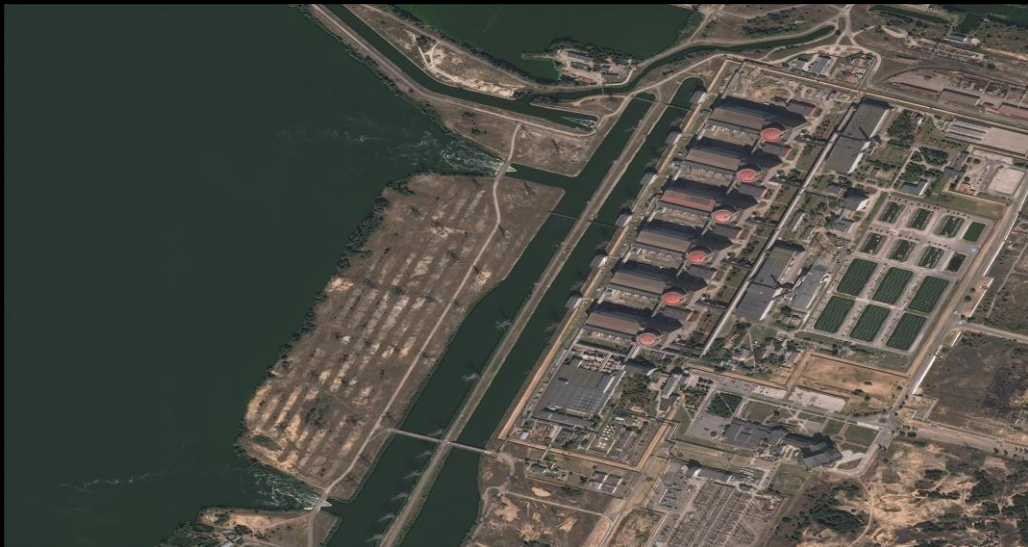


Protection of Nuclear Facilities and Japan's Role

**— In Response to Russian Invasion of Ukraine and
Attacks on Nuclear Power Plants —**



Zaporizhzhia Nuclear Power Plant: © Maxar Technologies, Inc. (October 2022)

**Study Group on Nuclear Non-Proliferation and Nuclear Security
Security Studies Program
Sasakawa Peace Foundation (SPF)
February 2023**

About the Study Group on Nuclear Non-Proliferation and Nuclear Security

In a bid to contribute to the peace and stability of Japan, Asia, and the world, the Sasakawa Peace Foundation (SPF) established the International Peace and Security Department (now named the Security Studies Program) to engage in relevant research activities and make policy recommendations based thereon.

In September 2018, the department launched research to explore how Japan, as a forerunner in the civilian use of nuclear energy and the only country to have suffered nuclear attacks in war, can contribute to nuclear non-proliferation in the world. A broad range of themes—including international management of plutonium, denuclearization of North Korea, global nuclear disarmament efforts, and Japan’s role in the face of the rise of Russia and China in the international nuclear market—have been studied to date, leading to the publication of a series of policy recommendations.

In fiscal 2021, we set up a Study Group on Nuclear Non-Proliferation and Nuclear Security (hereinafter “Study Group”), with the addition of some new members, to explore ways to improve the effectiveness of monitoring and surveillance (safeguards) of nuclear facilities and nuclear material by the International Atomic Energy Agency (IAEA), an activity critical to the promotion of nuclear non-proliferation, and to enhance nuclear security in the face of the emergence of new threats such as cyberattacks. On February 24, 2022, when the discussion at the Study Group was underway, Russian troops launched an invasion of Ukraine, attacking and seizing the Chernobyl and Zaporizhzhia Nuclear Power Plants (NPPs) shortly afterwards. The Russian act sent shock waves around the world as it posed a real danger, in which even the slightest misstep could lead to a devastating disaster involving a massive release of radioactive substances. In view of this state of affairs, in July 2022 we compiled and published a set of urgent recommendations on how to address shortcomings of international conventions governing the protection of nuclear facilities in wartime, what protection measures should be implemented to safeguard such facilities, and how to ensure international nuclear fuel supplies and enhance nuclear safety management in the future.

We have since continued to discuss possible international frameworks for nuclear facility protection in wartime. Today, one year since the start of the Russian invasion of Ukraine, we once again make recommendations regarding the roles of international agencies and individual countries in ensuring the protection of nuclear facilities, as well as on issues Japan should address as the host country of this year’s G7 Summit.

The policy recommendations contained herein have been supported by the members of the Study Group. However, the Study Group itself does not take any specific position on the civilian use of nuclear energy.

Members of the Study Group

Chairman:

Tatsujiro Suzuki, Vice-Director/Professor, Research Center for Nuclear Weapons Abolition, Nagasaki University (RECNA)

Members:

Isao Itabashi, Chief of Institute for Analysis and Studies, Council for Public Policy (CPP)

Sukeyuki Ichimasa, Senior Fellow, National Institute for Defense Studies (NIDS)

Tomonori Iwamoto, Director, Institute of Nuclear Materials Management (INMM) Japan Chapter

Masakatsu Ota, Editorial Committee Member, Kyodo News

Heigo Sato, Professor, Faculty of International Studies, Takushoku University

Yosuke Naoi, Director, Integrated Support Center for Nuclear Nonproliferation and Nuclear Security (ISCN)

Kazuko Hikawa, Professor, Osaka Jogakuin University Graduate School

Wakana Mukai, Assistant Professor, Faculty of International Relations, Asia University

