SRMUN ATLANTA 2017

Development through Dialogue: Using Global Cooperation to Build Lasting Change

November 16 - 18, 2017

iaea_atlanta@srmun.org

Greetings Delegates,

Welcome to SRMUN Atlanta 2017 and the International Atomic Energy Agency (IAEA). My name is Lydia Schlitt, and I am serving as your Director for the IAEA. This is my second conference as a SRMUN staff member. Previously, I served as the Assistant Director (AD) for the Group of 77 at SRMUN Atlanta 2016. I am currently a Juris Doctorate candidate at the University of Oregon School of Law and hold a Bachelor of Science with Honors in Political Science with a minor in Mathematics from Berry College. Our committee's Assistant Directors (ADs) will be Michael Englehardt and John Griffin. This is Michael's second time as a staff member. Last year he served as the AD for the Commission on Narcotics and Drugs. Michael graduated from the University of Wisconsin-River Falls with a Bachelor of Arts in History and a minor in Political Science. He went on to earn his Masters in International Security from the University of Denver. This is John's first time as a staff member at SRMUN, but his previous Model United Nations experience includes FMUN, SRMUN Atlanta, NMUN NYC, and NMUN Europe. He is currently a student at Florida State University, where he is working to complete a Political Science and International Affairs degree.

The IAEA's mission is to promote safe and peaceful use of nuclear technology to ensure sustainable development. It was created in 1957 after 81 nations approved the Statue of the IAEA in 1956. Currently the IAEA is composed of 168 Member States. The IAEA works toward achieving peace and development by inspecting nuclear facilities, creating programs to teach safe and secure methods of maintaining nuclear facilities, and supporting scientific and technological research aimed at peaceful application of nuclear technology.

By focusing on the mission of the IAEA and the SRMUN Atlanta 2017 theme of "*Development through Dialogue: Using Global Cooperation to Build Lasting Change,"* we have developed the following topics for the delegates to discuss at conference:

I. Enhancing Safety and Security Standards of Nuclear Power Facilities
II. Developing Solutions and Promoting Cooperation for the Disposal of Nuclear Waste

The background guide provides a strong introduction to the committee and the topics and should be utilized as a foundation for the delegate's independent research. While we have attempted to provide a holistic analysis of the issues, the background guide should not be used as the single mode of analysis for the topics. Delegates are expected to go beyond the background guide and engage in intellectual inquiry of their own. The position papers for the committee should reflect the complexity of these issues and their externalities. Delegations are expected to submit a position paper and be prepared for a vigorous discussion at the conference. Position papers should be no longer than two pages in length (single spaced) and demonstrate your Member State's position, policies and recommendations on each of the two topics. For more detailed information about formatting and how to write position papers, delegates can visit srmun.org. ***All position papers MUST be submitted no later than Friday, October 27, 2017 by 11:59pm EST via the SRMUN website.***

Michael, John, and I are enthusiastic about serving as your dais for the IAEA. We wish you all the best of luck in your conference preparation and look forward to working with you in the near future. Please feel free to contact Deputy Director-General Ryan Baerwalde, Michael, John, or me if you have any questions while preparing for the conference.

Lydia Schlitt
Director
iaea_atlanta@srmun.org

Michael Englehardt and John Griffin
Assistant Directors
iaea_atlanta@srmun.org

Ryan Baerwalde
Deputy Director-General
ddg_atlanta_security@srmun.org

History of the International Atomic Energy Agency

The International Atomic Energy Agency (IAEA) is an autonomous organization consisting of 168 Member States.[1] The foundation of the IAEA dates back to a speech by United States President Dwight Eisenhower in 1953.[2] In the speech, he called for the creation of an atomic energy agency, "…to devise methods whereby fissionable material would be allocated to serve the peaceful pursuits of mankind."[3] On 23 October 1956, the Statute of the IAEA was approved by the Conference of the Statute of the International Atomic Energy Agency held at United Nations (UN) headquarters in New York City.[4] On 29 July 1957, the IAEA was officially created when the United States ratified the statute.[5] Though created independently of the United Nations, the IAEA does report to the UN Security Council and the UN General Assembly. In fact, an agreement signed by both parties in 1957 intertwines the mission of the IAEA and the UN.[6] The agreement states that, "the agency undertakes to conduct its activities in accordance with the purposes and principles of the United Nations charter . . . and in accordance with policies of the United Nations."[7]

The IAEA has a vision and mission that calls for the organization to serve as an environment where increased global partnership in the field of atomic energy can occur. The vision is "to be the world's center of cooperation in the nuclear field," and its mission is, "to accelerate and enlarge the contribution of atomic energy to peace, health, and prosperity throughout the world."[8] The IAEA's main office is located in Vienna, Austria. The agency also operates four regional offices located in Geneva, Switzerland; New York, United States; Toronto, Canada; and Tokyo, Japan.[9] There are also three laboratories run by the IAEA located in Seibersdorf, Austria; Trieste, Italy; and Monaco.[10] The largest location is in Seibersdorf, where the IAEA maintains eight nuclear applications laboratories, five of which are jointly run with the UN's Food and Agriculture Organization.[11]

The IAEA consists of two main policy making bodies, the Board of Governors and the General Conference. The Board of Governors is made up of 35 Member States whose membership varies from year to year. The Board is responsible for making recommendations to the General Conference regarding programming and budgets and also considers applications for new members, approves publication of new safety standards. The Board meets five times per year.[12] The IAEA's General Conference meets once a year and consists of all Member States along with invited non-Member States and international organizations. At the General Conference, the delegations meet to approve the IAEA budget and to debate and decide issues brought by the Board of Governors, the Director General, or Member States.[13] Additionally, the IAEA has a Secretariat, which consists of a Director-General and six Deputy Directors General who head major departments.[14] The Director-General is chosen by the Board of Governors and approved by the General Conference to serve renewable four-year terms. The current Director General is Yukiya Amano of Japan who was chosen in 2009.[15] The Director General of the IAEA also serves as a member of the UN Chief Executive

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[1] "List of Member States," Governance, International Atomic Energy Agency (IAEA), https://www.iaea.org/about/governance/list-of-member-states (accessed May 16, 2017)
[2] "Atoms for Peace Speech," History, IAEA, https://www.iaea.org/about/history/atoms-for-peace-speech (accessed May 16, 2017)
[3] Ibid.
[4] "Statute," Overview, IAEA, https://www.iaea.org/about/overview/statute (accessed May 16, 2017)
[5] "History," Overview, IAEA, https://www.iaea.org/about/overview/history (accessed May 16, 2017)
[6] "Relationship with the United Nations," IAEA, https://www.iaea.org/technicalcooperation/Partnerships/Relation-UN/index.html (accessed May 16, 2017)
[7] Ibid.
[8] "Know your Vision and Mission," IAEA, https://www.iaea.org/nuccomtoolbox/knowwtsay/know07.html (accessed May 16, 2017)
[9] "The International Atomic Energy Agency: Fact Sheet," UN, http://www.un.org/en/conf/npt/2015/pdf/IAEA%20factsheet.pdf (accessed May 17, 2017)
[10] "IAEA Offices and Contact Information," IAEA, https://www.iaea.org/contact, (accessed May 17, 2017)
[11] "Seibersdorf Laboratories," Organizational Structure, IAEA, https://www.iaea.org/about/organizational-structure/department-of-nuclear-sciences-and-applications/seibersdorf-laboratories (accessed May 17, 2017)
[12] "Board of Governors," Governance, IAEA, https://www.iaea.org/node/16962 (accessed May 17, 2017)
[13] "General Conference," Governance, IAEA, https://www.iaea.org/about/governance/general-conference (accessed May 17, 2017)
[14] "IAEA Management Team," IAEA, https://www.iaea.org/about/leadership (accessed May 17, 2017)
[15] "Director General," Management Team, IAEA, https://www.iaea.org/about/management-team/director-general (accessed May 17, 2017)

