

Presented Abstracts

presented in alphabetical order

Nuclear Terrorism: Myths and Facts

By Abdul-Wali Ajlouni
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Many incorrect beliefs related to nuclear activities are common, and reflected on nuclear terrorism. In this paper, the author focuses light on major myths propagated, and countered with facts depending on physics principles and based on studies and data published by professional societies, and specialized physicists and engineers working around the world. The main elements of the paper are:

1. Illicit trafficking of nuclear material: definition and concepts
2. Nuclear terrorism: threat scenarios and potential sources
3. Nuclear material categories
4. Nuclear energy: physical concepts, uses, and effects.

Real World Response: The Goiania, Brazil, incident

Eliana Amaral
former-IAEA



On September 13, 1987, a teletherapy Cs-137 source of 50TBq was stolen from an abandoned clinic in Goiania, Brazil. The source was left at the clinic due to a legal dispute, and the owners did not notify the regulator. The source was sold to a junkyard and dismantled to get the valuable lead. However they were delighted with the brilliant light coming out from the source capsule and opened it. From Sept 13th to 21st several people, including families and friends, had contact with the source giving rise to the biggest radiological accident ever occurred. The theft of the source was informed to the regulator (Brazilian Nuclear Energy Commission) two weeks after, when the accident was found out. The source characteristics, unsealed and a water soluble powder facilitated the quick dispersion throughout the city by people and weather transport. The result of this incident was 249 contaminated people and four fatalities, together with a big economical loss and the social and psychological disruption and stress. Monitoring and treatment of people together with decontamination works and storage of waste amounted to US\$ 20 million. A continuous follow up for the victims and the final repository was established. The event could have been avoided if the regulator was notified by the situation. An effective control of all

radioactive sources from cradle to grave is fundamental.

A regulator must have clear attributions and adequate resources to have an inventory and register of all sources and make periodical inspections. It is also fundamental to develop a safety culture among users and to strengthen the management over disused sources, particularly over the metal recycling.

The Role of International Legal Instruments in Ensuring Radioactive Source Security

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Nuclear terrorism knows no boundaries. No State can afford to go it alone when it comes to ensuring the security of the radioactive sources within its territory or subject to its jurisdiction. Over the years, States have joined together to identify a common ground of standards and guidelines that help States to build robust national regimes to secure radioactive sources. Some of the instruments are binding on all States, some are binding on parties to the instruments, and some, while non-binding legally, offer critical guidance on securing radioactive sources (and other radioactive materials) wherever used or kept. This presentation will outline the instruments and highlight key elements of effective national regimes.

OPCW – An Outline

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The Chemical Weapons Convention (CWC) is an international treaty that is comprehensive in scope and non-discriminatory in application. It aims at the irreversible elimination of chemical weapons globally. The Convention assigns to the Organisation for the Prohibition of Chemical Weapons (OPCW), the responsibility of international verification of destruction of chemical weapons, of inspecting relevant industrial sites, of collecting and analysing data and monitoring exports and imports of chemicals of concern to the Convention. 188 countries are States Parties to the Convention. Only 8 remain as non-members. The proposal for the creation of a zone free from weapons of mass destruction in the Middle East presupposes the acceptance, by the countries of the region, of legal obligations that proscribe weapons of mass destruction within the zone. To be effective such a regime also needs to establish mechanisms that would promote confidence that such legal obligations are being complied with. It is



this question of the nature and content of the legal regime governing chemical weapons, where the OPCW considers its contribution to be of relevance towards the implementation of the decision of the 2010 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons (“NPT”).

A key task in the formulation of a regime governing a WMD free zone is a specification of the obligations, rights, and responsibilities of parties belonging to such a zone. In so far as chemical weapons are concerned, acceptance (ratification, accession) of the CWC by the countries that decide to participate in the ‘zone’, and which are not yet Parties to the Convention, will fulfil the objectives of a WMD free zone. This means acceptance of the Convention as individual States Parties without modifications or reservations regarding its provisions. This is not to say that the Convention prevents the OPCW from entering into agreements with arrangements, bilateral or multilateral. Such agreements however need to be consistent with the object and purpose of the Convention. Understandings/ agreements of this nature also need to be negotiated as additional to and not a substitute for individual countries joining the Convention on the same terms as are applicable to any other State Party to the CWC.

The question of security guarantees, which is normally associated with nuclear weapon free zones, and by extension can be expected to be a part of discussions related to a zone free from weapons of mass destruction, is likewise addressed within the Convention itself rather than as an extension or a protocol to it. Article X of the CWC establishes the rights under which any State Party to the Convention is entitled to seek and to receive assistance and protection in the face of aggression with chemical weapons or a credible threat thereof. Within a framework that is then essentially rooted in the Convention’s all encompassing scope, the OPCW stands ready to share its experience in terms of the extensive verification regime that it operates as well as its other programs that advance the core objectives of the Chemical Weapons Convention.

The Problem of Iran’s Lack of Trust in the Nuclear Dispute

Tytti Erästö
TIPRI



The Iranian nuclear dispute seems to have arrived at a permanent, irresolvable standstill. Since 2006, the UN Security Council has imposed four rounds of sanctions against Iran to make it suspend its nuclear fuel activities so as to build confidence in the peaceful nature of its nuclear program. The only perceivable

effect has been to strengthen the Iranian government’s determination not to give in to what it views as the Council’s illegal and illegitimate demands. The paper argues that the permanent Security Council members (the P5), who are also the five official nuclear weapon states (NWS) can and should do more to break the deadlock, rather than wait for Iran to make «the right choice». In doing so, they would do well to recall their special responsibility for trust-building within the NPT, and on this basis acknowledge the role that their own attitudes and actions have played in the negative dynamics of mistrust. The paper also identifies what is regarded as the three key problems in the dispute, namely Iran’s lack of trust regarding promises of future nuclear cooperation, its perception that non-proliferation is merely a pretext to contain or even to bring about a change of regime in the country, as well as the problem of military insecurity.