Background to Recommendations

— Enhancing Protection and Reducing Risks of Nuclear Facility in Wartime —

The Russian invasion of Ukraine on February 24, 2022 reawakened the world to the nuclear threat. Since the launch of the invasion, Russian President Vladimir Putin has not only repeatedly used the tactic of nuclear blackmail, which is unforgivable in itself, but also taken military action against nuclear facilities for peaceful use, a reckless act which was previously considered taboo. Shortly after invading Ukraine, Russian forces attacked and seized the Chernobyl Nuclear Power Plant (NPP) in northern Ukraine and the Zaporizhzhia NPP—the largest in Europe—in the southeastern part of the country. Although Russian troops withdrew from the Chernobyl NPP at a relatively early stage, they have continued to occupy the Zaporizhzhia NPP, turning it into a military base and using it as a nuclear shield against counterattacks from Ukraine. Areas around the Zaporizhzhia NPP have since been subjected to repeated shelling, which has caused damage to power lines and transformer stations, and hence a loss of external power supply to the power plant, forcing it time and again to rely on emergency diesel generators to cool down its reactors. There is serious concern over the possibility that damage to any of its reactors or spent fuel storage facilities could trigger a massive release of radioactive substances affecting vast regions of Europe. The ongoing crisis shows no signs of abating, with both Russia and Ukraine continuing to blame each other for the attacks.

Before Zaporizhzhia, there had been several cases of military attacks on nuclear facilities, such as Israeli aerial bombing of an Iraqi research reactor. However, in each of those cases, nuclear fuel rods had not been loaded at the time of the strike. Zaporizhzhia is the first active nuclear power plant that has been attacked and seized by military forces. This is an unprecedented incident that goes beyond what had been assumed under the conventional concept of nuclear security.

The shelling of the Zaporizhzhia NPP has exposed the real risk of a nuclear catastrophe, one that would entail massive radioactive contamination. All the while, however, the international community has been unable to respond effectively. If we are to elevate the effectiveness of nuclear facility protection in wartime, we need to learn hard lessons from this war and make a conceptual paradigm shift with an eye to legal changes and bold organizational restructuring, because both international law and the United Nations, as they stand today, are ill-prepared.

Against this backdrop, in July 2022 the Study Group on Nuclear Non-Proliferation and Nuclear Security, a research project of the Sasakawa Peace Foundation, published a set of urgent policy recommendations to the Japanese government, in which we primarily focused on measures for enhancing nuclear security, pointing to shortcomings of the Protocol I Additional to the Geneva Conventions, which in principle prohibits military attacks on nuclear power plants.¹ We have since continued to discuss measures to protect nuclear facilities

¹ Urgent Recommendations “[Russian Invasion of Ukraine: Challenges in the Civilian Use of Nuclear Energy and Japan’s Role](#),” July 1, 2022, Sasakawa Peace Foundation.

in wartime, which go beyond the conventional realm of nuclear security.

Based on this discussion, we have decided to present another set of recommendations, this time focusing on the protection of nuclear facilities—including nuclear power plants—in wartime, the roles of international agencies and individual countries in ensuring it, and issues Japan should address in this regard.

In May 2023, the G7 Summit meeting will be held in Hiroshima, a city once destroyed by an atomic bomb. As the host of the upcoming Summit and a forerunner in the civilian use of nuclear energy, Japan should play an active and leading role in efforts to enhance nuclear facility protection and mitigate risks in wartime, drawing on the experience and lessons of the accident at Tokyo Electric Power Company's Fukushima Daiichi Nuclear Power Station (NPS). We hope that these recommendations will be of help, so that Japan can effectively communicate to the international community its unique contribution based on such experience and lessons.

Recommendations

1. Protection of nuclear facilities² in wartime

Nuclear facility protection in wartime is inadequate as it stands today. The UN Security Council has been unable to fulfill its functions, resulting in its inability to properly intervene in the protection of nuclear facilities. Thus, it is necessary to develop a new mechanism for enabling the International Atomic Energy Agency (IAEA) to assist with the protection of nuclear facilities in consultation with the warring parties and neighboring countries. We call on the government to consider mechanisms, for instance, for establishing “nuclear safety and security protection zones” as proposed by the IAEA; cooperating with the International Committee of the Red Cross (ICRC), an agency with a proven record for its activities in war zones; and dispatching a “nuclear emergency safety mission (NESM)” by resolution of the UN General Assembly in readiness for cases where the UN Security Council fails to function properly. The international community should immediately start discussing ways to develop such mechanisms, and Japan should take a lead in the discussions.

2. Future steps, including changes to international law, for enhancing nuclear facility protection

There is an urgent need for the international community to start discussing steps—and challenges faced—toward achieving a complete ban on military attacks on nuclear facilities by amending or adding new provisions to the Geneva Conventions, which prohibit military attacks on nuclear power plants only in principle, as well as to nuclear-related international conventions, with an eye to cases in which a country with nuclear facilities or a neighboring country engages in war. As a forerunner in the civilian use of nuclear energy, Japan should propose concrete measures and take a lead in international discussions to reform international law and establish a new set of international principles.

