Nuclear Safety Commission

2024 ANNUAL REPORT

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Contents

I

The Nuclear Safety Commission's Vision

The Nuclear Safety Commission (NSC) is an independent regulatory authority in Taiwan responsible for the regulation of nuclear and radiation safety. It supervises the safety of nuclear facilities, radiation operations, and radioactive materials, and implements measures for radiation emergency preparedness, public protection, and environmental radiation monitoring. Furthermore, the NSC actively engages in international cooperation and technical exchanges on nuclear safety, aligns with global regulatory standards, strengthens safety-related regulatory measures, and promotes the safety and technological advancement of domestic nuclear energy applications to safeguard public health and the environment.

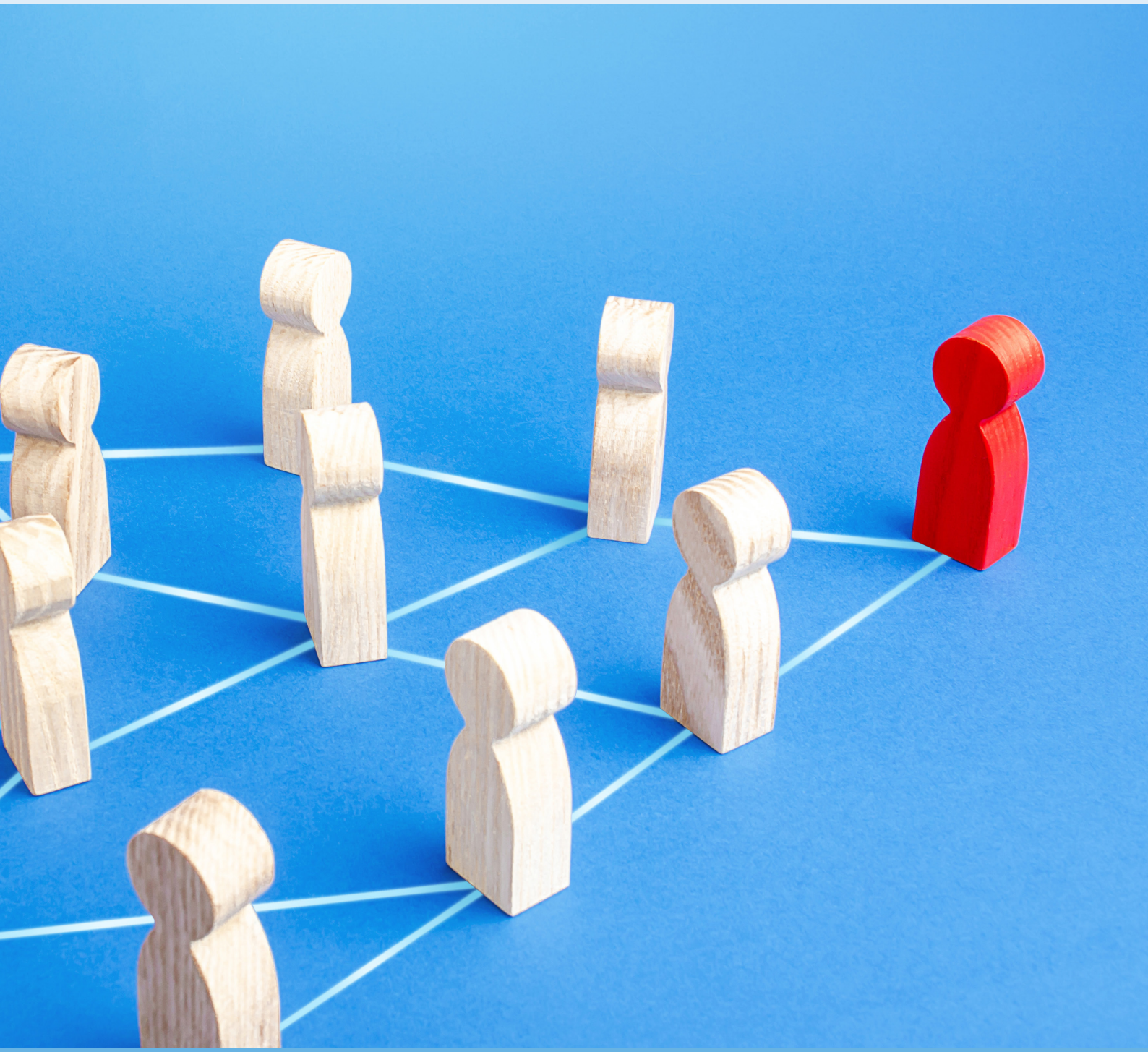
In 2024, regarding nuclear safety regulation, the NSC conducted multiple special inspections to ensure the safe transition of Maanshan Nuclear Power Plant (NPP) Unit 1 into the decommissioning phase following the expiration of its operating license. Additionally, during the first hot test of dry storage at the Chinshan NPP, inspectors were dispatched daily to ensure all operations complied with safety standards. Furthermore, regulatory requirements regarding industrial safety, radiation safety, nuclear safeguards, and nuclear security were fully implemented. Regarding public concerns over the radiation safety of food products, the NSC expanded domestic biological tritium testing capacity, extending its application to the testing of domestic fisheries and imported foods. Relevant data were made available on the NSC official website and the Ocean Radioactive Information System to reassure the public. Furthermore, the NSC actively promoted nuclear technology development, advancing interdisciplinary cooperation in areas such as nuclear power plant decommissioning, radioactive waste management, radiation safety, nuclear medicine, innovative semiconductors and electromechanical engineering, and advanced agriculture. These efforts aim to promote innovation in atomic energy technology and expand its applications for public welfare. Notably, for the first time, the nuclear emergency exercise invited persons with visual and hearing impairments to participate directly, to verify the feasibility and inclusivity of protective measures for diverse population groups.

The NSC also promoted nuclear science education through diverse approaches. It organized school programs in remote areas, incorporating hands-on experiments with physics and chemistry curricula to deepen students' understanding of nuclear energy. Additionally, teacher training courses were conducted to strengthen the professional competencies of elementary and junior high school educators in radiation applications and protection, cultivating more advocates for science communication. Moreover, in collaboration with local governments in New Taipei, Keelung, and Pingtung, the NSC carried out household visits and community-based campaigns, distributed radiation protection notebooks, set up information booths at disaster preparedness fairs, and provided multilingual materials for new immigrants, making radiation preparedness knowledge more accessible to diverse communities.

Looking ahead, the NSC will continue to enhance nuclear safety regulatory technologies while promoting transparency and public engagement to foster greater social understanding and trust. At the same time, it will also actively participate in international exchanges, carefully assess new-generation atomic energy technologies, mastering regulatory frameworks and safety standards, thereby reserving the nation's professional capacity in advanced nuclear safety oversight. The NSC will diligently fulfill its responsibilities as an independent regulatory authority, consistently taking steady, professional, and pragmatic steps to safeguard public safety while expanding the application of atomic energy across various fields.

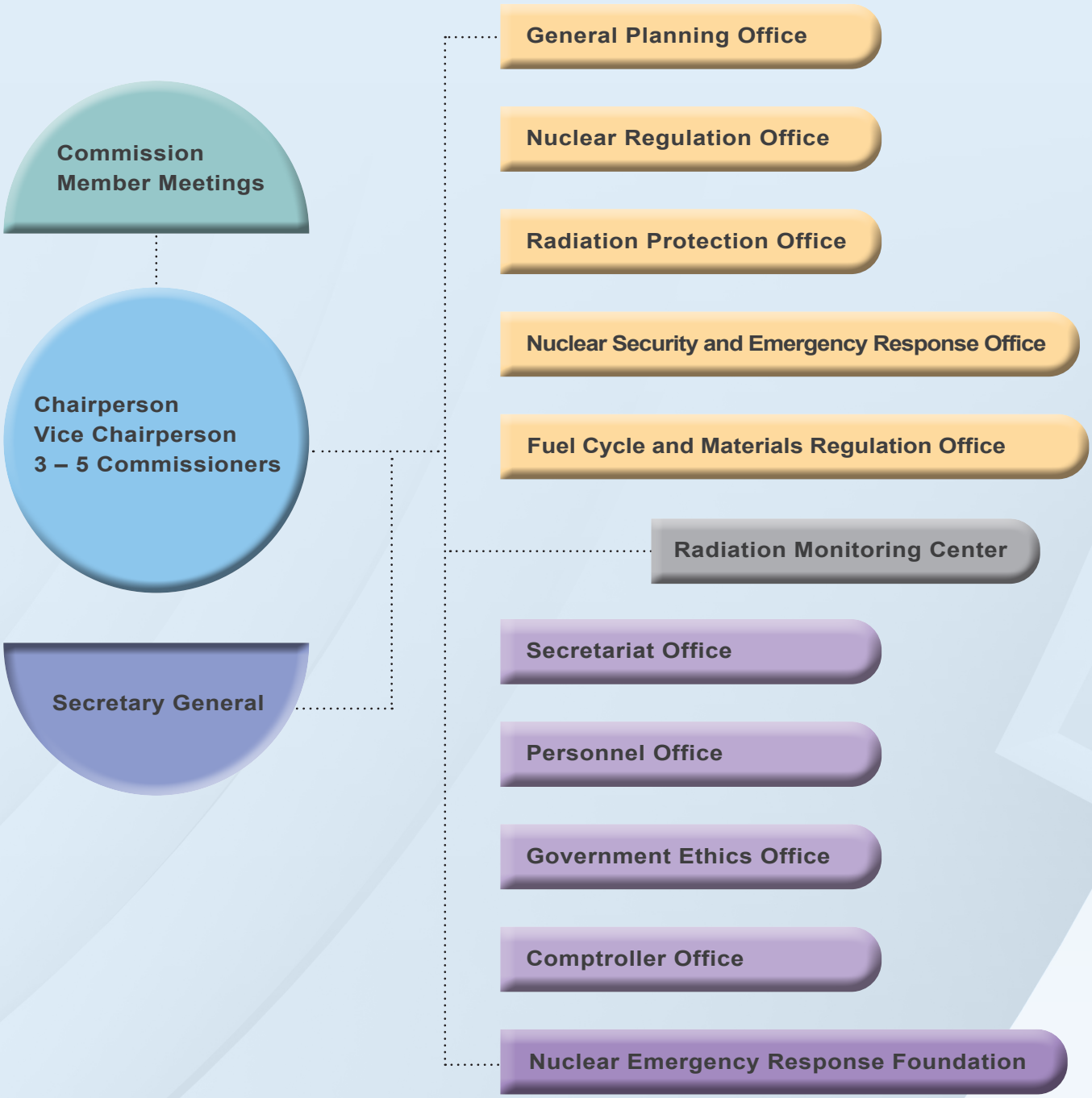
NUCLEAR SAFETY COMMISSION

II



Organization Structure

Organizational Structure

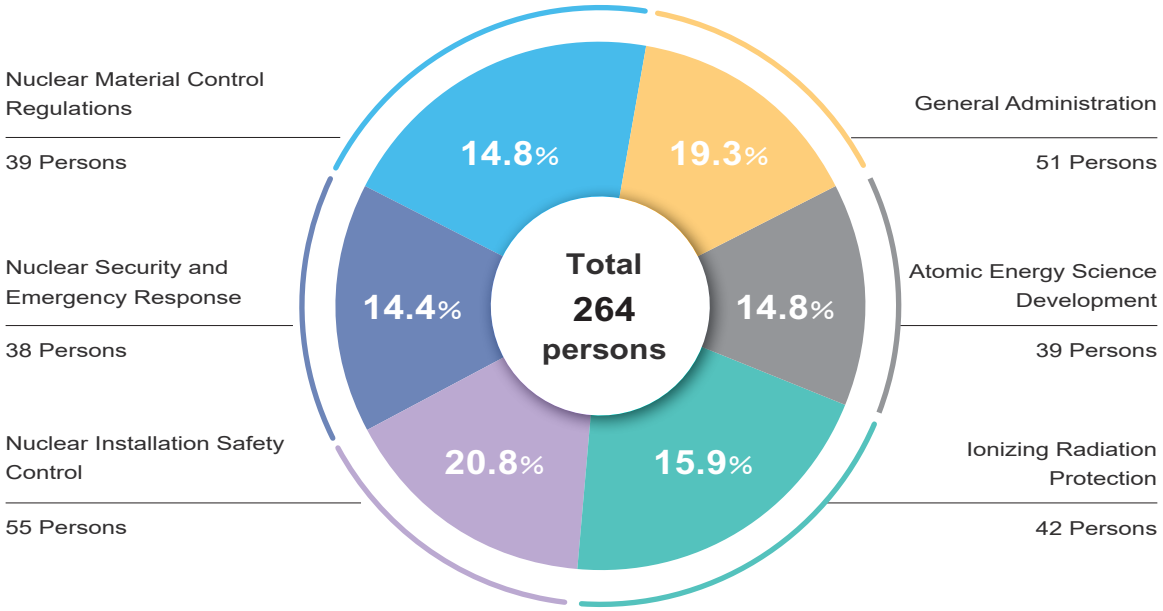

Commission
Member Meetings
Chairperson
Vice Chairperson
3 – 5 Commissioners
Secretary General
General Planning Office
Nuclear Regulation Office
Radiation Protection Office
Nuclear Security and Emergency Response Office
Fuel Cycle and Materials Regulation Office
Radiation Monitoring Center
Secretariat Office
Personnel Office
Government Ethics Office
Comptroller Office
Nuclear Emergency Response Foundation