Towards a Middle East WMD-Free Zone: Conditions and Possible Stages

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The 2012 Conference called for by the 2010 NPT Review Conference on a zone free of nuclear weapons and other weapons of mass destruction (WMD) in the Middle East should launch a comprehensive and incremental process. It should keep in mind the conditions for success of a nuclear-weapon free zone identified by the United Nations. The main difficulty will be to reconcile two opposing approaches: one focusing on nuclear weapons and aiming as a priority at pressuring Israel into accession to the NPT; and the other, more comprehensive and incremental, requiring progress in mutual recognition and confidence building as well as efforts covering all WMD and conventional armaments. As a first step, it should allow informal discussions on threat perceptions and the security environment of the region in order to increase transparency and confidence among the various stakeholders. It should then promote adherence of all regional states to existing multilateral agreements regarding both conventional weapons and WMD, beginning with those which affect less national security. Ideally, those states joining such agreements could do so simultaneously or in a coordinated fashion, with the assistance of the UN and external powers. Finally, adopting a regional treaty banning nuclear weapons and establishing a regional security architecture would be facilitated by the granting of positive and negative assurances to regional states by the five NPT nuclear-weapon states.

Arms Control and Confidence-Building: Synchronizing the Demands of Major Middle Eastern States

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Interestingly there is no disagreement among the relevant actors on the final goal of dismantling all nuclear weapons. Since 1980 the annual UN General Assembly resolution calling for the establishment of a Nuclear Weapon Free Zone in the Middle East has been supported by all regional parties. However, there is substantial disagreement on how to get there. Israel considers its nuclear arsenal as a necessary deterrent against what it perceives to be a hostile regional environment. The Arab states, led by Egypt, on the other hand, believe that Israel's nuclear monopoly only cements the latter's military superiority. Against this backdrop Israel traditionally favors to ease inter-state tensions by conceptualizing confidence- and security-building measures (CSBMs) and to commit to nuclear disarmament only after a comprehensive regional peace was materialized, while Egypt demands that the nuclear question is ultimately put on the agenda. That is why nuclear arms control will not be possible, as long as significant steps in tension-reduction are not taken in parallel. While the demands of the Arab Peace Initiative could pave the way for a 'tit for tat' approach to peace and disarmament between Israel and the Arab states, it does not allow for the inclusion of Iran in a tension-reduction process which is, however, of utmost importance. In this connection the United States, Iran's main opponent, comes into play. I will present the following building blocks for a disarmament process that is meant to advance the proposal of the 2010 Review Conference to the Nuclear Non-Proliferation Treaty (NPT) to negotiate the establishment of a Weapons of Mass Destruction Free Zone (WMDFFZ) in the Middle East:

Regional Security and Nuclear-Weapon-Free Zones: The (Almost) Intractable Case of the Middle East



Martin Malin & Paolo Foradori

Managing the Atom Project - Harvard Kennedy School of Government.

This article applies insights from international relations theory, and lessons from past efforts to create Nuclear Weapons Free Zones to the case of the Middle East.

The paper is divided into three sections. In the first, the concept of NWFZ is discussed in the context of regional security theory, a sub-field of international relations. It examines the logic of regional approaches to building security orders generally and nuclear weapons or WMD free zones specifically, considering the role of domestic political interests, regional power distribution, international support, and expert or «epistemic» advocacy. In the second section, the features and objectives of currently existing NWFZs and processes leading to their establishment are presented and assessed. The third section considers the proposal that the Middle East become a zone free of nuclear weapons and other weapons of mass destruction. Starting with a general assessment of the volatile security context of the Middle East, the analysis focuses on the numerous difficulties that make the actual establishment and entry into force of a NWFZ unlikely in the near term. A lack of regional cooperation and trust and the challenge of denuclearizing a de facto nuclear-armed Israel are the most potent obstacles to any positive outcome. Despite this bleak assessment, an incremental and sequential approach involving smaller, pragmatic and manageable steps might allow some progress towards the long-term NWFZ objective. The article ends by offering several policy recommendations for creating the conditions in which a WMD-free regional security order could be established.

The Arab Spring and Opportunities for the U.S. Policy on Nuclear Weapons in the Middle East

By Subrata Ghoshroy

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As is well known, the NPT stands on its three legs – non-proliferation, peaceful uses of atomic energy, and disarmament. There is no doubt that progress has been made since the signing of the treaty toward the elimination of nuclear weapons. However, the fact remains that the two largest weapon states will retain in their combined arsenal many thousands of weapons of mass destruction when the New START treaty will expire in 2018 – exactly half a century after the signing of the treaty in 1968. Other weapon states either recognized or de facto will continue to possess hundreds more. In reality, the treaty now stands only to serve the non-proliferation agenda of certain states. This is clearly not sustainable in the long run. The paper will argue that it is in the interest of the U.S. for the NPT to continue despite its flaws and further argue that the U.S. should shift its course in the Middle East in general and toward the presence of nuclear weapons in the region, in particular. The Arab Spring offers many challenges to the US foreign policy, but it also offers new opportunities to reverse its image. Clearly, it will

require a bold vision. President Obama's soaring rhetoric in Prague is now a distant memory. Time for action is now!

EURATOM Safeguards and Security Research in the Nuclear Fuel Cycle

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Joint Research Centre - European Commission



Since its signature in 1957, the Euratom treaty provides an essential framework for nuclear activities in the European Union, while enabling Europe to gain greater energy independence, contributing to its economic growth and technological development as well as improving standards of living.

The Joint Research Centre (JRC), initially established by the Euratom Treaty, is a scientific and technical Directorate-General of the European Commission, and a leading institute in Europe, in particular in the field of nuclear research. It has now in total seven scientific institutes focusing on activities responding to major EU and global challenges. JRC nuclear actions cover the following areas:

- Nuclear waste management, environmental impact and basic knowledge
- Nuclear safety for present and future generations of reactors
- Nuclear security (including safeguards, non-proliferation, combating illicit trafficking and nuclear forensics).

