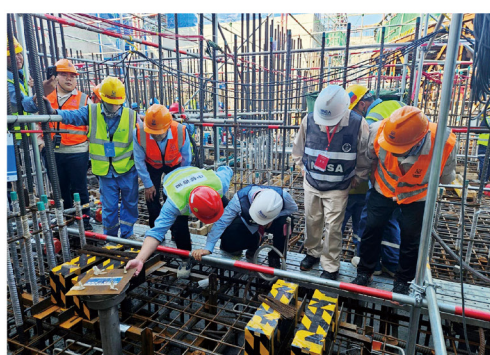




**2024 Annual Report**  
**National Nuclear Safety Administration**  
**The People's Republic of China**









# Message from the Administrator

The year 2024 marks the 10th Anniversary of Proposition of the Holistic Approach to National Security and China's Approach to Nuclear Security that President Xi Jinping brought up. The year 2024 also marks the 40th Anniversary of the establishment of the National Nuclear Safety Administration (NNSA). The Third Plenary Session of the 20th Central Committee of the Communist Party of China scientifically planned a blueprint for comprehensively deepening reforms in the new era, took promoting the modernization of the national security system and its capabilities as a strategic focus, and clearly proposed the initiative to promote the positive interaction between high-quality development and high-level safety, providing the guidance for the development of nuclear safety in the new era. Over the past year, we have resolutely implemented the decisions and arrangements of the CPC Central Committee, taken the implementation of the spirit of the important instructions and directives of the Party Central Committee as a major political task; under the strong leadership of the Party Committee of the Ministry, we have promoted the construction of a strict nuclear safety responsibility system,

accelerated the construction of a modern nuclear safety regulation system that is commensurate with the development of the nuclear industry, effectively assured nuclear and radiation safety with effective supervision, and contributed to the security bottom line of building a beautiful China and safeguarding national security in the new era.

First, NNSA made innovations on the basis of good practices to enhance regulatory efficiency. NNSA has strengthened the nuclear safety situation analysis mechanism and accurately grasped the industry safety situation; established a centralized analysis system for experience feedback, as well as conducted industry seminars on major issues, and promoted rectification in priority order; and set up special teams to strengthen research and technology reserve on common safety issues on the same type of reactors. Focusing on the regulatory mechanism of innovation on the first-ever, new-type and new-constructing reactors, NNSA implemented synchrotron review and guarantee supervision, found and solved problems jointly with the industry, and strongly supported the world's first-ever



reactor CAP1400, a major project of landmark significance for the construction of China into a strong nuclear country, to be successfully put into commercial operation. NNSA implemented graded approach according to the feature and the status of the facilities and stringent regulation on the concerned projects. The stubborn problems were solved, and the safety risks caused by the failure of water intake were effectively prevented and controlled through systematic management. No unplanned shutdowns caused by marine organism outbreaks occurred.

Second, NNSA enforced strict regulation, clearly defined the entities' responsibilities, and urged them to perform the responsibilities fully. Focusing on the implementation of the nuclear power corporations' nuclear safety management responsibilities, NNSA established a dialogue mechanism with the nuclear power corporations, clearly defined the responsibilities of the enterprises, and promoted the effective resolution of problems at the decision-making level. "Absolute Responsibility, Highest Standard, System Operation & Experience Feedback" has become the consensus of the industry. NNSA took multiple measures to curb complacency and promote awareness across the industry: a high WANO score does not mean that the enterprise may relax its vigilance, and complacency is a manifestation of the degradation of nuclear safety culture.

NNSA paid close attention to issues such as the distribution of benefits between the upstream and downstream of the nuclear power industry and the management of labor dispatching, to urge the industry to promote high-quality nuclear safety in depth. The special action to comprehensively strengthen nuclear safety management in the nuclear power industry has achieved positive results, promoting benchmarking and comparison, investigating hidden dangers, implementing rectification measures, and forming a long-term mechanism. The safety management of the nuclear power industry has been effectively strengthened. NNSA took nuclear safety as a core governance obligation. The Discipline Inspection & Supervision Team stationed in the Ministry and the Discipline Inspection & Supervision Team of nuclear power corporations have piloted nuclear safety bilateral coordinated supervision, and made joint efforts to conduct institutional supervision. NNSA strictly penalized noncompliance: it imposed 7 administrative penalties, and maintained a "zero tolerance" attitude towards counterfeit or violation of the regulations.

Third, NNSA consolidated the foundation to enhance construction of system capability. Taking the compilation of the Ecology and Environment Code as an opportunity, NNSA optimized the system of rules and standards, promoted the deep integration of radioactive/ electromagnetic pollution control and other



work with the ecological environment system, sped up the formulation and revision of rules and standards, and standardized enforcement for nuclear safety. Efforts were made to improve basic regulatory capabilities, focus on major science and technology projects for nuclear safety regulation, and jointly with the industry, promote research on credibility of nuclear fuel and other topics. NNSA continued to promote the construction of major nuclear and radiation safety infrastructure, and made positive progress in projects such as regional nuclear and radiation emergency monitoring equipment reserves and civil nuclear safety risk monitoring and early-warning systems. NNSA conducted leadership training courses, optimized training programs for individual professional domains, and further improved the systematicness and effectiveness of training. NNSA, taking the events for 40th Anniversary of Regulation on Nuclear and Radiation as an opportunity, comprehensively summarized valuable regulatory experience, and promoted the high-quality development of nuclear safety regulation.

Fourth, NNSA made overall coordination and combined efforts to ensure nuclear safety. NNSA strengthened the risk research and identification, conducted in-depth research on major topics, and coordinated to solve major and difficult problems. NNSA established a mechanism of regular communication with the State Administration of Science, Technology

and Industry for National Defense to better coordinate development and safety. NNSA investigated and optimized the management of liquid radioactive waste discharge from nuclear medicine, drafted regulation requirements for nuclear fusion facility in graded approach, and took active regulation as a way to promote the construction of an ecosystem that is more conducive to the safe and healthy development of the industry. NNSA formulated a work plan to enhance scientific cognition and build a public communication brand. By establishing an inter-departmental collaboration platform to coordinate technical resources, NNSA built a long-term mechanism for domestic participation in a more active and deeper manner in the formulation and revision of IAEA safety standards, and contributed Chinese wisdom to the construction of nuclear safety standards. NNSA deepened international cooperation in nuclear safety, actively participated in the activities of International Atomic Energy Agency and OECD Nuclear Energy Agency, and strengthened cooperation and exchanges with major nuclear energy countries and emerging nuclear technology countries along the Belt and Road, continuing to expand the partners in the nuclear safety regime. NNSA successfully held a list of events such as the International Exchange Conference on Modernization of Nuclear Safety Regulation, giving full play to its “home court” advantages to build an international platform and enhance international influence.



In 2024, the 58 units in operation, 17 civil research reactors in service, 21 civil nuclear fuel cycle facilities in operation, and 48 radioactive waste storage and treatment/disposal facilities in the Chinese mainland maintained good safety records, which are free of incidents or accidents at or above Level 1 as per the International Nuclear and Radiological Event Scale (INES). The quality of the nuclear facilities under construction was well assured. The safety of 172,000 radioactive sources in use and 320,000 sets of radiation-emitting devices is well controlled. The quality of the overall radiation environment was good. I would like to express, on behalf of the MEE/NNSA, heartfelt gratitude to all my colleagues contributing to nuclear and radiation safety and to friends from all walks of life who care about and support nuclear and radiation safety.

2025 is the year to achieve the comprehensive conclusion of the "14th Five-Year Plan" and to study and plan the "15th Five-Year Plan". It is also the first year of the next decade of nuclear safety regulation. We will always adhere to the guidance of the Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, especially his Thought on Ecological Civilization, the Holistic Approach to National Security and China's Approach to Nuclear

Security, comprehensively implement the spirit of the 20th National Congress of the Communist Party of China and the Second and Third Plenary Sessions of the 20th Communist Party of China Central Committee, and deeply implement the requirements of the national eco-environmental protection work conference. We will consolidate and transform China's 40 years of valuable experience in nuclear safety regulation, continue to build an "independent, professional, strict and efficient" nuclear safety regulation agency, demonstrate new responsibilities and new actions on the new journey, continuously strengthen the workforces and improve capabilities, and strictly implement and continuously improve nuclear safety regulation, to ensure sound nuclear safety by making unremitting endeavor and to guard high-quality development of the nuclear energy industry at high-level nuclear safety!

Vice Minister of Ecology and Environment  
Administrator of National Nuclear Safety Administration



DONG Baotong

May 15th, 2025





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A Map of Nuclear Power Plants in Chinese Mainland (as of December 31, 2024)



# I. Introduction

In 2024, China's civil nuclear facilities continued to perform well in terms of operation safety and construction quality, and no incidents or accidents at or above Level 1 as per the International Nuclear and Radiological and Event Scale (INES) occurred in operating nuclear power plants (NPPs), research reactors, fuel cycle facilities, radioactive waste storage and treatment/disposal facilities, or radioactive material transportation. All operational events and construction events of nuclear facilities were handled properly.\*

The quality of the radiation environment was generally good in 2024. There was no obvious change in the level of environmental ionizing radiation around nuclear facilities, or in the radiation level around electromagnetic radiation emission facilities.

## Rule of Law

The optimization of the system of rules and standards was actively promoted. To align with the National People's Congress (NPC) codification efforts, the National Nuclear

Safety Administration (NNSA) advanced the inclusion of radioactive pollution prevention and control, electromagnetic radiation pollution prevention and control, and other relevant provisions in the ecological environment code, and made great efforts in research and justification of major regime and key issues. NNSA actively promoted the optimization of the system of rules and standards. As of the end of 2024, there are currently 260 effective nuclear and radiation safety rules and standards, including 2 laws, 7 administrative regulations, 26 departmental rules, 117 standards, and 108 guides.

## Capacity Building

Significant progress has been made in the construction of the National Nuclear Safety Technology R&D Laboratory, which has significantly improved the independent verification capability of regulation body. NNSA, facing the implementation of major national strategies and the capability building of safety in key fields, compiled the project feasibility study reports on the national base for indigenous verification

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\* This report does not contain relevant data of Hong Kong Special Administrative Region, Macau Special Administrative Region and Taiwan Province of the People's Republic of China.



software, the civil nuclear safety risk monitoring and early warning system and the regional reserves of nuclear and radiation emergency monitoring equipment reserves, and completed the project preconditions. The number of laboratories and test benches under construction and operation has increased to 30. NNSA started the construction of laboratories in frontier fields such as nuclear fusion technology; built a nuclear safety software sharing center and promoted the online deployment of 82 sharewares; the key laboratory of the MEE released three open research topics for the first time, and the laboratory management system and supporting measures were gradually improved; the radiation monitoring laboratory of the Eastern Regional Office of Nuclear and Radiation Safety Inspection obtained the CMA certification of X-γ dose rate and α/β surface contamination monitoring.

## Strengthening Regulation

Innovating the regulation mechanism and strengthening regulation. NNSA organized and carried out Nuclear Safety Regulation Dialogue Meeting with the nuclear power corporations to focus on feedback on key issues. NNSA organized and completed special actions to comprehensively strengthen nuclear safety management in the nuclear power industry, promoted nuclear-related enterprises to benchmark against each

other, comprehensively eliminated latent risk, strengthened safety management, and significantly improved the safety level of the nuclear power industry. NNSA released the siting permits for 12 units, construction licenses for 6 nuclear power units and 1 research reactor, and operation licenses for 3 units, and approved environmental impact reports for 22 units and 1 research reactor. NNSA strictly carried out review and supervision of nuclear power plants under construction and operation, strengthened regulation of first-ever reactors, new-type reactors and new constructing reactors to ensure high-quality operation of key projects; implementing regulatory attention grading, promoted the establishment of nuclear power health records gradually, strengthened graded approach on nuclear power plants, and effectively operated special teams for nuclear power reactor regulation by reactor type. NNSA strengthened the nuclear safety regulation of research reactors, and positive progress has been made in eliminating defects and rectifying action; seriously investigated and dealt with typical problems, and imposed administrative penalties on activities with violation of rules/regulations; effectively operated the experience feedback system, consolidated and strengthened important mechanisms such as centralized analysis of experience feedback and regular screening, analysis

and discussion of important issues.

## Technical Support

In 2024, the technical support team completed a list of tasks with high quality. The Nuclear and Radiation Safety Center (NSC) of MEE/NNSA provided comprehensive technical support for nuclear and radiation safety regulation. The NSC fulfilled 4,372 tasks, participated in 720 regulatory inspections, and produced 2,930 technical outputs. NNSA provided high-quality regulation and technical support for nuclear power units in operation, under construction and approved by State Council, and carried out preliminary reviews of 17 units; strengthened the role of the special technical team for M<sub>3</sub>10 (and its improved version) and AP series reactors, and effectively operated the special review teams for CAP1400, HTGR, Taishan NPP fuel, reprocessing plant, etc.; continued to carry out the review of Small Modular Reactor (SMR) in Changjiang, medical isotope test reactor, and Accelerator Driven System (CiADS), and completed the safety review work with guaranteed quality and quantity. NNSA comprehensively strengthened research on radiation risk prevention and control, and continuously deepened and improved safety regulation and R&D capabilities. NNSA completed the review of 25 rules and standards and 6 guides. NNSA embraced digital intelligence technology to streamline regulation. It took efforts in public communication on nuclear and radiation safety, and carry out information

exchange and international cooperation in an orderly manner.

National Marine Environmental Monitoring Center (NMEMC) set up a special course to comprehensively promote the preparation of the Marine Radiation Environment Emergency Monitoring Plan. NNSA systematically carried out simulation and prediction research on ocean migration and diffusion of radionuclides, constructed a hydrodynamic foundation field model library of China's coastal nuclear power plants, and carried out scenario simulation of the transport, diffusion and migration of radioactive materials, thermal discharge and plankton in the sea area around the nuclear power plants, providing technical support for China's nuclear power radioactive pollution prediction and early warning, and cold source safety guarantee.

China Nuclear Safety and Environmental Culture Promotion Association completed key tasks such as the construction of nuclear safety culture demonstration bases, cooperated with regional offices to build and improve the nuclear safety culture assessment system, organized assessment, training and publicity, and promoted the establishment and release of community standards; carried out safety risk assessment of conventional islands and ancillary facilities in operating nuclear power bases; and held a sub-forum of 2024 International Academic Conference on Nuclear and Radiation Safety to interpret the rules and standards on nuclear safety and share



experience in building a nuclear safety culture.

The Radiation Monitoring Technical Center hosted the radiation monitoring skills competition of the 3rd National Ecological and Environmental Monitoring Skills Competition of Technical Professionals; formulated and organized the implementation of 2024 Monitoring Plan and Quality Assurance Plan for National Radiation Environment. guided all provinces across China to carry out the operation and maintenance of automatic radiation environment monitoring stations; It compiled regulatory monitoring monthly reports, conducted quarterly assessments of the national radiation environment monitoring situation, and prepared dozens of reports including the National Radiation Environment Quality Report; organized and carried out the formulation and revision of urgently needed standards in the field of radiation monitoring, and implemented the 2024 national certified assessment of radiation environment monitoring technician; cooperated with special inspections of radiation monitoring laboratories in more than 40 units.

## International Cooperation

NNSA deepened cooperation with the International Atomic Energy Agency (IAEA) and the Organisation for Economic Co-operation and Development Nuclear Energy Agency (OECD-NEA). It renewed the cooperation agreement with IAEA and deeply participated in the activities of the

IAEA Safety Standards Commission and sub-committees. Its three technical support units joined the network of environmental radioactivity analysis and measurement laboratories of the IAEA, and actively promoted the preparatory work for the comprehensive assessment of nuclear safety regulation. NNSA actively promoted nuclear safety cooperation with Russia, France, Pakistan, Saudi Arabia, United Arab Emirates and other countries.

## Public Communication

NNSA carried out extensive public publicity and constantly improved the quality of information release and public communication. It strengthened the construction of nuclear safety soft power, issued the Work Plan for Brand Building of Public Communication regarding Nuclear Safety and the Work Plan for Improving Scientific Cognition of Nuclear Energy and Nuclear Safety (2025-2029), and actively carried out nuclear safety themed event on the 415 National Security Education Day, released a public communication brand system, gathered the consensus and strength of the whole industry, publicized the effectiveness of nuclear safety work in the new era, and popularize national security and nuclear safety knowledge. The website of the National Nuclear Safety Administration has been revised and integrated, a database of rules and standards documents and a database of regulatory objects have been built, and a new column "Nuclear Safety

"Protects a Better Life" has been added to continuously improve the quality of information release. NNSA maintained its WeChat public account and website information as ever, enriched and updated brand columns such as "Foreign Nuclear

Safety Observation Post" and "Nuclear Safety Hotspot Monthly Issue", and organized and promoted "Nuclear Power People Fighting High Temperature" and "Building Strict Nuclear Safety Responsibility System" and other series of special reports.

## Events for 40th Anniversary of Regulation



Figure 1. SUN Jinlong, Secretary of the Leading Party Committee of MEE, and HUANG Ruiqiu, Minister of Ecology and Environment attended the symposium on nuclear and radiation safety regulation

Events for 40th Anniversary of Regulation on Nuclear and Radiation were successfully completed. SUN Jinlong, Secretary of the Leading Party Committee of MEE, HUANG Ruiqiu, Minister of Ecology and Environment attended the regulation symposium and delivered speeches. DONG Baotong, Vice Minister of Ecology and Environment and Administrator of National Nuclear Safety Administration presided over the symposium. Focusing on the theme of 40th Anniversary, NNSA successfully held the international exchange conference on the modernization of nuclear safety regulation, compiled historical documents, theoretical articles, essay

collection, and special issue of Nuclear Safety, held an exhibition on the history of nuclear and radiation safety regulation, filmed documentary promotional videos, and comprehensively sorted out and reviewed the 40-year history of regulation. It summarized the valuable experience: adhering to the comprehensive leadership of the Chinese Communist Party, upholding the rule of law, consisting on higher professional technology/capacity level, keeping strictness and prudence, and meticulousness, and persisting in openness and cooperation, and promoted the high-quality development of the nuclear industry with high-level nuclear safety assurance.



## **II. Polices, Plans, Rules, Standards, and Nuclear Safety Culture**

### **Nuclear Safety Polices and Plans**

NNSA initiated the compilation of the nuclear safety and radioactive pollution prevention and control plans for the 15th Five-Year Plan, issued preliminary research guides and prepare work plans, organized and carried out justifications of major engineering projects, and strengthened the accordance n with national plans. It improved the nuclear safety situation analysis system, formulated the Nuclear Safety Situation Analysis Working Procedures, carried out nuclear safety situation analysis activities every quarter and submit reports. It carried out research on nuclear safety regulation policies in the following aspects: safety production in coal mines, U.S. nuclear safety regulation cases, the volatility

impact of nuclear power development in major countries, applications of digital twins and artificial intelligence, and others.

### **Development/Revision of Rules and Standards**

NNSA organized and carried out research on the optimization of the system of rules and standards on nuclear and radiation safety, and issued discretionary calculation methods for administrative penalties. Throughout the past year, 14 rules and standards were issued, including 1 departmental rule, 2 national standards, 8 EE standards, and 3 guides, as detailed in Table 1. See Table 2 for the situation on reviews of National Nuclear Safety Expert Commission Situation on rules and standards.

**Table 1. List of Nuclear and Radiation Safety Rules and Standards Issued in 2024**

No.	Name	Category	No.	Issue type	Issue date
1	<i>Regulations on Nuclear Safety Reporting of Research Reactor Licensees</i>	Departmental rules	HAF001/02/02-2024	Order No.34 of the Ministry of Ecology and Environment	07/28/2024
2	<i>Technical Regulations for Radiation Environmental Management of Radioactive Wastes from Uranium Mining and Milling</i>	Standards	GB 14585-2024	MEE Bulletin [2024] No. 18	05/29/2024
3	<i>Regulations for Disposal of Solid Radioactive Wastes in Rock Cavities</i>	Standards	GB 13600-2024	MEE Bulletin [2024] No. 30	12/01/2024
4	<i>Technical Specification for Environmental Protection Facilities in Uranium Mining or Milling Project for Check and Accept of Completed Project</i>	Standards	HJ 1347.1-2024	MEE Bulletin [2024] No. 2	01/07/2024
5	<i>Technical Specification for Environmental Protection Facilities in Decommissioning Project of Uranium Mining or Milling for Check and Accept of Completed Project</i>	Standards	HJ 1347.2-2024	MEE Bulletin [2024] No. 2	01/07/2024
6	<i>Technical Specification for Environmental Protection Facilities in Satellite Up-Link Earth Station for Check and Acceptance of Completed Project</i>	Standards	HJ 1348-2024	MEE Bulletin [2024] No. 2	01/07/2024
7	<i>Survey and Assessment Methods for Area Electromagnetic Environment (On Trial)</i>	Standards	HJ 1349-2024	MEE Bulletin [2024] No. 2	01/07/2024
8	<i>Design Requirements of Spent Fuel Transport Cask</i>	Standards	HJ 1355-2024	MEE Bulletin [2024] No. 8	02/20/2024
9	<i>Determination of tritium in water vapor in atmosphere - the collecting method by adsorption sampling with molecular sieve</i>	Standards	HJ 1383-2024	MEE Bulletin [2024] No. 31	12/20/2024
10	<i>Technical specification for continuous monitoring of fixed NaI(Tl) gamma spectrometer</i>	Standards	HJ 1384-2024	MEE Bulletin [2024] No. 31	12/20/2024
11	<i>Safety requirements of lifting and tie-down devices of transport cask for radioactive material</i>	Standards	HJ 1385-2024	MEE Bulletin [2024] No. 34	12/23/2024
12	<i>In-service Inspection in Nuclear Power Plants</i>	Guides	HAD103/07-2024	NNSA [2024] No. 138	08/12/2024
13	<i>Aging Management for Nuclear Power Plants</i>	Guides	HAD103/12-2024	NNSA [2024] No. 138	08/12/2024
14	<i>Operating Limits and Conditions for Research Reactors</i>	Guides	HAD202/10-2024	NNSA [2024] No. 224	12/25/2024



**Table 2. List of Nuclear and Radiation Safety Rules and Standards Reviewed by the National Nuclear Safety Expert Commission in 2024**

No.	Name	Category	Development/Revision	Project progress	Review conference
1	Regulations for Environmental Radiation Protection of Nuclear Power Plant	National standards	Revision	First review Second review	The tenth symposium The seventeenth symposium
2	Technical regulations for the environmental management of decommissioning of uranium mining and milling facilities	EE standards	Development	Second review	The fourth symposium
3	Technical Specification for operation and management of radioactive waste repository for nuclear technology application	EE standards	Development	First review Second review	The fourth symposium The tenth symposium
4	Technical specification for continuous monitoring of fixed NaI(Tl) gamma spectrometer	EE standards	Development	First review Second review	The fourth symposium The tenth symposium
5	Determination of tritium in water vapor in atmosphere - The collecting method by adsorption sampling with molecular sieve	EE standards	Development	First review Second review	The fourth symposium The tenth symposium
6	Technical Guides for Environmental Impact Assessment - Format and Contents of Environmental Impact Reports for Near-surface Disposal of Radioactive Solid Waste	EE standards	Revision	First review Second review	The tenth symposium Q3 Regular Meeting
7	Guides for thermal test of transport cask for radioactive material	EE standards	Development	First review Second review	The tenth symposium Q3 Regular Meeting
8	Guides for drop test of transport cask for radioactive material	EE standards	Development	First review Second review	The tenth symposium Q3 Regular Meeting
9	Technical Guides for Environmental Impact Assessment - Research Reactor	EE standards	Revision	First review	The seventeenth symposium
10	Technical Guides for Environmental Impact Assessment - Format and Content of Environmental Impact Report for Nuclear Power Plant	EE standards	Revision	First review	Q4 Regular Meeting
11	Radiation Protection During Operation of Nuclear Power Plants	Guides	Revision	Second review	The fourth symposium
12	Operating Limits and Conditions for Research Reactors	Guides	Development	Second review	Q1 Regular Meeting
13	External Events in Design for Nuclear Power Plants	Guides	Revision	First review Second review	The fourth symposium Q3 Regular Meeting

continued

II

No.	Name	Category	Development/ Revision	Project progress	Review conference
14	Terminology and Abbreviations for Nuclear Power Plants and Research Reactors	Guides	Development	First review	Q1 Regular Meeting The fourth symposium
				Second review	Q4 Regular Meeting
15	External Human Induced Events in Site Evaluation for Nuclear Power Plants	Guides	Revision	First review	The tenth symposium
				Second review	Q4 Regular Meeting
16	Safety Classification of Structures, Systems and Components in Nuclear Power Plants	Guides	Revision	First review	The tenth symposium
				Second review	Q3 Regular Meeting
17	Core Management and Fuel Handling for Nuclear Power Plants	Guides	Revision	First review	The tenth symposium
18	Repair of Nuclear Power Plants	Guides	Revision	First review	Q3 Regular Meeting
				Second review	Q4 Regular Meeting
19	Periodic Safety Review for Nuclear Power Plants	Guides	Revision	Second review	The tenth symposium
20	Commissioning of Nuclear Power Plants	Guides	Revision	First review	Q4 Regular Meeting
21	Evaluation of Seismic Hazards for the Sites of Nuclear Power Plants	Guides	Revision	Second review	Q4 Regular Meeting

## **Nuclear Safety Culture**

NNSA organized and completed the compilation and follow-up analysis of reports such as the OECD Nuclear Energy Agency (NEA) "Practice for Strengthening the Safety

Leadership of Nuclear Regulatory Agencies". NNSA participated in the conference(s) of the Working Group on Leadership Harmony Safety Culture of NEA Committee on Nuclear Regulatory Activities.



### III. Safety Regulation on Nuclear Power Plants

As of the end of 2024, 58 nuclear power units have been issued operation licenses, 29 nuclear power units have been issued construction licenses, and 15 nuclear power units have been approved to be built in Chinese Mainland. In 2024, a total of 25 operational events and 24 construction events were reported by nuclear power plant licensees, and no radioactive events endangering public and environmental safety occurred in the nuclear power plants in operation. The monitoring results indicate that the integrity of the three physical barriers in all the nuclear power plants remained intact throughout the year.

