ISCN Newsletter

(ISCN Newsletter)

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Integrated Support Center for Nuclear Nonproliferation and Nuclear Security (ISCN)

Japan Atomic Energy Agency (JAEA)

※This document has been translated from the Japanese version into English using translation software except articles 2-2 ~ 2-4.

Contents

1. Announcements

1-1 Introduction of new ISCN Exercise Field (IEF)

The ISCN Exercise Field (IEF) was completed at the end of March 2024, and is an expansion of the Physical Protection Exercise Field (PP Field), which has been in operation since fiscal 2012.

Since its establishment in 2010, the ISCN has been supporting human resource development programs related to nuclear nonproliferation and nuclear security in Japan and abroad. The PP Field is a training tool that provides hands-on training on the features of the PP equipment actually used in nuclear facilities, such as intrusion detection sensors, surveillance cameras, and entry control equipment. After 12 years of use, the building equipped with a simulated Central Alarm Station (CAS) and entry/exit control equipment has deteriorated significantly over time, and the second supplementary budget for FY2022 was used to upgrade and expand this building. As a result of this upgrade and expansion, the old PP Field building was demolished and replaced with two new buildings, the Physical Protection Exercise Building (PPB) and the Virtual Reality System Exercise Building (VRB), and classrooms were newly installed. This expansion and improvement has not only made it possible to provide more efficient programs that are not limited to PP training, but also to develop new training curricula to respond to new threats, and has been renamed the "ISCN Exercise Field. The following is an overview of the facility.

Former PP Field Building

ISCN Exercise Field Building

[Physical Protection Exercise Building (PP B)]

The PPB is a two-story structure, and the mock CAS equipment and the entry control equipment installed in the former PP field building was updated and relocated on the first floor. The new classrooms on the second floor make it possible to organically combine lectures in the classroom with practical training using actual PP equipment on the ground floor and outdoors, which is expected to improve training efficiency and effectiveness by consolidating knowledge and reducing travel time.

[Virtual Reality System Exercise Building (VRB)]

The VR system is a tool to effectively learn about nuclear security and safeguards at nuclear facilities by simulating the way images from surveillance cameras look at different times of the day and in different weather conditions that cannot be reproduced at actual sites, and the inside of nuclear power plants and fuel fabrication facilities that are not easy to visit, as well as the points of measurement control and inspections at these facilities. The tool enables visitors to effectively learn the points of metrological control and inspections at these facilities.

Until now, the VR system was installed in a location far from the former PP field (in the Nuclear Science Research Institute), which required time-consuming transportation during the VR training. The new VRB in the ISCN Exercise Field will enable PP and VR training to be conducted efficiently on the same site. Furthermore, the projector and screen have been updated to provide brighter and clearer images than before. In future training, it will be possible to provide VR training in a more realistic environment.

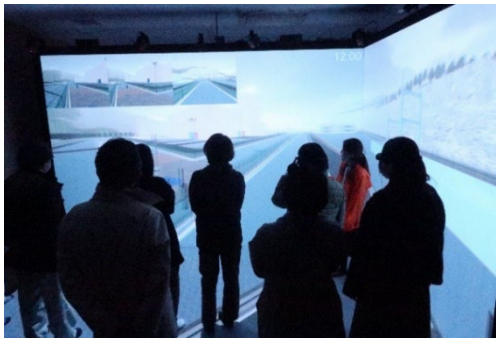
[ISCN Exercise Field New Building Tour]

The "ISCN Exercise Field New Building Tour" was held for two days on March 28 and April 10 for JAEA's Tokai Regional Center and Headquarters in order to deepen cross-organizational exchanges within JAEA and to exchange opinions on the utilization of the new facilities. A total of 90 people participated on both days, and an overview of ISCN activities, features of each facility, and how each facility is utilized in ISCN training were introduced. The participants asked many questions about the mechanisms of each piece of equipment, and the hands-on experience with the actual entry control equipment helped them better understand ISCN's activities. Many participants said they were interested in the equipment but had not had a chance to see it. We also received some specific suggestions. It was a very valuable opportunity for ISCN staff.

ISCN Exercise Field Briefing

Mock CAS

Entry control equipment



VR System

Outdoor Sensor

[Finally]

The construction of the ISCN Exercise Field was completed as planned with no accidents, thanks to the combined efforts of a great many people, including the Ministry of Education, Culture, Sports, Science and Technology (MEXT), which made a great effort to provide supplementary budget measures, the Construction Department, the Engineering Services Department of NSRI, the Nuclear Fuel Control Section, the Nuclear Safety Research Center, the General Affairs and Community Relations Section, contractors and related suppliers, and others. We will not forget our gratitude to all those who worked so hard to build a good facility, and we will maintain and utilize this facility with even greater care than before.

Report: Miku Mizuedani International Capacity-Building Support Office

1-2 Announcement for the start of the "Basics Training Course on IAEA Safeguards in Japanese (e-learning) "

We are pleased to announce that a new training course, "Basics Training Course on IAEA Safeguards in Japanese (e-learning) ", was launched in March 2024 at the International Capacity-Building Support Office of ISCN.

[Summary of this online course]

This course is a translation by ISCN of the "Basic Training Course on IAEA Safeguards," an e-learning course offered by the International Atomic Energy Agency (IAEA) on its website to provide an overall understanding of IAEA safeguards and the basic knowledge required for it.[1] . The course consists of the following four modules, and a certificate of completion can be obtained by passing all of the comprehension quizzes at the end of each module from 1 to 3. Module 4 summarizes the reference information available to strengthen safeguards implementation.

Module 1: Introduction

Module 2: IAEA Safeguards

Module 3: IAEA Verification Activities

Module 4: Reference Information

[Persons eligible to participate in the course]

Those involved in or interested in nuclear energy/accounting for and control of nuclear material /safeguards

[How to take the course]

If you wish to take the course, please register at the following URL.
We look forward to seeing many of you attend!