This presentation provides an overview of the main activities of the JRC in the field of nuclear safeguards in the nuclear fuel cycle and of other major aspects of nuclear security. It concerns research, technology development and training activities, which are complying with non-proliferation treaties and resolutions. The JRC programme focuses on the need for a strong and reliable system of nuclear safeguards and non-proliferation to prevent any diversion of fuel cycle materials from their intended use, and on the importance of developing modern technologies. For what concerns the Additional Protocol, which aims to prevent undeclared nuclear operations, methods are developed to detect clandestine programmes, in some cases by using the same techniques as for research in nuclear forensics. Major efforts are made to improve methods of trace particle analysis for the verification of declared activities or for the detection of undeclared activities. The concerns arising from illicit trafficking of nuclear and other radioactive material, the proliferation risks associated with it and the threat of nuclear terrorism call for a set of measures to address prevention, detection and response. Training of staff is of key importance for the implementation of

nuclear security measures. The JRC is going to establish a European Security Training Centre, which will initially focus on nuclear and radiological security.

Nuclear Security and Media - The Nexus

Sean Harder

Media Program Officer, The Stanley Foundation



Engaging the media on matters related to nuclear material security or radiological source security is challenging at best, due to the inherent esoteric nature of the issue. But competent media understanding of the nature of such threats is key to building support for political action. Experts and academics can assist journalists in communicating these issues to the public through relationship building, simple messaging strategies and embracing new communication tools such as Twitter.

Global Threat Reduction Initiative Support for Domestic Radiological Security

Ioanna Iliopoulos

Director, Office of North and South American Threat Reduction, NNSA



The U.S. National Nuclear Security Administration's (NNSA) Global Threat Reduction Initiative (GTRI) works to prevent terrorists from acquiring the materials for an Improvised Nuclear Device (IND) or Radioactive Dispersal Device (RDD). With partners in more than 100 countries, GTRI's mission is to reduce and protect vulnerable nuclear and radiological material located at civilian sites worldwide. GTRI achieves its mission through three goals – (1) Convert research reactors and isotope production facilities from the use of highly enriched uranium to low enriched uranium, (2) remove and dispose of excess nuclear and radiological materials, and (3) protect high priority nuclear and radiological materials from theft.

Domestically GTRI, in partnership with facility operators and local law enforcement agencies (LLEA), is engaged in cooperative efforts to reduce the domestic threat from radiological terrorism. This multifaceted effort includes: Joint strategic planning efforts to identify sites with risk-significant quantities of radioactive materials that could be targeted for material theft or sabotage; site protection assessments where risk-significant materials are used; installation of physical protection systems to enhance the security at sites with risk-significant

quantities of radioactive materials, including In-Device Delay for Cesium Chloride Irradiators; removal of disused sources through the Off-Site Source Recovery Program; Transportation security; Alarm response training for LLEA personnel and facility security operators at the Y-12 National Security Complex Alarm Response training facility which has a mockup of an operating hospital; and, joint table top exercises that include facility operators, LLEA, the Federal Bureau of Investigation, and others.

Raising Awareness Towards Nuclear Security Issues

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Professor, Institute of Foreign Affairs and National Security



One of the best ways to raise the profile and awareness of radiological source security is to bring this issue to the attention of leaders of states and Summits. That is going to happen at the 2012 Seoul Nuclear Security Summit on March 26-27, 2012 in Seoul, Korea. The Seoul Summit is expected to discuss the radiological security issue and to include this in the Seoul Communiqué. The inclusion of radiological source security in the list of agenda of the Seoul Nuclear Security Summit and its Communiqué will be one of a few differences from the 2010 Washington Summit. The Washington Summit, proposed by U.S President Barack Obama in his 2009 Prague Speech on “a world without nuclear weapons”, was aimed to “secure all vulnerable nuclear material in four years.” Therefore the nuclear security focus of the Washington Summit is to lock-down, consolidate and secure primarily weapons-usable fissile material, including highly enriched uranium and separated plutonium, to prevent nuclear terrorism. While most fissile material is secured quite safely and the possibility of nuclear terrorism is quite low, still there are serious concerns that a small amount of HEU could be diverted to end up at wrong hands and used for terrorism. According to a study by the International Panel on Fissile Material, a Princeton-based research group, there are about 2,100 tons of fissile material in the world, made of 1500 tons of HUE and 600 tons of separated Pu. Since 24 kg of HEU or 8 kg of Pu is needed to make a nuclear bomb, over 100,000 bombs could be made theoretically. While preparing for the 2012 Seoul Summit, the debates on the inclusion of radiological security returned. In the mean time, an unusual nuclear accident at the Fukushima nuclear power plants, caused a great Tsunami in March 2011, occurred. This accident raised serious concerns that nuclear power plants could be vulnerable to targeted terrorist and criminal attacks and the radiological consequences could be extremely damaging. Currently the Japanese government imposes a 20km radius off-the-limit evacuation zone from the Fukushima nuclear power plants. Chernobyl also keeps a 30km radius exclusion zone. What would happen if there is a biological terrorism in metropolitan cities, and 20 or 30km radius exclusion zone is imposed almost permanently.

Assessing the Risk Associated with a Malevolent Use of Radioactive Sources



Jean Jalouneix

Deputy Director, French Institute for Radiological Protection and Nuclear Safety

This presentation will focus on how to assess the risk associated with a malevolent use of radioactive sources and how to develop a regulation to prevent this risk.

Optimizing the Security of Radiological Sources: International Standards versus a Performance Based Approach



Caroline Jorant

President, SDRI

Although nuclear security issues are not included in the IAEA statutes and there is broad acknowledgment of the legitimate reasons for states to avoid international oversight of their physical protection and global security measures, an international nuclear security regime has been developing which now encompasses radioactive sources, but only within a “soft law” framework. Whereas today’s Code of Conduct and the more recent recommendations are certainly a first and very useful step towards the building of an international baseline, there is some scope for international adherence to a few specific standards, but there are also strong arguments in favor of a more national, performance based approach. This presentation will describe the need for two tier approach and will explore some ideas to further develop the regime while protecting confidentiality and cultural differences for the benefit of efficiency and credibility.

