

The Zaporizhzhia Nuclear Power Plant and *Jus in Bello*
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I. INTRODUCTION: WHAT HAPPENED AT THE ZAPORIZHZHIA NUCLEAR POWER PLANT?

On the night of March 3, 2022, two tanks and a column of ten armored vehicles from the Russian Federation army approached the Zaporizhzhia Nuclear Power Plant (“ZNPP”).² Fearing a takeover of ZNPP, Ukraine had assigned a military unit to the nuclear power plant and met the Russians with resistance. Nevertheless, by the next morning, the Russians had taken over the plant after heavy fighting.³ None of the personnel of the power plant were killed or physically injured during the fight, but some required medical attention from stress.⁴

Russian occupation of the ZNPP has continued with Russian President Vladimir Putin asserting Russian government control over it in October of 2022.⁵ Ever since then, the Western international community and the International Atomic Energy Agency (“IAEA”) have called for the removal of Russian military occupation from the power plant. The violation of customary international humanitarian law and

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² Geof Brumfiel, *Video analysis reveals Russian attack on Ukrainian nuclear plant veered near disaster*, NPR (March 11, 2022, 5:12 AM), <https://www.npr.org/2022/03/11/1085427380/ukraine-nuclear-power-plant-zaporizhzhia>.

³ *Id.*; see also State Nuclear Regulatory Inspectorate of Ukraine, *Updated information about Zaporizhzhia NPP (15:00)*, STATE SITES OF UKRAINE (March 4, 2022, 3:30 PM), <https://snriu.gov.ua/en/news/updated-information-about-zaporizhzhia-npp-1500>.

⁴ *Id.*

⁵ Russia still asserts control over ZNPP. Veronika Melkozerova, *Running Europe’s largest nuclear power plant under the barrel of a Russian rifle*, POLITICO (April 11, 2023, 4:52 PM), <https://www.politico.eu/article/running-europe-largest-nuclear-power-plant-russian-soldiers-zaporizhzhia/>.

the potential for environmental disaster implicate the necessity of evolving the IAEA's role to adapt to modern military tactics. Moreover, the vulnerability of the Zaporizhzhia nuclear power plant illustrates the need for a multilateral treaty prohibiting the use of nuclear power plants as a battleground or target during war and armed conflict.

II. BACKGROUND

The ZNPP is Europe's largest nuclear power plant and provided one-fifth of Ukraine's electricity before the Russian takeover.⁶ Through a livestream of the plant's security footage on YouTube,⁷ it was revealed that the Russian troops concentrated their attack on the main administrative building which is situated in front of the nuclear reactors with continuous shelling and rocket-propelled grenades.⁸



⁶ Lauren Frayer, *Russian forces in Ukraine attack and seize Europe's largest nuclear power plant*, NPR (March 4, 2022, 5:18 AM), <https://www.npr.org/2022/03/03/1084414241/a-contested-ukrainian-nuclear-plant-is-under-attack-by-russian-forces>.

⁷ Brumfiel, *supra* note 2.

⁸ *Id.*

Although the attack was aimed at the administrative building, rounds were fired occasionally towards the reactor buildings where the nuclear fission process takes place.⁹ Out of the six reactor buildings: Unit 1 was no longer operable; Unit 2's energy was used to energize the whole nuclear power plant; Unit 3 was disconnected from the grid to begin the shutdown state; Unit 4 was still operable; and Unit 5 and Unit 6 were being cooled down.¹⁰ The reactor building of Unit 1, the power transformer of Unit 6, and the spent fuel pad sustained damage, and two of the high-voltage lines outside of the plant were hit.¹¹ A Russian shell was found on the walkway next to the reactor building of Unit 2 and a building that holds radioactive waste.¹²

The safety systems that prevent the reactors from nuclear disaster were fortunately unscathed.¹³ While the nuclear reactor buildings are reinforced for catastrophic events and contained in a thick steel vessel, the safety systems are not built to withstand a war zone, and neither is the building that holds radioactive waste.¹⁴ The cooling systems, backup generators, electrical yards, and control rooms are all vulnerable and are required components of the plant to ensure its safety.¹⁵ The Russian forces, however, irresponsibly continued their assault on ZNPP.

Even as a fire raged on in the training building, Russian troops refused to allow Ukrainian firefighters to enter the premises and extinguish the growing flames which

⁹ *Id.*

¹⁰ *Updated information about Zaporizhzhia NPP (15:00), supra note 3.*

¹¹ *Id.*

¹² Brumfiel, *supra* note 2.

¹³ *Id.*

¹⁴ *Id.*

¹⁵ *Id.*

caused the training building to suffer extensive damage.¹⁶ Fortunately, the fire did not spread to other portions of the plant. An unchecked fire in a nuclear power plant could be disastrous, as Ukrainian President Volodymyr Zelenskyy said it could have been so catastrophic as to lead to “the evacuation of Europe.”¹⁷

Russian occupation of the plant also prevented the ZNPP personnel from immediately fixing the damage and continuing their daily responsibilities to maintain.¹⁸ Moreover, operational personnel were held captive and forced to work more than twenty-four hours by Russian troops.¹⁹ The Ukrainian nuclear inspectorate stated: “[w]e emphasize that incomplete and/or untimely implementation of maintenance measures for equipment important to safety can decrease its reliability and in turn lead to its failure and emergencies and accidents.”²⁰ The attack caused a fear for potential environmental radioactive contamination and nuclear disaster.²¹

The IAEA, the agency formed under the United Nations responsible for fostering nuclear peace, initially unaware of the extent of damage to ZNPP made the statement that “the action took place away from the reactors.”²² After the ZNPP attack, the Director-General of the IAEA, Rafael Mariano Grossi, attempted to come

¹⁶ *Id.*

¹⁷ Frayer, *supra* note 6.

¹⁸ Brumfiel, *supra* note 2.

¹⁹ *Updated information about Zaporizhzhia NPP (15:00)*, *supra* note 3.

²⁰ Brumfiel, *supra* note 2.

