Southern Regional Model United Nations XVIII

Fostering a Culture of Peace for International Development

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Email: iaea@srmun.org

Dear Delegates,

It is with great pleasure that I welcome your participation in this year's Southern Regional Model United Nations (SRMUN) XVIII and the International Atomic Energy Agency (IAEA). I have the distinct pleasure of serving as your director for the IAEA committee at this year's SRMUN. This conference will be my third formal conference on staff after having participated in MUN as a delegate for over four years. The Model United Nations programme has drastically impacted my life and shaped the direction I wish to take in my professional career. Through my role as the IAEA Director, I hope I can foster the same types of experiences that made my time as a delegate so meaningful. Additionally, I hope that through your participation at SRMUN you can build new skill sets or hone ones you already possess. Skills such as writing, researching, and negotiation skills are fundamentally necessary to be successful in the fields of international relations, politics, or business.

The International Atomic Energy Agency was spawned in 1953 in the wake of the Second World War. Having witnessed the awesome power of a nuclear weapon at Hiroshima and Nagasaki, knowing full well that power could also be harnessed for good, the international community and the United Nations took action. Today, the IAEA works to control the dual nature of nuclear technologies through enhancing the potential for good while attempting reign in nuclear technologies more nefarious side. This year's topics have been chosen carefully to reflect this reality:

I. IAEA Partnerships for Peace: Education, Development, and Confidence Building
II. Securing the Nuclear Fuel Cycle
III. Addressing Nuclear Threats

Delegates will be expected to submit one position paper per their delegation that addresses each of these three topics. Position papers should be limited to 2 pages in length and should be single spaced. These papers serve as an outline of your delegations position on the topics at hand. Position papers also provide other delegations with a general idea of your delegations position. Ultimately these papers should also inform both delegates and directors the direction, solution, or initiative that your delegation wishes to advance in order to tackle each given topic.

To this end position papers can be used to explicitly signal some of the things delegates wish to accomplish while in committee. If a delegation has designed a specific plan of action it is encouraged that they make this known in their position papers. The more well researched and written the position paper, the more fun, energetic, educational, and informative committee will be for all delegates involved. I strongly encourage creating a product to be proud of. **All position papers MUST be submitted by midnight EST on Friday, October 26th to IAEA@srmun.org.** Late or improperly formatted position papers will not be considered for awards. For more information regarding position paper specifications please see the SRMUN website.

I am greatly looking forward to this year's conference. Best of luck to you with your research and preparation!

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History of the International Atomic Energy Agency

In 1953, the seeds of the International Atomic Energy Agency (IAEA) were born from U.S. President Dwight D. Eisenhower's idea that nuclear energy could be used for the good of all man kind, thus deterring nuclear weapons proliferation. On December the 8th 1953, President Eisenhower gave his influential "Atoms for Peace" speech to the General Assembly of the United Nations (UN). The principal focus of the speech was to create an International Atomic Energy Agency, established under the auspices of the UN.[1] In 1957, after protracted and complicated negotiations due to the tenuous political atmosphere of the time, the IAEA was formally established.

Legitimacy is given to the IAEA by its statute, which came into force on July 29, 1957 and was accepted unanimously by 81 countries later that fall.[2] Article II of the statute establishes the IAEA's main objectives: the utilization of atomic energy for peaceful purposes and the creation of assurances within the IAEA's capability that its work and assistance will not in any way further the military ends.[3] In addition, the IAEA's functions are codified in the statute, including the role of carrying out nuclear verification and safeguards designs, promoting physical security of nuclear and radiological material, providing technical assistance, and creating and administering standards of safety to minimize the health risks associated with nuclear energy.[4] The statute also stipulates that the IAEA will act in accordance with the purposes of the UN, and when necessary report to its various agencies.[5]

It was not until the early 1960s that the IAEA began to take the shape as the organization it is today. Contributing to this evolution was the end of the Cuban Missile Crisis, and the rise of France and China as nuclear powers in 1960 and 1964.[6] This increase of nuclear technology and threats created an impetus for the Soviet Union and United States to seek greater arms. The result was an international outcry for actions that would preclude countries from seeking nuclear weapons capabilities. Compounding this problem was that the statute of the IAEA was not well equipped or intended to explicitly deter or impede proliferation of weapons.[7] The combination of these factors created the necessary conditions for the genesis of the 1968 Treaty on the Non-Proliferation of Nuclear Weapons (NPT).

Under Article III of the NPT the IAEA now had the responsibility of verification and enforcement of safeguards of fissionable nuclear material.[8] Since 1968, the NPT and the IAEA have been inexorably linked and stand as the hallmark of the disarmament regime. It was not until the early 1990s that the IAEA would be tested as an organization, due to a relative spark in proliferation initiatives spawned by several countries but most notably Iraq.[9]

As a result of the Iraqi proliferation conflict, the IAEA's safeguards and verification policy was re-shaped and evolved further still. Then IAEA Director-General Hans Blix was integral in establishing three new essential measures to prevent such proliferation breaches from occurring: the affirmation that countries accepting safeguards were reasonable to exhibit greater transparency to the IAEA, greater access to information from the Board of Governors of the IAEA regarding national nuclear programmes to guide the agencies safeguards and verification work, and lastly the Board of Governors agreed to support the UN Security Council in taking action against cases of non-compliance with safeguards agreements.[10]

Today Member States participate in the IAEA through two policy creating bodies: the Board of Governors and the General Conference.[11] The Board of Governors is tasked with making recommendations to the General Conference

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[1] Dwight D. Eisenhower. "Atoms for Peace." (1953). The Dwight D. Eisenhower Presidential Center. www.eisenhower.archives.gov/atom.htm
[2] Ibid.
[3] "History of the IAEA." The International Atomic Energy Agency. 2003-2004. www.iaea.org/about.history.html
[4] "Statute of the IAEA." The International Atomic Energy Agency. 1956. www.iaea.org/about//statute_text.html
[5] Ibid.
[6] "History of the IAEA." The International Atomic Energy Agency. 2003-2004. www.iaea.org/about.history.html
[7] Ibid.
[8] *Treaty on the Non-Proliferation of Nuclear Weapons.* The United Nations General Assembly. March 5, 1970. http://disarmament.un.org/wmd/npt/npttext.html
[9] "History of the IAEA." The International Atomic Energy Agency. 2003-2004. www.iaea.org/about.history.html
[10] "Then & Now: the IAEA Turns Forty." *IAEA Bulletin.* September 1997. http://www.iaea.org/Publications/Magazines/Bulletin/Bull393/bull393opt.pdf
[11] "Board of Governors." The International Atomic Energy Agency. 2003-2004. www.iaea.org/about/policy/board/index.html

regarding programmes, budgets, and membership requests. Additionally the Board approves safeguards agreements, and appoints the Director-General pending General Conference approval.[12]

The financing of projects, which encompasses any bilateral or multilateral agreements, handling or storage of fissionable material, and the agencies safeguards and verification agreements, will be proportionately distributed amongst the IAEA members through the utilization of a scale developed in accordance with the UN's assessment of member state budget contributions.[13] Other finances are derived from charging Member States for tasks performed by the agency not related to the above tasks.[14]

Members of the International Atomic Energy Agency's Board of Governors: ARGENTINA, AUSTRALIA, AUSTRIA, BELARUS, BOLIVIA, BRAZIL, CANADA, CHILE, CHINA, COLOMBIA, CROATIA, CUBA, EGYPT, ETHIOPIA, FINLAND, FRANCE, GERMANY, GREECE, INDIA, INDONESIA, JAPAN, REPUBLIC OF KOREA, LIYBAN ARAB JAMAHIRYA, MOROCCO, NIGERIA, NORWAY, PAKISTAN, RUSSIAN FEDERATION, SLOVENIA, SOUTH AFRICA, SWEDEN, SYRIAN ARAB REPUBLIC, THAILAND, UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND, AND THE UNITED STATES OF AMERICA.[15]

[12] Ibid.
[13] "Statute of the IAEA." The International Atomic Energy Agency. 1956. http://www.iaea.org/About/statute_text.html
[14] Ibid.
[15] "Board of Governors." The International Atomic Energy Agency. 2003-2004. www.iaea.org/about/policy/board/index.html

I: IAEA Partnerships for Peace: Education, Development and Confidence Building

Atoms for Peace at Fifty

July 2007 will officially mark the fiftieth anniversary of the creation of the International Atomic Energy Agency (IAEA) and the ideology behind the organization – a slogan which garnered international support for the organization at its inception: *Atoms for Peace*. This idea formed the theme behind a speech which United States President Dwight D. Eisenhower gave while addressing the United Nations (UN) General Assembly.[16] *Atoms for Peace* is widely recognized as a driving force in the creation of and design behind the IAEA.