Horizon 2012 Sailing in the Same Boat Toward a Nuclear Weapon-Free Zone in the Middle East

Akira Kawasaki
Peace Boat



Background and Rationale – Horizon 2012 is a creative and comprehensive program of multi-track strategy -building, advocacy and diplomacy in the Middle East that seeks to build upon the decision by the 2010 NPT Review Conference to convene an international conference in 2012 on the establishment of a Middle East zone free of nuclear weapons and all other weapons of mass destruction, through building confidence and understanding within the region of the value of such a conference and the concrete possibilities and benefits offered by a future Middle East Zone Free of Nuclear Weapons and All Other Weapons of Mass Destruction (MENWMDZF).

Indeed, the NPT Review Conference 2010 Final Document (NPT/CONF.2010/50 (Vol. I)) “underscore[d] the importance of the establishment of nuclear weapon-free zones where they do not exist, especially in the Middle East,” and announced it “will convene a conference in 2012, to be attended by all States of the Middle East, on the establishment of a Middle East zone free of nuclear weapons and all other weapons of mass destruction”. In addition, “the important role played by civil society” in this regard was recognized and “encourage[d]”.

Horizon 2012 is an attempt by civil society to contribute to this process by raising awareness on the value of such a process, building understanding, and facilitating dialogue, thus improving the chances of success in the 2012 international conference on the establishment of a MENWMDZF, which will take place in Finland under the facilitation of Finnish Under-Secretary of State Mr. Jaakko Laajava.

Developing a Multi-National Disarmament Verification System

David Keir
VERTIC



VERTIC has recently been granted funding from the Norwegian government to carry out a study on the possible contributory role of inter-governmental

organisations in developing a multi-national disarmament verification system and approach for the future. There is a case for an inter-governmental body to play a central role in future arms control agreements—with respect to verifying nuclear weapons dismantlement. In a future multilateral regime, an inspector team would need not only to carry out the measures necessary to satisfy themselves that an arms control or dismantlement activity had actually taken place; they would also need to have the status and pedigree to allow their conclusions to be trusted by all relevant state parties. Preparation, though, is the key. It seems clear that, whoever the future inter-governmental body might be to conduct disarmament verification in a multilateral setting, in the interim a set of technical protocols and systems need to be developed and agreed upon by NWS and NNWS alike. Not only this, but a technical capability needs to be built—in terms of a personnel resource that is educated, trained and experienced via realistic exercises; and which, crucially, should be made up of NNWS as well as NWS state specialists.

The Middle East as a WMD free zone – Lessons from Euratom Experience

Stephan Klement
Strategic Planning Division - European External Action Service



The European Atomic Energy Community (Euratom) has acquired substantial expertise and long standing experience in developing a system of nuclear material accountancy aimed at safeguarding all civilian nuclear activities in the European Union. In addition, through the development of a multinational nuclear industry, as well as integration and co-operation in the nuclear field, an unprecedented level of confidence between EU member states has been achieved in this area.

Against this background, important lessons for the situation in the Middle East can be drawn, including for the development of a process of confidence building aimed at the establishment of a WMD free zone. While initial steps of confidence building have to be phased-in in a cautious manner, the long term objective to establish such a zone can only be achieved through the development and implementation of a robust verification system.

The Importance of Local Law Enforcement in Containment and Response

Thomas Lee
Deputy Superintendent, Boston Police Department



The City of Boston is an internationally recognized hub for medicine and has a large number of radioactive sources in medical, industrial and academic research centers. The Boston Police Department has recognized the risk of radioactive materials that are secured by private institutions in open environments and has worked with our private partners and GTRI to increase security. Local law enforcement can play a key role in the prevention of theft of material by understanding the threat and training for response.

On INTERPOL's CBRNE Program

William E. Lipper
Criminal Intelligence Analyst, INTERPOL



INTERPOL's Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Program works to work with member countries to develop and share intelligence, facilitate and assist with international investigations, and provide training, and support or host international conferences. In the area of RN, INTERPOL has a RN investigation and preventive training course, international tabletop exercise, and writes analytical assessments on trends and patterns of nuclear trafficking, crimes, and terrorism. This analysis is based on a database of over 2500 incidents from a variety of sources, from 2002 to present. Analytical findings based on this data indicate that:

- Trafficking + Nuclear Terror Threat remains global
- Radioactive materials continue to be lost, stolen, and offered for sale
- Terrorists and traffickers have not effectively connected
- Improvised Nuclear Explosive Device is unlikely without State support/source
- RDD delivery is much more likely
- Threat to nuclear facilities remains real
- Vulnerability level of Nuclear facilities is uncertain
- Lack of attacks is somewhat surprising

Radioactive Material Security at Children's Hospital Boston

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The security and control over radioactive material has evolved as the diversity of uses has expanded. Malevolent acts involving radioactive material in the past several decades imitated more aggressive regulatory reform and control over radioactive materials particularly in academic and healthcare environments. After 9/11 there were additional concerns raised about potential dirty bombs and acts of terrorism against what are perceived to be "soft targets" such as hospitals. Improvements in the security systems and programs at hospitals have been specifically implemented to address the threat of terrorism and have led to enhancements to personnel screening, access control, physical deterrence, and law enforcement response. Although some security improvements were required by regulatory directive significant advancements were achieved through voluntary participation in government-funded initiatives