Course Registration: https://forms.office.com/r/dqSpEfsp2L

Contact: iscn-ssacj@jaea.go.jp

[1] This translation has been made by ISCN with the consent of the IAEA, but please note that it is not an official translation of the IAEA and that the IAEA has not confirmed or approved the translation.

2. Nuclear Non-proliferation and Nuclear Security Trends and Analysis

2-1 Summary of the Director General's Report on Ukraine to the IAEA March Board of Governors Meeting, etc.

Introduction.

To the March Board of Governors meeting, the IAEA submitted the Director General's Report entitled "Nuclear Safety, Security, and Safeguards in Ukraine"[2] (the "Report"). The Report covers, among other things, the IAEA's activities during the period from November 15 of last year to February 23 of this year (the "Reporting Period") since the Report to the Board of Governors in November of last year.

This detailed 30-page report, as with previous reports to the Board of Governors, provides a detailed account of Ukraine's nuclear facilities and the IAEA's activities at these facilities.

Ukraine's nuclear facilities, Zaporizhia (ZNPP), Riune, South Ukraine, Khmelinitsky NPP, and Chornobyl NPP, have been in a state of war due to Russian aggression, with the Zaporizhia NPP in particular remaining at risk for more than two years because it is on the frontline of the armed conflict between Ukraine and Russia. IAEA Director General Grossi has frequently warned that the situation at ZNPP "remains very precarious with regard to nuclear safety and security"[3] .

In the previous report to the Board of Governors last November[4] , it was stated that the IAEA was continuing to consider the safety and security of nuclear facilities during armed conflict to be reflected in various technical documents, and that the IAEA would consider their application to safety standards and nuclear security guidance with the relevant agencies, but this report are not mentioned. It can be inferred that actual consideration would not have progressed very far. The IAEA has proposed the establishment of "Nuclear Safety and Security Protection Zones" in the wake of Russia's armed aggression against Ukraine, as well as "Seven Principles" to be followed for nuclear safety, security, and safeguards, and "Five Specific Principles" for ZNPPs, and has been working on the establishment of such zones with the consent of IAEA member states and relevant organizations. However, it would be quite difficult to obtain the consent of IAEA member states and related organizations and to reflect these principles in various technical documents, etc., as the IAEA suggests.

Although February 23 of this year marked two full years since the Russian military invasion, no special report or other information has been issued as of the third anniversary of the invasion.

The following report will focus on the situation at ZNPP and other aspects of the report that we believe are noteworthy. We will also introduce the attacks on ZNPP that occurred from April 7 to 9 and the IAEA's response.

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[2] IAEA, "Nuclear Safety, Security and Safeguards in Ukraine", GOV/2024/9, 27 February 2024, https://www.iaea.org/sites/ default/files/documents/gov2024-9.pdf

[3] In the text noted in footnote 2, inserted on p. 7, the phrase "remains very precarious" is used.

[4] https://www.iaea.org/sites/default/files/documents/gov2023-59.pdf

1. the Zaporizhzhia Nuclear Power Plant (ZNPP)

The dangerous situation regarding nuclear safety and security at ZNPP continues: in six of the "seven principles" proposed by the IAEA to prevent nuclear accidents at ZNPP and to ensure the integrity of the power plant, and in five specific principles regarding ZNPP, the fulfillment of these The ZNPP continues to be unable to fulfill these principles.

(1) 8th loss of external power, etc.

ZNPP's external power supply was vulnerable and during this reporting period relied on one of its four 750 kV transmission lines (Dniprovska) and one of its six 330 kV transmission lines (Ferosplavana) for external power.

On December 2, the power supply from the above two transmission lines was disrupted, resulting in the eighth complete loss of external power since the Russian armed invasion, and this condition continued for more than four hours. During this period, all 20 emergency generators were operational and supplied power.

On January 14, the transformer supplying power to ZNPP experienced a trip (power interruption).

(2) Status of staff responsible for power plant operations

The number of staff, which was approximately 11,500 at the outbreak of the armed conflict, continues to decline significantly. The IAEA will continue to monitor the situation with regard to staffing issues in general and the qualifications and credentials of the operators of the central control room *(which is the heart of the plant) in particular.* The IAEA will continue to monitor the situation closely.

On February 1, ZNPP informed the resident IAEA staff team (ISAMZ) that there would no longer be any Energoatom (Ukraine's state-owned nuclear power plant operator) employees at ZNPP, and that all employees would either be Russian citizens or contractors with the Joint Stock All employees will be Russian citizens or those who have signed a contract with the "ZNPP Operating Company," which is a Joint Stock Company (established by Russia). He also stated that ZNPP has a sufficient number of employees, including newly hired employees from Russia, with appropriate qualifications.

On November 14, ISAMZ patrolled (walkdown) the central control room of several units, but unlike in the past, conversations with operators were limited. Many of the central control room personnel were granted operator status by Ukraine, but are in the process of applying for Russian status, according to ISAMZ.

ZNPP personnel continue to be under intense psychological stress in a variety of settings.

(3) Facility and surroundings, patrolled by ISAMZ (walkdown)

In January, ISAMZ discovered anti-personnel mines that had been placed along the area

surrounding the ZNPP. These were previously discovered by ISAMZ and removed in November 2023, but have been re-installed. The mine was placed between the power plant's inner and outer perimeter fences, where power plant personnel are not allowed to approach; the mine was temporarily removed in February, but was later found to have been placed again.

Eleven wells continue to supply cooling water; the surface of the cooling water pond at ZNPP is 15.67 m high, which is 1 m lower than it was before the destruction of the Kahovka Dam.