²¹ *Id.*

²² *Id.*

to an agreement with Ukrainian and Russian officials in order to prevent further attacks on the other nuclear power plants in Ukraine, but these negotiations failed.²³

A week later, Unit 2 and Unit 4 were the only operable reactors at ZNPP, and the two high-voltage lines were still disconnected from the grid.²⁴ The plant personnel were able to resume maintenance activities for Unit 1, but the scope of the maintenance had to be greatly reduced.²⁵ The parts necessary to maintain the plant were not able to be transported to the facility, as the surrounding territory was occupied by Russian troops.²⁶ Unit 6 was especially precarious. Unit 6 rose to the level of “emergency status” because the oil system of the transformer was destroyed, and it was unable to be fixed due to lack of necessary parts and specialized personnel being prevented from accessing ZNPP.²⁷ Equally incautious, the Russian Federation army began to store explosives and other incendiary devices on the premises which also posed significant risk to the safety of the plant.²⁸

Nevertheless, the Ukrainian personnel at ZNPP have continued to work under pressure by the Russian Federation.²⁹ On April 3, 2022, Ukraine appealed to the IAEA for assistance in preventing a nuclear disaster in accordance with Article 2 of

²³ *Id.*

²⁴ State Nuclear Regulatory Inspectorate of Ukraine, *Information on the Zaporizhzhia NPP as of 12.00 of 10 March 2022*, STATE SITES OF UKRAINE (March 10, 2022, 12:10 PM), <https://snriu.gov.ua/en/news/information-zaporizhzhia-npp-1200-10-march-2022>.

²⁵ *Id.*

²⁶ *Id.*

²⁷ *Id.*

²⁸ *Id.*

²⁹ State Nuclear Regulatory Inspectorate of Ukraine, *Joint Statement of IAEA Member-Countries of 12 August 2022 on the Situation at the Zaporizhzhia NPP*, STATE SITES OF UKRAINE (Aug. 14, 2022, 4:40 PM), <https://snriu.gov.ua/en/news/joint-statement-iaea-member-countries-12-august-2022-situation-zaporizhzhia-npp>.

the Convention on Early Notification of a Nuclear Accident.³⁰ Multiple countries including Canada, France, the United Kingdom, Germany, and the United States pledged to provide assistance, yet only the United States has sent portable spectrometers to monitor the levels of radioactive contamination at ZNPP.³¹ The Ukraine nuclear inspectorate refused to allow officials from the IAEA to visit the site because it feared that it “could not guarantee the safety” of its inspectors.³²

By June 2022, personnel at ZNPP feared that the supply of necessary parts for maintenance would be exhausted.³³ They also became concerned of the increased risk that the continuous power supply needed to keep the safety systems running and to continue the cooling of fuel would be cut off.³⁴ Confidence in relying on its own plant’s power for electricity was called into question.³⁵ The stationed Russian troops did not heed these concerns. Instead, the Russian Federation army increased its stockpile of ammunition and explosives located at the plant and added fifty military vehicles at the site which further exasperated the situation and the fear of explosive damage to the reactors.³⁶

³⁰ State Nuclear Regulatory Inspectorate of Ukraine, *Appeal to the World Community of the Board of the State Nuclear Regulatory Inspectorate of Ukraine*, STATE SITES OF UKRAINE (April 5, 2022, 10:00 PM), <https://snriu.gov.ua/en/news/appeal-world-community-board-state-nuclear-regulatory-inspectorate-ukraine>.

³¹ State Nuclear Regulatory Inspectorate of Ukraine, *Supply of Spare Parts to Zaporizhzhia Plant ‘May Be Exhausted’: Ukraine Regulatory*, STATE SITES OF UKRAINE (July 5, 2022, 9:05 AM), <https://snriu.gov.ua/en/news/supply-spare-parts-zaporizhzhia-plant-may-be-exhausted-ukraine-regulator>.

³² *Id.*

³³ *Id.*

³⁴ *Id.*

³⁵ *Id.*

³⁶ *Id.*

The IAEA responded to this by stating that “the deployment of Russian military personnel and weapons at a nuclear facility is an unacceptable disregard for the safety and safeguards principles that all IAEA members have pledged to respect” and called for Russia to remove its troops from ZNPP.³⁷ In early September, a delegation from the United Nations visited the power plant. Dismayed by the poor conditions of the buildings, the delegation pushed the IAEA to begin calling for a demilitarized security zone around the plant.³⁸

Disregarding this outcry, Russian President Vladimir Putin ordered the Russian military to seize total control of ZNPP on September 28, 2022, and to incorporate it as a Russian state-owned facility.³⁹ The situation escalated when Ihor Murashov, the Ukrainian director of ZNPP, was abducted from his car by Russian military agents.⁴⁰ He was responsible for leading nuclear and radiation safety at the power plant. On his way to oversee these duties at ZNPP, his automobile was stopped, he was blindfolded, and he was taken to an unknown destination.⁴¹ Later that day, President Putin announced the annexation of four regions in Ukraine, including the Zaporizhzhia region.⁴²

³⁷ *Joint Statement of IAEA Member-Countries of 12 August 2022 on the Situation at the Zaporizhzhia NPP*, *supra* note 28.

³⁸ *Boss of Ukraine’s Russian-occupied Zaporizhzhia Nuclear Power Plant released after “illegal detention,”* CBS NEWS (Oct. 3, 2022, 11:48 AM), <https://www.cbsnews.com/news/ukraine-russia-zaporizhzhia-nuclear-plant-boss-free-after-illegal-detention/>.

³⁹ Gareth Jones, *Putin asserts control over Ukraine nuclear plant, Kyiv disagrees*, REUTERS (Oct. 5, 2022, 2:55 PM), <https://www.reuters.com/world/europe/zaporizhzhia-plant-operate-under-russian-supervision-after-annexation-ria-2022-10-05/>.

⁴⁰ *Boss of Ukraine’s Russian-occupied Zaporizhzhia Nuclear Power Plant released after “illegal detention,”* *supra* note 38.

⁴¹ *Id.*

⁴² Russia does not have full control of any of the regions. Jones, *supra* note 39.

Condemned by Kyiv as an “illegal land grab,” the annexation gave justification for Russia’s state-owned nuclear power operator Rosenergoatom to take control over ZNPP, and it was designated as Russian federal property.⁴³ Russian Deputy Foreign Minister Sergei Vershinin stated that, “the Zaporizhzhia nuclear plant is now on the territory of the Russian Federation and, accordingly, should be operated under the supervision of our relevant agencies.”⁴⁴ Rosenergoatom planned to transfer the Ukrainian employees and personnel into its existing company structure and to begin repairing the damage of ZNPP to produce energy for Russia.⁴⁵ Murashov was released on October 3, 2022 but did not return to his directorship at ZNPP.⁴⁶ Amongst the tension for control of the facility and Murashov’s abduction, military shelling and strikes around the power plant restarted.⁴⁷

Ukrainian personnel continue to be put under “immense stress and pressure” to run the power plant.⁴⁸ Stressed personnel could potentially lead to human error and decrease the plant’s assurance of nuclear safety.⁴⁹ President Putin’s decree transferring ZNPP from Energoatom, the Ukrainian state-owned nuclear operator, to Rosenergoatom has placed the staff in a precarious position.⁵⁰ Energoatom urged

⁴³ Jones, *supra* note 39.

⁴⁴ *Id.*

⁴⁵ *Id.*

⁴⁶ *Boss of Ukraine’s Russian-occupied Zaporizhzhia Nuclear Power Plant released after “illegal detention,” supra* note 38.