In 2024, siting permit was issued for Jiangsu Xuwei Nuclear Energy Heating Plant Phase I

Project, Shandong Haiyang Integrated Small Reactor Demonstration Project, Sanmen NPP Units 5 and 6, Shandong Haiyang NPP Units 5 and 6, China Huaneng Xiapu NPP PWR Phase I Project, Liaoning Zhuanghe Nuclear Power Plant Phase I Project; construction licenses were issued for Fujian Zhangzhou NPP Units 3 and 4, Fujian Ningde NPP Units 5 and 6, Phase I Expansion Project of Shandong Shidao Bay NPP Units 1 and 2; operation licenses were issued for Guangxi Fangchenggang NPP Unit 4, CAP1400 Demonstration Project Unit 1, and Fujian Zhangzhou NPP Unit 1.

The operation data of China's nuclear power plants in 2024 are shown in Table 3.

**Table 3. Operation Data of Nuclear Power Plants in China in 2024**

NPP Name	Unit No.	Unified Unit No.	Rated Power (MW)	Nuclear Electricity by Unit (TWh)	Load Factor (%)	Unit Capacity Factor (%)
Qinshan	1	CN01	350	2.54	82.73	84.71
Qinshan Phase II	1	CN04	670	5.43	92.31	92.66
	2	CN05	670	5.85	99.32	99.94
	3	CN14	670	5.49	93.34	94.78
	4	CN15	670	5.50	93.53	94.33

# Safety Regulation on Nuclear Power Plants

continued

NPP Name	Unit No.	Unified Unit No.	Rated Power (MW)	Nuclear Electricity by Unit (TWh)	Load Factor (%)	Unit Capacity Factor (%)
Qinshan Phase III	1	CN08	728	6.28	98.24	100.00
	2	CN09	728	5.78	90.31	92.26
Fangjiashan	1	CN24	1,089	9.42	98.53	99.99
	2	CN25	1,089	8.44	88.28	89.59
Daya Bay	1	CN02	984	6.21	71.83	70.16
	2	CN03	984	8.66	74.93	99.03
Ling'ao	1	CN06	990	8.30	95.42	96.72
	2	CN07	990	7.80	89.74	93.75
	3	CN12	1,086	8.54	89.53	90.82
	4	CN13	1,086	8.38	87.79	90.25
Tianwan	1	CN10	1,060	7.86	84.38	90.25
	2	CN11	1,060	8.01	85.99	90.20
	3	CN45	1,126	8.46	85.57	90.13
	4	CN46	1,126	9.28	93.86	100.00
	5	CN53	1,118	9.12	92.85	93.46
	6	CN54	1,118	9.03	91.99	99.69
Hongyanhe	1	CN16	1,119	8.35	84.97	96.35
	2	CN17	1,119	8.13	82.70	88.69
	3	CN26	1,119	8.38	85.22	92.14
	4	CN27	1,119	9.54	97.12	99.99
	5	CN49	1,100	8.42	85.67	91.51
	6	CN50	1,100	8.56	87.08	92.54
Ningde	1	CN18	1,089	8.85	92.47	94.26
	2	CN19	1,089	7.95	83.09	84.07
	3	CN34	1,089	8.80	91.96	95.40
	4	CN35	1,089	9.26	96.76	99.93
Fuqing	1	CN20	1,089	8.12	84.87	85.25
	2	CN21	1,089	8.34	87.17	89.56
	3	CN42	1,089	8.48	88.62	94.27
	4	CN43	1,089	3.16	33.00	33.04
	5	CN51	1,150	8.97	87.93	92.56
	6	CN52	1,150	9.09	89.10	91.17

III



continued

NPP Name	Unit No.	Unified Unit No.	Rated Power (MW)	Nuclear Electricity by Unit (TWh)	Load Factor (%)	Unit Capacity Factor (%)
Yangjiang	1	CN22	1,086	8.28	86.78	87.28
	2	CN23	1,086	9.35	98.06	100
	3	CN40	1,086	8.68	91.00	92.89
	4	CN41	1,086	8.67	90.90	91.88
	5	CN47	1,086	9.56	100.16	99.99
	6	CN48	1,086	8.68	91.02	94.14
Sanmen	1	CN28	1,251	10.20	92.85	94.57
	2	CN29	1,251	10.59	96.49	99.99
Haiyang	1	CN30	1,250	9.31	94.35	92.82
	2	CN31	1,250	8.69	91.64	89.82
Taishan	1	CN32	1,750	13.61	88.54	90.50
	2	CN33	1,750	10.74	69.86	71.13
Changjiang	1	CN36	650	4.90	85.83	93.33
	2	CN37	650	4.78	83.66	92.25
Fangchenggang	1	CN38	1,086	8.17	85.64	94.40
	2	CN39	1,086	8.67	90.93	99.98
	3	CN55	1,180	7.44	71.25	77.72
	4	CN56	1,180	6.23	90.71	99.97
Zhangzhou	1	CN57	1,212	0.49	NA	NA
CAP1400 Demonstration Project	1	CN59	1,534	17.89	NA	NA
Shidao Bay	HTGR demonstration project	CN44	150	0.27	20.66	20.66

## Qinshan NPP

In 2024, the one unit of Qinshan NPP continued to operate stably and safely. The failure rate of fuel elements, leakage rate of primary system coolant pressure boundary, and leakage rate of containment were all within the prescribed limits. The 23rd refueling outage of Unit 1 was

completed on July 26, 2024. The Nuclear Safety-related Regulatory Approvals for Qinshan NPP in 2024 are shown in Table 4. Qinshan NPP reported 2 operational events, as shown in Table 5. The occupational radioactive doses at the Qinshan NPP are shown in Table 6.

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In 2024, the Eastern Regional Office of Nuclear and Radiation Safety Inspection assigned 1,302 man-days for inspection at Qinshan Nuclear Power Base (including Qinshan NPP,

Qinshan Phase II NPP, Qinshan Phase III NPP, and Fangjiashan NPP), including 6 routine inspections. A total of 193 findings were identified and 159 regulatory requirements were imposed.



Figure 2 Qinshan NPP 123 Outage Supervision Site



Figure 3 Qinshan NPP Seawater Pump Room Inspection

Table 4. Nuclear Safety-Related Regulatory Approvals for Qinshan NPP in 2024

Date	Document No.	Document Title
01/19/2024	NNSA [2024] No. 12	Notice on Approving the New Constructing Emergency Diesel Engine Fuel Storage Building in Qinshan NPP Unit 1
04/03/2024	NNSA [2024] No. 52	Notice on Approving the Modification to Contents about Containment Isolation Valves in the Technical Specification for Qinshan NPP Unit 1
04/03/2024	NNSA [2024] No. 55	Notice on Approving the Modification to Emergency Diesel Generator in Qinshan NPP Unit 1
10/12/2024	NNSA Letter [2024] No. 96	Reply Letter on Agreeing to the "On-site Nuclear Emergency Response Plan of Qinshan NPP, Qinshan Phase II NPP, Qinshan Phase III NPP and Fangjiashan NPP (Version 2-2024)"

Table 5. Operational Event of Qinshan NPP Reported in 2024

Date of Occurrence	Event	Cause	INES Level
02/19/2024	The abnormal fluctuation of the data on $\gamma$ monitoring channel A in the LOCA area of the radiation monitoring system of Qinshan NPP Unit 1 caused the containment ventilation isolation Operational event	Equipment	0
06/01/2024	Operational event of loose lock nut of type I support column of lower internal component of Qinshan NPP Unit 1	Equipment	0

Table 6. Occupational Radioactive Doses at Qinshan NPP in 2024

Unit	Annual Average Effective Dose/Person (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man·Sv)	Normalized Collective Effective Dose (man·mSv/Gwh)
Unit 1	0.085	5.482	0.399	0.157



## Qinshan Phase II NPP

In 2024, the four units of Qinshan Phase II NPP continued to operate stably and safely. The failure rate of fuel elements, leakage rate of primary system coolant pressure boundary, and leakage rate of containment were all within the prescribed limits. The 18th refueling outage of Unit 1 was completed on May 14, 2024, the 11th refueling outage of Unit 3 on October 13, 2024 and the 10th refueling outage of Unit 4 on March 25, 2024.

The nuclear safety-related regulatory approvals for Qinshan Phase II NPP in 2024 are shown in Table 7. Qinshan Phase II NPP reported 1 operational



*Figure 4 Witness of rod pulling of Qinshan Phase II NPP Unit 4*

event, as shown in Table 8. The occupational radioactive doses at Qinshan Phase II NPP are shown in Table 9.

**Table 7. Nuclear Safety-related Regulatory Approvals for Qinshan Phase II NPP in 2024**

Date	Document No.	Document Title
01/19/2024	NNSA [2024] No. 6	Notice on Approving the Overall Upgrade and Transformation of the Nuclear Power Measurement System Equipment of Qinshan Phase II-1 and -2
07/16/2024	NNSA [2024] No. 114	Notice on Approving the Optimization of Fuel Cycle Length and Modification to Extended Operation Envelope of Four Units of Qinshan Phase II NPP
09/10/2024	NNSA [2024] No. 161	Notice on Approving the Periodic Test Requirements for Safety-Related Systems of Qinshan Phase II-3 and -4 (Rev. 000.29)
10/24/2024	NNSA [2024] No. 195	Notice on Approving the Modification to the Protection Group Cabinet of the Process Instrument Measurement System of Qinshan Phase II-1 and -2
11/19/2024	NNSA [2024] No. 209	Notice on Approving the Phase II Reconstruction of Spent Fuel Storage System in Qinshan Phase II-3 and -4

**Table 8. Operational Events of Qinshan Phase II NPP Reported in 2024**

Date of Occurrence	Event	Cause	INES Level
10/28/2024	The failure of the test switch during the T3 test of Qinshan Phase II-1 caused the unexpected start-up and operation of the auxiliary feed water electric pump	Equipment	0

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**Table 9. Occupational Radioactive Doses at Qinshan Phase II NPP in 2024**

Unit	Annual Average Effective Dose/Person (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man·Sv)	Normalized Collective Effective Dose (man·mSv/Gwh)
Units 1 and 2	0.107	2.528	0.346	0.031
Units 3 and 4	0.180	5.293	0.603	0.055

## Qinshan Phase III NPP

In 2024, the two units of Qinshan Phase III NPP continued to operate stably and safely. The failure rate of fuel elements, leakage rate of primary system coolant pressure boundary, and leakage rate of containment were all within the prescribed limits. The 12th refueling outage of Unit 2 was completed on May 7, 2024.



*Figure 5. Inspection of Seawater Pump Room of Qinshan Phase III NPP*

The nuclear safety-related regulatory approvals for Qinshan Phase III NPP in 2024 are shown in Table 10. Qinshan Phase III NPP reported 1 operational event, as shown

in Table 11. The occupational radioactive doses at the Qinshan Phase III NPP are shown in Table 12.

**Table 10. Nuclear Safety-Related Regulatory Approvals for Qinshan Phase III NPP in 2024**

Date	Document No.	Document Title
04/03/2024	NNSA [2024] No. 51	Notice on Approving the Modification of Adding Reactor Pressure Vessel Head Irradiation Device of Qinshan Phase III-2 to Produce Isotope
09/03/2024	NNSA [2024] No. 147	Notice on Approving the Version Upgrade to “Technical Specification for Qinshan Phase III-1 and -2”
11/08/2024	NNSA [2024] No. 203	Notice on Approving the Domestic Substitution of Zirconium Fuel Materials of Qinshan Phase III NPP for Pilot Rod Bundles into the Reactor Irradiation Test

**Table 11. Operational Event of Qinshan Phase III NPP Reported in 2024**

Date of Occurrence	Event	Cause	INES Level
6/22/2024	The scavenging of the helium charging and discharge pipeline of the new irradiation production isotope device in Qinshan Phase III-2 triggers the automatic Operational event of the containment isolation system	Equipment	0



Table 12. Occupational Radioactive Doses at Qinshan Phase III NPP in 2024

Unit	Annual Average Effective Dose/Person (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man·Sv)	Normalized Collective Effective Dose (man·mSv/Gwh)
Units 1 and 2	0.211	6.289	0.805	0.067

Fangjiashan NPP

In 2024, the two units of Fangjiashan NPP continued to operate stably and safely. The failure rate of fuel elements, leakage rate of primary system coolant pressure boundary, and leakage rate of containment were all within the prescribed limits. The 7th refueling outage of Unit 2 was completed on March 29, 2024.

The nuclear safety-related regulatory approvals for Fangjiashan NPP in 2024 are shown in Table 13. The occupational



Figure 6. On-site Inspection on Criticality Permit for Fangjiashan NPP 207 Outage

radioactive doses at Fangjiashan NPP are shown in Table 14.

Table 13. Nuclear Safety-Related Regulatory Approvals for Fangjiashan NPP in 2024

Date	Document No.	Document Title
02/08/2024	NNSA [2024] No. 24	Notice on Approving the Version Upgrade to “In-Service Inspection Program for Fangjiashan NPP (Rev. B)”
06/03/2024	NNSA [2024] No. 78	Notice on Approving the Modification of Adding Zinc Filling Operation Mode to the Primary System of Fangjiashan NPP Units 1 and 2
06/20/2024	NNSA [2024] No. 90	Letter on Approving the First Periodic Safety Review Program of Fangjiashan NPP Units 1 and 2

Table 14. Occupational Radioactive Doses at Fangjiashan NPP in 2024

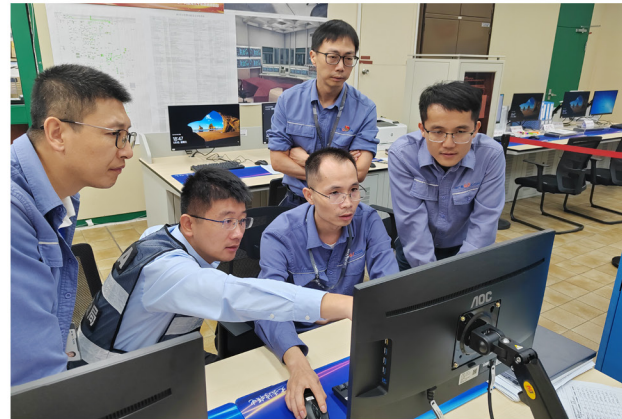
Unit	Annual Average Effective Dose/Person (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man·Sv)	Normalized Collective Effective Dose (man·mSv/Gwh)
Units 1 and 2	0.375	6.007	1.144	0.064

## Daya Bay NPP

In 2024, the two units of Daya Bay NPP continued to operate stably and safely. The failure rate of fuel elements, leakage rate of primary system coolant pressure boundary, and leakage rate of containment were all within the prescribed limits. Daya Bay NPP Unit 1 completed its 23rd refueling outage on June 12, 2024.

The nuclear safety-related regulatory approvals for Daya Bay NPP in 2024 are shown in Table 15. The occupational radioactive doses at the Daya Bay NPP are shown in Table 16.

In 2024, Southern Regional Office of Nuclear and Radiation Safety Inspection assigned 1,532 man-days for inspection on the six operating units at Daya Bay Nuclear Power



*Figure 7. On-site Inspection at Daya Bay NPP*

Base (including Daya Bay NPP and Ling'ao NPP), including 6 routine inspections: A total of 120 findings were identified and 40 regulatory requirements were imposed. One special action to comprehensively strengthen nuclear safety management in the nuclear power industry was conducted: A total of 34 findings were identified and 7 regulatory requirements were imposed.

**Table 15. Nuclear Safety-Related Regulatory Approvals for Daya Bay NPP in 2024**

Date	Document No.	Document Title
02/08/2024	NNSA [2024] No. 27	Notice on Approving the Modification to the Operational Quality Assurance Programs for Daya Bay NPP and Ling'ao NPP
12/31/2024	NNSA [2024] No. 235	Notice on Approving the Modifications to the Technical Specification for Daya Bay NPP and Ling'ao NPP

**Table 16. occupational radioactive doses at Daya Bay NPP in 2024**

Unit	Annual Average Effective Dose/Person (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man·Sv)	Normalized Collective Effective Dose (·mSv/Gwh)
Units 1 and 2	0.349	7.208	1.248911	0.084



Ling’ao NPP

In 2024, the four units of Ling'ao NPP continued to operate stably and safely. The failure rate of fuel elements, leakage rate of primary system coolant pressure boundary, and leakage rate of containment were all within the prescribed limits. The 20th refueling outage of Unit 1, the 19th refueling outage of Unit 2, the 12th refueling outage of Unit 3, and the 11th refueling outage of Unit 4 were completed on January 20, 2025, October 21, 2024, February 24, 2024 and May 19, 2024, respectively.



Figure 8. On-site Inspection at Ling'ao NPP

The nuclear safety-related regulatory approvals for Ling'ao NPP in 2024 are shown in Table 17. The occupational radioactive doses at Ling'ao NPP are shown in Table 18.

Table 17. Nuclear Safety-Related Regulatory Approvals for Ling’ao NPP in 2024

Date	Document No.	Document Title
02/08/2024	NNSA [2024] No. 27	Notice on Approving the Modification to the Operational Quality Assurance Programs for Daya Bay NPP and Ling'ao NPP
12/31/2024	NNSA [2024] No. 235	Notice on Approving the Modifications to the Technical Specification for Daya Bay NPP and Ling'ao NPP

Table 18. Occupational Radioactive Doses at Ling’ao NPP in 2024

Unit	Annual Average Effective Dose/Person (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man·Sv)	Normalized Collective Effective Dose (man·mSv/Gwh)
Units 1 and 2	0.281	5.984	0.947	0.059
Units 3 and 4	0.301	4.651	1.020	0.060

Tianwan NPP

In 2024, Units 1 to 6 of Tianwan NPP continued to operate stably and safely. The failure rate of fuel elements, leakage rate of primary coolant pressure boundary, and leakage rate of containment were all within the prescribed limits. The 15th refueling outage of Unit 1, the 14th refueling outage of Unit 2, the 5th refueling outage of Unit



Figure 9. On-site Inspection at Tianwan NPP

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3 and the 3rd refueling outage of Unit 5 were completed on December 4, 2024, April 6, 2024, November 5, 2024 and June 24, 2024, respectively. Units 7 and 8 were in the construction and installation stage. Unit 7 completed the main pipe welding on September 14, 2024, and Unit 8 started the main pipe welding on October 25, 2024.

The nuclear safety-related regulatory approvals for Tianwan NPP in 2024 are shown in Table 19. Regulatory inspection activities at Tianwan NPP in 2024 are shown in Table 20.

Tianwan NPP reported 1 operational event, as shown in Table 21, and Tianwan NPP reported 1 construction event, as shown in Table 22. The occupational radiation dose of Tianwan NPP is shown in Table 23.

In 2024, the Northern Regional Office of Nuclear and Radiation Safety Inspection assigned 3,980 man-days for inspection of Tianwan NPP, including 13 routine inspections. A total of 152 findings were identified and 70 regulatory requirements were imposed.

**Table 19. Nuclear Safety-related Regulatory Approvals for Tianwan NPP in 2024**

Date	Document No.	Document Title
02/21/2024	NNSA [2024] No. 35	Notice on Approving Safety-Critical Modifications for the Adjustment of the Radiation Monitoring Assemblies Sampling Plan for Tianwan NPP Units 1, 2
03/20/2024	NNSA [2024] No. 45	Notice on Approving the In-Service Inspection Program (Version G2) for Units 1 and 2 and the In-Service Inspection Program (Version C2) for Tianwan NPP Units 3 and 4
06/20/2024	NNSA [2024] No. 89	Notice on Approving the Safety-Critical Modifications to Manual Shutdown Control Circuit Renovation for Tianwan NPP Units 1 and 2
08/12/2024	NNSA [2024] No. 134	Notice on Approving the Safety-Critical Modifications to the Irradiation Testing of the J6-E Pilot Fuel Assembly of Tianwan NPP Unit 1
12/20/2024	NNSA [2024] No. 219	Notice on Approving the "Assembly and Refueling Program (Version F) of Tianwan NPP Units 1 and 2" and the "Assembly and Refueling Program (Version G) of Tianwan NPP Units 3 and 4"
03/20/2024	NNSA Letter [2024] No. 28	Reply Letter on Approving the Technical Capability Verification Program for Non-destructive Inspection in Pre-service and In-service Inspection of Tianwan NPP Units 7 and 8

**Table 20. Regulatory Inspection Activities at Tianwan NPP in 2024**

Starting Date	Item	Main Contents of the Inspection
5/6/2024	Comprehensively strengthening special inspection on nuclear safety management actions	Through document spot checks, on-site inspections, dialogues and interviews, etc., a comprehensive inspection was conducted on the implementation of special nuclear power operations in Jiangsu, the implementation of nuclear safety responsibilities, and the safety and quality management of the entire process.

*Note: Inspections organized by regional offices of nuclear and radiation safety inspection are not included.*



Table 21. Operational Events Reported by Tianwan NPP in 2024

Date of Occurrence	Event	Cause	INES Level
7/22/2024	The turbine generator of Tianwan NPP Unit 6 was shut down due to false triggering of high shaft vibration signal and then superimposed condenser fault signal, resulting in reactor shutdown	Equipment	0

Table 22 Construction Event Reported by Tianwan NPP in 2024

Date of Occurrence	Event
5/13/2024	Out-of-tolerance construction event of -3.700 m stainless steel embedded parts in the reactor building of Tianwan NPP Units 7 and 8 due to settlement of the floor support system

Table 23 Occupational Radiation Dose of Tianwan NPP in 2024

Unit	Annual Average Effective Dose/Person (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man·Sv)	Normalized Collective Effective Dose (man·mSv/Gwh)
Units 1 and 2	0.127	2.863	0.486	0.031
Units 3 and 4	0.132	2.900	0.436	0.025
Units 5 and 6	0.114	2.516	0.336	0.019

## Hongyanhe NPP

In 2024, six units of Hongyanhe NPP continued to operate stably and safely. The failure rate of fuel elements, leakage rate of primary system coolant pressure boundary, and leakage rate of containment were all within the prescribed limits. The 8th refueling outage of Unit 2, the 8th refueling outage of Unit 3, the 2nd refueling outage of Unit 5, and the 2nd refueling outage of Unit 6 were completed on October 29, 2024, July 5, 2024, March 3, 2024 and November 25, 2024, respectively.

The nuclear safety-related regulatory approvals for Hongyanhe NPP in 2024 are



Figure 10. On-site Inspection on Water Intake of Hongyanhe NPP

shown in Table 24. Regulatory Inspection Activities at Hongyanhe NPP in 2024 are shown in Table 25. Hongyanhe NPP reported 3 operational events, as shown in Table

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26. The occupational radioactive doses at Hongyanhe NPP are shown in Table 27.

assigned 1,903 man-days for inspection of the Hongyanhe NPP, including 7 routine inspections. A total of 135 issues were identified and 36 regulatory requirements were imposed.

In 2024, the Northeast China Regional Office of Nuclear and Radiation Safety Inspection

**Table 24. Nuclear Safety-related Regulatory Approvals for Hongyanhe NPP in 2024**

Date	Document No.	Document Title
01/07/2024	NNSA [2024] No. 2	Notice on Approving Optimized Improvement to In-Service Inspection on Related System Pipeline of Hongyanhe-1 to -4 in Liaoning
05/19/2024	NNSA [2024] No. 75	Notice on Approving the "Quality Assurance Program for Hongyanhe NPP in Liaoning at Operation Stage" (Version 1)
05/19/2024	NNSA [2024] No. 76	Notice on Approving Technical Specification for Operation of Hongyanhe-5, 6 in Liaoning (Version 2)
06/20/2024	NNSA [2024] No. 86	Notice on Approving the Revision to Partial Content of Final Safety Analysis Report on Hongyanhe NPP in Liaoning
09/07/2024	NNSA [2024] No. 156	Notice on Approving the "In-Service Inspection Program of Hongyanhe NPP in Liaoning" (Version 2)

**Table 25. Regulatory Inspection Activity at Hongyanhe NPP in 2024**

Starting Date	Item	Main Contents of the Inspection
03/18/2024	Water intake safety inspection by three ministries and commissions	Cold source guarantee facilities, cold source risk plans and procedures, unit operation & management, abnormal response, organizational support, etc.

*Note: Inspections organized by regional offices of nuclear and radiation safety inspection are not included.*

**Table 26. Operational Event of Hongyanhe NPP Reported in 2024**

Date of Occurrence	Event	Cause	INES Level
04/08/2024	The 220V uninterruptible power supply failure in Train B of Hongyanhe NPP-2 caused the secondary alarm of the air γ monitor in the main control room to falsely trigger and automatically start the iodine filtration circuit of the residential system in the main control room	Equipment	0
04/22/2024	Hongyanhe NPP-1 triggered automatic shutdown due to high water level of No. 1 steam generator	Equipment	0
08/12/2024	Tripping of coolant pump of No. 1 reactor of Hongyanhe NPP-1 triggers automatic shutdown	Equipment	0

Table 27. Occupational Radioactive Doses at the Hongyanhe NPP in 2024

Unit	Annual Average Effective Dose/Person (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man-Sv)	Normalized Collective Effective Dose (man-mSv/Gwh)
Units 1 and 2	0.299	4.292	0.909	0.055
Units 3 and 4	0.152	3.173	0.379	0.021
Units 5 and 6	0.252	5.021	0.744	0.044

## Ningde NPP

In 2024, Units 1 to 4 of Ningde NPP continued to operate stably and safely. The failure rate of fuel elements, leakage rate of primary coolant pressure boundary, and leakage rate of containment were all within the prescribed limits. The 6th refueling outage of Unit 3, the 7th refueling outage of Unit 2, and the 8th refueling outage of Unit 1 were completed on January 14, 2024, April 1, 2024, and September 27, 2024, respectively. Units 5 and 6 obtained the construction licenses. The first concrete pouring for the nuclear island foundation of Unit 5 was carried out on July 28, 2024, and the first concrete pouring for the nuclear island foundation of Unit 6 was under preparation.

The nuclear safety-related regulatory approvals for Ningde NPP in 2024 are shown in Table 28. Regulatory Inspection Activities at Ningde NPP in 2024 are shown



Figure 11 On-site Inspection on Equipment Requalification Test during Ningde NPP-2 Outage

in Table 29. The occupational radioactive doses at Ningde NPP are shown in Table 30.