During the reporting period, ISAMZ has been discussing maintenance plans for 2023 and 2024, and the IAEA has concluded that the 2023 maintenance plan is inadequate due to lack of spare parts and that an adequate maintenance plan for 2024 will not be implemented. The author assumes that if this situation continues, safety problems will occur due to degradation of safety systems and other factors.

During the reporting period, ISAMZ has been constrained regarding the on-site patrols to check the status of the "Five Specific Principles" regarding the ZNPP On December 7, ISAMZ conducted a patrol of the six turbine buildings. Although no heavy weapons or other items were found during the patrols, ISAMZ only had access to the eastern portion of the turbine buildings (not the western portion) and was limited in the height at which it could patrol to only those floors that were 15 meters above the ground. In addition, armed soldiers were guarding the western end of the building.

In addition, access to the roof of each unit and to the reactor building was also restricted.

Although the ISAMZ did not discover any heavy weapons or other weapons during its patrols, it is essential that the ISAMZ be able to conduct timely and appropriate on-site patrols without restrictions to ensure that no heavy weapons or other weapons are present.

During the reporting period, ISAMZ has not confirmed any attacks from or against the power plant. However, ISAMZ has observed rocket fire, possibly from the vicinity of the power plant, and explosions on or near the power plant premises.

The IAEA has received claims from Russia about flying objects and provocations by Ukraine against the ZNPP. Regarding the claim that there was a drone strike on Enerhodal[5] , when ISAMZ went to the site, the wreckage had been removed and the facts could not be confirmed.

ISAMZ has continuously reported the presence of armed soldiers in the power plant, and Russia claims that National Guard and specialized CBRN (chemical, biological, radiological, and nuclear) units are stationed there. Russia also claims that the power plant's key installations are protected by Russian troops, but ISAMZ has not been able to confirm Russia's explanation due to insufficient information.

2. situation at Khmelinitsky NPP, Riune, South Ukraine

During the reporting period, these nuclear power plants have been operating and supplying power as usual. All of the power reactors (7 units in total) at these power plants

[5] Neighborhoods where many ZNPP staff live

are in operation, except during scheduled inspections, etc.

Although no accidents have been reported, air raid warnings are frequently issued in the vicinity of these power plants.

On November 28, an IAEA team stationed at the Khmelinitsky NPP (ISAMIK) confirmed several explosions very close to where they were staying.

The three power plants have sufficient staff with competence, external power supply is secured, and there are no problems with the supply of materials and equipment.

3. support of the IAEA in providing supplies and medical care (physical and mental) to nuclear power plants, etc.

The IAEA has provided various assistance to the above three NPPs and the Chornobyl NPP, among others.

At Ukraine's request, the IAEA has provided €8.5 million in material assistance since Russia's military aggression up to the reporting period, through its regular budget and special budgets from Member States.

The IAEA has also initiated medical assistance for physical and mental health issues at the power plant. Psychiatric assistance includes support for psychological trauma and life in general during military conflict.

Approval of this report by the IAEA Board of Governors[6]

This report was approved by the Board of Directors and, as in previous resolutions, requires that the Executive Director continue to report on the status of Ukraine in the future.

5. drone attacks on ZNPP on April 7-9

After the period covered by this report, Russia reported a three-day drone strike by Ukraine on ZNPP-related facilities on April 7-9, which Ukraine has opposed as a self-initiated attack by Russia.[7]

The attack was on the roof of the reactor building and other areas, and did not directly damage the reactor or other nuclear facilities. In addition, this is the first direct attack on ZNPP since November 2022.

On April 11, the IAEA convened an emergency board meeting, but the contents of the board meeting have not been made public. The UN Security Council also reported on the 15th. [8]

Note that there was a similar drone attack on ZNPP on April 18.[9]

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6 https://www.iaea.org/sites/default/files/documents/gov2024-18.pdf

7 https://www3.nhk.or.jp/news/html/20240412/k10014389421000.html

8 https: //reliefweb.int/report/ukraine/prospect-nuclear-accident-dangerously-close-zaporizhzhia-power-plant-ukraine-international- atomic-energy-agency-chief-warns-security-council

9 https://jp.reuters.com/world/ukraine/AU6W5XBHZJKEJG5COAOI7H6UDY-2024-04-18/

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Report by Naoki Kobayashi, Integrated Support Center for Nuclear Nonproliferation and Nuclear Security

2-2 Summary of the report by the IAEA Director General (GOV/2024/8) on NPT Safeguards Agreement with the Islamic Republic of Iran

This article explains the summary of the report by the IAEA Director General (GOV/2024/8) on "NPT Safeguards Agreement with the Islamic Republic of Iran". Please take a look at GOV/2024/8 (https://www.iaea.org/sites/default/files/gov2024-8.pdf) for the original document.

2-3 Biden Administration's budget request for FY 2025

This article summarizes (1) the DOE/NNSA's budget request for FY 2025 on nuclear non-proliferation and nuclear security related issues within "Defense Nuclear Nonproliferation" category as well as (2) the DOS's request for its contribution to nuclear non-proliferation related international organizations / activities including IAEA and CTBTO. Please refer following original documents for more details.

NNSA: https://www.energy.gov/sites/default/files/2024-03/doe-fy-2025-budget-vol-1-v4.pdf

DOS: https://www.state.gov/wp-content/uploads/2024/03/FY-2025-Congressional-Budget-Justification-Department-of-State-Foreign-Operations-and-Related-Programs.pdf

2-4 Summary of nuclear non-proliferation and nuclear security related issues within (1) “United States - Japan Joint Leaders’ Statement (Global Partner for the Future)", (2) “FACT SHEET: Japan Official Visit with State Dinner to the United States, and (3)"Joint Vision Statement from the Leaders of Japan, the Philippines and the United States”

This article introduces nuclear non-proliferation and nuclear security related issues within above mentioned 3 documents . Please take a look at following URLs for original documents.