⁴⁷ *Id.*

⁴⁸ Dame Barbara Woodward, Speech at the UN Security Council briefing on the Zaporizhzhia nuclear power plant (Sep. 6, 2022), <https://www.gov.uk/government/speeches/russia-is-playing-roulette-with-nuclear-safety-uk-statement-at-un-security-council>.

⁴⁹ C. Mandler, *What’s at stake with Ukraine’s Zaporizhzhia nuclear power plant, and how does it compare to Chernobyl?*, CBS NEWS (Sept. 14, 2022, 4:48 AM), <https://www.cbsnews.com/news/ukraine-zaporizhzhia-nuclear-power-plant-risks-chernobyl-comparison/>.

⁵⁰ Peleschuk, *supra* note 5.

staff to not sign any contracts presented to them from Rosenergoatom, as Russian forces warned the Ukrainian personnel that they would not be paid until they did so.⁵¹ Energoatom reassured the personnel that if they stayed loyal to Ukraine, they would be paid more than their yearly salary.⁵²

In November, explosions continued around ZNPP.⁵³ During one of the shellings, several buildings were damaged, but none were critical to ongoing safety measures.⁵⁴ Grossi, the director general of the IAEA, used this resurgence of shelling to renew calls for “urgent measures to help prevent a nuclear accident” by creating a de-militarized security zone around the plant and removing all military forces and materials from the site.⁵⁵ The IAEA hoped to have a security zone established before the start of 2023, but that hope has been suspended.⁵⁶

Grossi stressed that the situation has become so entrenched that the IAEA’s main goal is just to prevent a nuclear accident from occurring.⁵⁷ The IAEA has placed inspectors on site, but ZNPP personnel have been treated harshly by the Russian military.⁵⁸ Their movements are incredibly restricted by soldiers around the plant, and workers who were outspoken and refused to obey Russian control were sent to

⁵¹ *Id.*

⁵² *Id.*

⁵³ John Leicester, *Renewed shelling in Zaporizhzhia threatens key Ukrainian nuclear plant again*, PBS NEWS HOUR (Nov. 20, 2022, 3:41 PM), <https://www.pbs.org/newshour/world/renewed-shelling-in-zaporizhzhia-threatens-key-ukrainian-nuclear-plant-again>.

⁵⁴ *Id.*

⁵⁵ *Id.*

⁵⁶ Peleschuk, *supra* note 5.

⁵⁷ Louise Guillot, *UN watchdog ditches Ukrainian nuclear plant safety zone scheme*, POLITICO (March 29, 2023, 7:34 PM), <https://www.politico.eu/article/un-watchdog-ditches-ukrainian-nuclear-plant-safety-zone-scheme/>.

⁵⁸ Melkozerova, *supra* note 5.

torture chambers.⁵⁹ Out of the eleven thousand workers who worked at the plant before the war, only two thousand remain.⁶⁰ Fears still remain that ZNPP will be caught in the crossfire again without an established de-militarized zone, as ZNPP is on the frontline with Ukrainian forces only a few kilometers away.⁶¹

III. WHAT DO THE RULES OF WAR PROVIDE?

A. *International Humanitarian Law*

Rules of war have existed for centuries. Customary law in regards to limitations of warfare began to be supplemented by multilateral agreements in the seventeenth century starting with the Declaration of St. Petersburg of 1868.⁶² This agreement focused on emphasizing that war should be conducted in a way that abides by the laws of humanity,⁶³ and it begins by stating, “the progress of civilization should have the effect of alleviating as much as possible the calamities of war.”⁶⁴ It idealized the notion that belligerent parties should only target military forces and avoid attacks on civilians and wounded soldiers.⁶⁵ In doing so, the Declaration of St. Petersburg specifically forbid the use of a projectile that weighed below 400 grams and was of an incendiary nature because of the agonizing death it caused.⁶⁶ The

⁵⁹ *Id.*

⁶⁰ *Id.*

⁶¹ *Id.*

⁶² Jozef Goldblat, *The Laws of Armed Conflict: An Overview of the Restrictions and Limitations on the Methods and Means of Warfare*, 13 BULLETIN OF PEACE PROPOSALS 127, 127 (1982).

⁶³ *Id.* at 127.

⁶⁴ Declaration Renouncing the Use, in Time of War, of Explosive Projectiles Under 400 Grammes Weight, St. Petersburg, Dec. 11, 1868, 130 I.H.L. 6.

⁶⁵ Goldblat, *supra* note 62 at 127.

⁶⁶ *Id.*

Declaration of St. Petersburg began the prohibition of certain weapons in order to make the inhumane act of war more humane.⁶⁷

In 1899, Western states came together for the first Hague Convention and passed declarations on permissible conduct during war.⁶⁸ Importantly, the fourth declaration prohibited the use of “dum-dum bullets” due to the serious wounds they caused from their capability to shift once entering the body.⁶⁹ In 1907, they reconvened again for the Second Hague Conference.⁷⁰ The Second Hague Conference committed to paper the customs of land warfare in Convention IV.⁷¹ It focused on preventing unnecessary suffering and the “treacherous killing or wounding of individuals belonging to the hostile nation or army” by prohibiting certain arms and projectiles, including poisonous weapons.⁷² For naval fighting, it prohibited the use of submarine mines and attacks on undefended ports and cities.⁷³ It espoused the underlying doctrine of international humanitarian law that “[t]he right of belligerents to adopt a means of injuring the enemy is not unlimited” in Article 22.⁷⁴

World War I further underscored the need to articulate the laws of war, as the gruesome warfare exposed millions to horrors of unnecessary suffering.⁷⁵ The Allies uniformly signed a treaty to prevent the use of noxious gases.⁷⁶ They aimed to create

⁶⁷ *Id.*

⁶⁸ *Id.*

⁶⁹ *Id.*

⁷⁰ Goldblat, *supra* note 62 at 127.

⁷¹ *Id.*

⁷² *Id.*

⁷³ *Id.* at 128.

⁷⁴ Convention (IV) respecting the Laws and Customs of War on Land and its annex: Regulations concerning the Laws and Customs of War on Land art. 22, the Hague, Oct. 18, 1907, 195 I.H.L. 19.

⁷⁵ Goldblat, *supra* note 62 at 128.

