

International Atomic Energy Agency (IAEA)

Greetings Delegates,

I am a sophomore at MIT double majoring in course 10B, chemical-biological engineering, and course 7, biology, and minoring in Spanish. I'm excited to be your head chair, and to delve into topics that trouble countries, regions, and our futures. In high school, I attended fifteen conferences, in committees that included a handful of IAEAs! Studying chemical engineering has taught me a lot about energy consumption, ranging from unconventional oil to nuclear energy. In many ways, I feel like energy is a uniting concept: from the developing world to the developed world, energy is quite literally the fuel behind growth.

Just this past year, I attended a conference in France, in the IAEA committee, and it seems as if, even a continent away, we have the same, universal concerns about energy. How do we ensure we have enough? How will our ideas be sustainable and safe? Answering these questions will prove difficult, but I believe that your research and creativity will allow you to make sound judgments and present eloquent, novel solutions.

Other than Model UN, I'm currently a researcher at the Koch Institute of Integrative Cancer Research, the VP of the class of 2017, the secretary of the MIT Undergraduate Association, an education director of GlobeMed, a sister of Sigma Kappa, and other activities that we can talk more if you have any questions about MIT. My co-chair, Nahom, is a freshman, aspiring computer science major passionate about good food and good movies, and can also answer any questions you may have; he will be helping me run the committee as well as carry out proper parliamentary procedure.

Please feel free to contact me if you have any questions about how the committee will be run and the topics in general via email at iaea-mitmunc2015@mitmunc.mit.edu.

Looking forward to meeting you all!

Warmest regards,

Sophia Liu

Topic A: International Safety Regulations and Responses to Nuclear Crises

The International Atomic Energy Agency

The International Atomic Energy Agency (IAEA) was initially started by the United Nations as the world's "Atoms for Peace" organization in 1957, and "works with Member States and other partners worldwide to promote the safe, secure, and peaceful use of nuclear technologies."¹ The IAEA has three main work areas: Nuclear Technology & Applications, Nuclear Safety & Security, and Safeguards & Verification². Our committee will be focusing on the second department, Nuclear Safety & Security, which has been further divided into groups focusing on capacity building, global nuclear safety & security network, infrastructure, and international seismic safety.³ We will emphasize the IAEA's role as a mediator between countries to foster cooperation with respect to nuclear development, and develop an international document that provides recommendations on international safety regulations and responses to nuclear crises.

Introduction

Nuclear energy is a form of energy often obtained through the fission of elements in the actinide series, most commonly uranium. In the United States, it accounts for

¹ <http://www.iaea.org/about/about-iaea>

² <http://www.iaea.org/ourwork>

³ <http://www-ns.iaea.org>

approximately 20% of electricity production and in France, approximately 73.3%, the highest of any nuclear share⁴. As we expand the creation of reactors, the IAEA needs to establish a regulatory system to protect against incidents risking the safety of civilians internationally. In doing so, the goal is to achieve a state of global preparedness, through updating existing safety standards and nuclear technologies. The consequences of not being prepared could be catastrophic: nuclear accidents that would endanger thousands, millions of lives, and cause widespread conflict if the accident were to be international. From better safety checks and building of facilities to protected transport and storage of various radioactive wastes, there is a lot of ground that needs to be covered.

History

Legal documents referencing the IAEA's former attempts to address nuclear safety include the *Convention on Nuclear Safety* (1994) and the *Protection of Nuclear Materials* (1979), and several others, which can be found in the IAEA database⁵. While it would be prudent to review the gist of these documents, despite these efforts, there still lacks an overarching document that addresses nuclear security comprehensively, and this dearth of authority has resulted in several nuclear incidents.⁶ The following case studies describe what went wrong, and further research on them will allow you to better focus your solutions and tailor them to the real world.