Fifty years ago the role the IAEA played in international policy was much different then it is today. The IAEA was not an organization equipped to police the world's largest super powers, nor was it designed to end a decade's old ideological dispute between them.[17] In essence, the IAEA turned to what it could practically accomplish within its charter. The statute of the IAEA clearly states under Article II the Agency's objectives: "the Agency shall seek to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world."[18] It is only of late that the IAEA has become known as the nuclear watchdog of the UN. Only in IAEA statue Article III section five are safeguards and verification discussed.[19] The remainder of IAEA functions, as outlined in its charter, pertains to research assistance, material assistance, and the promotion of the peaceful uses of nuclear energy. Fundamentally, IAEA Member States set to work towards bettering collective human security through using nuclear power as a development tool.

Historically the IAEA has welcomed forming new alliances and partnerships in the hopes of advancing its goals. In 1961 the IAEA opened the doors to its first research facility in Austria. The agreement was between an oceanographic institute headed by Jacques Cousteau and the country of Monaco in an effort to study the effects of radiation on the sea and the life within it.[20] This development was paramount because it would eventually evolve into what is now the IAEA's Marine Environment Laboratory.[21] Following the success of their first formal partnership, the IAEA partnered again in 1988 with the UN Food and Agricultural Organization (FAO) to eradicate a strand of screw worm that was affecting livestock.[22] This development would eventually lead to a formal partnership between the two organizations to create better food security and sustainable development.

It is for these efforts and others like them, coupled with the IAEA's commitment to riding the world of militarized nuclear weapons, which led to the organization receiving the 2005 Noble Peace Prize. Upon receiving the Nobel Prize Dr. ElBaradei, the current Secretary-General of the IAEA, made it clear that the award further cemented the IAEA's commitment to the "dual mandate" assuring safeguards and building peace through nuclear technologies.[23] Upon receiving the 1.07 million Euro monetary award with the prize, the Board of Governors announced to use the funds to assist developing countries through human health and food security programs.[24] Additionally, the IAEA has utilized the money to develop a new programme, the IAEA Noble Cancer and Nutrition Fund, the goal being to assist patients in the developing world achieve the highest level of medical assistance possible.[25]

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[16] "International Atomic Energy Agency History." The International Atomic Energy Agency. 2006-2007. http://www.iaea.org/About/history.html

[17] Ibid.

[18] "Statute of the IAEA." The International Atomic Energy Agency. 1956. http://www.iaea.org/About/statute_text.html

[19] Ibid.

[20] "History of the IAEA." The International Atomic Energy Agency. 2006-2007. http://www.iaea.org/About/history.html.

[21] Ibid.

[22] Ibid.

[23] "Nobel Message: Keep Doing What You're Doing." The International Atomic Energy Agency. October 7, 2005. http://www.iaea.org/NewsCenter/News/2005/nobelwinner.html

[24] "Nobel Prize Money to Improve Health & Food Production in Developing Countries." The International Atomic Energy Agency. October 14, 2005. http://www.iaea.org/NewsCenter/News/2005/nobelmoney.html

[25] "Nobel Prize Money to Fund Cancer and Nutrition Fellowships in Developing World." The International Atomic Energy Agency. November 25, 2005. http://www.iaea.org/NewsCenter/News/2005/nobelfunds.html

Current Applications of Nuclear Technology in the Service of Peace

Nuclear Energy in Search of Sustainable Development

Sustainable Development has become a theme if not a battle cry for many organizations and governments in the threshold of the 21st century. However, Sustainable Development is often thought of as the work of some and not all. When questioned on Sustainable Development typically programmes such as United Nations Environmental Programme, United Nations Development Programme, and Non-Governmental Organizations like Green Peace and World Conservation Union are called upon. But viewing sustainable development programmes through this environmental lens is not viewing the problem holistically.

Problems that are often associated with Sustainable Development include growing populations, food shortages, water resource management, as well as presenting equal opportunity for North-South development and industrialization. The IAEA, as an invaluable member of the scientific community with a staff of the world's most intelligent biological, chemical, and nuclear scientists, offers the hope of achieving the Millennium development Goals and fulfilling Agenda 21. Biological, chemical, and nuclear science applications have the potential to aid in water desalinization, crop fertilization, unlimited and unbounded medicinal properties, and many other projects. Recognizing its critical role in sustainable development projects, the IAEA has created a department focusing on the application of these technologies.

The department of Nuclear Sciences and Applications is tasked with using radio isotopes to accomplish the goals of the agency's Major Programme on Nuclear Techniques for Development and Environmental Protection.[26] The IAEA has built this wing of their organization to be mutually supportive of the 2002 Johannesburg Plan of Action developed at the World Summit on Sustainable Development (WSSD).[27] The department has five major focus areas which include food and agriculture, human health, water resources, environmental protection and chemical applications.[28] In addition to having identified these areas of concern, the IAEA in their *Strategy for Nuclear Sciences Application* made a pledge in support of the WSSD that it would assist developing countries, develop new technologies, and form partnerships with other relevant bodies to accomplish their auspicious goals. Within the IAEA's *Strategy for Nuclear Sciences Applications* the agency identified targeted objectives within each of the five areas of concentration.[29] Some of these targets include the use of nuclear technology to treat cancer, using radioisotopes to identify strains of drug resistant infectious diseases such as malaria, and the ability to use nuclear applications for crop and livestock development.[30] To these ends the IAEA has kept with the spirit of Johannesburg and formed multiple partnerships to enable these projects to have enduring success.

Case Study: IAEA / FAO Joint Programme

Forty years ago the IAEA and the UN Food and Agricultural Programme (FAO) formed a mutually supportive relationship which to this day provides new insights into more efficient and sustainable methods of farming and raising livestock. The original impetus of this partnership between organizations was to give Member States the chance to increase production of better, sustainable foods, particularly in the developing world.[31] The partnership was designed in such a way that it is completely compatible with the WSSD and the Millennium Development Goals. The program focuses on continually garnering support and interest in achieving the benchmarks set between the two. The research conducted under the Joint Programme is guided by the Statute of the IAEA, specifically Article III. Article III encourages the agency to conduct research for the betterment of human security and peaceful use of nuclear technology. And while it does not explicitly state partnerships should be formed, there is nothing in the Statute, which forbids them from being developed.[32]

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[26] "The Major Programme on Nuclear Techniques for Development and Environmental Protection." The International Atomic Energy Agency. 2003-2006. http://www-naweb.iaea.org/na/about/index.html

[27] Ibid.

[28] Ibid.

[29] "A Strategy for Nuclear Sciences Applications." The International Atomic Energy Agency. 2003. http://www-naweb.iaea.org/na/about/na-strategy03.pdf

[30] Ibid.

[31] "Nuclear Sciences and Applications." The International Atomic Energy Agency. 2003-2006. http://www-naweb.iaea.org/na/our-work-na.html

[32] "Statute of the IAEA." The International Atomic Energy Agency. 1956. http://www.iaea.org/About/statute_text.html

Today, the partnership functions in over 600 research facilities that are established in 40 Member State countries. The projects that are undertaken in these facilities are directed towards solving problems in the developing world.[33] These coordinated research projects (CRPs) are unique in their approach to tackling the problems of food security. CRPs are partnerships between ten and fifteen institutions, in several Member State countries, focusing on one specific problem related to food security.[34] CRPs are in fact the primary manner in which the IAEA and FAO fulfill their obligations to the Joint Programme.

Under the Joint Programme there are five target areas research is conducted on through CRPs, these include food and environmental protection, insect pest control, animal production, plant breeding, and soil and water management.[35] Within each target area there are multiple CRPs occurring at one time. Many CRPs have already been completed, and research institutions are moving on to additional CRPs. This bodes well for the success and duration of the program. Further, the more projects that are successfully completed, the more empirical scientific information is gathered to help developing countries provide food and clean water in an environmentally friendly manner. Some of the newest CRPs include the development of tools to improve the quality of traditionally agriculturally produced crops, and systems to detect and diagnose animal born diseases such as the Avian Flu.[36]

A Closer Look: Soil and Water Management CRPs

Currently the Joint Programme is running seven different CRPs on soil and water management. The fundamentals behind the soil and water sub-programme are simple: the earth's population is growing too rapidly. The sharp population increase puts stress on current resources, particularly agricultural resources. Therefore it is important to research sustainable food production. The specific problems the sub-programme has set out to solve include soil degradation, such as erosion and desertification; water scarcity; drought; and a general deterioration in water and soil quality.[37] The IAEA, through tackling these problems which negatively effect crop production, agrarian based economies, degrade health standards and detract from generally adequate living situations, hopes to foster sustainable development and aid human security. One example of an innovative CRP just completed was research conducted on the use of irradiated sewage sludge to increase soil fertility and crop yields.[38] The dual objective of this CRP was to derive whether there was an empirical increase in soil fertility and crop yield while at the same time assessing whether or not there were adverse effects to soil and crop as a result of the irradiated sludge.[39] Given the radiological properties of procedure, this is the type of research that only the IAEA could effectively and safely engage in. The additional benefits, as well implicit, in utilizing sewage sludge for fertilizer included finding a sustainable way to dispose of waste, decreasing the amount of contaminated water in zones of poor sewage, and developing proper and sound water management techniques. Overall eleven countries participated in the CRP including Argentina, Bangladesh, Egypt, India, Indonesia, Malaysia, Pakistan, Portugal, Romania, Sweden and Thailand.[40] The findings of the study showed that by using irradiated sewage sludge crop production had shown a measurable increase and soil fertility had also improved. While there were effects on the soil due to the use of the irradiated material, the levels were far below what scientists had expected and remained at safe levels.[41] Thanks to the IAEA and the Joint Programme, with additional research similar programmes may be implemented on national and regional levels thus contributing to better water resource management and increased potential of agrarian economies.