⁷⁶ *Id.*

more meaningful rules to protect the lives of non-combatants and neutrals.⁷⁷ With the conclusion of World War I, the prohibition of poisonous gases was reaffirmed in the 1925 Geneva Protocol along with the prohibition of biological and chemical methods of warfare.⁷⁸

After World War II, the Geneva Conventions advanced the codification of protections for the civilian population during war.⁷⁹ Protocol I was passed in 1977 and it reiterated the basic Hague rules: “The right of the parties to an armed conflict to choose methods or means of warfare is not unlimited, and that it is prohibited to use weapons, projectiles and material and methods of warfare of a nature that causes superfluous injury or unnecessary suffering.”⁸⁰ It forbade reprisals against civilians and attacks on undefended locations or demilitarized zones.⁸¹ Energy-generating locations were also given special protection, specifically hydroelectric plants and nuclear power plants.⁸² These marked the first examples of environmental concern in the rules of war,⁸³ mainly that the natural environment should be protected from long-term damage when it risks the health of the local population.⁸⁴

These multilateral agreements supplement customary law regarding the conduct of warfare.⁸⁵ The laws of war have always provided protection to civilians

⁷⁷ *Id.*

⁷⁸ *Id.*

⁷⁹ *Id.* at 129.

⁸⁰ *Id.*

⁸¹ Goldblat, *supra* note 62 at 130.

⁸² *Id.*

⁸³ *Id.*

⁸⁴ *Id.* at 132

⁸⁵ *Id.*

and non-combatants from armed conflict.⁸⁶ Civilians should never be the target of a military attack, and care must be issued to distinguish combatants from non-combatants to ensure the protection of civilians.⁸⁷ Attacks should be kept to only military objectives that make “an effective contribution to military action and whose destruction, capture, or neutralization offers a definite military advantage” like capturing combatants or the enemy’s supply of ammunition and weapons.⁸⁸ When force is used against combatants, the force should be proportional and not more than necessary to achieve a military objective.⁸⁹ Military objectives are distinct from civilian objectives. Civilian homes, hospitals, schools, orphanages, and businesses should never be directly attacked.⁹⁰

This development of the laws of war codified in treaties and conventions reflects the first cardinal principle of international humanitarian law: “the protection of the civilian population and civilian objects” and “the distinction between combatants and non-combatants.”⁹¹ Military, in general, needs clear rules, especially regarding weapon prohibitions and the law of armed conflict. Clearly restricting the targeting of a nuclear power plant would provide all militaries a new law of armed conflict and protect the civilian personnel from being treated as combatants. It would also reinforce the cardinal principle underlying international humanitarian law.

⁸⁶ *Russia, Ukraine & International Law: On Occupation, Armed Conflict and Human Rights*, HUMAN RIGHTS WATCH (Feb. 23, 2022, 5:25 PM), <https://www.hrw.org/news/2022/02/23/russia-ukraine-international-law-occupation-armed-conflict-and-human-rights>.

⁸⁷ *Id.*

⁸⁸ *Id.*

⁸⁹ Mary Ellen O’Connell, *Lawful Self-Defense to Terrorism*, 63 U. PITT. L. REV. 889, 902 (2001-2002).

⁹⁰ *Russia, Ukraine & International Law: On Occupation, Armed Conflict and Human Rights*, *supra* note 86.

⁹¹ *Legality of the Threat or Use of Nuclear Weapons*, Advisory Opinion, 1996 I.C.J. 226 (July 8).

B. Environmental Protection

After the Vietnam War, environmental concerns during armed conflict increased because of the use of Agent Orange.⁹² During the Vietnam War, or the American War as it is known in Vietnam, the United States sprayed over twenty million gallons of “herbicide defoliants,” including Agent Orange.⁹³ When plants absorb the extremely toxic herbicide, their growth is accelerated and uncontrolled, which leads to their death.⁹⁴ President Kennedy approved these operations and rationalized that it did not violate the 1925 Geneva Protocol on Chemical and Biological Warfare because the 1925 Protocol referred to humans and not plants, although historically it was treated as all encompassing.⁹⁵

In response, the United Nations General Assembly passed the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques in 1977. Article I states that “[e]ach State Party to this Convention undertakes not to engage in military or any other hostile use of environmental modification techniques having widespread, long-lasting or severe effects as the means of destruction, damage or injury to any other State Party.”⁹⁶ An “environmental modification technique” is defined as “changing—through the deliberate manipulation of natural processes—the dynamics, composition or

⁹² THE LAWS OF WAR, 69 (W. Michael Reisman & Chris T. Antoniou eds., 1994).

⁹³ Patricia Hynes, *The Legacy of Agent Orange in Vietnam*, 28 PEACE REVIEW 114, 115 (2016).

⁹⁴ *Id.* at 116.

⁹⁵ *Id.*

⁹⁶ Convention on the prohibition of military or any other hostile use of environmental techniques art. I, Oct. 5, 1978, 1108 U.N.T.S. 151.

structure of the Earth, including its biota, lithosphere, hydrosphere and atmosphere or of outer space.”⁹⁷

The Geneva Conventions were also amended to include Article 55 Protection of the Natural Environment in 1977.⁹⁸ It states that:

Care shall be taken in warfare to protect the natural environment against widespread, long-term and severe damage. This protection includes a prohibition of the use of methods or means of warfare which are intended or may be expected to cause such damage to the natural environment and thereby to prejudice the health or survival of the population.⁹⁹

Both of these rules of warfare laid the foundation for prohibiting the use of nuclear power plants as battlegrounds. Nuclear disaster indicates widespread, long-term, and severe damage to the environment. An attack on a nuclear power plant could cause a nuclear disaster that would jeopardize the health of the neighboring population. A treaty which prohibits the targeting of nuclear power plants would be a natural evolution of international humanitarian law in environmental and human protection. It would also provide clear steps for power plant personnel, the IAEA, and the UN to follow when an attack occurs during war.

⁹⁷ *Id.*

⁹⁸ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflict (Protocol I) art. 55, June 8, 1977, 470 A.P. 1.

⁹⁹ *Id.*

IV. WHY SHOULD THE ZAPORIZHZHIA NUCLEAR POWER PLANT OPERATE NORMALLY?

A. Nuclear Disasters

The Russian Federation began their invasion of Ukraine on February 24, 2022, through the Chornobyl¹⁰⁰ Exclusion Zone in the northern part of Ukraine which contained radioactive material from the Chornobyl disaster.¹⁰¹ Russian troops seized the Chornobyl nuclear power plant and its facilities that housed nuclear fuel and radioactive waste on the same day.¹⁰² The seizure of the Chornobyl nuclear power plant was followed by the takeover of ZNPP a week later. The attack on ZNPP was a carefully premeditated attack to further Russian takeover of Ukrainian territory and to disrupt Ukrainian infrastructure.¹⁰³ The invasion through Chornobyl and the fear of nuclear disaster at ZNPP reminded the Ukrainian people of the horrendous Chornobyl disaster.¹⁰⁴ President Zelenskyy emphasized that “an explosion at Zaporizhzhia would have equaled ‘six Chornobyls.’”¹⁰⁵

¹⁰⁰ According to the Library of Congress, “Chernobyl is the Romanization of the Russian spelling of the town and is generally used in English to refer to the nuclear accident. Chornobyl is the Romanization of the Ukrainian spelling and is the current standard in English for the town itself.” *Chernobyl Nuclear Accident, Chornobyl, Ukraine: A Resource Guide*, LIBRARY OF CONGRESS, <https://guides.loc.gov/chernobyl-nuclear-accident#:~:text=Chernobyl%20is%20the%20Romanization%20of,English%20for%20the%20town%20itself>. Thus, Chornobyl will be used for continuity throughout this Article.