III

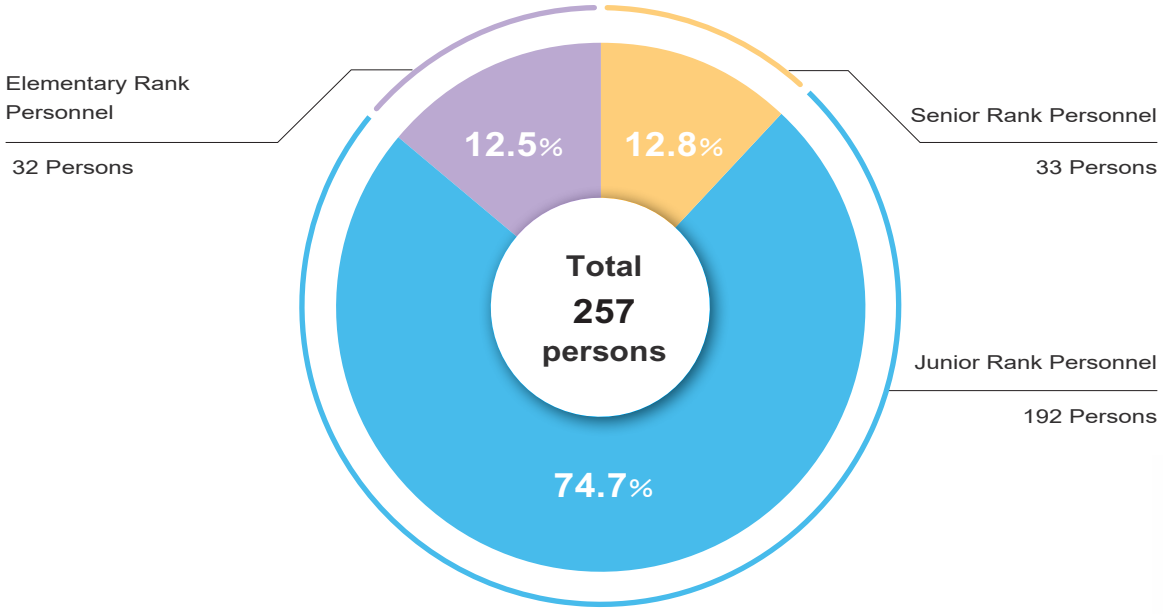
Manpower and Budget

Nuclear Safety Commission

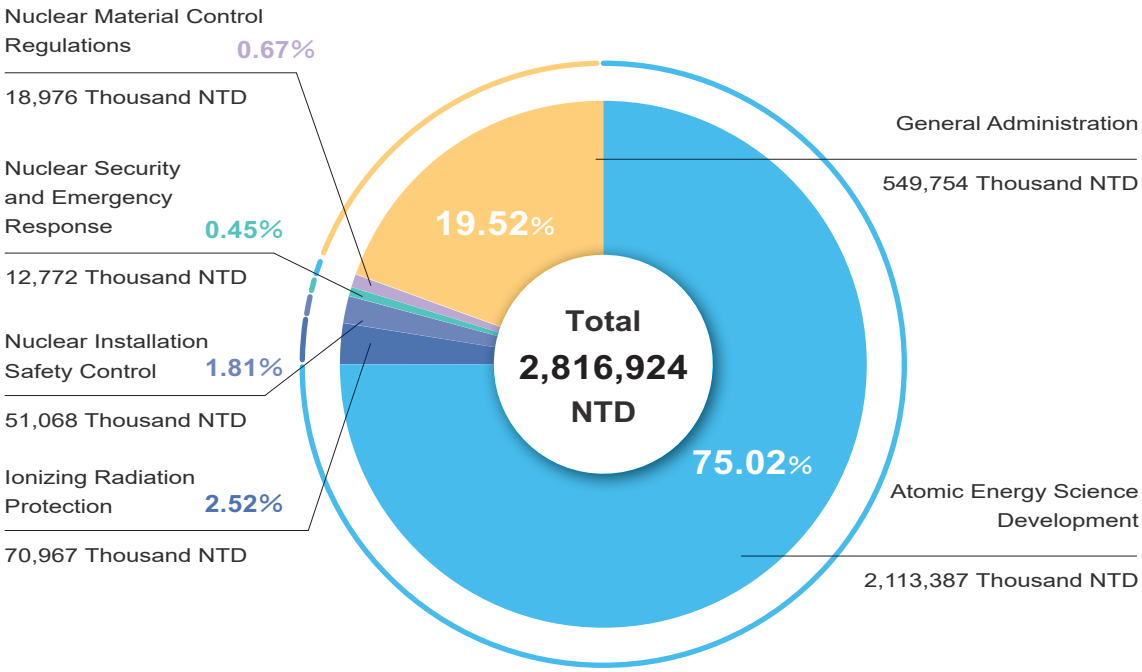
Human Resources Breakdown for Fiscal Year 2024(including 7 contractual employees)



Employees' Official Ranks in Fiscal Year 2024



Allocation of Budget Expenditure for Fiscal Year 2024



IV

Key Governance Outcomes

I. Public Participation and Information Transparency

Growing Up with Clear and Bright Popular Science – Cultivating Nuclear Energy Knowledge on Campus

To promote public understanding of nuclear energy, the Nuclear Safety Commission (NSC) has organized outreach activities across counties and cities to broaden public participation, aiming to plant the seeds of knowledge in the hearts of students. Recognizing the continuity and lasting influence of campus education, the NSC made schools its primary focus in 2024, seeking to spark students' interest in nuclear science. The initiative also aims to nurture their ability to think independently and communicate effectively when encountering information related to the environment and nuclear policy. Ultimately, students are encouraged to share what they have learned with their families and communities, further expanding awareness and understanding.

In response to the growing public concern over nuclear energy and radiation safety, the importance of literacy in atomic energy issues has also increasingly gained attention. Therefore, the NSC, based on the natural science curriculum guidelines of the 12-year basic education, designed experiments on ionizing radiation, radiation protection, and radiation measurement under the theme "Understanding Nuclear Energy in Daily Life." In addition to organizing three training workshops on radiation applications and protection for elementary and junior high school teachers, the NSC also participated in five "Experiment and Curriculum Competency-Based Instructional Design Workshops for Elementary and Junior High School Science Teachers" organized by National Taiwan Normal University, as well as two events aimed at enhancing experimental skills in natural science for elementary and junior high school students. A total of 935 elementary and junior high school teachers and students participated in these activities.

Moreover, learning worksheets were designed for the self-organized training courses to help participants evaluate their learning outcomes. According to feedback from post-activity questionnaires, over 98% of participants expressed satisfaction with the overall program, indicating that the course design effectively met their needs. Through the use of teaching plans and materials related to atomic energy topics, teachers are better equipped to promote relevant knowledge on campus and foster students' independent thinking and critical judgment regarding nuclear energy safety issues.

▲The Atomic Energy Science Popularization and Experimental Operation Teacher Training Course in 2024

▲Students from Shanlin Junior High School focused on conducting experiments and learned about the application of iodine in nuclear disaster protection.

To enhance opportunities for students in remote areas to acquire knowledge about atomic energy, the NSC has planned diverse learning experiences and organized atomic energy science popularization activities at remote schools in the Kaohsiung area as designated by the Ministry of Education: Shanlin Junior High School, Sipu Junior High School, and Jhongyun Junior High School. These activities were integrated with the schools' physics and chemistry curricula and included hands-on experiments and extracurricular learning. The program guided students in understanding ionizing radiation and its applications while incorporating stories of female scientists to promote the concept of gender equality.

At Shoufeng Junior High School in Hualien, a film featuring women in science and technology was screened, accompanied by a digital worksheet for students to complete. By incorporating open-ended questions, the activity aimed to inspire critical thinking and encourage peer discussion, thereby helping students gain a broader understanding of various aspects of nuclear technology.

In several self-organized science outreach events, the NSC also invited local junior and senior high school students to serve as exhibition guides. These students received training in atomic energy information and were provided with certificates acknowledging their learning process. The initiative aimed to cultivate their self-directed learning and communication skills, transforming them from passive learners into active communicators of knowledge, and further sparking their interest and motivation to engage in the field of nuclear energy.

The NSC encourages young students to engage in practical nuclear-related work by offering internship opportunities to students from the College of Public Health, National Taiwan University. A total of 448 person-hours of internship were completed. Through briefings on the operations of the NSC, site visits, and participation in science popularization activities, the interns gained an understanding of nuclear safety regulatory work and related policy measures.

An experience-sharing session was also held, during which students shared their insights from participating in various tasks of the NSC based on their expertise in public health. From the public's perspective, they provided recommendations to the NSC regarding public protection and science communication initiatives. Through this reciprocal learning process, the NSC's effectiveness in external communication was further enhanced.

The clear voices of students reading aloud carry their thirst for knowledge and bear witness to the NSC's dedicated efforts in promoting atomic energy science education. Along the journey of exploring science, the NSC has continuously supported students—ranging from teacher training and science outreach in remote areas to youth internships. Each transfer of knowledge not only equips students with fundamental understanding of atomic energy but also nurtures their ability to think independently. As a result, atomic energy science education is transformed from a difficult, abstract theory into practical knowledge closely connected to everyday life.

▲Interactions between the NSC interns and the public

▲Atomic Energy Science Exhibition (Yunlin Session) - Junior high school students serve as interpreters, introducing atomic energy science knowledge

Launch of the Advisory Committee on Public Engagement, Further Upgrading Public Communication

On September 27, 2023, the NSC underwent organizational reform and was transformed into a three-tier collegial body. To better align the functions of the former "Public Participation Committee" with practical needs, it was restructured into the "Advisory Committee on Public Engagement." Six experts and scholars or representatives from civil society groups concerned with nuclear safety were invited to serve as council members. They provide concrete recommendations on public participation and communication initiatives carried out by the NSC, aiming to strengthen practical measures and enhance public trust and understanding of nuclear and radiation safety issues.

In 2024, the NSC convened the Advisory Committee on Public Engagement meetings in April, August, and December. During these meetings, committee members combined public perspectives with their professional expertise to provide specific recommendations on public communication regarding several key issues. These included quality assurance in radiation exposure during medical procedures, disclosure of seismic and disaster preparedness information for nuclear power plants, public user experience with the marine information platform for the dispersion of radioactive materials, as well as response measures of nuclear power plants and dry storage facilities in addressing seismic risks, offering concrete recommendations on how to effectively communicate these issues to the public.

The feedback was not only implemented to enhance radiation safety education for medical personnel and optimize quality assurance systems, but also prompted improvements in the transparency of the information platform's user interface and data disclosure. In addition, the mechanism for information release during earthquakes or natural disasters at nuclear facilities was strengthened, thereby improving the public's ability to access and understand critical information in a timely manner. These efforts have further strengthened the effectiveness of external communication and the clarity of risk information dissemination.

▲The third Advisory Committee on Public Engagement Meeting in 2024

Active Communication on Nuclear Safety and Protection, Emergency Preparedness Awareness Is Essential

1.Home Visits within the Emergency Planning Zone

In October, a one-month door-to-door home visit program was carried out across 38 villages in 4 districts within the Emergency Planning Zone (EPZ) of New Taipei City. Local residents were recruited as outreach personnel to carry out these visits. Despite the impact of a typhoon, which caused flooding and road closures in several areas along the northern coast (including Shimen, Chinshan, and Wanli), the home visitors overcame these challenges and successfully completed the planned visits, reaching a total of 13,410 households.

The home visitors entered the communities to deliver information on nuclear safety and protection and to collect feedback on residents' needs regarding nuclear emergency response. In consideration of interactions with new immigrants, the visitors also carried multilingual informational materials to overcome language barriers and ensure that all residents fully understood the nuclear safety and protection information.

2.Participation in Communication and Outreach Activities within the Local Government's Emergency Planning Zone (EPZ)

To broaden public access to nuclear safety and protection knowledge, enhance community-based emergency preparedness awareness, and strengthen the public's capacity for self-help and mutual assistance, the NSC collaborated with the local governments of New Taipei City, Keelung City, and Pingtung County. Following a two- to three-year rotational cycle and designating each "village (Li)" as the basic unit, the NSC conducted localized outreach and evacuation drills within the Emergency Planning Zones (EPZs). These activities aimed to implement nuclear safety education and improve residents' emergency response capabilities. In 2024, a total of 40 sessions were conducted, with 3,855 participants.

3.Production of the 2025 Nuclear Safety Protection Notebook

The 2025 Nuclear Safety Protection Notebook features practical content such as a monthly calendar, note pages, and the traditional lunar calendar. It features vivid and lively illustrations presenting protection maps and eight Protection Tips. In addition to distributing the notebooks to households within the nuclear power plant (NPP) Emergency Planning Zones (EPZs), the NSC also hosts a giveaway event on the official Facebook page “NSC - Radiation Safety” to broaden the dissemination of nuclear safety knowledge.

4.Coordination with local governments for Emergency Preparedness Fairs and the National Emergency Preparedness Day on September 21.

In addition to organizing public participation activities related to safety regulation, the NSC collaborated with local government agencies to conduct events such as the National Emergency Preparedness Day on September 21 (9/21), the Emergency Preparedness Awareness Day on January 19 (1/19), and various Emergency Preparedness Fairs. Through interactive experiences and challenge games in nuclear science outreach activities, people of all ages learned about radiation safety and nuclear safety in an entertaining way. In 2024, in cooperation with local governments, the NSC set up booths at four Emergency Preparedness Fairs in Taipei City, New Taipei City, and Pingtung County, attracting approximately 2,000 participants.

▲Home visits within the Emergency Planning Zone（EPZ）

▲Communication and outreach activities within the Emergency Planning Zone（EPZ）

▲2025 Nuclear Safety Protection Notebook

▲Booth activities at the local government's Emergency Preparedness Fair

Upgrading Cybersecurity Protection and Optimizing the Website to Enhance Public Trust.

To ensure the stable operation of information and communication services in support of nuclear safety and radiation protection efforts, the NSC continues strengthening its cybersecurity environment and information system services. In 2024, a complete overhaul of the official website was completed, achieving certification for Level AA of the Web Content Accessibility Guidelines. New sections such as “Key Businesses,” “International Cooperation,” and “Popular Science” were added to enhance information transparency and improve ease of access.

The newly updated website also provides clear, accessible, and up-to-date information on socially relevant topics such as the discharge of tritium–contaminated wastewater, regulatory oversight of NPP decommissioning, and spent fuel dry storage. It enables the public access correct information, enhances better understanding of the NSC’s actions, and fosters greater trust in related regulatory measures.