In 2024, Eastern Regional Office of Nuclear and Radiation Safety Inspection assigned 978 man-days for inspection of Ningde NPP, including 3 routine inspections. A total of 257 findings were identified and 130 regulatory requirements were imposed.



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**Table 28. Nuclear Safety-related Regulatory Approvals for Ningde NPP in 2024**

Date	Document No.	Document Title
02/07/2024	NNSA [2024] No. 22	Notice on Approving Process of Waste Resin Clearance for Steam Generator Blowdown System of Ningde NPP Units 1-4
02/07/2024	NNSA [2024] No. 23	Notice on Approving Waste Resin Clearance for Steam Generator Blowdown System of Ningde NPP Units 1-4
02/8/2024	NNSA [2024] No. 25	Notice on Approving the In-Service Inspection Program for Ningde NPP Units 1-4 (Version 5)
06/24/2024	NNSA [2024] No. 94	Notice on Approving the “Quality Assurance Program for Ningde NPP Units 5 and 6 (Construction Phase)”
07/23/2024	NNSA [2024] No. 121	Notice on Issuing the Construction Licenses for Ningde NPP Units 5 and 6 in Fujian
11/19/2024	NNSA Letter [2024] No. 107	Letter on Confirming the Changes in Registered Office Information of Construction License for Ningde NPP Units 5 and 6 in Fujian
07/22/2024	MEE App [2024] No. 73	Reply on Environmental Impact Report for Ningde NPP Units 5 and 6 in Fujian (Construction Phase)

**Table 29. Regulatory Inspection Activities at Ningde NPP in 2024**

Starting Date	Item	Main Contents of the Inspection
June 03, 2024	Nuclear safety inspection for the preparations before FCD for the nuclear island foundation of Ningde NPP Unit 5 in Fujian	Preparation of construction management conditions such as nuclear island construction organization and construction plan; preparation of technical conditions such as design documents and construction schemes; site preparation before pouring the FCD for the nuclear island foundation; implementation of quality assurance program in construction phase; handling of legacy problems identified in preliminary construction regulatory inspection; the establishment and operation of the experience feedback system.

*Note: Inspections organized by regional offices of nuclear and radiation safety inspection are not included.*

**Table 30. Occupational Radioactive Doses at Ningde NPP in 2024**

Unit	Annual Average Effective Dose/Person (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man·Sv)	Normalized Collective Effective Dose (man·mSv/Gwh)
Units 1 and 2	0.392	10.291	1.373	0.082
Units 3 and 4	0.080	1.259	0.168	0.009

## Fuqing NPP

In 2024, the six units of Fuqing NPP continued to operate stably and safely. The failure rate of fuel elements, leakage rate of primary system coolant pressure boundary, and leakage rate of containment were all within the prescribed limits. The 7th refueling outage of Unit 1, the 2nd refueling outage of Unit 6, the 6th refueling outage of Unit 3, the 7th refueling outage of Unit 1, the 409 minor repair of Unit 4, the 410 minor repair of Unit 4, the 3rd refueling outage of Unit 5 and the 7th refueling outage of Unit 2 were completed on January 14, 2024, June 16, 2024, September 21, 2024, March 20, 2024, October 8, 2024, October 14, 2024 and November 30, 2024, respectively.

Nuclear safety-related regulatory approvals for Fuqing NPP in 2024 are shown in Table 31 and the regulatory inspection activities in



**Figure 12. On-site Inspection on Unfueling Operation for 410 Minor Repair at Fuqing NPP-4**

Table 32. Fuqing NPP reported 2 operational events, as shown in Table 33. The occupational radioactive doses at Fuqing NPP are shown in Table 34.

In 2024, Eastern Regional Office of Nuclear and Radiation Safety Inspection assigned 989 man-days for inspection of Fuqing NPP, including 8 routine inspections. A total of 318 findings were identified and 163 regulatory requirements were imposed.

**Table 31. Nuclear Safety-related Regulatory Approvals for Fuqing NPP in 2024**

Date	Document No.	Document Title
02/21/2024	NNSA [2024] No. 32	Notice on Approving the "Assembly and Refueling Program for Fuqing NPP Units 5 and 6 in Fujian (Version 001)"
10/12/2024	NNSA [2024] No. 186	Notice on Approving the In-Service Inspection Program for Fuqing NPP Units 1 and 2 in Fujian (Version 002)
10/29/2024	NNSA [2024] No. 197	Notice on Approving the "Maintenance Program for Fuqing NPP Units 5 and 6 in Fujian" (Version 002)

**Table 32. Regulatory Inspection Activities at Fuqing NPP in 2024**

Starting Date	Item	Main Contents of the Inspection
03/17/2024	Non-routine nuclear safety inspection for 409 minor repair of Fuqing NPP-4 in Fujian	Implementation of minor repair activities; radiation safety management; preparedness for charging and first critical conditions; fuel breakage event management.

*Note: Inspections organized by regional offices of nuclear and radiation safety inspection are not included.*

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Table 33. Operational Events of Fuqing NPP Reported in 2024

Date of Occurrence	Event	Cause	INES Level
01/30/2024	Lack of end-of-manufacturing air tightness test for the check valve in the containment of the water supply pipeline of the safety injection tank of Fuqing NPP Units 2 and 4	Management	0
06/05/2024	Abnormal contact event between lower reactor internals and component pool storage rack of Fuqing NPP-4	Human factor	0

Table 34. Occupational Radioactive Doses at Fuqing NPP in 2024

Unit	Annual Average Effective Dose/Person (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (·Sv)	Normalized Collective Effective Dose (man·mSv/Gwh)
Units 1 and 2	0.504	7.619	1.855	0.113
Units 3 and 4	0.193	3.905	0.666	0.057
Units 5 and 6	0.190	4.851	0.665	0.037

## Yangjiang NPP

In 2024, the six units of Yangjiang NPP continued to operate stably and safely. The leakage rate of the primary system, the failure rate of fuel elements, leakage rate of primary system coolant pressure boundary, and leakage rate of containment were all within the prescribed limits. The 5th refueling outage of Unit 4, the 7th refueling outage of Unit 1, the 6th refueling outage of Unit 3 and the 4th refueling outage of Unit 6 were completed on February 24, 2024, March 24, 2024, September 27, 2024, and November 23, 2024, respectively.

The nuclear safety-related regulatory approvals for Yangjiang NPP in 2024 are shown in Table 35. The occupational radioactive doses at Yangjiang NPP are shown in Table 36.



Figure 13 On-site Inspection on Refueling Outage at Yangjiang NPP

In 2024, Southern Regional Office of Nuclear and Radiation Safety Inspection assigned 1,228 man-days for inspection of the six operating units of Yangjiang NPP, including 8 routine inspections. A total of 86 findings were identified and 35 regulatory requirements were imposed.



**Table 35. Nuclear Safety-related Regulatory Approvals for Yangjiang NPP in 2024**

Date	Document No.	Document Title
02/08/2024	NNSA [2024] No. 26	Notice on Approving the Version Upgrade to “In-Service Inspection Program for Yangjiang NPP”
07/01/2024	NNSA [2024] No. 104	Notice on Approving the Technical Specification for Yangjiang NPP Units 1-6
09/07/2024	NNSA [2024] No. 150	Notice on Approving “Yangjiang NPP Maintenance Program” (Version 13)
12/31/2024	NNSA [2024] No. 238	Notice on Approving “In-Service Inspection Program for Yangjiang NPP” (Version 15)

**Table 36. Occupational Radioactive Doses at Yangjiang NPP in 2024**

Unit	Annual Average Effective Dose/Person Dose (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (·Sv)	Normalized Collective Effective Dose (man·mSv/Gwh)
Unit 1	0.508	10.271	0.865	0.047
Unit 2			0.063	
Unit 3			0.452	
Unit 4			0.733	
Unit 5			0.023	
Unit 6			0.368	

*Note: The annual average effective dose/person, annual maximum individual dose and normalized collective effective dose are plant-wide indicators for Yangjiang NPP.*

## Sanmen NPP

In 2024, Sanmen NPP Units 1 and 2 continued to operate stably and safely. The failure rate of fuel elements, leakage rate of primary coolant pressure boundary, and leakage rate of containment were all within the prescribed limits. The 4th refueling outage of Unit 1 was completed on June 1, 2024. Units 3 and 4 are in the civil construction and installation stages. Unit 3 completed the hoisting of the steel containment top head of the nuclear



**Figure 14. On-site Inspection at Sanmen NPP**

island on September 6, 2024, and Unit 4 completed the hoisting of the reactor

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pressure vessel on October 22, 2024.

NPP are shown in Table 41.

The nuclear safety-related regulatory approvals for Sanmen NPP in 2024 are shown in Table 37 and the regulatory inspection activities in Table 38. Sanmen NPP reported 4 operational events, as shown in Table 39, and 2 construction events, as shown in Table 40. The occupational radioactive doses of Sanmen

In 2024, Eastern Regional Office of Nuclear and Radiation Safety Inspection assigned 1,459 man-days for regulatory inspection of Sanmen NPP, including 2 routine inspections. A total of 150 findings were identified and concerned and 119 regulatory requirements were imposed.

**Table 37. Nuclear Safety-related Regulatory Approvals for Sanmen NPP in 2024**

Date	Document No.	Document Title
05/16/2024	NNSA [2024] No. 74	Notice on Approving the “Refueling Program for Sanmen NPP Units 1 and 2” (Version 2)
09/04/2024	NNSA [2024] No. 146	Notice on Disapproving the Downward Adjustment of Control Rod Position (Steps 264-257) of Sanmen NPP Units 1 and 2
09/10/2024	NNSA [2024] No. 159	Notice on Approving Changes in Thermal Conductivity Requirements for Inorganic Zinc Coatings for Steel Containment of Sanmen NPP Units 1 and 2
10/18/2024	NNSA [2024] No. 191	Notice on Issuing the “Review Opinion on Siting of Sanmen NPP Units 5 and 6”
10/18/2024	MEE App [2024] No. 105	Reply on the Environmental Impact Reports for Sanmen NPP Units 5 and 6 (Siting Phase)

**Table 38. Regulatory Inspection Activity at Sanmen NPP in 2024**

Starting Date	Item	Main Contents of the Inspection
04/08/2024	Special action inspection for comprehensively strengthening nuclear safety management in the nuclear power industry: Sanmen Nuclear Power Co., Ltd.	Implementation of nuclear safety responsibilities; design safety management; equipment manufacturing management; civil construction quality management; installation quality management; commissioning and operational safety management; water intake safety; civil nuclear material safety management; implementation of nuclear emergency responsibilities; radiation monitoring and the rectification and implementation of issues identified in the three-year hazard investigation
10/21/2024	Investigation of Construction Event Inconsistency between Welding Record and Site of CA33 Module Weld of Unit 4	An independent investigation was carried out into the construction incident of inconsistent welding records of CA33 module of Sanmen NPP Unit 4 with the site.

*Note: Inspections organized by regional offices of nuclear and radiation safety inspection are not included.*

**Table 39. Operational Event of Sanmen NPP Reported in 2024**

Date of Occurrence	Event	Cause	INES Level
12/19/2023	The safety classification of some safety-grade valves in Sanmen NPP Unit 2 is lower than the design requirements or the safety classification Operational event cannot be confirmed	Equipment	0
03/03/2024	The failure of the A5 and B5 cylinder power units of the standby diesel engine B of Sanmen NPP Unit 1 makes the standby diesel engine B unavailable	Equipment	0
03/29/2024	During the pipeline dredging of the WSS system of Sanmen NPP Unit 1, the radiation monitor of the normal range of the exhaust air of the power station increased, triggering a high 2 alarm	Management	0
07/31/2024	The DC system relay settings of Sanmen NPP Units 1 and 2 are not set according to the calculation sheet, resulting in failure to meet the safety function design requirements	Management	0

**Table 40. Construction Event of Sanmen NPP Reported in 2024**

Date of Occurrence	Event
05/05/2024	20 steel bars in the nuclear island auxiliary building of Sanmen NPP Unit 3 were not pre-embedded before wall pouring according to the design requirements
08/27/2024	The welding record of CA33 module weld of Sanmen NPP Unit 4 is inconsistent with the site

**Table 41. Occupational Radioactive Doses at the Sanmen NPP in 2024**

Unit	Annual Average Effective Dose/Person (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man·Sv)	Normalized Collective Effective Dose (man·mSv/Gwh)
Units 1 and 2	0.167	3.264	0.384	0.019

## Haiyang NPP

In 2024, the Units 1 and 2 of Haiyang NPP continued to operate stably and safely. The failure rate of fuel elements, leakage rate of primary system coolant pressure boundary, and leakage rate of containment were all within the prescribed limits. The 3rd refueling outage of Unit 1 and the 4th refueling outage of Unit 2 were completed on October 23, 2024 and September 24, 2024, respectively. Unit 3 had its No. 3 reactor building capping



**Figure 15. On-site Inspection on Arc Sample Plate of Top Head of Haiyang NPP Unit 3**



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III

head in place on September 25, 2024, and Unit 4 completed the capping of the annex building on November 10, 2024.

Nuclear Safety-related Regulatory Approvals for Haiyang NPP in 2024 are shown in Table 42 and the regulatory inspection activities in Table 43. Haiyang NPP reported 2 operational events, as shown in Table 44. The occupational

radioactive doses at Haiyang NPP are shown in Table 45.

In 2024, Eastern Regional Office of Nuclear and Radiation Safety Inspection assigned 1,475 man-days for inspection of Haiyang NPP, including 3 routine inspections and 1 non-routine inspection. A total of 217 issues were identified and 21 regulatory requirements were imposed.

**Table 42. Nuclear Safety-related Regulatory Approvals for Haiyang NPP in 2024**

Date	Document No.	Document Title
01/07/2024	NNSA [2024] No. 3	Notice on Approving the Boundary Adjustment, Change and Renovation of the Physical Protection Control Area of the Phase I Project of Haiyang NPP
02/19/2024	NNSA [2024] No. 28	Notice on Approving the Addition of Contents Related to Sliding Power Operation to the Final Safety Analysis Report and Refueling Program of Haiyang NPP Units 1 and 2
08/12/2024	NNSA [2024] No. 132	Notice on Approving the Cancellation of the Loading of Secondary Neutron Sources in the Refueling Cores of Haiyang NPP Units 1 and 2
09/03/2024	NNSA [2024] No. 143	Notice on Approving SDNPC's Supplementation of Related Content on "Adding 4 Sets of New Fuel Assemblies" in Final Safety Analysis Report and Refueling Program of Haiyang NPP Units 1 and 2
09/10/2024	NNSA [2024] No. 160	Notice on Approving the Addition of Dynamic Vibration Absorbers to Main Steam Pipelines of Haiyang NPP Units 1 and 2
10/11/2024	NNSA [2024] No. 184	Notice on Approving the Application for Human Reactor Irradiation Test of SAF-14 Autonomous Fuel Pilot Assembly of Haiyang NPP Unit 1
11/02/2024	NNSA [2024] No. 199	Notice on Issuing the "Review Opinion on Siting of Haiyang NPP Units 5 and 6 in Shandong"
11/02/2024	MEE App [2024] No. 109	Approval Reply on the Environmental Impact Reports (Siting Stage) for Haiyang NPP Units 5 and 6 in Shandong

**Table 43. Regulatory Inspection Activities at the Haiyang NPP in 2024**

Starting Date	Item	Main Contents of the Inspection
04/22/2024	Haiyang NPP comprehensively strengthens special inspection on nuclear safety management actions	Nuclear safety responsibility implementation, design safety management, civil construction management, installation quality management, e\ manufacturing, NPP operation safety, water intake safety, radiation monitoring, nuclear materials, nuclear emergency response
11/11/2024	Carry out non-routine inspections of Haiyang NPP	In the process of concrete production and transportation of Haiyang Phase II NPP Project, there are some irregularities such as adding water to the tanker receiving port and dispatching and commanding the tanker driver to modify the pouring time record

*Note: Inspections organized by regional offices of nuclear and radiation safety inspection are not included.*

**Table 44. Operational Events of Haiyang NPP Reported in 2024**

Date of Occurrence	Event	Cause	INES Level
03/05/2024	The main pump 2A shutdown of Haiyang NPP Unit 2 resulted in a low flow rate 2 in the hot section of the reactor coolant loop 2 triggering an automatic reactor shutdown.	Equipment	0
09/27/2024	During the normal water replenishment of the spent fuel pool of Unit 2, the desalination water pump tripped and the check valve was not completely closed, resulting in the operational event - backflow of spent fuel pool water to the desalination pipeline	Equipment	0

**Table 45. Occupational Radioactive Doses at Haiyang NPP in 2024**

Unit	Annual Average Effective Dose/Person (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man·Sv)	Normalized Collective Effective Dose (man·mSv/Gwh)
Unit 1	0.132	1.889	0.291	0.031
Unit 2	0.149	2.084	0.330	0.034

## Taishan NPP

In 2024, Units 1 and 2 of Taishan NPP continued to operate stably and safely. The failure rate of fuel elements, leakage rate of primary system coolant pressure boundary, and leakage rate of containment were all within the prescribed limits. The 3rd refueling outage of Unit 2 was completed on July 5, 2024.

The nuclear safety-related regulatory approvals for Taishan NPP in 2024 are shown in Table 46 and the regulatory inspection activities in Table 47. The occupational radioactive doses at Taishan NPP are shown in Table 48.

In 2024, Southern Regional Office of Nuclear and Radiation Safety Inspection



*Figure 16. On-site Inspection on New Fuel Arrival for Taishan NPP Unit 1*

assigned 1025 man-days for inspection of the two operating units of Taishan NPP, including 9 routine inspections. A total of 105 findings were identified and 48 regulatory requirements were imposed.

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**Table 46. Nuclear Safety-related Regulatory Approvals for Taishan NPP in 2024**

Date	Document No.	Document Title
06/24/2024	NNSA [2024] No. 92	Notice on Approving the Technical Specification Limit for Increasing the Maximum Iron Content of Cladding of Fuel Assembly of Taishan NPP
07/01/2024	NNSA [2024] No. 105	Notice on Approving the Version Upgrade to "Technical Specification for Taishan NPP Units 1 and 2"
11/08/2024	NNSA [2024] No. 206	Notice on Approving the "Maintenance Program (Version B) for Taishan NPP Units 1 and 2"

**Table 47. Regulatory Inspection Activity at Taishan NPP in 2024**

Starting Date	Item	Main Contents of the Inspection
10/9/2024	Inspection of monitoring and operation of Taishan NPP Units 1 and 2	Upgrading of the monitoring operation plan, personnel training, implementation of the monitoring operation plan, handling of abnormal fuel-related issues, implementation of nuclear safety management requirements, and experience feedback.

*Note: Inspections organized by regional offices of nuclear and radiation safety inspection are not included.*

**Table 48. Occupational Radiation Doses of Taishan NPP Reported in 2024**

Unit	Annual Average Effective Dose/Person (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man-Sv)	Normalized Collective Effective Dose (man-mSv/Gwh)
Units 1 and 2	0.144	4.208	0.410	0.017

## Changjiang NPP

In 2024, Units 1 and 2 of Changjiang NPP continued to operate stably and safely. The failure rate of fuel elements, leakage rate of primary system coolant pressure boundary, and leakage rate of containment were all within the prescribed limits. The 7th refueling outage of Unit 1 and the 6th refueling outage of Unit 2 were completed on September 25, 2024 and April 5, 2024, respectively. Units 3 and 4 and Small Modular Reactor (SMR)



**Figure 17. On-site Inspection on Small Modular Reactor (SMR) in Changjiang**



are in stages of civil engineering construction and equipment installation. Unit 3 completed the welding of the main pipeline on May 6, 2024, and the installation of reactor internals began on August 14, 2024. Unit 4 started the welding of the main pipeline on October 25, 2024. Small Modular Reactor (SMR) completed reactor internals installation on November 29, 2024.

The nuclear safety-related regulatory approvals for Changjiang NPP in 2024

are shown in Table 49. Changjiang NPP reported 1 construction event, as shown in Table 50. The occupational radiation doses at Changjiang NPP are shown in Table 51.

In 2024, Southern Regional Office of Nuclear and Radiation Safety Inspection assigned 989 man-days for inspection of Changjiang NPP, including 10 routine inspections. A total of 248 findings were identified and 68 regulatory requirements were imposed.

**Table 49. Nuclear Safety-related Regulatory Approvals for Changjiang NPP in 2024**

Date	Document No.	Document Title
07/08/2024	NNSA [2024] No. 110	Notice on Approving the “Quality Assurance Program for Changjiang NPP Units 3 and 4 in Hainan (Construction Phase)”
07/11/2024	NNSA [2024] No. 112	Notice on Approving the Change of Construction License for Changjiang-3 and -4 in Hainan
09/16/2024	NNSA [2024] No. 168	Notice on Approving the Risk-Informed In-service Inspection and Optimization for Part of the Pipelines in Residual Heat Removal System, etc. of Changjiang NPP Units 1 and 2 in Hainan

**Table 50. Construction Events of Changjiang NPP Reported in 2024**

Date of Occurrence	Event
08/19/2024	Construction event that the in-service inspection requirements of the main pump nozzle weld of Changjiang Multi-Purpose Small Modular Reactor Technology Demonstration Project are inconsistent with the description in the preliminary safety analysis report

**Table 51. Occupational Radioactive Doses at Changjiang NPP in 2024**

Unit	Annual Average Effective Dose/Person (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man·Sv)	Normalized Collective Effective Dose (man·mSv/Gwh)
Units 1 and 2	0.198	5.389	520.911	0.054

## Fangchenggang NPP

In 2024, Unit 4 of Fangchenggang NPP was put into operation, while Units 1-3 continued to operate stably and safely. The failure rate of fuel elements, leakage rate of primary coolant pressure boundary, and leakage rate of containment were all within the prescribed limits. The 6th refueling outage of Unit 1 and the first refueling outage of Unit 3 were completed on August 12, 2024 and April 21, 2024 respectively.

The nuclear-safety-related administrative approvals for Fangchenggang NPP in 2024 are shown in Table 52 and the regulatory inspection activities in Table 53. Fangchenggang NPP reported two operational events, as shown in Table 54. Fangchenggang NPP reported one construction event, as shown in Table 55. The occupational radiation doses of Fangchenggang NPP are shown in Table 56.



*Figure 18. On-site Inspection on Fangchenggang NPP*

In 2024, the Southern Regional Office of Nuclear and Radiation Safety Inspection assigned 1,140 man-days for inspection at Fangchenggang NPP, including 8 routine inspections and coordinated with the National Nuclear Safety Administration to conduct three inspections. For operating organizations, a total of 100 findings were identified and 41 regulatory requirements were imposed; and for constructing organizations, a total of 87 findings were identified and 21 regulatory requirements were imposed.

**Table 52. Nuclear-safety-related Administrative Approvals for Fangchenggang NPP in 2024**

Date	Document No.	Document Title
01/19/2024	NNSA [2024] No. 11	Notice on Approving the "Refueling Program for Fangchenggang NPP Units 3 and 4 in Guangxi (Version 1)"
02/21/2024	NNSA [2024] No. 34	Notice on Approving the "Technical Specifications for Fangchenggang NPP Units 3 and 4 in Guangxi (Version 1 - Draft for Approval)"
02/23/2024	NNSA [2024] No. 36	Notice on Issuing the "Operation License for Fangchenggang NPP Unit 4 in Guangxi"
04/01/2024	NNSA [2024] No. 49	Notice on Releasing the Initial Criticality Control Point for Fangchenggang NPP Unit 4 in Guangxi
04/10/2024	NNSA [2024] No. 59	Notice on Approving the "Technical Specifications for Fangchenggang NPP Units 1 and 2 in Guangxi (Version 4)"
04/18/2024	NNSA [2024] No. 69	Notice on Releasing the First Reactor Criticality Control Point (CCP) after the First Refueling Outage of Fangchenggang NPP Unit 3
07/19/2024	NNSA [2024] No. 115	Notice on the Approving the Second Batch of STEP-12C Pilot Assembly for Reactor Test in Fangchenggang NPP Unit 1

**Table 53. Regulatory Inspection Activities at Fangchenggang NPP in 2024**

Starting Date	Item	Main Contents of the Inspection
01/23/2024	Comprehensive nuclear safety inspection before issuing the operation license for Fangchenggang NPP Unit 4 in Guangxi	Implementation of the quality assurance program; conditions of the construction license; implementation of important experience feedback; construction of structures and installation of systems and equipment; pre-service inspection; commissioning and non-conformance item handling; operation and production preparation; fuel loading preparation; physical protection; fuel storage; emergency preparedness; radiation source management; fire protection, radioactive waste treatment, and environmental monitoring.
03/26/2024	Nuclear safety inspection on the first criticality control point of Fangchenggang NPP Unit 4 in Guangxi	Completion of commissioning test items before its first criticality; implementation of design changes and defect treatment; preparation before the first criticality, implementation of periodic tests, radiation protection and effluent monitoring, implementation of technical specifications after fuel loading, experience feedback; and implementation of nuclear safety management requirements
04/15/2024	Nuclear safety inspection on the first criticality control point of Fangchenggang NPP Unit 3 in Guangxi after the first refueling outage	Implementation of outage activities and implementation of changes to safety-critical system and equipment; in-service inspection of safety-critical system and equipment; readiness for the first criticality condition after unit refueling outage; quality assurance and quality control during outage; implementation of radiation protection and radioactive waste management during outage; and implementation of nuclear safety supervision

*Note: Inspections organized by regional offices of nuclear and radiation safety inspection are not included.*

**Table 54. Operational Events Reported by Fangchenggang NPP in 2024**

Date of Occurrence	Event	Cause	INES Level
05/05/2024	The maximum flow rate of F4RCP first loop in Fangchenggang NPP Unit 4 in Guangxi exceeded the mechanical design flow criterion	Equipment	0
08/01/2024	A grid-side fault in the 220kV No.1 auxiliary external power supply of Fangchenggang NPP in Guangxi caused the automatic start (without load) of the Train A emergency diesel generator of Unit F1	Management	0

**Table 55. Construction Events of Fangchenggang NNP Reported in 2024**

Date of Occurrence	Event
05/06/2024	The flame-retardant characteristics of the core wires of Nexans cables used for the safety-class panel of Fangchenggang NPP Unit 4 in Guangxi failed to meet the requirements of the Final Safety Analysis Report



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Table 56. Occupational Radiation Doses at Fangchenggang NPP in 2024

Unit	Annual Average Effective Dose/Person (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man·Sv)	Normalized Collective Effective Dose (man·mSv/Gwh)
Units 1 and 2	0.152	10.656	0.391	0.023
Units 3 and 4	0.167		0.634	0.046

## Shidao Bay NPP (High Temperature Gas-cooled Reactor Demonstration Project)

In 2024, the operation safety of the high-temperature gas-cooled reactor (HTGR) demonstration project were operated stably and safely. The high-temperature gas-cooled reactor demonstration project completed its first major overhaul on December 12, 2024.

