application. These measures could be incorporated in legally binding ways through adherence by the zonal States to the NPT, the BTWC, and the CWC, and by acceptance of their respective verification procedures, while a mechanism would need to be defined to capture delivery systems. The 1990 proposal by Egypt for the establishment of a WMD/DVs Free Zone in the Middle East,<sup>8</sup> specified three elements: (i) all WMD to be prohibited; (ii) all states of the

### Abstract

*Recognizing the 1995 NPT Resolution calling for a WMD/DVs Free Zone in the Middle East, it is worth noting that no such zone exists worldwide yet. Nuclear Weapon Free Zones are in effect, providing examples for issues of verification and organizational setup. Making the Middle East zone successful and sustainable will require, among others, solutions to verification issues that consider feasible and effective setups for institutional frameworks.*

*Therefore, this POLICY BRIEF addresses these issues by developing three possible verification frameworks for an NWFZ in the Middle East, in the broader context of a WMD/DVs Free Zone: verification carried out by the International Atomic Energy Agency; joint verification by the IAEA and a regional control mechanism; and separate verification by both institutions. This POLICY BRIEF argues that, on balance, a Middle East NWFZ would be better off relying on IAEA verification and safeguards at the beginning. Over the medium- to longer-term, given the political will, financial, and human resources, the regional states could invest in a regional authority to build up their own capacity and thereby contribute to strengthening mutual confidence and trust. ■*

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*» Nuclear weapon free zones help to strengthen the security of the states involved. They are an important disarmament tool which contributes to the primary objective of strengthening regional and, by extension, international peace and security.«*

region to make equal and reciprocal commitments; and, (iii) establishment of verification measures and modalities to ensure compliance by all countries of the region.

With regard to the five existing NWFZs, all of them provide for verification obligations on the part of member states and require states parties to conclude with the International Atomic Energy Agency (IAEA), and bring into force, a safeguards agreement. Furthermore, one NWFZ treaty additionally requires states parties to bring into force an Additional Protocol (AP).<sup>9</sup> It is recognized that each new treaty has built upon the experience of previous ones, while taking into due account the specific characteristics of each region. Thus, the concept of NWFZs has evolved over time with new treaties incorporating additional elements as agreed by the states parties.

The focus of this POLICY BRIEF is to address issues concerning possible verification frameworks for an NWFZ in the Middle East, in the broader context of a zone free of other weapons of mass destruction and their delivery vehicles as referenced above. Verification frameworks will need to be devised for biological weapons, taking into account the work of the Implementation Support Unit (ISU) for the Biological and Toxin Weapons Convention. For chemical weapons verification, the modalities in the Chemical Weapon Convention and the practices of the Organisation for the Prohibition of Chemical Weapons will be relevant. Verification modalities for delivery vehicles also will need to be addressed.

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### **Basic Obligations for a Nuclear Weapon Free Zone in the Middle East**

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With regard to nuclear weapon free zones, each one is the product of the specific circumstances of the region concerned and highlights the diversity of regionally different situations. Moreover, the establishment of NWFZs is a dynamic process. The experience of existing zones clearly shows that these are not static structures. Also, in spite of the diversity of the situation in different regions, the establishment of the new NWFZs has proven to be feasible on the basis of arrangements freely arrived at among the states of the region concerned. Nuclear weapon free zones help to strengthen the security of the states involved. They are an important disarmament tool that contributes to the primary objective of strengthening regional and, by

extension, international peace and security. They are also considered to be important regional confidence- and security-building measures. NWFZs can also be a means of expressing and promoting common values in the areas of nuclear disarmament, arms control, and non-proliferation. In effect, NWFZs constitute important first steps to achieve a nuclear weapon free world.

An NWFZ prohibits the development, manufacture, stockpiling, acquisition, possession, control, and assistance in research of any nuclear explosive device within the zone of application by any contracting party. Peaceful applications and uses of nuclear energy, under appropriate IAEA safeguards, are allowed. Following the model of general prohibitions in existing treaties, the basic obligations under an NWFZ agreement in the Middle East might include, inter alia, undertakings such as:

- to use nuclear energy for exclusively peaceful, non-explosive purposes;
- not to conduct research on, manufacture, possess, control or use nuclear weapons or nuclear explosive devices;
- not to permit the deployment or testing of nuclear weapons or nuclear explosive devices anywhere in their territories;
- to declare, dismantle, destroy or convert any nuclear explosive devices and facilities for their manufacture;
- not to conduct research on, manufacture, possess, control, or use any nuclear-weapon-usable material in relation of a nuclear weapon programme;
- to report all imports, exports and production of nuclear material and specified equipment as well as non-nuclear material;<sup>10</sup>
- to accept full-scope IAEA safeguards on all nuclear material and installations located in their territories or under their control, including an undertaking to facilitate prompt access by Agency inspectors;
- to accept the Additional Protocol to comprehensive safeguards agreements;
- to report on all nuclear fuel cycle related research and development (this is already a requirement under the AP); and
- to declare any past program for the manufacture of nuclear explosive devices and to dismantle and destroy such programs under international verification.

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### **Institutional Verification Arrangements**

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Effective verification is an important measure of arms control agreements that aims



at creating the necessary confidence. In the Middle East, with a reported although undeclared legacy of nuclear weapons development and possession, and consequently fear and mistrust, the creation of such confidence requires verification arrangements that are comprehensive and effective. It would be necessary that all facilities involved in the development of a nuclear weapon program in a state as well as the stock of nuclear weapons be dismantled by the possessor state prior to the creation of the NWFZ. In this particular regard, zonal disarmament agreements are of relevance not only to the parties directly involved, but also to states bordering the region and to the wider international state community. In order to meet both regional and global concerns, verification arrangements under existing NWFZ agreements provide for international inspection through the IAEA and additionally by regional structures.