Board and participates in meetings chaired by the Secretary General.[16]

While the IAEA's budget is fully funded by Member States, it is separated into two main areas: the regular program and the Technical Cooperation Fund (TCF). In 2016, the regular budget made up 71 percent of the entire Agency and is usually divided into six major programs, in accordance with the structure of the Agency's current work program.[17] The agency's TCF is made up of voluntary contributions from Member States. This Fund is used to finance programs that were submitted to the Board of Governors without funds being immediately available.[18] The IAEA may also occasionally ask Member States for additional contributions when the need arises, such as in 2015, when the Director-General requested an additional $10 million dollars to assist in the implementation and monitoring of the Joint Comprehensive Plan of Action addressing Iran's nuclear program.[19]

IAEA has three main pillars that underpin everything the agency does. These are: safety and security, science and technology, and safeguards and verifications.[20] In 2012, the IAEA Department of Safeguards unveiled a long-term strategy, using these pillars that were designed to help guide the IAEA's actions over the next decade until 2023. The strategy identified three main over-arching objectives for the next decade: deterring the proliferation of nuclear weapons, contribute to nuclear arms control and disarmament, and continually improve and optimize departmental operations and capabilities.[21] To achieve these, the agency has been dedicated to further develop the state-level concept, develop and implement customized state-level safeguards, and to make safeguards implementation more objectives-based and information-driven.[22]

One of the IAEA's most important roles is the verification of Member States' upholding of the Nuclear Non-Proliferation Treaty (NPT). Though not a party to the treaty, the IAEA serves a specific role as international safeguards inspectorate.[23] Article III of the NPT states that "each non-nuclear weapon state party undertakes to accept safeguards set forth in an agreement concluded with the IAEA in accordance with the Statute of the IAEA."[24] Therefore, non-nuclear weapons states that are a party to the NPT must conclude an agreement with the IAEA, even if the state is not an IAEA member, to enable the IAEA to verify the state's fulfillment of obligations under the treaty.[25] Under the treaty, the IAEA also facilitates the technology for peaceful applications of nuclear power to Member States.[26]

Currently, the IAEA has organized a variety of conferences for 2017 related to safety taking place in Vienna, Austria and Lyon, France.[27] In addition, the 2017 Preparatory Committee for the 2020 NPT treaty Review Conference will kick-off and the United Arab Emirates will host a large conference focusing on nuclear power in the

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[16] "Relationship with the United Nations," IAEA, https://www.iaea.org/technicalcooperation/Partnerships/Relation-UN/index.html (accessed May 17, 2017)
[17] "Budget," Overview, IAEA, https://www.iaea.org/about/overview/budget (accessed May 17, 2017)
[18] "Technical Cooperation: Funding the Program," IAEA, https://www.iaea.org/technicalcooperation/programme/Funding/index.html (accessed May 17, 2017)
[19] "UN Watchdog: We Need More Money to Monitor Iran Nuclear Deal," CNN, published August 25, 2015, http://www.cnn.com/2015/08/25/world/iaea-iran-nuclear-deal/ (accessed May 17, 2017)
[20] "Know your Vision and Mission," IAEA, https://www.iaea.org/nuccomtoolbox/knowwtsay/know07.html (accessed May 16, 2017)
[21] "Department of Safeguards: Long Term Strategic Plan (2012-2023) Summary, IAEA, https://www.iaea.org/safeguards/symposium/2014/images/pdfs/LongTerm_Strategic_Plan_(20122023)-Summary.pdf (accessed May 18, 2017)
[22] Ibid.
[23] "The International Atomic Energy Agency: Fact Sheet," UN, http://www.un.org/en/conf/npt/2015/pdf/IAEA%20factsheet.pdf (accessed May 17, 2017)
[24] "Information Circular: Treaty on the Non-Proliferation of Nuclear Weapons," IAEA, https://www.iaea.org/sites/default/files/publications/documents/infcircs/1970/infcirc140.pdf (accessed May 17, 2017)
[25] "Non-Proliferation Treaty," Safeguards, IAEA, https://www.iaea.org/safeguards/safeguards-legal-framework/non-proliferation-treaty (accessed May 17, 2017)
[26] Ibid.
[27] "IAEA Meetings in 2017: Conferences and Symposia," IAEA, http://www-pub.iaea.org/iaeameetings/ (accessed May 18, 2017)

21st century.[2829] The 61st IAEA General Conference will be held from 18-22 September 2017 in Vienna, Austria.[30]

The following IAEA Member States are represented at SRMUN Atlanta 2017:

AFGHANISTAN, ALBANIA, ALGERIA, ARGENTINA, AUSTRALIA, BANGLADESH, BELARUS, BELGIUM, BOLIVIA, BOSNIA & HERZEGOVINA, BOTSWANA, BRAZIL, BULGARIA, BURKINA FASO, BURUNDI, CAMBODIA, CAMEROON, CANADA, CHILE, CHINA, COLOMBIA, COSTA RICA, COTE D'IVOIRE, CROATIA, CUBA, CZECH REPUBLIC, DEMOCRATIC REPUBLIC OF THE CONGO, DENMARK, ECUADOR, EGYPT, EL SALVADOR, ERITREA, ETHIOPIA, FRANCE, GEORGIA, GERMANY, GHANA, GREECE, GUATEMALA, GUYANA, HOLY SEE, HUNGARY, ICELAND, INDIA, INDONESIA, IRAN, IRAQ, ISRAEL, ITALY, JAPAN, KAZAKHSTAN, KENYA, KUWAIT, KYRGYZSTAN, LAOS, LATVIA, LEBANON, LESOTHO, LIBERIA, LITHUANIA, LUXEMBOURG, MALAWI, MEXICO, MONGOLIA, MOROCCO, NEPAL, NETHERLANDS, NIGERIA, NORWAY, PAKISTAN, PALAU, PANAMA, PARAGUAY, PHILIPPINES, POLAND, PORTUGAL, QATAR, REPUBLIC OF KOREA, RUSSIAN FEDERATION, RWANDA, SAUDI ARABIA, SENEGAL, SEYCHELLES, SLOVENIA, SOUTH AFRICA, , SPAIN, SWEDEN, SWITERLAND, TAJIKISTAN, THAILAND, TOGO, TRINIDAD & TOBAGO, TUNISIA, TURKEY, UGANDA, UKRAINE, UNITED ARAB EMIRATES, UNITED KINGDOM, UNITED REPUBLIC OF TANZANIA, UNITED STATES OF AMERICA, URUGUAY, VENEZUELA, VIETNAM.

[28] "2017 Preparatory Committee for the 2020 Nuclear Non-Proliferation Treaty Review Conference," United Nations Office for Disarmament Affairs, https://www.un.org/disarmament/wmd/nuclear/npt2020/prepcom2017/ (accessed May 17, 2017)
[29] "Nuclear Power in the 21st Century – International Ministerial Conference," IAEA, https://www.iaea.org/events/nuclear-power-conference-2017/host-government (accessed May 17, 2017)
[30] "61st IAEA General Conference," IAEA, https://www.iaea.org/about/policy/gc/gc61 (accessed May 17, 2017)

I. Enhancing Safety and Security Standards at Nuclear Power Facilities

"The Agency is authorized to establish or adopt, in consultation and collaboration with the competent organs of the United Nations, standards of safety for protection of health and minimization of danger to life and property."
-Article III, Section A of the International Atomic Energy Agency (IAEA) Statute approved 23 October 1956 in Vienna, Austria[31]

Introduction

Since the creation of the IAEA over sixty years ago, safety and security has been at the forefront of the agency's mission. Today, the safety and security of nuclear power facilities are paramount in the face of threats from terrorism[32], cybercrime[33], and, as seen as recently in 2011 in Fukushima, Japan, the environment.[34] In the 2016-2017 budget, the Agency has committed to spending nearly 20% of their regular budget, approximately USD 82.8 million, toward safety and security programs.[35] This underscores the level of importance of how the safety and security of the world's nuclear power plants will continue to be a key strategic mission for the IAEA for many years to come.