(1) “United States - Japan Joint Leaders’ Statement (Global Partner for the Future)" https://www.mofa.go.jp/mofaj/files/100652147.pdf

(2) “FACT SHEET: Japan Official Visit with State Dinner to the United States” https://www.mofa.go.jp/mofaj/files/100652149.pdf

(3) "Joint Vision Statement from the Leaders of Japan, the Philippines and the United States” https://www.mofa.go.jp/files/100652855.pdf

2-5 UN Security Council meeting on nuclear disarmament and non-proliferation hosted by Foreign Minister Kamikawa

1. Summary of deliberations[10]

(1) "On March 18 (early morning of March 19, Japan's time), the Presidency of the United Nations Security Council (Security Council) hosted a Security Council Ministerial-level meeting on nuclear disarmament and non-proliferation at the UN Headquarter in New York, chaired by Foreign Minister of Japan Kamikawa. At the opening of the meeting, UN Secretary-General Guterres stated that disarmament is the only solution to the current world situation that casts a meaningless and suicidal shadow over the world and urged nuclear-weapon-States in particular to refrain from employing any nuclear weapons, reaffirm their commitment to the nuclear test ban moratorium, and not become nuclear-weapon-States. In particular, he urged the U.S. and Russia to negotiate a successor treaty to the New START. He also stated (quoting Pope Francesco Vatican City) that the

[10] UN Doc. S/PV.9579, 18 March 2024, pp. 1-24, URL:
https://documents.un.org/doc/undoc/pro/n24/072/92/pdf/n2407292.pdf.: UN Doc. SC/15630, 18 March 2024, "Nuclear Warfare Risk at Highest Point in Decades, Secretary-General Warns Security Council, Urging Largest Arsenal Holders to Find a Way Back to the Negotiating Table: Delegates Stress Non-proliferation Architecture Must Be Strengthened."
URL: Nuclear Warfare Risk at Highest Point in Decades, Secretary-General Warns Security Council, Urging Largest Arsenal Holders to Find Way Back to Negotiating Table | Meetings Coverage and Press Releases (as of 3 April 2024)
For the press release by the Ministry of Foreign Affairs, see "Foreign Minister Kamikawa to Attend UN Security Council Ministerial-level Meeting" URL: https://www.mofa.go.jp/mofaj/dns/acd/pageit00000100423.html (as of 3 April 2024)

possession of nuclear weapons is immoral for the *Hibakusha*.

(2) Mr. Floyd, Executive Secretary the PTS of the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), PTS, continued by noting the sharp decline in nuclear testing since the CTBTO was adopted in 1996, and expressed concern about the increased activity of certain states in relying on nuclear weapons, despite the addition of two new signatories after 2021. He also expressed concern about the increased use of nuclear-weapon-dependent language and actions by certain states. Furthermore, on behalf of civil society, Ms. Mukhazanova, Director of International Organizations and Non-Proliferation Programs at the Vienna Center for Disarmament and Non-Proliferation (VCDNP), spoke about the threat of nuclear weapons and the need for nuclear disarmament and non-proliferation, citing the importance of the responsibilities of the five Nuclear-weapon States. The representatives of Switzerland, Ecuador, and Algeria then spoke of the need to strengthen the non-proliferation regime for nuclear weapons, including the Nuclear Non-Proliferation Treaty (NPT)[11] and the Nuclear Weapons Convention (NWC). The representatives of Malta and Guyana stressed the need for further participation of women in disarmament discussions and decision-making.

(3) Foreign Minister Kamikawa explained Japan's disarmament and non-proliferation policies, including the Hiroshima Action Plan, as Japan, as the only country who suffered from nuclear weapons, has taken the initiative in leading discussions in the world in the hope that a world without nuclear weapons will be realized.[12] In this connection, it is worth mentioning that, in order to maintain and strengthen the political momentum for the Fissile Material Production Treaty for Nuclear Weapons or Other explosive devices (FMCT)[13], she recently proposed the launch of "Friends of FMCT"[14], consisting of representatives from each region. In addition, the possible impact of AI (Artificial Intelligence) and other emerging technologies and the perspective of the WSP[15] were also considered important.

(4) Nuclear-weapon-States continued to speak in turn, with the UK stating that it is the only nuclear-weapon-State that has reduced its means of delivery and introducing its

11 Treaty on the Non-Proliferation of Nuclear Weapons (NPT), 729 UNTS 161 (adopted 1 July 1968, entered into force 5 March 1970).

12 Statement by Foreign Minister KAMIKAWA Yoko at the Security Council Ministerial Briefing on Nuclear Disarmament and Non-Proliferation, 18 March 2024
URL: https://www.mofa.go.jp/mofaj/files/100643806.pdf

13 As a realistic and practical measure to achieve a "world without nuclear weapons," Japan emphasizes the FMCT, which imposes restrictions on the quantitative enhancement of nuclear weapons by prohibiting the production of fissile materials for nuclear weapons and other nuclear explosive devices.

14 Regarding the Friends of the FMCT, the Ministry of Foreign Affairs of Japan says, "A cross-regional group of nuclear weapons States and non-nuclear weapons States with the aim of maintaining and strengthening political interest in the FMCT and contributing to increased support for the FMCT negotiations. Participating countries, in addition to Japan, are Italy, the United Kingdom, the Netherlands, Canada, Australia, Germany, Nigeria, the Philippines, Brazil, France, and the United States." The above press release explains.