The recognized requirement of verifying that contracting parties are complying with the treaty obligations can be met by ensuring that all nuclear material, facilities, and activities are subject to full-scope safeguards administered by the IAEA. The specifics of the 'control systems' may vary from region to region, but all states within one zone must implement Comprehensive Safeguards Agreements (CSA) of the Vienna-based agency.

Institutional arrangements relying on international and regional verification could be developed for a Middle East NWFZ in three alternative ways:

1. to assign all routine and non-routine verification responsibility to the IAEA;
2. for all routine and non-routine verification activities to be conducted by international (IAEA) and regional authorities acting jointly; and
3. for routine and non-routine verification activities to be carried out independently by the IAEA and, in parallel, independently by an inspection body created by – and responsible to – an authority consisting of the parties to the NWFZ agreement.

Considering existing zonal models, all five NWFZs rely on IAEA safeguards to ensure compliance and verification, but supplement safeguards with regional mechanisms and procedures (see POLICY BRIEF No. 32). A party to these treaties is required to negotiate and conclude a safeguards agreement with the IAEA covering all fissionable material within



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its territory, allowing the IAEA to carry out routine, ad hoc, and special inspections of safeguarded nuclear facilities and materials.<sup>11</sup> Routine inspections include verifying the amount, location, and identity of declared nuclear material as well as verifying the consistency between reports and records; ad-hoc inspections verify information contained in the initial reports and the changes that occurred since the date of the initial reports; and special inspections are made in addition to routine inspections to verify information contained in special reports when unusual circumstances occur or are detected by the Agency. Special inspections may be either in addition to routine inspections, or involve

access to information or locations that are additional to those involved in routine and ad hoc inspections, or both. While special inspections have not often been carried out by the IAEA, they are an important element of the Agency's legal authority to implement safeguards, and may be necessary in order to fully achieve the objectives of safeguards pursuant to the NPT and the Middle East NWFZ.

While relying on the IAEA system allows countries to take advantage of the organization's considerable experience in this area as well as to save costs, the IAEA system does not cover all verification functions required by NWFZs. The safeguards system is geared to ensure that non-nuclear weapon states do not divert nuclear material to build nuclear explosives. It does not monitor other possible violations of an NWFZ, such as clandestine import of nuclear weapons by a party, or the use of a state's territory within the zone by an extra-regional country for the stationing or deployment of nuclear weapons. Thus, the scope of the obligations of NWFZs goes beyond the full application of IAEA safeguards.

#### **The Role of IAEA Safeguards within Nuclear Weapon Free Zones**

The principal role of the Agency within NWFZs is to verify compliance of the states parties of the zone with their undertakings under the NWFZ treaty and including compliance with NPT comprehensive safeguards agreements, and additional protocols if specified. A typical verification of peaceful uses provision calls for a comprehensive safeguards agreement with the IAEA for the purpose of verifying compliance; and not to provide source or special fissionable material, or equipment or material especially designed or prepared for the processing, use, or production of special fissionable material for peaceful purposes to any non-nuclear weapon state unless subject to a comprehensive safeguards agreement concluded with the IAEA.

In general, the regional control mechanisms have chosen to rely on the IAEA to carry out the technical aspects of verification, without developing the technical expertise themselves. Under a special arrangement, Argentina and Brazil carry out bilateral nuclear inspections through the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC) with the involvement of the IAEA.<sup>12</sup>

#### **'Special Inspections' to Verify Compliance**

Under certain circumstances, as provided for in the Statute of the IAEA and in NPT-related safeguards agreements (IAEA-INFCIRC/153 Corr.) 'special inspections' may be carried out by the IAEA in performance of its safeguards functions within the territories of the contracting parties to an NWFZ. Special inspections can be triggered by the IAEA in situations where there are indications of undeclared nuclear activities, and/or if the IAEA considers that information made available by the state is not adequate for the Agency to fulfil its responsibilities in the implementation of safeguards. Such inspections may be either additional to routine inspections, or involve access to information or locations which are additional to those involved in routine and ad hoc inspections or both. (Furthermore, under the Additional Protocol (INFCIRC/540 Corr.), the IAEA can request 'complementary access' to resolve questions or inconsistencies, or to seek additional information, in the course of the implementation of safeguards.) It is worth noting that the procedure to initiate a special inspection is far more complex than the one established for a complementary access under the Additional Protocol.<sup>13</sup>

#### **Regional Control Mechanisms**

Regional control mechanisms created by NWFZs – such as the Organization for the Prohibition of Nuclear Weapons in Latin America (OPANAL), the Consultative Committee of the South Pacific Nuclear Weapon Free Zone, the Commission for the Southeast Asia Nuclear Weapon Free Zone and its subsidiary organ, the Executive Committee, and the African Commission on Nuclear Energy (AFCON) – oversee and review the application of the IAEA safeguards system. This is including challenge inspections authorized by the regional control mechanisms, but carried out by IAEA inspectors within their respective zones during their periodic meetings of zonal states. Moreover, they provide for a number of additional control measures. Thus, in addition to the application of the IAEA system, the Latin American treaty provides for reports and exchanges of information, and special reports requested by OPANAL. A provision for special inspections contained in the original draft of the Latin American treaty has been removed as a result of amendments proposed by Brazil and Argentina.