History

Article III of the IAEA Statute authorizes the Agency to establish safety standards for nuclear plants, nuclear materials, and the application of these standards toward Member States.[36] Safety standards and measures established by the Agency are issued through the IAEA Safety Standards Series, which covers areas like nuclear safety, radiation safety, transport safety, and waste safety.[37] This Series has produced over 250 documents in its history, covering every stage of the nuclear process from transport and disposing of fissionable materials to the construction and decommissioning of nuclear power plants.[38] However, IAEA safety standards are not legally binding and may be adopted at the discretion of Member States.[39] The only exception to this are facilities operated by Member States with assistance from the IAEA.[40]

In the mid 1990's an overhaul of the IAEA safety standards was initiated, which addressed two major strategies. First, it focused on developing new standards to protect against global terrorism.[41] Second, it focused on revising the structure of the oversight committee and updating the entire agency's standards.[42] As part of protecting against non-state actors, the IAEA developed a threat assessment process known as Design Basis Threat (DBT).[43] Officially, the DBT is a "description of the attributes and characteristics of potential insider or external adversaries who might

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[31] "Statute," Overview, IAEA, https://www.iaea.org/about/overview/statute (accessed May 24, 2017)
[32] "Science and Technology to Counter Terrorism: Proceedings of an Indo-U.S. Workshop. Chapter 7: Threats to Civil Nuclear Facilities," The National Academies of Sciences, https://www.nap.edu/read/11848/chapter/8#62 (accessed March 24, 2017)
[33] "IAEA Chief: Nuclear Power Plant was Disrupted by Cyber Attack," by Andrea Shalal, Reuters, published 10 October 2016, http://www.reuters.com/article/us-nuclear-cyber-idUSKCN12A1OC (accessed March 24, 2017)
[34] "IAEA Releases Director General's Report on Fukushima Daichii Accident," by Miklos Gaspar, IAEA, published 31 August 2015, https://www.iaea.org/newscenter/news/iaea-releases-director-generals-report-on-fukushima-daiichi-accident (accessed March 24, 2017)
[35] "The Agency's Programme and Budget 2016-2017," IAEA, https://www.iaea.org/About/Policy/GC/GC59/GC59Documents/English/gc59-2_en.pdf (accessed March 24, 2017)
[36] "Statute," Overview, IAEA, https://www.iaea.org/about/overview/statute (accessed May 22, 2017)
[37] https://www.iaea.org/ns/tutorials/regcontrol/refs/4safeoperat.pdf
[38] "Safety Standards Series," IAEA, http://www-pub.iaea.org/books/IAEABooks/Series/33/Safety-Standards-Series (accessed May 24, 2017)
[39] "IAEA Safety Standards Series: Safety of Nuclear Power Plants: Operation," IAEA, https://www.iaea.org/ns/tutorials/regcontrol/refs/4safeoperat.pdf (accessed May 25, 2017)
[40] Ibid.
[41] "Nuclear Terrorism: Threats, Risks, and Vulnerabilities," IAEA, http://www-ns.iaea.org/security/threats.asp?s=4 (accessed June 18, 2017)
[42] "IAEA Safety Standards: Fundamental Safety Principles," IAEA, http://www-pub.iaea.org/MTCD/publications/PDF/Pub1273_web.pdf (accessed May 25, 2017)
[43] "Design Basis Threat," IAEA, http://www-ns.iaea.org/security/dbt.asp?s=4 (June 18, 2017)

attempt unauthorized removal of nuclear material or sabotage against a physical protection system."[44] The DBT works to outline which characteristics nuclear site operators and state organizations have responsibility for protecting.[45] Member States typically use DBTs in their regulation systems to appropriately allocate resources to protect nuclear material and nuclear facilities against malicious and/or terroristic acts. Besides outlining responsibilities between operators and the states, a DBT can be used to establish performance objectives and to specify design criteria of protection systems.[46]

To accomplish the second goal of increasing acceptance of their standards by Member States, the IAEA assisted in creating the Arab Network of Nuclear Regulators (ANNuR) in 2010.[47] This Network brings together 22 Arab States for the purpose of enhancing and harmonizing the regulatory infrastructure across the region.[48] In addition, the IAEA and the Forum for Nuclear Regulatory Bodies in Africa (FNRBA) signed an agreement in 2013 to increase cooperation between the two bodies.[49] The objective of the Practical Arrangement is to not only create a framework for increased cooperation, but also to strengthen safety and security standards in Member States that belong to both organizations.[50]

New Global Network Initiative

One of the methods of encouraging international cooperation is through networks, such as the launching of the Global Nuclear Safety and Security Network (GNSSN) in 2014.[51] Over 100 participants from Member States and participating networks attended the plenary meeting of the GNSSN held on the sidelines of the 58th IAEA General Conference.[52] The main goal behind the GNSSN is increasing cooperation and dialogue in the fields of nuclear safety and security amongst Member States. Through this Program, the IAEA is supporting the transfer of knowledge from Member States with more advanced energy programs to those with less experience in the field.[53] In addition, the GNSSN allows Member States to more easily access and connect with specific areas of the IAEA, including the Emergency Preparedness and Response Network, the National Security Information Portal, and the Technical and Scientific Support Organization Forum.[54]

Within the GNSSN system, the IAEA has worked to establish regional networks by recognizing that Member States in the same region face similar challenges and can collaborate to find common solutions.[55] In 2015, 20 IAEA Member States and 22 organizations responsible for nuclear safety from both Europe and Asia came together to create the European and Central Asian Safety Network (EuCAS).[56] The initial vision of the Network is to focus on

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[44] "The Physical Protection of Nuclear Materials: INFCIRC/225/Rev.4" IAEA, published 1 May 1999, https://www.iaea.org/sites/default/files/infcirc225r4c.pdf (accessed June 18, 2017)

[45] "Design Basis Threat," IAEA, http://www-ns.iaea.org/security/dbt.asp?s=4 (accessed June 18, 2017)

[46] "Development, Use and Maintenance of the Design Basic Threat," 2009, IAEA, http://www-pub.iaea.org/MTCD/publications/PDF/Pub1386_web.pdf (accessed August 1, 2017)

[47] "Strengthening Arab Network of Nuclear Regulators," by: Ruth Morgart, IAEA, https://www.iaea.org/newscenter/news/strengthening-arab-network-nuclear-regulators (accessed May 24, 2017)

[48] Ibid.

[49] "Strengthening Nuclear Safety in Africa," IAEA, https://www.iaea.org/newscenter/news/strengthening-nuclear-safety-africa (accessed May 24, 2017)

[50] "Practical Arrangements between the International Atomic Energy Agency and the Forum of Nuclear Regulatory Bodies in Africa on Cooperation in the Area of Strengthening Nuclear Safety and Security," published 17 September 2013, IAEA, https://gnssn.iaea.org/demo/FNRBA/Documents/2013/FNRBA-MOU%20with%20IAEA%20DNS.pdf. (accessed August 20, 2017)

[51] "Connecting, Collaborating, and Communicating Globally on Nuclear Safety and Security," by Rodolfo Quevenco, IAEA, https://www.iaea.org/newscenter/news/connecting-collaborating-and-communicating-globally-nuclear-safety-and-security (accessed May 24, 2017)

[52] Ibid.