15 WPS stands for Women, Peace and Security, and in 2000, for the first time in the Council's history, the UN Security Council unanimously adopted the Security Council Resolution 1325 on Women, Peace and Security (WPS), which clearly stated that international peace, conflict prevention and conflict resolution require the equal participation of women, protection against sexual violence in conflict and gender equality. The Council unanimously adopted Security Council Resolution No. 1325 on Women, Peace and Security (WPS). To implement this and related resolutions, Japan has developed and implemented three rounds of action plans.

financial contribution to the CTBTO Preparatory Commission and the IAEA. France stressed that it possesses only nuclear weapons strictly necessary for its security. On the other hand, it said that Iran's nuclear weapons program is accelerating, and its stockpile of highly enriched uranium is increasing, and that it should comply with its commitments under the Joint Comprehensive Plan of Action (JCPOA) and its obligations under the NPT. The U.S. also condemned Iran and expressed non-proliferation concerns (as seen in vertical proliferation, etc.) that Russia is irresponsibly using dangerous nuclear rhetoric and neglecting its arms control obligations, and that China is also rapidly building up its nuclear arsenal in an uncertain manner. In response, China countered that the U.S. assertion lacked grounds, arguing that the U.S. should not use self-imposed sanctions to make threats and that coercitive measures should be taken because nuclear submarine cooperation with certain countries entails risks of nuclear proliferation. Furthermore, he condemned some countries for adopting a policy of extended deterrence, even though he said that the role of nuclear weapons should be reduced in the national security of the countries concerned (author's addition: non-nuclear-weapon-States are also included). Russia responded that the nuclear weapons it currently possesses are limited to those necessary to maintain strategic balance and that it is ready for strategic dialogue with the U.S. On the other hand, the North Atlantic Treaty Organization (NATO) should review its "hostile policy toward Russia.

(5) Furthermore, other non-nuclear-weapon-States also spoke, arguing that DPRK's clear nuclear proliferation and its aggressive nuclear policy make a preemptive strike against South Korea possible, that the permanent members of the Security Council in particular enforce vital global norms, and that promoting military cooperation with DPRK is not only contrary to Security Council decisions but also undermines the authority and validity of the Council. The representative of Slovenia also expressed his concern that the permanent members of the Security Council are not only enforcing vital global norms but also undermining the authority and relevance of the Council. The representative of Slovenia also expressed concern over the lowering of the threshold for the use of tactical nuclear weapons, arguing, as one example, that it is irresponsible and simply wrong to maintain the option of first use of low-yield nuclear weapons in the nuclear doctrine. Also, Minister of Foreign Affairs and Cooperation of Mozambique, Mr. Makamo, asserted that 54 African countries do not possess nuclear weapons, i.e., do not rely on nuclear deterrence, but instead emphasize the peaceful use of nuclear energy, and that the UN Global Compact[16] should be established to propagate appropriate nuclear knowledge for the advancement of humanity. He proposed that the UN Global Compact be established for the propagation of appropriate nuclear knowledge for the advancement of humanity. Mr. Argali, Deputy Minister of Foreign Affairs and International Cooperation of Sierra Leone, said that more than 12,000 nuclear weapons are held by a handful of countries worldwide, that the recent rhetoric surrounding nuclear weapons raises serious concerns, that major conflicts in Ukraine, the Middle East, and the Korean Peninsula involve nuclear threats, and that the Security Council must take decisive steps to eliminate the

[16] The UN Global Compact is the world's largest sustainability initiative, in which the United Nations and the private sector (companies and organizations) join hands to build a healthy global society. The UN Global Compact is the world's largest sustainability initiative, in which the United Nations and the private sector (companies and organizations) join forces to build a healthy global society, and is a voluntary effort by companies and organizations to act as good members of society and achieve sustainable growth through responsible and creative leadership. URL: https://www.ungcjn.org/gcnj/about.html

risk of nuclear conflict. He said that the Security Council must take decisive steps to eliminate the risk of nuclear conflict and that nuclear war has no winners and must never be fought.

concluding views　At this Security Council ministerial-level open briefing meeting focused on nuclear disarmament and nonproliferation, it is noteworthy that Foreign Minister Kamikawa , who chaired the meeting on this occasion, proposed the launch of an "FMCT Friends Meeting." FMCT is an initiative to prohibit the production of fissile materials for nuclear weapons and other explosive devices to prevent quantitative proliferation of nuclear weapons. Although negotiations have been attempted at the Conference on Disarmament for more than 20 years, “the consensus rule” stipulated Rules of procedure　has remained an obstacle, preventing even the start of negotiations. Last year, the FMCT resolution was adopted by the First Committee of the UN General Assembly with much support. If the FMCT Friends of the United Nations meeting can be used as an opportunity to build momentum for starting negotiations on the FMCT, and if substantive negotiations can be started at an early date, it would be an important step toward advancing practical nuclear disarmament and nonproliferation and achieving a world without nuclear weapons, and we should pay particular attention to trends in discussions on the verification system for the FMCT.

In addition, Foreign Minister Kamikawa, as the representative of Japan, stated clearly her country's position by stating that Japan would maintain and strengthen the nuclear disarmament and nonproliferation regime based on the NPT, while at the same time, as the chairperson, she has been conducting fair proceedings with impartiality by allowing the participation of countries with other opinions. In particular, the Security Council has been criticized often by NAM(Non-Aligned Members) and others in the past because the number of participating countries is limited in addition to the five nuclear- weapon-States having *veto*　as permanent members of the Council. It is important to build a stable foundation of support for the FMCT concept when considering not only legal issuess but also the verification system of the FMCT in the future. This is desirable in view of future discussions.

Report by Yasuto Fukui, Office of Planning Management and Policy Research

3. ISCN's Activities Reports

3-1 Report on Participation in the Atomic Energy Society of Japan's 2024 Spring Annual Meeting

The ISCN made two presentations on "Nuclear Nonproliferation, Safeguards and Nuclear Security" and four presentations on "Nuclear SKecurity Technologies for Large-Scale Events" in the general session "Nuclear Nonproliferation, Safeguards and Nuclear Security". The following is a summary of the four presentations made by ISCN.