The nuclear-safety-related administrative approvals for the HTGR demonstration project in 2024 are shown in Table 57 and the regulatory inspection activities in Table 58. The HTGR demonstration project reported 3 operational events, as shown in Table 59. The occupational radiation doses at the Shidao Bay NPP are shown in Table 60.



Figure 19. On-site inspection on high temperature reactor at Shidao Bay NPP

In 2024, the Eastern Regional Office of Nuclear and Radiation Safety Inspection assigned 2,163 man-days for inspection of Shidao Bay NPP, including four routine inspections. A total of 223 findings were identified and 34 regulatory requirements were imposed.

Table 57. Nuclear-safety-related Administrative Approvals for the HTGR Demonstration Project in 2024

Date	Document No.	Document Title
06/03/2024	NNSA [2024] No. 83	Notice on Approving Control Rod Grouping Optimization for HTGR Demonstration Project
08/12/2024	NNSA [2024] No. 133	Notice on Approving Changes such as Modification of Alarm Thresholds for Radiation Monitoring Equipment at Fresh Air Inlets of the Main Control Room of the HTGR Demonstration Project
09/20/2024	NNSA [2024] No. 175	Notice on Approving the Modification of Shielding of Some Room Doors in the Nuclear Island Building and the Adjustment of Radiation Zoning in the Spent Fuel Welding Equipment Room of the HTGR Demonstration Project
11/08/2024	NNSA [2024] No. 207	Notice on Approving the In - Service Inspection Program of the HTGR Demonstration Project (Version C - Draft for Approval)

**Table 58. Regulatory Inspection Activity at the HTGR Demonstration Project in 2024**

Starting Date	Item	Main Contents of the Inspection
04/15/2024	Huaneng Shandong Shidao Bay Nuclear Power Co., Ltd. comprehensively strengthened special actions for nuclear safety management in the nuclear power industry	Special-action inspection on nuclear safety management
11/11/2024	Expert evaluation of the first outage of the HTGR demonstration project	Good practices and shortcomings in personnel management, work process control, equipment maintenance and inspection were evaluated during the first outage

*Note: Inspections organized by regional offices of nuclear and radiation safety inspection are not included.*

**Table 59. Operational Events of the HTGR Demonstration Project Reported in 2024**

Date of Occurrence	Event	Cause	INES Level
01/15/2024	Steam temperature deviation at the outlet of the heat transfer tube of the No. 1 steam generator of the HTGR Demonstration Project failed to meet the requirements of the Final Safety Analysis Report	Equipment, management	0
02/13/2024	Gas emission from the ventilation system of the spent fuel storage tank in the HTGR Demonstration Project failed to meet the requirement in the Rules on Radiation Protection in the Environment of Nuclear Power Plants that airborne radioactive effluents shall be purified before being discharged.	Equipment, personnel	0
08/01/2024	Emergency shutdown was triggered due to the protection signal of "low mass flow ratio of primary and secondary systems" at No. 1 reactor of HTGR Demonstration Project.	Equipment, management	0

**Table 60. Occupational Radiation Doses at the HTGR Demonstration Project in 2024**

Unit	Annual Average Effective Dose/Person (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man-Sv)	Normalized Collective Effective Dose (man·mSv/Gwh)
HTGR demonstration project	0.048	2.125	0.078	0.287

## Phase I Expansion Project of Shandong Shidao Bay NPP

In 2024, Units 1 and 2 of Phase I Expansion Project of Shandong Shidao Bay NPP obtained construction licenses. Unit 1 entered the civil construction phase. The FCD for the nuclear island foundation was poured on July 28, 2024; the construction of the inner and outer shell foundations was completed on December 20; and the construction of the internal structure floor was completed on December 28. Unit 2 is in the construction preparation stage.

In 2024, the nuclear-safety-related administrative approvals for Phase I



*Figure 20. On-site Inspection on Expansion Project of Shidao Bay NPP*

Expansion Project of Shandong Shidao Bay NPP are shown in Table 61 and the regulatory inspection activities are shown in Table 62; one construction event was reported as shown in Table 63.

**Table 61. Nuclear-safety-related Administrative Approvals for Phase I Expansion Project of Shandong Shidao Bay NPP in 2024**

Date	Document No.	Document Title
06/03/2024	NNSA [2024] No. 80	Notice on Approving the “Quality Assurance Program for Phase I Expansion Project of Shandong Shidao Bay NPP (Construction Phase) (Version A2)”
07/23/2024	NNSA [2024] No. 118	Notice on Issuing the Construction Licenses for Units 1 and 2 of Phase I Expansion Project of Shandong Shidao Bay NPP
07/22/2024	MEE App [2024] No. 74	Reply on EIS for Units 1 and 2 of Phase I Expansion Project of Shandong Shidao Bay NPP (at construction phase)

**Table 62. Regulatory Inspection Activities for Phase I Expansion Project of Shandong Shidao Bay NPP in 2024**

Starting Date	Item	Main Contents of the Inspection
05/28/2024	Inspection of the preparation before the pouring of the FCD for the nuclear island foundation of Unit 1 in Phase I Expansion Project of Shandong Shidao Bay NPP	Handling of outstanding issues identified during early construction regulatory inspection such as excavation of the nuclear island foundation pit; preparation of construction management conditions such as nuclear island construction organization and construction plan; preparation of technical conditions such as design documents and construction schemes; preparation of construction conditions before FCD for the nuclear island; implementation of quality assurance program at construction phase

*Note: Inspections organized by regional offices of nuclear and radiation safety inspection are not included.*



Table 63. Construction Events Reported for Phase I Expansion Project of Shandong Shidao Bay NPP in 2024

Date of Occurrence	Event
10/07/2024	The deviation of steel bar installation spacing in some areas of Unit 1 failed to meet the design requirements

## CAP1400 Demonstration Project

In 2024, Unit 1 of the CAP1400 demonstration project was put into operation, while Unit 2 was at the installation and commissioning stages. For Unit 1, the operation license was obtained on July 19, 2024; the initial loading began on July 20; the first criticality was achieved on August 31; the first grid connection was achieved on September 20; the 168-hour trial operation was successfully completed on December 16. For Unit 2, the primary system hydrostatic test was completed on June 16; the thermal test commenced on October 15; the first batch of nuclear fuel entered the site on December 9; the thermal test project was completed on December 16.

The nuclear-safety-related administrative approvals for CAP1400 demonstration project are shown in Table 64 and the regulatory inspection activities in Table 65. Three operational events and five construction events were reported for CAP1400 demonstration project, as shown



*Figure 21. On-site Inspection on Uncovered Sealing Surface of Pressure Vessel for CAP1400 Demonstration Project*

in Tables 66 and 67. The occupational radiation doses at CAP1400 demonstration project are shown in Table 68.

In 2024, the Eastern Regional Office of Nuclear and Radiation Safety Inspection assigned 2,064 man-days for inspection of the CAP1400 demonstration project, including five routine inspections. A total of 467 findings were identified and 238 regulatory requirements were imposed.

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**Table 64. Nuclear-safety-related Administrative Approvals for the CAP1400 Demonstration Project in 2024**

Date	Document No.	Document Title
07/04/2024	NNSA [2024] No. 106	Notice on Approving the "Commissioning Program for CAP1400 Units 1 and 2" (Version 4)
07/04/2024	NNSA [2024] No. 107	Notice on Approving the "Fueling and Refueling Program for CAP1400 Units 1 and 2" (Version 1)
07/19/2024	NNSA [2024] No. 116	Notice on Issuing the Operation License for Unit 1 of the CAP1400 Demonstration Project
07/19/2024	MEE App [2024] No. 72	Reply on EIS (Operation Stage) for CAP1400 Units 1 and 2

**Table 65. Regulatory Inspection Activity at the CAP1400 Demonstration Project in 2024**

Starting Date	Item	Main Contents of the Inspection
06/17/2024	Comprehensive inspection before issuing the operation license for Unit 1 of the CAP1400 demonstration project	Implementation of the quality assurance program; structures and nuclear safety equipment; system commissioning; operation and production preparation; radiation protection; physical protection and fuel storage; radioactive waste management and environmental monitoring; fire-fighting facilities; implementation of requirements for construction license, operation license application documents and issues identified in the documents review; implementation of regulatory requirements proposed in the nuclear safety regulatory inspection at construction phase; Fukushima Accident related improvement items
09/01/2024	Inspection of Unit 1 of CAP1400 demonstration project when departing from the 5% rated thermal power control point	System commissioning, operation management, maintenance management, non-compliance, outstanding issues from the previous stage, and the implementation of previous nuclear safety-related regulatory inspection management requirements
10/09/2024	Inspection of Unit 1 of CAP1400 demonstration project when departing from the 50% rated thermal power control point	System commissioning, operation management, maintenance management, inspection and supervision, test management, design change and modification management, non-compliance of mechanical, instrumentation and electrical equipment, and implementation of previous nuclear safety-related regulatory inspection requirements

*Note: Inspections organized by regional offices of nuclear and radiation safety inspection are not included.*

**Table 66. Operational Events of the CAP1400 Demonstration Project Reported in 2024**

Date of Occurrence	Event	Cause	INES Level
10/22/2024	The high water temperature of the main pump 2B bearing in Unit 1 of CAP1400 demonstration project triggered the automatic shutdown event of the reactor	Equipment	0
10/27/2024	Unexpected shutdown of normal residual heat removal pump resulting from periodic test of PMS ESF drive logic of Unit 1 of CAP1400 demonstration project	Equipment	0
11/30/2024	Automatic reactor shutdown event of Unit 1 in the CAP1400 demonstration project resulting from abnormal measurement of the flow meters RCS - FT102A&C in the hot leg of RCS Loop 2	Equipment	0

**Table 67. Construction Events of the CAP1400 Demonstration Project Reported in 2024**

Date of Occurrence	Event
01/25/2024	Construction event that the insertion depth of anti-vibration bars for the steam generator of Unit 1 in the CAP1400 demonstration project failed to meet design requirements
05/17/2024	Construction event that the effective circulation area of ADS Levels 2 and 3 stop valves in CAP1400 demonstration project failed to meet FSAR
05/30/2024	Construction event that DN25 Class 2 nuclear-grade stainless steel elbow section of Unit 1 of CAP1400 demonstration project being burned by arc
08/06/2024	Construction event report that the insertion depth of anti-vibration bars for the steam generator of Unit 2 in CAP1400 demonstration project failed to meet the design requirements
10/08/2024	Construction event that the sulfur content of stainless steel welding materials used in specific parts of equipment in CAP1400 demonstration project failed to meet the design requirements

**Table 68. Occupational Radiation Doses at CAP1400 Demonstration Project in 2024**

Unit	Annual Average Effective Dose/Person (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man-Sv)	Normalized Collective Effective Dose (man-mSv/Gwh)
Unit 1	NA	0.186	0.005	NA

## Zhangzhou NPP

In 2024, Unit 1 of Zhangzhou NPP obtained the operation license. Unit 2 was in the installation and commissioning phase. Units 3 and 4 obtained the construction licenses. The first concrete pouring for the nuclear island foundation of Unit 3 was carried out on February 22, 2024, and that of Unit 4 was on September 27, 2024.

The nuclear-safety-related administrative approvals for Zhangzhou NPP in 2024 are shown in Table 69 and the regulatory inspection activities in Table 70. The Zhangzhou NPP reported one operational event, as shown in Table 71,



*Figure 22. HUANG Runqiu, Minister of Ecology and Environment, Conducted a Field Survey for Zhangzhou NPP*

and two construction events, as shown in Table 72. The occupational radiation doses at Zhangzhou NPP are shown in Table 73.



## Safety Regulation on Nuclear Power Plants

In 2024, the Eastern Regional Office of Nuclear and Radiation Safety Inspection assigned 1,654 man-days for inspection of Zhangzhou NPP, including seven

routine inspections. A total of 440 findings were identified and 21 regulatory requirements were imposed.

**Table 69. Nuclear-safety-related Administrative Approvals for Zhangzhou NPP in 2024**

Date	Document No.	Document Title
02/21/2024	NNSA [2024] No. 30	Notice on Issuing the Construction Licenses for Zhangzhou NPP Units 3 and 4 in Fujian
03/01/2024	NNSA [2024] No. 40	Notice on Approving the In-Service Inspection Program for Zhangzhou NPP Units 1 and 2 in Fujian (Version 000)
09/07/2024	NNSA [2024] No. 153	Notice on Approving the “Maintenance Program for Zhangzhou NPP Units 1 and 2 in Fujian (Version 001)”
09/07/2024	NNSA [2024] No. 154	Notice on Approving the “Fueling and Refueling Program for Zhangzhou NPP Units 1 and 2 in Fujian (Version 003)”
09/07/2024	NNSA [2024] No. 155	Notice on Approving the “Quality Assurance Program (operation phase) for Zhangzhou NPP Units 1 and 2 in Fujian (Version C2)”
09/16/2024	NNSA [2024] No. 170	Notice on Approving the “Commissioning Program for Zhangzhou NPP Units 1 and 2 in Fujian (Version B/1)”
10/12/2024	NNSA [2024] No. 185	Notice on Issuing the Operation Licenses for Zhangzhou NPP Unit 1 in Fujian
02/20/2024	MEE App [2024] No. 24	Reply on EIS (construction phase) for Zhangzhou NPP Units 3 and 4 in Fujian
10/12/2024	MEE App [2024] No. 100	Replay on EIS (operation phase) for Zhangzhou NPP Units 1 and 2 in Fujian

**Table 70. Regulatory Inspection Activities at Zhangzhou NPP in 2024**

Starting Date	Item	Main Contents of the Inspection
04/15/2024	Special inspection for comprehensively strengthening nuclear safety management in the nuclear power industry: CNNP Guodian Zhangzhou Energy Co., Ltd.	Implementation of nuclear safety responsibilities; design safety management; equipment manufacturing management; civil construction quality management; installation quality management; commissioning and operational safety management; water intake safety; civil nuclear material safety management; implementation of nuclear emergency responsibilities; radiation monitoring and the rectification and implementation of issues identified in the three-year hazard investigation
08/12/2024	Comprehensive inspection before issuing the operation license for Zhangzhou NPP Unit 1 in Fujian	Implementation of the quality assurance program; structures and nuclear safety equipment; system commissioning; operation and production preparation; radiation protection; emergency preparedness; physical protection and fuel storage; radioactive waste management and environmental monitoring; fire protection in nuclear power plants; implementation of conditions for construction license, operation license application documents and issues identified during review; implementation of regulatory requirements proposed in the nuclear safety regulatory inspection at construction phase; others like Fukushima Accident related improvement items

*Note: Inspections organized by regional offices of nuclear and radiation safety inspection are not included.*

**Table 71. Operational Event of Zhangzhou NPP Reported in 2024**

Date of Occurrence	Event	Cause	INES Level
11/30/2024	Weld fracture in instrument pipeline of low-pressure safety injection pump small-flow pipeline for Zhangzhou NPP Unit 1	Equipment	0

**Table 72. Construction Event of Zhangzhou NPP Reported in 2024**

Date of Occurrence	Event
05/31/2024	Out-of-tolerance event of cold clearance between two cylindrical end faces of pressure vessel outlet nozzle and internals hanging basket outlet nozzle of Zhangzhou NPP Unit 2
11/26/2024	Fracture of prestressed finished rolled threaded steel bar in Room R401 of No. 2 Nuclear Island of Zhangzhou NPP

**Table 73. Occupational Radiation Doses at Zhangzhou NPP in 2024**

Unit	Annual Average Effective Dose/Person (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man-Sv)	Normalized Collective Effective Dose (man-mSv/Gwh)
Unit 1	0.005	0.074	0.007	0.014

## Taipingling NPP

In 2024, Taipingling NPP Units 1 and 2 were at the stages of civil construction, equipment installation, and system commissioning. Unit 1 commenced thermal performance tests on June 27, 2024, and Unit 2 completed main pipe welding on May 20, 2024.

The nuclear-safety-related administrative approvals for Taipingling NPP in 2024 are shown in Table 74, and the regulatory inspection activities in Table 75. Taipingling NPP reported five construction events, as shown in Table 76.

In 2024, the Southern Regional Office of



**Figure 23. On-site Inspection of Taipingling NPP**

Nuclear and Radiation Safety Inspection assigned 674 man-days for inspection of Taipingling NPP, including six routine inspections. A total of 96 findings were identified and 37 regulatory requirements were imposed.

# Safety Regulation on Nuclear Power Plants

**Table 74. Nuclear-safety-related Administrative Approvals for Taipingling NPP in 2024**

Date	Document No.	Document Title
06/20/2024	NNSA [2024] No. 88	Notice on Approving Change of Application Design of Adding Zinc Injection Technology to the Primary System of Taipingling NPP Units 1 and 2
09/03/2024	NNSA [2024] No. 145	Notice on Approving the "Quality Assurance Program (Construction Phase) for CGN Guangdong Taipingling NPP Phase I Project (Version 0)"
11/08/2024	NNSA [2024] No. 204	Notice on Approving the "Quality Assurance Program (Operation Stage) for CGN Guangdong Taipingling NPP Phase I Project"
12/25/2024	NNSA [2024] No. 226	Notice on Approving Mechanical Design Flow Changes of Primary System for Taipingling NPP Units 1 and 2
12/27/2024	NNSA [2024] No. 230	Notice on Approving Change of Over-temperature $\Delta T$ and Over-power $\Delta T$ Protection Channel Settings for Taipingling NPP Units 1 and 2
12/31/2024	NNSA [2024] No. 236	Notice on Approving the In-Service Inspection Program for Taipingling NPP Units 1 and 2 (Draft for Approval)

**Table 75. Regulatory Inspection Activities at Taipingling NPP in 2024**

Starting Date	Item	Main Contents of the Inspection
04/08/2024	Special action inspection for comprehensively strengthening nuclear safety management in the nuclear power industry	Nuclear safety responsibility implementation, design safety management, equipment manufacturing, civil construction, installation quality, commissioning and operation safety, radiation monitoring, water intake safety, nuclear materials

*Note: Inspections organized by regional offices of nuclear and radiation safety inspection are not included.*

**Table 76. Construction Event of Taipingling NPP Reported in 2024**

Date of Occurrence	Event
07/30/2024	RCC-M grade control error of nuclear grade welds for Taipingling NPP Units 1 and 2
09/25/2024	Excessive defects were found in the pre-service inspection of the piping welds of the RIS system for Taipingling NPP Unit 1
12/13/2024	The installation orientation of the EM4 valves in the nuclear island of Taipingling NPP Units 1 and 2 is incorrect due to the inconsistent installation orientation between the isometric drawing and the assembly drawing of the valves
12/13/2024	Due to irregular equipment deployment by the engineering company of Taipingling NPP, the scrapped valves of Unit 1 were deployed to Unit 2
12/30/2024	Oil leakage occurred from the hydraulic damper used to support the main equipment of Taipingling NPP Unit 1



San’ao NPP

In 2024, San’ao NPP Units 1 and 2 were at the civil construction and installation stages. For Unit 1, the welding of the main pipe was completed on February 29, 2024, and the cold performance test was completed on November 13, 2024. For Unit 2, the welding of the main pipeline was started on September 6, 2024. Units 3 and 4 were approved on August 19, 2024. For Unit 3, the excavation of the nuclear island foundation pit was completed in November 2024 and the subsequent work was performed after passing the excavation trench inspection.

The nuclear-safety-related administrative approvals for San’ao NPP in 2024 are shown in Table 77. San’ao NPP reported three



Figure 24. On-site Inspection at San’ao NPP

construction events, as shown in Table 78.

In 2024, the Eastern Regional Office of Nuclear and Radiation Safety Inspection assigned 1,126 man-days for inspection of San’ao NPP, including one routine inspection. A total of 147 findings were identified and 136 regulatory requirements were imposed.

Table 77. Nuclear-safety-related Administrative Approvals for San’ao NPP in 2024

Date	Document No.	Document Title
06/03/2024	NNSA [2024] No. 79	Notice on Approving Change of Application Design of Adding Zinc Injection Technology to the Primary System of CGN Zhejiang San'ao NPP Units 1 and 2
06/03/2024	NNSA [2024] No. 82	Notice on Approving Design Changes of Number of Neutron Sources for CGN Zhejiang San'ao NPP Units 1 and 2
11/08/2024	NNSA [2024] No. 202	Notice on Approving the Commissioning Program for San'ao NPP Units 1 and 2 (Version A2)
12/06/2024	NNSA [2024] No. 215	Notice on Approving the Quality Assurance Program (Construction Phase) for CGN Zhejiang San'ao NPP Units 1 and 2 (Version 4 - Draft for Approval)

# Safety Regulation on Nuclear Power Plants

**Table 78. Construction Event of San'ao NPP Reported in 2024**

Date of Occurrence	Event
01/05/2024	The incident of falsifying the submission of concrete specimens for same-condition curing from the joint pump room (BPX) of San'ao NPP Units 1 and 2
05/15/2024	Multiple quality defects occurred in the KSB main pump and motor of San'ao NPP Unit 1 due to insufficient control in the manufacturing process
09/11/2024	Qualification of welders for the exhaust pipe welding of the 1LHQ emergency diesel generator for San'ao NPP failed to meet the requirements of HAF603

## Xudapu NPP

In 2024, Xudapu NPP Units 1 and 2 entered the construction phase, and Units 3 and 4 entered the peak equipment installation period. On May 20, 2024, the CA01 module of Unit 1 was put in place. For Unit 2, the FCD for the nuclear island foundation was on July 17, 2024. For Unit 3, main pipe welding was completed on March 10, 2024; 220kV reverse power transmission was completed on October 30; the internals of the reactor were delivered to the site on November 20. For Unit 4, the dome was hoisted into place On June 18, 2024. The reactor pressure vessel started to install on December 17, 2024.

The nuclear-safety-related administrative approvals for Xudapu NPP in 2024 are shown in Table 79.



*Figure 25. On-site Inspection on Welding Control Points of Main Pipeline for Xudapu NPP Unit 3*

In 2024, the North-Eastern Regional Office of Nuclear and Radiation Safety Inspection assigned 2,095 man-days for inspection of Xudapu NPP, including six routine inspections. A total of 160 findings were identified and 28 regulatory requirements were imposed.

**Table 79. Nuclear Safety Regulatory Approval for Xudapu NPP in 2024**

Date	Document No.	Document Title
12/23/2024	NNSA Letter [2024] No. 116	Reply Letter on Approving the Technical Capability Verification Program for Non-destructive Inspection in Pre-service and In-service Inspection of Xudapu NPP Units 3 and 4

## Lufeng NPP

On August 19, 2024, Lufeng NPP Units 1 and 2 were approved. For Unit 1, the steel bar binding of the nuclear island base plate was completed on November 25, 2024 and Unit 2 is in the stage of nuclear island foundation pit maintenance. Units 5 and 6 were in the construction phase. For Unit 5, the hoisting of the dome in the reactor building was completed on April 29, 2024. For Unit 6, the hoisting of the stainless steel module on the IVR pool wall was completed on September 23, 2024.

The nuclear-safety-related administrative approvals for Lufeng NPP in 2024 are shown in Table 80, and the regulatory inspection activities in Table 81. Lufeng NPP reported one construction event, as shown in Table 82.



Figure 26. On-site Inspection at Lufeng NPP

In 2024, the Southern Regional Office of Nuclear and Radiation Safety Inspection assigned 818 man-days for inspection of Lufeng NPP, including 5 routine inspections. A total of 116 findings were identified and 23 regulatory requirements were imposed.

Table 80. Nuclear-safety-related Administrative Approvals for Lufeng NPP in 2024

Date	Document No.	Document Title
03/04/2024	NNSA [2024] No. 39	Notice on Approving Design Changes in Boron Misdilution Protection Caused by Chemical and Volume Control System Faults of Lufeng NPP Units 5 and 6
09/03/2024	NNSA [2024] No. 144	Notice on Approving the Quality Assurance Program (Construction Phase) for Lufeng NPP Units 1 and 2 in Guangdong (Version 1.0)

Table 81. Regulatory Inspection Activities at Lufeng NPP in 2024

Starting Date	Item	Main Contents of the Inspection
11/26/2024	Nuclear safety inspection for the preparations before FCD for the nuclear island foundation of Lufeng NPP Unit 1	Implementation of quality assurance program in construction phase; preparation of construction management conditions such as construction organization and construction plan; preparation of technical conditions such as design documents and construction plans; handling of problems left over from early construction such as excavation of nuclear island excavation; on-site preparation status before pouring the FCD for the nuclear island foundation establishment and operation of the experience feedback system.

Note: Inspections organized by regional offices of nuclear and radiation safety inspection are not included.



# Safety Regulation on Nuclear Power Plants

**Table 82. Construction Event of Lufeng NPP Reported in 2024**

Date of Occurrence	Event
07/02/2024	The installation position of embedded parts in section 5-1 of wall 0806VB of the emergency diesel generator building (5BDA) for Lufeng NPP Unit 5 is incorrect

## Lianjiang NPP

In 2024, Lianjiang NPP Units 1 and 2 were at the civil construction phase. For Unit 1, the hoisting of the nuclear island CA01 module (steam generator compartment and refueling channel module) was completed on April 13, 2024. For Unit 2, the FCD for nuclear island foundation was poured on April 26, 2024, and the lifting of the steel containment vessel bottom head was completed on September 27, 2024.

The nuclear-safety-related administrative approvals for Lianjiang NPP in 2024 are shown in Table 83, and two construction events were reported, as shown in Table 84.

In 2024, the Southern Regional Office of



*Figure 27. Hoisting of CV Bottom Head for Lianjiang NPP Unit 2*

Nuclear and Radiation Safety Inspection assigned 978 man-days for inspection of units under construction at Lianjiang NPP, including five routine inspections. A total of 118 findings were identified and 39 regulatory requirements were imposed.