² The term “nuclear facilities” in this report refers to facilities in which nuclear material is present, such as nuclear power plants, research reactors, nuclear fuel cycle facilities, and spent nuclear fuel storage facilities (including those used for military purposes). This is based on the definition provided in Article 1, paragraph 3 of the International Convention for the Suppression of Acts of Nuclear Terrorism (Nuclear Terrorism Convention) as shown below:

Article 1, paragraph 3. “Nuclear facility” means:

- (a) Any nuclear reactor, including reactors installed on vessels, vehicles, aircraft or space objects for use as an energy source in order to propel such vessels, vehicles, aircraft or space objects or for any other purpose;
- (b) Any plant or conveyance being used for the production, storage, processing or transport of radioactive material.

Recommendation 1:

Nuclear facility protection in wartime is inadequate as it stands today. The UN Security Council has been unable to fulfill its functions, resulting in its inability to properly intervene in the protection of nuclear facilities. Thus, it is necessary to develop a new mechanism for enabling the International Atomic Energy Agency (IAEA) to assist with the protection of nuclear facilities in consultation with the warring parties and neighboring countries. We call on the government to consider mechanisms, for instance, for establishing “nuclear safety and security protection zones” as proposed by the IAEA; cooperating with the International Committee of the Red Cross (ICRC), an agency with a proven record for its activities in war zones; and dispatching a “nuclear emergency safety mission (NESM)” by resolution of the UN General Assembly in readiness for cases where the UN Security Council fails to function properly. The international community should immediately start discussing ways to develop such mechanisms, and Japan should take a lead in the discussions.

After invading Ukraine, Russia went on to take reckless actions, launching military attacks on and seizing the Zaporizhzhia NPP, an active nuclear power plant. In March 2022, immediately after the Russian seizure of the nuclear power plant, the IAEA set out “Seven Pillars,”³ a set of imperatives that must be met to prevent a catastrophe resulting from armed attacks on nuclear facilities and to ensure nuclear safety and security, calling on both Russia and Ukraine to restrain themselves from engaging in armed conflict in the vicinity of nuclear power plants. The Seven Pillars—including the physical integrity of nuclear facilities and secure off-site power supply—are indispensable elements in ensuring the safe and secure management of nuclear reactors. In September 2022, under the agreement between both the Russian and the Ukrainian government, the IAEA sent an inspection team, including Director General Rafael Mariano Grossi, to the Zaporizhzhia NPP. Two IAEA staff members have since been stationed on a permanent basis to monitor the situation there. Japan and other IAEA member states have been contributing to these efforts.⁴ In December 2022, the IAEA announced that it would send safety and security experts to three other active nuclear plants in Ukraine, based on agreement with the Ukrainian government.⁵

In the ongoing crisis, the UN Security Council has been unable to function properly as Russia, one of the warring parties, is a member. Against this backdrop, the IAEA, after consulting with the warring parties on

³ See Appendix 1.

⁴ For instance, the Japanese government has provided 2 million euro of assistance, including four bulletproof vehicles, to the IAEA.

⁵ [“Ukraina Zen-Genpatsu ni IAEA Senmonka ga Jochu e: Rosia-gun no Shuchu Kogeki de Shien Kyoka \[IAEA Experts to Be Stationed Permanently at All Nuclear Power Plants in Ukraine: Stepping up Support in Response to Concentrated Attacks by Russia\].”](#) *Yomiuri Shimbun*, December 14, 2022.

its own initiative, stepped in directly to secure the safety of nuclear power plants in Ukraine. The presence of the IAEA on the site has neither led to the cessation of attacks on areas around the Zaporizhzhia NPP nor eliminated the risk of a massive release of radioactive substances. However, it is meaningful that the IAEA's efforts have, to some extent, mitigated certain nuclear proliferation and security concerns, such as those over the inappropriate handling, theft, and diversion of nuclear material. Also of significant importance is the fact that the IAEA has managed to intervene to secure the safety of nuclear power plants after consulting directly with and gaining consent from the warring parties.

In the future, a similar situation could quite possibly arise, where a country with nuclear facilities enters war and the UN Security Council is unable to fulfill its role due to confrontation between member states. Based on the ongoing experience, we should start a serious discussion to develop a mechanism for enabling the IAEA to consult directly with warring countries and help protect nuclear facilities.

Firstly, in order to ensure the fulfillment of the Seven Pillars, it is important to bring together warring parties and neighboring countries to discuss the establishment of “nuclear safety and security protection zones” as proposed by the IAEA. For instance, although there were political twists and turns in the process, Russia and Ukraine managed to agree on the “Black Sea Grain Initiative⁶” in view of humanitarian needs. It is worthwhile examining the possibility of using such a localized ceasefire scheme as a means to protect nuclear facilities.

Secondly, another promising possibility is to create a mechanism under which to obtain the assistance and cooperation of the ICRC, an agency highly trusted by the international community with a proven record for its humanitarian aid in war zones. Indeed, the ICRC has a history of being the first to call on the international community to legislate the protection of nuclear power plants in wartime. Draft rules for the protection of civilian populations in time of war, prepared by the ICRC in 1956, call for rendering nuclear power plants immune from military attacks by agreement between the parties.⁷ In the case of the ongoing Russian invasion of Ukraine, ICRC Director-General Robert Mardini, who visited Ukraine shortly before the dispatch of the IAEA inspection team to the Zaporizhzhia NPP, said, “It is encouraging that a team from the IAEA is now on its way to Zaporizhzhia to inspect the damage.” He expressed his support for the IAEA's activities, noting that a nuclear leak—should it happen—would make it “difficult if not impossible to provide humanitarian assistance.”⁸

As such, there is significant room for cooperation between the IAEA and the ICRC, both of which have high

⁶ Due to the Russian invasion of Ukraine in February 2022, the maritime transport of grain via the Black Sea was blocked. This caused a sharp rise in global food prices, particularly those of wheat, and concern was raised over the possibility of a famine in low-income countries. Thus, with the help of UN Secretary General Antonio Guterres, Turkey, which has a degree of influence on maritime transportation in the Black Sea, mediated talks with Russia aimed at resuming grain exports from Ukraine. As a result, on July 22, 2022, Ukraine and Russia reached agreement on the Black Sea Grain Initiative, which sets forth procedures to safely export Ukrainian grain from designated ports.