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[33] "About the Joint FAO/IAEA Programme." The International Atomic Energy Agency. 2003-2007. http://www-naweb.iaea.org/nafa/about-nafa/index.hmtl

[34] "FAO/IAEA Coordinated Research Projects." The International Atomic Energy Agency. 2003-2007. http://www-naweb.iaea.org/nafa/crp/basic.html

[35] Ibid.

[36] Ibid.

[37] "Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture Sub-programme on Soil and Water Management and Crop Nutrition. The International Atomic Energy Agency. 2002. http://www-naweb.iaea.org/nafa/swmn/overview-soil-prog.pdf

[38] Ibid.

[39] Ibid.

[40] Ibid.

[41] "Report of the Fourth Research Coordinated Meeting of the FAO/IAEA Coordinated Research Project on the use of Irradiated Sewage Sludge to Increase Soil Fertility and Crop Yields and to Preserve the Environment." The International Atomic Energy Agency. http://www-naweb.iaea.org/nafa/swmn/crp/sewage-fourth.pdf

Partnerships in Nuclear Science for Human Health

Concurrent with Article II of the IAEA Statute, the agency will seek through all of its means, including the formation of partnerships, to improve human health through nuclear sciences applications.[42] While it can not be denied that HIV/AIDS is a problem of global proportions it is a little known fact that cancer is the leading cause of death worldwide.[43] In search of a solution to these global problems and in support of Millennium Development Goal six, the IAEA puts its scientists to task researching molecular biology, based on nuclear techniques, to find the latest treatments for diseases like HIV/AIDS, malaria, other infectious diseases, and cancer.[44] Because the health needs of the global community are so vast, the IAEA has focused its efforts on a select number of health issues. The use of radiation therapy in treating cancer presents an obvious scientific link and entry point for the IAEA into promoting global health.

In 2003 the World Health Organization (WHO) and International Union Against Cancer (IUAC) responded to the alarming increase of cancer patients, by calling for dedication towards the cause of fighting cancer from the private and public sector.[45] The IAEA's response was the establishment of the Programme of Action for Cancer Therapy (PACT). In 2004 the IAEA Board of Governors passed Resolution GC(48)/RES/13 formally creating PACT.[46] In 2005 the WHO welcomed the IAEA's new PACT programme by acknowledging it a resolution on cancer prevention and treatment. Immediately following these developments Dr. Margret Chang, Director-General of the WHO, set out to investigate the feasibility of a partnership between the WHO and IAEA.[47] The benefits of a partnership between the WHO and IAEA could mean improved cancer treatment globally. Several areas which could use increased capacity and would clearly benefit include research and development, access to treatment, patient care, post treatment care, and human resources for health care.

PACT is founded on two essential principles: to form partnerships and coalitions between the public and private sectors to fight cancer; and to mine resources from sources such as financial institutions and charitable organizations. These resources can then be mobilized by the IAEA and utilized for cancer treatment and the PACT programme overall.[48] These resources are of utmost importance as the IAEA estimates that it will cost in the realm of one billion dollars over the next ten years to meet the developing worlds need for cancer treatment.[49] The primary cause for this gross inadequacy is that the developing world accounts for well over three quarters of the earth's population, yet it houses less then one third of the globe's cancer treatment facilities.[50]

The needs of PACT are met primarily through the IAEA's technical assistance programme, however not all of PACT's needs can be met in this fashion. The technical assistance programme is not tailored to address certain problems such as technician training. It is these unique issues which prompted the creation of PACT, to assist the developing world with problems related to issues of nuclear sciences applications, while perhaps not explicitly related to science. Essentially PACT functions on a quadripartite platform: Member State policy development, healthcare professional training, instituting national cancer control contingencies, and enhancing safety and security associated with the risks of radiotherapy.[51]

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[42] "Statute of the IAEA." The International Atomic Energy Agency. 1956. http://www.iaea.org/About/statute_text.html

[43] "PACT Grant Raising Prospectus." The International Atomic Energy Agency. http://www-naweb.iaea.org/pact/documents/pact1006.pdf

[44] "The United Nations Millennium Development Goals." The United Nations. (2005). http://www.un.org/millenniumgoals/

[45] "Programme of Action for Cancer Therapy." The International Atomic Energy Agency. 2005. http://www-naweb.iaea.org/pact/pdf/2005-08-03_PACT_Summary.pdf

[46] "Strengthening the Agency's Activities Related to Nuclear Sciences and Applications." The International Atomic Energy Agency Board of Governors. 2004. http://www-naweb.iaea.org/pact/pdf/GC_48__Res_13_D_Sep_04.pdf

[47] "Building Strategic Alliances." The International Atomic Energy Agency. 2006. http://www-naweb.iaea.org/pact/partnerships/index.html

[48] "Programme of Action for Cancer Therapy." The International Atomic Energy Agency. 2005. http://www-naweb.iaea.org/pact/pdf/2005-08-03_PACT_Summary.pdf

[49] "PACT: Where We Work." The International Atomic Energy Agency. 2006. http://www-naweb.iaea.org/pact/where_we_work/index.html

[50] Ibid.

[51] "PACT: How We Work." The International Atomic Energy Agency. 2006. http://www-naweb.iaea.org/pact/how_we_work/index.html

Prospects for the Future: Atoms for Peace the Next Fifty Years

The IAEA is at an historic crossroads. In recent years it has become a lighting rod in the international community with many singing its praises and condemning its failures. The IAEA has become known as the "UN's Nuclear Watchdog" and while this is a statement of truth there is no reason the IAEA can not be known for more than safeguards and verifications. Over the past fifty years the IAEA has made great strides forward in furthering the cause of sustainable development, human security, and global health. This is evident in the actions of the Board of Governors and the Agency at large. But these actions are not what the global community or news media focuses on. What will the next fifty years of the IAEA hold for the organization? The IAEA continues to be a stronghold in the international security arena. However, if the IAEA can survive the height of the Cold War and nuclear arms race it will certainly survive the errant slings and arrows of over zealous detractors. To date, there has been call for reformation from within or outside of the organization. Part of the strength of the IAEA is that the worlds super powers and developing countries alike realize the necessity of the organization to safeguard against nuclear threats. It is ironic, but perhaps the fact that the IAEA has a dual mission, which is often overlooked, may in the end be the reason for its longevity and effectiveness in carrying out its humanitarian objectives.

So what of future partnerships? Thus far the IAEA has proven a very good agency to associate with. The collaboration which they forged with Monaco and the Oceanographic institute of the late Jacque Cousteau is still functions through the IAEA Marine Research Center. The current Joint Programme between the FAO and IAEA is a present day manifestation of the primary partnership the organizations entered into to fight new world screw worm in 1988. Could the IAEA partner with WHO through their Nuclear Science and Applications division focusing on human health?

Sustainable development is the paramount problem facing our world, it is the specter in the distance looming large with negative implications. To think of the issue as one sided and relegated to one set of organizations will only limit the achievement of development. Embracing the IAEA for its strengths may yield surprising results. It is time for the international community to cease the labeling of the IAEA as a guarantor of their traditional security and realize that its "UN Watchdog" status extends to human security as well.

Committee Directive

When addressing these topics delegates should first realize that the information contained within this guide is but a short snip-it of the Nuclear Sciences and Applications the IAEA actually carries out. The Director and Assistant Director strongly urge you to conduct your own research on the topic. Additionally, consider if your Member State has engaged in any technical cooperative projects with the IAEA, has your country participated in any CRPs? How much has your country contributed to the technical assistance fund? Or, are they actively engaged in the PACT programme? Are your membership dues up to date, as those help to fund many of these projects, does your country or members of your countries public and private sector contribute donor aid to the IAEA? This topic should afford delegates the opportunity to be creative and escape the traditional image of what the IAEA should be and explore what the IAEA could be. Lastly are there currently any IAEA partnerships in the works, and how can the IAEA enhance, build upon and strengthen current partnerships to make them more effective; how can the IAEA further contribute to a creating a culture of peace?