¹⁰¹ *Appeal to the World Community of the Board of the State Nuclear Regulatory Inspectorate of Ukraine*, *supra* note 30.

¹⁰² *Id.*

¹⁰³ Brumfiel, *supra* note 2.

¹⁰⁴ Mandler, *supra* note 49.

¹⁰⁵ *Id.*

The nuclear disaster at Chernobyl provided incredible insight to the severe effects of nuclear disasters on the human body and on the local environment.¹⁰⁶ When radioactive materials and ionizing radiation are released during a disaster, humans can be exposed by breathing in contaminated dust particles or consuming contaminated water and food.¹⁰⁷ At lower exposure, humans can develop cardiovascular disease, cataracts, and multiple forms of cancer, most specifically thyroid cancer.¹⁰⁸ With higher exposure, there is immediate damage to the human body which leads to radiation sickness and death.¹⁰⁹ Similar effects occur to the surrounding wildlife, and radiation can remain for years in the soil, making nuclear disaster sites inhabitable for decades afterwards.¹¹⁰

At the Chernobyl Nuclear Power Plant, an experiment at one of the reactors went wrong which resulted in a power surge unable to be contained by the steel container housing the reactor.¹¹¹ The reactor was not adequately designed to prevent a meltdown, and the work culture of the power plant influenced mistakes to be covered up rather than raised.¹¹² Radioactive material escaped into the cloud coverage and killed thirty-two people within the first few days after the disaster.¹¹³

¹⁰⁶ National Cancer Institute, *Accidents at Nuclear Power Plants and Cancer Risk*, NATIONAL INSTITUTE OF HEALTH (May 12, 2022), <https://www.cancer.gov/about-cancer/causes-prevention/risk/radiation/nuclear-accidents-fact-sheet>.

¹⁰⁷ *Id.*

¹⁰⁸ *Id.*

¹⁰⁹ *Id.*

¹¹⁰ Marina Somma, *The Effects of Nuclear Radiation on the Environment*, SCIENCING (October 20, 2021), <https://sciencing.com/environmental-effects-atomic-bomb-8203814.html>.

¹¹¹ Jennie Cohen, *History's 5 Worst Nuclear Disasters*, HISTORY (Dec. 15, 2022), <https://www.history.com/news/historys-worst-nuclear-disasters>.

¹¹² *What are the effects of nuclear accidents?*, WORLD NUCLEAR ASSOCIATION, <https://world-nuclear.org/nuclear-essentials/what-are-the-effects-of-nuclear-accidents.aspx>.

¹¹³ Cohen, *supra* note 111.

Up to seventy thousand people may have experienced severe poisoning from the radioactive contamination,¹¹⁴ and two-hundred-thousand people were displaced.¹¹⁵ The effects were lasting on the population with the Chernobyl Childhood Illness Program finding that children born around or after the disaster had an “increased prevalence of thyroid cancer, thyroid tumors, depression, and suicide ideation.”¹¹⁶ The National Research Centre for Radiation Medicine in Ukraine also found that the Ukrainian workers who helped clean-up the disaster had extreme health defects and only 5.5% were considered *healthy* in 2014.¹¹⁷

Chernobyl is not the only significant nuclear disaster; in fact, there was a concerning nuclear disaster near Harrisburg, Pennsylvania known as the Three Mile Island disaster.¹¹⁸ Although it was created with the most technologically advanced equipment at the time, a nuclear disaster occurred when a pressure valve failed to close in 1979.¹¹⁹ Cooling water from the reactor seeped out with radiation into the neighboring buildings.¹²⁰ The operators were so ill-equipped and under-experienced to deal with such an error that the core of the faulty reactor heated well-above what could be contained.¹²¹ Radioactive steam escaped the plant and spread into the surrounding counties.¹²² Thankfully, no injuries or deaths resulted from the accident,

¹¹⁴ *Id.*

¹¹⁵ Mandler, *supra* note 49.

¹¹⁶ *Id.*

¹¹⁷ *Id.*

¹¹⁸ Cohen, *supra* note 111.

¹¹⁹ *Id.*

¹²⁰ *Id.*

¹²¹ *Id.*

¹²² *Id.*

and no health defects were found within the local population due to the radiation exposure from the accident.¹²³

Another nuclear disaster occurred in 1979 in Japan at the Fukushima Daiichi nuclear power plant.¹²⁴ A 9.1 magnitude earthquake off the coast of Japan triggered a deadly tsunami.¹²⁵ The reactors at the nuclear power plant were manually shutdown to prevent a nuclear disaster, but the backup generators were destroyed by the tsunami.¹²⁶ Without the backup generators pumping water to cool the reactors, fuel rods in the reactors were partially melted and three cores melted and caused several hydrogen explosions.¹²⁷ The nuclear accident did not cause any immediate radiation sickness, but one-hundred-thousand people were evacuated and relocated from their homes.¹²⁸ However, around two-thousand people suffered “disaster-related deaths” from the evacuation and four-hundred-fifty people were exposed to radiation from the contaminated ground.¹²⁹ Three employees were also killed by the tsunami while they were working to prevent a nuclear disaster at the plant.¹³⁰

A nuclear disaster at ZNPP would be devastating for the local community, causing it to be exposed to radiation poisoning immediately.¹³¹ In August of 2022,

¹²³ *Lessons From the 1979 Accident at Three Mile Island*, NUCLEAR ENERGY INSTITUTE, <https://www.nei.org/resources/fact-sheets/lessons-from-1979-accident-at-three-mile-island#:~:text=The%20TMI%20%20accident%20caused,the%20vicinity%20of%20the%20plant.>

¹²⁴ *What are the effects of nuclear accidents?*, *supra* note 112.

¹²⁵ *Id.*

¹²⁶ *Id.*

¹²⁷ *Id.*

¹²⁸ *Fukushima Daiichi Accident*, WORLD NUCLEAR ASSOCIATION (May 2022), <https://world-nuclear.org/information-library/safety-and-security/safety-of-plants/fukushima-daiichi-accident.aspx>.