[53] "Global Nuclear Safety and Security Network," IAEA, https://www.iaea.org/services/networks/global-nuclear-safety-and-security-network (accessed May 24, 2017)

[54] "GNSSN Video, published on 2 February 2015, IAEA, https://www.youtube.com/watch?v=xf8NM-kqbpc (accessed May 24, 2017)

[55] Ibid.

[56] "New Network to Strengthen Nuclear and Radiation Safety in Europe and Central Asia," by May Fawaz-Huber, IAEA, https://www.iaea.org/newscenter/news/new-network-to-strengthen-nuclear-and-radiation-safety-in-europe-and-central-asia (accessed May 24, 2017)

the management of radioactive waste resulting from power plants and to share practical experience between Member States on the classification, storage, and disposal of such waste.[57] EuCAS will work to use the long history and experience of nuclear power Member States in Western and Central Europe to provide assistance to Member States in the region currently developing the technology. The Organization aims to raise radiation safety infrastructure to IAEA international standards throughout the entire region by utilizing the open exchange of information, the coordination of development activities, and the building of common principles and approaches. To assist with this, EuCAS has organized a three-week workshop in late October 2017 to focus on regulatory supervision of legacy sites.[58]

Besides EuCAS, ANNuR, and FNRBA mentioned above, the GNSSN system also includes regional networks in Asia, Western Europe, and Spanish-speaking States. The Member States of the Asian Nuclear Safety Network (ANSN) have all agreed to implement knowledge platforms within the GNSSN platform.[59] In Europe, the Western European Nuclear Regulatory Association was founded in 1999 and works for nuclear safety within the European Union.[60] Finally, the IAEA has had a partnership with the Ibero-American Radiological and Nuclear Regulators for nearly 20 years.[61]

Along with the regional networks, the IAEA built a new website for GNSSN to allow the free exchange of ideas between Member States. On the website, Member States can log into a dedicated area and explore National Nuclear Regulatory Portals (NNRPs). The NNRPs serve as web-based indexes developed on a voluntary basis by Member States to share their national nuclear safety and security information securely and quickly with fellow members.[62] The NNRPs also include a brief national profile and a list of nuclear safety regulations developed by individual Member States.[63] At its core, the GNSSN is a human network operating at a global, regional, and a national level throughout the 168 Member States of the IAEA.[64]

Limitations/Failures

As with any intergovernmental agency, the IAEA is continually tasked with doing more work for the same amount of money which limits its productivity and reach. A 2012 report from the United States Department of Energy found that the Agency's budget would need to grow five percent per year just to maintain the status quo.[65] The Agency is responsible for overseeing the safety of over 440 nuclear reactors around the world, monitoring Member States' activities in relation to possible production of nuclear weapons, and, indirectly, enforcing the Nuclear Non-Proliferation Treaty (NPT).[66] The U.S. Department of Energy Report further looked into alternative funding schemes for the IAEA and concluded that the creation of an endowment would be the most effective way forward. However, there are many questions as to what form that endowment would take.[67]

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[57] Ibid.
[58] "European and Central Asian Safety Network (EuCAS)", IAEA, https://gnssn.iaea.org/main/EuCAS/Pages/default.aspx (accessed August 1, 2017)
[59] "Asian National Security Network", ANSN, https://ansn.iaea.org/ (accessed May 25, 2017)
[60] "About Us: WENRA's Mission", Western European Nuclear Regulators Association, http://www.wenra.org/about-us/ (accessed May 25, 2017)
[61] "IAEA and Ibero-American Radiological and Nuclear Regulators Hail 15-year Partnership," by Susanna Loof, IAEA, https://www.iaea.org/newscenter/news/iaea-and-ibero-american-radiological-and-nuclear-regulators-hail-15-year-partnership (accessed May 24, 2017)
[62] GNSSN Video, published on 2 February 2015, IAEA, https://www.youtube.com/watch?v=xf8NM-kqbpc (accessed May 24, 2017)
[63] "National Nuclear Regulatory Portal", IAEA, https://gnssn.iaea.org/regnet/Pages/NNRP.aspx (accessed May 25, 2017)
[64] "GNSSN: Main Page," IAEA, https://gnssn.iaea.org/main/pages/default.aspx (accessed May 25, 2017)
[65] "Alternate Funding Sources for the IAEA", September 2012, U.S. Department of Energy, http://www.pnnl.gov/main/publications/external/technical_reports/PNNL-21735.pdf (accessed August 1, 2017)
[66] "Nuclear Safety, Nuclear Security: Whiter the IAEA?" by Richard Weitz, World Affairs, November/December 2011, http://www.worldaffairsjournal.org/article/nuclear-safety-nuclear-security-whither-iaea (accessed June 18, 2017)
[67] "Alternate Funding Sources for the IAEA", September 2012, U.S. Department of Energy, http://www.pnnl.gov/main/publications/external/technical_reports/PNNL-21735.pdf (accessed August 1, 2017)

The limitations of the IAEA have been seen when monitors failed to detect clandestine uranium enrichment programs in Libya under Muammar Gaddafi and in Iraq under Saddam Hussein in the 1990s.[68] A recent example was the IAEA's difficulty with monitors in the Democratic People's Republic of Korea. In this situation, the monitors were asked to leave the Nation's nuclear plants in 2002, were subsequently invited back in, and dismissed again in 2009.[69] The IAEA has also experienced difficulties enforcing the NPT with regards to Iran and Syria. In 2002, the Vice-President of the Islamic Republic of Iran, H.E. Reza Aghazadeh, announced at the 46th General Conference of the IAEA that Iran was planning to construct nuclear power plants for technological advancement.[70] However, it was reported in 2002 that Iran was building a nuclear facility capable of enriching and weaponizing Uranium.[71] After this came to light, sanctions were imposed on Iran for violating the NPT.[72] IAEA has had difficulties negotiating and monitoring Iran's nuclear development until 2013, when the IAEA and Iran signed the Joint Statement on a Framework for Cooperation.[73] This Framework was a first step to increased cooperation between IAEA and Iran with regard to verification activities and relies on "mutually agreed relevant information and managed access."[74] Nevertheless, less than a year later, the IAEA reported limitations in executing the agreed measures.[75] Additionally, the aforementioned sanctions began to be lifted once a nuclear deal began negotiations in 2016.[76] The IAEA and Iran continue to work toward agreeing on nuclear verification and monitoring efforts. In a statement delivered by IAEA Director General Yukiya Amano at the Board of Governors meeting in 2017, Director General Amano stated that the IAEA was working with the Iranian government to implement nuclear verification and monitoring commitments under the Joint Comprehensive Plan of Action (JCPOA).[77] In addition to Iran, nuclear activity in Syria has also caused limitation with implementing nuclear safety standards. The IAEA became aware of nuclear reactors in Syria after it was destructed in 2007.[78] Syria denied the building to be a nuclear reactor, and the continued unrest in Syria makes nuclear verification nearly impossible.[79] As of 2017, Syria still has not agreed to cooperate with the NPT Safeguards Agreement.[80]

The IAEA nuclear safeguards, such as the NPT and the Additional Protocol, depend on Member States agreeing and complying with the verification and monitoring efforts of the IAEA.[81] The Additional Protocol is "not a stand-alone

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[68] "Nuclear Safety, Nuclear Security: Whiter the IAEA?" by Richard Weitz, World Affairs, November/December 2011, http://www.worldaffairsjournal.org/article/nuclear-safety-nuclear-security-whither-iaea (accessed June 18, 2017)

[69] "IAEA and DPRK: Chronology of Key Events," IAEA, https://www.iaea.org/newscenter/focus/dprk/chronology-of-key-events (accessed June 18, 2017)

[70] "Statement by H.E. Reza Aghazadeh Vice President of the Islamic Republic of Iran and President of the Atomic Energy Organization of Iran at the 46th General Conference of the International Atomic Energy Agency," published on 26 September 2002, IAEA, https://www.iaea.org/sites/default/files/16/08/aghazadeh160902.pdf. p. 3 (accessed August 21, 2017).