Furthermore, to address increasingly complex cybersecurity threats, the NSC has deployed a Next-Generation Firewall (NGFW), enhancing network defense-in-depth and improving cybersecurity protection capabilities, which ensures the security and stability of information environment, and further strengthens the reliability and user trust in nuclear safety information services.

Group Visits of the Radiation Monitoring Center by Appointment to Explore Radiation Safety

In order to make the public better understand the practical operations of environmental radiation monitoring, the Radiation Monitoring Center (RMC) under the NSC offers group visits by appointment, providing a comprehensive and diverse science education environment. The visit includes laboratory tours, introductory videos on radiation monitoring, and detailed explanations by professional staff on the operation of various precision instruments, as well as the processes of environmental radiation monitoring and radiochemical analysis of radionuclides. Through interactive learning, visitors gain in-depth knowledge of the principles and structures of different radiation monitoring instruments and have hands-on experience operating the equipment, and enhance their interest in learning and sense of engagement through interactive question-and-answer methods.

Upholding the principles of “interaction, exchange, and learning,” the RMC gathers public feedback through various visit activities to better understand the concerns of the public. By sharing knowledge and technology, the RMC conveys the NSC’s dedication and commitment to protecting the public from radiation risks. In 2024, the RMC hosted a total of 96 visitors, providing comprehensive guided tours to help participants gain a deeper understanding of the basic principles of radiation and monitoring methods.

II. International Nuclear Safety Regulation Exchange Summary

Tenth NSC–NRA Nuclear Regulatory Information Exchange Meeting

▲Group photo of NSC and NRA participants

The Nuclear Regulatory Information Exchange Meeting was held in Taiwan from October 22 to 24, 2024. During the meeting, both sides shared experiences and exchanged views on topics including the current status of NPP safety regulation, the regulation and response measures for the discharge of Advanced Liquid Processing System (ALPS) treated water, nuclear security systems and physical protection, as well as the safety regulation of decommissioning waste. The discussions aimed to further strengthen nuclear and radiation safety regulatory practices on both sides.

2024 Taiwan–U.S. Civil Nuclear Cooperation Meeting

▲Group photo of Taiwanese and U.S. participants

The 2024 Taiwan–U.S. Civil Nuclear Cooperation Meeting was held in California, USA, from December 2 to 5. During the meeting, both sides engaged in in-depth discussions and shared experiences on topics including NPP operation regulation, NPP decommissioning regulation and technology development, regulation of radioactive waste and development of management technologies, as well as emergency response management and public protective actions. The meeting also covered the planning of bilateral cooperation projects for the upcoming year, aiming to further deepen collaboration in the nuclear energy field and promote technical exchange.

2024 NSC-NRC Bilateral Technical Meeting

▲A group photo of all representatives from the NSC and the U.S. NRC at the 2024 BTM

The NSC-NRC Bilateral Technical Meeting (BTM) is a regular international cooperation meeting jointly held by the NSC and the U.S. NRC. The meeting has been hosted on a rotational basis by both sides to share practical experiences and engage in technical discussions on nuclear safety regulatory issues since 2003. This initiative aims to further deepen bilateral cooperation and continuously enhance the effectiveness of Taiwan's nuclear safety regulations.

The 2024 BTM was hosted by the NSC on June 18 to 19. The NRC delegation, led by Mr. Russell Felts, the Division Director of the Office of Nuclear Reactor Regulation (NRR) of the U.S. NRC , along with relevant personnel, participated in the meeting. Both sides engaged in discussions and shared experiences on various topics, including recent regulatory activities, regulatory approaches during the decommissioning transition phase, nuclear emergency exercises at NPPs, response measures and information disclosure regarding tritium-containing nuclear waste water discharge from the Fukushima NPP, and regulatory developments concerning small modular reactors (SMRs).

2024 Seminar on Safety Regulatory Technology for NPP Decommissioning: Japan's Experience

▲2024 Seminar on Safety Regulatory Technology for NPP Decommissioning: Japan's Experience

To enhance Taiwan's technical capacity in the safety regulation of decommissioning radioactive waste, the NSC invited six experts and scholars from the Association for Nuclear Decommissioning Study (ANDES) and other relevant Japanese institutions to jointly host the "2024 Seminar on Safety Regulatory Technology for NPP Decommissioning: Japan's Experience" on July 4, 2024, at the Global Intelligence Service Convention Center at National Taiwan University. The seminar focused on sharing technical expertise and practical experience related to the treatment of low-level radioactive waste during NPP decommissioning, aging management of storage facilities, and safety regulation of spent nuclear fuel dry storage facilities. The event attracted around 80 participants from industry, government, academia, and research institutions. Through in-depth exchanges with Japanese experts, participants gained valuable insights into key safety considerations, helping to strengthen Taiwan's regulatory capabilities in nuclear materials safety and align with international standards.

IAEA Declares All Nuclear Material in Taiwan is Used Exclusively for Peaceful Purposes

Taiwan remains firmly committed to the peaceful use of nuclear energy and upholds the spirit of the Non-Proliferation Treaty (NPT). In accordance with the Trilateral Agreement on Nuclear Safeguards among the International Atomic Energy Agency (IAEA), the United States, and the Republic of China, as well as its Additional Protocol, Taiwan cooperates with the IAEA in implementing nuclear safeguards to prevent the proliferation of nuclear weapons. According to the IAEA's "Safeguards Statement for 2023", Taiwan was recognized for the 18th consecutive year as a territory where "all nuclear material is used exclusively for peaceful purposes."

III. Effective Oversight of Nuclear Power Plant Safety

Strictly Overseeing the Safety of Operating nuclear power plants

1.Conducting Inspections and Safety Regulations of Refueling Outage Activities at Maanshan Nuclear Power Plant Unit 2

Prior to the 28th refueling outage of Maanshan Nuclear Power Plant Unit 2, the Nuclear Safety Commission (NSC) reviewed the refueling outage plan and related risk assessment documents submitted by the Taiwan Power Company (TPC) to ensure that all refueling outage activities were properly planned. During the refueling outage, the NSC assembled a task force to inspect the implementation of maintenance and safety management activities and confirmed that the quality of refueling outage activities met pertinent regulatory requirements.

After the TPC completed all required pre-criticality refueling outage work for Maanshan Nuclear Power Plant Unit 2 and submitted an application for the unit to restart and reach criticality, the NSC reviewed the submitted documents in accordance with established procedures and dispatched its inspectors to the site to conduct enhanced inspections. Based on the comprehensive results of document reviews, on-site inspections conducted during the refueling outage, and enhanced inspections, the NSC concluded that the submitted documents and the unit's conditions met the startup requirements. Accordingly, the NSC approved the application on December 5, 2024.

▲The NSC conducted an inspection during Maanshan NPP Unit 2's 28th refueling outage

▲The NSC convened a pre-startup meeting for the Maanshan NPP Unit 2's 28th refueling outage on November 27, 2024

Regarding the grid synchronization application, the NSC conducted document reviews and on-site inspections during the startup process. Upon confirming that the unit's operational conditions met the grid synchronization requirements, the NSC approved the application on December 7, 2024. Furthermore, during the grid synchronization and power ascension phase, the NSC resident inspectors continued their supervision to ensure that all operations were carried out in accordance with all applicable regulatory requirements.

2. Conducting Project Inspections

The NSC conducted various project inspections at operating nuclear power plants, including resident inspections, Reactor Oversight Process team-inspections, team-inspections of post-Fukushima safety enhancement measures, and unannounced inspections. Regarding Reactor Oversight Process team-inspections, the NSC conducted project inspections such as fire protection inspections and maintenance effectiveness inspections in accordance with its annual inspection plan. These inspections were intended to verify that the plant operations conformed to all applicable safety standards and quality requirements.

To urge that on-duty staff members at nuclear power plants remain vigilant and fully comprehend unit operating conditions, the NSC conducted three unannounced inspections at the Maanshan NPP during non-working hours in 2024. These inspections were conducted to assess the performance of on-duty staff members and verify plant operational safety. Additionally, when a typhoon warning is issued and the storm radius is projected to encompass a nuclear power plant, the NSC will dispatch additional inspectors to the site to oversee and confirm that typhoon and flooding prevention measures are implemented in accordance with relevant operational procedures, thereby ensuring unit operational safety.

▲From March 18 to 22, 2024, the NSC conducted the 2024 fire protection inspection and the 2024 team-inspection of post-Fukushima safety enhancement measures at the Maanshan NPP

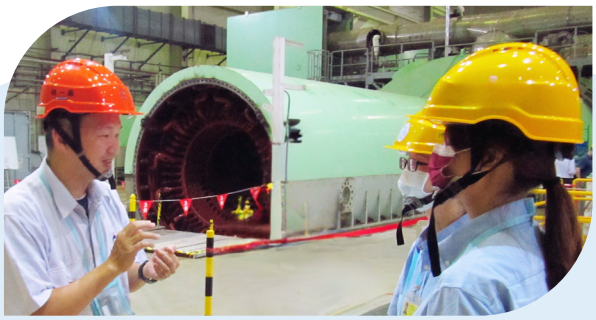
▲The NSC conducted an unannounced inspection at the Maanshan NPP on August 16, 2024

Rigorous Implementation of Safety Regulatory Measures for NPP Decommissioning

1.Conducting Chinshan and Kuosheng NPP Decommissioning Project Inspections

The Chinshan and Kuosheng NPPs have entered their decommissioning phases. During the period when spent nuclear fuel is temporarily stored in the reactor vessel, the NSC continues to implement the safety regulatory measures previously applied during the operational period. These include Reactor Oversight Process team-inspections, team-inspections of post-Fukushima safety enhancement measures, and unannounced inspections, which focus on

verifying safety-related aspects of the spent nuclear fuel and ensuring that NPPs carry out related maintenance and management activities in accordance with relevant regulations, thereby ensuring the safety of spent fuel. The NSC also conducts quarterly inspections of decommissioning plan implementation. A team comprising staff members from relevant offices carries out on-site inspections of decommissioning activities at the Chinshan and Kuosheng NPPs, as well as reviews of progress in addressing key regulatory follow-up items, to confirm that the TPC is properly implementing decommissioning work.



▲On August 12, 2024, the NSC conducted an inspection of the dismantling activities at the Chinshan NPP

▲On August 19, 2024, the NSC conducted a team-inspection of post-Fukushima safety enhancement measures at the Chinshan NPP

▲On March 7, 2024, the NSC conducted the first quarterly inspection of decommissioning plan implementation at the Kuosheng NPP

▲On May 15, 2024, the NSC conducted the second quarterly Reactor Oversight Process team-inspections at the Kuosheng NPP

2.Conducting Inspections of Decommissioning Preparatory Activities at Maanshan NPP Unit 1

The operating license of Maanshan NPP Unit 1 expired on July 27, 2024, upon which the unit entered its decommissioning phase. To ensure a smooth transition from the operational phase to the decommissioning phase and confirm that the decommissioning preparatory activities of Unit 1 do not compromise the safety and stability of Unit 2's continued operation, the NSC dispatched inspectors to conduct the Maanshan NPP Unit 1 Decommissioning Preparation activities project inspections prior to and during the shutdown of Unit 1. These inspections confirmed that Unit 1 had been permanently shut down in compliance with regulations, and that essential preparatory work for decommissioning had been conducted in alignment with the established plans. The preparatory work includes revisions to operational procedures, planning and implementation of training programs, updates to the maintenance database, main control room panel relabeling, and the installation of physical separation and clear signage between Units 1 and 2.

The inspections confirmed that the Maanshan NPP carried out all safety-related operations in compliance with applicable regulations and procedures.

▲On July 27, 2024, the NSC conducted an inspection of the permanent shutdown operations at the expiration date of the Maanshan NPP Unit 1 operating license

▲On July 29, 2024, the NSC verified the implementation of the main control room panel relabeling work at Maanshan NPP Unit 1

3.Regulatory Reviews of Nuclear Power Plant Decommissioning Projects

(1) Reviews of the "Chinshan NPP Nitrogen Tank Room Equipment and Piping Dismantling Plan" and the "Chinshan NPP Hydrogen Water Chemistry (HWC) System Equipment Inside and Outside the Offgas Building Dismantling Plan"

To ensure that the following elements had been properly planned—the prerequisites for the dismantling work, dismantling methods, radiation monitoring and waste management measures, and safety management measures, the NSC convened a project review panel comprising external experts along with NSC staff members to review the two dismantling plans submitted by the TPC. After confirming that the TPC had provided clarifications in response to all review comments and had revised the two plans in compliance with all relevant regulations and safety requirements, the NSC reviewed and approved the two submitted plans. During the dismantling periods, the NSC will dispatch inspectors to verify that the on-site work is being carried out in accordance with the approved plans.

(2) Review of the "Kuosheng NPP Cask Loading Pool Restoration Safety Analysis Report"

In 2017 and 2018, the TPC completed cask loading pool modifications for Units 1 and 2 at the Kuosheng NPP to resolve the issue of insufficient spent fuel pool storage capacity caused by delays in the dry storage project. As the Kuosheng NPP has now entered its decommissioning phase, the cask loading pool will be restored to its original design function to facilitate spent fuel transport operations from spent fuel pool to storage facility. The NSC convened a project review panel comprising external experts along with NSC staff members, to review the safety analysis report submitted by the TPC. After confirming that the TPC had provided clarifications in response to all review comments and that the report complied with applicable regulatory and safety requirements, the NSC approved the report on March 14, 2024.

(3) Review of Key Decommissioning Regulatory Items of the Maanshan NPP

To ensure the safety of the spent fuel stored in the spent fuel pool during the Maanshan NPP's decommissioning period, the NSC convened a project review panel comprising external experts along with NSC staff members to review the "Maanshan NPP Decommissioning Safety Analysis Report" and the "Maanshan NPP Decommissioning Technical Specifications" submitted by the TPC. After confirming that the TPC had addressed all review comments through clarifications and revisions, and that the two aforementioned documents complied with all applicable regulations and safety requirements, the NSC approved both documents on September 6, 2024.