*» Thus far, the NWFZ regional control mechanisms have found it cost effective to rely on the IAEA for verification rather than developing the technical expertise themselves in light of various constraints, including adequately trained manpower, cost of verification technologies and equipment, and other infrastructure and managerial challenges.«*



In addition to IAEA safeguards, the South Pacific zone's verification regime includes reports and information exchanges, consultations, and a complaints procedure. The complaints procedure provides for special inspections authorized by and carried out by the Consultative Committee, the main regional verification body established by the treaty.

The Southeast Asian zone also supplements the IAEA safeguards system with reports and exchange of information, requests for clarification, fact-finding missions, and a dispute settlement procedure. The Commission for the Southeast Asia Nuclear Weapon Free Zone is responsible for overseeing the implementation of the treaty and for ensuring compliance with its provisions, while the Executive Committee is responsible for ensuring the proper operation of verification measures, including requests for clarification and fact-finding missions.

In the African zone, the control system supervised by the AFCONE includes the application of the IAEA safeguards system, as well as a regional system of reporting and exchange of information, consultations and conferences. The treaty also provides for a complaints and dispute settlement mechanism, including technical visits and special inspections using Agency inspectors.

The Consultative Meetings as provided for in the Central Asian NWFZ Treaty can be held to review compliance as well as other matters related to implementation of the treaty.

It should be noted that so far there have been no reported cases of special inspections carried out by the IAEA at the request of any of the five regional control bodies. This may have to do with the absence of any serious effort by countries located within any of the five zones to acquire nuclear weapons or absence of any indication of diversion of nuclear material and prohibited activities as concluded in the annual IAEA Safeguards Implementation Report (SIR). In general, the regional control mechanisms have chosen to rely on the IAEA to carry out the technical aspects of verification and have accepted the findings of the SIR as meeting the requirements of the respective zonal treaties. Thus far, the NWFZ regional control mechanisms have found it cost effective to rely on the IAEA for verification rather than developing the technical expertise themselves in light of various constraints,



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including adequately trained personnel, cost of verification technologies and equipment, and other infrastructure and managerial challenges.

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### Verification Frameworks – Option 1: Verification Carried out by the IAEA

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The standard model and experience of the five existing NWFZs is to assign all verification responsibilities to the Vienna-based agency in accordance with the legal obligations of comprehensive safeguards agreements (INFCIRC/153/Corr.) and the additional protocol (INFCIRC/540/Corr.) based on each NWFZ treaty provisions. This provides for standardization of verification, avoidance of duplication and disruption for nuclear operators, cost savings, effectiveness and efficiency, reporting of safeguards conclusions to the IAEA Board of Governors, and methodologies and frameworks for addressing questions or irregularities. Membership of the IAEA, nor membership in the NPT,

*» The objective of safeguards is the timely detection of diversion of significant quantities of nuclear material from peaceful nuclear activities to the manufacture of nuclear weapons or of other nuclear explosive devices or for purposes unknown, and deterrence of such diversion by the risk of early detection.«*

is a prerequisite for a state to bring into force a safeguards agreement with the IAEA.

As an NWFZ treaty requires its parties to use nuclear energy exclusively for peaceful purposes, verification of this obligation would be fulfilled by bringing into force a comprehensive safeguards agreement with the Agency. The basic undertaking of the state would be to accept safeguards on all source or special fissionable material in all peaceful nuclear activities within its territory, under its jurisdiction or carried out under its control anywhere, for the exclusive purpose of verifying that such material is not diverted to nuclear weapons or other nuclear explosive devices.<sup>14</sup> For its part, the IAEA has the corresponding right and obligation to ensure that safeguards are applied. For states with comprehensive safeguards agreements in force but with little or no nuclear material or nuclear activities, a Small Quantities Protocol (SQP) may be concluded which holds in abeyance certain measures of the agreement, until the state acquires more than specified quantities of nuclear material and/or a nuclear facility. While the reporting requirements and the conduct of inspections in states with SQPs are far less intense than in states without, all states must establish a functioning system for accounting and control of nuclear material and maintain ongoing communications with the Agency.<sup>15</sup>

In February 1992, the Board of Governors affirmed that the scope of comprehensive safeguards agreements was not limited to nuclear material actually declared by a state, but included any material that is required to be declared. In other words, the Board confirmed that the organization has the right and obligation, under such agreements, to verify not only that state declarations of nuclear material subject to safeguards are ‘correct’ (i.e. they accurately describe the types and quantities of the state’s declared nuclear material holdings), but that they are also ‘complete’ (i.e. that they include all material that should have been declared).

The objective of safeguards is the timely detection of diversion of significant quantities of nuclear material from peaceful nuclear activities to the manufacture of nuclear weapons or of other nuclear explosive devices or for purposes unknown, and deterrence of such diversion by the risk of early detection. The ‘timely detection’ of the diversion of ‘significant quantities’ is based on the premise that, in case a certain quantity of nuclear material cannot be accounted for,

the possibility of the state manufacturing a nuclear explosive device cannot be excluded. Furthermore, a certain amount of time is required for the state to convert nuclear material into a weapon-usable form.

Goal quantities and timeliness requirements are established for detecting diversion of different categories and forms of nuclear material (e.g. low-enriched uranium and high-enriched uranium; bulk form or fresh reactor fuel assemblies). If the overall objective of a comprehensive safeguards agreement is to be achieved, a second objective must be pursued, that is the detection of undeclared nuclear material and activities in a state. This requires different tools from those needed for the timely detection of the diversion of declared nuclear material, such as a broader range of information, more emphasis on the evaluation of information, more access for inspectors to locations, and a more analytical approach in implementing safeguards. It also requires the evaluation of the state’s entire nuclear fuel cycle capabilities (i.e. the state ‘as a whole’) in addition to individual facilities.