Regional Radiological Security Zones

Kenneth N. Luongo
President, Partnership for Global Security



Planning for the March 2012 Nuclear Security Summit (NSS) in Seoul is underway with "sherpas" from nearly 50 country participants working to draft consensus documents, report on commitment implementation from the last summit, and decide upon new national commitments to improve global nuclear material security. A conference on establishing a weapon of mass destruction free zone (WMDFFZ) in the Middle East is also scheduled to take place in 2012 (or later), and the two events have the potential to be complementary. Unlike the 2010 NSS which focused entirely on nuclear material security, the 2012 summit is expected to also integrate radiological source security and some discussion of nuclear safety into the agenda. High intensity radiological sources are used for many medical and industrial purposes and can be found in many public buildings. Unsecured radiological materials can be used in a "dirty bomb" that could spew radioactive contamination if detonated. One approach to the control of these sources is to link nations together in regional efforts to ensure that all

are accounted for and secure. In relation to the location of the 2012 NSS and the MEWMDZ, one of these zones could be in North East Asia and include South Korea, North Korea, China, and Japan. With the possible exception of North Korea all will be NSS invitees. In addition, several countries from the Middle East and Africa are NSS participants – Algeria, Egypt, Jordan, Morocco, Nigeria, Saudi Arabia, South Africa, and United Arab Emirates. While there is diversity among these states in the status of their nuclear programs and expertise, all have radiological sources on their territory. By building on the common concern about radiological terrorism, and the work already being done to secure radiological sources in the Middle East, these and other states in the region could produce a tangible outcome to benefit both conferences. Establishment of radiological security zones could be offered as regional “house gifts” at the NSS, and could serve as a constructive, concrete achievement in the lead up to, or at, the WMDZ conference.

Nuclear Security - An Egyptian Perspective

Yasser Tawfik Mohamed

Radioactive Waste Operator, Egyptian Atomic Energy Authority



Efforts made by Egyptian Government to safely manage and secure all radioactive sealed sources in public premises through some national efforts and through international cooperation with IAEA through some Technical cooperation and AFRA projects and USA through USAID (Sandia National Laboratories NM) and USDOE through GTRI program under what is called Amnesty Recovery program for all disused and orphan radioactive sealed sources and secure all sources in public premises to avoid their lost even deliberately.

Radiological Security – Identifying High Priority Sources and Threats

Anita Nilsson

Executive Director, AN & Associates, LLC



Radioactive sources are essential in medicine, industry and for research. A majority of all countries have these sources in daily use, and later in waste disposal storages. All regions of the world possess such sources, and all countries see transports of radioactive sources, as recipients or as a transit country. Uncontrolled and unprotected, these radioactive sources are potential threats; for

misuse, for threats and for dispersal that would result in destruction and disaster of civil society.

Radiological dispersal devices would use conventional explosives to disperse radioactivity, and be possible to move to any place. The threat of radiological dispersal is therefore global, to which no country can stay complacent. The presentation will give a general introduction to the subject Radiological Security, by give an overview of the fields in which radioactive sources are used and the form in which they appear. The presentation will also give an overview of how the international community has looked at the threat of radiological dispersal; in binding and non-binding international legal instruments, IAEA guidance and the essential elements in a national legal framework for nuclear security.

A Nuclear-Weapon-Free Middle East: Looking for Solutions

Vladimir A. Orlov

PIR Center



The fast moving controversial developments in the Middle East and North Africa seem to be sidelining the search for responses to some fundamental security challenges in the region. This refers, for example, to the discussion of steps for the preparation and successful conduct of next year's conference on the establishment of a nuclear-weapon-free zone (NWFZ) in the Middle East. Furthermore, some people think dial there is not a favorable environment for such a conference now or in the foreseeable future.

It should be recalled that the decision to hold a conference on the creation of a Middle East NWFZ was made through consensus at the NPT Review Conference 2010. Without that decision it would have been impossible to adopt the final document of that conference - the result of a fragile but viable compromise that helped preserve and even strengthen somewhat the architecture of the international nuclear nonproliferation regime at a difficult time. It is equally important that the aim of establishing a zone free of nuclear and other weapons of mass destruction (WMD) in the Middle East was recorded in the NPT Conference decision in 1995 when the treaty's future, including its extension, was discussed. There should be no illusions: Without the obligation to move toward freeing the Middle East of nuclear weapons there would not have been an indefinite extension of the treaty that, four decades after it entered into force, remains a cornerstone of global stability.

However, the main obstacle in the path of a NWFZ conference in 2012 is even not so much impediments from the opponents of a nuclear-free Middle East as skepticism and distrust that any progress in this field is possible in the first place. Such conclusions are not entirely baseless -they arise from the assessment of what has been achieved on a Middle East NWFZ since 1974 when it was first declared: Indeed, it has for the most part been marking time ever since. As a result, both experts and diplomats sometimes wish to brush aside the question of creating an NWFZ in the Middle East as hopeless and unviable. This approach leads to the risk of zero expectations from the 2012 conference and, as a result, complete inaction.

Without going into another extreme and painting the situation in rosy colors which would be entirely inappropriate with regard to the Middle East - we should still introduce a constructive element in the discussion on how the 2012 conference should be prepared, what issues it should consider and how the extent of its success or failure should be measured.

Nuclear Weapons Free Zone in the Middle East: A Significant Step Towards an Eventual Nuclear Weapons Free World

GG P amidi
USI of India



The Middle East has been described as one of the most volatile and violent political systems since the end of the Second World War. In a conflict-ridden area with a history of mistrust and animosity, where chemical weapons were used in the past, the prospect of renewed use of Weapons of Mass Destruction (WMD) use is possible. For these reasons, a WMD-free zone in the Middle East is not only an aspirational goal, but a matter of urgency. The end of the Cold War brought in tectonic changes and this has affected the international landscape. However, during the last twenty odd years, the world appears to have forgotten about thinking and working toward a non-nuclear and non-violent world. Perhaps this was understandable since the prospects of a catastrophic nuclear exchange suddenly appeared remote. The pursuit of nuclear disarmament across the world seemed less important. Events during the last couple of decades have changed the world dramatically. Tragically, one aspect that has not altered is the persistent threat to survival of mankind due to nuclear weapons. The aim of this paper is to highlight a methodology wherein concrete and tangible steps can be taken by the world community to eventually eliminate nuclear weapons. The creation of a Nuclear Weapon Free Zone in the Middle East is a significant step and will go a long way in realizing the ultimate goal of Global Zero.