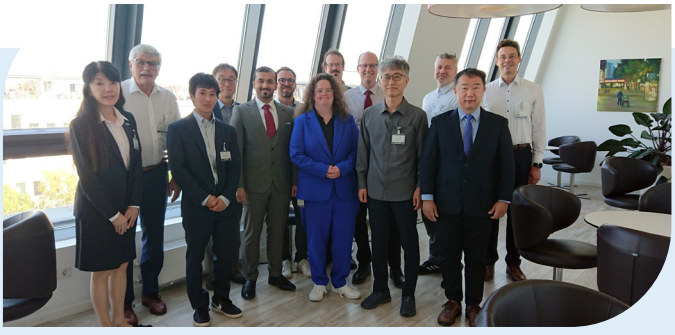
Enhancement of Nuclear Safety Regulation Effectiveness

1. Participation in International Technology Conferences

(1) In March, the NSC dispatched a staff member to attend the 36th Regulatory Information Conference (RIC) hosted by the U.S. Nuclear Regulatory Commission (NRC), to gather the latest international updates on regulatory legislation and lessons learned from long-term operational experiences pertaining to the front-end and back-end of nuclear fuel cycle management, accident-tolerant fuel, small modular reactors, advanced reactors, and nuclear fusion development. These insights serve as reference materials for nuclear safety regulation practices in Taiwan.

▲In March 2024, the NSC dispatched a staff member to attend the 36th Regulatory Information Conference (RIC) hosted by the U.S. Nuclear Regulatory Commission (NRC).

(2) In September 2024, the NSC dispatched its representative to attend the 28th meeting of the Component Operational Experience, Degradation and Ageing Programme (CODAP), hosted by the Nuclear Energy Agency (NEA) of the Organization for Economic Cooperation and Development (OECD). During the meeting, Taiwan's recent regulatory experiences were shared and discussed. The NSC also gathered the latest international information regarding the degradation and ageing of equipment and components at nuclear power plants, regulatory practices adopted by other countries, and global trends in nuclear safety technology development. These insights serve as reference materials for nuclear safety regulations and contribute to enhancing operational safety at nuclear power plants in Taiwan.



▲In September 2024, the NSC dispatched representative to participate in the CODAP meeting hosted by the NEA/OECD

(3) In November 2024, the NSC dispatched its representatives to participate in the first International Nuclear Reactor Oversight Workshop (INROW) in Japan, hosted by the Working Group on Reactor Oversight (WGRO) of the Organization for Economic Cooperation and Development (OECD). During the workshop, NSC representatives engaged in discussions with nuclear regulatory authorities from various countries on topics such as cross-cutting safety, station blackout incidents, and innovations in nuclear regulatory practices. NSC representatives also visited the Monju NPP to gain a deeper understanding of its ongoing decommissioning activities. The technical insights and regulatory experiences acquired will further enhance the nuclear safety regulations in Taiwan.

▲In November 2024, the NSC dispatched representatives to participate in the International Nuclear Reactor Oversight Workshop（INROW）in Japan, hosted by the OECD

2. Enhancing Workforce Training and Improving Regulatory Procedures

To enhance the professional and technical capabilities of its nuclear safety regulatory staff, the NSC organized a series of training programs, including the Nuclear Power Plant Decommissioning Inspector Initial Training Program, and NPP operator licensing examiner and resident inspector refresher training programs. Additionally, the NSC dispatched staff members to participate in international training courses relevant to nuclear safety regulations. These included the GE BWR Technology Review and GE BWR Simulator Refresher conducted by the U.S. NRC, a site visit to the Indian Point NPP undergoing decommissioning, and the Argonne National Laboratory Facility Decommissioning Training Course. Moreover, the NSC organized post-training experience-sharing sessions following overseas training programs to deepen its inspectors' understanding of international developments in nuclear safety regulation and further strengthen their regulatory expertise. In addition, the NSC continues to review and update its inspection manuals to consolidate its regulatory practices.

▲In August 2024, the NSC organized an initial training program for NPP decommissioning inspectors

▲In July 2024, the NSC dispatched its staff members to the United States to participate in training courses and to visit the Indian Point NPP

3.Organizing Advisory Committee on Nuclear Safety (ACNS) meetings and NPP Regulatory meetings

To increase the efficiency and effectiveness of NPP operational and decommissioning safety regulations, the NSC convened three Advisory Committee on Nuclear Safety meetings in 2024 to discuss the impacts of the Hualien Earthquake occurred on April 3 and corresponding countermeasures, as well as the implementation and management strategies for dismantlement during the decommissioning period. Additionally, two Task Force Meetings on NPP Decommissioning Safety Oversight were convened to discuss the regulation of off-site transfer processes for decommissioning waste and other pertinent issues through these meetings. The NSC also convened two meetings with the TPC regarding NPP operational regulations and two additional meetings concerning NPP decommissioning regulations to discuss safety-related regulatory issues. Through these meetings, the NSC prompted the TPC to adopt enhanced safety measures, drawing upon domestic and international experiences, to ensure nuclear power plant safety.

▲On May 28, 2024, the NSC convened the 22nd Task Force Meeting on NPP Decommissioning Safety Oversight

▲On June 5, 2024, the NSC convened the first Nuclear Regulatory Meeting of 2024

IV. Enhancing Radiation Protection and Safety Management

● Promoting awareness of radiation dose protection for the eye lens

With recent developments in epidemiological research, countries around the world have increasingly emphasized radiation protection for the eye lens. To strengthen radiation protection awareness among radiation workers, the NSC has conducted relevant training and activities focused on the technology of dose monitoring and assessment of eye lens, aiming to enhance radiation protection practices.

1. Conducting three training sessions on eye lens dose protection

The NSC held eye lens training sessions on September 21, September 28, and October 19 in Taichung, Taipei, and Kaohsiung, respectively. Individuals identified as critical group of eye lens dose exposure were invited to attend. The sessions included discussions and sharing on topics such as the current status of international regulations on eye lens radiation protection, radiation field characteristics of interventional radiology procedures, results from clinical research surveys in Taiwan, and recommendations for optimizing radiation protection measures. A total of 298 participants from 124 organizations attended these sessions.

2.Developing training materials on eye lens protection

The NSC produced a one-hour training video based on the content of the training and compiled a set of 10 practical Q&A items covering topics such as eye lens dose monitoring and related radiation protection concepts. These materials can serve as reference resources for radiation workers , facilitating the promotion of radiation dose protection concepts for the eye lens.

▲September 21, Eye Lens Training Course – Taichung Session

▲September 28, Eye Lens Training Course – Taipei Session

▲October 19, Eye Lens Training Course – Kaohsiung Session

▲Course video

▲Key concepts Q&A on eye lens dose

Conducting a Pilot Program for Cosmic Radiation Dose Management for Aircrew Personnel in Taiwan

Cosmic radiation exists naturally in the environment, and aircrew personnel working at high altitudes are exposed to higher levels of cosmic radiation compared to individuals at ground level. Therefore, radiation exposure among aircrew should be carefully considered. The International Commission on Radiological Protection (ICRP) recommends that social and economic factors be comprehensively considered when conducting dose assessment and management for aircrew personnel. The ICRP also sets a reference level for occupational dose management at 5 to 10 millisieverts per year.

With the increasing international emphasis on the management of cosmic radiation doses for aircrew personnel, and considering the cross-regional nature of international flight routes, the NSC has actively promoted a Pilot Program for Cosmic Radiation Dose Management for Aircrew (hereinafter referred to as the "Pilot Program"). This initiative aims to safeguard the radiation safety of aircrew and align with international best practices. Six Taiwan-based international airlines have been invited to participate in the program, which is scheduled to begin in 2025. The program is designed to gradually assist airlines in establishing radiation dose management systems for aircrew personnel, understand trends in radiation exposure from flight duties, accumulate practical experience and statistical data required for effective management, and facilitate the rolling adjustment of management measures. It also aims to ensure the accuracy of dose assessment and record-keeping, strengthen risk management, and ensure the radiation safety of aircrew personnel.

In 2024, the NSC completed the preparatory work for the Pilot Program. The key aspects of this work include:

1.Conducting Educational Promotion on Cosmic Radiation Safety for Aircrew Personnel

The NSC invited the Civil Aviation Administration, the Taoyuan Flight Attendants Union, the Air Line Pilots Association-Taiwan, and six Taiwan-based airlines to participate in an educational promotion. The initiative aimed to raise awareness of cosmic radiation safety, radiation dose management, and related risk concepts, helping front-line aircrew personnel work with greater confidence and peace of mind.

2.Establishment of a Public Education Webpage on Cosmic Radiation

A user-friendly webpage was created to provide clear and accessible information about cosmic radiation, flight dose assessment, aircrew dose management, and frequently asked questions. This resource is designed for aircrew personnel as well as the general public interested in the topic.

3.Development of "Aircrew Flight Dose Assessment Software" and Implementation of Training

The "Aircrew Flight Dose Assessment Software" was developed and completed. Six Taiwan-based international airlines were invited to participate in hands-on training sessions to familiarize themselves with the software's operation in advance, ensuring a smooth rollout and usage during the pilot program.

4.Hosting the "Pilot Program Briefing for Cosmic Radiation Dose Management for Aircrew Personnel"

The Civil Aviation Administration and six Taiwan-based airlines were invited to participate in the briefing session. The meeting aimed to conduct a comprehensive review of the pilot program and facilitate mutual dialogue, thereby enhancing and refining the program.

▲Educational promotion activity for aircrew

▲Briefing session on the Pilot Program for aircrew

Enhancing Taiwan's Capacity for Tritium Testing in Foods

In response to the potential radiation risks associated with the discharge of ALPS treated water from Japan's Fukushima Daiichi NPP, the Executive Yuan has tasked the NSC and the Ministry of Health and Welfare (MOHW) with jointly implementing the "Project for Enhancing Tritium Testing Capacity in Foods." This initiative aims to enhance domestic tritium testing capacity for foods. The key stages of implementation are as follows:

1.Two-Phase Standardized Tritium Testing Method in Foods

To ensure consistent testing procedures across Taiwan's tritium analysis laboratories, the National Atomic Research Institute (NARI) has proposed a two-phase method for testing tritium in foods. The first phase involves the analysis of tissue free water tritium, and the second phase involves the determination of organically bound tritium. This method was publicly released by the Food and Drug Administration (TFDA) under the MOHW, providing a standardized reference for other laboratories conducting tritium analysis in foods.

2. Expanding Taiwan's Capacity for Tritium Testing in Foods

To meet the increasing domestic demand for tritium testing, the NARI has continued to enhance its laboratory capabilities. Additionally, the NARI has assisted the Radiation Monitoring Center and Department of health, Kaohsiung City Government in training technical personnel and establishing tritium analysis laboratories for foods. Commissioning and unveiling ceremonies for these laboratories were held on June 17 and 25, 2024, respectively. Upon completion, Taiwan's annual tritium testing capacity increased from 500 to 2,000 samples. All three tritium analysis laboratories in Taiwan have successfully passed inter-laboratory comparison tests conducted by the National Radiation Standard

Laboratory (NRSL) under the Ministry of Economic Affairs (MOEA), thereby strengthening the quality and reliability of tritium testing for foods nationwide.

3.Expanding Tritium Testing and Analysis for Fishery Products and Japanese Imported Aquatic Food

With the enhancement of Taiwan's tritium testing capacity, the NSC, through an inter-ministerial coordination platform, has expanded its support for the testing and analysis of tritium in domestic fishery products and aquatic products imported from Japan. In 2024, a total of 972 samples were tested, assisting the Fisheries Agency and the TFDA in safeguarding the radiation safety of foods for the public.

▲Educational and Demonstration Seminar on Tritium Analysis Laboratories

▲Inauguration Ceremony of the Tritium Analysis Laboratory, RMC, NSC

▲Inauguration Ceremony of the Tritium Analysis Laboratory, Department of Health, Kaohsiung City Government

▲Briefing Session on the Inter-Laboratory Comparison Test for Tritium Analysis Laboratories

V. Enhancing Radiological Emergency Preparedness and Response Capacity

● Nuclear Safety Exercise Simulated International Natural Disasters and Wartime Scenarios to Strengthen Emergency Preparedness at Decommissioned NPPs and Maintain Nuclear Emergency Response Capabilities.

The 2024 Nuclear Safety Exercise No. 30 simulated an accident scenario at the decommissioning Chinshan NPP. Although the risk of an actual accident at the plant is extremely low, the exercise adopted a rigorous scenario, assuming the simultaneous loss of on-site and off-site power, heavy rainfall, earthquakes,

and other natural disasters, as well as wartime threats. The purpose was to evaluate the emergency preparedness capabilities both inside and outside the plant and to assess the coordination and availability of nuclear accident response resources. In addition, representatives from non-governmental organizations (NGOs) and assessment committee members were invited to form an unannounced scenario design team. This team issued unannounced scenarios in real-time during the exercise and incorporated randomly selected exercise items to simulate realistic emergency response conditions. The exercise was conducted in two phases: a tabletop exercise and a field exercise, as detailed below:

1. Tabletop Exercise

On August 1, the tabletop exercise was held at the National Nuclear Emergency Response Center, with simultaneous video conferencing connected to the New Taipei City Emergency Response Center, Forward Command Post of the Nuclear Emergency Support Center, the Nuclear Emergency Radiation Monitoring and Dose Assessment Center (hereinafter referred to as the Radiation Monitoring Center), and the TPC's Nuclear Emergency Response Center. The simulated scenarios included on-site unit rescue and security protection of critical infrastructure, advanced deployment and response for public protection in a nuclear incident, lessons learned from Japan's Noto Peninsula incident, and discussion of actions under military impact conditions. During the exercise, unannounced scenarios were also released in a timely manner to test the crisis management capabilities of the response personnel. All participating units closely coordinated and collaborated, successfully achieving the exercise objectives. A total of 254 personnel participated in this exercise.