**Table 83. Nuclear-safety-related Administrative Approvals for Lianjiang NPP in 2024**

Date	Document No.	Document Title
08/12/2024	NNSA [2024] No. 136	Notice on Approving Design Changes of the Reactor Pressure Vessel Support Foundation for Lianjiang NPP Units 1 and 2

**Table 84. Construction Events of Lianjiang NPP Reported in 2024**

Date of Occurrence	Event
11/06/2024	Construction event that anchoring steel bar welding of CA03 module for Lianjiang NPP Unit 1 in Guangdong failed to meet specifications
11/29/2024	Construction event that OLP-type embedded part anchor bar bending on the wall of CA20 module in the nuclear island of Lianjiang NPP Unit 2

## IV. Safety Regulation on Research Reactors

IV

As of the end of 2024, there were 17 civil research reactors (critical assemblies) in service, 2 civil research reactors under construction, and 3 civil research reactors (critical assemblies) under decommissioning in China (see Table 85). Out of the civil research reactors (critical assemblies) in service, 4 were in long-term shutdown, 2 were under closure management, and the rest 11 ones were operated well generally. According to the Reporting System for Research Reactor Licensees, the in-service civil research reactors (critical assemblies) reported 9 operational events throughout the year (see Table 86), none of which caused unacceptable consequences for the environment outside the reactor building. Two civil research reactors under construction were under construction quality control.

In 2024, the construction license of Tianhong research reactor was issued. The nuclear-safety-related administrative approvals for research reactors in 2024 are shown



*Figure 28. DONG Baotong, Vice Minister of Ecology and Environment and Administrator of National Nuclear Safety Administration, Conducted Field Investigation at the China Institute of Atomic Energy*

in Table 87, and the regulatory inspection activities in Table 88.

In 2024, the Regional Offices of Nuclear and Radiation Safety Inspection assigned 3,358 man-days for inspection of research reactor licensees, including 11 routine inspections and 14 non-routine inspections. A total of 567 findings were identified and 164 regulatory requirements were imposed.

# Safety Regulation on Research Reactors

Table 85. Operation of Research Reactors in 2024

Facility	Design Power	Licensee	Operation Situation
China Experimental Fast Reactor (CEFR)	65MW	China Institute of Atomic Energy	In operation
China Advanced Research Reactor (CARR)	60MW	China Institute of Atomic Energy	In operation
49-2 Swimming Pool Reactor (49-2 SPR)	3.5MW	China Institute of Atomic Energy	In operation
Prototype Miniature Neutron Source Reactor (PMNSR)	27kW	China Institute of Atomic Energy	Long-term shutdown
Zero-power Assembly of MNSR	—	China Institute of Atomic Energy	Long-term shutdown
DF-VI Fast Neutron Critical Assembly	—	China Institute of Atomic Energy	Long-term shutdown
Nuclear Criticality Safety Test Facility in Pilot Plant	—	China Institute of Atomic Energy	Long-term shutdown
Critical Assembly of Solid State Zirconium-hydride Reactor (SSZR)	—	China Institute of Atomic Energy	Decommissioning
101 Heavy Water Research Reactor (101 HWRR)	10MW	China Institute of Atomic Energy	Decommissioning
10 MW High Temperature Gas-Cooled Test Reactor (HTR-10)	10MW	Tsinghua University	In operation
5MW Low Temperature Nuclear Heating Test Reactor (NHR-5)	5MW	Tsinghua University	Closure management
Bulk Shielding Reactor (BSR)	1MW	Tsinghua University	Decommissioning
Medical Isotope Test Reactor	200kW	Nuclear Power Institute of China	Under construction
High Flux Engineering Test Reactor (HFETR)	125MW	Nuclear Power Institute of China	In operation
Critical Assembly of High Flux Engineering Test Reactor (HFETR)	—	Nuclear Power Institute of China	In operation
China Pulsed Reactor (CPR)	1MW	Nuclear Power Institute of China	In operation
Minjiang Test Reactor (MJTR)	5MW	Nuclear Power Institute of China	In operation
18-5 Critical Assembly	—	Nuclear Power Institute of China	In operation
Miniature Neutron Source Reactor (MNSR) in Shenzhen University	30kW	Shenzhen University	Closure management
In-Hospital Neutron Irradiator (IHNI)	30kW	Beijing Capture Tech Co., Ltd.	In operation
2 MWt Liquid Fuel Thorium Molten Salt Reactor (TMSR-LF)	2MW	Shanghai Institute of Applied Physics, Chinese Academy of Sciences	In operation
Tianhong Research Reactor	20MW	Tianhong Technology Co., Ltd.	Under construction



Table 86. Operational Events of Research Reactors in 2024

Date of Occurrence	Facility	Event	Cause	INES Level
01/20/2024	China Experimental Fast Reactor (CEFR)	Operational event of reactor protection shutdown caused by cutting off No. 1 primary pump in primary system of China experimental fast reactor	Management	0
03/30/2024	China Advanced Research Reactor (CARR)	Power reduction and shutdown of China Advanced Research Reactor due to large - scale fluctuation of the indication in the D4 ionization chamber channel.	Equipment	0
04/08/2024	10MW High Temperature Gas-Cooled Test Reactor (HTR-10)	Failure of the Q2 drive mechanism of the absorption ball shutdown system in the 10MW high - temperature gas - cooled test reactor	Equipment	0
05/26/2024	China Advanced Research Reactor (CARR)	China Advanced Research Reactor failed to set nuclear power protection set values of protection system as required	Management	0
07/21/2024	49-2 Swimming Pool Reactor (49-2 SPR)	During the practical operation training of the operators of the 49-2 swimming - pool - type reactor, the reactor shut down automatically during the manual rod lifting process.	Equipment	0
08/23/2024	China Experimental Fast Reactor (CEFR)	The 2 # main pump of the emergency diesel engine in China Experimental Fast Reactor Emergency Stage II failed due to the setting of frequency converter parameters during the load test	Equipment	0
09/25/2024	High Flux Engineering Test Reactor (HFETR)	Protection shutdown triggered by failure of 1 # process measurement cabinet of high flux engineering test reactor	Equipment	0
10/13/2024	China Experimental Fast Reactor (CEFR)	A false alarm of the air inlet radioactivity monitoring system in the control room of China Experimental Fast Reactor caused unexpected start-up of the purification branch of the air conditioning system in the main control room	Equipment	0
12/19/2024	China Advanced Research Reactor (CARR)	The cold source OFF signal of the China Advanced Research Reactor triggered the reactor protection shutdown	Equipment	0

# Safety Regulation on Research Reactors

**Table 87. Nuclear-safety-related Administrative Approvals for Research Reactors in 2024**

Date	Document No.	Document Title
04/03/2024	NNSA [2024] No. 50	Notice on Approving the Alarm Value of Inert Gas Activity Concentration and the Adjustment of Operation Restrictions in the Safety Vessel of 2MWt Liquid Fuel Thorium-Based Molten Salt Experimental Reactor
04/07/2024	NNSA [2024] No. 56	Notice on Approving the In-Service Inspection Program of 10MW High Temperature Gas-Cooled Test Reactor (Version B)
06/03/2024	NNSA [2024] No. 83	Notice on Approving Control Rod Grouping Optimization for HTGR Demonstration Project
08/12/2024	NNSA [2024] No. 133	Notice on Approving Changes such as Modification of Alarm Thresholds for Radiation Monitoring Equipment at Fresh Air Inlets of the Main Control Room of the HTGR Demonstration Project
09/07/2024	NNSA [2024] No. 157	Notice on Approving the Modification of the Control System of the Primary Loop Sodium Pump Distilled Water Cooling System Based on Pressure Signal of China Experimental Fast Reactor
09/20/2024	NNSA [2024] No. 174	Notice on Approving Thorium Addition Experiment for 2MWt Liquid-Fueled Thorium Molten Salt Reactor
09/20/2024	NNSA [2024] No. 175	Notice on Approving the Modification of Shielding of Some Room Doors in the Nuclear Island Building and the Adjustment of Radiation Zoning in the Spent Fuel Welding Equipment Room of the HTGR Demonstration Project
11/08/2024	NNSA [2024] No. 207	Notice on Approving the In - Service Inspection Program of the HTGR Demonstration Project (Version C - Draft for Approval)
12/17/2024	NNSA [2024] No. 218	Notice on Approving the Modification of Tachometer-Based Double-Winding Motor Switching Control for China Experimental Fast Reactor
12/22/2024	NNSA [2024] No. 221	Notice on Issuing the Construction License of Tianhong Research Reactor
12/27/2024	NNSA [2024] No. 232	Notice on Approving the Operation Resumption of the China Experimental Fast Reactor
03/27/2024	NNSA Letter [2024] No. 30	Reply Letter on Approving the Adjustment of Licensing Conditions for the Change of Main and Auxiliary Winding Switching Logic of the Main Pump of China Experimental Fast Reactor
05/03/2024	NNSA Letter [2024] No. 35	Reply Letter on Approving the Adjustment of Licensing Conditions for the Modification of the Distilled Water Cooling System of the Primary Sodium Pump in the China Experimental Fast Reactor
12/19/2024	MEE App [2024] No. 127	Reply on EIS of Tianhong Research Reactor (Construction Phase)

**Table 88. Regulatory Inspection Activities at the Research Reactors in 2024**

Starting Date	Item	Main Contents of the Inspection
01/24/2024	Special inspection on research reactor management of Tsinghua University	Checking the implementation of nuclear safety responsibilities and the operation of quality assurance system of Tsinghua University research reactors
03/20/2024	On-site survey of EIS (siting stage) of a project in Huludao, China Institute of Atomic Energy	Verifying the environmental status of the factory site and the implementation of environmental protection requirements
08/12/2024	Regulatory inspection of the overhaul of the high flux engineering test reactor at Nuclear Power Institute of China	Regulatory inspection of overhaul work of high flux engineering test reactor
09/02/2024	Inspections on environmental protection of a project of Nuclear Power Institute of China according to "Three Simultaneousness" requirements (i.e., design, construction and operation in simultaneous progress with the project)	Verifying the implementation of the requirements of the "Three Simultaneousness" of environmental protection, including the construction and commissioning of environmental protection facilities
11/18/2024	On-site verification of the implementation of the quality assurance program (construction phase) of Tianhong Research Reactor	Checking the operation of the quality assurance system of the licensee
12/18/2024	Verifying modification and preparations for the operation of China Experimental Fast Reactor	Checking the completion of relevant modification of China Experimental Fast Reactor, self-inspection of system equipment before reactor operation, etc.

*Note: Inspections organized by regional offices of nuclear and radiation safety inspection are not included.*



# V. Safety Regulation on Nuclear Fuel Cycle Facilities

V

As of the end of 2024, China had a total of 20 civil nuclear fuel cycle facilities in operation and 1 civil nuclear fuel cycle facility under construction. China's in-service facilities of nuclear fuel production, processing, storage, and so forth were operated safely and maintained a good safety record continuously. The quality of facilities under construction was controlled effectively. Nuclear and radiation safety of nuclear fuel cycle facilities was under control without posing any unacceptable nuclear and radiation hazard to staff, public and the environment. The main facilities are listed in Table 89.

### Administrative Approvals

In 2024, NNSA issued 1 operation license and administrative approval to 8 projects for nuclear safety technical modification.

### Regulatory Inspections

In 2024, NNSA organized regulatory



*Figure 29. On-site Inspection on a Nuclear Fuel Cycle facility*

inspections for effluents from nuclear fuel cycle facilities and environmental monitoring. NNSA's regional offices of nuclear and radiation safety inspection assigned 3,495 man-days for inspection of the nuclear fuel cycle facility licensees, including 26 routine regulatory inspections, and 2 non-routine inspections. A total of 507 findings were identified and 334 regulatory requirements were imposed.

**Table 89. Major Civil Nuclear Fuel Production, Processing and Storage Facilities in China**

Facility	Licensee	Major Product Form	Current Status
Dry Fabrication Line for Chemical Conversion	CNNC Jianzhong Nuclear Fuel Co., Ltd.	UO <sub>2</sub> powder	In operation
Powder Metallurgical Fabrication Line	CNNC Jianzhong Nuclear Fuel Co., Ltd.	UO <sub>2</sub> pellet	In operation
Fuel Element Assembly Line	CNNC Jianzhong Nuclear Fuel Co., Ltd.	PWR nuclear fuel element	In operation
IDR Process Research and Equipment Production Line	CNNC Jianzhong Nuclear Fuel Co., Ltd.	UO <sub>2</sub> powder	In operation
Nuclear Fuel Element Fabrication Line Extension and Technical Modification Reconstruction Project	CNNC Jianzhong Nuclear Fuel Co., Ltd.	PWR nuclear fuel element	In operation
HWR Nuclear Fuel Element Fabrication Line	CNNC North Nuclear Fuel Co., Ltd.	HWR Nuclear fuel element	In operation
PWR Nuclear Fuel Element Fabrication Line	CNNC North Nuclear Fuel Co., Ltd.	PWR nuclear fuel element	In operation
Nuclear Fuel Element Fabrication Line for the HTGR Demonstration Project	CNNC North Nuclear Fuel Co., Ltd.	HTGR fuel element	In operation
Nuclear Fuel Element Fabrication Line Extension Project for PWR NPPs	CNNC North Nuclear Fuel Co., Ltd.	PWR fuel element	In operation
Nuclear Fuel Element Fabrication Line for AP1000 NPP	CNNC North Nuclear Fuel Co., Ltd.	Nuclear fuel element for AP1000 NPP	In operation
405-1A Project	CNNC Shaanxi Uranium Enrichment Co., Ltd.	Low enriched UF <sub>6</sub>	In operation
New Centrifuge Project, Phase IV	CNNC Shaanxi Uranium Enrichment Co., Ltd.	Low enriched UF <sub>6</sub>	In operation
Centrifuge Project Extension in North Region, Phase I	CNNC Shaanxi Uranium Enrichment Co., Ltd.	Low enriched UF <sub>6</sub>	In operation
Centrifuge Project Extension in North Region, Phase II	CNNC Shaanxi Uranium Enrichment Co., Ltd.	Low enriched UF <sub>6</sub>	In operation
Centrifuge Project	CNNC Lanzhou Uranium Enrichment Co., Ltd.	Low enriched UF <sub>6</sub>	In operation

## Safety Regulation on Nuclear Fuel Cycle Facilities

continued

Facility	Licensee	Major Product Form	Current Status
Commercial Demonstration Project of Domestic Centrifuge	CNNC Lanzhou Uranium Enrichment Co., Ltd.	Low enriched UF <sub>6</sub>	In operation
Uranium Enrichment Project, Phase III	CNNC Lanzhou Uranium Enrichment Co., Ltd.	Low enriched UF <sub>6</sub>	In operation
Uranium Enrichment Project, Phase IV	CNNC Lanzhou Uranium Enrichment Co., Ltd.	Low enriched UF <sub>6</sub>	In operation
Temporary Dry Storage Facility for Spent Fuel of Qinshan Phase III NPP	CNNC Nuclear Power Operation Management Co., Ltd.	—	In operation
CGN Advanced Fuel Development Center	CGN Uranium Resources Co., Ltd.	PWR nuclear fuel element	In operation
Hot Cell Facility Construction Project for CGN Nuclear Power Technology Research Institute Co., Ltd.	CGN Nuclear Power Technology Research Institute Co., Ltd.	—	Commissioning

V



## VI. Regulation of Radiation Environment on Uranium Mines and Radioactive Associated (NORM) Minerals/Ores

VI

As of the end of 2024, China had 13 uranium mining and milling facilities in service, 9 uranium mining and milling facilities under testing, 3 uranium mining and milling facilities under construction, 11 uranium mining and milling facilities suspended from production and construction, 16 uranium mining and milling facilities to be decommissioned, 10 uranium mining and milling facilities under decommissioning, and 41 uranium mining and milling facilities decommissioned.

### Administrative Approvals

In 2024, MEE/NNSA approved the environmental impact assessment (EIA) documents of 9 uranium mining and milling and uranium geological exploration projects, including the BSK1 exploration project in 2024-2025 (see Table 90).

**Table 90. Nuclear Safety Related Administrative Approvals for Regulation of the Uranium Mining and Milling Radiation Environment in 2024**

Date	Document No.	Document Title
01/19/2024	MEE App [2024] No. 9	Approval Reply on to the Environmental Impact Report Form for Research on the Key In-Situ Recovery Technology for Reforming Low-Permeability Well-Cemented Sandstone-Type Uranium Deposits in Tamusu
01/19/2024	MEE App [2024] No. 10	Approval Reply on to the Environmental Impact Report Form for Research on the Testing and Evaluation of In-Situ Uranium Recovery from the Tutunhe Formation in Deep Area of Honghaigou
07/04/2024	MEE App [2024] No. 67	Approval Reply on to the Environmental Impact Report Form for Research on the In-Situ Recovery Testing of the Bayinqinggeli Uranium Deposit (Northern)

Date	Document No.	Document Title
09/03/2024	MEE App [2024] No. 87	Approval Reply on to the Environmental Impact Report Form for Research on the Uranium Deposit Exploration in Qianjiadian (2024-2026)
09/29/2024	MEE App [2024] No. 95	Approval Reply on to the Environmental Impact Report Form for Research on the Testing of In-Situ Uranium Recovery from the Hadatu Uranium Deposit in the Erlian Basin
10/12/2024	MEE App [2024] No. 99	Approval Reply on the Environmental Impact Report Form for Two Projects Including the Investigation, Assessment and Exploration of Uranium Resources in Yajiangqiao Area of Hunan Province
12/13/2024	MEE App [2024] No. 124	Approval Reply on the Environmental Impact Report Form for the Investigation, Assessment and Exploration of Uranium Resources in Zhenyuan (Gansu)-Pengyang (Ningxia) Area
12/24/2024	MEE App [2024] No. 131	Approval Reply on to the Environmental Impact Report Form for BSK1 Exploration Project (2024-2025)

## Regulatory Inspections

MEE/NNSA organized a review on the annual effluent and environmental monitoring reports for 2023 submitted by uranium mining and milling enterprises, and a special verification on the environmental radiation monitoring and information disclosure conditions of radioactive associated (NORM) mineral/ore development and utilization enterprises.

In accordance with the requirements of the Notice on Identifying Nuclear and Radiation Safety Hazards, MEE/NNSA organized research on protection activities in uranium mining and milling radiation environment to identify potential hazards, and urged relevant organizations to take corrective actions.

In 2024, MEE/NNSA's regional offices of



*Figure 30. Regulatory Inspection on the CNNC Lantian Uranium Orefield Site in Xi'an*

nuclear and radiation safety inspection assigned 360 man-days for inspection of uranium mining and milling facilities, including 49 routine regulatory inspections and 2 non-routine inspections. A total of 136 findings were identified and 124 regulatory requirements were imposed.

## VII. Safety Regulation on Radioactive Waste

As of the end of 2024, China had 48 radioactive waste storage, treatment and disposal facilities in operation and 3 radioactive waste storage, treatment and disposal facilities under construction. NNSA vigorously promoted the construction of radioactive waste disposal facilities, strengthened safety regulation of radioactive waste, promoted the treatment and disposal of legacy radioactive wastes as well as the decommissioning and remediation of disused nuclear facilities, and made efforts in operational safety regulation of radioactive waste disposal facilities, radioactive waste storage and treatment facilities.

### Administrative Approvals

In 2024, NNSA issued a license for the treatment and storage of solid radioactive waste and an operation license for a new radioactive waste repository to the 404 Company Limited, China National Nuclear Corporation, and approved the renewal of the solid radioactive waste storage license of CNNC Everclean Environmental Technology Engineering Co., Ltd.

### Regulatory Inspections

In 2024, the Northwest disposal facility received 8,271 radioactive waste packages, with a volume of 7,222.45m<sup>3</sup> and a radioactivity of 7.66E+13Bq. By the end of 2024, the Northwest disposal facility had received 82,185 radioactive waste packages in total, with a volume of 38,291.1m<sup>3</sup> and a radioactivity of 7.41E+14Bq.

In 2024, the Feifengshan disposal facility received 13,905 radioactive waste packages, with a volume of 8,425.8m<sup>3</sup>, and a radioactivity of 6.65E+14Bq. By the end of 2024, the Feifengshan disposal facility had received 119,635 radioactive waste packages in total, with a volume of 56,282.68m<sup>3</sup>, and a radioactivity of 3.71E+15Bq.

In 2024, no waste was received at the Beilong disposal facility. By the end of 2024, the Beilong disposal facility had received 2,240 radioactive waste packages in total, with a volume of 2,526.44m<sup>3</sup>, and a radioactivity of 7.95E+13Bq.



In 2024, the Longhe disposal facility received 3,341 radioactive waste packages, with a volume of 1,942.82m<sup>3</sup>, and a radioactivity of 7.55E+13Bq. By the end of 2024, the Longhe disposal facility had received 6,583 radioactive waste packages in total, with a volume of 4,932.12m<sup>3</sup>, and a radioactivity of 1.45E+14Bq.

In 2024, the Jinta very low-level radioactive waste landfill received 1,422 radioactive waste packages, with a volume of 913.73m<sup>3</sup>, and a radioactivity of 6.78E+10Bq. By the end of 2024, the Jinta very low-level radioactive waste landfill had received 10,879 radioactive waste packages in total, with a volume of 4,749.02m<sup>3</sup>, and a radioactivity of 1.37E+11Bq.

In 2024, the main project of Beishan URL had 5,505-meter drifting for spiral ramps in total completed, 560-meter excavation for full lengths of the main shaft and the air intake shaft completed, and 280-meter excavation for the upper part of the air return shaft completed; the roadway construction for the auxiliary test level at -280 meters completed, and 1,057-meter drifting for the main test level

at -560 meters completed; Scientific research experiments related to the experimental levels at the -280 and -560 meters were successfully carried out as planned.

In 2024, the regional offices of nuclear and radiation safety inspection assigned 344 man-days for inspection of radioactive waste disposal facilities, including 6 routine regulatory inspections, 2 non-routine inspections and 1 special inspection. A total of 108 findings were identified and 82 regulatory requirements were imposed.

### Treatment of Legacy Radioactive Waste and Decommissioning of Nuclear Facilities

NNSA further strengthened the safety regulation of legacy radioactive waste to promote the decommissioning of disused nuclear facilities and the treatment and disposal of legacy radioactive waste. In 2024, a total of 12 environmental impact assessment-related documents were approved and 3 special inspections were carried out.

In 2024, the regional offices of nuclear and radiation safety inspection assigned 374.5 man-days for inspection of the legacy radioactive waste treatment and decommissioning of nuclear facilities, including 12 routine regulatory inspections and 2 non-routine inspections. A total of 120 findings were identified and 34 regulatory requirements were imposed.



*Figure 31. Special Inspection on Radiation Monitoring Work at Feifengshan Disposal Facility*

## VIII. Safety Regulation on Radioisotopes and Radiation-emitting Devices

By the end of 2024, the total number of organization producing, selling and/or using radioisotopes and/or radiation-emitting devices was 140,166 in China, including 9,599 organizations producing, selling and/or using radioisotopes and 130,567 organizations producing, selling and/or using radiation-emitting devices only. The number of radioactive sources in use was 171,973 (including 16,719 Category I radioactive sources, 18,260 Category II radioactive sources, 1,793 Category III radioactive sources, and 135,201 other radioactive sources); the number of various radiation-emitting devices was 320,218. The repositories for radioactive waste in provinces, autonomous regions, and municipalities directly under the Central Government collected and stored 48,186 disused sealed sources. Totally, 176,528 disused sealed sources were collected to the national repository for centralized storage of disused sealed sources or recycled by the manufacturers.

In 2024, 239 organizations were under direct regulation of MEE/NNSA, which



*Figure 32. Survey at Hefei Institutes of Physical Science, Chinese Academy of Sciences*

involve those producing radioisotopes [excluding those for self-use to prepare radiopharmaceuticals for Positron Emission Computed Tomography (PET)], selling and using Category I radioactive sources (excluding Category I radioactive sources for medical use), selling (including construction) and/or using Category I radiation-emitting devices, having workplaces with Category A unsealed radioactive materials, and using magnetic confinement fusion devices. The radiation safety of these organizations was under control.

Figure 32. Survey at Hefei Institutes of



Physical Science, Chinese Academy of Sciences

### Optimized Management

Promoting high-quality industrial development. In response to the problem of duplicate monitoring of medical radiation sites in the medical field, MEE/NNSA has actively communicated with the competent authorities in the industry to promote an organic combination of and joint governance by the competent and regulatory authorities. Jointly with the National Health Commission, the State Administration for Market Regulation and the National Disease Control and Prevention Administration, it has issued the Notice on Matters Relating to Further Improving Radiation Monitoring of Medical Radiation Sites in Medical Institutions (NHC Office Issue on Occupational Health [2024] No. 12). This collaborative effort requires departments, e.g., ecology, environment, hygiene and health, at all levels work closely together to carry out mutual recognition of monitoring qualifications, so as to facilitate radiation-related monitoring in medical institutions, and effectively reduce the burdens on medical institutions.

MEE/NNSA has actively communicated with relevant departments, and jointly issued the Three-Year Action Programme (2024-2026) for the High-Quality Development of the Nuclear Technology Application Industry (CAEA Issue [2024] No. 5) with the China Atomic Energy Authority (CAEA)

and the National Development and Reform Commission, to solve relevant problems encountered in the development of the nuclear technology application industry in a coordinated manner, schedule the progress of key tasks and promote effective synergy of policies.

Optimization of the radiation safety management system. MEE/NNSA has continuously upgraded the level of regulatory modernization; further optimized the functionality of the National Radiation Safety Management System for Nuclear Technology Application (hereinafter referred to as the Management System); completed the Phase III Stage II function upgrading of the Management System; introduced the electronic licensing function for radioisotope import/export approval and function of managing the environmental impact report (form) for nuclear technology application projects, and completed the adaptive adjustment and upgrading of the regulatory

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*Figure 33. On-site Inspection on CNNC Qinshan Isotope Co., Ltd.*



App. MEE/NNSA has improved and optimized the data quality review programme for the Management System, developed the function module of online data quality review, carried out data quality review of the Management System, and further improved the accuracy, integrity and timeliness of the data in the Management System.