Nuclear Security - International Cooperation and Best-Practices



Jasper Pandza
Research Analyst, International Institute for Strategic Studies

A radiological terrorist attack can result in high levels of distress among the public and in substantial economic damages as affected areas become unusable for lengthy periods. The Fukushima disaster and its aftermath demonstrate the consequences of a major sabotage attack against a nuclear installation. Despite worldwide efforts to increase physical protection of radioactive materials and at nuclear facilities, preventive measures can never guarantee absolute security. International nuclear and radiological security efforts currently lack sufficient emphasis on strengthening national capacities to manage and mitigate the adverse consequences of a radiological attack. There are three broad areas with potential for more international cooperation and best-practise sharing: (1) Identifying, responding to and managing a radiological emergency; (2) effectively communicating with the public during and after an event; (3) decontaminating and restoring affected areas. There are various options to facilitate cooperation in these areas, with the newest one being the “response and mitigation” priority functional area of the Global Initiative to Combat Nuclear Terrorism (GICNT).

The Role of External Actors - the United States and the Middle Eastern WMDFZ

Anna Péczei
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This paper basically focuses on the 2010 NPT Review Conference and the proposed 2012 meeting from an American point of view. It touches upon three main issues:

First, the problems and benefits of such a meeting to the U.S. Second, the relevance of U.S.-Israeli relations with regard to the proposed conference; and Finally, the intervention will discuss some practical steps in connection with the role of the U.S. as an external actor.

Security in Domestic and International Transport of Sealed Radioactive Sources



Richard Rawl
Consultant, Radioactive and Nuclear Material Transportation Security, Oak Ridge National Laboratory

Transport is widely recognized as potentially the most vulnerable phase in the life cycle of radioactive sources used for health care, industrial and research applications. Transport is integral to the supply chain for these radioactive sources – frequently involving transport from production of the radioactive material to its fabrication into sealed sources, distribution to users and disposition of disused sources. Consequently, security during transport is critical to ensuring that the beneficial uses of these sources can be realized without posing undue security risks to society. Radioactive material transport safety is an area that the international community has addressed for over 50 years. Transport security, however, is a newer concern and has only garnered focused attention since the idea of «self protecting» radioactive material was dispelled with the recognition that adversaries are willing to sacrifice themselves to accomplish their objectives. The international community has responded to the need for a coordinated security approach, including development of transport security recommendations and guidance at the International Atomic Energy Agency (with extensive input from Member States and other international organizations). These recommendations are being implemented both internationally and domestically and are helping to ensure appropriate levels of security for all radioactive material shipments by all modes of transport (land, air and sea). The presentation will provide an overview of the radioactive material transport security recommendations and their implementation worldwide. It will highlight some of the remaining challenges and ways in which these efforts can be accelerated.

GTRI - An Overview



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Program Manager for Africa/Middle East, Office of European and African Threat Reduction (NA212), National Nuclear Security Administration

A review of current activities of the Global Threat Reduction Initiatives (GTRI) program with particular emphasis on how they relate to Africa and the Middle East. This presentation will also discuss the types of assistance that is available under the

program and how it differs from High-Income States to other than High-Income states. It will also focus on specific security upgrades that GTRI performs as well as the need for long-term sustainability of installed systems.

Inter-relationship between a Nuclear Security Regime and a Non-Proliferation Regime



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The International Regime of Nuclear Nonproliferation is considered in the context of its main components, namely: the IAEA safeguards system; the international control regime for exports of key materials, equipment and technology; infrastructure to prevent illicit trafficking of nuclear materials. NPT Review Conference in 2010 reached a consensus in the adoption of the Final Document, but did not achieve any significant results in understanding of strengthening of the Nuclear Nonproliferation Regime. Participants did not find a common understanding of the issues for extending the application and effectiveness of the IAEA safeguards system. The activities of the Nuclear Suppliers Group has been criticized so heavily at the Conference, that even the mentioning of its existence have been deleted from the text of Final Document. At the same time, in recent years the international community has consolidated the efforts to prevent the threat of illicit trafficking of nuclear and radioactive materials, which undoubtedly is a significant contribution in achieving the objectives of nuclear nonproliferation and counter terrorism. That is why the issues of ensuring the physical protection of nuclear installations and nuclear materials are in the focus of attention and have become the subject of discussion on the highest political level at the Washington Summit in April 2010. The documents adopted in Washington may be considered as a supplement to the Convention on the Physical Protection of Nuclear Material and Nuclear Facilities (2005), to establish the mechanisms for regular review and assessment of the countries activities to provide the adequate physical protection. Thus, we can see the process of creating a new international regime of nuclear security that can be a quite feasible strengthening of the Nuclear Nonproliferation Regime. Formation and development of the Nuclear Security Regime during the expected lack of tangible progress in strengthening both the IAEA safeguards system and the International Export Control Regime could have a significant impact on the future of the Nuclear Nonproliferation Regime.

Myths of the ME NWFZ on the way to 2012

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Hungarian Academy



The Middle Eastern nuclear weapon-free zone is the oldest NWFZ in forming, with its underlying obstacles - delineation, sequencing and scope - taken for granted. The present article argues that while these elements by definition belong to the core of the subject, in themselves they are not unchangeable and can be negotiated. The delineation of a region where no natural boundaries exist is always problematic, especially so in the Middle East. The selection and definition of thematic, rather than an overreaching geographical delineation of the region may be more useful. Sequencing arises in two different ways: on the one hand in the context of peace and security, on the other hand in the context of the different weapons categories. The scope is closely related to the first two, covering not only the possible participants, but also the security guarantees.» The paper discusses preparations and impact of the 2012 process.