The drill at the Radiation Monitoring Center was coordinated by the NSC's RMC and, for the first time, included participation from the National Airborne Service Corps under the Ministry of the Interior to assess interagency emergency response coordination capabilities. In addition, to strengthen emergency response capacity in southern Taiwan, response personnel from the southern region were specially arranged to deploy to the center in advance to conduct on-site drills of the electronic check-in procedure, ensuring smooth notification processes during emergencies. The exercise also simulated scenarios such as communication failures at on-site radiation monitoring stations and radiation monitoring in isolated areas, thereby evaluating the Radiation Monitoring Center's emergency response capabilities and continuously enhancing personnel's field coordination and response experience.

▲Tabletop Exercise – National Nuclear Emergency Response Center

▲Tabletop Exercise – New Taipei City Emergency Response Center

▲Tabletop Exercise –the Nuclear Emergency Radiation Monitoring and Dose Assessment Center

▲Tabletop Exercise –Forward Command Post of the National Military Command Center

▲Tabletop Exercise –the TPC's Nuclear Emergency Response Center

2. Field Exercise

The field exercise was conducted in two phases: on September 10 at the Chinshan NPP site, and on September 11 in the surrounding off-site areas. Each drill station was live-streamed online, enabling the public to observe the off-site exercises in real time. Additionally, an unannounced holiday mobilization test was carried out at the Chinshan NPP on September 1. A summary of the exercise results is presented below:

(1) To ensure the emergency response capability of personnel, the NSC conducted an unannounced mobilization test at the Chinshan NPP on Sunday, September 1, during off-duty hours. All tested personnel were able to return to work within the required time frame, successfully activated the emergency response center, completed video communication tests, and performed emergency response actions to maintain the NPP safety.

(2) The on-site exercise at the Chinshan NPP was conducted on September 10. Although the plant is in the decommissioning transition phase with an extremely low risk of incidents, the exercise adopted strict and challenging assumptions, including the loss of all on-site and off-site AC power, followed by natural disasters such as heavy rainfall and earthquakes, resulting in an isolated area. This was designed to deepen the response and handling of various potential disasters. Key focuses of this exercise included ensuring the redundancy and diversity of on-site water and power sources. For the first time, a single subject exercise was conducted without compressing the drill timeline to enhance realism. Additionally, in response to the earthquake scenario in Japan's Noto Peninsula, the exercise practiced strategies such as refilling spent fuel pool, removal of road blockages, and alternative operations for communication interruptions at radiation monitoring stations. Unexpected scenarios were also incorporated during the exercise to evaluate the plant's emergency response capabilities for accident management.

(3) On September 11, the off-site emergency response teams conducted exercises including coordination and dispatching led by the RMC. The drill reviewed the command and personnel deployment efficiency following the consolidation of the northern and southern radiation monitoring centers. The military forces and the National Airborne Service Corps jointly carried out radiation detection exercises across land, sea, and air domains. This included microwave data transmission from on-site real-time radiation monitoring stations, maritime radiation detection data, and real-time drone surveillance data transmission to the integrated radiation data visualization system. In New Taipei City, the drill focused on public protective actions. These included advising tourists to leave, self-help, mutual aid, and public assistance efforts within emergency preparedness communities, and emergency responses for isolated areas. Exercise messages were also sent through various channels, including nuclear accident alarms, Cell Broadcast Service (CBS) disaster warning messages, Location Based Service (LBS) text messages, the civil defense broadcasting system, and the Police Broadcasting Service. Elementary and junior high schools within New Taipei City's Emergency Planning Zone also conducted nuclear emergency preparedness education simultaneously. A total of 3,846 people participated in this field exercise.

(4) This field exercise was successfully completed through coordinated efforts between central and local governments, military units, and civilians, demonstrating optimal emergency response operations. The exercise also served to evaluate the operability of local emergency plans and related procedural manuals. By participating in the drill, both the general public and students gained a better understanding of the government's efforts in nuclear emergency preparedness. Furthermore, proactive preparedness in normal times is also one of the keys to the successful completion of this exercise. Personnel stationed at the Radiation Monitoring Center had completed a series of trainings in 2024, including basic and advanced response training, aerial, land-based, and marine radiation detection and sampling, dose assessment system operations, and use of the Advanced Visualization and Integration of Data (AVID) analytical software. A total of 22 training sessions were held, amounting to 131 hours and involving 513 person-times, thereby continuously strengthening the professional capabilities of emergency response personnel.

▲Drills of 4.16kV Power Supply Vehicle Deployment and Connection

▲Drills of Firefighting Operations within the Plant

▲Drills of the Anti-tsunami Gate Operations

▲Drills of Multi-functional Bulldozer Operations

▲Drills of Home Sheltering and Distribution of Iodine Tablets

▲Drills for Isolated Areas Logistics Support

▲Evacuation Drills for Vulnerable Populations (Visually and Hearing Impaired)

▲Drills for Diversified Notification Methods: Cell Broadcast Service (CBS) and Community Motorcycle Broadcasts

▲Radiation Detection Drills across Land, Sea and Air by the Radiation Monitoring Center

Strengthening NPP Defense Resilience to Safeguard Nuclear Safety

Due to the ongoing war between Ukraine-Russia, and although nuclear power plants are generally not considered primary military targets under the Geneva Conventions of the United Nations, they may still face threats arising from grey-zone conflicts. Moreover, following the damage sustained by the nuclear power plant and surrounding areas during the Noto Peninsula earthquake in Japan on January 1, 2024, the NSC convened a “Discussion Meeting on NPP Emergency Preparedness and Exercise Operations” with the TPC on January 25, 2024. At the meeting, the TPC was instructed to supervise all nuclear power plants in converting their “Preparedness and Response Plans for Ensuring Nuclear Safety Under Military Threats” into formal operating procedures, with regular reviews and updates to enhance plant defense resilience. Additionally, the TPC was requested to incorporate relevant scenarios into on-site drills based on the Noto Peninsula earthquake, including spent

fuel pool water overflow, transformer oil leakage, and failure of environmental radiation monitoring stations, as well as military threat scenarios, to verify the operability of these operating procedures and ensure nuclear safety.

Nuclear power plants are national critical infrastructure, and to prevent nuclear security incidents involving sabotage or intrusion, the NSC requires all nuclear power plants to conduct nuclear security and anti-terrorism tabletop exercises or force-on-force exercises. The tabletop exercises follow a "scripted scenario, unscripted response" approach, in which opposing Red and Blue Teams engage in adversarial simulations based on realistic threat scenarios to test preparedness and response capabilities. The exercise simulated adversaries who had meticulously observed and planned an intrusion into the plant. The goal was to validate the feasibility and effectiveness of the plant's contingency plans and related operating procedures. The force-on-force exercise was designed based on issues identified in previous tabletop exercises, simulating an intrusion by adversaries through security vulnerabilities in the plant. It aimed to assess the core defensive capabilities of the plant's special police and their effectiveness in responding to nuclear security incidents.

▲The Chinshan NPP Fire Emergency Response Drill for Transformer Oil Leakage

▲The Chinshan NPP Backup Measures Drill for On-site Environmental Radiation Monitoring Station Failure

▲The Kuosheng NPP Nuclear Security and Anti-terrorism Tabletop Exercise

▲The Maanshan NPP Nuclear Security and Anti-terrorism Tabletop Exercise

Conducting the Central Disasters Prevention and Protection Council Visit and Diverse Radiological Emergency Exercises to Enhance Response Effectiveness

The NSC has always approached radiological emergency preparedness with the utmost seriousness, upholding the principle of preparing for the worst while striving for the best outcomes, to safeguard public safety and property. To this end, the NSC continuously refines its emergency preparedness operations and consistently invites relevant central and local agencies to participate in exercises and training. These efforts aim to familiarize response personnel with emergency response protocols and enhance inter-agency communication,

coordination, and decision-making efficiency across all levels of government. In 2024, the NSC successfully completed the Central Disasters Prevention and Protection Council visit and conducted a series of diverse radiological emergency exercises, as outlined below:

1.Official Visit from the Central Disasters Prevention and Protection Council

On August 23, 2024, Minister without Portfolio Lien-Cheng Chi of the Executive Yuan led a joint visit of the NSC's radiological emergency prevention and protection operations. The delegation included experts, scholars, representatives from the Office of Disaster Management, Executive Yuan, various disaster prevention and protection authorities, and local governments. During the official visit, the NSC first provided a briefing on the progress of its radiological emergency preparedness and response initiatives. The delegation then visited the Kuosheng NPP to inspect on-site facilities, including radiation monitoring stations, emergency equipment warehouses, and the fixed secondary heat sink, to gain a deeper understanding of the nuclear emergency response mechanisms and facility capabilities that Taiwan has established with the goal of confining disasters within the nuclear power plant.

The visit team acknowledged the NSC's preparedness efforts and offered several recommendations for further improvement, to be considered in future planning. Finally, Minister without Portfolio Lien-Cheng Chi also provided guidance and encouragement to the relevant agencies, urging them to strengthen source control for radiological emergencies and to implement a protection strategy centered on disaster mitigation. By integrating professional emergency response personnel with public disaster evacuation actions, agencies should continue to enhance disaster resilience and emergency response capabilities, thereby safeguarding the lives and property of the public.

2. Participation in the sixth International Nuclear Emergency Exercise

To enhance preparedness and response capabilities for radiation emergencies and nuclear incidents, Taiwan actively participated in the sixth International Nuclear Emergency Exercise (INEX-6), organized by the Nuclear Energy Agency (NEA) of the Organisation for Economic Co-operation and Development (OECD). This exercise focused on food safety control during the long-term recovery phase following a nuclear or radiological emergency. Convened by the NSC, it was held on March 21, 2024, at the Central Emergency Operations Center (CEOC) with 50 personnel participating. Representatives from the Executive Yuan's Office of Disaster Management and the Office of Food Safety also attended to provide guidance and oversight. The exercise served as a platform for reviewing Taiwan's recovery preparedness mechanisms for radiological disasters. With the concerted efforts of all participating agencies, the exercise was successfully completed. Moving forward, Taiwan will continue to engage in international exchanges, share experiences, and learn from other countries and international organizations.

▲Group Photo of Official Visit Personnel for Radiological Emergency Preparedness and Response Operations

▲Inspection of the Emergency Equipment Warehouse at the Kuosheng NPP

▲Scenario and Situation Briefing for INEX-6 Exercise

▲Live Scene from the INEX-6 Exercise

3.Joint Radiological Emergency Exercises Conducted in Collaboration with Local Governments

Given the unique and rare nature of radiological emergencies, local governments generally lack practical experience in radiological emergency response. To address this gap, the NSC has supported local authorities by developing reference scenarios, assisting with scenario revisions, and dispatching Radiological Emergency Response Teams to participate in exercises. In 2024, the NSC assisted 11 local governments in conducting radiological emergency response exercises, mobilizing a total of 47 person-days of support. Notably, the exercises in Taoyuan City featured a display of radiological emergency response equipment co-developed by the NSC and the NARI, which received widespread recognition. Through these collaborative exercises, local response personnel have gained familiarity with radiological emergency response procedures, while the joint response mechanisms between the NSC and local governments have been strengthened. This partnership has also fostered valuable two-way communication and learning.

4.Annual Training for Radiation Emergency Response Personnel

In order to systematically strengthen Taiwan's radiation emergency response capabilities, the NSC conducted its annual training program for radiation emergency response personnel from May 20 to 21, 2024. To enhance interagency collaboration, participants included not only members of the NSC's Radiological Emergency Response Team but also personnel from the Ministry of National Defense and radiation emergency preparedness and response personnel from various municipal governments. The training incorporated classroom lectures, scenario simulations, case studies, hands-on practice, and group discussions. Key topics included: the use of personal protective equipment, the practical operation of vehicle-mounted and handheld radiation detectors, a response drill for incidents involving sources becoming dislodged from the shielded position during non-destructive testing, and a discussion on on-site operation procedures for radiation incidents. This blended approach of theory and practice enabled participants to become proficient in front-line radiation emergency response techniques and further strengthened central-local cooperation mechanisms.

5.Training Seminar on Radiological Emergency Preparedness and Response for Local Government Personnel

To strengthen Taiwan's capabilities in responding to radiological emergencies and to assist local governments and public transportation-related agencies in enhancing front-line response expertise, the NSC held one session of the "2024 Radiological Emergency Response Workshop for Local Governments" in each of the northern, southern, eastern, and central regions in August. The workshop covered fundamental concepts of radiation protection, key considerations for front-

line response personnel during radiological emergencies, case studies of domestic and international incidents, and the operation of radiation detection instruments. In addition, the workshop featured scenario-based exercises involving radioactive material incidents using the “Radiological Emergency Simulation Training System” developed by the NSC. These exercises enabled participants to apply the response techniques they had learned, enhance training effectiveness, and ensure that emergency responders can protect themselves when responding to radiological emergencies.

▲Participation of the NSC Radiological Emergency Response Team in Local Government Radiological Emergency Drills

▲Exhibition of Emergency Response Equipment Developed Jointly by the NSC and the NARI

▲Annual Training Program for Radiological Emergency Response Personnel Organized by the NSC

▲Classroom Session of the Local Government Radiological Emergency Preparedness and Response Seminar

VI.Enforcement of Nuclear Material and Radioactive Waste Regulation

Regulation of Spent Nuclear Fuel Dry Storage Facilities, A New Milestone in Decommissioning Safety

In 2024, the NSC allocated substantial manpower to oversee the safety of the dry storage project at the Chinshan NPP, particularly during the hot test operations. After the TPC obtained the Soil and Water Conservation Plan Completion Certificate issued by the New Taipei City Government on October 15, 2024, it commenced hot test operations on October 23. The hot test operations marked the first actual domestic implementation of spent nuclear fuel loading and dry storage transfer operations. To ensure operational safety, the NSC deployed personnel for daily inspections and required the TPC to strictly

follow the pre-operation procedural plan. After nearly two months of operations, the TPC completed the hot test for two cask units on December 18. Under the NSC's safety inspections and supervision, it was confirmed that all operations complied with the operational limits and acceptance criteria specified in the safety analysis report and operational procedures. Furthermore, regulatory requirements regarding industrial safety, radiation safety, nuclear safeguards, and nuclear security were fully implemented. Following the completion of the hot test, the TPC will submit an application for an operating license for the dry storage facility. The NSC will then conduct a rigorous review to ensure all safety standards are met in accordance with regulatory requirements, thereby safeguarding public safety.