Ongoing in-depth study of wastewater discharge management in nuclear medicine. MEE/NNSA organized the China Institute for Radiation Protection to carry out a study on the management of nuclear medicine wastewater discharge. With the support of the Radiation Monitoring Technical Center and some provincial- and municipal-level offices of radiation environment inspection, MEE/NNSA completed the tracking and monitoring of the I-131 activity concentration in nuclear medicine wastewater in the decay tanks of 19 hospitals in 9 provinces in China over a cycle of 180 days. Report on I-131 Activity Concentrations in the Nuclear Medicine Decay Tanks was developed to provide data support for subsequent optimization of the management.

Recheck of EIA Documents. In accordance with the Measures for Regulation on Preparation of Environmental Impact Report (Form) for Construction Project and the relevant requirements for regular review on environmental impact report (form), NNSA organized the technical review of 45 environmental impact reports (forms) for nuclear technology application in

Hunan, Liaoning, Hainan and Tianjin. The clues of problems found in the recheck of EIA document were referred to relevant provincial ecology and environment authorities for investigation and evidence collection, and imposing a punishment on and scoring dishonest behaviors to relevant organizations and personnel in accordance with the law.

Maintaining radiation safety training and examination properly. In 2024, a total of 4,565 on-site assessments were held in 31 provinces (municipalities directly under the Central Government, and autonomous regions), with a total of 191,600 persons registering for the assessments, 153,613 persons participating the assessments and 105,404 passing the assessments, with a passing rate of 68.6% and 411 cheaters handled. The independent assessment of Category III radiation-emitting device workers has been consistently promoted, with a total of 468,906 individuals participating in the independent assessments entered into the regulatory platform. The number of entries for centralized assessments reached 373,239. The cumulative registered users of the radiation protection training platform have reached 216,000.

Three training courses on regulation in nuclear technology application, for radiation safety regulation personnel trainers in nuclear technology application, and for administrators of the National Radiation

Safety Management System for Nuclear Technology Application were held, with a total of 110 on-site participants.

## Administrative Approvals

In 2024, NNSA issued radiation safety licenses to 22 nuclear technology application organizations. Licenses of 15 organizations were renewed, licenses of 30 organizations were re-applied, some items were added to the licenses of 24 organizations, and licenses of 28 organizations were changed. The licensees of 6 organizations were partially canceled (see Table 91). In 2024, a total of 8 conditional exemption letters were replied (see Table 92).

In 2024, NNSA approved 3,267 import and export applications for radioactive sources and unsealed radioactive materials (containing radiopharmaceuticals and their raw materials), including 1,337 applications for importing and exporting radioactive sources and 1,133 applications for exporting radioactive sources, with 8,786 radioactive sources imported and 3,774 exported. The gross radioactivity of imported unsealed radioactive materials was  $2.43\text{E}+16\text{Bq}$  and that of exported unsealed radioactive materials was  $3.38\text{E}+13\text{Bq}$ ; The gross radioactivity of imported radiopharmaceuticals and their raw materials was  $6.52\text{E}+15\text{Bq}$  and that of exported radiopharmaceuticals and their raw materials was  $6.73\text{E}+09\text{Bq}$ .

## Regulatory Inspections

In 2024, the regional offices of nuclear and radiation safety inspection assigned 1,337 man-days for inspection of nuclear technology application organizations, including 314 routine regulatory inspections, 26 non-routine inspections and 57 special inspections. A total of 946 findings were identified and 677 regulatory requirements were imposed.

## Radiation Accidents

In 2024, 3 radiation accidents, 2 of which are classified as ordinary radiation accidents and the other as serious accidents, were reported by the ecology and environment departments (bureaus) of 31 provinces, autonomous regions, and municipalities directly under the Central Government, as well as the ecology and environment bureau of the Xinjiang Production and Construction Corps.

**Table 91. List of Radiation Safety Licenses Approved in 2024**

No.	Organization	Item
1	HTA Co., Ltd.	Change and addition
2	OUR United Corporation	Partial cancellation
3	Guizhou Academy of Agricultural Sciences	Change
4	Nuclear and Radiation Safety Center of Ningxia Hui Autonomous Region	Change
5	China Isotope & Radiation Corporation	Change
6	Nanjing University of Aeronautics and Astronautics	Re-application and change
7	Zhejiang Radiation Environment Monitoring Station	Addition and change
8	JYAMS Ltd.	Re-application and addition
9	Chengdu Yunke Pharmaceutical Co., Ltd.	Re-application and change
10	Sichuan Atom Gaotong Pharmaceutical Co., Ltd.	Addition
11	Elekta Medical Instruments (Shanghai) Co., Ltd.	Re-application
12	Glotope (Mianyang) Advanced Pharmaceutical Technology Ltd.	Initial application and addition
13	CNNC Everclean Environmental Technology Engineering Co., Ltd.	Re-application
14	Hebei Yizhou Cancer Hospital Co., Ltd.	Change
15	Environmental Radiation Monitoring and Nuclear Emergency Response Technical Support Center of Guangdong	Change
16	Southwestern Institute of Physics	Change
17	Radiation Environment Workstation of Qinghai	Change
18	Sichuan Jinhe Irradiation Technology Co., Ltd.	Renewal
19	Cancer Hospital of Shandong First Medical University	Re-application
20	Ruijin Hospital, Shanghai Jiao Tong University School of Medicine	Re-application
21	Institute of High Energy Physics, Chinese Academy of Sciences	Addition and partial cancellation
22	Shenzhen Haibo S&T Co., Ltd.	Renewal
23	SPIC Zheda (Hainan) Green Energy Technology Co., Ltd.	Renewal
24	Shenzhen OUR New Medical Technology Development Co., Ltd.	Renewal
25	Ecology and Environment Monitoring and Safety Center of Henan	Renewal and change
26	Tsinghua University	Renewal and change
27	University of Science and Technology of China	Renewal and re-application
28	Zhejiang Yindu Irradiation Technology Co., Ltd.	Renewal
29	Baoji Jinqiao Irradiation Technology Co., Ltd.	Renewal
30	The 404 Company Limited, China National Nuclear Corporation	Renewal and change



# Safety Regulation on Radioisotopes and Radiation-emitting Devices

continued

No.	Organization	Item
31	Chengdu Gaotong Isotope Co., Ltd. (CNNC)	Addition
32	State Nuclear Uranium Resource Development Co., Ltd.	Addition
33	Jilin Zhonghe Irradiation Technology Co., Ltd.	Change and renewal
34	Hunan Institute of Nuclear Agronomy and Seed Cultivation	Change
35	National Institute for Radiological Protection, Chinese Center for Disease Control and Prevention	Change
36	Chongqing HTA Pharmaceutical Co., Ltd.	Initial application
37	Institute of Nuclear and New Energy Technology, Tsinghua University	Change
38	Energy Singularity Fusion Power Technology (Shanghai) Ltd.	Initial application
39	Sichuan Zhonghe Gaotong Pharmaceutical Co., Ltd.	Re-application
40	Zhongjin Irradiation Chengdu Co., Ltd.	Re-application
41	Peking University	Re-application
42	Mevion Medical Systems	Re-application
43	National Institute of Measurement and Testing Technology	Change and re-application
44	Anhui Bioer Biomedical Co., Ltd.	Initial application
45	Harbin Institute of Technology	Addition
46	China Institute for Radiation Protection	Addition
47	Sichuan Institute of Atomic Energy	Re-application
48	Dalian Institute of Chemical Physics, Chinese Academy of Sciences	Partial cancellation
49	Shanghai Academy of Agricultural Sciences	Renewal
50	Zhejiang Yonghe Pharmaceutical Technology Co., Ltd.	Initial application
51	ShanghaiTech University	Re-application
52	Xuzhou HTA Pharmaceutical Co., Ltd.	Initial application
53	Shenzhen Dayi Gamma Knife Technology Co., Ltd.	Change
54	CNNC Hainan Haiyuan Development Co., Ltd.	Change
55	Tongji Hospital affiliated to Tongji Medical College of Huazhong University of Science and Technology	Initial application
56	Institute of Modern Physics, Chinese Academy of Sciences	Addition, change and partial cancellation
57	Hubei 303 Storage	Addition and re-application
58	Nuclear Power Institute of China	Addition
59	Zibo Wanjie Cancer Hospital	Addition
60	Hefei CAS Ion Medical and Technical Devices Co., Ltd.	Addition
61	Lanzhou Ion Therapy Co., Ltd.	Change and re-application

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No.	Organization	Item
62	China Institute of Atomic Energy	Addition
63	Hefei Institutes of Physical Science, Chinese Academy of Sciences	Re-application
64	Union Hospital affiliated to Tongji Medical College of Huazhong University of Science and Technology	Initial application and change
65	Shandong Quangang Irradiation Technology Development Co., Ltd.	Change
66	CNNC 272 Uranium Industry Co., Ltd.	Addition
67	Gansu Heavy Ion Hospital Co., Ltd.	Re-application and addition
68	CNNC Qinshan Isotope Co., Ltd.	Initial application
69	Sichuan Haitong Isotope Technology Co., Ltd.	Initial application
70	Shanghai ATRACTRON Particle Equipment Co., Ltd.	Change and re-application
71	Siemens Medical Systems Limited	Change
72	Wuxi Beita Pharmatech Co., Ltd.	Initial application
73	Ruijin Hospital, Shanghai Jiao Tong University	Partial cancellation
74	Hebei Tongfang Nuclear Radiation Polytron Technologies Co., Ltd.	Partial cancellation
75	HTA North China Pharmaceutical Co., Ltd.	Initial application
76	Lucky Star Irradiation Science Co., Ltd., Shanghai	Change
77	Tianjin Hengrui Pharmaceuticals Co., Ltd.	Initial application
78	Tianjin HTA Isotope Pharmaceutical Co., Ltd.	Initial application
79	Ningbo Junan Pharmaceutical Technology Co., Ltd.	Initial application
80	Fujian Medical University Union Hospital	Initial application
81	CGN Medical Technology (Mianyang) Co., Ltd.	Initial application
82	Chengdu New Radiomedicine Technology Co., Ltd.	Re-application and addition
83	China State Shipbuilding Corporation, Limited (CSSC) 719th Research Institute	Re-application and addition
84	Seeds Pharmaceuticals Research Institute (Tianjin) Ltd.	Re-application and addition
85	Kunshan Hospital of Chinese Medicine	Initial application
86	Jinxiang Dajiang Technology and Trade Co., Ltd.	Re-application
87	C-Ray Therapeutics (Chengdu) Co., Ltd.	Re-application and addition
88	Southwest Jiaotong University	Initial application
89	Liaoning Branch of JYAMS Ltd.	Re-application and addition
90	Kunming Longhui Sterilization Technology Development Co., Ltd.	Removal of license conditions
91	Soochow University	Re-application

continued

No.	Organization	Item
92	Anhui Polymeric Chemicals Co., Ltd.	Renewal
93	Varian Medical Systems Trading (Beijing) Co., Ltd.	Re-application and addition
94	Guangxi Zhuang Autonomous Region Office of Radiation Environment Regulation	Re-application
95	CNNC Chengying (Xi'an) Medical Equipment Co., Ltd.	Initial application
96	Beijing HTA Jinhui Radiation Technology Co., Ltd.	Renewal
97	Nuclear and Radiation Safety Center of Gansu	Renewal
98	Yunnan Yuanhe Technology Co., Ltd.	Initial application
99	Chengdu Syncor Pharmaceutical Co., Ltd.	Initial application and re-application

**Table 92. Other Related Approval Documents in 2024**

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Date	Document No.	Document Title
02/03/2024	MEE RL [2024] No. 54	Reply Letter on Approving the Exemption Management for the End-User Applications of Four Instrument Models—SP-5110, SP5210, SP-5220 and SP-5220Plus of Beijing Beifen-Ruili Analytical Instrument (Group) Co., Ltd.
02/03/2024	MEE RL [2024] No. 51	Reply Letter on Approving the Exemption Management for the End-User Applications of Five Instrument Models, Including IM300 and IM301 Portable Chemical Toxic Gas Detectors, of Beijing Beifen Instrument Technology Co., Ltd.
02/19/2024	MEE RL [2024] No. 65	Reply Letter on Approving the Exemption Management for the End-User Applications of Three Instrument Models—F60, F70 and F80 of Zhejiang Fuli Analytical Instruments Inc.
02/19/2024	MEE RL [2024] No. 66	Reply Letter on Approving the Exemption Management for the End-User Applications of Three Instrument Models—A60Pro, A91Pro and GC1949 of Changzhou Panna Instrument Co., Ltd.
03/27/2024	MEE RL [2024] No. 121	Reply Letter on Approving the Exemption Management for the End-User Applications of GC2400 Gas Chromatographs of PerkinElmer Management (Shanghai) Co., Ltd.
03/27/2024	MEE RL [2024] No. 119	Reply Letter on Approving Zhejiang Fuli Analytical Instrument Co., Ltd. to Change its Name in Exemption Approval
05/05/2024	MEE RL [2024] No. 172	Reply Letter on Approving the Exemption Management for the End-User Applications of GC-4200 Gas Chromatographs of East & West Analytical Instruments, Inc.
11/22/2024	MEE RL [2024] No. 425	Reply Letter on Approving the Exemption Management for the End-User Applications of GC3900 Gas Chromatographs of Shandong Ruineng Instrument Co., Ltd.



# IX. Nuclear Material Control and Physical Protection of Nuclear Facilities

In 2024, NNSA organized the implementation of Notice on the Standardization of Matters Relating to the Safety Reporting of Civil Nuclear Materials (NNSA Letter [2023] No. 80) to strengthened safety regulation for the whole process of civil nuclear materials and narrowly avoid the safety risks of civil nuclear materials. Annual reports on the accounting for civil nuclear materials from more than 50 nuclear material licensees were received.

### Administrative Approvals

NNSA conducted technical review and on-site inspection on the nuclear material license applications of CGN Huizhou Nuclear Power Co., Ltd. and CNNC Chengying (Xi'an) Medical Equipment Co., Ltd. and

completed the verification and approval procedures.

### Regulatory Inspections

In 2024, NNSA performed its duties on nuclear material control well, and its regional offices of nuclear and radiation safety inspection carried out 36 inspections on nuclear material license holders, in accordance with the Nuclear Safety Law of the People's Republic of China, the Regulations of the PRC on the Control of Nuclear Materials, and its implementation rules, as well as other relevant laws and regulations, which has effectively strengthened the regulatory control of nuclear materials.

## X. Safety Regulation on Transportation of Radioactive Materials

In 2024, the transportation activities of radioactive materials were safely implemented without the occurrence of any nuclear and radiation accidents or incidents in China.

### Administrative Approvals

In 2024, NNSA issued 7 certificates of design approval of transport containers for Category I radioactive materials (including 4 changes and renewals); issued 5 manufacturing licenses of transport containers for Category I radioactive materials (including 3 changes and renewals); approved 5 transport containers designed and manufactured abroad for Category I radioactive materials (including 2 changes and renewals) for use in China; issued 6

certificates of design approval of special form radioactive materials; approved 30 nuclear and radiation safety analysis reports for the transportation of radioactive materials (including 1 change). The major administrative approvals in the field of safety regulation on radioactive material transportation in 2024 are shown in Table 93.

### Regulatory Inspections

The regulatory inspection activities on transportation safety of radioactive materials in 2024 are shown in Table 94.

Table 93. Major Administrative Approvals in the Field of Safety Regulation on Radioactive

Table 93. Major Administrative Approvals in the Field of Safety Regulation on Radioactive Material Transportation in 2024

Date	Document No.	Document Title
02/20/2024	NNSA [2024] No. 29	Notice on Approving the Nuclear and Radiation Safety Analysis Report (2024-2029) for Road-Rail Intermodal Transport of TVS-2M Fuel Assemblies of CNNC Jianzhong Nuclear Fuel Co., Ltd. from Yibin to Tianwan NPP

Date	Document No.	Document Title
02/21/2024	NNSA [2024] No. 31	Notice on Approving the Nuclear and Radiation Safety Analysis Report (2024-2029) for Domestic Transport of C-188 and RSL-2089 Co-60 Radioactive Sources (F-168 (F-168-X) Transport Containers) of Beijing Sanqiang Nuclear Radiation Engineering Technology Co., Ltd.
02/21/2024	NNSA [2024] No. 33	Notice on Approving the Nuclear and Radiation Safety Analysis Report for Transport of Co-60 Sources (GY-20 Containers) of Chengdu Gaotong Isotope Co., Ltd. (CNNC)
03/01/2024	NNSA [2024] No. 38	Notice on Issuing the Manufacturing License for Transport Containers for Category I Radioactive Materials of CNNC Jianzhong Nuclear Fuel Co., Ltd.
04/03/2024	NNSA [2024] No. 53	Notice on Approving the Use of NCS 45 Transport Containers in the People's Republic of China
04/17/2024	NNSA [2024] No. 62	Notice on Approving the Change of the Design Approval for STC-NF1A Fresh Fuel Transport Containers of Shanghai Nuclear Engineering Research & Design Institute Co., Ltd.
04/18/2024	NNSA [2024] No. 66	Notice on Approving the Change to the "Nuclear and Radiation Safety Analysis Report for Transport of Fuel Assemblies of CGN Uranium Resources Co., Ltd. from Alataw Pass to Fangchenggang NPP"
05/05/2024	NNSA [2024] No. 70	Notice on Approving the Nuclear and Radiation Safety Analysis Report (2024-2029) for Road Transport of High-Temperature Gas-Cooled Reactor Fuel Elements of CNNC North Nuclear Fuel Co., Ltd. from Baotou to Shidao Bay NPP
05/05/2024	NNSA [2024] No. 71	Notice on Approving the Use of Traveller XL Fresh Fuel Transport Containers in the People's Republic of China
06/03/2024	NNSA [2024] No. 81	Notice on Approving the Nuclear and Radiation Safety Analysis Report for Road Transport of Fuel Assemblies of CNNC North Nuclear Fuel Co., Ltd. from Baotou to Sanmen, Haiyang and State Nuclear Power Demonstration NPPs
06/20/2024	NNSA [2024] No. 91	Notice on Approving the Nuclear and Radiation Safety Analysis Report (2024-2029) for Road Transport of Fuel Assemblies of CNNC Jianzhong Nuclear Fuel Co., Ltd. from Yibin to Fangchenggang NPP
06/24/2024	NNSA [2024] No. 93	Notice on Approving the Technical Modification to TVS Fuel Assembly Production of CNNC Jianzhong Nuclear Fuel Co., Ltd.
06/24/2024	NNSA [2024] No. 95	Notice on Approving the Nuclear and Radiation Safety Analysis Report for Road-Rail Intermodal Transport of Fuel Assemblies of CGN Uranium Resources Co., Ltd. from Alataw Pass to Ningde NPP
06/27/2024	NNSA [2024] No. 98	Notice on Issuing the Approval Letter on Use of Four NAC-STC Spent Fuel Transport Containers of CGN Uranium Resources Co., Ltd.
06/29/2024	NNSA [2024] No. 99	Notice on Approving the Nuclear and Radiation Safety Analysis Report on Road Transport of Fuel Assemblies of State Nuclear Uranium Resource Development Co., Ltd. from Shanghai to Haiyang NPP



# Safety Regulation on Transportation of Radioactive Materials

continued

Date	Document No.	Document Title
06/29/2024	NNSA [2024] No. 100	Notice on Approving the Nuclear and Radiation Safety Analysis Report (Special Arrangement) for Transport of Co-60 Medical Source (GW-01 Containers) of Chengdu Gaotong Isotope Co., Ltd. (CNNC) along 2 Routes Including the Yanting-Jiajiang Route
06/30/2024	NNSA [2024] No. 101	Notice on Approving the Increase of Quantity of 3977A Transport Containers for the Use in the People's Republic of China
07/01/2024	NNSA [2024] No. 102	Notice on Approving the Nuclear and Radiation Safety Analysis Report (2024-2029) for Transport of Co-60 Rod Cluster Component (GY-40 Containers) of Chengdu Gaotong Isotope Co., Ltd. (CNNC) from Qingshan
07/01/2024	NNSA [2024] No. 103	Notice on Approving the Nuclear and Radiation Safety Analysis Report for Road Transport of Co-60 Disused Sealed Sources from Lanzhou (Urban Radioactive Waste Repository of Gansu) to Jiayuguan, Gansu
07/13/2024	NNSA [2024] No. 113	Notice on Approving the Renewal of the Validity Period of UK50S and UK12S Transport Containers of the Institute of Atomic Reactors State Scientific Centre for the Use in the People's Republic of China
07/23/2024	NNSA [2024] No. 119	Notice on Approving the Use of 30B Containers and UX-30 Overpacks in the People's Republic of China
07/23/2024	NNSA [2024] No. 120	Notice on Approving the Renewal of the Design Approval for FCTC10 Transport Containers
07/30/2024	NNSA [2024] No. 122	Notice on Approving the Nuclear and Radiation Safety Analysis Report for Multimodal Transport Project of Spent Fuel of CGN Uranium Resources Co., Ltd. from Yangjiang NPP and Daya Bay NPP Base to the 404 Company Limited, China National Nuclear Corporation
08/01/2024	NNSA [2024] No. 123	Notice on Issuing the Design Approval of Fresh Fuel Transport Containers for Hualong One (CNFC-HL01)
08/12/2024	NNSA [2024] No. 131	Notice on Approving the Change to the Activity Scope of Manufacturing License for Transport Containers for Category I Radioactive Materials of Xi'an Nuclear Equipment Co., Ltd.
09/02/2024	NNSA [2024] No. 140	Notice on Approving the Nuclear and Radiation Safety Analysis Report (2024-2029) for Road-Sea-Rail Intermodal Transport of Spent Fuel of CNNC Everclean Environmental Technology Engineering Co., Ltd. from Daya Bay to Jiayuguan
09/07/2024	NNSA [2024] No. 148	Notice on Approving the Nuclear and Radiation Safety Analysis Report for Transport of Low-Enriched UF <sub>6</sub> of CNNC Shaanxi Uranium Enrichment Co., Ltd.
09/07/2024	NNSA [2024] No. 149	Notice on Approving the Nuclear and Radiation Safety Analysis Report for Transport of Low-Enriched UF <sub>6</sub> of CNNC Jianzhong Nuclear Fuel Co., Ltd.
09/07/2024	NNSA [2024] No. 151	Notice on Approving the Nuclear and Radiation Safety Analysis Report for Transport of Low-Enriched UF <sub>6</sub> of China North Nuclear Fuel Co., Ltd.