[71] "Challenges in Nuclear Verification: The IAEA's Role on the Iranian Nuclear Issue," published 31 October 2014, IAEA, https://www.iaea.org/newscenter/statements/challenges-nuclear-verification-iaea's-role-iranian-nuclear-issue (accessed August 21, 2017)

[72] "Iran," Nuclear Threat Initiative, http://www.nti.org/learn/countries/iran/. (accessed August 21, 2017)

[73] "IAEA, Iran Sign Joint Statement on Framework for Cooperation," published on 11 November 2013, IAEA, https://www.iaea.org/newscenter/pressreleases/iaea-iran-sign-joint-statement-framework-cooperation. (accessed August 21, 2017)

[74] Ibid.

[75] "Challenges in Nuclear Verification: The IAEA's Role on the Iranian Nuclear Issue," published 31 October 2014, IAEA, https://www.iaea.org/newscenter/statements/challenges-nuclear-verification-iaea's-role-iranian-nuclear-issue. (accessed August 21, 2017)

[76] Ibid.

[77] "IAEA Director General's Introductory Statement to the Board of Governors," published 12 June 2017, IAEA, https://www.iaea.org/newscenter/statements/introductory-statement-to-the-board-of-governors-12-june-2017. (accessed August 21, 2017)

[78] "Meeting Safeguards Challenges," published 3 December 2013, IAEA, https://www.iaea.org/newscenter/statements/meeting-safeguards-challenges. (accessed August 21, 2017)

[79] Ibid.

[80] "IAEA Director General's Introductory Statement to the Board of Governors," published 12 June 2017, IAEA, https://www.iaea.org/newscenter/statements/introductory-statement-to-the-board-of-governors-12-june-2017. (accessed August 21, 2017)

[81] "Safeguards to Prevent Nuclear Proliferation: Limitations of Safeguards," published March 2017, World Nuclear Association, http://www.world-nuclear.org/information-library/safety-and-security/non-proliferation/safeguards-to-prevent-nuclear-proliferation.aspx. (accessed on August 21, 2017)

agreement, but rather safeguards that provides additional instruments for verification."[82] The Additional Protocol was approved by the IAEA Board of Governors in May of 1997, with the intention of utilizing it as a model for all other safeguard agreements.[83] The Additional Protocol works to strengthen the measures the IAEA uses to verify and monitor nuclear activity.[84] These new measures work to enhance the safety standards of the IAEA; however, the success of the Additional Protocol depends on Member State enforcement. As of May 19, 2017, eighteen Member States of the NPT have not enforced an Additional Protocol.[85] Without complete support by all Member States, IAEA efforts to increase safety standards suffer.

Former IAEA Director-General, Mohamed El Baradei has said the Agency enjoys "uneven authority."[86] As with most UN agencies, the IAEA's role is to monitor and inform. The decision on what to do with that information will, and must, always remain with individual Member States. Thus, the goal of the IAEA's global cooperation initiative is utilizing the collective power of Member States to reduce these difficult relationships and minimize the uneven authority that currently exists.

Conclusion

As the Director-General of the IAEA has said, "countries must be able to transfer education and training capacity together with the technology they provide."[87] The goal of the GNSSN is to facilitate and encourage that transfer. Raoul Awad, the Chairman of the GNSSN, has put it another way: "an accident anywhere is an accident everywhere."[88] The safety and security of nuclear power facilities has been at the forefront of the IAEA's mission since its creation and it continues to be a major part of the Agency's focus today. The global community must continue to work together to address challenges facing nuclear power plants from criminal, cyber, and environmental threats. This Body must be proactive in answering difficult questions that will shape how the world looks at the nuclear security issue for decades to come.

Committee Directive

When researching, the delegates should consider the following questions. What should be done to address both natural and human threats facing nuclear power facilities? How should these new standards be equally implemented across facilities and across Member States, especially those with limited resources? To what extent should the IAEA be responsible for funding safety standards at sites in individual Member States and how should that funding be guaranteed? How should the IAEA address Member States' noncompliance with safeguards? What steps should be taken to enforce IAEA verification and monitoring processes? What changes should be implemented to ensure that the shortcomings of the situation in DPRK, Iran, or Syria are not repeated? In what capacity should the IAEA and other Member States work to ensure nuclear safety in DPRK? In Syria? How can the IAEA strengthen cooperation amongst Member States on topics of nuclear safety and security?

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[82] "Additional Protocol," IAEA, https://www.iaea.org/topics/additional-protocol. (accessed August 21, 2017)
[83] Ibid.
[84] "Strengthening Measures," IAEA, https://www.iaea.org/topics/additional-protocol/strengthening-measures (accessed August 21, 2017)
[85] "Status of the Additional Protocol," IAEA, https://www.iaea.org/topics/additional-protocol/status. (accessed August 21, 2017)
[86] "IAEA Profile," BBC News, updated: 15 February 2012, http://news.bbc.co.uk/2/hi/europe/country_profiles/2642835.stm#issues (accessed June 18, 2017)
[87] "GNSSN: Main Page," IAEA, https://gnssn.iaea.org/main/pages/default.aspx (accessed May 25, 2017)
[88] GNSSN Video, published on 2 February 2015, IAEA, https://www.youtube.com/watch?v=xf8NM-kqbpc (accessed May 24, 2017)

II. Developing Solutions and Promoting Cooperation for the Disposal of Nuclear Waste

Introduction

Nuclear energy is no longer the energy source of the future; nuclear energy is the present. According to the World Nuclear Association, nuclear power supplies 11.5 percent of the world's electricity.[89] Thirty-one Member States hold over 440 commercial nuclear power reactors, fifty-five Member States have a combined total of 245 research reactors, and there are currently sixty reactors under construction.[90] The growing reliance on nuclear power provides a carbon dioxide emissions free energy source, which helps the global community get one step closer to completing Sustainable Development Goal (SDG) Number 7 "Affordable and Clean Energy" and SDG Number 13 "Climate Action."[91] However, nuclear power produces radioactive waste, and improper disposal of radioactive waste threatens the well-being of all living organisms. With several proven methods for disposal of radioactive waste, global cooperation in implementing such methods will ensure safety from the harm caused by exposure to nuclear waste.

Definition of Disposal

Proper disposal of radioactive waste is defined in the *IAEA Safety Glossary* as "emplacement of [radioactive] *waste* in an appropriate *facility* without the intent of retrieval. In some States, the term *disposal* is used to include *discharges* of effluents to the *environment*."[92] It is important to note for discussion on this topic that disposal differs from storage. Storage refers to temporary containment with the intent of later retrieving the waste.[93] The difference emphasized between disposal and storage is the intent to retrieve nuclear waste. Disposal "implies that retrieval is not intended and would require deliberate action to regain access to the waste; it does not mean that retrieval is not possible."[94] Although the proper storage of radioactive waste is essential to ensuring nuclear energy safety, this topic focuses on the growing need to evaluate the disposal of nuclear waste.