In 2023, the TPC completed fabrication of the outdoor dry storage cask components, which are now temporarily stored on-site at the Kuosheng NPP. To ensure strict maintenance oversight, the NSC conducted two special inspections in 2024, focusing on the implementation of maintenance procedures, the effectiveness of maintenance management, and the quality of the components. Furthermore, the Soil and Water Conservation Plan for the facility was approved by the New Taipei City Government. Construction is scheduled to begin in January 2025. The NSC will rigorously carry out safety inspections and supervise the construction quality of the facility.

The TPC is currently conducting procurement and tendering procedures for the construction projects of indoor dry storage facilities at Chinshan, Kuosheng, and Maanshan NPPs. To ensure facility safety, the NSC regularly convenes regulatory coordination meetings on dry storage, facilitating communication and discussion on key technical safety issues and urging the TPC to expedite the construction plans for indoor dry storage facility. Additionally, the NSC continues collecting and analyzing safety regulatory frameworks and operational experiences from leading nuclear countries. It also collaborates with domestic scholars and experts to analyze critical safety regulation topics related to indoor dry storage facilities. These efforts aim to strengthen technical review capabilities and serve as preparatory work for the safety review of future construction license applications.

▲Safety Inspection of Hot Test Operations at the Chinshan Outdoor Dry Storage Facility

▲Safety Inspection of Hot Test Operations at the Chinshan Outdoor Dry Storage Facility

Rigorous Safety Review of Low-Level Radioactive Waste Storage Facilities and Ensuring Robust Operational Regulation

To ensure the operational safety of low-level radioactive waste treatment and storage facilities, the NSC has continued to carry out thorough reviews and inspections of these facilities. In 2024, the NSC proceeded with the review of the TPC's construction license application for the low-level radioactive waste storage facility at the Chinshan NPP. After convening experts, scholars, and relevant agencies for a rigorous assessment confirming that the proposed

facility complies with regulatory requirements, the NSC completed the review and issued the construction license in July 2024. During the construction phase, the NSC will continue to conduct strict inspections to ensure the quality of construction. In addition, in November 2024, the NSC approved the TPC's application for the use of low-level radioactive waste containers, thereby enhancing the safety of low-level radioactive waste storage.

To safeguard public health and environmental quality, the NSC strictly regulates the operational safety of existing radioactive waste treatment and storage facilities. It conducts regular and periodic inspections, along with rigorous environmental radiation monitoring at each facility. The NSC also requires the TPC to regularly conduct accident response drills to enhance the crisis awareness and emergency response capabilities of operators. During these drills, NSC inspectors are dispatched on-site to oversee their execution. After each accident drill, the TPC is required to submit an accident drill review report to improve training effectiveness and overall preparedness.

In July 2024, the TPC commenced the dismantling of the main generator and associated equipment at the turbine building of the Chinshan NPP, along with conducting radiation detection for clearance waste. To ensure strict regulatory control over the decommissioning process and the safe management of dismantled waste at NPPs, the NSC developed a project inspection plan. Based on this plan, preparatory project inspections and on-site safety inspections for this case were conducted in June and July 2024, respectively. During the initial phase of dismantling, NSC inspectors were stationed at the plant daily to carry out safety inspections. The NSC also required the TPC to implement internal quality assurance and third-party verification measures, and to report waste shipments to the competent environmental protection authority prior to the removal of waste from the site, in order to ensure on-site operational quality and protect public radiological safety.

To demonstrate the government's strong commitment to the relocation of the low-level radioactive waste storage Facility in Lanyu, the NSC regularly convenes coordination meetings with the Ministry of Economic Affairs and the Council of Indigenous Peoples to discuss relocation and compensation matters. These meetings aim to collectively urge the TPC to expedite the relocation process. The NSC also requires the TPC to submit quarterly progress reports, which are forwarded to the Executive Yuan's Task Force for the Promotion of a Nuclear-Free Homeland for oversight. To accelerate relocation preparedness, the NSC has instructed the TPC to complete the design and planning of the transport vessels and to continue dredging and reinforcing the structure of the dedicated port facilities. Under the NSC's strict supervision, the TPC has also completed the "Implementation Plan for Enhancing the Operational Safety of the Lanyu Storage Facility," including the successful repackaging of all radioactive waste drums. This has enabled the facility's return to a stable, static storage state. The NSC will maintain rigorous and sustained environmental radiation monitoring in the area to ensure the safety of the storage facility and protect the health of local residents.

To ensure the competence of personnel operating radioactive waste management facilities, the NSC conducts an annual "Radioactive Waste Treatment Facility Operator Qualification Examination." The NSC proactively notifies relevant facility personnel to participate in the exam. On May 21, 2024, the NSC held the 2024 Radioactive Waste Treatment Facility Operator Qualification Examination at the TPC Headquarters. By the end of 2024, the number of individuals holding operator and senior operator accreditation certificates reached 280 and 91, respectively. This provides a qualified and sufficient workforce to support the safe operation of radioactive waste treatment facilities in Taiwan.

▲Review of the Construction License Application for the Chinshan NPP Low-Level Radioactive Waste Storage Facility

▲Inspections of Low-Level Radioactive Waste Treatment Facilities

▲Inspection of Accident Response Drill Execution for Low-Level Radioactive Waste Facilities

▲Safety Inspections of Radiation Detection for Decommissioning Clearance Waste at the Chinshan NPP

▲The NSC Convened the 2024 Lanyu Site Relocation and Compensation Coordination Meetings

▲2024 Radioactive Waste Treatment Facility Operator Qualification Examination

Strengthening Safety Oversight of Nuclear Fuel Transportation to Ensure Public Safety

To maintain the normal operations of power generation at Unit 2 of the Maanshan NPP, the TPC submitted an application to the NSC in May 2024 for the import and transportation of nuclear fuel. After review, the NSC approved the application upon confirming compliance with the Nuclear Materials and Radioactive Waste Management Act and the Regulations for the Safe Transport of Radioactive Materials. During the transportation process, the NSC inspectors were deployed throughout to oversee and ensure operational safety. The fuel was successfully delivered to the Maanshan NPP in July 2024.

The NSC continues to closely oversee the implementation progress of the NARI's uranium hexafluoride (UF_6) stabilization, treatment, and disposal project. The NARI is required to carry out transportation operations in accordance with the Nuclear Materials and Radioactive Waste Management Act, and to submit a transportation plan, a safety regulation plan, and legally required application documents. Following a rigorous review and confirmation of compliance with the Nuclear Materials and Radioactive Waste Management Act, the Regulations for the Safe Transport of Radioactive Materials, and international nuclear safeguards and security requirements, the NSC approved the NARI's application for the transportation and export of UF_6 in September 2024. The NARI has completed the first batch of transportation, during which the NSC inspectors were present throughout the domestic segment to ensure transport safety.

▲Regulatory Oversight of Nuclear Fuel Transportation for the Maanshan NPP

▲Surface Dose Rate Measurement of UF_6 Containers

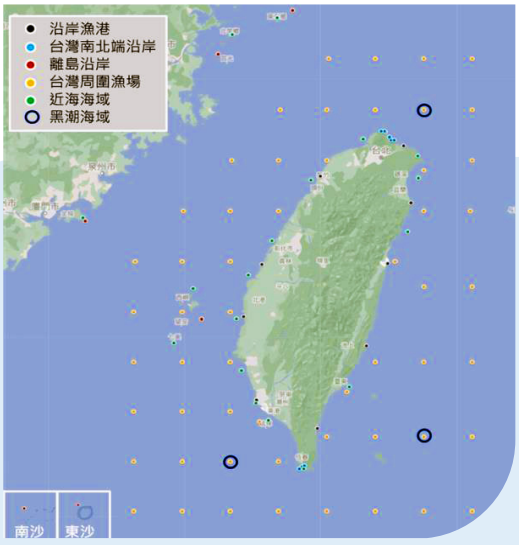
VIII. Strengthening Environmental Radiation Monitoring

Marine Environmental Radiation Monitoring in 2024

To address potential radioactive contamination arising from foreign radiological incidents and the nearby nuclear power plant, the RMC continues to implement the "Taiwan Marine Radiation Monitoring and Investigation Plan." Through interagency collaboration, this program monitors the environmental radiation levels in Taiwan's surrounding marine areas. Monitoring items include gamma-emitting radionuclides, tritium, and strontium in seawater; radioactive cesium and strontium in marine organisms; and radioactive cesium in sediments. These efforts help gradually establish a baseline for environmental radiation levels in Taiwan's marine territories.

In addition to the RMC's own sampling efforts, the Coast Guard Administration, the Ocean Conservation Administration, the Fisheries Research Institute, and the Fisheries Agency have assisted in collecting samples of seawater, marine products, and shore sand. Sampling locations cover coastal fishing ports, the northern and southern coastal waters near nuclear power plants, offshore islands, nearshore waters, surrounding fishing grounds, and the Kuroshio Current region (including areas along the main and branch currents). All collected samples are submitted to the RMC for radionuclide analysis. In 2024, the RMC completed sampling and radionuclide analysis for 542 seawater samples, 413 marine product samples, and 12 shore sand samples. The analysis results showed no abnormal radiation levels. In addition, to enhance its monitoring capacity for biological tritium, the RMC established a dedicated laboratory for tritium analysis in the same year, thereby enhancing the national capacity for related analysis.

Through regular sampling and analyzing of radionuclide levels in marine environmental samples, Taiwan conducts long-term monitoring of radiation in surrounding waters to ensure the radiological safety of the marine environment. Monitoring data are regularly disclosed to promote transparency, reassure the public, and safeguard the reputation of Taiwan's marine economy and related industries.



▲Marine radiation monitoring seawater sampling location map

Sample type	No. of samples	Analyzed radionuclides
Seawater	542	Cs-134, Cs-137, Tritium, Sr-90, Gamma-emitting radionuclides (Co-60, Ru-106, Sb-125)
Shore sand	12	Cs-134, Cs-137, K-40, Co-60, Thorium series, Uranium series
Marine products	413	Cs-134, Cs-137, Tritium, K-40, I-131, Thorium series, Uranium series, Sr-90

▲Types of samples, analyzed radionuclides, and number of samples in 2024

Establishing Radiation Detection Technology and Next-Generation Intelligent Radiation Monitoring Stations

1. Developing Radiation Detection Technology

The RMC serves as the national professional laboratory for radiological analysis. To address the decommissioning of nuclear power plants in Taiwan and potential overseas nuclear incidents, it is necessary to develop detection and analytical techniques for relevant radionuclides. This effort aims to enhance existing environmental radiation measurement technologies to ensure the radiological safety of the public.

As Taiwan's nuclear power plants gradually enter the decommissioning phase, the focus of environmental radiation monitoring has shifted from radionuclides generated during normal operations to those potentially arising from the long-term storage of radioactive waste and spent nuclear fuel. Therefore, analytical methods for the radionuclide of interest during the decommissioning phase, such as technetium-99 (^{99}Tc) and carbon-14(^{14}C), were established in 2024.

The analytical method for technetium-99 (^{99}Tc) primarily involves purification using resin, followed by measurement with a liquid scintillation counter. In 2024, tests were conducted using 1-liter seawater samples and different tracers (such as Tc-99m and rhenium) to evaluate the separation recovery rate and minimum detectable activity (MDA) when combining anion exchange resin AG1-X8 with a resin, TK-201. The results indicated that the recovery rate for analyzing 1-liter seawater samples exceeded 80%, and the MDA was approximately 0.03–0.04 Bq/L.

The analytical method for carbon-14 was developed with reference to techniques used in Japan and China. It adopts a dry decomposition method combined with carbon dioxide absorption to extract and recover carbon-14 from marine organisms for activity measurement. The results indicated that the average recovery rate for carbon-14 using this method was 74%, with a minimum detectable activity of 0.74 Bq per kilogram of wet weight.

The analytical methods established in 2024 can be applied during the decommissioning of Taiwan's nuclear power plants to monitor radiation safety in surrounding environments. In addition, carbon-14 analysis of marine organisms will be implemented in monitoring and surveys of marine life in the waters around Taiwan, contributing to the marine radiation background database in Taiwan.

2. Next-Generation Intelligent Radiation Monitoring Stations

To enhance the remote automation and monitoring capabilities of existing environmental radiation detection equipment, the RMC has launched a four-year research project to develop and establish a new generation of modular environmental radiation monitoring stations. These next-generation stations are designed to support real-time monitoring, autonomous operation, multi-source power backup, mobile deployment, and intelligent management. They will serve as prototypes for future environmental radiation monitoring infrastructure and will also strengthen the RMC's current nationwide radiological safety early warning automatic system. The four-year project focuses on technical advancements in the following key areas: (1)development and implementation of diverse power backup systems for environmental radiation monitoring stations; (2)system integration of real-time environmental radiation monitoring related technologies; (3)development and implementation of remote gamma spectrometry technologies; (4)design of compact and modular station components. Progress on the project in 2024 is outlined below:

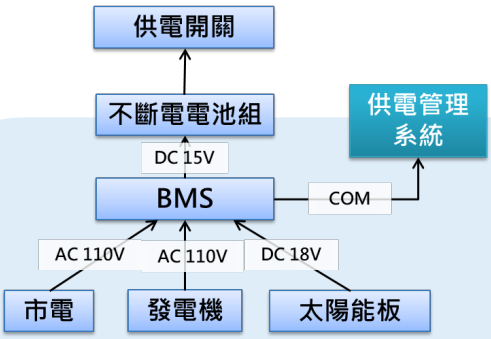
(1) Completed the development and design of a module equipped with a Battery Management System (BMS) for monitoring the voltage, current, and temperature of the instruments. The system features protective functions that are triggered under abnormal conditions, and incorporates a power switching mechanism to allow for diverse external power sources.