Remarking on the future of the IAEA in the coming fifty years Dr. Elbaradei the Director-General of the IAEA stated: "The 21st century has brought new and critical challenges to the mission [of the IAEA]. But the questions remains: what legacy do we want to leave our children?"[52]

[52] Mohammed Elbaradei. (2003). "Atoms for Peace: A Vision for the Future." *IAEA Bulletin*. December 2003. http://www.iaea.org/Publications/Magazines/Bulletin/Bull452/article5.pdf

II: Securing the Nuclear Fuel Cycle

Introduction

Article IV of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) explicitly guarantees states the "inalienable right … to develop research, production and use of nuclear energy for peaceful purposes without discrimination."[53] Unfortunately, because of the nature of the nuclear fuel cycle, it is difficult to guarantee the true intentions of any state in pursuit of a nuclear energy program. As the IAEA Director General Mohamed ElBaradei said in 2003:

> "The area of fuel cycle design and operation may face a number of critical choices for the future, in part to address proliferation and waste management concerns. This is an important issue that has been discussed over the years, but in my view now merits serious consideration, as part of our effort to cope with the increasing non-proliferation, safety, security and technical challenges facing nuclear power."[54]

The IAEA addresses this problem today because nuclear energy is increasingly important as more countries wish to exercise their right of Article IV of the NPT: to develop a nuclear infrastructure. Through this process more countries will have access to the materials necessary to make a nuclear weapon. This duality of the nuclear fuel cycle is a reality that must be addressed. Nuclear energy has the capability to be one of the greatest aids to development, but it simultaneously possesses the power to destroy if the fuel cycle is utilized to produce nuclear weapons.

There have been several historical events that revolved directly around the issue of the duality of the fuel cycle. Member States such as Iran, Libya, and the Democratic Peoples Republic of Korea (DPRK) have continually posed problems for the IAEA such as presenting a lack of transparency, negligence in declaring all nuclear and related materials, and the removal of IAEA safeguards and verifications experts from their countries. Iran and the DPRK are also charged with the development of nuclear weapons. As a result, both countries have had punitive actions taken against them by the UN Security Council. However, there have also been nations who have had questionable motives in their nuclear programs but have since reaffirmed their commitment to peace. Most notably in 2003, the Libyan Arab Jamahiriya announced that it would be abandoning its nuclear program in favor of better standing in the international community.[55] Since that time in 2003 the Libyan government has acted in a supportive and proactive manner towards the IAEA in an effort to make amends for their past proliferation initiative.[56]

Today, nations universally see securing the nuclear fuel cycle as a primary step in making the world safer. Because of this many Member States have come together to propose methods of internationalizing the fuel cycle, starting from enrichment through the disposal of spent nuclear fuel, so that the world can be protected from the devastation of nuclear weapons.

Specifics of Enrichment

The nuclear fuel cycle starts with the mining of Uranium. Uranium is usually found with impurities and must be refined to Uranium-235 (U-235) and Uranium-238 (U-238) - the two most common isotopes, only different in the numbers of neutrons of Uranium.[57] Once it is in a pure form, Uranium must be enriched to increase the ratio of U-

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[53] *Treaty on the Non-Proliferation of Nuclear Weapons.* The United Nations General Assembly. March 5, 1970. http://disarmament.un.org/wmd/npt/npttext.html

[54] Tariq Rauf. "Perspectives on Multilateral Approaches to the Nuclear Fuel Cycle." The International Atomic Energy Agency. April 30, 2004. http://www.iaea.org/NewsCenter/Focus/Npt/npt2004_3004_mnfc_npt.pdf

[55] "News Update on IAEA and Libya: Chronology of Key Events." The International Atomic Energy Agency. 2003-2007. http://www.iaea.org/NewsCenter/Focus/IaeaLibya/libya_timeline.shtml

[56] Ibid.

[57] "The Nuclear Fuel Cycle: Mining." British Broadcasting Corporation. http://news.bbc.co.uk/2/shared/spl/hi/sci_nat/05/nuclear_fuel/html/mining.stm

235 to U-238. In order for a nuclear reaction there must a 3 percent U-235 to 97 percent U-238 ratio.[58] U-235 is only 0.7 percent of all Uranium mined and is known at the "critical mass" needed for a reaction.[59] It is also referred to as Low-Enriched Uranium (LEU) and is the most basic fuel used in nuclear reactors.[60] High-Enriched Uranium (HEU) is Uranium with 90 percent or more U-235 isotopes, and is the level of enrichment required for a nuclear weapon.[61] HEU has civilian purposes as well. The increased amount of U-235 has a direct correlation with increased energy output for nuclear reactors.[62] It is widely believed though that such high levels of enrichment are not needed, or desirable for the purposes of providing energy for a country. LEU have proven to be sufficient in providing sustainable energy. HEU can easily be used for thermo-nuclear weapons, and when countries enrich to that level, the international community has remained skeptical towards the actual goal of that country's nuclear program.

Once the Uranium has gone through the refinement and enrichment process, it can be used in a nuclear reactor. Once all of the U-235 isotopes have undergone fission, the process whereby atoms divide to become other atoms, the nuclear fuel is said to be spent. The spent fuel can then be recycled to produce more fuel for the nuclear reactor or a by-product of the fuel, Plutonium, can be used in a nuclear weapon. While Plutonium is only 1 percent of the spent fuel, relatively little (4kg) is required to make a very effective nuclear weapon. This unwanted byproduct of the fuel cycle is yet another problem that must be tackled. The question is what to do about this powerful and potentially devastating product? How can the IAEA encourage countries to recycle their spent fuel in a sustainable fashion rather then cultivating it for other purposes?

Case Study: DPRK

Presently, the debate over the most effective measures to secure the nuclear fuel cycle and prevent enrichment from being utilized for weapons production has taken center stage. Countries such as the DPRK and Iran are frequently in the international news media and are at the heart of the heated debate. The discussion is centered around the efficacy of Article IV of the NPT which defines a Member States right to the peaceful development of nuclear technology.

In 1980 the DPRK began to develop nuclear technology and initially its program was well within the fold of the IAEA. The program was being monitored by the IAEA and safeguards and verification policies were adhered to. However, in March 1993, the DPRK announced to the international community their intentions of withdrawing from the NPT.[63] One year following this event, the DPRK formally withdrew their membership from the IAEA.[64] A year later, in what would become a futile attempt to bring the DPRK back towards the IAEA, the United States developed a framework for the DPRK. The "Agreed Framework" would guarantee the DPRK industrial development assistance from the US while requiring them to subject their now highly suspect nuclear program to international safeguards and verifications. Over several years and many rounds of talks, the Agreed Framework broke down. During this time, the DPRK was continuing to develop a nuclear weapon and in fall of 2006 the DPRK conducted their first atmospheric nuclear test.

Since October of 2006, the DPRK has resumed the six-party talks. These talks are a forum between the United States, Russia, China, South Korea, Japan, and the DPRK, to engage the DPRK to come back under the umbrella of the NPT and IAEA. The spring of 2007 saw some progress and forward momentum, despite that the DPRK did not initially begin to cease enrichment or shut down its reactors. However, they have since allowed IAEA inspectors back into the country to investigate the research reactors. And on July 18, 2007 the IAEA confirmed that the DPRK had indeed shut down its Yongbyon nuclear facility. While this was significant action taken in the relationship

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[58] "The Nuclear Fuel Cycle: Enrichment." British Broadcasting Corporation. http://news.bbc.co.uk/2/shared/spl/hi/sci_nat/05/nuclear_fuel/html/enrichment.stm

[59] "The Nuclear Fuel Cycle: Enrichment." British Broadcasting Corporation. http://news.bbc.co.uk/2/shared/spl/hi/sci_nat/05/nuclear_fuel/html/enrichment.shtm

[60] Ibid

[61] Ibid

[62] "Civilian Uses of HEU." Nuclear Threat Initiative. 2006. http://www.nti.org/db/heu/civilian.html

[63] "IAEA Media Advisory Fact Sheet on DPRK Nuclear Safeguards." The International Atomic Energy Agency. (2002). http://www.iaea.org/NewsCenter/MediaAdviosry/2002/med-advise_052.shtm

[64] Ibid.

between the IAEA and the DPRK, IAEA Director General, Mohamed ElBaradei noted that "this is an important step in the right direction but only the first in a long journey."[65] How the DPRK continues to interact with the IAEA will serve as a test case for the development and installation of nuclear safeguards in the 21st century.