Disposal Methods

Since disposal means no intent of retrieval of waste, proper disposal must meet certain criteria to be sufficient. Disposal must ensure that little to no radioactivity from the waste is released into the biosphere by isolating, containing, and delaying the radionuclides form the waste.[95] According to the *2011 Safety Standards for Disposal of Radioactive Waste*, the IAEA recognizes six types of nuclear waste disposal.[96] These disposal methods include: specific landfill disposal, near-surface disposal, disposal in caverns, vaults or silos between a few tens and a few hundred meters below ground level, geological disposal, and borehole disposal.[97] Each type of disposal corresponds to a specific classification of nuclear waste. Typically, nuclear waste is classified into one of three main categories, which include low-level waste (LLW), intermediate-level waste (ILW), and high-level waste (HLW).[98] LLW is waste that makes up only one percent radioactive content, yet it comprises ninety percent of all radioactive waste.[99] Generally, LLW includes items such as tool or clothes used in nuclear power plants. [100] ILW is nuclear waste that contains four percent of the radioactivity from power plants.[101] ILW items include filters, steel from inside reactors,

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[89] World Nuclear Association. "Nuclear Power in the World Today," January 2017. http://www.world-nuclear.org/information-library/current-and-future-generation/nuclear-power-in-the-world-today.aspx, (accessed June 1, 2017)
[90] Ibid.
[91] "Sustainable Development Goals," United Nations, 2016. https://sustainabledevelopment.un.org/sdgs. (accessed June 1, 2017)
[92] IAEA. IAEA Safety Glossary, 2016. https://www-ns.iaea.org/downloads/standards/glossary/iaea-safety-glossary-draft-2016.pdf. (accessed June 3, 2017)
[93] Ibid.
[94] Ibid.
[95] Juhani Vira, "Concepts developed for disposal of HLW and/or SNF," Posiva Oy, 2014. http://www-pub.iaea.org/MTCD/Meetings/PDFplus/2014/cn219/Presentations/17JVira.pdf. (accessed June 3, 2017).
[96] IAEA Safety Standards Disposal of Radioactive Waste. IAEA, 2011 http://www-pub.iaea.org/MTCD/publications/PDF/Pub1449_web.pdf, p. 4-5 (accessed June 4, 2017)
[97] Ibid.
[98] World Nuclear Association. "What are Nuclear Wastes and How are they Managed?" 2016. http://www.world-nuclear.org/nuclear-basics/what-are-nuclear-wastes.aspx. (accessed June 4, 2017)
[99] Ibid.
[100] Ibid.
[101] Ibid.

and some liquid waste.[102] Typically, LLW and ILW can be disposed of with landfill or near-surface disposal.[103] Despite having low levels of radioactivity, LLW and ILW still need proper disposal. Near-surface disposal remains a popular method of depositing LLW and ILW. Near surface disposal includes "emplacement of solid radioactive waste in earthen trenches, above ground engineered structures, engineered structures just below the ground surface and rock caverns, silos, and tunnels excavated at depths of up to a few tens of meters underground."[104] These near-surface disposal sites are monitored by the national government, an appointed, independent regulatory body, and the disposal facility operator.[105] The job of the facility and monitoring groups is to ensure proper containment and isolation. The IAEA outlined the requirements and guidelines for new and existing disposal sites in the 2014 *IAEA Safety Standards: Near Surface Disposal Facilities for Radioactive Waste.*[106]

Although HLW makes up only three percent of the total nuclear waste, it contains ninety-five percent of all radioactivity.[107] HLW is the byproduct of generated nuclear power, and it must be permanently isolated to prevent risking serious nonreversible environmental effects.[108] To prevent such environmental damage, HLW must be stored deep below ground. Therefore, the remaining methods of disposal primarily focus on containing HLW. Geological disposal requires the encapsulation of HLW or spent fuel in canisters with very long half-lives, which will be buried deep underground with multi-barriers to prevent leeks or erosion.[109] Geological disposal seems to be an efficient and effective method of disposing HLW. However, there are currently no geological disposal sites for HLW or spent fuel yet.[110] Several Member States, including the United States of America (USA), Finland, Sweden, France, Canada, Switzerland, and Japan, have plans to open geological repositories. However, none of these proposed repositories are scheduled to open until at least 2020.[111] Although Finland, Sweden, and the USA have applied for licensing to design geological repositories for the disposal of HLW and spent fuel, the licensing process is still ongoing.[112] Additionally, understanding the effectiveness of these facilities comes from extensive research; most research has been carried out by underground research laboratories (URLs).[113] In conjunction with the IAEA Network of Centres of Excellence, URLs in Belgium, Canada, Switzerland, Sweden, USA, and the United Kingdom (UK) have been able to share their research and information with other Member States.[114] The information sharing allows for greater international cooperation to establishing and managing geological disposal repositories. Nevertheless, there are few URLs due to the expensive of operating the research laboratories.[115]

Another option for HLW disposal is borehole disposal.[116] Currently, disposing of radioactive waste with borehole disposal "entails the emplacement of disused sealed radioactive sources and small volumes of low and intermediate level wastes in an engineered facility bored or drilled and operated directly from the surface."[117] Borehole disposal is when nuclear waste is packed and placed into a hole in the ground that has been drilled to a depth of up to a few hundred meters. Borehole disposal currently only applies to LLW and ILW.[118] However, deep borehole disposal

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[102] Ibid.
[103] IAEA, Disposal of Radioactive Waste, 2011. (accessed June 10, 2017)
[104] IAEA Safety Standards: Near Surface Disposal Facilities for Radioactive Waste," IAEA, 2014. http://www-pub.iaea.org/MTCD/publications/PDF/Pub1637_web.pdf. (accessed June 10, 2017)
[105] Ibid.
[106] Ibid.
[107] World Nuclear Association. "What are Nuclear Wastes and How are they Managed?" 2016. http://www.world-nuclear.org/nuclear-basics/what-are-nuclear-wastes.aspx. (accessed June 10, 2017).
[108] Nuclear Energy Agency. The Disposal of High-Level Radioactive Waste, 1989. https://www.oecd-nea.org/brief/brief-03.html. (accessed June 10, 2017)
[109] IAEA. Storage and Disposal of Spent Fuel and High Level Radioactive Waste, 2006. https://www.iaea.org/About/Policy/GC/GC50/GC50InfDocuments/English/gc50inf-3-att5_en.pdf. (accessed June 12, 2017)
[110] Ibid.
[111] Ibid.
[112] Ibid.
[113] Ibid.
[114] Ibid.
[115] Ibid.
[116] IAEA, Borehole Disposal Facilities for Radioactive Waste, 2009. http://www-pub.iaea.org/MTCD/publications/PDF/Pub1418_web.pdf. (accessed June 12, 2017)
[117] Ibid.
[118] Ibid.

(DBD) has been discussed as a viable option for HLW and spent fuel disposal.[119] DBD could potentially be a safer and more cost-effective method of HLW disposal than any other method including geological disposal.[120] DBD "involves sinking large-diameter cased boreholes 4-6 km into the granitic basement of the continental crust and deploying packages of radioactive waste in the lower reaches of the hole before sealing it above, or at the top of, the disposal zone and backfilling the rest of the borehole."[121] DBD provides several advantages. First, in theory, waste deposited by DBD would not be effected by climate change, sea-level rises, or even earthquakes.[122] Secondly, the depth of drilling ensures that no radiation can reach the ground level, so, if radionuclides were to escape, they will have nowhere to go.[123] Additionally, near-surface circulating groundwater is safe from chemical contact because of the depth of drilling, which prevents drinking water from possible contamination.[124] Although there is water in deep layers of the earth, this water has no contact with the water in the upper layers of depth up to two kilometers, which is what humans use.[125] However, implementing DBD comes with complications. The drilling of such deep holes is still technically challenging and further development will be needed before the necessary number of deep boreholes can be constructed.[126] Furthermore, there still needs to be research and discussion on how to get the waste into the drilled holes, heat flow, and adequate containing and sealing of the borehole.[127] Borehole disposal for LLW and ILW already answer these questions, yet the exact same methods will not hold at greater depths. Therefore, the process of borehole disposal still needs to be reevaluated and adjusted to fit the safety standards of ensuring proper disposal of HLW.[128]