NWFZ in the Middle East

Javier Serrat
MIIS



As the 2012 timeframe to convene a regional conference on the establishment of a zone free of weapons of mass destruction in the Middle East quickly approaches, there is a re-energized interest in whether and how this endeavor might work. While most of the literature has focused on the impediments to progress in convening the conference itself, as well as the political challenges such a negotiation would face, little has been written about how the absence of WMD in the region will be enforced and certified. Indeed, there is, for instance, disagreement among the potential parties to the agreement on the role of existing verification organizations such as the IAEA and the OPCW would play in a WMD-free zone in the Middle East. One may argue that in the face of myriad political hurdles, looking at the technical aspects of the proposed zone is a futile exercise. However, there are two strong, compelling reasons for examining how the verification regime of that zone might look like. The first is that the technical groundwork will have to be laid out ahead of the negotiations so that the substance of the agreement will have enough solidity to it to garner support among the negotiating parties. The second is that the proposed concept diverges

from anything that has ever been tried before: the envisioned arrangement is not merely a nuclear weapons free zone (NWFZ) ; instead, it will cover all weapons of mass destruction and, potentially, even delivery systems. This paper looks at all the precedents of NWFZ>s, noting which elements may be borrowed from those models, and which ones are not feasible for either technical and political reasons. Where appropriate, it offers alternatives to enable the application of certain aspects of those models. The paper also addresses regional and multilateral verification efforts and confidence-building measures in the biological, chemical, and missile arenas, again, identifying constraints and opportunities.

Main Elements of a Future Regime of a WMD-Free Zone in the Middle East An Attempt in Drawing a Preliminary Framework

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ECFA



The paper addresses the status quo of the process towards an eventual weapons of mass destruction free zone in the Middle East. Starting with the delimitation of the zone, which should consist of all Arab states that are members to the League of Arab States plus Israel and Iran. The paper refers to the idea of establishing a zone including core group of states such as Egypt, Israel, Iran and others and to the role of the neighbouring states in this process. Necessary steps that the participating states have to undertake in establishing the WMD free zone is analyzed. With regard to the verification systems, it pointed out that in the nuclear field, new IAEA comprehensive safeguards agreements would have to be negotiated, that any regional verification systems for the BTWC are lacking and would have to be designed and concludes that inspiration could be taken for example by the systems developed by EURATOM or ABACC. The paper argues for negative security assurances by the NWS, which should be extended to the non-use or non-threat of all kinds of WMD.

Toward a WMD-Free Zone in the Middle East

Douglas Shaw
Elliott School of International Affairs



Nuclear weapon-free zones represent a gradual, functionalist approach to managing risk of nuclear proliferation regionally. Zones can reinforce and even facilitate important positive changes to the security condition of member states. However, the power of the zone process globally resides in a collaborative

approach of cooperation where, when, and to the extent possible, bracketing more difficult political challenges for future resolution. In this sense, the Middle East may be a difficult region for a zone process for two reasons: 1) because the amount of pre-existing agreement around the terms of a zone are low, and 2) because the Middle East zone process significantly leverages the global but non-universal Nuclear Non-Proliferation Treaty Review Process. The success of the Middle East zone process, therefore, may require reliance on its more positive idiosyncrasies, including: 1) the inclusion of chemical and biological weapons around which there may be more latent regional agreement, 2) the existence of a substantial historical record of functioning zones and nuclear weapon state engagement with these zones, and 3) the early focused engagement of the nuclear weapon states in the negotiating process.

A New Middle Eastern Nuclear Weapons Free Zone: An Idealistic or a Realistic Solution for Achieving Security and Stemming Off Nuclear Military Proliferation?

Ahmad Shikara
ECSSR



Many countries of the world -Latin America, the Caribbean, the South Pacific, South East Asia, Central Asia and Africa – have managed to establish NWFZ's (Nuclear Weapons Free Zones) though admittedly at varying forms of specificity, strength and credibility. Probably the greater Middle East (including the Gulf) is one of the very few areas of the world that has up till now failed to express strong determination to establish such a zone. The 2012 forthcoming UN conference on the establishment of NWFZ in the Middle East may provide a narrow but significantly a refreshing opportunity to advance the long term objective of creating a nuclear free world and certainly a peaceful Middle East world stretching from Egypt to Iraq and from Turkey to the Arab Gulf. On the face of it, it should not be an impossible endeavor or process to occur, whilst at the same time it is not an easy expedition to launch when there is only one country (Israel) that possesses nuclear weapons but as yet not declared officially its nuclear status. Along this argument, there is another state on its way of achieving the nuclear status (Iran) within the next relatively few years. What makes matters even foggier; most of the Middle Eastern countries have no strategic clear vision on how to proceed in their long journey to develop nuclear energy. Moreover the greater region is as yet has not stabilized in sufficient terms. From the very start security and the issue of WMD proliferation with all its ramifications including nuclear proliferation became salient conception that need to be further understood, addressed and

interpreted in an interdependent and interactive fashion. The essential meaning of the NWFZ centers on prohibiting "...the testing, stationing, development, and use of nuclear weapons within a designated territory..." Furthermore, for compliance to achieve its final destination and be credible there has to be an attached network of "protocols by which nuclear states can renounce the use and threat of the use of nuclear weapons against states included in the zone". But what is changing in a rather positive development is the prospect of a number of Middle Eastern-Gulf countries seeking to gain peaceful nuclear energy. However, the line between optimism and pessimism is still a relatively thin one depending on when and how much effort will be exerted toward directing their attention to the nuclear military or to the peaceful status.