Case Study: Middletown, Pennsylvania (USA) – March 28, 1979

⁴ <http://www.world-nuclear.org/info/Facts-and-Figures/Nuclear-generation-by-country/#.UkrawYakrOM>

⁵ <http://www-ns.iaea.org/standards/documents/pubdoc-list.asp?s=11&l=83>

⁶ <http://www.bbc.co.uk/news/world-13047267>

This disaster was the result of a cooling malfunction, when radioactive water and then gas were released. While no deaths or injuries were reported, or even cancer cases, it is widely considered to be the United States' worst nuclear accident, and is attributed to the failure of plant operators' ability to recognize what had happened due to their inadequate training, as well as design failures in the plant itself. Cleanup of the site started in August 1979 and ended in December 1993, costing \$1 billion USD, and the accident itself caused a total of \$2.4 billion USD in property damages⁷. While the site was reopened later on, the public stigma behind nuclear energy has never quite left the area, and security provisions are still lacking in desired depth.

Case Study: Chernobyl, Russia – April 26, 1986

The Chernobyl disaster is known to be the worst nuclear power plant accident in history, when using monetary and life losses as measures. Over 500,000 workers and an estimated \$18 billion USD were lost to the incident, and 31 lives were lost during the accident itself. To this day, there are still reports of cancers and deformities from the site. This disaster is one of only two to be considered as a 7, major accident, on the International Nuclear and Radiological Event Scale (INES) created by the IAEA⁸.

What happened at Chernobyl was the result of a routine safety test that went wrong. At reactor number four, a power surge caused an emergency shutdown that actually resulted in more power and the explosion of a vessel⁹. As the results ignited, a fire spread

⁷ http://en.wikipedia.org/wiki/Three_Mile_Island_accident#cite_note-nytimes1993-13

⁸ http://www.world-nuclear-news.org/RS_Event_scale_revised_for_further_clarity_0510081.html

⁹ <http://www.iaea.org/newscenter/features/chernobyl-15/chno-faq.shtml>

and burned for nine days with the resulting radiation at least 100 times more potent than that from the bombs dropped on Nagasaki and Hiroshima¹⁰.

Case Study: Fukushima, Japan – March 11, 2011

The Fukushima incident is the only other to be classified as level 7, moved up from a 5 after initial reports of radiation were deemed to be underestimates, and critics dispute the comparison to Chernobyl's level of destruction.

Problems began after the region experienced a major earthquake, when the resulting tsunami caused cooling to be cut off to three reactors. This induced the consequent melting of the reactors themselves. After two weeks of various approaches, they were eventually stabilized with water, and while deaths did not occur during the accident due to successful government evacuations, Japan was not left unscathed. Reports have predicted that populations in the most contaminated areas had a 70% increase in risk of thyroid cancer for females and a 7% increase in risk of leukemia in males, with an estimated third of workers having increased cancer risks generally.¹¹ The IAEA needs to have set recommendations for responses to natural disasters that protect not only civilians, but also the workers that are contracted/volunteer to help in the remediation processes.

Country Blocs: General guidelines (note that there are exceptions within each group)

Western Bloc: In the U.S. and in European countries, the utilization of nuclear power plants

¹⁰ <http://www.bbc.co.uk/news/world-13047267>

¹¹ <http://science.time.com/2013/03/01/meltdown-despite-the-fear-the-health-risks-from-the-fukushima-accident-are-minimal/#ixzz2MnbjhPmv>

as an energy source is projected to increase. These countries typically show the highest efficiency in maintenance and strictest regulations, and report relatively few incidents. In Germany, Chancellor Angela Merkel has proposed a nuclear power phase-out, closing all of the nuclear plants by 2022. Attitudes there may prevent the growth of nuclear industries in neighboring countries.

Middle Eastern Bloc: In the Middle East, there are several strong nuclear powers, but many are still in the process of developing their energy systems and reactors. Countries need better guidelines on construction and how to properly and safely grow the industry. Furthermore, there is a strong concern of nuclear terrorism in this region, and safety regulations may have to address cross-border conflicts and how to evaluate the legitimacy behind the establishment of various nuclear energy program.