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Date	Document No.	Document Title
09/07/2024	NNSA [2024] No. 152	Notice on Approving the Nuclear and Radiation Safety Analysis Report for Transport of Low-Enriched UF <sub>6</sub> of CNNC Lanzhou Uranium Enrichment Co., Ltd.
09/12/2024	NNSA [2024] No. 165	Notice on Approving the Nuclear and Radiation Safety Analysis Report (2024-2029) on Domestic Road-Rail Intermodal Transport for PC Fuel Projects of CNNC Jianzhong Nuclear Fuel Co., Ltd. from Yibin to Shanghai/Zhanjiang
09/12/2024	NNSA [2024] No. 166	Notice on Approving the Nuclear and Radiation Safety Analysis Report (2024-2029) on Domestic Road-Rail Intermodal Transport for PK Fuel Projects of CNNC Jianzhong Nuclear Fuel Co., Ltd. from Yibin to Shanghai/Zhanjiang
09/16/2024	NNSA [2024] No. 171	Notice on Approving the Nuclear and Radiation Safety Analysis Report (2024-2029) for Full Road Transport of Fuel Assemblies of CNNC Jianzhong Nuclear Fuel Co., Ltd. from Yibin to Taipingling NPP
09/16/2024	NNSA [2024] No. 172	Notice on Issuing the Design Approval of Uranium Dioxide Transport Containers for Heyun III (STC-UO0C)
09/16/2024	NNSA [2024] No. 173	Notice on Issuing the Design Approval of CNFC-3GS Fresh Fuel Transport Containers
09/28/2024	NNSA [2024] No. 176	Notice on Issuing the Approval Letter on Use of the Imported UF <sub>6</sub> Transport Containers (UX-30 Overpacks and 30B Containers) of China Nuclear Energy Industry Corporation
09/28/2024	NNSA [2024] No. 177	Notice on Issuing the Manufacturing License for Transport Containers for Category I Radioactive Materials of China State Shipbuilding Corporation, Limited (CSSC) 725th Research Institute
09/28/2024	NNSA [2024] No. 178	Notice on Approving the Nuclear and Radiation Safety Analysis Report (2024-2029) for Domestic Road Transport of Ir-192 and Se-75 Radioactive Sources of Beijing CIAE-RIAR Radioisotope Technology Co., Ltd.
09/28/2024	NNSA [2024] No. 179	Notice on Approving the Change to the Activity Scope of Manufacturing License for Transport Containers for Category I Radioactive Materials of Xi'an Nuclear Equipment Co., Ltd.
09/28/2024	NNSA [2024] No. 181	Notice on Issuing the Approval Letter on Use of NCS 45 Spent Fuel Rod Transport Containers of CNNC Everclean Environmental Technology Engineering Co., Ltd.
10/24/2024	NNSA [2024] No. 193	Notice on Approving the Nuclear and Radiation Safety Analysis Report for Road-Rail Intermodal Transport of Fuel Assemblies of CGN Uranium Resources Co., Ltd. from Alataw Pass to Daya Bay/Ling'ao NPP
10/24/2024	NNSA [2024] No. 194	Notice on Approving the Nuclear and Radiation Safety Analysis Report on Domestic Transport of Industrial Cobalt Sources (GY-20 Transport Containers) of Yunnan Yuanhe Technology Co., Ltd.
10/24/2024	NNSA [2024] No. 192	Notice on Approving the Nuclear and Radiation Safety Analysis Report for Transport of Co-60 Radioactive Sources (F-168 Containers) of Zhongjin Irradiation Incorporated Company

# Safety Regulation on Transportation of Radioactive Materials

continued

Date	Document No.	Document Title
11/12/2024	NNSA [2024] No. 208	Notice on Approving the Nuclear and Radiation Safety Analysis Report for Road Transport of Low Enriched Uranium Dioxide Powder of CGN Uranium Resources Co., Ltd. from Yibin to Yangjiang
11/19/2024	NNSA [2024] No. 211	Notice on Approving the Change of Contents in the Design Approval of CNFC-3G Fresh Fuel Transport Containers of China Nuclear Power Engineering Co., Ltd.
11/20/2024	NNSA [2024] No. 212	Notice on Issuing the Design Approval for Six Special Form Radioactive Materials of CNNC Qinshan Isotope Co., Ltd.
12/13/2024	NNSA [2024] No. 216	Notice on Approving the Renewal of Manufacturing License for Transport Containers for Category I Radioactive Materials of CNNC Lanzhou Uranium Enrichment Co., Ltd.
12/20/2024	NNSA [2024] No. 220	Notice on Approving the Renewal of the Design Approval for GY-20 Co-60 Transport Containers
12/23/2024	NNSA [2024] No. 222	Notice on Approving the Nuclear and Radiation Safety Analysis Report for Transport of Cobalt Sources (GY-20 Containers) of CNNC Tongxing (Beijing) Nuclear Technology Co., Ltd.
12/23/2024	NNSA [2024] No. 223	Notice on Approving the Nuclear and Radiation Safety Analysis Report for Transport of Cobalt Sources (FCTC10 Containers) of CNNC Tongxing (Beijing) Nuclear Technology Co., Ltd.
12/25/2024	NNSA [2024] No. 225	Notice on Approving the Nuclear and Radiation Safety Analysis Report (2024-2029) for Road Transport of Co-60 Medical Radioactive Sources of Beijing Hefuyuan Science & Technology Development Co., Ltd.
12/27/2024	NNSA [2024] No. 228	Notice on Approving the Renewal of Approval Letter on Use of Six NAC-STC Spent Fuel Transport Containers of CGN Uranium Resources Co., Ltd.
12/27/2024	NNSA [2024] No. 229	Notice on Approving the Renewal of Approval Letter on Use of Four NAC-STC Spent Fuel Transport Containers of CNNC Everclean Environmental Technology Engineering Co., Ltd.
12/31/2024	NNSA [2024] No. 239	Notice on Approving the Nuclear and Radiation Safety Analysis Report for Road-Rail Intermodal Transport of Fuel Assemblies of CGN Uranium Resources Co., Ltd. from Alataw Pass to Hongyanhe NPP

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**Table 94. Regulatory Inspection Activities in the Field of Safety Regulation on Transportation of Radioactive Materials in 2024**

Starting Date	Activity	Main Contents of the Inspection
01/08/2024	Witness of the end-of-manufacturing test on CNFC-3GS fresh fuel transport containers of Xi'an Nuclear Equipment Co., Ltd.	Witness of end-of-manufacturing test (loading/unloading test, load test, safety valve test, and air tightness test)
01/15/2024	Witness of the shielding performance test and thermal conductivity test on GY-20A Co-60 transport containers of Shanghai Apollo Machinery Co., Ltd.	Manufacturing test witness (shielding performance test and thermal conductivity test)
01/22/2024	Witness of the load test on the rotating recess of TC-24P spent fuel transport containers of Shanghai Apollo Machinery Co., Ltd.	Manufacturing test witness (load test on the rotating recess)
01/31/2024	Witness of the design verification test on CNFC-3GS fresh fuel transport containers of China Nuclear Power Engineering Co., Ltd.	Design verification test (1.2m free-drop test, free-drop tests I and II, thermal test and post-test disassembly)
03/06/2024	Witness of the water immersion test on GY-20A Co-60 transport containers	Design verification test (water immersion test)
03/10/2024	Supervision on the manufacturing site of NAC-STC spent fuel transport container	On-site supervision on imported container manufacturing
04/22/2024	Witness of the end-of-manufacturing test on TC-24P spent fuel transport containers of Shanghai Apollo Machinery Co., Ltd.	End-of-manufacturing test witnesses (leakage test, load test on lifting trunnion, hydrostatic test on containment boundary, and bubble test on neutron shield chamber)
05/08/2024	Witness of the thermal conductivity test on TC-24P spent fuel transport containers of Shanghai Apollo Machinery Co., Ltd.	Manufacturing verification test (thermal conductivity test)
05/28/2024	Witness of the second thermal conductivity test on GY-20A Co-60 transport containers of Shanghai Apollo Machinery Co., Ltd.	Manufacturing verification test (thermal conductivity test)
05/28/2024	Witness of the design verification test on R911 Ir-192 transport containers of HTA Co., Ltd.	Design verification test (water spray test, lifting device verification, stacking test, 1.2m free drop test, 1m penetration test, and post-test shielding test)
05/28/2024	Witness of the design verification test on N050 transport containers for sealed neutron sources of HTA Co., Ltd.	Design verification test (water spray test, lifting device verification, stacking test, 1.2m free drop test, 1m penetration test, and post-test shielding test)
07/17/2024	Witness of the design verification test on GY-20A Co-60 transport containers of China Nuclear Power Engineering Co., Ltd.	Design verification test (free-drop tests I and II, thermal test and post-test disassembly)
07/24/2024	Witness of the thermal conductivity test on the simulated sample of TC-24P spent fuel transport container of Shanghai Apollo Machinery Co., Ltd.	Manufacturing verification test (thermal conductivity test)
08/19/2024	Witness of the design verification test on special form radioactive materials of CNNC Qinshan Isotope Co., Ltd.	Design test witnessing (impact test, flexural test, thermal test and post-test leakage test)

# Safety Regulation on Transportation of Radioactive Materials

Starting Date	Activity	Main Contents of the Inspection
08/20/2024	Inspection on the pre-conditions for fabrication of the simulated samples for the application for change to the manufacturing license of transport containers for Category I radioactive materials (adding QY740 transport containers for uranium hexafluoride) of CNNC Lanzhou Uranium Enrichment Co., Ltd.	Inspection on pre-conditions (Point H)
09/09/2024	Inspection on the pre-conditions for fabrication of the simulated samples for the application for change to the manufacturing license of transport containers for Category I radioactive materials (adding QY740 transport containers for uranium hexafluoride) of CNNC Shanyou Hanzhong Mechanical and Electrical Equipment Manufacturing Co., Ltd.	Inspection on pre-conditions (Point H)
10/23/2024	Witness of the end-of-manufacturing test on the simulated samples of the autonomized fresh fuel transport containers of Nantong CIMC Energy Equipment Co., Ltd.	Witness of the end-of-manufacturing test on the prototype (no-load test, loaded test, load test, transport test and lug load test)
11/19/2024	Witness of the end-of-manufacturing test on the simulated samples for the application for change to the manufacturing license of transport containers for Category I radioactive materials (adding QY740 transport containers for uranium hexafluoride) of CNNC Lanzhou Uranium Enrichment Co., Ltd.	Witness of the end-of-manufacturing test on the prototype (volumetric test, hydrostatic test, leakage test, vacuum seal test, upper shell load test and package load test)
11/25/2024	Inspection on the pre-conditions for fabrication of the prototypes for the application for change to the manufacturing license of transport containers for Category I radioactive materials (adding YJ-3 transport containers) of China Institute of Atomic Energy	Inspection on pre-conditions (Point H)
12/17/2024	Witness of the lead filling test on the verification samples and comprehensive inspection of the transport container for Category I radioactive materials (CNSC-24S spent fuel containers) of Xi'an Nuclear Equipment Co., Ltd.	Witness of filling the container with lead On-site comprehensive inspection of container-related documents, personnel qualifications, site, etc.
12/29/2024	Witness of the shielding test on the verification samples of the transport container for Category I radioactive materials (CNSC-24S spent fuel containers) of Xi'an Nuclear Equipment Co., Ltd.	Witness of the shielding test on the lead-filled container

*Note: Inspections organized by MEE/NNSA's regional offices of nuclear and radiation safety inspection are not included.*

# XI. Regulation on Civil Nuclear Safety Equipment

## Administrative Approvals

In 2024, NNSA received and reviewed 70 applications for civil nuclear safety equipment licenses, and approved 163 applications, including 12 new applications for licenses (see Table 95), 41 applications for renewal (see Table 96), and 110 applications for change (see Table 97). As of the end of 2024, a total of 228 organizations have been licensed for the design, manufacture, installation and non-destructive testing (NDT) of civil nuclear safety equipment.

Forty-three applications for registration of import of civil nuclear safety equipment were received and reviewed, 65 applications were approved (see Table 98), and the information on 11 confirmations of registration was changed (see Table 97). As of the end of 2024, the total number of overseas organizations holding confirmations of registration for design, manufacture, and/or NDT of civil nuclear safety equipment was 166.

Table 95. Issuance of New Licenses for Civil Nuclear Safety Equipment in 2024

Date	Document No.	Document Title
01/20/2024	NNSA [2024] No. 13	Notice on Issuing the Manufacturing License for Civil Nuclear Safety Equipment to Baoyin Nuclear Power Tubing (Guangzhou) Co., Ltd.
01/30/2024	NNSA [2024] No. 16	Notice on Issuing the Design License for Civil Nuclear Safety Equipment to Harbin Boiler Co., Ltd.
03/16/2024	NNSA [2024] No. 44	Notice on Issuing the Manufacturing License for Civil Nuclear Safety Equipment to Jiangsu Futai Electric Power Equipment Co., Ltd.
04/03/2024	NNSA [2024] No. 54	Notice on Issuing the Design and Manufacturing License for Civil Nuclear Safety Equipment to Shaanxi Weifeng Instrument Inc.
04/07/2024	NNSA [2024] No. 57	Notice on Issuing the Design and Manufacturing License for Civil Nuclear Safety Equipment to EnerSys (Chongqing) Huada Batteries Co., Ltd.
04/17/2024	NNSA [2024] No. 65	Notice on Issuing the Manufacturing License for Civil Nuclear Safety Equipment to Chengdu Fangda Carbon Composite Materials Co., Ltd.



# Regulation on Civil Nuclear Safety Equipment

continued

Date	Document No.	Document Title
05/16/2024	NNSA [2024] No. 73	Notice on Issuing the Manufacturing License for Civil Nuclear Safety Equipment to Dongtai Qinbiao Stainless Steel Co., Ltd.
05/21/2024	NNSA [2024] No. 77	Notice on Issuing the Design and Manufacturing License for Civil Nuclear Safety Equipment to Zhongding Hengsheng Gas Equipment (Wuhu) Co., Ltd.
08/01/2024	NNSA [2024] No. 125	Notice on Issuing the Design and Manufacturing License for Civil Nuclear Safety Equipment to Yangzhou Hengchun Electronics Co., Ltd.
08/01/2024	NNSA [2024] No. 126	Notice on Issuing the Manufacturing License for Civil Nuclear Safety Equipment to Hangzhou Zhefu Nuclear Power Equipment Co., Ltd.
08/12/2024	NNSA [2024] No. 135	Notice on Issuing the Manufacturing License for Civil Nuclear Safety Equipment to Yangzhou Lontrin Energy Equipment Co., Ltd.
10/14/2024	NNSA [2024] No. 190	Notice on Issuing the Manufacturing License for Civil Nuclear Safety Equipment to Jiangsu Wanheng New Material Technology Co., Ltd.

**Table 96. Approvals of License Renewal for Civil Nuclear Safety Equipment in 2024**

Date	Document No.	Document Title
03/20/2024	NNSA [2024] No. 46	Notice on Approving the Renewal of Licenses for Civil Nuclear Safety Equipment of 14 Organizations Including Shanghai Electric Power Generation Equipment Co., Ltd.
04/01/2024	NNSA [2024] No. 48	Notice on Approving the Renewal of the Manufacturing License for Civil Nuclear Safety Equipment of Dongfang Electric Co., Ltd.
06/20/2024	NNSA [2024] No. 87	Notice on Approving the Renewal of Licenses for Civil Nuclear Safety Equipment of 12 Organizations Including Harbin Boiler Co., Ltd.
09/16/2024	NNSA [2024] No. 169	Notice on Approving the Renewal of Licenses for Civil Nuclear Safety Equipment of 9 Organizations Including Changzhou Power Station Auxiliary Equipment Co., Ltd.
12/13/2024	NNSA [2024] No. 217	Notice on Approving the Renewal of Licenses for Civil Nuclear Safety Equipment of 5 Organizations Including Shanghai Nagamori Machinery Co., Ltd.

**Table 97. Changes to Civil Nuclear Safety Equipment Licenses and Changes to the Information on the Confirmations of Registration of Overseas Organizations in 2024**

Date	Document No.	Document Title
01/20/2024	NNSA [2024] No. 14	Notice on Approving the Change to the Activity Scope of Manufacturing License for Civil Nuclear Safety Equipment of Wuxi Paikexin New Materials Technology Co., Ltd.
01/24/2024	NNSA [2024] No. 15	Notice on Approving the Change to the Activity Scope of Manufacturing License for Civil Nuclear Safety Equipment of Hebei Hongrun Nuclear Equipment Science and Technology Co., Ltd.

Date	Document No.	Document Title
01/30/2024	NNSA [2024] No. 17	Notice on Approving the Change to the Activity Scope of Installation License for Civil Nuclear Safety Equipment of PowerChina Nuclear Engineering Co., Ltd.
01/30/2024	NNSA [2024] No. 18	Notice on Approving the Change to the Activity Scope of Design and Manufacturing License for Civil Nuclear Safety Equipment of China Nuclear Control System Engineering Co., Ltd.
01/30/2024	NNSA [2024] No. 19	Notice on Approving the Change to the Activity Scope of Installation License for Civil Nuclear Safety Equipment of China Energy Engineering Group Zhejiang Thermal Power Construction Co., Ltd.
02/03/2024	NNSA [2024] No. 21	Notice on Approving the Change to the Activity Scope of Non-destructive Testing License for Civil Nuclear Safety Equipment of Nuclear Power Institute of China
03/01/2024	NNSA [2024] No. 37	Notice on Approving the Change to the Activity Scope of Manufacturing License for Civil Nuclear Safety Equipment of China Nuclear Industry Fifth Construction Co., Ltd.
04/08/2024	NNSA [2024] No. 58	Notice on Approving the Change to the Activity Scope of Design and Manufacturing License for Civil Nuclear Safety Equipment of Jiangsu Xinghe Valve Co., Ltd.
04/17/2024	NNSA [2024] No. 60	Notice on Approving the Change to the Activity Scope of Design and Manufacturing License for Civil Nuclear Safety Equipment of China State Shipbuilding Corporation, Limited 719th Research Institute
07/07/2024	NNSA [2024] No. 109	Notice on Approving the Change to the Activity Scope of Design and Manufacturing License for Civil Nuclear Safety Equipment of Yangzhou Shuguang Cable Co., Ltd.
08/01/2024	NNSA [2024] No. 124	Notice on Approving the Change to the Activity Scope of Manufacturing License for Civil Nuclear Safety Equipment of Guizhou Aerospace Xinli Technology Co., Ltd.
08/12/2024	NNSA [2024] No. 130	Notice on Approving the Change to the Activity Scope of Design and Manufacturing License for Civil Nuclear Safety Equipment of Jiangsu Shentong Nuclear Energy Equipment Co., Ltd.
09/03/2024	NNSA [2024] No. 142	Notice on Approving the Change to the Activity Scope of Manufacturing License for Civil Nuclear Safety Equipment of Harbin Electric Power Equipment Co., Ltd.
09/10/2024	NNSA [2024] No. 162	Notice on Approving the Change to the Activity Scope of Design and Manufacturing License for Civil Nuclear Safety Equipment of Neway Valve (Suzhou) Co., Ltd.
10/14/2024	NNSA [2024] No. 188	Notice on Approving the Respective Changes to the Activity Scope of Design and Manufacturing License for Civil Nuclear Safety Equipment of Nuclear Power Institute of China and SUFA Technology Industry Co., Ltd., CNNC
10/14/2024	NNSA [2024] No. 189	Notice on Approving the Change to the Activity Scope of Manufacturing License for Civil Nuclear Safety Equipment of Shanghai No.1 Machine Tool Works Co., Ltd.

# Regulation on Civil Nuclear Safety Equipment

continued

Date	Document No.	Document Title
01/18/2024	NNSA Letter [2024] No. 5	Notice on Approving the Change of Information in Licenses for Civil Nuclear Safety Equipment of 5 Organizations Including China Techenergy Co., Ltd.
01/24/2024	NNSA Letter [2024] No. 7	Notice on Approving the Change of Information in Licenses for Civil Nuclear Safety Equipment of 12 Organizations Including Hudong Heavy Machinery Co., Ltd.
02/21/2024	NNSA Letter [2024] No. 16	Notice on Approving the Change of Information in Licenses for Civil Nuclear Safety Equipment of 3 Organizations Including Shanghai No.1 Machine Tool Works Co., Ltd.
04/03/2024	NNSA Letter [2024] No. 33	Notice on Approving the Change of Information in Confirmations of Registration of 6 Overseas Organizations Including Rolls-Royce Solutions GmbH
04/01/2024	NNSA Letter [2024] No. 32	Notice on Approving the Change of Information in Licenses for Civil Nuclear Safety Equipment of 11 Organizations Including Shanghai Automation Instrumentation Co., Ltd.
05/16/2024	NNSA Letter [2024] No. 38	Notice on Approving the Change of Information in Licenses for Civil Nuclear Safety Equipment of 4 Organizations Including Sunway Co., Ltd.
05/19/2024	NNSA Letter [2024] No. 39	Notice on Approving the Change of Information in Licenses for Civil Nuclear Safety Equipment of 3 Organizations Including Zhejiang Jiuli Hi-Tech Metals Co., Ltd.
06/20/2024	NNSA Letter [2024] No. 45	Notice on Approving the Change of Information in Licenses for Civil Nuclear Safety Equipment of 3 Organizations Including Shanghai Lianggong Valve Factory Co., Ltd.
06/20/2024	NNSA Letter [2024] No. 47	Notice on Approving the Change of Information in Licenses for Civil Nuclear Safety Equipment of 6 Organizations Including Shanghai Electric Power Generation Equipment Co., Ltd.
07/07/2024	NNSA Letter [2024] No. 58	Notice on Approving the Change to the Activity Scope of Design and Manufacturing License for Civil Nuclear Safety Equipment of Shandong Taikai Apparatus Complete Co., Ltd.
08/01/2024	NNSA Letter [2024] No. 69	Notice on Approving the Change of Information in Licenses for Civil Nuclear Safety Equipment of 11 Organizations Including SUFA Technology Industry Co., Ltd., CNNC and that in Confirmations of Registration of 2 Overseas Organizations Including RSCC Wire & Cable LLC
08/12/2024	NNSA Letter [2024] No. 71	Notice on Approving the Change of Information in Licenses for Civil Nuclear Safety Equipment of 4 Organizations Including Inner Mongolia Northern Heavy Industries Group Corp., Ltd.
09/03/2024	NNSA Letter [2024] No. 81	Notice on Approving the Change of Information in Licenses for Civil Nuclear Safety Equipment of 5 Organizations Including Jiangsu Power Equipment Co., Ltd.
09/16/2024	NNSA Letter [2024] No. 86	Notice on Approving the Change of Information in Licenses for Civil Nuclear Safety Equipment of 4 Organizations Including Shanghai Guanghua Instrument Co., Ltd., and that in Confirmation of Registration of POMPEX RUTSCHI

XI



Date	Document No.	Document Title
10/12/2024	NNSA Letter [2024] No. 95	Notice on Approving the Change of Information in Licenses for Civil Nuclear Safety Equipment of 2 Organizations Including Nuclear Power Institute of China
10/14/2024	NNSA Letter [2024] No. 98	Notice on Approving the Change of Information in Licenses for Civil Nuclear Safety Equipment of 4 Organizations Including Shanghai Electric Machinery Co., Ltd. and that in Confirmations of Registration of 2 Overseas Organizations Including PJSC “Kyiv Central Design Bureau of Valves”
11/02/2024	NNSA Letter [2024] No. 103	Notice on Approving the Change of Information in Licenses for Civil Nuclear Safety Equipment of 4 Organizations Including Pearl Electric Co., Ltd.
11/08/2024	NNSA Letter [2024] No. 104	Notice on Approving the Change of Information in Licenses for Civil Nuclear Safety Equipment of 3 Organizations Including Shandong Taikai Apparatus Complete Co., Ltd.
11/28/2024	NNSA Letter [2024] No. 110	Notice on Approving the Change of Information in Licenses for Civil Nuclear Safety Equipment of 4 Organizations Including Jiangsu Shentong Nuclear Energy Equipment Co., Ltd.
12/20/2024	NNSA Letter [2024] No. 117	Notice on Approving the Change of Information in Licenses for Civil Nuclear Safety Equipment of 5 Organizations Including Shanghai Automation Instrumentation Co., Ltd.

**Table 98. Issuance of Confirmation of Registration for Civil Nuclear Safety Equipment Activities to Overseas Organizations in 2024**

Date	Document No.	Document Title
02/03/2024	NNSA [2024] No. 20	Notice on Issuing Confirmations of Registration for Overseas Organizations Undertaking Civil Nuclear Safety Equipment Activities to 7 Organizations Including WEED Instrument Company Inc.
03/05/2024	NNSA [2024] No. 42	Notice on Issuing Confirmations of Registration for Overseas Organizations Undertaking Civil Nuclear Safety Equipment Activities to 11 Organizations Including SEGault S.A.S.
03/09/2024	NNSA [2024] No. 43	Notice on Issuing Confirmations of Registration for Overseas Organizations Undertaking Civil Nuclear Safety Equipment Activities to 7 Organizations Including VELAN S.A.S.
04/18/2024	NNSA [2024] No. 68	Notice on Issuing Confirmations of Registration for Overseas Organizations Undertaking Civil Nuclear Safety Equipment Activities to 7 Organizations Including Candu Energy Inc.
05/14/2024	NNSA [2024] No. 72	Notice on Issuing Confirmations of Registration for Overseas Organizations Undertaking Civil Nuclear Safety Equipment Activities to 5 Organizations Including AUMA Riester GmbH & Co.KG
08/01/2024	NNSA [2024] No. 127	Notice on Issuing Confirmations of Registration for Overseas Organizations Undertaking Civil Nuclear Safety Equipment Activities to 8 Organizations Including Wartsila France S.A.S.
08/01/2024	NNSA [2024] No. 129	Notice on Issuing Confirmations of Registration for Overseas Organizations Undertaking Civil Nuclear Safety Equipment Activities to 5 Organizations Including Photonis France S.A.S.

Date	Document No.	Document Title
09/03/2024	NNSA [2024] No. 141	Notice on Issuing Confirmations of Registration for Overseas Organizations Undertaking Civil Nuclear Safety Equipment Activities to 3 Organizations Including FRAMATOME SAS
10/29/2024	NNSA [2024] No. 198	Notice on Issuing Confirmations of Registration for Overseas Organizations Undertaking Civil Nuclear Safety Equipment Activities to 4 Organizations Including Clyde Union Pumps SAS
12/27/2024	NNSA [2024] No. 227	Notice on Issuing Confirmations of Registration for Overseas Organizations Undertaking Civil Nuclear Safety Equipment Activities to 8 Organizations Including KSB S.A.S.

## Regulatory Inspections

According to the regulatory inspection program and work plan, the Northern Regional Office of Nuclear and Radiation Safety Inspection carried out 47 comprehensive inspections (see Table 99) and 25 special inspections (see Table 100) on domestic organizations, identifying a total of 1,310 problems and putting forward 443 requirements for rectification; and 2 nuclear safety inspections (see Table 101) on overseas organizations, identifying 18 problems and putting forward 8 requirements for rectification. The office assigned 3,702 man-days for regulation. It put forward in time rectification requirements for problems found in regulatory inspection, and organized experts to review and



*Figure 34. On-site Inspection on Civil Nuclear Safety Equipment*

conduct special inspections on major nonconformities affecting nuclear safety. In 2024, the quality of design, manufacture, installation, and non-destructive testing activities of civil nuclear safety equipment is largely under control.

**Table 99. Comprehensive Inspections on Domestic Organizations of Civil Nuclear Safety Equipment in 2024**

Starting Date	Inspected Organization
01/09/2024	Wuxi Flange Forging Co., Ltd.
01/22/2024	Jiangsu Huakan Nuclear Power Equipment Technology Co., Ltd.
01/23/2024	Nantong Kunlun Air Conditioning Co., Ltd.
02/27/2024	Sunten Electric Equipment Co., Ltd.
02/28/2024	China Nuclear Industry Fifth Construction Co., Ltd.
03/05/2024	Jiangsu Yanxin Science & Technology Incorporated Corporation
03/25/2024	Sunway Co., Ltd.
04/08/2024	Nuclear Power Institute of China
04/08/2024	Chongqing Chuanyi Automation Co., Ltd.
04/08/2024	Chuan Kai Electric Co., Ltd.
04/08/2024	Jiangsu Power Equipment Co., Ltd.
04/09/2024	China Nuclear Industry 23 Construction Co., Ltd.
04/09/2024	Xi'an Nuclear Equipment Co., Ltd.
04/10/2024	China Nuclear Industry 23 Construction Co., Ltd. (NDT), Nuclear Industry Engineering Research and Design Co., Ltd. (design)
04/15/2024	Wolong Electric Nanyang Explosion Protection Group Co., Ltd.
04/15/2024	China Nuclear Power Operation Technology Corporation, Ltd.
04/22/2024	China Nuclear Power Engineering Co., Ltd.
04/22/2024	China Techenergy Co., Ltd.
04/22/2024	Nanjing Chenguang Dongluo Bellows Co., Ltd.
04/23/2024	Shanghai Electric-KSB Nuclear Pumps and Valves Co., Ltd.
05/07/2024	Zhejiang Jiuli Hi-Tech Metals Co., Ltd.
05/07/2024	Shenyang Dongbei Storage Battery Co., Ltd.
05/13/2024	Shenyang Kejin Special Material Co., Ltd.
06/04/2024	Special Equipment Co., Ltd., CSIC
06/12/2024	Dalian Baoyuan Nuclear Equipment Co., Ltd.
06/18/2024	Alfa Laval (Jiangyin) Manufacturing Co., Ltd.
06/25/2024	Jiangsu Dalicheng Electric Co., Ltd.
06/25/2024	Ningbo Auqi Auto-Instrument Equipment Co., Ltd.
07/16/2024	Shanghai Electric SHMP Casting & Forging Co., Ltd.
07/22/2024	TBEA Shenyang Transformer Group Co., Ltd.
08/13/2024	Jiangsu DunAn Environmental Control System Co., Ltd.
08/26/2024	China State Shipbuilding Corporation, Limited (CSSC) 719th Research Institute
09/02/2024	Jiangsu Yinhuan Precision Steel Tube Co., Ltd.
09/02/2024	Hoppecke Battery Systems (Wuhan) Co., Ltd.



continued

Starting Date	Inspected Organization
09/10/2024	Dalian Shipbuilding Industry Co., Ltd.
09/11/2024	Nuclear Power Institute of China
09/11/2024	Beijing Cisri-Gaona Materials & Technology Co., Ltd.
09/24/2024	China First Heavy Industries Co., Ltd.
10/08/2024	Hebei Qianhai Blower Co., Ltd.
10/14/2024	Yangzhou Chengde Steel Pipe Co., Ltd.
10/21/2024	Shanghai Regeon Electric Co., Ltd.
10/29/2024	Dongfang Electric Corporation/Dongfang Turbine Co., Ltd.
11/04/2024	Siait Cable Co., Ltd.
11/12/2024	Guangdong Zhengchao Electric Co., Ltd.
11/13/2024	Chongqing Pump Industry Co., Ltd.
11/26/2024	Pearl Electric Co., Ltd.
12/09/2024	Zibo Torch Energy Co., Ltd.