Environmental Impact of Waste Disposal

It is impossible to discuss radioactive waste disposal without addressing the potential environmental risk.[129] The main concern of harmful environmental impact stems from the long half-life periods. Nuclear half-life can cause the waste to be radioactive for thousands of years. This means that, even if the waste is sealed and stored in geological disposals that are out of reach of water sources, over time the radionuclides and other radioactive materials may eventually reach water.[130] When considering disposal of radioactive material, breaching of containers that hold the waste must be avoided.[131] One main concern is the contamination of groundwater. If waste is improperly stored, there could be rapid distribution of radioactive material into the water, which would pollute the water and cause serious health effects in humans and the surrounding environment.[132] Not only would compromised contaminates pollute the water in immediate area, but the radioactive materials could also reach rivers and oceans, leading to more widespread ecological damage.[133]

The reactor meltdown at Three Mile Island in 1979 and at Chernobyl in 1986 serves as an example of the potential dangers of radioactive exposure and spreading of nuclear material.[134] The incident at Chernobyl, for example, led to

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[119] Beswisc et al. Deep Borehole Disposal of Nuclear Waste: Engineering Challenges, 2014. http://www.mkg.se/uploads/DB/Deep_borehole_disposal_of_nuclear_waste-engineering_challenges_Beswick_Gibbs_Travis_Proceedings_of_the_Institution_of_Civil_Engineers_April_2014.pdf. (accessed June 12, 2017)

[120] Ibid.

[121] Ibid.

[122] Ibid.

[123] Ibid.

[124] Ibid.

[125] Ibid.

[126] Ibid.

[127] Ibid.

[128] Ibid.

[129] Conserve Energy Future. Nuclear Waste Disposal. 2017. http://www.conserve-energy-future.com/dangers-and-effects-of-nuclear-waste-disposal.php. (accessed June 17, 2017)

[130] Ibid.

[131] United States Environmental Protection Agency. Radioactive Waste Disposal: An Environmental Perspective. 1994. https://www.epa.gov/sites/production/files/2015-03/documents/000003ob.pdf. (accessed June 17, 2017)

[132] Ibid.

[133] Ibid.

[134] Pollution Issues. Disasters: Nuclear Accidents, 2016. http://www.pollutionissues.com/Co-Ea/Disasters-Nuclear-Accidents.html. (accessed June 17, 2017)

an explosion that sent radioactive material all over Europe and lead to the evacuation of 4000 square kilometers.[135] To this day, it is uncertain all the health consequences caused by the explosion; although, there is an observable and devastating rise in cancer rates in the area surrounding Chernobyl.[136] The accident at Chernobyl serves as a warning of the possible damaging effects of improper handling of radioactive material, which led to toxic levels of radioactive exposure.[137] Although Chernobyl was an explosion, the possibility of improper disposal of radioactive waste, leading to radioactive material to leak into the environment, could potentially cause greater environmental and human damage since the radioactive material in water would be able to travel greater distances. Improper nuclear disposal also presents a threat to the oceans. The first disposal of nuclear waste by dumping it into the ocean occurred 80 kilometers off the California coast in 1946.[138] Although to date there are no recorded accounts of HLW being deposited into the ocean, 63 petabecquerel (PBq) of nuclear waste was disposed of into the ocean between 1946 and 1982.[139] The ocean does dilute the radioactivity of nuclear waste, but it does not completely negate radioactivity; Between 1946 and 1993, thirteen nations with nuclear capabilities used the ocean to dispose of nuclear waste.[140] After 1993, ocean disposal of nuclear waste was banned by international treaties, such as the London Convention, Basel Convention, and MARPOL.[141] Despite the fact that dumping of nuclear waste is prohibited, the negative effects of previous ocean nuclear disposal may harm contemporary marine life.[142] Additionally, nuclear waste unintentionally released into the ocean, such as the waste released from the Fukushima Daiichi nuclear power plant in Japan, have already resulted in increased level radioactivity in the water .[143] The total marine impact of the nuclear/radioactive material discharged into the ocean is still not fully known.[144] Overall, proper disposal of nuclear waste must be ensured as to eliminate negative environmental effects.

Disposal Standards and Development

Since nuclear power has become more accessible, more Member States are beginning to use nuclear power and nuclear technology. Increasing utilization of nuclear power and nuclear technology in medicine, research, and mining in developing Member States illustrates the importance of a more international discussion on nuclear waste management and disposal, more specifically.[145] Better regulations and better understanding of the necessary measures to ensure nuclear safety are essential to proper nuclear disposal, making international cooperation crucial.[146] The IAEA has undertaken successful initiatives to improve the handling of nuclear waste, such as the Waste Management Advisory Programme (WAMAP), which was established in 1986.[147] This program helps Member States understand their needs for nuclear waste management and assists them in evaluating possible solutions.[148] One such solution is to develop multinational cooperative repositories for radioactive waste as an option for developing Member States to reduce cost and the technical challenges associated with the construction and management of geological repositories.[149] Since Member States are now showing a willingness to begin

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[135] World Nuclear Association. Chernobyl Accident, 1986, 2016. http://www.world-nuclear.org/information-library/safety-and-security/safety-of-plants/chernobyl-accident.aspx. (accessed June 17, 2017)
[136] Pollution Issues. Disasters: Nuclear Accidents, 2016. (accessed June 17, 2017)
[137] Ibid. (accessed June 17, 2017)
[138] Dominique P. Calmet. "Ocean Disposal of Radioactive Waste: Status Report," 1989. https://www.iaea.org/sites/default/files/31404684750.pdf. (accessed July 28, 2017)
[139] Ibid.
[140] Patrick Kozakiewicz. CBRNe Portal, "The Disposal of Nuclear Waste into the World's Oceans," 2014. http://www.cbrneportal.com/the-disposal-of-nuclear-waste-into-the-worlds-oceans/. (accessed July 28, 2017).
[141] Ibid.
[142] Elizabeth Grossman. YaleEnvironment360, "Radioactivity in the Ocean: Diluted, but Far from Harmless," April 7, 2011. http://e360.yale.edu/features/radioactivity_in_the_ocean_diluted_but_far_from_harmless. (accessed July 28, 2017)
[143] Ibid.
[144] Ibid.
[145] Thomas et al., Radioactive Waste Management in Developing Countries, 1989. https://www.iaea.org/sites/default/files/publications/magazines/bulletin/bull31-4/31404683236.pdf. (accessed June 14, 2017)
[146] Thomas. Management of Radioactive Wastes in Developing Countries: Growing Needs, 1992. https://www.iaea.org/sites/default/files/publications/magazines/bulletin/bull34-3/34304681618.pdf. (accessed June 14, 2017)
[147] Thomas, et al., Radioactive Waste Management in Developing Countries, 1989. (accessed June 14, 2017)
[148] Ibid. (accessed June 14, 2017)
[149] IAEA. Developing Multinational Radioactive Waste Repositories: Infrastructural Framework and Scenarios of Cooperation, 2004. http://www-pub.iaea.org/MTCD/Publications/PDF/te_1413_web.pdf. (accessed June 14, 2017)

development of international repositories, the IAEA has begun addressing the questions of financing, liability, public acceptance, and other legal matters.[150] Shared repositories are an important initiative, not only due to the financial challenges posed by the storage of nuclear waste, but because not all States have suitable locations for the disposal of nuclear material.[151] The overarching question is how the responsibility amongst Member States will be distributed.[152] The work the IAEA has done on these issues showcases the possibilities available; however, it also provides evidence of areas where further evaluation is needed.[153] Furthermore, it is necessary to work toward a proper way of handling the waste created to make sustainable use of these technological possibilities.[154] It is necessary to promote and ensure sustainable handling of nuclear waste to avoid the dangerous influences on the environment and to ensure progress toward reaching the SDGs.[155] Continuing to solve these questions on liability, evaluation of existing data on nuclear waste, and fostering the cooperation between Member States will be important aspects of the IAEA's work in the next years.[156]