Case Study: Iran

Iran, through the development of its nuclear program, has defied not only the IAEA but the UN Security Council as well. Since early 2002, Iran's nuclear program has been under suspicion. Iran has continually denied the IAEA access to their nuclear reactors, and in an act of utter defiance last year, broke the seals on their reactors and began the enrichment process after they had been explicitly told to cease by the Security Council. As a result of these actions Iran has been the subject of several Chapter VII Security Council resolutions including S/RES/1696, S/RES/1737, and most recently S/RES/1747.[66] The most recent of these resolutions, S/RES/1747, imposes further sanctions on the Iranian government and strongly urges Iran to cease enrichment. Due to Iran's geopolitical status, the insecurity of the nuclear fuel cycle, the knowledge that Iran is enriching HEU, combined with their lack of cooperation this situation is of major concern for the IAEA, the Security Council, and the international community as a whole. Finding a solution to this case may lie within developing multinational supervision of the fuel cycle.

Case Study: Libya

In 2003, the Libyan Arab Jamahiriya began to develop a nuclear infrastructure.[67] Libya had not previously been known for its good relations with the international community and its designs on a nuclear technology program had many worried. However, in August of 2003, Muammar Qaddafi announced that Libya had no intentions of developing or acquiring a nuclear weapon.[68] To reinforce this statement, IAEA inspectors were allowed into the country and cooperation was achieved with the development of the Additional Protocol for Libya in securing nuclear material.[69] The case of Libya is an example of how international work and encouragement can bring a country from a suspicious nuclear program to one which is accepted and encouraged.[70] This is also an example of where securing nuclear enrichment, as the IAEA has verified, is not a guarantee of nuclear security. For instance, according to IAEA inspections, Libya has begun to harvest Plutonium from spent fuel cells which can be used to create a nuclear weapon.[71] So while officially Libya has a secure nuclear enrichment process, they cannot be ignored as a threat in terms of exporting or employing nuclear weapons capable material because of the insecurities in nuclear waste.

Actions Taken by the IAEA

One of the primary objectives of the IAEA is to monitor the Non-Proliferation Regime; that is to make sure that all nuclear development starts and remains for peaceful purposes only. Inspections, however, have proven only to raise suspicions, not disarm them, with the exception of early 1990s discovery of the two separate nuclear sites. Inspectors have two jobs, as demonstrated in Iraq – testing nuclear facilities, called on-site inspections, and continuous monitoring of a country's facilities to ensure continued compliance.[72] In on-site inspections, inspectors go through the plant and set up the tools which will be used for future monitoring and ensure that all nuclear-related technologies are for peaceful, civilian purposes. They often put seals on any technology which could be modified

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[65] "IAEA Team Confirms Shutdown of DPRK Nuclear Facilities." IAEA Press Release. July, 18 2007. http://www.iaea.org/NewsCenter/PressReleases/2007/prn200712.html

[66] S/RES/1747. *Non-Proliferation.* The United Nations Security Council. (2007). http://daccessdds.un.org/doc/UNDOC/GEN/N07/281/40/PDF/N0728140.pdf?OpenElement

[67] "Libya Timeline." Iraq Watch. http://www.iraqwatch.org/roundtables/RT4/Libya-Timeline.htm

[68] Paul Reynolds. "Gaddafi: In From the Cold." British Broadcasting Corporation. December 20, 2003. http://news.bbc.co.uk/1/hi/world/africa/3336493.stm

[69] "IAEA's Verification of Libya's Nuclear Programme." The International Atomic Energy Agency. March 10, 2004. http://www.iaea.org/NewsCenter/News/2004/libya_ap1003.html

[70] "Libyan Nuclear Weapons." Global Security. http://www.globalsecurity.org/wmd/world/libya/nuclear.htm

[71] "Libya 'Produced Nuclear Material.'" British Broadcasting Corporation. February 20, 2004. http://news.bbc.co.uk/2/hi/africa/3508047.stm

[72] "Frequently Asked Questions." Iraq Nuclear Verification Office. http://www.iaea.org/worldatom/Programmes/ActionTeam/faqs.html

easily for criminal purposes.[73] They use many techniques and technologies, from satellite monitoring to hand-held devices, in the process of inspecting facilities.[74] At the end of an inspection or series of inspections, depending on the agreement that the individual state has with the IAEA, the IAEA is able to report to the international community whether or not a state has a peaceful and civilian nuclear energy program or a suspect nuclear program.[75] They are also able to put in the means of performing extended monitoring of the areas to ensured continued compliance with the NPT and other agreements between the IAEA and the individual state.[76]

Outside of inspections, the IAEA has worked closely to expand the Nuclear Suppliers Group (NSG) from its original mandate. The NSG was created in 1974 in reaction to the denotation of India's first nuclear device.[77] The NSG was set up to restrict the transfer of the hardware and technology needed for enriching Uranium in the direction of nuclear weapons.[78] In the NSG expansion, the NSG directly addressed an insecure nuclear fuel cycle and banned the transfer of technologies which, if a fuel cycle was insecure on the developing nation's end, could result in the development of a nuclear weapon.[79] Information circular 254 (Rev 2) put out by the IAEA explicitly states that:

> "Suppliers should not authorize the transfers of equipment, materials, software, or related technology:
> - for use in a non-nuclear-weapon state in a nuclear explosive activity or an un-safeguarded nuclear fuel-cycle activity;
> - in general, when there is an unacceptable risk of diversion to such an activity, or when the transfers are contrary to the objective of averting the proliferation of nuclear weapons, or
> - when there is an unacceptable risk of diversion to acts of nuclear terrorism."[80]

This requires that all states party to the NSG ensure the security of those to whom they are transferring nuclear technology to before they initiate the transfer. This also helps to set up an inter-state system of responsibility and accountability, making states culpable when they share their technologies with unsafe states.

Aside from their traditional role of safeguards and verification IAEA has begun to address the issue of fuel cycle security from new angles. The most important work done directly by the IAEA is through studies and research into feasibility. In a 113-page report commissioned by the IAEA, experts in the field detailed several possible solutions to the issue of securing the fuel cycle, including putting Uranium enrichment under multi-national control.[81] The IAEA Director General also called for a limited number of regional centers as a method for centralizing nuclear material and keeping "proliferation-sensitive" parts of the nuclear fuel cycle safe.[82] Russia has responded to this suggestion by creating its Global Nuclear Power Initiative (GNPI).[83] The first stage of the GNPI involves creating an International Uranium Enrichment Center in Russia which would enrich Uranium for all countries wishing to buy in.[84] This would save countries the time and cost of creating an infrastructure and would put the enrichment process in the hands of a country that already possesses the appropriate technology for enrichment.[85] The IAEA has been

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[73] "IAEA Safeguards: Stemming the Spread of Nuclear Weapons." The International Atomic Energy Agency. http://www.iaea.org/Publications/Factsheets/English/S1_Safeguards.pdf

[74] "Tools for Nuclear Inspection." The International Atomic Energy Agency. November 22, 2002. http://www.iaea.org/NewsCenter/News/2002/22-11-22170.shtml

[75] "Frequently Asked Questions." Iraq Nuclear Verification Office. http://www.iaea.org/worldatom/Programmes/ActionTeam/faqs.html

[76] Ibid

[77] "History of the NSG." Nuclear Suppliers Group." http://www.nuclearsuppliersgroup.org/history.htm

[78] "Nuclear Suppliers Group: Guidelines." Nuclear Suppliers Group. http://www.nuclearsuppliersgroup.org/guide.htm

[79] Ibid

[80] INFCIRC254. *Guidelines for Transfers of Nuclear-Related Dual-Use Equipment, Materials, Software, and Related Technology*. The International Atomic Energy Agency. http://www.nuclearsuppliersgroup.org/PDF/infcirc254r7p2-060320.pdf

[81] INFCIRC-640. *Multilateral Approaches to the Nuclear Fuel Cycle*. The International Atomic Energy Agency. http://www.iaea.org/Publications/Documents/Infcircs/2005/infcirc640.pdf

[82] Tariq Rauf. "Perspectives on Multilateral Approaches to the Nuclear Fuel Cycle." The International Atomic Energy Agency. April 30, 2004. http://www.iaea.org/NewsCenter/Focus/Npt/npt2004_3004_mnfc_npt.pdf

[83] S.V. Rushkin and V.Y. Loginov. "Securing the Nuclear Fuel Cycle: What Next?" *IAEA Bulletin*. 48/1. http://www.iaea.org/Publications/Magazines/Bulletin/Bull481/htmls/nuclear_fuel_cycle.html

[84] Ibid

[85] Ibid

working closely with Russia to discuss feasibility and application of this International Uranium Enrichment Center.[86]