The IAEA has defined three safeguards objectives that are common to all states with CSAs, as follows:

- to detect undeclared nuclear material and activities anywhere in the state;
- to detect undeclared production or processing of nuclear material at facilities and Locations Outside Facilities (LOFs); and,
- to detect diversion of declared nuclear material at facilities and LOFs.<sup>16</sup>

In order to meet the overall objective the Agency determines an optimized combination of safeguards measures needed to achieve state-specific technical objectives, based on the evaluation of all available information on the state. The concept of considering the state as a whole provides the opportunity to focus verification efforts and resources where needed to meet the state-specific objectives. The methodology and approach are based on a comprehensive state evaluation that takes state-specific factors into consideration in all stages of safeguards implementation.

In order to apply effective safeguards under comprehensive safeguards agreements, the Agency identifies and conducts safeguards activities to address generic state-level safeguards objectives that are common to all states with comprehensive safeguards agreements.



In determining how these generic safeguards objectives are to be addressed for a particular state, the Agency conducts an analysis of all technically plausible paths by which that state could pursue the acquisition of nuclear material for the development of a nuclear weapon or other nuclear explosive device. Such an acquisition path could involve the diversion of declared nuclear material, unreported imports of nuclear material, unreported production or processing of nuclear material at declared nuclear facilities or LOFs, undeclared nuclear material and activities, or any combination of these. The Agency then establishes technical objectives for each path.

The generic and technical objectives and applicable safeguards measures to address them form the basis of a state-level safeguards approach for a state. In developing and implementing a state level safeguards approach for a state, the Agency takes into account state-specific factors, such as the nuclear fuel cycle and related technical capabilities of the respective country. In evaluating safeguards implementation, the Agency assesses the extent to which the planned activities have been carried out and the objectives of the state-level safeguards approach achieved. In addition, the Agency monitors the status of follow-up actions, including the actions necessary in order to conclude whether or not any identified anomalies, discrepancies and inconsistencies constitute an indication of diversion of nuclear material or of the presence of undeclared nuclear material or activities.

Access to locations and information is essential for meeting the objectives of safeguards agreements. The state's Safeguards Regulatory Authority (SRA) is responsible for facilitating the access and providing support to IAEA inspectors. Agency activities in the state fall into three major categories: design information verification, inspections, and complementary access. Each category of activity involves various tasks needed to achieve the technical objectives, and may involve access to a variety of locations within a facility, site, or other locations in a state.

The IAEA may carry out three kinds of inspections: ad hoc, routine, and special inspections, as well as complementary accesses. States must ensure the inspectors are able to carry out their activities, by providing access to locations and to information necessary to meet independently the objectives of the inspection. States, and NWFZ

### The IAEA's Three Safeguards Objectives



Source: UN Photo/Mark Garten

<p><b>Objective A</b> To detect undeclared nuclear material and activities</p>	<p>State as a whole</p>	<p>This objective is achieved through evaluating State declarations and all safeguards relevant information available to the Agency and performing activities in the field.</p>
<p><b>Objective B</b> To detect undeclared production or processing of nuclear material</p>	<p>Declared facilities and LOFs</p>	<p>This objective is achieved through evaluating State declarations and performing activities at declared facilities and LOFs.</p>
<p><b>Objective C</b> To detect diversion of declared nuclear material</p>	<p>Declared facilities and LOFs</p>	<p>This objective is achieved through evaluating State accounting reports and performing activities at declared nuclear facilities and LOFs to verify inventories and flows of declared nuclear material.</p>
<p><b>Activity common to the three objectives</b> Follow-up questions, discrepancies, anomalies and inconsistencies identified when performing activities necessary to meet the above objectives.</p>		<p>Follow-up activities are defined and carried out in order to ascertain whether the identified discrepancies, anomalies and inconsistencies indicate the possible presence of undeclared nuclear material or activities or the diversion of nuclear material from peaceful activities.</p>

Source: IAEA, 'The Safeguards Implementation Report for 2013: Report by the Director General', GOV/2014/27, April 23, 2014.

regional control mechanisms, have the right to have IAEA personnel accompanied during inspections, provided that in doing so, inspectors are not delayed or otherwise impeded in carrying out their functions.

Ad hoc inspections are normally conducted to verify the information contained in the initial report by a state to the IAEA, before subsidiary arrangements have been concluded and facility attachments have been prepared, or to verify nuclear material before it is exported or upon receipt in the importing state.

Routine inspections<sup>17</sup> are conducted after the Subsidiary Arrangements Attachments have been concluded and specific information has been incorporated in the attachments, including information on 'strategic points' in each facility. Once the broader conclusions are drawn in a state with an AP in force, the IAEA has the right under certain conditions to conduct inspections on

a random basis, with a minimum advance notification to the state and operator or to select part of the routine inspection activities randomly. This supplementary measure can achieve increases in both effectiveness and efficiency, and is an important component of the state level concept for safeguards planning and implementation. States, and NWFZ regional control mechanisms, have the right to have inspectors accompanied during unannounced inspections; such accompaniment must not delay or otherwise impede the inspectors in the exercise of their functions.<sup>18</sup> States may find the logistics challenging, but the Agency may nonetheless exercise its right to conduct unannounced inspections. The IAEA periodically communicates to the state its general programme of inspections to help minimize impacts on the facilities. Inspectors conducting a routine inspection must be granted access and support to carry out their activities to meet the verification objectives.

The IAEA may require special inspections which may be either additional to the routine inspection effort, or involve access to information or locations which are additional to those involved in routine and ad hoc inspections, or both. While special inspections have rarely been carried out, they are an important element of the Agency's legal authority to implement safeguards, and may be necessary for the IAEA to achieve the objectives of the NWFZ treaty and NPT safeguards.