¹²⁹ *Id.*

¹³⁰ *Id.*

¹³¹ Mandler, *supra* note 49.

residents living within thirty-five miles of ZNPP began receiving potassium iodine pills from the European Union because iodine strengthens the thyroid, the most vulnerable part of the body during radiation exposure.¹³² Four hundred thousand people received them in a preventative health measure, reflecting the seriousness of the ZNPP takeover and potential disaster.¹³³ Millions in the region would be exposed to the danger of a nuclear disaster, and most of Eastern Europe would be affected.¹³⁴ By invading ZNPP, Russian forces exposed and continuously expose the region to the potential of nuclear disaster and the health consequences that follow.

The potential for a nuclear disaster and the deleterious consequences illustrates the need for a treaty prohibiting the use of nuclear power plants as battlegrounds during armed conflict. Preventing a takeover of a nuclear power plant and implementing immediate remedial measures when a takeover occurs would preclude a situation like this from happening.

B. The Importance of Energy

The takeover of ZNPP is part of Russia's military strategy to destroy Ukrainian infrastructure.¹³⁵ Destroying the energy infrastructure has left Ukrainians in sweeping blackouts, leaving Ukrainians with no access to heat during winter blackouts which posed serious health concerns for the population.¹³⁶ Zaporizhzhia is a key stronghold in withholding electricity from Ukrainians because it provides one-

¹³² *Id.*

¹³³ *Id.*

¹³⁴ *Id.*

¹³⁵ Leceister, *supra* note 53.

¹³⁶ *Id.*

fifth of the country's energy. Without its energy production, Ukrainians do not have access to the amount of energy that they had before the war.¹³⁷

Russia has also used energy as leverage in the war in Ukraine and against Ukrainian allies.¹³⁸ Sanctions against Russia are heavily relied on as a non-violent method to support Ukraine; however, European countries became dependent on Russian natural gas in their energy infrastructures which presented them with a hard choice to make when the war began.¹³⁹ The choices were to either use Russian natural gas to maintain fuel levels, or sanction Russian natural gas to weaken Russia and pressure it to withdraw its troops from Ukraine.¹⁴⁰ This challenge stresses the necessity of diversification of a country's energy infrastructure to clean and renewable energy.¹⁴¹

As a result of Russia's aggression against Ukraine, European countries have had to source liquified natural gas from outside of Europe, begin burning more coal, and reverse nuclear phaseout steps to accommodate this challenge to become less dependent on Russian natural gas.¹⁴² The Russia-Ukraine war has propelled Europe to change its energy infrastructure from fossil fuels to renewable energy.¹⁴³ Across Europe, energy efficiency has also played a key role in lowering energy consumption,

¹³⁷ *Id.*

¹³⁸ Johann David Wadephul, *The War against Ukraine and the World Order*, 21 HORIZONS: J. INT'L RELATIONS AND SUSTAINABLE DEV. 106, 113 (2022).

¹³⁹ Marc Ozama, *The Russia-Ukraine war and the European energy crisis*, NATO DEFENSE COLLEGE 41, 49 (Thierry Tardy ed. 2022).

¹⁴⁰ *Id.*

¹⁴¹ Wadephul, *supra* note 138.

¹⁴² Ozama, *supra* note 138.

¹⁴³ Rebecca Leber, *What Europe showed the world about renewable energy*, VOX (Feb. 21, 2023, 8:00 AM), <https://www.vox.com/climate/2023/2/21/23594544/europe-electricity-natural-gas-renewable-energy-russia>.

specifically by switching to electric heat pumps and setting thermostats a couple degrees below normal.¹⁴⁴ On February 5, 2023 almost a year after Russia invaded Ukraine, the European Union placed a ban on purchases of Russian gasoline, diesel fuel, and other refined petroleum products which solidifies their commitment to retiring their reliance on Russia for energy.¹⁴⁵

How Europe was forced to change its energy infrastructure emphasizes how much leverage Russia had prior to the war and the importance of energy to international humanitarian law. Energy is integral to society and should be considered a necessity to mankind. Throughout the history of war, treaties and conventions have provided protections for the foundations of society to be able to continue during war.¹⁴⁶ In Article 23 of the Treaty of 1785 between the United States and Prussia, a provision provided that:

[I]f war should arise between the contracting parties, ‘all women and children, scholars of every faculty, cultivators of the earth, artisans, manufacturers and fishermen, unarmed and inhabiting unfortified towns, villages or places, and in general all others whose occupations are for the common subsistence and benefit of mankind, shall be allowed to continue their respective employments.

Article 23 articulates the necessity of allowing non-combatants to continue their professions during wartime.¹⁴⁷ Non-combatants being able to continue with their

¹⁴⁴ *Id.*

¹⁴⁵ Richard Martin, *Sanctions against Russia – a timeline*, S&P GLOBAL (April 13, 2023), <https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/sanctions-against-russia-8211-a-timeline-69602559>. On March 8, 2022, the United States banned all imports of Russian oil, gas, and other energy. Other sanctions placed on Russia include sanctions on Kremlin elites, oligarchs, Russian banks, platinum, jewelry, gold, technology industry, etc. *Id.*

¹⁴⁶ *The Paquete Habana*, 175 U.S. 677 (1900).

¹⁴⁷ *Id.*

daily pre-war lives harks back to the basis of international humanitarian law that civilians should not suffer unnecessarily during war.¹⁴⁸

The structure of society depends on consistent energy use, such that allowing war to interfere with energy infrastructure may violate international humanitarian law. Additionally, forcing civilian nuclear power plant personnel to work under military rule certainly violates international humanitarian law and customary international law. A treaty that prohibits the takeover of nuclear power plants by militaries would further support the energy infrastructure and protect civilians from the calamities of war and unnecessary suffering. Codifying this treaty would illustrate the progression of international humanitarian law's adaptation to the ever-changing energy infrastructure and development of nuclear technology.

V. THE INTERNATIONAL ATOMIC ENERGY AGENCY

The United Nations has codified customary rules of war to prevent unnecessary suffering.¹⁴⁹ The formation of the International Atomic Energy Agency ("IAEA") is one example of these formal codifications. In 1957, the United Nations orchestrated the creation of the IAEA to aid in its goal of preventing unnecessary suffering.¹⁵⁰ The development of nuclear technology, while innovative, created a deep fear in the general population, and the IAEA was created to implement safety

¹⁴⁸ Declaration Renouncing the Use, in Time of War, of Explosive Projectiles Under 400 Grammes Weight, *supra* note 64.

¹⁴⁹ *Russia, Ukraine & International Law: On Occupation, Armed Conflict and Human Rights*, *supra* note 86.