⁷ Lecture by Akira Mayama, professor, Osaka Gakuin University, at the 13th meeting of the Study Group on Nuclear Non-Proliferation and Nuclear Security, Sasakawa Peace Foundation, on November 16, 2022.

⁸ “[ICRC Director-General in Ukraine: Concern over nuclear plant situation and access to prisoners of war.](#)” Statement by ICRC Director-General Robert Mardini on September 1, 2022.

credibility internationally. Given the enormous potential impacts that armed attacks on nuclear facilities could have on human lives and health as well as on the environment, and considering the daunting difficulties involved in the task of protecting nuclear facilities in the midst of warfare, an extremely perilous situation, creating a mechanism for collaboration and cooperation between the ICRC, an international humanitarian organization conducting dialogues with all warring parties from a neutral standpoint, and the IAEA, an agency offering support to ensure the safety of the world's nuclear facilities as one of its key tasks, is one possible option.

The fact that it is considered possible to provide a legal basis for IAEA activities under existing international law also adds momentum to moves to establish such a new mechanism. Article 56 of the Protocol I Additional to the Geneva Conventions (hereinafter, "Additional Protocol I") calls on warring parties to conclude voluntary agreements, as provided for thereunder, to prohibit in principle attacks against nuclear power plants.⁹ This provision is internationally regarded as partially reflecting the draft rules for nuclear facility protection proposed by the ICRC in 1956,¹⁰ and it is consistent with the intent of this provision that the IAEA and the ICRC help warring parties to conclude such voluntary agreements.

Next, it is necessary to provide for the roles of warring parties as well as those of neighboring countries. Article 56 of Additional Protocol I simply provides for the principle that nuclear power plants must not be made the object of attack, and thus, other nuclear facilities are not subject to protection. In addition, the possibility of attacking nuclear power plants is not necessarily completely ruled out, as there remains room for tolerating attacks on a nuclear power plant if it is of significant military importance, for instance, as a major electricity source for military facilities. Therefore, in the event that a country falls into a state of war, it needs to immediately shut down the operations of its nuclear facilities to reduce the risk of severe accidents and segregate such facilities from military operations. Eliminating the military nature of nuclear facilities will provide a clearer legal basis for seeking special protection for such facilities. Also, if it is anticipated that the halting of nuclear power plant operations will result in a severe electricity shortage, it is necessary to establish a mechanism for enabling the country to receive energy assistance from its neighbors.

However, under a system where the IAEA, with support and assistance from the ICRC, assumes the leading role in protecting nuclear facilities in time of war, the safety of officials engaged in on-site activities is far from guaranteed.¹¹ Ideally, the necessary measures would be endorsed by the UN Security Council. Still, it is desirable to have an alternative framework in place to allow, by means of a UN General Assembly resolution, the dispatch of security forces or guards carrying the minimum weapons needed for self-defense, even if the UN Security Council is unable to function properly.¹²

⁹ See Appendix 2 for Article 56 of Protocol I Additional to the Geneva Conventions.

¹⁰ Lecture by Akira Mayama, professor, Osaka Gakuin University, at the 13th meeting of the Study Group on Nuclear Non-Proliferation and Nuclear Security, Sasayama Peace Foundation, on November 16, 2022.

¹¹ The 1994 Convention on the Safety and Security of United Nations and Associated Personnel provides that the government of a host state has the primary duty to ensure the safety and security of UN officials. When IAEA officials engage in activities to protect nuclear facilities in a way similar to what is observed in Ukraine today, the duty to protect their safety and security rests with the warring countries.

¹² The deployment of United Nations Emergency Force (UNEF) troops to monitor a ceasefire in the 1956 Suez Crisis can be cited as a past

We propose the establishment of a new framework under which to dispatch what is tentatively called a “Nuclear Emergency Safety Mission (NESM),” comprising national forces of countries not party to the conflict, by a resolution of the UN General Assembly in the event that a country with a nuclear facility enters into war *and* the UN Security Council has fallen into a state of incapacity. However, the realization of this proposed scheme is premised on the presence of a localized ceasefire agreement as discussed earlier.¹³ The task of the mission would be to monitor a ceasefire and secure the safety of IAEA and ICRC officials and associated staff, so that they could smoothly carry out their activities to protect nuclear facilities.

Lastly, we would like to touch on the role of Japan. Japan should take a lead in international discussions on nuclear facility protection in wartime, including the creation of a new framework within the United Nations. At the G7 Summit in Hiroshima in May 2023, it should commit to contributions to strengthen nuclear facility protection, seeking the understanding of other G7 members.

As a forerunner in the civilian use of nuclear energy, Japan has long endeavored, in full cooperation with the IAEA, to promote the existing nuclear non-proliferation regime based on the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). Japan is the world’s 14th largest donor to the ICRC and the only Asian country listed among the top 20 donors, contributing some 227.8 billion yen in 2019,¹⁴ while its assessed contribution to the United Nations is the third largest in the world. As such, Japan is well qualified to lead international discussions. Also, having experienced the Fukushima Daiichi nuclear accident, Japan has a responsibility to contribute to the protection of nuclear facilities.