Complementary access refers to access provided to IAEA inspectors by a state under an Additional Protocol, to enable the inspectors to carry out specific verification and assessment activities to meet the Agency's safeguards objectives. The Agency may request complementary access to a variety of locations in a state with an Additional Protocol in force. The IAEA may request access to any location on a site; complementary access at sites is often conducted in conjunction with design information verification (DIV) or inspections at facilities on or at the site. Complementary access is also used to confirm the continued decommissioned status of a facility or LOF. The Agency may also request complementary access to locations at which activities take place as declared by a state to the IAEA.<sup>19</sup> Furthermore, the state shall provide access to the Agency to any location specified by the Agency, other than the above, to carry out location-specific environmental sampling, provided that if the state is unable to provide such access, the

state shall make every reasonable effort to satisfy IAEA requirements, without delay, at adjacent locations or through other means.<sup>20</sup> Each type of access requested has specific advance notice requirements; in some cases this may be less than two hours. In addition to locations associated with State declarations under an AP, the IAEA may also request complementary access to any location in the state. Such conditions require effective coordination within the country, and as with inspections, the state has the right to accompany IAEA inspectors on complementary access, provided that such accompaniment does not impede or delay the access.<sup>21</sup>

Managed access refers to steps taken by the state to prevent the dissemination of proliferation-sensitive information,<sup>22</sup> to meet safety or physical security requirements, or to protect proprietary or commercially sensitive information, in such a manner as to not impede the IAEA's activities to fulfil the purpose of the access. The state when providing its initial declaration pursuant to its Additional Protocol, should inform the Agency of the places at a site or location at which managed access may be applicable. Arrangements for managed access shall not preclude the IAEA from conducting activities necessary to provide credible assurance of the absence of undeclared nuclear material and activities at the location in question, including the resolution of a question relating to the correctness and completeness of the information provided by the state in its initial declaration under the Additional Protocol or of an inconsistency relating to that information. An example of managed access is the designation of routes through buildings that avoid areas where inspectors' safety is a concern but which allow inspectors to gain a thorough understanding of the function and purpose of the building. Ultimately, the state must provide sufficient access to information and locations during managed access to allow the IAEA inspectors to fulfil the purpose of the access.

The advantages of this option include the several decades' long experience of the IAEA in nuclear verification, the credibility of the Agency's safeguards conclusions, and the recognized independence and impartiality of the IAEA. Only the IAEA has the legal authority, under its Additional Protocol, to confirm the absence of undeclared nuclear material and activities. However, some doubt will always remain, as an absence can rarely be confirmed. As an example, the concealed Fordow facility in Iran was uncovered by

intelligence agencies. Furthermore, all five existing nuclear weapon free zones rely upon comprehensive safeguards to meet respective treaty requirements. In addition, there are considerations of cost effectiveness and accepted technical competence of the safeguards system. Possible disadvantages might include that in the view of very few analysts, safeguards would need to be supplemented by additional monitoring and verification mechanisms in the Middle East given the history of undeclared nuclear activities in Iran, Iraq, Israel, Libya, Egypt, and Syria. In this context it must be stated that though, except for Israel, the above-mentioned States had comprehensive safeguards agreements in force but not the Additional Protocol. Israel is not party to the NPT and thus does not have a comprehensive safeguards agreement in force.<sup>23</sup> No verification system in the world anywhere can provide an absolute guarantee of detecting violations if a state is taking active concealment measures, on the other hand, the suite of safeguards technologies and methodologies being implemented by the IAEA currently make it very difficult for a state to have the assurance of the non-detection of clandestine nuclear activities by the Agency.

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### **Verification Frameworks – Option 2: Verification Carried out Jointly by the IAEA and a Regional Control Mechanism**

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The rights and obligations, as well as the safeguards objectives and practices, of the IAEA have been described in the preceding section. In situations where the IAEA agrees to jointly carry out safeguards implementation with a regional NWFZ authority, the Agency will fully implement its rights and obligations and implement safeguards in accordance with its practices without any interference or hindrance and reach its own independent safeguards conclusions. Inspectors or staff of a regional NWFZ authority may accompany Agency inspectors with the consent of the country, but may not interfere or hinder their work. The regional zonal authority would need to define its safeguards objectives and practices and implement them, and develop a reporting procedure and metrics for its governance structure. The regional NWFZ authority would be responsible for covering its own costs. As a way of assisting, this authority may work jointly with the Agency to develop safeguards technologies and equipment, the specifications for which would be provided by the IAEA.





Advantages of this option include that an additional regional control mechanism would complement the implementation of IAEA safeguards and verification, thereby allowing direct involvement of the states in the actual conduct of verification activities and reporting to a regional verification authority. This could add an additional layer of confidence in a region such as the Middle East where trust is lacking. Disadvantages would include additional costs, duplication of verification activities, possible additional burdens, and disruptions for nuclear operators.

### Verification Frameworks – Option 3: Separate Verification by the IAEA and by a Regional Authority

Safeguards could be implemented separately and in parallel by the IAEA and the regional authority. The provisions noted under the previous option would also apply in this case. A model for Option 3 is ABACC or the European Atomic Energy Community (Euratom), neither of which implement safeguards and verification pursuant to a regional NWFZ arrangement.

#### The European Atomic Energy Community – Euratom

The legal basis for Euratom<sup>24</sup> safeguards is to be found in the Euratom Treaty of 1957, between six European states. It set out a framework for pooling efforts to develop nuclear energy. It had been successfully preceded by the 1951 Paris Treaty between the same six countries that provided for a common organisation of the strategic industries of coal and steel production. The European Economic Community Treaty was signed at the same time as the Euratom Treaty. Over the intervening fifty years, these three communities have evolved into today's European Union, which currently has 28 members.