The IAEA has also looked at creating a nuclear energy bank which would ensure supply of nuclear reactors.[87] With this guarantee, states would be more likely to buy into a multinational system of fuel regulation since they will not have to worry about falling short when harvesting and enriching uranium themselves.[88] As justification, Director General Mohamed ElBaradei has said: "I want to make sure that every country that is a bona fide user of nuclear energy, and that is fulfilling its non-proliferation obligations, is getting fuel."[89] In addition to the bank, the IAEA has considered creating its own nuclear enrichment facility instead of converting a pre-existing infrastructure which may be subject to political disruption.[90]

Future Possibilities

When it comes to regulating nuclear fuel, the international community has set in place a multi-lateral approach to regulations despite the fact that some states still act on their own. At the same time, it is possible to internationalize the enrichment process so that one state or international organization manages the enrichment process? This was one option that was explored in attempting to negotiate a solution to the Iranian nuclear crisis.[91] This idea has now been expanded into a complete International Uranium Enrichment Center.[92] States can also band together to enforce enrichment, using soft power and regional inspections to ensure limited levels of enrichment and peaceful uses of nuclear energy only. There is also the so far unexplored option of the privatization of the fuel cycle. Like many utilities and natural resources before it, perhaps there is a future for nuclear fuel in the private sector with joint regulation between states, international organizations, and corporations.

These issues focus mainly on the enrichment of Uranium, not necessarily on the safeguarding of nuclear waste. One solution could be the possibility of the purchase of nuclear waste and spent fuel in an effort to establish a recycling program. There is a further multinational solution: if all enrichment and processing is done at several regional facilities which are under multinational control and states cease to process their own energy, the issues of enrichment and post-processing of nuclear waste become moot. However, states may be unlikely to agree to this power-sharing agreement where they have little control over the enrichment process.

Conclusion

Nuclear energy is clean, efficient, and the natural resource used in its production, Uranium, is not one which will expire in the foreseeable future.[93] Because every state, particularly one working towards development, have a primary need to supply energy to its people, nuclear energy is becoming a more popular option. Unfortunately for the international community, this means the problem of securing the nuclear fuel cycle becomes more critical as more states acquire the technology and grow their nuclear programs.

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[86] "Talks Proceed on Proposed International Uranium Enrichment Centre." The International Atomic Energy Agency. March 22, 2007. http://www.iaea.org/NewsCenter/News/2007/russiatalks.html

[87] "Report on Possible New Framework for Using Nuclear Energy. The International Atomic Energy Agency. June 15, 2007. http://www.iaea.org/NewsCenter/News/2007/nuclenframework.html

[88] "IAEA Seeks Guarantees of Nuclear Fuel." The International Atomic Energy Agency. September 15, 2006. http://www.iaea.org/NewsCenter/PressReleases/2006/prn200615.html

[89] Ibid

[90] "Report on Possible New Framework for Using Nuclear Energy. The International Atomic Energy Agency. June 15, 2007. http://www.iaea.org/NewsCenter/News/2007/nuclenframework.html

[91] "Russian Solution to Iran Nuclear Crisis Gets Support." Canadian Broadcasting Corporation. January 26, 2006. http://www.cbc.ca/world/story/2006/01/26/iran060126.html

[92] S.V. Rushkin and V.Y. Loginov. "Securing the Nuclear Fuel Cycle: What Next?" *IAEA Bulletin*. 48/1. http://www.iaea.org/Publications/Magazines/Bulletin/Bull481/htmls/nuclear_fuel_cycle.html

[93] "Tariq Rauf. "Perspectives on Multilateral Approaches to the Nuclear Fuel Cycle." The International Atomic Energy Agency. April 30, 2004. http://www.iaea.org/NewsCenter/Focus/Npt/npt2004_3004_mnfc_npt.pdf

As of yet there is no universal solution for this problem. Collection of spent fuel is a huge level of insecurity even when the actual enrichment problem is addressed. Careful timing can contribute to effective collection of the majority of spent fuel cells but even this idea has not been fully discussed by the international community.

Inspections, if they continue in the present fashion, must analyze both enrichment and nuclear waste management and ensure these activities remain civilian in nature. The future is unclear on the full implementation of the International Uranium Enrichment Center, and how it will provide a methodology for dealing with political issues and actual logistics of the center. On June 15, 2007 the IAEA released a report entitle the *Possible New Framework for the Utilization of Nuclear Energy: Options for Assurance of Supply of Nuclear Fuel*. IAEA Director-General Dr. ElBaredei commented that, "Trends clearly point to the need for developing a new multilateral framework for the nuclear fuel cycle. And it's clear that an incremental approach, with multiple assurances in place, is the way to move forward," thus echoing the need to incorporate development and nuclear technologies while upholding the commitment to peace which the organization promised 50 years ago.[94]

Committee Directive

How can the IAEA address the issues of countries which have proliferated by abuse of the nuclear fuel cycle? In following the theme of the conference, how can addressing this issue foster an international culture of peace so that nuclear energy is able to proliferate and the world can develop without simultaneously fostering the proliferation of nuclear weapons?

When grappling with this topic delegates should first consider the status of their country's nuclear energy program. It will be necessary to understand the goals of all current ideas on the topic and of solutions to the problem which have been considered both in the IAEA and between your country and others outside of the IAEA. When looking at your country's status, it will be important to consider costs of maintaining or creating an infrastructure and what your country can offer as far as aiding in security. .

Questions which a delegate should come prepared to answer and which any workable solution will address are: how do we address states which already own or have started construction on a nuclear energy infrastructure? Will the cost of developing a solution be prohibitive and/or greater than the cost of a nation developing its own nuclear energy program and enrichment infrastructure? How will monitoring of whatever solution is created take place? Is this a solution which will be well-received and easily implemented by developing nations? Is this a solution which can be easily circumvented or which will interfere with sovereignty? And lastly, will any foreseeable solution enhance the security of the nuclear fuel cycle?

III: Addressing Nuclear Threats

Introduction

More and more frequently when discussing nuclear threat related topics the dialogue is no longer about missile defense systems or inter-continental ballistic missiles. The debate has shifted away from these more traditional security topics and the pendulum has swung towards a new non-traditional threat. The question is who posses these threats and how should the IAEA combat them. A non-traditional nuclear threat is one that is not directly or immediately posed by a state-actor. Important to remember though is that while these threats are not explicitly caused by state-actors they can be implicitly caused, influenced, or tacitly allowed to occur through negligence on the part of state actors. If the threat is not perpetrated by a state actor, it must be characterized by a non-state actor. The threats posed by such actors can range anywhere from minute to devastating, from an attempted act of illicit trafficking thwarted by law enforcement officials to unthinkable attainment of nuclear materials. Threats can also come in the form of nuclear sabotage. Non-traditional nuclear threats are not black and white - there can be many variations of a threat and still many more solutions to one.

[94] "Report on Possible New Framework for Using Nuclear Energy." The International Atomic Energy Agency. June 15, 2007. http://www.iaea.org/NewsCenter/News/2007/nuclenframework.html

The Treaty on the Non-Proliferation of Nuclear Weapons

Up until the early 1990s the terminology "nuclear threat" typically pertained to a state actor. While states posing as nuclear threats may be problematic, the IAEA and the international community at large possessed the proper tools to address these threats. These tools were the bi-partite partnership of the IAEA and the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). Through a combination of NPT adherence and the enforcement regime created within it, Member States could be sure that their citizens were relatively safe and secure from various nuclear dangers.

Directly following the creation of the NPT several other organizations were created to mutually support the treaty regimes goals and purposes. One such organization was the Nuclear Suppliers Group (NSG).[95] The goals and purpose of the NSG are designed to be complementary to Article III of the NPT. Article III of the NPT provides that no state shall undertake the transfer of nuclear material to a non-nuclear weapon state unless that material is subject to proper IAEA safeguards.[96] Essentially the group created strict guidelines for the transfer and trade of nuclear materials between states.[97] In addition to the NSG, in 1971 Member States convened and formed another body, the Zangger Committee.[98] Similar to the NSG, the Zangger Committee's objective was to focus on Article III of the NPT and its enforcement. These groups with the IAEA play a major role in addressing and mitigating traditional nuclear threats. However, questions have arisen about their capabilities to address non-traditional nuclear threats. Has the global community reached a point in time when the efficacy of the NPT and subsequent enforcement groups should be called into question?

The enforcement regime of the NPT is embodied by the IAEA's inspections, safeguards, and verification capabilities and techniques. While these tools are well suited and have stood the test of time in monitoring member state activities, the turn of the century has brought new nuclear threats that call into question the current techniques utilized by the IAEA. The NPT was designed to combat nuclear proliferation by Member States but new threats have emerged, and these are threats which the NPT and IAEA could not have foreseen so many years ago. Non-states actors, illicit trafficking, radiological dangers, and the increased transboundary movement of nuclear and radiological materials are all realities the IAEA must now live with and combat in order to reduce the nuclear threat.