One proposal for enhancing the effectiveness of nuclear facility protection in wartime has been put forward from within Japan. In response to the Russian invasion of Ukraine and the subsequent attacks and seizures of nuclear facilities, on March 30, 2022, the National Governors’ Association of Japan submitted to the government an urgent request regarding the protection of nuclear power plants in the event of military attacks. Specifically, it called on the government to act quickly when faced with a situation that may lead to military attacks on nuclear power plants—for instance, ordering nuclear operators to suspend operation of their nuclear power plants pursuant to the Act concerning the Measures for Protection of the People in Armed Attack Situations, etc. (hereinafter the “People Protection Act”)—and instruct nuclear operators properly so that, in the event of an emergency, they can suspend operations without waiting for a government order.¹⁵

case in which armed forces were dispatched by a resolution of the UN General Assembly, rather than the UN Security Council. The UN Security Council was not functioning properly and failed to play its role in monitoring the ceasefire because two of its members—i.e., the United Kingdom and France—were parties to the conflict at the time, holding interests in the Suez Canal in Egypt. Thus, the decision to send UNEF troops was made by a resolution of the UN General Assembly. See, for instance, Araoka, Kotaro, “*Kokurengun no Kino: Suez to Kongo Ryo-Kokurengun o Kesu Sutadi toshite*” [Functions of the United Nation Forces: Case Studies of UN Forces Deployed in Response to the Suez and Congo Crises], Doshisha Law Association, 1968.

¹³ Toshio Sano, former ambassador and head of the Delegation of Japan to the Conference on Disarmament, who is currently serving as a commissioner of the Japan Atomic Energy Commission (JAEC), also points to the possibility of securing the safety and protection of nuclear power plants in wartime and sending armed forces for that purpose by means of a UN General Assembly resolution. See “*Rosia no Ukuraina Shinryaku ga Kaku-Mondai ni Ataeru Eikyo*” [Impact of Russian Invasion of Ukraine on Nuclear Issues], Kasumigaseki Foreign Service Association (KaFSA), December 21, 2022.

¹⁴ “*ICRC no Zaisei*” [ICRC’s Finances], ICRC’s Japanese language website.

¹⁵ “*Zenkoku Chijikai ‘Kokunai no Genpatsu Kogeki e no Sonae Tettei o’ Kuni ni Kinkyu Yosei*” [National Governors’ Association of Japan Makes an Urgent Request Calling on the Government to Ensure the Safeguarding of Nuclear Power Plants in Japan against Possible

The proposal, which is primarily aimed at ensuring the safety of people living in areas around nuclear power plants, has a legal ground in the People Protection Act and is implementable.¹⁶ Japan should call on other countries to consider introducing an emergency response system that would shut down the operations of their nuclear facilities immediately if they fall into a state of war.

By presenting such concrete and effective measures, Japan should strongly call on the international community to develop a mechanism for implementing the protection of nuclear facilities in wartime.

Attacks], *NHK*, March 30, 2022.

¹⁶ Based on Article 106 (Prevention of Armed Attack Disasters Associated with Nuclear Reactors, etc.) of the Act concerning the Measures for Protection of the People in Armed Attack Situation, etc. See Appendix 3 for the text of the article.

Recommendation 2

There is an urgent need for the international community to start discussing steps—and challenges faced—toward achieving a complete ban on military attacks on nuclear facilities by amending or adding new provisions to the Geneva Conventions, which prohibit military attacks on nuclear power plants only in principle, as well as to nuclear-related international conventions, with an eye to cases in which a country with nuclear facilities or a neighboring country engages in war. As a forerunner in the civilian use of nuclear energy, Japan should propose concrete measures and take a lead in international discussions to reform international law and establish a new set of international principles.

The ongoing Russian invasion of Ukraine has exposed the real risk of a nuclear catastrophe stemming from attack and seizure of civilian nuclear facilities. Such an incident would entail massive radioactive contamination, yet all the while, the international community has been unable to respond effectively. It has become apparent that both international law and the United Nations, as they stand today, are ill-prepared to ensure nuclear facility protection in wartime. Drastic reform of international law and a conceptual paradigm shift are required.

Drawing on lessons from the military attacks on, and seizure of, the Zaporizhzhia NPP, countries around the world should firstly review the existing prohibition in principle of military attacks on nuclear power plants under Additional Protocol I, and start working toward changing international law and unifying the interpretation thereof. More specifically, countries need to discuss ways to implement a complete ban on military action against *all* nuclear facilities, including nuclear power plants. However, if such agreement is reached, some countries may take malicious advantage of it and locate military facilities in the vicinity of nuclear facilities. In order to prevent such moves, countries must commit not to use their nuclear facilities as a cover for military bases.¹⁷ In time of war, explicitly designating nuclear facilities as non-military facilities would also reduce the risk of attack.¹⁸

The prohibition in principle of attacks on nuclear power plants under Article 56 of Additional Protocol I is based on the idea that nuclear facilities must not be made the object of attacks even when military advantage is expected to be gained by attacking, with greater weight given to the possibility of causing severe consequential losses. However, this prohibition is subject to certain exceptions, such as when the nuclear

¹⁷ This is stipulated in Article 56, paragraph 5, of Protocol I Additional to the Geneva Conventions. See Appendix 2.