The Euratom Treaty together with its derived legislation remains the principal legal vehicle regulating civil nuclear questions in the EU and is binding primary law in all member states of the EU. The Euratom Treaty assigns the responsibility for implementation of Euratom Safeguards to the European Commission. Under the Euratom Treaty, the Commission has the task of satisfying itself that, [in the territories of member states]: (a) ores, source materials and special fissile materials are not diverted from their intended uses as declared by the users; (b) the provisions relating to supply and any

particular safeguarding obligations assumed by the Community under an agreement concluded with a third state or an international organization are complied with.

The safeguards agreement between the IAEA, Euratom and Euratom's non-nuclear weapon Member States (INFCIRC/193) represents the first multilateral NPT safeguards agreement. It includes a Protocol that amplifies the cooperation arrangements that are necessary because of the existence of the Euratom safeguards system. All new states joining the EU are obliged to be parties to the NPT, and are obliged to accede to the INFCIRC/193 Agreement together with its Additional Protocol. Euratom is also a party to the safeguards agreements between the IAEA and the United Kingdom as well as the IAEA and France: (INFCIRC/263 and INFCIRC/290 respectively). All three agreements are complemented by their respective Additional Protocols that came into force in 2004.

Euratom is of a supranational nature and, in the area of safeguards, has especially wide powers and is part of a cooperative approach to international safeguards (common inspections with the IAEA, development of a partnership with the IAEA, and the IAEA making use of the Euratom safeguards system as a whole). A common system of safeguards for all states in a region is a clear advantage for the effective and efficient implementation of safeguards in that region because of its independence of the technical capabilities of individual states. The Euratom Treaty gives the Commission the right to send inspectors into the territories of the member states who shall at all times have access to all places and data and to all persons who deal with materials, equipment or installations subject to safeguards. This right of access can be enforced by the EU Court of Justice if necessary. Inspectors are directly employed by the Commission and are therefore independent from their country of origin. Inspections in the EU non-nuclear weapon states and in certain installations in France and the United Kingdom are carried out jointly by Euratom and IAEA inspectors. More generally, both organizations' safeguards activities complement each other, which require close cooperation. The common implementation of safeguards between Commission and IAEA usually entails agreement on very detailed technical issues. Euratom and its safeguards system were created under specific historical circumstances. Its safeguards system has evolved over time and has become a partner of the IAEA in international safeguards and

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non-proliferation. With the implementation of the Additional Protocol in states party of the European Community, the role of Euratom has been considerably reduced without compromising its role.

There are a number of aspects in the development of the Euratom safeguards system and its current implementation that might be of interest when considering ways to arrive at creating an NWFZ in the Middle East. For example, the ‘New Partnership Approach’ (NPA), signed between the IAEA and Euratom in April 1992, has the objective to enhance the effectiveness and efficiency of safeguards. The NPA includes: optimizing practical arrangements; using commonly agreed safeguards approaches, inspection planning and procedures, inspection activities, and inspection instruments, methods and techniques; avoiding unnecessary duplication of effort by performing inspection activities based on the principle ‘one-job-one-person’, supplemented by quality control measures; sharing analytical capabilities; cooperating in research and development and in the training of inspectors; and increasing the common use of technologies to replace, to the extent possible, the physical presence of inspectors by appropriate equipment. As a result of the NPA, significant reductions have been achieved in the IAEA and Euratom inspection effort while allowing both organizations to meet their respective obligations to reach independent conclusions and required assurances.

#### **Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials – ABACC**

As a regional agency dealing with safeguards, its main goal is guaranteeing Argentina, Brazil and the international community that all the nuclear materials are used exclusively for peaceful purposes. The safeguards inspections in Argentina and Brazil are performed jointly by the ABACC and the IAEA, so as to optimize human, financial, and material resources. They take place after thorough planning and involve three stages: pre-inspection, inspection in situ, and post-inspection. In the pre-inspection stage, both organizations’ inspectors either come to ABACC to be briefed on the activities proposed by the Agency to be carried out at facilities to be inspected or the briefing is carried out via video conference. The in-situ inspections are always performed accompanied by the operator of the facility and a state representative. ABACC inspectors

are mainly facility operators selected and trained to perform inspections in the other country (Brazilian inspectors carrying out inspections for ABACC in Argentina and vice versa). In the post-inspection stage, the inspectors prepare the report, attend an inspection debriefing, carry out the analysis of the data collected and measurement performed during the inspection, and report on any follow up action to be carried out. The “Inspection Database” with the data obtained during the mission is updated. As noted above, in order to maintain the impartiality of the reports, the inspections are mutual: the Brazilian inspectors perform the inspections in Argentina and vice versa.<sup>25</sup>

On December 13, 1991, Brazil, Argentina, the IAEA, and the ABACC signed a Quadripartite Agreement. Thereby both countries committed themselves to accept safeguards applied to all the nuclear materials in all the nuclear activities carried out within their territories, under their jurisdictions or under their control, with the single goal of assuring that such materials would not be deviated for their application to nuclear weapons or other explosive nuclear devices. All of the activities performed by the ABACC for the application of safeguards are carried out in full agreement with the IAEA, respecting independence in the decisions made by each one of the agencies and under the terms of the Quadripartite Agreement and the safeguards agreements.