Title: Nuclear material identification based on electron microscope image analysis using deep learning models for nuclear forensic analysis

Presenter: Yoshiki Kimura

As part of the development of nuclear forensics technology that contributes to the identification of the origin of nuclear and radioactive materials outside of regulatory control, the Office of Technology Development is developing analytical techniques for nuclear material identification based on the morphological characteristics of nuclear materials observed with electron microscopes. We have developed a novel method for simultaneously classifying nuclear materials and detecting unknown nuclear materials by applying deep metric learning models based on convolutional neural networks (CNN) to the analysis of images taken with a scanning electron microscope, and demonstrated that it can achieve high performance in identifying uranium concentrate (UOC) samples. In this presentation, we report the results of our study to improve the confidence in results and to provide timely analysis, in order to establish as an robust analytical technique to support criminal investigations and other activities. The results of the study were as follows: (1) optimization of the model structure and training process, (2) optimization of the unknown material detection, and (3) evaluation of performance robustness with varying types of UOCs. The results showed that using a new criterion for the unknown detection, the model logits (predicted model outputs without normalization), could reduce the time required for analysis while achieving high performance even when the number of UOC types increases.

Title: Application of prompt fission gamma rays to nuclear security -Applicability of Am-Li Neutron Source-

Presenter: Shiba Tomooki

For nuclear security purposes, there is a need for technology to detect nuclear material concealed within a shielded container. The prompt gamma rays associated with nuclear fission, unique to nuclear materials, have continuous spectra reaching a high-energy region with significant penetrating power. In this study, we explore the feasibility of active prompt fission gamma-ray measurement using an Am-Li source.

During the meeting, one participant inquired whether the technology was designed to detect heavily shielded nuclear materials such as uranium and plutonium. The presenter responded, "It is intended to detect nuclear materials within containers, such as those made of lead, for example." Another participant asked, "What type of detector is used?" The presenter replied, "Currently, a high-purity germanium detector is assumed, but given that the purpose is not to observe full energy peaks, a scintillation detector such as LYSO, suitable for high-energy gamma ray measurements, can be used."

Title: Development of Nuclear Security Technologies for a Large Public Events

Four series of presentations were given under the above titles. The contents of each presentation are reported below.

(1) Project Overview

Presenter: Mitsuo Koizumi

The ISCN has been developing monitoring technology for prompt detection of nuclear and radioactive materials brought into venue facilities and surrounding areas, aiming at strengthen nuclear security of large public events by preventing nuclear terrorism. The development is focused on a portable device equipped with radiation detectors, positioning sensors, a network device, and so on.

Initially, we built a prototype portable device that consists of a control board, a battery, a CsI(Tl) detector, and a Global Navigation Satellite System (GNSS)[17] device which can receive the radio waves from the QZSS[18] satellite. Outdoor test measurement was performed. It was confirmed that the system can display environmental radioactive field on a map with the accuracy less than 1 m. The system can be controlled by a single-board computer. This enables us to connect additional devices such as a camera, a networking device, and even a unmanned vehicle (UMV), by the external single-board computer.

(2) Radiation mapping techniques

Presenter: Ikuto Yamaguchi

Indoor radiation mapping is challenging due to the limitation of the GNSS-based location identification, which relies on radio waves from the satellite and thus becomes inoperable indoors. To overcome the difficulty, a robotic technique, Simultaneous Localization And Mapping (SLAM)[19], would be useful. SLAM utilizes devices such as

[17] The Global Navigation Satellite System (GNSS) is the generic name for positioning systems that use satellites, such as the U.S. Global Navigation Satellite System (GPS), Russia's GLONASS, and so on.

[18] Abbreviation for Quasi-Zenith Satellite System, QZSS, is the English name of the GNSS satellite system, MICHIBIKI, which is composed of quasi-zenith satellites. (Reference URL: https://qzss.go.jp/)

[19] Simultaneous Localization And Mapping (SLAM) is a term for the technologies that simultaneously map the surroundings and acquire information on the sensor's own location from the information from LiDAR, gyro sensors, camera images, and other sources.

LiDAR[20] (Light Detection And Ranging), which measures the positional relationship of surroundings from the LiDAR using laser beams continuously. This allows the system to construct a map of an unknown location while simultaneously determining its own position in the environment.

We developed a UMV equipped with radiation detectors and a LiDAR. To evaluate the performance of this system, a test experiment was conducted at the SuperKEKB facility of the High Energy Accelerator Research Organization (KEK). Radiation field was measured along a quarter of the beam line of the acceleration and storage ring. We confirmed that the positional accuracy of the SLAM was less than 1 m over a range of approximately 700 m of the curve. The resultant radiation mapping indicated the existence of activated devices. The origin of the radiation was identified from the obtained gamma-ray spectra near the device. We discussed with the audience about the possibility of upgrading the equipment by introducing scintillators with high energy resolution. (Development of portable high-resolution gamma ray detector was presented laser as given below.)

(3) Neutron source detection

Presenter: Takanori Mochimaru

Neutron detectors play a crucial role in detecting nuclear material and other neutron sources. Because fast neutron detectors measure direct neutrons, they are potentially useful to determine the direction of the neutron sources. The ISCN started a development of fast neutron detector system using plastic scintillation detectors. However, the drawback of the plastic scintillation detectors is its sensitivity to gamma rays. This reduces the neutron sensitivity due to the gamma ray background. To overcome the drawback, we introduced the plastic scintillator, EJ-276, which can discriminate neutrons and gamma ray events.

The ISCN has proposed the use of a neutron detector system on a moving UMV that can determine the neutron source direction. The detector system consists of plastic scintillation detectors with characteristic angular sensitivity, which is realized by the scintillator shapes: rod and plate. The detectors are placed different angles to the moving direction. Experiments were performed at the Nuclear Research Institute of Kindai University using a neutron source. Change of neutron counts was measured at each position. From the obtained data, we confirmed that the change of the counting rate indicates the neutron source detection. This technique would be effective for finding a neutron source secretly placed in a public space using a detector system on a UMV.