¹⁸ The possibility of deploying anti-air missile systems is currently being discussed as a way to protect nuclear facilities. However, the presence of missile systems could put the nuclear facility in danger of being considered a military base and thus giving justification to attacks. Lecture by Akira Mayama, professor, Osaka Gakuin University, at the 13th meeting of the Study Group on Nuclear Non-Proliferation and Nuclear Security, Sasakawa Peace Foundation, on November 16, 2022.

power plant in question provides electric power in significant and direct support of military operations and if attacking the nuclear power plant is the only feasible way to terminate such military operations. Furthermore, the interpretation of Article 56 is not necessarily unified, with some countries having their own reservations to its applicability.

For instance, the United States and other member states of the North Atlantic Treaty Organization (NATO) take the stance that whether or not nuclear facilities should be made the object of attacks should be determined by taking into account the advantage expected to be gained by attacking, as is the case with other military targets. Thus, they do not agree with the idea that Article 56 provides special protection to nuclear power plants, making a distinction between nuclear facilities and other military targets. This signifies that during the Cold War years, the United States and other NATO member states assumed the possibility of destroying nuclear facilities as one of their tactics against the Unified Armed Forces of the Warsaw Treaty Organization, which had superiority in conventional weapons. Given that NATO member states are not criticizing Russian actions in the ongoing war on the ground of Article 56, it appears that their stance on Article 56 remains unchanged.¹⁹

Meanwhile, in 1977, when Additional Protocol I was adopted, the international community did not have a deep insight into potential perils brought on by destroying a nuclear facility, namely, a massive release of radioactive substances and its serious impacts on humans and the environment. Subsequently, through experience with nuclear disasters in Chernobyl (1986) and Fukushima (2011), the international community has significantly deepened its understanding of the grave damage to humans and the planet that could result from a release of radioactive substances.

Indeed, at the 53rd session of the IAEA General Conference in 2009, a presidential statement entitled “Prohibition of armed attack or threat of attack against nuclear installations, during operation or under construction” was issued and unanimously adopted as a decision. The statement confirmed the importance of protecting nuclear facilities, noting that any armed attack on nuclear facilities for civilian purposes constitutes a violation of the principles of the United Nations Charter, international law, and the IAEA Statutes.²⁰

Based on the decision of the IAEA General Conference, in considering “severe losses” under Article 56 of Additional Protocol I, countries should start discussing ways to enhance nuclear facility protection in wartime, simulating a case involving a massive release of radioactive substances from a nuclear power plant or other nuclear facility.

In doing so, they should consider including provisions for nuclear facility protection in wartime not only in

¹⁹ Lecture by Akira Mayama, professor, Osaka Gakuin University, at the 13th meeting of the Study Group on Nuclear Non-Proliferation and Nuclear Security, Sasakawa Peace Foundation, on November 16, 2022.

²⁰ “*Kokusai Genshiryoku Kikan (IAEA) Dai-53-kai Sokai no Kekka Gaiyo*” [Summary of the Outcome of the 53rd General Conference of the International Atomic Energy Agency (IAEA)], Website of the Ministry of Foreign Affairs (MOFA), Japan. Also, the 64-item action plan set forth in the final document of the 2010 NPT Review Conference explicitly calls for abiding by the decision adopted at the IAEA General Conference in 2009. <https://documents-dds-ny.un.org/doc/UNDOC/GEN/N10/390/21/PDF/N1039021.pdf?OpenElement>

Additional Protocol I, but also in other nuclear-related international conventions. For instance, provisions for enhancing nuclear facility protection should be added to the Convention on Nuclear Safety,²¹ which is designed to establish effective defenses against potential radiological hazards arising from nuclear facilities. Such provisions should also be added to the Convention on the Physical Protection of Nuclear Material and Nuclear Facilities, which provides for measures to protect nuclear material. Moreover, countries should immediately launch a discussion on developing a legally binding mechanism, such as an additional protocol or a verbal note.

However, making changes to nuclear-related international conventions would take an extremely long time. In fact, the Amendment to the Convention on the Physical Protection of Nuclear Material, which was designed to strengthen protection measures for nuclear material in response to the 9/11 terrorist attacks in the United States and other developments, was adopted in 2005 but entered into force only in 2016.²² Although discussions on changes to international law would help boost momentum in the entire international community toward preventing armed attacks on nuclear facilities, the hurdles that need to be cleared to achieve that end are not low. Thus, one option is to revive the Nuclear Security Summit, which was held between 2010 and 2016, as a forum for regularly discussing security enhancement for nuclear facilities.²³ Another option is to set up a conference where countries regularly report and review the status of implementation of the Convention on the Physical Protection of Nuclear Material and Nuclear Facilities,²⁴ drawing on the example set by the NPT Review Conference.

Meanwhile, in order to enhance mechanisms for matters such as ensuring the enforceability of compliance with international law and penalties in case of non-compliance, it is necessary to reform the organizational structure of the UN system. In Recommendation 1, we discussed alternative measures to be applied when the UN Security Council is unable to function properly. However, we would also like to note that enabling the UN Security Council to fulfill its functions properly is of essential future importance, and it is imperative to start discussion toward achieving this end, including organizational reform of the United Nations. We also note that there are calls for seeking solutions to international problems under a non-UN framework, such as a coalition of willing states.²⁵

Japan needs to take an active lead in such discussions on amending international law, establishing international forums, and implementing UN reforms. Having experienced the Fukushima Daiichi nuclear accident, Japan knows better than any other country the consequences for humans and the natural

²¹ “[Genshiryoku ni kan suru Omo na Kokusai Joyaku](#)” [Major International Conventions and Treaties on Nuclear Power], Website of the Nuclear Regulation Authority (NRA), Japan.