Conclusion

In 1995, the IAEA made a declaration that nuclear waste management and disposal must not "[impose] undue burdens on future generations."[157] Over twenty years later, the IAEA is still dedicated to understanding the dangers of improper radioactive waste disposal and finding ways to mitigate the harmful effects of leakage. The international community is still searching for the most effective way to properly dispose of HLW and spent fuel.[158] However, to find the best method possible will take time, demonstrating that a quick solution to proper long-term disposal is not possible.[159] Therefore, Member States need to consider cooperative efforts, such as shared repositories, to find the solution.[160] While looking for these solutions, it is necessary to keep in mind the dangers not only for humans, but also the potential environmental dangers, as well as understanding the consequences of leakage from disposal facility.[161] Additionally, it is important to consider total global cooperation, meaning the inclusion and support of developing nations in handling nuclear waste to allow them to utilize technical advancements through nuclear technology.[162] The IAEA will have to work as a facilitator between the many parties involved to guide the current processes in a direction that not only allows radioactive waste to be dealt with for the present, but also ensures that future generations will not be harmed by the waste generated now.[163]

Committee Directive

Throughout the research process, delegates should consider the following questions: how can the IAEA help with the development of disposal facilities? Can the safety of the designated geological disposal facilities and DBD be ensured? Are international repositories possible? If so, what are the requirements to ensure access and availability of these repositories? What are the necessary measures to prevent nuclear waste disposal leaking in the oceans and other waterways? What is the most effective way to help developing Member States properly dispose of nuclear waste? Where is the IAEA's support, needed in the process toward finding suitable repositories? How can the nuclear industry and governments work toward nuclear waste disposal solutions that respect all interests? What is

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[150] IAEA. Technical, Institutional, and Economic Factors Important for Developing a Multinational Radioactive Waste Repository, 1998. http://www-pub.iaea.org/MTCD/Publications/PDF/te_1021_prn.pdf. (accessed June 14, 2017)
[151] World Nuclear Association. International Nuclear Waste Disposal Concepts, 2016. http://www.world-nuclear.org/information-library/nuclear-fuel-cycle/nuclear-wastes/international-nuclear-waste-disposal-concepts.aspx. (accessed June 14, 2017)
[152] Ibid.
[153] IAEA. Developing Multinational Radioactive Waste Repositories, 2004. (accessed June 14, 2017)
[154] UNCED. Agenda 21, 1992. https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf. (accessed June 14, 2017)
[155] Ibid.
[156] IAEA. Developing Multinational Radioactive Waste Repositories, 2004. (accessed June 14, 2017)
[157] IAEA. The Principles of Radioactive Waste Management, 1995. (accessed June 14, 2017)
[158] IAEA. Disposal of Radioactive Waste, 2011. (accessed June 11, 2017)
[159] Ibid.
[160] IAEA. Storage and Disposal of Spent Fuel and High Level Radioactive Waste, 2006. (accessed June 12, 2017)
[161] World Nuclear Association. International Nuclear Waste Disposal Concepts, 2016. (accessed June 12, 2017)
[162] Ibid. (accessed June 12, 2017)
[163] Beswick et al., Deep Borehole Disposal of Nuclear Waste: Engineering Challenges, 2014. (accessed June 12, 2017)

your individual Member State doing to minimize the generation of nuclear energy so that production of nuclear waste is minimal? What waste management methods do they implement to save resources?

Technical Appendix Guide

Topic I: Enhancing Safety and Security Standards at Nuclear Power Facilities

(2016) 'Success Through Symbiosis: How We Contribute. Annual Report 2017,' *The World Institute for Nuclear Security*, file:///C:/Users/Owner/Downloads/20170809_annual_report_2017_12_final_web_03_april.pdf

This is the annual report of The World Institute for Nuclear Security (WINS), an international NGO focused on improving nuclear safety and security. They work closely with the IAEA in developing solutions from a perspective of the private sector or non-profits. In 2015, the organization laid out 10 strategic objectives to be achieved by the world by 2020. WINS 2017 annual report updates the progress made by the international community in achieving these objectives.

'IAEA Action Plan on Nuclear Security,' And 'Progress in the Implementation of the IAEA Action Plan on Nuclear Safety', *International Atomic Energy Agency*, https://www.iaea.org/sites/default/files/actionplanns.pdf And https://www.iaea.org/About/Policy/GC/GC59/GC59InfDocuments/English/gc59inf-5_en.pdf

In 2011, the Ministerial Conference on Nuclear Safety was convened to develop a new international action plan on nuclear safety in the wake of the Fukushima accident. The report the organization came out with detailed steps the organization should take to improve nuclear safety. In 2015, the IAEA Board of Governors and the Director General issued a report updating the international community on the progress of the implementations suggested by the original report in 2011.

M. Snell and J. Rivers (2015) 'The Treatment of Blended Attacks in Nuclear Security Effectiveness Assessments', https://www.osti.gov/scitech/servlets/purl/1252934

In this paper, the authors looked at the how nuclear facilities physical protection systems stood up to combined cyber and physical attacks. Many times, a facility can be affected by a combination of a physical attack on the site and a cyber-attack against the site's computers or infrastructure. These types of attacks have often been relegated in nuclear security planning by international agencies and national governments. This report designs a methodology to test a specific sites effectiveness against combined attacks and offers recommendations for the implementation of future protection.

Pierre Goldschmidt (January 14, 2010) "Safeguards Noncompliance: A Challenge for the IAEA and the UN Security Council," *Arms Control Association*, *https://www.armscontrol.org/act/2010_01-02/Goldschmidt*.

IAEA safeguards are in place to ensure that nuclear efforts of Member States remain peaceful. This article outlines challenges the IAEA and the Security Council face in implementing safeguards to nuclear use. Such challenges include noncompliance reports and withdrawal from the NPT. A major consideration of the article is how nuclear safety measures are enforced since the IAEA is technically not legally binding.

Topic II: Developing Solutions and Promoting Cooperation for the Disposal of Nuclear Waste

"Disposal," *International Atomic Energy Agency*, https://www.iaea.org/topics/disposal

The IAEA outlines its efforts for proper disposal of nuclear waste. This site addresses safety standards, disposal options, current projects, news, and events operated by the IAEA to ensure the safe disposal of radioactive waste and material. The projects and safety standards discuss how the IAEA assists Member States with accurate nuclear waste disposal.

Laura Gill Martinez (2012) "Technological Challenges to Safe Disposal of Radioactive Waste," *International Atomic Energy Agency,* https://www.iaea.org/newscenter/news/technological-challenges-safe-disposal-radioactive-waste

This article discusses the challenges of nuclear waste disposal. The IAEA looks into technological challenges many Member States face with the small amount of nuclear waste they produce through ways, such as medicine. Any form of nuclear power produces waste, and Member States need to know how to properly dispose of their nuclear waste. The IAEA works with the Member States to implement proper nuclear waste strategies.

"Radioactive Waste Disposal Facilities," *International Atomic Energy Agency,* http://www-ns.iaea.org/standards/documents/default.asp?s=11&l=90&sub=40

The IAEA outlines safety fundamentals, general safety requirements, general safety guides, specific requirements, and specific safety guides for disposal facilities. Each section relates to the necessary requirements for the operating and starting of nuclear waste disposal facilities. The regulations outline what is required by the IAEA to legally and effectively dispose of nuclear waste.

"The Reversibility and Retrievability (R&R) Project," *Nuclear Energy Agency,* https://www.oecd-nea.org/rwm/rr/

The IAEA, along with 15 Member States, and other international organizations supported the Nuclear Energy Agency's (NEA) efforts to start the R&R project. The R&R project looks at how to retrieve radioactive waste in geological disposal sites. The project produced reports, leaflets, and a brochure on the topic of nuclear waste disposal in repositories. The project started in 2007 and was completed in 2011.