(4) Portable Gamma-ray Detectors

Presenter: Tohn Takahashi

[20] A sensor that emits laser beams in different directions and measures the distances to objects. The distance is deduced from the time from the emission of the laser beam to the detection of the bounce-backed laser beam.

We have been developing portable instruments using CsI(Tl) scintillation detectors, which are inexpensive and easy to handle. However, the energy resolution is not good enough for spectroscopic measurements especially for nuclear identification of nuclides which emits low energy gamma rays. In order to enhance the identification capability of those nuclides, improvement of the gamma-ray energy resolution is required.

We, therefore, started the development of a portable high-resolution gamma-ray detector system using a $LaBr_3$ scintillator, which is one of the high-resolution scintillators arose after 2000s. The gamma-ray detector system contains a $LaBr_3$ crystal, a photodetector and a data acquisition system. Some test experiments were performed using photomultiplier tubes (PMTs) and Si photomultipliers. The energy resolution of 3.1% at 662 keV was achieved with a PMT. However, such good resolution was not realized with Si photomultipliers. This is likely attributed to the mismatches between the $LaBr_3$ scintillator and the Si photomultipliers, i.e., the fluorescence wavelength and the shortness of the scintillation time structure. To make the detector portable, further developments are in progress for a high-voltage power supply for the PMT, and a compact data acquisition system.

Reported by Yoshikii Kimura, Tomooki Shiba, Mitsuo Koizumi, and Ikuto Yamaguchi, Technology Development Promotion Office,
Takanori Mochimaru, Tohn Takahashi]

3-2 Visit to ISCN and exchange of views at the Cooperative Monitoring Center (CMC), Sandia National Laboratories, Sandia National Laboratories, U.S.A.

On April 5, 2024, Mr. Justin Johannes, Deputy Director General (Global Security Program) and Mr. David Sandison, Director of the Cooperative Monitoring Center (CMC) at Sandia National Laboratories (SNL), USA, and three others visited the ISCN Exercise Field at the JAEA Nuclear Science Research Institute in Tokai-mura, Ibaraki Prefecture.

The CMC was established in 1994 for the purpose of international cooperation to strengthen international security. The CMC has expertise in equipment demonstration facilities and security, and has cooperative relationships with relevant organizations in other countries. On the occasion of the 30th anniversary of the CMC's establishment, the CMC has been visiting institutions that have cooperated with the CMC in the past. The CMC visited JAEA/ISCN on the occasion of the 30th anniversary of its establishment to revitalize the cooperative relationship by visiting the institutions with which the CMC has cooperated in the past.

After visiting the ISCN Exercise Field, the participants were introduced to the CMC's programs, and the ISCN presented and exchanged views on the recent topics of technical development, human resource development support, CTBT verification system support, and policy research and study. The CMC covers the entire scope of ISCN's work. We would like to cooperate with ISCN in the future in areas such as VRS acceptance," and both sides confirmed that they would establish a POC (Point of Contact) to continue discussions.

In addition, he handed over an invitation addressed to the ISCN Center Director to the 30th anniversary celebration to be held at CMC in September 2024.

Group photo of CMC and ISCN opinion exchange

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3-3 Discussion with Kazakhstan government and civil nuclear officials and site visit

On April 3, 2024, nuclear officials from the government of Kazakhstan and private companies visited JAEA and exchanged opinions with JAEA and inspected the ISCN Exercise Field at the Nuclear Science Research Institute in Tokai-mura, Ibaraki Prefecture.

This visit was the last cooperation project under the Japan-Kazakhstan Denuclearization Cooperation Agreement signed in 1994, which will expire in August 2024.[21] ISCN is supporting the Nuclear Security Training Center (NSTC) established at the Institute of Nuclear Physics (INP) in Kazakhstan in cooperation with the U.S. Department of Energy's National Nuclear Security Administration (DOE/NNSA). The ISCN will support the Nuclear Security Training Center (NSTC) at the Institute of Nuclear Physics (INP) in Kazakhstan in cooperation with the National Nuclear Security Administration (DOE/NNSA) of the U.S. Department of Energy (DOE/NNSA). The Secretariat for Denuclearization Cooperation of the former Soviet Union ([22]) requested an ISCN field visit to observe the ISCN's practical training.

Japan concluded bilateral cooperation agreements with Russia, Ukraine, Kazakhstan, and Belarus in 1993-1994 to implement denuclearization cooperation for the former Soviet Union countries, and each country established a cooperation committee to implement cooperation. Japan and Belarus, and Japan and Ukraine will expire in 2015 and 2018, respectively[23] , and Russia notified its withdrawal from the agreement in November last year[24] , leaving Japan and Kazakhstan as the only remaining cooperative framework. For Japan, it is important to continue Japan-Kazakhstan cooperation under the framework of the "Central Asia + Japan" dialogue.

The Kazakhstan side has a strong interest in continuing cooperation with Japan, especially with JAEA, while JAEA has a close relationship with the Kazakhstan National Nuclear Center (NNC), including a memorandum of understanding on cooperation. [25]

In terms of nuclear security and nonproliferation human resource development, NNC has participated in ISCN's nuclear security training and State Systems of Accounting for and Control of Nuclear Material(SSAC) training, implemented INP/NSTC support with DOE/NNSA, and co-hosted with DOE/NNSA the 2017 Washington Cooperation

21 http://www.tecsec.org/?p=4260

22 Japan and the former Soviet Union countries concerned had established cooperation committees with Russia, Ukraine, Kazakhstan, and Belarus as institutions to implement denuclearization cooperation based on bilateral agreements, but Japan and Belarus were dissolved in 2015 and Japan and Ukraine in 2018. Russia notified Japan of the termination of the agreement in November 2023, resulting in the continuation of only Japan-Kazakhstan denuclearization cooperation (this cooperation is scheduled to end in August 2024).