²² “[Kakubusshitsu no Bogo ni kan suru Joyaku no Kaisei](#) [Amendment to the Convention on the Physical Protection of Nuclear Material],” Website of the Ministry of Foreign Affairs (MOFA), Japan.

²³ “[Why the world must protect nuclear reactors from military attacks. Now.](#),” George M. Moore, Bulletin of the Atomic Scientists, December 15, 2022.

²⁴ Urgent Recommendations “[Russian Invasion of Ukraine: Challenges in the Civilian Use of Nuclear Energy and Japan’s Role](#),” July 2022, Sasakawa Peace Foundation (SPF).

²⁵ See, for instance, Ukrainian President Volodymyr Zelenskyy’s speech before the Diet on March 23, 2022. “[Speech by President of Ukraine Volodymyr Zelenskyy in the Parliament of Japan](#)”

environment of damage to nuclear facilities such as nuclear power plants and nuclear fuel reprocessing facilities. In the process of changing international law, such as the aforementioned Additional Protocol I and the Convention on Nuclear Safety, Japan must lead discussions, for instance by presenting measurements on the impact of a massive release of radioactive substances on the natural environment.

Japan is a non-permanent member of the UN Security Council for two years from 2023 and will host the G7 Hiroshima Summit in May this year. It is of paramount importance for Japan to call for the start discussions aimed at making the prevention of military action against nuclear facilities a universal international principle, highlighting that doing so will benefit the international community. To this end, Japan should immediately start internal discussions among relevant government agencies.

References

1. Kimura, Naohito, 2012, *Kaku Sekyuriti no Kiso Chishiki [Basic Knowledge of Nuclear Security]*, Denki Shimbun.
2. Nuclear Material Control Center, *Kaku-Busshitsu Bogo Handobukku 2020 [Handbook for the Protection of Nuclear Materials 2020]*.
3. Kokumin Hogo Hosei Kenkyukai, 2005, *Chikujo Kaisetsu: Kokumin-Hogo-Ho [Clause-by-Clause Commentary: People Protection Act]*, Gyosei
4. Araoka, Kotaro, 1968, “*Kokurengun no Kino: Suezu to Kongo Ryo-Kokurengun o Kesu Sutadi toshite*” [Functions of the United Nation Forces: Case Studies of UN Forces Deployed in Response to the Suez and Congo Crises], Doshisha Law Association, 1968.
5. “[Charter of the United Nations](#)” (in Japanese), United Nations Information Center website.
6. IAEA, “[Nuclear Safety, Security and Safeguards in Ukraine](#),” September 5, 2022.
7. “[Rosia no Ukuraina Shinryaku ga Kaku-Mondai ni Ataeru Eikyo](#)” [Impact of Russian Invasion of Ukraine on Nuclear Issues], Kasumigaseki Foreign Service Association (KaFSA).
8. “[ICRC no Zaisei](#)” [ICRC’s Finances], ICRC’s Japanese language website.
9. “[Genshiryoku ni kan suru Omo na Kokusai Joyaku](#)” [Major International Conventions and Treaties on Nuclear Power], Website of the Nuclear Regulation Authority (NRA), Japan.
10. “[Kokusai Genshiryoku Kikan \(IAEA\) Dai-53-kai Sokai no Kekka Gaiyo](#)” [Summary of the Outcome of the 53rd General Conference of the International Atomic Energy Agency (IAEA)],” Website of the Ministry of Foreign Affairs (MOFA), Japan.

SPF’s past recommendations on nuclear energy

- “[Proposals to the Japanese Government Concerning International Management of Plutonium: Aiming for Reduction in Plutonium Stocks and Adoption of New International Norms](#),” May 2019.
- “[Proposals to the Japanese Government Concerning the Denuclearization of North Korea: With a View to Reduction of Nuclear Threat and Establishment of New Security Framework in Northeast Asia](#),” February 2020.
- “[Japan’s Contribution to Global Nuclear Disarmament and Non-Proliferation: Toward a Policy for Fulfilling the Responsibilities of Japan as the Only Country to Have Suffered from Atomic Bombs](#),” April 2020.
- “[Rise of China and Russia in the Civilian Use of Nuclear Energy: Strengthening of the Global Nuclear Non-proliferation Regime and Japan’s Role](#),” April 2021.
- Urgent Recommendation “[Russian Invasion of Ukraine: Challenges in the Civilian Use of Nuclear Energy and Japan’s Role](#),” July 2022.

Appendices

原子力の安全と核セキュリティに不可欠な7つの柱：国際原子力機関（IAEA）

1. 原子力施設の物理的健全性の維持
2. 全ての安全・セキュリティに係るシステム及び装置が常時、全面的に機能していること
3. 運転スタッフは不当な圧力を受けることなく安全・セキュリティ上の義務を履行し、決定を行う能力を有すること
4. 全ての原子力サイトに対し、外部からの確実な電力供給が確保されること
5. 原子力サイトからの（への）サプライチェーン、輸送手段が中断されないこと
6. 効果的なサイト内、サイト外の放射線監視システム及び緊急事態への準備、対応措置が整備されていること
7. 規制機関その他との信頼性が高いコミュニケーションが確立されていること²⁶

1. The physical integrity of the facilities — whether it is the reactors, fuel ponds or radioactive waste stores — must be maintained;
2. All safety and security systems and equipment must be fully functional at all times;
3. The operating staff must be able to fulfil their safety and security duties and have the capacity to make decisions free of undue pressure;
4. There must be secure off-site power supply from the grid for all nuclear sites;
5. There must be uninterrupted logistical supply chains and transportation to and from the sites;
6. There must be effective on-site and off-site radiation monitoring systems and emergency preparedness and response measures;²⁷ and
7. There must be reliable communications with the regulator and others.