(2) Integrated a commercially available solar charging module (including solar panels and a power controller) to enhance the backup power capacity of the monitoring station's battery system.

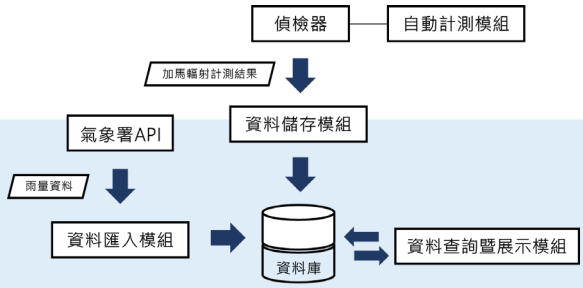
(3) Developed data integration software and a backend interface for the next-generation environmental radiation monitoring station, enabling the expansion of data volume and diversity. The interface supports simultaneous display of energy spectra, real-time dose rates, and cumulative dose rates.

(4) Procured one unit each of plastic scintillation counters, sodium iodide (NaI) scintillation counters, and cerium bromide ($CeBr_3$) scintillation counters for characterization research. Preliminary efforts have begun on developing automated remote monitoring functions and a graphical data display interface for gamma spectrometry detectors.

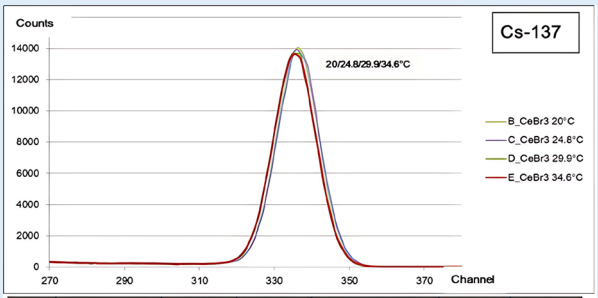
(5) Completed integration of multi-power modules (including diesel generators, solar power, and lithium batteries) , a gamma spectrometry analysis module, and a real-time dose rate module using plastic scintillation detectors. The integrated systems were mounted on mobile vehicles to enhance mobility and emergency response capabilities for on-site radiation incident detection.



▲Design Architecture Diagram of the Battery Management System（BMS）Module

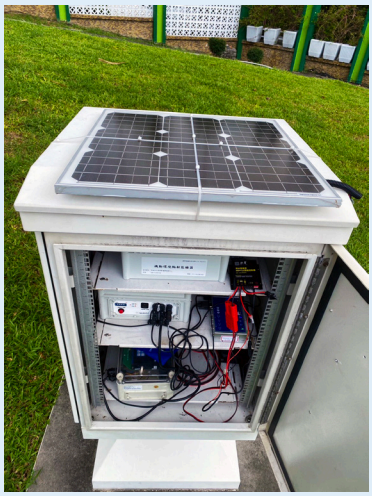


▲Schematic diagram of Automated Remote Monitoring Architecture for Gamma Spectrometry Detectors



編號	場域	測試溫度(℃)	濕度# (%RH)	最高計數頻道值 (channel)	差異值 (%)	計數值 (count)
B	校正室	20	36.3	336	-	14019
C	校正室	24.8	61.9	336	0	13931
D	4F會議室	29.9	72.4	335	-0.03%	13674
E	戶外(遮蔽處)	34.6	52.6	335	-0.03%	13604

▲Temperature variation characteristics research of cerium bromide（$CeBr_3$）scintillation counter



▲Expansion of Monitoring Station Power Supply with Solar Charging Module

V

Chronicle of Major Events

Date	Major Events
1	
January 2 to May 3	Conducted inspections activities at the Chinshan NPP: Special inspection of the third Maintenance Surveillance Cycle of Unit 2.
March 18 to March 22	Q1: Regular inspection of decommissioning activities.
May 20 to May 24	Q2: Regular inspection of decommissioning activities and special inspection of the Reactor Oversight Process.
August 19 to August 27	Q3: Regular inspection of decommissioning activities and special inspection of post-Fukushima safety enhancement measures.
December 2 to December 6	Q4: Regular inspection of decommissioning activities and special inspection of the Reactor Oversight Process.
January 4	Completed the “2024 Environmental Radiation Monitoring Plan” and published it online.
January 4, April 1, June 12	Conducted the “On-site inspection of the re-accreditation application,” “Approval for the issuance of the accreditation certificate,” and “Special inspection of quality assurance and operational performance” to assess the qualification of NARI as a commercial-grade items dedication agency.

Date	Major Events
January 6	Personnel were dispatched to consumer markets and Lunar New Year markets to purchase 40 imported food items, including cashews, dates, pistachios, walnuts, pumpkin seeds, tree mushrooms, and seafood such as shredded squid, conch meat, anchovies, South American shellfish, crustaceans, and Kappaphycus. Radioactivity testing was conducted on these samples, and all results complied with national regulatory standards. The results were published as the latest update on the website of the NSC.
January 16	Convened a communication and discussion meeting on the legislative process of the "High-Level Radioactive Waste Disposal Site Selection Act."
January 16, April 19, August 8,November 1	Radioactivity Analysis of Water Samples: A total of 439 tap water samples were tested under the 2024 "Radioactivity Analysis of Tap Water Samples in Taiwan" project. The results were officially submitted in writing to the Taiwan Water Corporation.
February 2, August 20	Completed the analysis of 4 water samples under the 2024 "Radioactivity Analysis of Water Samples from the Feitsui Reservoir Catchment Area," and the results were officially submitted in writing to the Taipei Feitsui Reservoir Administration.
March 27, September 23	Completed the analysis of 55 water samples under the 2024 "Radioactivity Analysis of Tap Water Samples in the Kinmen Area," and the results were officially submitted in writing to the Kinmen County Water Plant.
June 24, November 29	Completed the analysis of 35 water samples under the 2024 "Radioactivity Analysis of Tap Water Samples from Lienchiang County Water Plant," and the results were officially submitted in writing to the Lienchiang County Plant.
August 5, December 9	Completed the analysis of 28 water samples under the 2024 "Radioactivity Analysis of Water Samples from Water Purification Plants under the Taipei Water Department," and the results were officially submitted in writing to the Taipei Water Department.

Date	Major Events
January 24, January 24, January 31	Conducted the annual inspections at the Chinshan, Kuosheng, and Maanshan NPPs.
January 25, April 10, May 22	Held three meetings for the first performance evaluation of the NARI.
January 31, May 1, July 17, October 9	Held four inter-agency response meetings regarding the discharge of tritium-containing wastewater from the Fukushima Daiichi NPP in Japan.
January to December	Implemented the 2024 Radiation-Contaminated Building Residents Medical Consultation and Follow-up Care Program, completing health examinations for 718 residents of radiation-affected buildings.
January to December	Implemented the 2024 Home Health Care Program for Residents of Low-Contaminated Buildings, completing home health visits for 476 households.
January to December	Conducted unannounced radiation work site inspections for 43 radiographic inspection firms across Taiwan to improve the quality of radiation protection regulation.

Date	Major Events
January to December	Implemented the Executive Yuan–approved "2023–2026 National Marine Radiological Environmental Monitoring and Safety Assessment Response Project." Following Japan's discharge of ALPS treated water, 18 progress updates on Taiwan's response measures were issued.
2	
February 27, April 25, June 25, August 27, October 29, December 3	Convened six Nuclear Safety Commission committee meetings.
February 28	Participated in the "2024 International Women in Science Fair" to encourage female students to pursue careers in scientific research.
February 28, March 6, March 29	Conducted the first round of unannounced inspections at the Chinshan, Maanshan, and Kuosheng NPPs.
3	
March 4 to March 8	Conducted inspections at the Kuosheng NPP Q1: Regular inspection of decommissioning activities and special inspection of the Reactor Oversight Process.
May 13 to May 17	Q2: Regular inspection of decommissioning activities and special inspection of the Reactor Oversight Process.
August 12 to August 16	Q3: Regular inspection of decommissioning activities and special inspection of post-Fukushima safety enhancement measures.
October 14 to October 18	Q4: Regular inspection of decommissioning activities and special inspection of the Reactor Oversight Process.

Date	Major Events
March 8	Revised and issued the "Operation Directions for the Nuclear Safety Commission's Disaster Reporting and Emergency Response Task Force."
March 8, April 9, May 3, May 24, June 14	Convened four review meetings for TPC's "Maanshan NPP Unit 1 28th Fuel Cycle Coastdown Operational Evaluation Report," and approved the report on June 14.
	Summary of International Exchanges on Nuclear Safety Regulatory Affairs:
March 10 to March 17	Participated in the 36th "Regulatory Information Conference" hosted by the U.S. Nuclear Regulatory Commission (NRC).
July 5 to July 27	Attended U.S. NRC inspector training programs and visited the Indian Point NPP.
July 14 to July 22	Attended the "Argonne National Laboratory Facility Decommissioning Training Course".
September 15 to September 21	Participated in the 2024 Component Operational Experience, Degradation and Aging Programme (CODAP) meeting organized by the Organisation for Economic Co-operation and Development/ Nuclear Energy Agency (OECD/NEA).
November 10 to November 16	Attended the 2024 International Nuclear Reactor Oversight Workshop organized by the OECD/ NEA.
November 16 to November 23	Participated in the 2024 International Conference on Nuclear Decommissioning.
March 15	Conducted the "Biosample Tritium Analysis Training" to support the training of technical personnel from domestic food radioactivity analysis laboratories in biosample tritium analysis techniques.

Date	Major Events
March 18 to March 22	Co-hosted a "Cybersecurity Incident Response at Nuclear Facilities" technical exchange training in collaboration with the U.S. Department of Energy's National Nuclear Security Administration (DOE/NNSA).
March 18 to March 22 June 11 to June 14 July 26 to July 29 July 28 to September 6	Conducted inspections at the Maanshan NPP: Q1: Special inspection of the Reactor Oversight Process and the post-Fukushima safety enhancement measures. Q2: Special inspection of the Reactor Oversight Process. Maanshan NPP Unit 1 Decommissioning Preparation Following License Expiry inspections. Special inspection of the first Maintenance Surveillance Cycle operation of Unit 1.
March 21	Participated in the sixth International Nuclear Emergency Exercise (INEX-6).
March 29, June 28, September 24, December 26	Conducted four meetings of the 2024 Marine Radiation Monitoring Task Force.
March to November	Completed the annual inspection of radiation protection and medical exposure quality assurance at 52 medical institutions with two or more radiation-related specialty departments.

Date	Major Events
April 2, June 26	Held two Advisory Committee on Nuclear Legislation meetings of the Nuclear Safety Commission in 2024.
April 9	The NSC conducted the special inspection for the maintenance of equipment of the dry storage facility at Kuosheng NPP.
April 11	Dispatched the Radiological Emergency Response Team to participate in the Taoyuan City Min-An No. 10 Exercise, including the radiological emergency response drill and emergency equipment exhibition.
April 13, October 5 to October 6	Organized nuclear energy technology popular science exhibitions in Yunlin and Hsinchu, using interactive and educational approaches to present topics such as nuclear safety regulation, radiation detection, and civilian applications. A total of 9,391 visitors attended the two events.

Date	Major Events
	Conducted Chinshan NPP decommissioning-related regulatory work:
April 15 to May 24	Conducted on-site inspection of the "Dismantling Work Plan for Transmission Towers G1T2 and G2T3 connecting the Main Transformer to the Switchyard at the Chinshan NPP."
June 17 to November 8	Conducted on-site inspections of the "Dismantling Work Plan for the Chinshan NPP 69kV Switchyard."
July 1 to December 31	Conducted on-site inspections of the "Dismantling Work of the Main Generator and Associated Equipment" (Unit 2).
July 16 to December 31	Reviewed the "Chinshan NPP Hydrogen Water Chemistry (HWC) System Equipment Inside and Outside the Offgas Building Dismantling Plan"
July 23 to December 31	Reviewed the "Chinshan NPP Nitrogen Tank Room Equipment and Piping Dismantling Plan."
April 18, May 15, July 31, September 2	Completed and publicly released the "Quarterly Report on Environmental Radiation Monitoring of Nuclear Facilities" for the fourth quarter of 2023, the "Annual Report on Environmental Radiation Monitoring of Nuclear Facilities" for 2023, and the "Quarterly Report on Environmental Radiation Monitoring of Nuclear Facilities' for the first quarter and second quarter of 2024."
April 19, September 13, November 27	Convened three meetings of the Committee on Ionizing Radiation Safety.

Date	Major Events
April 22, April 25 to April 26, April 29, May 1 to May 3, May 7, May 9 to May 10, May 13 to May 14	Conducted professional training for nuclear security and emergency response inspectors.
April 25, August 14, December 30	Convened three meetings of the Public Participation Affairs Advisory Committee.
April 26, August 9, November 29	Convened three meetings of the Advisory Committee on Nuclear Safety (ACNS).
April 27, October 12	Hold two sessions of the 2024 “Radiation Protection Professional Examination and Radiation Safety Certification Examination for Operators.”
April 30, August 21, December 18	Convened three meetings of the Advisory Committee on Radioactive Materials Safety.
April to June	Completed administrative inspections of personal data protection measures at 13 firms in the ionizing radiation equipment manufacturing industry.