Multiple Challenges Multiple Threats

The global community is fortunate because to date there has not been a nuclear threat that has turned into a major nuclear catastrophe. Perhaps this is due to well enforced export controls like those exercised by the NSG and Zangger committee. Perhaps this is due to the close safeguarding of nuclear materials by the IAEA and Member States. Perhaps it is luck. The fact of the matter is, however, there have been attempts to wreak nuclear havoc and there have been significant breeches of nuclear security.

In May 2002 Jose Padilla was departing his flight at Chicago O'Hare International Airport when he was whisked away by United States law enforcement agents.[99] Mr. Padilla was on his way from Pakistan to the United States that day and was arrested due to suspicion he was planning to utilize a dirty bomb against the citizens of the United States.[100] A dirty bomb is common terminology for a radiological dispersion devise (RDD). RDD's, while not as devastating as a tactical nuclear weapon, have the capability to inflict significant casualties and damage. The arrest of Mr. Padilla confirmed that non-traditional nuclear threats are real. The Padilla case drew attention to RDD's and the unique dangers they posed: ease of material acquisition, ease of use, and ease of concealment.

For RDD's and non-traditional nuclear threats to exist, there must be a way for to build or purchase the weapons. Many times this occurs through back channels and illicit trafficking. Perhaps the most well known and most nefarious actor in illicit trafficking is Pakistani scientist Abdul Qadeer Khan (AQ Khan). Dr. Khan is primarily

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[95] "History of the Nuclear Suppliers Group." Nuclear Suppliers Group. 2006. http://www.nuclearsuppliersgroup.org/history.htm

[96] *Treaty on the Non-Proliferation of Nuclear Weapons.* The United Nations General Assembly. March 5, 1970. http://disarmament.un.org/wmd/npt/npttext.html

[97] Ibid.

[98] "Zangger Committee: Our Mission." Zangger Committee. 2006. http://www.zanggercommittee.org/Zangger/Disclaimer/default.htm

[99] "Profile: Jose Padilla." British Broadcasting Corporation. http://news.bbc.co.uk/2/hi/americas/2037444.stm

[100] Ibid.

responsible for the nuclear weaponization of Pakistan, a nuclear weapons state not party to the NPT. But he gained his infamy from acts not officially sanctioned by the government of Pakistan. In the early part of the 21st century suspicion around the activities of Dr. Khan and his colleagues grew. It was also at this time that Pakistani President Musharaf removed Dr. Khan from his official state sanctioned position. Then in 2004 Dr. Khan made a public statement that he had provided, aided, and sold nuclear technology geared towards creating highly enriched uranium to several countries: Iran, Libya, and the Democratic Peoples Republic of Korea.[101] Dr. Khan's network was expansive and encompassed many other actors besides himself. The scope of his network uncovers the reality that the nuclear black market is large and expansive. Dr. Khan has been reigned in but the question still remains; who are the countless other actors he worked with between 1989 and 2000?[102]

In mid 2006, IAEA scientists discovered two orphan sources of radiological material in Georgia.[103] An orphaned source is best explained as radiological material that is lost or left over from some prior legal use. In this case the IAEA and Georgian authorities found one of the sources on the floor of an abandoned factory, while the second was found in the workshop of a family's house just sitting in a tin tool box.[104] It may seem that orphaned sources do not pose a large threat aside from the clear health risks associated with there presence. The fact remains that orphan sources are active and dangerous radiological material that can be easily manipulated into an RDD. Clearly there is a real danger that an orphaned source may find its way into the hands of a non-state actor who can easily change the material from a simple health risk into a real nuclear menace.

The examples above illustrate the new types of nuclear threats the IAEA faces in the 21st century. With so many threats how is the IAEA supposed to protect and aggressively combat these threats simultaneously? Additionally how should the IAEA evolve and change to meet the threats of an enemy that exists in the shadows and operates beyond the reach of the traditional state actor?

IAEA and Member State Response to Nuclear Threats

Critics may argue that the untimely response to non-traditional nuclear threats was not commensurate with their size and growth, and was too late. However, the global community is in the process of changing how it thinks about security while these threats continue to evolve and develop.

These threats are multifaceted and varied. As mentioned, some may come from state actors utilizing new and unfamiliar technology. Their lack of expertise may lead to an accident that endangers lives, and negligence can lead to poorly protected radiological and nuclear material. This poor protection can leave open a window that non-state actors can exploit. A threat may similarly exist because of an oversight by a government agency. For example, the air space around a research reactor may not be sufficiently monitored or administered. Non-traditional nuclear threats can arise out of a lack of security, planning, or oversight – all of which are preventable. Non-traditional threats are most often caused by small mistakes and lapses in security which have larger then life consequences.

In 2002 the IAEA convened to create a new *Plan of Activities to Protect against Nuclear Terrorism*.[105] Subsequently the IAEA has renamed its Office of Physical Protection and Material Security to the Office of Nuclear Security (NSNS).[106] The NSNS is officially in charge of all activities that relate to prevention, detection and response to nuclear threats.[107] In addition to the tasks listed above, the NSNS is also responsible for providing technical assistance to Member States in the physical protection of their nuclear and radiological material as well as assisting in responding to suspected nuclear threats.[108] These tasks are of the utmost importance because not every country with nuclear capabilities is financially and technically capable of safeguarding them in the manner fully

[101] "A.Q. Khan." Global Security. http://www.globalsecurity.org/wmd/world/pakistan/khan.htm
[102] Ibid.
[103] "Radioactive Sources Recovered in Georgia." The International Atomic Energy Agency. 2000-2006. http://www.iaea.org/NewsCenter/News/2006/georgia_radsources.html.
[104] Ibid.
[105] "Nuclear Security." The International Atomic Energy Agency. 2000-2006. http://www-ns.iaea.org/security/default.htm
[106] Ibid.
[107] Ibid.
[108] Ibid.

industrialized countries are. By providing these important services, such as capacity building, the IAEA can fill in the gaps missed by state energy agencies. Without playing this role those gaps may turn into real security risks.

Prevention

Examples of preventative measures undertaken be the IAEA and Member States include, but are not limited to, physical protection of nuclear materials, physical protection of nuclear sites, transport of nuclear and radiological materials, and the recovery and search for orphaned sources.[109] Under the auspices of the NSNS, the IAEA has raised over 27 million dollars towards fighting nuclear terrorism.[110] These funds have been raised through donor support and member state contributions.[111]

The beginning of the physical protection regime can be traced back to the 1980 Convention on the Physical Protection of Nuclear Material, which is still highly relevant and enforced today.[112] Acting under the Convention, Member States undertook responsibilities to safe guard nuclear material that was either on their sovereign territory or in the process of being transferred to another member state. The 1980 Convention opened the door for further IAEA preventative action.

In recent years the IAEA has developed new and more advanced tools to use as a first line of defense in the fight against nuclear threats. One such tool is the International Nuclear Security Advisory Service (INSServ).[113] INSServ missions are requested by Member States and assist in evaluating domestic nuclear security, and possible nuclear security risks.[114] The purpose of the programme is to uncover these short comings on Member States parts and then utilize more specific programmes in order to tackle the problem.[115] In one specific example of a successful INSServ mission, IAEA inspectors evaluating a research reactor containing HEU and Cobalt 60 (a radiological isotope) found that the reactor was essentially un-secure and un-protected.[116] An un-secure and un-protected facility is one that essentially is devoid of basic security measures such as high fences, reinforced concrete barriers, armed and trained security guards, closed circuit monitoring devices and appropriate clearance levels. Due to the sensitive nature of the information, the location of the reactor was kept classified. The appropriate measures were taken briefly following the INSServ mission.[117] Physical protection measures were improved such as enhancing restrictive access to the sight and improving hard security measures such as security guards and monitoring. Had this location gone on un-protected it would have continued to posse a serious security threat.

The IAEA also utilizes International Physical Protection Advisory Services (IPPAS).[118] These services, which can be carried out on a case by case basis or through a national review, focus specifically on the physical protection of Member States.[119] IAEA personnel compare national programmes to international guidelines and best practices, following the programme recommendations are issued by IAEA personnel to enhance physical security and protection. The idea behind these programmes is with proper physical protection the risk of nuclear and radiological materials falling into terrorist hands are minimized.