23 http://www.tecsec.org/?page_id=249

24 TASS, "Russia withdraws from agreement with Japan regarding destruction of nuke weapons," 10 November 2023, https://tass. com/politics/1704215

25 Japan Atomic Energy Agency, "Memorandum of Understanding for Cooperation with Kazakhstan National Nuclear Energy Center," April 30, 2007, https://www.jaea.go.jp/02/news2007/070507/

includes inviting a guest speaker from NNC at the workshop. [26]

In addition to the visit to the ISCN Exercise Field, the participants exchanged views on the continuation of cooperation, including support for human resource development, and the possibility of new cooperation between JAEA and Kazakhstan, as the cooperation agreement with Kazakhstan on nuclear weapons disposal support will celebrate its 30th anniversary in June this year. At the Forum for Nuclear Cooperation in Asia (FNCA), it was decided that Kazakhstan will host a workshop on nuclear security and safeguards projects in October 2024, and it was agreed to continue exchanging views in the future.

Tour of the ISCN Exercise Field

Director Inoue introducing ISCN

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[26] ISCN, "3-4 Joint Workshop with U.S. Department of Energy on Nuclear Security Workforce Development (Washington, DC, USA)," ISCN Newsletter, No. 0245 August 2017, https://www.jaea.go.jp/04/iscn/nnp_news/attached/0245.pdf#page=45

4. Column

4-1 ISCN newcomer series ～TADOKORO Towa～

Nice to meet you. My name is Towa Tadokoro, and I have been assigned to the ISCN Office of Planning, Management and Policy Research since April this year (2024). I was born and raised in Hitachinaka City and live near the sea. I have a dog at home, and my grandparents on both my father's and mother's side of the family love dogs.

Career Summary

I attended a local junior high school and after graduating from junior high school, I entered a commercial high school.

In my high school life, I have mainly studied calculators, bookkeeping, and computers (Excel and Word) since it is a commercial high school.

I graduated from high school and started working here at JAEA.

I was a member of club activities during my school years, and was a member of the soft tennis club in junior high school and the badminton club in high school. Perhaps it was because I played only racket sports, but I am not good at any sports such as soccer, basketball, volleyball, or baseball. Still, I love playing soccer and baseball in itself, so I used to play them with my friends when I was in school.

Hobbies

My hobby is collecting vintage clothing.

What kind of image do you have of used clothing? I am sure that some of you have negative opinions such as "dirty," "smelly," or "new clothes are fine. Certainly, you would have such an image at first. I, too, came into contact with secondhand clothes from that negative image at first.

Recently, however, secondhand clothing has become very popular among the younger generation, and the quality of secondhand clothing is gradually improving, dispelling the image of dirty and smelly clothes, and I have been getting deeper and deeper into the secondhand clothing swamp. In the vintage clothing genre, there is a more detailed term called "vintage. Vintage clothes are those made in the 1980s, 70s, 60s, etc. The older they are, the more the price changes. This is why vintage clothing is so interesting. The older the vintage clothing gets, the more valuable it becomes, and the less likely you are to find it in the same place as other people. This is another good thing about secondhand clothing, and the reason why I collect secondhand clothing.

From the perspective of the environment and the SDGs, which are currently being questioned, it is eco-friendly and wonderful that once-worn clothes are not thrown away but are passed on to the next person. There are many people who are interested in secondhand clothes but cannot afford to buy them or have a bad image of secondhand

clothes. It only needs to be done once. Please visit a vintage clothing store and look at, touch, try on, and actually hold many items in your hands. You may end up in the same swamp as me.

In the previous sentence, I mentioned that the clothes will be passed on to the next person, but isn't it exciting to look at old clothes and imagine what kind of people have worn the clothes you picked up and what kind of stories they have, and what kind of people will wear the clothes you gave away in the future? Maybe "secondhand clothes" cannot be confined to the framework of fashion.

● Finally.

I am very honored to be working in this new environment at ISCN. I hope to quickly get used to this environment, learn the job, and contribute to the company to the best of my ability. I look forward to working with you in the future.

Reported by Towa Tadokoro, Office of Planning Management and Policy Research

editorial postscript

Recently, we have seen a lot of news about the historic appreciation of the dollar against the yen, which is a particular headache for those who go on overseas business trips and may be surprised to see their credit card statements sent to them later. Conversely, foreigners have the impression that everything is cheaper in Japan thanks to the weak yen, which is probably one of the reasons for the increase in inbound travel. Frankly speaking, I have the impression that prices in Japan, especially for food and beverages at restaurants, are much cheaper than in Europe and the United States (and there are usually no surprises). When I lived in Europe, the yen was not as weak as it is now, but when converted to yen, it was very expensive compared to the Japanese price level. Even so, I could not hide my surprise at the rising prices after Russia's invasion of Ukraine, with gasoline temporarily exceeding 2 euros per liter and eggs close to 4 euros per pack. Although Europe gives the impression of being more expensive than Japan as a whole, the price of alcohol is low, making it a comfortable place for drinkers. Beer costs less than 1 euro for a 500 ml can (350 ml cans are not so common in Japan), and table wines for everyday drinking are available at low prices and of reasonable quality (except for wine connoisseurs). In fact, beer, water, and juice are about the same price in restaurants. Although there are many advantages to the weak yen, such as export industries and the inbound effect, a moderate exchange rate is desirable, and when the extreme depreciation of the yen improves in the near future, why not go abroad and experience the differences between Japan and other countries?

(H.T.)

If you have any questions or comments about the ISCN Newsletter, please send them to the following address

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