African Bloc: Countries here are in the process of developing their nuclear energy programs, but have faced many economic and infrastructural issues during the process. They need international support in building their programs, and, as these facilities are being built and left, agencies to investigate the safety of their efforts.

Latin American Bloc: Countries such as Argentina and Brazil are countries that primarily use nuclear power as an electricity source, and are also growing their systems. However, there are also countries such as Chile that are still researching nuclear systems.

Asian Bloc: Many of the world's leaders in nuclear energy are situated here, and are planning on further expanding their programs to support rapid population growth and increasing energy demands. However, the public stigma of nuclear energy due to various safety incidents have left the region paused in their growth; the IAEA needs to create strong legislature in order to shift public opinion.

Conclusion

It has been shown that global preparedness is key in avoiding nuclear accidents and responding effectively to those that do occur. To protect lives, we must find a way to streamline the processes of safety standards and protocols to find one that countries are willing to agree upon. However, we still face many questions. How can we structure nuclear facilities so that terrorists seeking to take advantage of the resources available cause nuclear terrorism? How can we regulate radioactive waste globally? How can we create a framework that respects national sovereignty while still being defined properly to sufficiently prevent nuclear disasters? What provisions should we provide to accommodate countries that do not want nuclear energy? Why is having a streamlined procedure important? Would countries report directly to the IAEA or to other, regional groups? Should nuclear power plants do the reports, or should external groups be used? Being able to answer these questions would bring us one step closer to protecting Member States of the United Nations and their citizens.

Topic B: Expanding Nuclear Weapon Free Zones in the Middle East

Introduction

Tensions in the Middle East, even in the present day, are quite far from ceasing. These tensions can in part be traced back to the existence and ease of access to nuclear weapons in the region. In turn, the global community is constantly on edge when tensions flare in the region. Efforts at enforcing the Middle East Nuclear Weapon Free Zone (MENWFZ) flickered in the wake of Iran's initial request for the region and discussions on creating the MENWFZ have continued for over 30 years to date [1]. Establishing the MENWFZ would work to strengthen the existing Non-Proliferation Treaty (NPT) and fill the void of confidence and trust in the region as well. In particular, countries that have refused to sign the NPT, including Israel and Pakistan, have shown stubbornness in progressing through talks due to lack of mutual trust. Encouragement from signatories of the NPT and sponsors of the MENWFZ are crucial in the future of talks amongst the countries in the Middle East.

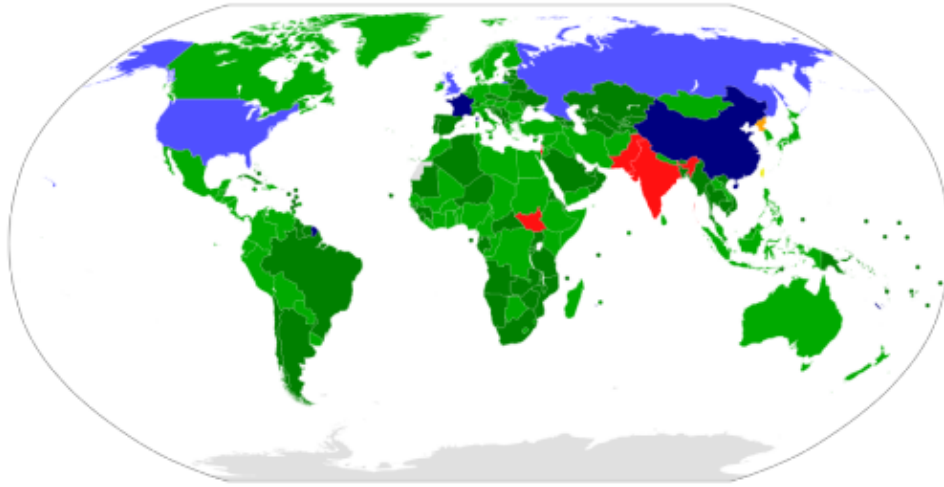


Figure 1: The figure above shows the countries that abide by the NPT (blue, green, yellow), and those that do not (red).