²⁶ [“Genshiryoku Sangyokai wa Ukuraina ni okeru Genshiryoku Shisetsu oyobi Shokuin no Anzen to Sekyuriti o Kakuho Suru tame no IAEA no Doryoku o Shien Suru Yoi ga Aru: Sekai no Genshiryoku Sangyo Dantai ga Seimei o Kohyo”](#) [The nuclear industry stands ready to support the IAEA’s efforts to ensure the safety and security of nuclear facilities and staff in Ukraine: A statement issued jointly by nuclear industry associations across the world], March 14, 2022, Japan Atomic Industrial Forum, Inc.

²⁷ IAEA, [“Nuclear Safety, Security and Safeguards in Ukraine,”](#) September 5, 2022.

Article 56 of Protocol I Additional to the Geneva Conventions

Article 56 – Protection of works and installations containing dangerous forces

1. Works or installations containing dangerous forces, namely dams, dykes and nuclear electrical generating stations, shall not be made the object of attack, even where these objects are military objectives, if such attack may cause the release of dangerous forces and consequent severe losses among the civilian population. Other military objectives located at or in the vicinity of these works or installations shall not be made the object of attack if such attack may cause the release of dangerous forces from the works or installations and consequent severe losses among the civilian population.
2. The special protection against attack provided by paragraph 1 shall cease:
 - a. for a dam or a dyke only if it is used for other than its normal function and in regular, significant and direct support of military operations and if such attack is the only feasible way to terminate such support;
 - b. for a nuclear electrical generating station only if it provides electric power in regular, significant and direct support of military operations and if such attack is the only feasible way to terminate such support;
 - c. for other military objectives located at or in the vicinity of these works or installations only if they are used in regular, significant and direct support of military operations and if such attack is the only feasible way to terminate such support.
3. In all cases, the civilian population and individual civilians shall remain entitled to all the protection accorded them by international law, including the protection of the precautionary measures provided for in Article 57. If the protection ceases and any of the works, installations or military objectives mentioned in paragraph 1 is attacked, all practical precautions shall be taken to avoid the release of the dangerous forces.
4. It is prohibited to make any of the works, installations or military objectives mentioned in paragraph 1 the object of reprisals.
5. The Parties to the conflict shall endeavor to avoid locating any military objectives in the vicinity of the works or installations mentioned in paragraph 1. Nevertheless, installations erected for the sole purpose of defending the protected works or installations from attack are permissible and shall not themselves be made the object of attack, provided that they are not used in hostilities except for defensive actions necessary to respond to attacks against the protected works or installations and that their armament is limited to weapons capable only of repelling hostile action against the protected works or installations.
6. The High Contracting Parties and the Parties to the conflict are urged to conclude further agreements among themselves to provide additional protection for objects containing dangerous forces.
7. In order to facilitate the identification of the objects protected by this article, the Parties to the conflict may mark them with a special sign consisting of a group of three bright orange circles placed on the same axis, as specified in Article 16 of Annex I to this Protocol [Article 17 of Amended Annex]. The absence of such marking in no way relieves any Party to the conflict of its obligations under this Article.²⁸

²⁸ [Protocol I Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts](#), Ministry of Foreign Affairs (MOFA), Japan.

**Act concerning the Measures for Protection of the People in Armed Attack Situation, etc.
(People Protection Act)**

Article 106 (Prevention of Armed Attack Disasters Associated with Nuclear Reactors, etc.)²⁹

In the case of the occurrence or potential occurrence of an armed attack disaster associated with nuclear fuel material (as defined in Article 3, item (ii), of the Atomic Energy Basic Act (Act No. 186 of 1955); hereinafter the same applies in this Article) or material contaminated by nuclear material, or a reactor (as defined in item (iv) of the same Article; hereinafter the same applies in this Article) in an armed attack situation, etc., the Nuclear Regulation Authority (and the Minister of Land, Infrastructure, Transport and Tourism in the case of occurrence of a fact pertaining to transport outside the nuclear site) may order the operator, etc. prescribed in Article 64, paragraph (1), of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors (Act No. 166 of 1957), as applicable according to the classification set forth in the items of paragraph (3) of the same Article, to suspend the use of refining facilities, fuel fabrication facilities, research and test reactor facilities, power reactor facilities, spent fuel storage facilities, reprocessing facilities, waste burial or storage facilities, or usage facilities, to relocate nuclear fuel material or material contaminated by nuclear material, and/or to take other necessary measures to prevent the occurrence or expansion of the armed attack disaster associated with the nuclear fuel material or material contaminated by nuclear fuel material or with the reactor, if it is deemed that there is an urgent need to do so to prevent the occurrence or expansion of such armed attack disaster.

²⁹ [Act concerning the Measures for Protection of the People in Armed Attack Situation, etc. \(Act No. 112 of 2004\)](#), e-Gov website.

 さいたま平和財団