Date	Major Events
5	
May 6	Approved TPC's resumption of operations for the Volume Reduction Center at the Kuosheng NPP.
May 7	Approval was granted to lift the decommissioning regulatory control for "the NARI Building 016 Nuclear Materials and Fuel Storage Facility."
May 9, May 10, May 13, **May 15, May 28,** **June 3, June 21, June 27**	Aerial Radiation Detection Training: Completed three sessions of hands-on operation and maintenance training on aerial detection equipment vehicles with the Army Chemical Corps, with a total of 33 participants. Completed two sessions of equipment installation and practical flight training on aerial radiation detection instruments for the Army Aviation and Special Forces Command, with a total of 25 participants. Completed three sessions of practical flight training on aerial detection conducted with the National Airborne Service Corps, with a total of 35 participants.
May 15, November 14	Convened two nuclear power plant decommissioning regulatory meetings.
May 15 to May 18	Organized the 5th expert delegation to visit Japan, conducting an on-site inspection at the Tokyo Electric Power Company's Fukushima Daiichi NPP to directly assess the latest status of the "ALPS treated water" ocean discharge, and to engage in technical and information exchange.

Date	Major Events
May 17	In response to public concerns regarding Japan's discharge of tritium-containing wastewater and food testing issues, media reporters were invited to visit the NARI.
May 20, May 21	Conducted two sessions of the “Annual Radiation Emergency Response Personnel Training.”
May 21	Conducted the “2024 Radioactive Waste Treatment Facility Operator Qualification Examination.”
May 23, May 30, June 6, June 13	Nuclear Accident-Related Training of the RMC: Completed four basic training sessions for personnel of the RMC, with a total of 149 participants.
May 24, May 31, June 7, June 14	Completed four advanced training sessions for personnel of the RMC, with a total of 165 participants.
July 12, August 9	Completed two maritime radiation detection and sampling training sessions, with a total of 41 participants.
August 12, August 28	Completed two land-based radiation detection training sessions, with a total of 41 participants.
October 15	Conducted one dose assessment system operation training session, with a total of 13 participants.
November 18, November 19	Conducted one aerial radiation detection AVID software operation training session, with a total of 11 participants.

Date	Major Events
May 23, October 14	Completed the "Radioactive Fallout and Food Products Survey Semiannual Report," for the second half of 2023 and the first half of 2024, which were distributed to relevant agencies, government publication outlets, and made available online.
May 24	Fan Sun-Lu, Convener of the Education and Culture Committee of the Control Yuan, Vice President Lee Hung-Chun, along with ten other Control Yuan members, visited the NSC to tour the Nuclear Safety Duty Center and participate in a comprehensive discussion session.
May 24	Approved and announced the "Public Protective Action and Emergency Response Plan for the Emergency Planning Zone" of Pingtung County.
May 25	The NSC officially launched its newly updated website, which features dedicated sections for key businesses, international cooperation, and popular science, allowing external parties to quickly understand the NSC's core functions.
May 28, December 10	Convened two "Task Force Meetings on NPP Decommissioning Safety Oversight."

Date	Major Events
May 31	Conducted the special inspection for the maintenance of equipment of the dry storage facility at Chinshan NPP.
May 31, October 16, November 11	Kaohsiung Municipal Fong Siang Junior High School, Shu-Zen Junior College of Medicine and Management, | and Kaohsiung Medical University visited the RMC, with a total of 96 participants.
June 4	Convened the 2023 NSC-commissioned "Research Project Results Presentation Conference," featuring a total of 46 projects presented across 7 research fields.
June 5, December 11	Convened two Nuclear Power Plant Operation Regulatory Meetings.
June 6 to June 7, September 10, November 7	Conducted inspections of emergency response exercises at the Maanshan, Chinshan, and Kuosheng NPPs
June 12	Approval was granted to lift the decommissioning regulatory control for "the Nuclear Fuel Storage Facility of the Chinshan NPP"

Date	Major Events
June 17	Inauguration Ceremony of the Biosample–Tritium Analysis Laboratory of the RMC.
June 18	The IAEA published the “Safeguards Statement for 2023”, declaring Taiwan as a country where “all nuclear materials have been used for peaceful purposes” for the 18th consecutive year.
June 18 to June 19	Hosted the 2024 NSC-NRC Bilateral Technical Meeting (BTM)
June 19	Conducted “Educational Promotion on Cosmic Radiation Safety for Aircrew Personnel.”
June 25	Completed the comprehensive update of monitoring station nameplates to reflect the organization reform and name changes.
June 26	Published the “Annual Report of Occupation Radiation Exposure in Taiwan, 2023”.
June 26	Conducted the special inspection of the decommissioning operations for the NARI’s “Zero Power Reactor at Lung-Tan (ZPRL) Facility.”

Date	Major Events
June 27	Conducted the preparatory special inspection for the "Chinshan NPP Detection Program for Clearance Waste."
June 27	To accommodate with the nationwide shutdown of 3G networks, the monitoring stations' wireless networks were fully upgraded to 4G, and 25 detectors originally equipped with 3G specifications were replaced with 4G models.
June 30	Completed the Executive Yuan–approved "Project for Enhancing Bio-Tritium Testing Capacity," increasing testing capacity from 500 samples per year to 2,000 samples per year.
June to September	Completed the "Annual Key Inspections of Radiation Protection Training Operations" for eight firms.
June to November	Organized a series of ten outreach sessions of the 'Radiation Safety and Protection Education Workshop' across universities and colleges, engaging 1,267 medical and healthcare Students.
July 2 to July 5, December 17 to December 20	Special inspections of the spent fuel pools at the Chinshan and Kuosheng NPPs.

Date	Major Events
July 4	Conducted the inspection of nuclear fuel transportation operations of the Maanshan NPP.
July 4	Signed a memorandum of understanding (MOU) for collaboration with the Taiwan Ocean Research Institute, National Institutes of Applied Research.
July 12	Conducted the on-site safety inspection for the "Chinshan NPP Detection Program for Clearance Waste."
July 17	Issued the construction license for the low-level radioactive waste storage facility at the Chinshan NPP.
July 17, July 19	Supported various single-item drills and the first rehearsal of Kaohsiung City's 2024 Min-An Exercise No. 10. Took part in the "Wartime Traffic Accident and Ionizing Radiation Handling" drill, simulating a traffic accident involving a vehicle transporting radioactive materials (unsealed nuclear medicine substances), and conducted response actions for suspected radiation contamination.
July 22	Announced the revision of the "Fundamental Plan of Nuclear Emergency Response."

Date	Major Events
July 31 to August 9	Nuclear Safety Regulation Training Programs: Conducted a Nuclear Power Plant Decommissioning Inspector Initial Training Program.
August 12 to September 30	Conducted the Maanshan NPP operator licensing examiner and resident inspector refresher training program.
September 5 to September 20	Conducted the Chinshan and Kuosheng NPP operator licensing examiner and resident inspector refresher training program.
October 16	Conducted a training course on Groundwater Protection at a Nuclear Power Plant Site.
October 28	Conducted a training course on the TRACE code program.
October 30	Conducted a training course on the MELCOR code program.
November 4	Conducted a training course on the "PRA Model Based Risk Significance Evaluation Tool (PRiSE)".
November 6 to November 8	Conducted a training course on Probabilistic Risk Assessment (PRA) for nuclear power plant inspectors.
July to September	Completed the annual inspection operations of personnel dosimetry service providers for seven firms.
August 1	Conducted the tabletop exercise of the No. 30 Nuclear Safety Exercise in 2024.
August 6, August 9, August 26, August 29	Conducted a total of four sessions of the "Radiological Emergency Preparedness and Response Workshop for Local Governments" in New Taipei, Kaohsiung, Hualien, and Taichung.

Date	Major Events
August 12	Completed the revision and promulgation of Article 2 of Fee-charging Standards for Regulatory Services Under the Nuclear Materials and Radioactive Waste Management Act.
August 17, August 23, August 28, August 30	Conducted the second round of unannounced inspections at the Maanshan, Kuosheng, and Chinshan NPPs.
August 23	The Central Disasters Prevention and Protection Council conducted an official visit to the NSC to inspect radiological emergency preparedness and response operations.
September 1, November 14	Conducted unannounced off-duty hours communication tests for the emergency response of the Chinshan and Maanshan NPPs.
September 4	Conducted an inspection of the progress in addressing the decommissioning site boundary issues at the Kuosheng NPP.
September 5	Convened the 2023 “Nuclear Science and Technology Academic Collaboration Research Project” Results Presentation Conference, featuring 57 projects presented across seven sessions in four fields.

Date	Major Events
September 10 to September 11	Conducted the field exercise for the No. 30 Nuclear Safety Exercise in 2024 at the Chinshan NPP and surrounding areas.
September 11	Conducted the inspection of the nuclear security and anti-terrorism field exercise at the Chinshan NPP.
September 11	Published the 2023 Annual Report on the Application and Management of Ionizing Radiation in Taiwan.
September 18, November 7, November 21, December 6 to December 7	Conducted atomic energy science outreach events at Shanlin Junior High School, Sipu Junior High School, and Jhongyun Junior High School in Kaohsiung, as well as Shoufeng Junior High School in Hualien. The events aimed to help students understand ionizing radiation and its applications, incorporating stories of female scientists to promote the concept of gender equality within the field of atomic energy science and technology.
September 19	The Gamma Dose Calibration Laboratory of RMC passed the “Nineth Proficiency Test for Calibration Capability of Radiation Detection Instruments.”

Date	Major Events
September 21, September 28, October 19	Conducted three training sessions on eye lens dose protection in Taichung, Taipei, and Kaohsiung.
September 24 to September 25	Participated in the “2024 Technical Safeguards Implementation Meeting” in Vienna, Austria.
September 28	Conducted the “2024 Social Event for Residents of Radiation-Contaminated Buildings” at the Renai Branch of Taipei City Hospital.
September 28, October 13, October 20	Organized training courses on radiation applications and protection for elementary and junior high school teachers, and designed radiation measurement experiments and learning sheets to help participants self-assess their learning outcomes.
October 1 to October 31	Conducted home visits within the emergency response plan areas of New Taipei City.
October 9, October 17	Conducted unscripted nuclear security and anti-terrorism tabletop exercise inspection at the Maanshan and Kuosheng NPPs.

Date	Major Events
October 11	Conducted the special inspection of the "Uranium Hexafluoride Nuclear Fuel Transportation Operation" of the NARI.
October 21	Convened the review meeting for Taiwan's 2024 National Report as referred to the "Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management"
October 21 to December 7	Summary of Maanshan NPP Unit 2: Conducted inspections of Maanshan NPP Unit 2 28th refueling outage.
December 1 to December 5	Conducted the enhanced on-site inspection of the application for Maanshan NPP Unit 2 to restart and reach criticality.
December 5	Approved the application for Maanshan NPP Unit 2 to reach criticality.
December 7	Approved Maanshan NPP Unit 2 grid synchronization application.
October 22	Successfully passed the 2024 IAEA proficiency test, with participation in items including gamma-emitting radionuclides, gross beta, tritium, and strontium-90.
October 22 to October 24	Held the "10th NSC-NRA Nuclear Safety Information Exchange Meeting" in Taiwan to share experiences and exchange views.

Date	Major Events
October 23	Conducted a special inspection for the hot test operations of the dry storage facility at Chinshan NPP.
October 30, November 7, November 12	Conducted three sessions of the "Radiation Safety and Regulatory Promotion for Radiographical Testing Service Operators" in Taoyuan, Yunlin, and Kaohsiung.
October to December	In response to Taiwan's first dry storage hot testing, proactive coordination was carried out among the IAEA, TPC, and the regulatory authority. As a result, the IAEA successfully aligned with Taiwan's testing schedule and arranged for inspectors to conduct on-site inspections.
November 7	Approved the ten-year re-assessment reports for the low-level radioactive waste storage facilities at the NARI Buildings 067 and 075.
November 20	Convened a briefing session on the "Pilot Program for Cosmic Radiation Dose Management for Aircrew," inviting six Taiwan-based airlines operating international routes to participate.
November 28	Completed the review of TPC's application for the use of T1 containers as storage and transport packages for low-level radioactive waste.

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Date	Major Events
November 29	Held an award ceremony to commend top-performing medical institutions in the Inspection Program on Radiation Protection and Medical Exposure Quality Assurance.
December 2 to December 5	Attended the “2024 Taiwan–U.S. Civil Nuclear Cooperation Meeting” in California, United States, to share experiences and exchange views.
December 3, December 5	Two sessions of the “Advanced Training for Emergency Decision-Makers in Nuclear Accidents 2024” were held separately at the NSC and the Pingtung County Fire Department.
December 5	Convened the 57th Radiation Protection Regulatory Meeting for Nuclear Facilities.

Date	Major Events
December 10, December 13, December 14	Conducted the third round of unannounced inspections at the Kuosheng, Maanshan, and Chinshan NPPs.
December 12	Convened the “2024 Workshop on Early Warning and Safety Assessment Techniques for Radioactive Material Diffusion in National Marine Areas.”
December 18	Completed the inspection of fuel loading and storage/transport operations for two storage casks of the TPC.
December 19	Conducted an on-site inspection of the armor-piercing ammunition containers under the “Phase 11 Outsourced Overseas Disposal Project for Expired Military Ammunition.”

Nuclear Safety Commission

2024 ANNUAL REPORT

Editor	Nuclear Safety Commission
Publisher	Nuclear Safety Commission
Tel	+886-2-8231-7919
Add	2F., No.80, Sec. 1, Chenggong Rd., Yonghe Dist., New Taipei City 234036, Taiwan (R.O.C.)
Website	https://www.nusc.gov.tw/english/
Edited	Wish Creative Design co., LTD.
Date of Publication	December 2025

ISBN：9786267658444　　GPN：4711400094

Wu Nan Bookstore

Address: No.85, Sec. 2, Taiwan Blvd., West Dist., Taichung City 403018 , Taiwan (R.O.C.)

Tel: +886-4-2226-0330

Government Publications Bookstore

Address: 1F., No.209, Songjiang Rd., Zhongshan Dist., Taipei City 104472, Taiwan (R.O.C.)

Tel: +886-2-2518-0207

Price　　NT$150

This report is also published on the Administration & Regulations of NSC,

Website : https://www.nusc.gov.tw/english/

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ISBN: 978-626-7658-44-4
00150
9 786267 658444
GPN: 4711400094
NT:150