¹⁵⁰ *History*, INTERNATIONAL ATOMIC ENERGY AGENCY, <https://www.iaea.org/about/overview/history#:~:text=The%20IAEA%20was%20created%20in,Nations%20on%208%20December%201953>.

precautions and regulations to help stifle these fears.¹⁵¹ Article II of IAEA's Charter states that:

The Agency shall seek to accelerate and enlarge the contribution of atomic energy to peace, health, and prosperity throughout the world. It shall ensure, so far as it is able, that assistance provided by it or at its request or under its supervision or control is not used in such a way as to further any military purpose.¹⁵²

While the IAEA wanted its standards to be legally binding, its standards has never been agreed upon.¹⁵³ What has given the IAEA the most international sway is its response in aiding the mitigation of severe nuclear disasters such as Three Mile Island and the Chernobyl disasters.¹⁵⁴

The IAEA is generally criticized for not having legally binding standards and for not being progressive enough to deal with modern problems.¹⁵⁵ A “[p]rohibition of armed attack or threat of attack against nuclear installations, during operation or under construction” has been raised before the IAEA before in 2009.¹⁵⁶ At the IAEA General Conference's Eleventh Meeting of the Fifty-third Regular Session held at its headquarters in Vienna, the Islamic Republic of Iran requested that the prohibition be included in the agenda.¹⁵⁷ Iran's motion was supported by Egypt and the Republic of Syria.¹⁵⁸

¹⁵¹ *Id.*

¹⁵² *Id.*

¹⁵³ *Id.*

¹⁵⁴ *Id.*

¹⁵⁵ Int'l Atomic Energy Agency [IAEA], Record of the Eleventh Meeting, IAEA Doc. GC(53)/OR.11 (Sept. 18, 2009).

¹⁵⁶ *Id.*

¹⁵⁷ *Id.*

¹⁵⁸ *Id.*

Iranian representative Soltanieh rationalized that “sustainable development and nuclear energy applications were highly dependent on the safe and secure management of nuclear energy.”¹⁵⁹ Passing a resolution that prohibited an armed attack or threat of attack would help encourage the public perception of support for developing the peaceful use of nuclear energy because accidents and military attacks have in the past deteriorated that perception.¹⁶⁰ Soltanieh also said that the accident in Chornobyl illustrates that radioactive material is not constrained by international boundaries and any release of radioactive material has serious consequences.¹⁶¹ He also stressed that it is the IAEA’s duty to be responsible for promoting “the peaceful and safe use of nuclear energy.”¹⁶² Explaining why the resolution for the prohibition would not be passed, the IAEA president cited that the political environment prevents action leading to the creation of a legally binding instrument as an

¹⁵⁹ *Id.*

¹⁶⁰ IAEA, *supra* note 155.

¹⁶¹ *Id.*

¹⁶² The proposal contained multiple provisions that create a resolution aimed to secure nuclear power plants during war or armed conflict:

“[Iran] proposed that the General Conference should: a) Deplore any threat of attack or attack against any nuclear installation and enact appropriate collective punitive measures vis-à-vis possible violators, in accordance with the Statute of the Agency and the United Nations Charter; b) Request the Director General to study the feasibility of starting negotiations, under the auspices of the Agency, with a view to concluding a legally binding international instrument to prevent the attack or threat of attack against nuclear installations; c) Request the Director General to explore the possibility of using the texts of two post-Chernobyl conventions, the Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, as a model for early notification and mutual assistance in case of an armed attack against nuclear facilities and, in that context, request the Director General to establish an emergency assistance mechanism at the Agency’s Headquarters in Vienna similar to that which exists for nuclear accidents, to render technical assistance to Member States that have been attacked, upon request, inter alia radiation protection assistance; d) Encourage all Member States to render, upon request, immediate technical and humanitarian assistance to any Member States whose nuclear installations have been subjected to an armed attack; and e) Request the Director General to include the item under discussion in the agenda for the 54th regular session of the General Conference . . .” *Id.*

international preventative measure for military attacks against nuclear installations.¹⁶³ The resolution was tabled for a time in the future.¹⁶⁴

While in 2009, the main countries concerned with prohibiting attacks on nuclear facilities were located in the Middle East;¹⁶⁵ today, however, countries around the world should be concerned about protecting their nuclear facilities because Russia showed how easily its military forces seized ZNPP and threatened its stability.¹⁶⁶ As the Iranian representative Soltanieh emphasized before, nuclear disasters are not constrained by international borders.¹⁶⁷ After witnessing the takeover of ZNPP, more countries should support a multilateral treaty prohibiting the use of a nuclear power plant as a battleground during an armed conflict.

VI. RECOMMENDATION: A MULTILATERAL TREATY SHOULD BE ADOPTED

Article 38(1) of the Statute of the International Court of Justice states the widely accepted sources of international law: international conventions, customary international law, general principles of law, and previous judicial decisions for that particular court.¹⁶⁸ International conventions, or treaties, are like contracts holding signatory parties accountable to express duties.¹⁶⁹ In the modern era, treaties are the most extensively used in international law because they clearly articulate the legal

¹⁶³ *Id.*

¹⁶⁴ *Id.*

¹⁶⁵ *Id.*

¹⁶⁶ Brumfiel, *supra* note 2.

¹⁶⁷ IAEA, *supra* note 155.

¹⁶⁸ Statute of the International Court of Justice art. 38, April 18, 1946, 33 U.N.T.S. 993.

¹⁶⁹ Mark Weston Janis, John E. Noyes, & Leila Nayda Sadat, *International Law*, AMERICAN CASEBOOK SERIES, 31 (6th ed. 2020).

rule and are subject to acceptance by states which makes the terms and acceptance of the treaty unambiguous.¹⁷⁰

Military rules need to be clear for them to be easily followed, so the clear articulation of treaty terms would be best to create a new military rule. Treaties should also clearly show the acceptance of signatory parties to create less ambiguity, especially in a time sensitive matter like the takeover of a nuclear power plant. As demonstrated above in the careful listing of customary international law and general principles, the takeover of ZNPP violates multiple conventions, international humanitarian law, and the general principle of proportionality. A multilateral treaty would clearly articulate the terms to prohibit the takeover of a nuclear power plant during war and the terms of the parties in response to a takeover of a nuclear power plant during war.

While some states have been urging for the adoption of a treaty that would prohibit the attack of nuclear power plants during armed conflict and the historical record has shown the necessity of such a multilateral treaty, the Russian takeover of the ZNPP solidifies this need.¹⁷¹ The treaty should encompass the deterrence of such an attack, the response by signatory parties if a nuclear facility is attacked, how it would be implemented, what role the United Nations would play, what role the IAEA would play, and the execution of the treaty itself.

¹⁷⁰ *Id.*

¹⁷¹ IAEA, *supra* note 155.