Advantages of this option include not only the direct involvement of all states participating in the regional authority, but also facilitate direct contacts and interactions between officials and technical experts from the states of the region – thus serving as a confidence-building measure. It would also promote education and training, as well as development of technical expertise, in nuclear verification involving personnel from participating regional states. On the other hand, this option could have considerable financial costs and require infrastructure and administrative investments as well as a cadre of experienced professionals to start up the regional authority, not to mention a high measure of political agreement among the concerned states.

It should be noted that, unlike the IAEA, neither ABACC nor EURATOM have the legal authority to confirm the absence of undeclared nuclear material and activities, as their respective mandates cover confirmation of peaceful use of declared nuclear material and activities.

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## Conclusion and Recommendations

The three verification options discussed above may be assessed comparatively in terms of efficiency, cost, practicality, technical expertise, administrative capacity, and human resource requirements. As argued before, Option 1 of verification carried out by the IAEA has several advantages that possibly places it as the most viable and cost effective option, with minimal disadvantages. Option 2 involving verification carried out jointly by the IAEA and a regional control mechanism has the advantage of directly involving the concerned regional states. While Option 3 involving separate verification by the IAEA and by a regional authority also has the advantage of involving the regional states and building confidence through a regional authority. On the other hand, both Options 2 and 3 would entail considerable costs as well as duplication of effort and neither option in the short- to medium-term could match the expertise, credibility, and scope of verification authority of the IAEA, thus possibly resulting in two levels of verification assessments and conclusions – with the IAEA having the higher and universally accepted credibility regarding its technical competence and conclusions, while the regional authority would occupy a lower status. Thus, on balance, a Middle East NWFZ would be better off relying on IAEA verification and safeguards. Over the medium- to longer-term, given the political will as well as financial and human resources, the states of the region could invest in a regional authority to build up their own capacity and thereby contribute to strengthening mutual confidence and trust.

To conclude, this POLICY BRIEF has described the nuclear verification, or safeguards, practices, and requirements as laid out by the IAEA in connection with safeguards implementation in connection with the NPT and NWFZ treaties. The states of the Middle East will need to define a verification system as an integral part of an NWFZ treaty to be concluded amongst them. These states also will need to agree upon the institutional arrangements for safeguards.

As discussed in this POLICY BRIEF, the best option for the states of the region would be to rely as much as possible on the relevant experience of existing nuclear weapon free zones and their verification modalities, rather than reinventing processes, frameworks, and

## Endnotes

1. The states of the region of the Middle East include Algeria, Bahrain, Comoros, Djibouti, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Qatar, Saudi Arabia, Somalia, Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates, and Yemen – see Technical Study on Different Modalities of the Application of Safeguards in the Middle East, (IAEA Document) GC(XXXIII)/887, August 29, 1989, para. 3; and Report of the Director General, Application of IAEA Safeguards in the Middle East, (IAEA Document) GC(58)/15, August 5, 2014, footnote 1. With the addition of South Sudan and the future state of Palestine, 25 states will be in the zone of application of a Middle East NWFZ.
2. The three depositary states of the NPT are the Russian Federation, the United Kingdom, and the United States of America.
3. Treaty for the Prohibition of Nuclear Weapons in Latin America and the Caribbean (Treaty of Tlatelolco), February 14, 1967; and the South Pacific Nuclear-Free Zone Treaty (Treaty of Rarotonga), August 6, 1985.
4. African Nuclear Weapon Free Zone Treaty (Treaty of Pelindaba) and the Southeast Asia Nuclear Weapon Free Zone Treaty (Treaty of Bangkok), December 15, 1995.
5. Latin America and the Caribbean, South Pacific, Africa, Southeast Asia, and Central Asia as well as Mongolia which declared itself a single-state nuclear-weapon-free space, endorsed by the UN General Assembly.
6. See James F. Leonard and Jan Prawitz (1999) 'The Middle East as a NWFZ or WMDFZ application', Excerpts from *Pacifica Review*, 11 (3): 263-264; and Dan Plesch (2008) 'Introducing the Concept of a Weapons of Mass Destruction Free Zone', *International Relations*, 22 (3): 323-229.
7. Category I items include complete rocket and unmanned aerial vehicle systems (including ballistic missiles, space launch vehicles, sounding rockets, cruise missiles, target drones, and reconnaissance drones), capable of delivering a payload of at least 500 kg to a range of at least 300 km, their major complete subsystems (such as rocket stages, engines, guidance sets, and re-entry vehicles), and related software and technology, as well as specially designed production facilities for these items. Category II items include other less-sensitive and dual-use missile related components, as well as other complete missile systems capable of a range of at least 300 km, regardless of payload. See Missile Technology Control System (2014). Online, available at <http://www.mtcr.info/english/FAQ-E.html> (June 30, 2014). UN Security Council Resolution 687 (1991) prohibited Iraq from possessing any ballistic missile with a range in excess of 150 km. It would be unproductive to attempt to revise this definition of delivery systems to include those with ranges shorter than 150 km, as such an exercise would further complicate and over burden an already complex endeavour.
8. CD/989, April 20, 1990.
9. Central Asian NWFZ Treaty, March 21, 2009.
10. According to Annex II of the Additional Protocol, List of Specified Equipment and Non-Nuclear Material, INFCIRC/540 (Corrected).
11. Safeguards agreements brought into force by states in connection with the NPT are recognized as fulfilling NWFZ treaty requirements.
12. ABACC, which will also be discussed at a later stage in this POLICY BRIEF, is the only bi-national safeguards organization in the world that originated from an atmosphere of lack of trust that was gradually replaced by a climate of mutual confidence and cooperation between Argentina and Brazil. It is responsible for verifying the direct or indirect use of nuclear materials for the manufacture of weapons of mass destruction.
13. In some cases the IAEA may seek a complementary access with advance notice of two hours, or even less than two hours.
14. Paragraph 1, INFCIRC/153/Corr.
15. IAEA (2012) 'Guidance for States Implementing Comprehensive Safeguards Agreements and Additional Protocols', (IAEA Services Series 21), pp. 1-2.
16. See 'The Safeguards System of the International Atomic Energy Agency'. Online, available at [http://www.iaea.org/safeguards/documents/safeg\\_system.pdf](http://www.iaea.org/safeguards/documents/safeg_system.pdf) (June 6, 2014).
17. The purposes of routine inspections are listed in paragraph 72 of INFCIRC/153.
18. Paragraph 89 of INFCIRC/153.
19. Activities declared pursuant to Article 2 of INFCIRC/540.
20. INFCIRC/540, Article 5.
21. INFCIRC/540, Article 4.
22. Such as uranium enrichment or plutonium separation.
23. Israel's nuclear-weapon program was developed in the 1960s, with active assistance from France and other Western nuclear-weapon and non-nuclear weapon states according to various sources. The clandestine nuclear activities in Iran, Iraq, Libya, and Syria benefitted from clandestine supply networks involving entities and individuals in more than 30 countries.
24. The information in this section is drawn from the presentation at the IAEA Forum on a Middle East NWFZ held on November 21, 2011: 'The EURATOM regional safeguards system' by Piotr Szymanski, Director, Directorate for Nuclear Safeguards, Directorate General for Energy, European Commission, Luxembourg.
25. For further information on the ABACC and its possible transfer potential as a model for the Middle East see POLICY BRIEF No. 32 by Irma Argüello and Emiliano Buis.