Physical protection can take on many different shades and meanings. The excepted meaning of the term is defined in Annex I of the Convention on the Physical Protection of Nuclear Material. There are several levels of protection,

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[109] "Promoting Nuclear Security." The International Atomic Energy Agency. 2000-2006. http://www.iaea.org/NewsCenter/Features/NuclearSecurity/iaea20040601.html

[110] "IAEA Action Against Terrorism." The International Atomic Energy Agency. 2000-2006. http://www.iaea.org/NewsCenter/Features/NuclearSecurity/terrorism.html

[111] Ibid.

[112] *Convention on the Physical Protection of Nuclear Materials*. The United Nations General Assembly. March 3, 1980. http://www.unodc.org/unodc/terrorism_convention_nuclear_material.html

[113] "Prevention of Nuclear Terrorism." The International Atomic Energy Agency. 2000-2006. http://www-ns.iaea.org/security/prevention.htm

[114] Ibid.

[115] Ibid.

[116] "Promoting Nuclear Security: What the IAEA is Doing." The International Atomic Energy Agency. 2004. http://f40.iaea.org/worldatom/Periodicals/Factsheets/English/nuclsecurity.pdf

[117] Ibid.

[118] "Prevention of Nuclear Terrorism." The International Atomic Energy Agency. 2000-2006. http://www-ns.iaea.org/security/prevention.htm

[119] Ibid.

including: controlled access to sensitive areas, constant surveillance of sensitive materials, or physically impounding material and measures to deter a direct attack on a facility.[120] Additional internationally recognized guidelines and information on physical protection are established in IAEA document INFCIRC/225/Rev.4. As of 2004 the IAEA has conducted over 50 missions to Member States and over 60 training courses to help Member States strengthen physical security.[121] Thailand, Kazakhstan and the Islamic Republic of Iran are examples of three of the most recent countries where IPPAS have been carried out.[122]

Detection

The IAEA's primary response for detection is to give Member States the tools they need, such as recommendations on best practices and additional resources from the IAEA technical assistance and cooperation fund. These efforts are undertaken in order to uncover nuclear threats and address them properly. This essentially means the IAEA takes the role of educators. In order to fulfill this role the IAEA takes a tripartite approach focusing on regional seminars on illicit trafficking, promoting methodology of detection at the regional level and training on the use and operation of detection equipment.[123] In an effort to enhance this programme the IAEA has developed a facility at their laboratories in Vienna, Austria to help develop, test, and distribute new tools and technologies to Member States to be used in detection.[124]

In addition to these roles, the IAEA also makes recommendations to Member States in developing better border security and more secure border crossings, and more adequately trained customs officials.[125] The hope of such a programme is to deter and decrease the opportunity for illicit trafficking as well as enhance governments' ability to monitor the official movement of nuclear and radiological materials. By enhancing government capability opportunity for hi-jacking is effectively combated.

Response

While Member States are primarily responsible for responding to nuclear and radiological incidence the IAEA take an active role in facilitating proper response and training in such an event. While still in its preliminary phases, the IAEA is developing a course on proper response to occurrences of nuclear terrorism.[126] Currently the IAEA is drafting a new document entitled "Preparedness and Response for Malicious Acts involving Radioactive Material."[127] The document is instructional in nature and geared towards arming Member States with methodology for combating acts of nuclear and radiological terrorism.[128] Lastly, but no less important, under the auspices of response the IAEA conducts response missions which typically take the form of orphan material retrieval.

IAEA international legal response: treaty action

In addition to the IAEA's three tier response of prevention, detection, and response, the organization has also developed a large body of treaties over its fifty year existence with which to combat nuclear threats. While the original intent of these treaties, principles, and programmes may not have been to target non-traditional nuclear threats they have been applied to combating these dangers in the 21st century.

The cornerstone of this work is the aforementioned Convention on the Physical Protection on Nuclear Material (CPPNM). The CPPNM was penned in 1980, before the idea of non-state actors utilizing radiological and nuclear

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[120] *Convention on the Physical Protection of Nuclear Materials.* The United Nations General Assembly. March 3, 1980. http://www.unodc.org/unodc/terrorism_convention_nuclear_material.html

[121] "IAEA Action Against Terrorism." The International Atomic Energy Agency. 2000-2006. http://www.iaea.org/NewsCenter/Features/NuclearSecurity/terrorism.html

[122] "Annual Report 2004 – Additional Annex Tables." The International Atomic Energy Agency. 2004. http://iaea.org/Publications/Reports/Anrep2004/annex_tables.pdf

[123] "Detection of Illicit Trafficking in Nuclear and other related Radioactive Materials." The International Atomic Energy Agency. 2000-2006. http://www-ns.iaea.org/security/detection.htm

[124] Ibid.

[125] "Promoting Nuclear Security." The International Atomic Energy Agency. 2000-2006. http://www.iaea.org/NewsCenter/Features/NuclearSecurity/iaea20040601.html

[126] "Response to Malicious Acts and threats thereof." The International Atomic Energy Agency. 2000-2006. http://www-ns.iaea.org/security/response.htm

[127] Ibid.

[128] Ibid.

materials had become a topic of concern to many. Thus in the wake of September 11th the IAEA convened to discuss the possibility of an amendment to the CPPNM. What resulted were the ***Physical Protection Objectives and Fundamental Principles.***[129] This document outlined areas that needing improving to respond to the growing threat of radiological and nuclear terrorism. Objectives included were designed in response to threats of sabotage of materials during transport or domestic use and the minimization of the consequences of sabotage.[130] The principles the IAEA envisioned included enhanced state responsibility which speaks directly to the development of competent legislative and regulatory domestic structures and contingency plans.[131]

An additional source of guidelines for governments can be found in *the Code of conduct on the Safety and Security of Radioactive Sources* (hereto referred to as the Code). The Code, like the CPPNM was updated in 2003 in response to growing demands from the international community, and findings of both the *International Conference on Security of Radioactive Sources* and the G-8 summit of 2003.[132] The primary motive behind amending the Code was to allow for more appropriate measures against obtaining radioactive materials. The over arching purpose of the Code is to assist governments in developing their national policy and legislative tools on radioactive materials.[133] The Code, in its most basic form, is a list of best practices for governments to follow in order to achieve the highest level of success in securing and maintaining radioactive sources and materials.

Another tool employed by the IAEA is the Illicit Trafficking Database (ITDB). Established in 1995 the primary purpose of the ITDB is to monitor, report on, and provide accurate and accountable information about incidence involving nuclear and radiological materials. The point of all this is to provide information to participating states on past incidences. Knowing the specifics of what led to an incident will allow States participating in the ITDB to learn from and avoid the same failures. An additional strength of the program is that it may help national law enforcement authorities in the tracking down and retrieving of lost or stolen materials. Information pertaining to the ITDB is transmitted from the IAEA through participating States Points of Contact or POC.[134]

Conclusion

Even with so much oversight from the IAEA, and groups like the NSG and Zangger Committee, threats still exist. This is evidenced by the 2006 capture of nuclear materials by authorities that were being trafficked through Georgia on their way to the hands of a non-state actor. It is up to the IAEA to work to combat this enemy. The fight against non-traditional nuclear threats is a multi-faceted fight but unique in that it is a fight the entire international community must wage. Where as traditional nuclear threats pitted state against state, the threats of the 21st century endangers not only sovereign countries but human life every where. What further action can be taken to combat the threat of nuclear and radiological terrorism, illicit trafficking and enhance physical protection of nuclear materials? What role do Member States have to play and what role must the IAEA taken on?

Committee Directive

When researching and writing for this topic delegates must remain focused as the literature on this topic is vast and expansive. First and fore most delegates should be intimately aware of their own countries nuclear situation, what is your physical protection like, do you suffer from orphaned materials, have you experienced incidence of illicit trafficking, what if anything does your domestic government and legal structure attempt to do about nuclear threats, is your government a member of a group such as the NSG or Zangger Committee? These are all important questions and certainly not an exhaustive list of them. Delegates must also consider if they have participated in any IAEA technical cooperation or educational training programmes? Has your country been the subject of an INSServ

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[129] "Nuclear Verification and Security of Material – Physical Protection Objectives and Fundamental Principles." The International Atomic Energy Agency. 2001. http://www.iaea.org/About/Policy/GC/GC45/Documents/gc45inf-14.pdf

[130] Ibid.

[131] Ibid.

[132] "Code of Conduct on the Safety and Security of Radioactive Sources." The International Atomic Energy Agency. 2004. http://www.-pub.iaea.org/MTCD/publications/PDF/Code-2004_web.pdf

[133] Ibid.

[134] "Illicit Trafficking and Other Unauthorized Activities Involving Nuclear and Radioactive Materials." The International Atomic Energy Agency. 2006. http://www.iaea.org/NewsCenter/Features/RadSources/PDF/fact_figures2005.pdf

or IPPAS? Lastly but perhaps most importantly what is it that your country proposes to do about the growing problem of non-traditional nuclear threats?