A treaty that prohibits takeover of a nuclear power plant would need to be implemented much stronger than how the IAEA enforces its policies currently.¹⁷² Real consequences would have to be immediate and implemented by the signatory states to ensure the treaty is enforceable. A strategy proffered by the IAEA in response to the takeover of ZNPP is turning a nuclear facility into a demilitarized zone with a neutral party providing protection to the facility and its civilian employees.¹⁷³

The United Nations peacekeeping services have the potential to be used to fend off any further attack or imminent attack. The hypothetical nuclear facility would have to be turned into a demilitarized zone in accordance with international law. As the IAEA currently provides assistance in monitoring nuclear facilities across the globe, it would be easiest for Agency members to contribute to maintenance and repairs to the facility because it would prevent the terroristic attacks on civilian employees by the belligerent party.¹⁷⁴

Proposed language for a treaty would be:

Any armed attack on and threat against nuclear facilities devoted to peaceful purposes constitutes a violation of the principles of the United Nations Charter, international law and the Statute of the International Atomic Energy Agency. Any such attack requires the immediate stop of violence and deployment of United Nations peacekeeping services to the nuclear facility. The International Atomic Energy Agency will provide assistance to the facility in any way necessary, including but not limited to, continued maintenance of the facility, replacement of damaged parts, and protection of the reactors from overheating. Any actor of an attack

¹⁷² *Id.*

¹⁷³ *Boss of Ukraine's Russian-occupied Zaporizhzhia Nuclear Power Plant released after "illegal detention," supra note 38.*

¹⁷⁴ *History, supra note 150.*

will be provided a full prosecution by the International Criminal Court for violating this treaty and the principles of the United Nations Charter, international law, and the Statute of the International Atomic Energy Agency.

States should ratify a multilateral treaty, particularly in light of this current political climate and the heightened stress of the war in Ukraine. The Russian takeover of ZNPP shows the necessity of a treaty to provide reassurance to civilian nuclear power plant employees.¹⁷⁵ In addition to the civilian lives at stake when a nuclear power plant is taken over, it would also prevent catastrophic events from occurring.¹⁷⁶ As shown by the reactions of experts and politicians to bullets barely missing the nuclear reactors during the Russian takeover of the ZNPP, nuclear facilities are fragile. Shooting and launching military weapons towards reactors can cause meltdowns if a reactor gets hit or if a safety mechanism is destroyed.¹⁷⁷

Although there are many reasons to create and enforce a treaty prohibiting attacks on nuclear power plants, there is a strong military rationale against such treaty. Destroying a source of energy is detrimental to a country and its population which would accelerate and pressure surrender.¹⁷⁸ Countries can be easily overtaken when targeting energy infrastructure.¹⁷⁹ However, the potential effects of a nuclear disaster outweigh any military strategy to takeover a nuclear power plant. Rules of war are maintained to prevent unnecessary suffering and military strategy can be restricted to protect non-combatants.

¹⁷⁵ Mandler, *supra* note 49.

¹⁷⁶ *Id.*

¹⁷⁷ Brumfiel, *supra* note 2.

¹⁷⁸ Leceister, *supra* note 53.

¹⁷⁹ *Id.*

Having a designated treaty to deter attacks on nuclear facilities and a method in place for when an attack occurs would help prevent another takeover like the one at ZNPP from occurring. As the IAEA calls for Russia and Ukraine to agree on a de-militarized zone and withdrawal of military forces, a treaty in place would have automatically established a de-militarized zone once the ZNPP was attacked.¹⁸⁰ The Ukrainian personnel at ZNPP would not be subject to harsh treatment by Russian forces, their loyalty would not be questioned, and they would not be placed under such stressful conditions that could lead to human error and a nuclear disaster.¹⁸¹ The Zaporizhzhia region, Ukraine, and Eastern Europe, as a whole, would be less worried for nuclear disaster, environmental damage, radiation poisoning, and the unavailability of energy.¹⁸² A treaty prohibiting attacks on nuclear facilities and articulating what to do in case of an attack would have alleviated the situation at the ZNPP.

VII. CONCLUSION

Ukrainians are still fearful of another Chernobyl Nuclear disaster.¹⁸³ When Russian forces invaded Ukraine through the Chernobyl region and took over the ZNPP a week later, Ukrainians were yet again reminded of the vulnerability of their nuclear power plants.¹⁸⁴ The Chernobyl nuclear disaster, the Three Mile Island nuclear disaster, and the Fukushima Daiichi nuclear disaster all emphasize the

¹⁸⁰ *Boss of Ukraine's Russian-occupied Zaporizhzhia Nuclear Power Plant released after "illegal detention," supra note 38.*

¹⁸¹ Woodward, *supra* note 48.

¹⁸² Mandler, *supra* note 49.

¹⁸³ *Appeal to the World Community of the Board of the State Nuclear Regulatory Inspectorate of Ukraine, supra note 30.*

¹⁸⁴ *Id.*

consequences of a nuclear disaster to the human population surrounding the facilities and to the environment. Those consequences are lasting, and a multilateral treaty would help prevent a nuclear disaster from occurring during times of war.

Moreover, the violence that the non-combatant civilian personnel experienced during the ZNPP takeover and the shelling that the ZNPP facilities experienced both show the costly outcome of preventing attacks on a nuclear facility.¹⁸⁵ International humanitarian law provides for the protection of civilians from the calamities and sufferings of war.¹⁸⁶ The evolution of prohibiting certain weapons and military tactics to protecting the environment during war illustrates the possibility for development further in protecting nuclear facilities during armed conflict. It also provides the foundation for justification for such a treaty.¹⁸⁷ Further support for a multilateral treaty lies in the protection of the energy infrastructure.¹⁸⁸ Energy is vital to societal infrastructure and should not be disturbed during wartime. The IAEA has been approached by multiple countries before about prohibiting attacks on nuclear facilities, but the political environment was not right at the time.¹⁸⁹

With the Russian takeover of ZNPP, the time has come for action. A treaty prohibiting the use of nuclear facilities as battleground would be instrumental in furthering the IAEA's goal of using atomic energy to garner peace. A multilateral treaty prohibiting military takeover of nuclear power plants is necessary to prevent

¹⁸⁵ *Updated information about Zaporizhzhia NPP (15:00)*, *supra* note 3.

¹⁸⁶ Goldblat, *supra* note 62.

¹⁸⁷ *Russia, Ukraine & International Law: On Occupation, Armed Conflict and Human Rights*, *supra* note 86.

¹⁸⁸ Ozama, *supra* note 139.

¹⁸⁹ IAEA, *supra* note 155.

the suffering of civilians and potential environmental disaster. The treaty should establish nuclear facilities as de-militarized zones, deploy United Nations peacekeeping forces, use IAEA agents to monitor the safety and regulation of the nuclear facilities, and maintain the nuclear facilities to prevent nuclear disaster.