Nuclear Non-Proliferation and Nuclear Security – Possible Linkages

Susi Snyder
IKV Pax Christi



There are a number of existing mechanisms that would increase and enhance nuclear security, safety if they were universally applied. Those mechanisms also address non proliferation concerns. Universalization of the International Convention on Suppression of Acts of Nuclear Terrorism and the 2005 Amendment of the Convention on Physical Protection of Nuclear Materials as well as a universal application of the Model Additional Protocol would provide a significant and clear mechanism for the verified prevention of diversion of nuclear materials to nuclear weapon programs. In conjunction with national legislation required under UNSCR 1540, this would secure nuclear materials and contribute to global non-proliferation and disarmament efforts. One of the greatest challenges inherent in the NPT regime is the dual nature of the treaty - the oft-called discriminatory nature that classifies states into haves and have-nots. One of the greatest advantages of the 2010 Nuclear Security Summit is that it stepped away from the discussions of non-proliferation versus disarmament which often bring forward contentions of inequality. The effort managed to bring together almost all of the nuclear capable and nuclear armed states. However, while the Summit did overcome some previously discriminatory discussions on nuclear issues, the commitments made were solely political- non binding, and they were non universal. Safeguards exist in all of the nuclear weapons states, yet the extent of these commitments is less than those in the non nuclear weapons states, and they are voluntary - something that is perceived as easily changeable.

The restrictions placed on nuclear technologies of non-nuclear weapon states are far greater and more intrusive, even for states that have maintained a long history of full compliance with their agreements. Universalization can reduce this discriminatory effect of current treaty regimes while at the same time increasing nuclear safety throughout the world. Requiring a legally binding agreement between the IAEA and ALL states, based on the Model Additional Protocol would not only reduce the discriminatory nature of the NPT, but would also address some of the challenges of securing nuclear materials. Many have suggested that issues of non-proliferation and disarmament should be kept separate from discussions of nuclear security, yet there are necessary overlaps between these efforts. If done properly, efforts to increase the security and safety of nuclear materials will positively affect efforts towards non-proliferation. If the current global divide between nuclear haves and have nots can be overcome by focusing efforts on security of materials this will contribute to security of states and contribute to global non-proliferation and disarmament efforts at the same time.

Application of the IAEA Safeguards System: Implications for International Confidence Building through Verification – Austrian Perspective

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Federal Ministry for European and International Affairs of Austria



The paper sheds light on the history and status quo of the Austrian nuclear ambitions as well as the constitutional law on nuclear free Austria and Austrian neutrality – guarantee for a “de facto” single state nuclear weapon free zone? The presentation will cover the application of safeguards in Austria, i.e. Euratom, the IAEA safeguards system and the additional protocol as applied in an EU Member State. The author presents the Austrian views on the future of the nuclear fuel cycle and the universalization of the additional protocol on non-proliferation and nuclear disarmament

Euratom Supply Agency – An Overview

Stamatios Tsalas
Director General of the Euratom Supply Agency



The basics of the EU Nuclear Energy legislation are included in the Treaty establishing the European Atomic Energy Community (“Euratom Treaty”). Chapter 6 of the Treaty is addressing the issue of nuclear materials supply with a view to securing a regular and equal access to nuclear fuels for all nuclear plant operators in the EU. The responsibility for this task was given to an ad hoc

agency, named the “the Euratom Supply Agency” (ESA), which was established by the Treaty itself in 1958. The ESA, autonomous entity under the supervision of the European Commission, is assisted by an Advisory Committee composed of representatives of the Member States. It has been equipped with a set of tools enabling it to operate as a centralized supply system within the European States involved. Moreover, the Euratom Community has been conferred, as per the Treaty itself, a right of ownership with respect to all special fissile materials under safeguards within its territory. In the course of the decades having followed its creation, the ESA gradually changed to adapt to the modern open market requirements, developing its role as a policy adviser and a nuclear market observatory, while still maintaining its original function of concluding supply contracts as well as following up contracts for provision of services related to nuclear materials (such as conversion and enrichment). Furthermore, the ESA and its advisory committee constitute a platform of information exchange and policy making deliberations concerning the European and international nuclear fuel market. The presentation will address the evolution of the ESA and its role within the Euratom Community. It intends to explain the logic of the terms “Supply” and “Ownership” of nuclear materials, and to set out the way of operation of the Euratom Supply Agency including the lessons learnt, as well as the current and future perspectives.

The Biological Weapons Convention – A Paper Tiger in the Middle East?

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Danish Institute for International Studies



During its thirty-six years, the Biological Weapons Convention (BWC) has been scarred by treaty violations, failed compliance negotiations, and ambiguous treaty language. Essentially a bruised paper tiger, the BWC adds no clarification to its distinction between biological activities for peaceful purposes versus hostile ones. This presentation follows on an article recently published by Cindy Vestergaard and Animesh Roul in the Nonproliferation Review which examines the BWC’s ambiguous language and how it has affected diplomacy. The presentation then focuses on the role of the BWC in relation to a WMD-free zone in the Middle East and how additional measures would have to be put in place to ensure confidence. It addresses the current challenges to the BWC’s contemporary application and how these challenges would have to be – and potentially could be – addressed in a regional context.

International Standards and Guidance, Including IAEA Recommendations for Radioactive Materials



Carlos Torres Vidal

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Since the publication of the first Code of Conduct on the Safety and Security of Radioactive Sources in September of 2000, significant changes have occurred concerning the security of radioactive materials and associated facilities. The Code of Conduct was revised in 2003 to take into account the possible deliberate “malicious use” of radioactive materials to cause harm. Since then, the concepts of “Safety” and “Security” for radioactive materials have been developed separately and in parallel.

In 2009, the IAEA published a document on the “Security of Radioactive Sources” as part of the Nuclear Security Series (Number 11). This document broadly outlines the major security concepts and how to apply them to facilities with radioactive materials. The subsequent “Nuclear Security Recommendations on Radioactive Material and Associated Facilities” (NSS No. 14) was published in 2011 to help define the major elements of a States nuclear security regime for radioactive materials.

Although considerable progress has been made by the IAEA to develop and publish guidelines for States, it is clear that further work is needed. The Office of Nuclear Security is currently undergoing a process to review and assess its structure, priorities and activities in order to undergo a comprehensive evaluation of what is done well, what can be improved upon and what is being missed. It is hoped that the outcome of this effort will establish the IAEA as the major focal point for coordinating global efforts to implement the international security guidelines in States that need assistance.