### Further Reading

- Jan Prawitz and James F. Leonard (1996) *A Zone Free of Weapons of Mass Destruction in the Middle East*, Geneva: United Nations Institute for Disarmament Research.
- UNIDIR and VERTIC (2003) *Coming to Terms with Security: A Handbook on Verification and Compliance*, Geneva: UNIDIR.
- Corey Hinderstein (ed.) (2010) *Cultivating Confidence: Verification, Monitoring and Enforcement for a World Free of Nuclear Weapons*, Washington, D.C.: Nuclear Threat Initiative.
- IAEA (2012) *Application of IAEA Safeguards in the Middle East, Report by the Director General*, Vienna: IAEA.
- IAEA (2012) *Guidance for States Implementing Comprehensive Safeguards Agreements and Additional Protocols*, IAEA Services Series, No. 21, Vienna: IAEA.

modalities that have been shown to have worked well in other regions. Since every region has its own history and circumstances, particularly the region of the Middle East given its long history of armed conflict, mistrust, acquisition of nuclear weapons or undeclared nuclear weapon programs, and acquisition of other weapons of mass destruction as well as their delivery systems, the challenges for successful negotiation of an NWFZ are both manifold and complex. On the other hand, all states of the Middle East region except for Israel are non-nuclear weapon states party to the NPT and have undertaken to implement comprehensive or full-scope IAEA safeguards – and most such states already are implementing IAEA safeguards with a few also implementing the Additional Protocol to safeguards agreements.

In order to establish a NWFZ in the region of the Middle East, Israel would have to unilaterally dismantle its nuclear weapons and related infrastructure, invite the IAEA to verify the elimination of its nuclear weapon program, and then accede to the NPT as a non-nuclear weapon state – there can be no other viable option. Furthermore, all militarily significant states in the Middle East are member states of the IAEA and are familiar

with safeguards concepts and methodologies. Thus, logically, it would stand to reason that the IAEA safeguards system could easily be accepted as the verification mechanism for an NWFZ in the Middle East. Following the lead of the Central Asian NWFZ Treaty which also requires its five states parties to implement the Additional Protocol, the states of the Middle East could make the nuclear verification requirements as comprising full-scope IAEA safeguards plus the Additional Protocol. The IAEA Secretariat in the past has provided upon request technical and legal expertise to the negotiations on other NWFZs, notably in Central Asia and in Africa, and it can be requested to provide its expertise to the negotiations on a Middle East zone.

This POLICY BRIEF should be of interest to those engaged in discussions on the establishment of a nuclear weapon free zone in the region of the Middle East, especially those involved in the preparations for the convening the Helsinki Conference on establishing a WMD/DVs Free Zone, as mandated by the 2010 NPT Review Conference in the context of the 1995 Resolution on the Middle East – without which the NPT would not have been extended indefinitely. ■

### About the ACADEMIC PEACE ORCHESTRA MIDDLE EAST (APOME)

The ORCHESTRA is the follow-up project of the “Multilateral Study Group on the Establishment of a Missile Free Zone in the Middle East”. The ACADEMIC PEACE ORCHESTRA MIDDLE EAST is a classical Track II initiative: it consists of some 100 experts – mainly from the Middle East/Gulf, one of the most conflict-ridden areas of the world. The ORCHESTRA is meeting regularly in working groups (CHAMBER ORCHESTRA UNITS) on specific topics in the context of a workshop cycle from 2011-2014. The main goal of this initiative is to shape the prospective Middle East Conference on the establishment of a zone free of weapons of mass destruction and their delivery vehicles agreed upon by the international community in May 2010. For this reason, these experts develop ideas, concepts, and background information in a series of POLICY BRIEFS which are the results of intense discussions within the CHAMBER ORCHESTRA UNITS. In this framework, the broader normative Cooperative Security Concept will be further developed, embedded, and institutionalized in the region. At the same time, the ORCHESTRA meetings serve as venues for confidence building among the experts. The networking activities of PRIF’s Project Group are documented by the ATLAS on Track II research activities in or about the Middle East/Gulf region.

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