Underlying Issues

Distrust in the region

The Middle East has had more than its share of conflicts over the past several decades.

Especially after the introduction of nuclear weapons in the area, the tendency to lean towards distrust and malicious intentions in many cases, has all but grown. Similar to other NWFZs, the MENWFZ must be a collaborative effort amongst the countries of the Middle East and overcoming the tensions and mistrust of one another in the area is a crucial beginning step if a progressive discussion is ever going to take place.

Disregard for the NPT

As the MENWFZ would naturally lend itself to strengthening the existing NPT [2], reminding the existing signatories of the NPT of their position as a signatory and encouraging signatories to engage in discussions with non-signatories, especially those in the Middle East, would be a proactive initial measure in ensuring the stability of future

discussions involving the entire global community. Further, establishing the NPT as an internationally recognized and approved treaty would allow for an approach to the MENWFZ that takes the form of a measure to strengthen the NPT, not simply a means by which to force the Middle Eastern countries to disarm [2].

The need for caution by countries outside the region

The Middle East, as is, is already populated with countries that are very cautious about the idea of approaching discussions with other countries in the region, especially when the topic at hand is as sensitive as setting up a NWFZ. That being said, countries outside of the region should not rush into action regarding the MENWFZ, nor should the international community put heavy negative pressure on a region that could very well react with vehement opposition. All involved should keep in mind that the end goal is a Nuclear Weapon Free Zone, and as such cautious, peaceful discussions and approaches are the best means by which to attain this.

Meeting the Players

As the name suggests, the MENWFZ is primarily a discussion amongst the countries in the Middle East; however, the global community, having already seen the formation of past NWFZs, is highly encouraged to lend a hand in the formation of the zone. Iran and Egypt, having been the initiators of the MENWFZ discussion, are key members of this discussion, but non-NPT signatories are to be approached with more caution than the other countries in the region, as their reactions are presumably more liable to defer to violence or vehement anti-compliance [3]. While most countries in the General Assembly, including the United States and Russia, have agreed on the need for the establishment of such a region, countries such as Israel, are heavily opposed to such an establishment, as there are countries that have made their long-standing attachment to their nuclear weapons well known.

End Goals

The goal of this committee is to ultimately finalize discussions on the establishment

of the MENWFZ and have all affected parties reach a final and comprehensive solution regarding the consequences of violating the agreements therein. Delegates should focus on peaceful and cautious approaches during the process, looking to foster increased trust and amicability in the region atop further discussions of the establishment of the MENWFZ.

Focus questions:

- ❑ How can distrust be overcome or greatly reduced in the Middle East?
- ❑ How can the global community ensure compliance with the rules of the MENWFZ?
- ❑ What types of approaches will allow the more non-compliant countries in the region to actively join progressive discussions?

Keep in mind that discussions should be more progressive than they have been in the past; let's look to wrap up a discussion that has lasted over 30 years [1].

Bibliography

[1] Mideast Nuclear Weapon Free Zone (MENWFZ) Texts. (n.d.). Retrieved December 19, 2014, from <http://fas.org/nuke/control/menwfz/docs/index.html>

[2] Mideast Nuclear Weapon Free Zone (MENWFZ) Texts. (n.d.). Retrieved December 19, 2014, from <http://fas.org/nuke/control/menwfz/docs/index.html>

[3] "Nuclear Non-Proliferation Treaty (NPT)". Defense Treaty Inspection Readiness Program -

United States Department of Defense. Defense Treaty Inspection Readiness Program.

[4] "Treaty on the Non-Proliferation of Nuclear Weapons". United Nations Office for Disarmament Affairs