**Table 100. Special Inspections on Domestic Organizations of Civil Nuclear Safety Equipment in 2024**

Starting Date	Inspected Organization
03/25/2024	Sunway Co., Ltd.
03/25/2024	Shanghai Nuclear Engineering Research & Design Institute Co., Ltd.
04/08/2024	Chuan Kai Electric Co., Ltd.
04/08/2024	Harbin Electric Group (Qinhuangdao) Heavy Equipment Co., Ltd.
04/08/2024	Chongqing Chuanyi Automation Co., Ltd.
04/15/2024	Wolong Electric Nanyang Explosion Protection Group Co., Ltd.
04/15/2024	China Nuclear Power Design Co., Ltd. (Shenzhen)
04/15/2024	Shanghai Electric Nuclear Power Equipment Co., Ltd.
04/16/2024	Harbin Boiler Co., Ltd.
04/16/2024	Harbin Electric Power Equipment Co., Ltd.
04/16/2024	HE Harbin Power Plant Valve Co., Ltd.
04/17/2024	Harbin Electric Corporation
04/22/2024	China Techenergy Co., Ltd.
04/23/2024	China First Heavy Industries Co., Ltd.
05/06/2024	Dongfang Electric (Guangzhou) Heavy Machinery Co., Ltd.
05/07/2024	Shenyang Dongbei Storage Battery Co., Ltd.
05/13/2024	Shaanxi Diesel Heavy Industry Co., Ltd.
05/14/2024	CSSC Bohai Shipbuilding Heavy Industry Co., Ltd.

continued

Starting Date	Inspected Organization
05/16/2024	Ansteel Heavy Machinery Co., Ltd.
06/26/2024	Jiangsu Huaguang Cable and Electrical Equipment Co., Ltd.
09/02/2024	CSSC Bohai Shipbuilding Heavy Industry Co., Ltd.
09/23/2024	Guizhou Aerospace Xinli Technology Co., Ltd.
10/08/2024	Hudong Heavy Machinery Co., Ltd.
11/19/2024	Wuxi Xinqisheng Electrical Co., Ltd.

**Table 101. Regulatory Inspections on Overseas Organizations of Domestic Civil Nuclear Safety Equipment in 2024**

Starting Date	Inspected Organization
03/18/2024	Emerson Automation Solutions Final Control US LP
09/23/2024	Hoppecke Batterien GmbH & Co. KG

## Safety Inspection on Imported Equipment

NNSA conducted safety inspections on imported civil nuclear safety equipment in accordance with law, and further standardized and optimized the safety inspection process. Applicants submitted 653 batches of safety inspection application

documents (for customs and opening package inspection) (including 314 for mechanical equipment, 266 for electrical equipment, and 73 for combined mechanical and electrical equipment), among which, 643 were released, 10 were rejected, and 133 were opened for witness.

## XII. Regulation on Electromagnetic Radiation Environment

By the end of 2024 (since 2008), MEE/NNSA had approved 242 electromagnetic radiation projects.

### Administrative Approvals

In 2024, MEE/NNSA approved the EIA documents of 5 electromagnetic radiation construction projects, including the Northern Shaanxi–Anhui  $\pm 800$  kV UHV DC power transmission project (see Table 102).

### Pilot Program

NNSA organized pilot surveys on the current state of regional electromagnetic environments, to investigate the current situation of regional electromagnetic environment to identify the level of electromagnetic environment in typical regions and summarize the results of the pilots, supporting the legislation on the prevention and control of electromagnetic radiation pollution in 10 provinces/autonomous regions/municipalities—Beijing, Hebei, Shanghai, Jiangsu, Zhejiang,

Hubei, Guangxi, Chongqing, Sichuan and Shaanxi. NNSA organized the development of supporting documents related to the licensing of electromagnetic radiation emissions, and demonstrated the scientific rationality and feasibility of the inclusion of different electromagnetic radiation facilities in the licensing of pollution discharge.

### Regulatory Inspections

NNSA strengthened the regulation of power transmission and transformation construction projects during and after the construction period, and organized State Grid Corporation of China and China Southern Power Grid to carry out self-inspection and verification for ecological and environmental protection during the construction period of power transmission and transformation projects.

### Re-check of EIA Documents

NNSA reviewed 91 EIA documents for the power construction projects with electromagnetic radiation impact



in 4 provinces/autonomous regions/ municipalities—Tianjin, Liaoning, Hunan and Hainan. Seventeen EIA documents suspected of quality problems were transferred to the corresponding provincial

ecology and environment department, and organizations and personnel involved were punished in accordance with the law, with their credit scores deducted for their breach of trust.

**Table 102. Administrative Approvals for EIA of Electromagnetic Radiation Construction Projects in 2024**

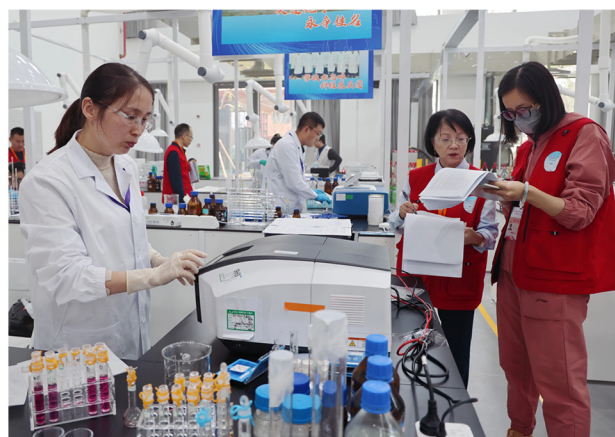
Date	Document No.	Document Title
06/12/2024	MEE App [2024] No. 58	Approval Reply on the Environmental Impact Report for the Northern Shaanxi–Anhui ±800 kV UHV DC Power Transmission Project
09/03/2024	MEE App [2024] No. 88	Approval Reply on the Environmental Impact Report for the Ship Traffic Management System Renovation and Expansion Project of Hainan Maritime Safety Administration
09/03/2024	MEE App [2024] No. 89	Approval Reply on the Environmental Impact Report for Sanya Ship Traffic Management System Renovation and Expansion Project of Hainan Maritime Safety Administration
12/31/2024	MEE App [2024] No. 139	Approval Reply on the Environmental Impact Report for the Datong–Tianjin South 1,000kV UHV AC Project
12/31/2024	MEE App [2024] No. 140	Approval Reply on the Environmental Impact Report for the West Inner Mongolia–Beijing/Tianjin/Hebei ±800 kV UHV DC Power Transmission Project

## XIII. Radiation Environmental Monitoring

By the end of 2024, a total of 1,835 State-controlled radiation environment quality monitoring sites have been built, including 500 automatic radiation environment monitoring stations, 328 terrestrial gamma radiation monitoring sites, 526 water sampling and monitoring sites, 34 marine life monitoring sites, 362 soil sampling and monitoring sites, and 85 electromagnetic radiation monitoring sites.

### Monitoring of Ionizing Radiation Environment

In 2024, the nationwide environmental ionizing radiation level was within the range of background fluctuations. The dose rates of  $\gamma$ -radiation were within the range of local natural background fluctuation. The activity concentrations of naturally occurring radionuclides such as Pb-210, Po-210, and Ra-228 in aerosols were at the background level. No abnormalities were detected in the activity concentrations of artificial radionuclides such as Sr-90, Cs-134, and Cs-137. The daily deposition amounts of naturally occurring radionuclides such as Pb-210 and Ra-228 in fallout were at the



*Figure 35. Monitoring Skills Competition Venue*

background level. No abnormalities were detected in the daily deposition amounts of artificial radionuclides such as Sr-90, Cs-134, and Cs-137. No abnormalities were detected in the activity concentration of tritium in air moisture and precipitation. No abnormalities were detected in the activity concentrations of artificial radionuclide iodine-131 in the air. In the seven major river basins including the Yangtze River, the Yellow River, the Pearl River, the Songhua River, the Huaihe River, the Haihe River, and the Liaohe River, the rivers in the Zhejiang-Fujian basin, the northwestern rivers, the southwestern rivers, and the key lakes (reservoirs), the concentrations of naturally occurring radionuclides uranium

and thorium, and the activity concentration of Ra-226 were at the background level, and no abnormalities were detected in the activity concentrations of artificial radionuclides Sr-90 and Cs-137. In groundwater, the concentrations of naturally occurring radionuclides uranium and thorium, and the activity concentrations of Pb-210, Po-210, and Ra-226 were at the background level. The activity concentrations of gross  $\alpha$  and gross  $\beta$  met those specified for Category III in Standard for Groundwater Quality (GB/T 14848-2017). The activity concentrations of gross  $\alpha$  and gross  $\beta$  in urban centralized drinking water source were at the background level. No abnormalities were detected in the activity concentrations of tritium, C-14, Sr-90, Cs-134, Cs-137, etc. in the seawater under the jurisdiction. Also, no abnormalities were detected in the activity concentrations of Sr-90, Cs-134, Cs-137, etc. in the sediments under the jurisdiction. No abnormalities were

detected in the activity concentrations of tritium, C-14, Sr-90, Cs-134 and Cs-137 in marine organisms in the nearshore sea area. The activity concentrations of artificial radionuclides such as Sr-90 and Cs-137 in seawater were far lower than the limits specified in the Sea Water Quality Standard (GB 3097-1997). The activity concentrations of naturally occurring radionuclides such as U-238, thorium-232 and Ra-226 in soil were at the background level. No abnormalities were detected in the activity concentration of artificial radionuclide Cs-137.

## Ionizing Radiation Environmental Monitoring Around Nuclear Facilities

In 2024, around operating nuclear power bases, civil research reactors, nuclear fuel cycle facilities and radioactive waste disposal facilities, the dose rates of  $\gamma$ -radiation as well as, the activity

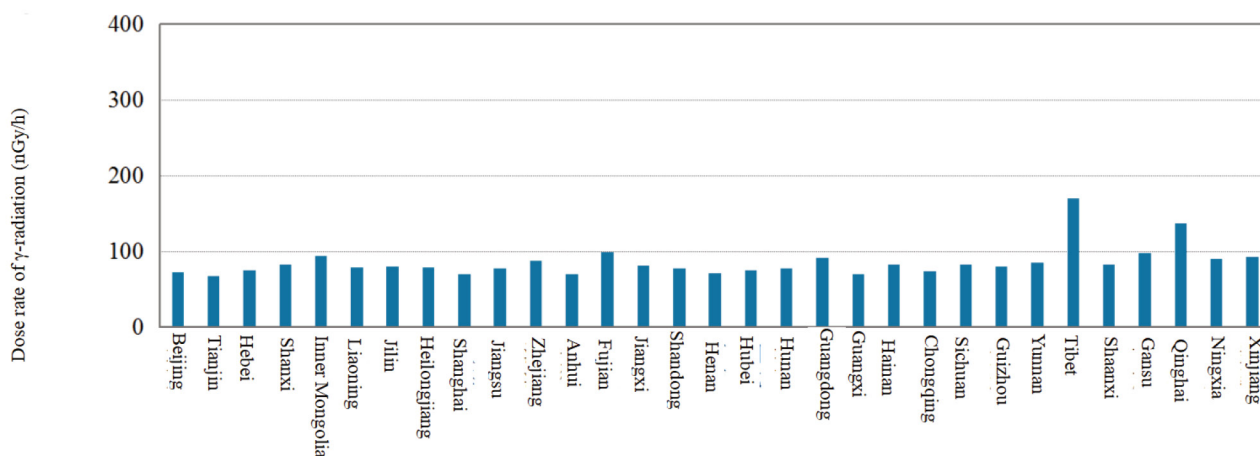


Figure 36. Annual Average Dose Rate of Environmental  $\gamma$ -Radiation Measured by Automatic Radiation Environment Monitoring Stations in 31 Provinces in 2024\*



concentrations of radionuclides related to activities of such facilities in air, water, soil, organisms and other environmental media were generally within the fluctuation range over the years. The assessment results indicated that the radiation doses exposure to the public caused by the operation of the above-mentioned nuclear facilities were far lower than the national limits, without any impact on environmental safety and public health.

## Ionizing Radiation Environmental Monitoring Around Uranium Mining and Milling Facilities

In 2024, around uranium mining and milling facilities, the dose rates of  $\gamma$ -radiation were generally within the fluctuation range over the years, so were the activity concentrations of radionuclides related to activities of such facilities in air, water, soil and organisms.

## Electromagnetic Radiation

In 2024, the environmental electromagnetic radiation levels at the state control points for electromagnetic radiation environment monitoring in 31 provinces (autonomous regions and municipalities), and the electromagnetic radiation levels at the electromagnetic radiation sensitive targets around the monitored broadcast and television transmitting facilities, power

transmission and transformation facilities, and mobile communication bases all complied with the Controlling Limits for Electromagnetic Environment (GB 8702-2014).

## Management Enhancement and Capacity Building

NNSA organized provinces to efficiently operate and manage the national radiation environment monitoring network. Throughout the year, the acquisition rate of real-time monitoring data from automatic radiation monitoring stations remained stable at 99.11% on average. It successfully hosted the radiation monitoring skills competition of the 3rd National Ecological and Environmental Monitoring Skills Competition of Technical Professionals, stimulating the enthusiasm of professionals in radiation environment monitoring to study theoretical knowledge and technical expertise, and laying a solid foundation for comprehensively improving the national radiation environment monitoring skills. It completed the annual business training, including the training courses on nuclear and radiation accident emergency response, national radiation environment monitoring data management and quality control requirements, and automatic radiation environment monitoring and automatic station operation management in 2024.

\* The background range of the national environmental  $\gamma$ -radiation dose rate (the response value of the instrument to cosmic rays was not deducted) was 39.3 ~ 403.5 nGy/h, which was from Environment Natural Radioactivity Levels in China.

NNSA approved adjustments to monitoring sites in the state-controlled network in provinces such as Ningxia, Guangdong, Shandong, Sichuan, Hebei, Heilongjiang, and Inner Mongolia. It approved the supplementary construction plan for the supervisory monitoring system of Hainan Changjiang NPP Units 3 and 4, the construction plan for the supervisory monitoring system of the Comprehensive Test Facility of the China Institute of Atomic

Energy, the supervisory monitoring plan for the Yangjiang Nuclear Power Base, and the siting report for the supervisory monitoring system of the Zhejiang Jinqimen NPP. It completed pre-acceptance of the supervisory monitoring system (supplementary) for Yangjiang Nuclear Power Base, the reconstruction of the supervisory monitoring system for Hongyanhe NPP, and the supervisory monitoring system for Zhangzhou NPP.

# XIV. Management of Nuclear and Radiation Emergency

In 2024, NNSA reviewed and re-examined the on-site emergency plans for civil nuclear facilities in accordance with laws and regulations. It also conducted regulatory inspection and evaluation on the daily emergency preparedness as well as comprehensive on-site emergency exercises for nuclear facilities, with the aim of effectively strengthening the regulation of emergency preparedness for nuclear facilities. NNSA continued to strengthen its emergency preparedness and response capabilities and successfully completed several tasks concerning nuclear and radiation emergency response.

### Regulation of Nuclear Facility Emergency Preparedness

In 2024, NNSA completed the regulatory inspection of emergency preparedness before the initial loading of CGN Advanced Fuel Development Center, Fujian Zhangzhou NPP Unit 1, and Guangdong Taipingling NPP Unit 1, as well as the inspection and evaluation of on-site comprehensive emergency exercises.



*Figure 36. Evaluation on Shaanxi Province's "Qin Dun-2024" Comprehensive Radiation Accident Emergency Exercises*

NNSA organized the national nuclear emergency capability assessment of civil nuclear facilities, completed the inspection and evaluation of on-site comprehensive emergency exercises of 17 nuclear facility licensees such as Daya Bay NPP, Taishan NPP, CNNC Lanzhou Uranium Enrichment Co., Ltd. and China Institute of Atomic Energy, systematically analyzed the problems found, provided relevant experience feedback, strengthened follow-up inspection, and urged the rectification.



## Approval of On-site Emergency Plans

NNSA approved the on-site nuclear emergency response plans for six nuclear facility licensees, including CNNC Jianzhong Nuclear Fuel Co., Ltd., CGN Advanced Fuel Development Center, CAP1400 Demonstration Project, Zhangzhou NPP, Qinshan NPP, and Fuqing NPP. NNSA filed the on-site nuclear emergency response plans for eight nuclear facility licensees, including Fangchenggang NPP, Sanmen NPP, Daya Bay NPP, and HTGR Demonstration Project.

## Nuclear and Radiological Emergency and Security Preparedness

NNSA has implemented a 24-hour emergency duty system, and kept making good emergency duty preparedness during important events and major festivals. In 2024, NNSA kept making good duty preparedness for nuclear emergency during important meetings and major events such as the “Two Sessions” of National People's Congress (NPC) and the Chinese People's Political Consultative Conference (CPPCC), the Third Plenary Session of the 20th Central Committee of the Communist Party of China, the 2024 Summit of the Forum on China-Africa Cooperation, and the China International Import Expo in Shanghai, as well as during important festivals such as the New Year's Day, the Spring Festival, and the National Day.

## Provincial Ecology and Environment Authorities on Radiation Accident Emergency Exercises

NNSA guided pilot practical radiation accident emergency exercises of "No advance notice" in Hebei Province and Zhejiang Province. Regional offices of nuclear and radiation safety inspection coordinated and guided ecology and environment authorities in Inner Mongolia, Shanghai, Hainan, Yunnan, Shaanxi and other provinces (autonomous regions and municipalities) to take the lead in implementing comprehensive radiation accident emergency exercises. Through these exercises, the impetus placed by the local governments on radiation accident emergency was enhanced, and the prime responsibilities of the local governments in radiation accident emergency were implemented. The emergency teams were comprehensively trained, the emergency plans and facilities were examined, the emergency response and handling capabilities were improved, and the radiation safety regulation was further promoted.

## Nuclear and Radiation Accident Emergency Preparedness

NNSA issued the new edition of the Nuclear Emergency Plan of the Ministry of Ecology and Environment/National Nuclear Safety Administration, the Radiation Emergency Plan of the Ministry of Ecology

and Environment/National Nuclear Safety Administration and various supporting implementation plans. It updated and issued the List of Personnel for Nuclear and Radiation Accident Emergency Organization Positions of the Ministry of Ecology and Environment/National Nuclear Safety Administration. It held the nuclear and radiation accident emergency training classes of the MEE/NNSA in 2024.

NNSA organized and carried out joint comprehensive nuclear accident emergency exercises of the MEE/NNSA with Hongyanhe NPP. It successfully instructed the North-Eastern Regional Office of Nuclear and Radiation Safety Inspection, and the Nuclear

and Radiation Safety Center to organize a special drill for emergency monitoring of radiation environment in border areas and surrounding areas of Northeast China, coordinated the Department of Ecology and Environment of Anhui Province to assist in the emergency monitoring, and organized the China Institute of Atomic Energy, an external organization, to assist in emergency monitoring for the first time. It strengthened the operation and maintenance management of nuclear and radiation emergency command and dispatch platform, and carried out special emergency communication exercises every month to ensure the high sustainability of emergency response capability.

## XV. Personnel Qualification

### Qualification of Civil Nuclear Facility Operators

In 2024, the civil nuclear facility operator licenses were issued in five batches by NNSA to 1,092 operators in total, including 1,039 NPP operators, and 53 civil research facility operators.

As of the end of 2024, there were totally

3,082 persons holding NPP operator licenses (see Table 103), including 1,977 persons holding senior operator licenses and 1,105 holding operator licenses. There were 270 persons holding 297 civil research reactor operator licenses (see Table 104), including 158 persons holding 173 senior operator licenses and 120 holding 124 operator licenses.

**Table 103. Statistics on Licenses for Operators of Nuclear Power Plants**

Licensee	Nuclear Facility	Senior operator	Operator	Subtotal
CNNC Nuclear Power Operation Management Co., Ltd.	Qinshan NPP Unit 1	37	22	59
	Qinshan Phase II NPP Units 1 and 2	62	38	100
	Qinshan Phase II NPP Units 3 and 4	70	29	99
	Qinshan Phase III NPP Units 1 and 2	78	41	119
Daya Bay Nuclear Power Operations and Management Co., Ltd.	Fangjiashan NPP Units 1 and 2	73	27	100
	Daya Bay NPP Units 1 and 2	72	19	91
	Ling'ao NPP Units 1 and 2	73	17	90
	Ling'ao NPP Units 3 and 4	58	20	78
Jiangsu Nuclear Power Co., Ltd.	Tianwan NPP Units 1 and 2	96	57	153
	Tianwan NPP Units 3 and 4	76	43	119
	Tianwan NPP Units 5 and 6	61	49	110
Fujian Ningde Nuclear Power Co., Ltd.	Ningde NPP Units 1 and 2	60	26	86
	Ningde NPP Units 3 and 4	62	35	97



continued

Licensee	Nuclear Facility	Senior operator	Operator	Subtotal
Liaoning Hongyanhe Nuclear Power Co., Ltd.	Hongyanhe NPP Units 1 and 2	55	27	82
	Hongyanhe NPP Units 3 and 4	57	17	74
	Hongyanhe NPP Units 5 and 6	43	34	77
Yangjiang Nuclear Power Co., Ltd.	Yangjiang NPP Units 1 and 2	53	20	73
	Yangjiang NPP Units 3 and 4	61	22	83
	Yangjiang NPP Units 5 and 6	56	19	75
Fujian Fuqing Nuclear Power Co., Ltd.	Fuqing NPP Units 1 and 2	62	34	96
	Fuqing NPP Units 3 and 4	59	32	91
	Fuqing NPP Units 5 and 6	58	50	108
Guangxi Fangchenggang Nuclear Power Co., Ltd.	Fangchenggang NPP Units 1 and 2	60	30	90
	Fangchenggang NPP Units 3 and 4	52	70	122
Hainan Nuclear Power Co., Ltd.	Changjiang NPP Units 1 and 2	64	36	100
Sanmen Nuclear Power Co., Ltd.	Sanmen NPP Units 1 and 2	91	38	129
Shandong Nuclear Power Company Ltd.	Haiyang NPP Units 1 and 2	101	56	157
Taishan Nuclear Power Joint Venture Co., Ltd.	Taishan NPP Units 1 and 2	56	40	96
Huaneng Shandong Shidao Bay Nuclear Power Co., Ltd.	Units 1 and 2 of HTGR Demonstration Project	37	26	63
State Nuclear Power Demonstration Plant Co., Ltd.	Units 1 and 2 of CAP1400 Demonstration Project	39	68	107
CGN Huizhou Nuclear Power Co., Ltd.	Guangdong Taipingling NPP Units 1 and 2	55	26	81
CNNP Guodian Zhangzhou Energy Co., Ltd.	Fujian Zhangzhou NPP Units 1 and 2	40	37	77
	Total	1,977	1,105	3,082

**Table 104. Statistics on Civil Research Reactor Operator Licenses**

Licensee	Nuclear Facility	Senior operator	Operator	Subtotal
China Institute of Atomic Energy	49-2 Swimming Pool Reactor (49-2 SPR)	15	10	25
	Nuclear Criticality Safety Test Facility in Pilot Plant	9	19	28
	Prototype Miniature Neutron Source Reactor (PMNSR)	3	5	8
	China Experimental Fast Reactor (CEFR)	34	9	43
	China Advanced Research Reactor (CARR)	15	9	24
	Zero-power Assembly of MNSR	4	5	9
Nuclear Power Institute of China	High Flux Engineering Test Reactor (HFETR)	28	23	51
	Minjiang Test Reactor (MJTR)	11	7	18
	Critical Assembly of High Flux Engineering Test Reactor (HFETR)	5	5	10
	China Pulsed Reactor (CPR)	6	1	7
	18-5 Critical Assembly	7	6	13
Institute of Nuclear and New Energy Technology, Tsinghua University	5MW Low Temperature Nuclear Heating Test Reactor (NHR-5)	7	8	15
	10MW High Temperature Gas-Cooled Test Reactor (HTR-10)	21	8	29
Beijing Capture Tech Co., Ltd.	In-Hospital Neutron Irradiator (IHNI)	0	2	2
Shanghai Institute of Applied Physics, Chinese Academy of Sciences	2 MWt Liquid Fuel Thorium Molten Salt Reactor (TMSR-LF)	8	7	15
Total		173	124	297

## Management over Qualifications of Non-destructive Testing Personnel for Civil Nuclear Safety Equipment

In 2024, NNSA issued two batches of examination plans for civil nuclear safety equipment NDT personnel and authorized five examination centers to hold 37 NDT personnel exams. Ten batches of civil

nuclear safety equipment NDT personnel qualification certificates were issued, and a total of 2,932 persons and 3,659 certificates were approved.

As of the end of 2024, a total of 9,404 persons held 25,619 civil nuclear safety equipment NDT personnel qualification certificates, including 7,657 Level I

(primary) certificates, 15,972 Level II (intermediate) certificates and 1,990 Level III (advanced) certificates.

In 2024, the 4th Vocational Skills Competition on National Nuclear Energy System Non-destructive Testing was held, with 183 participants in total, grouped into 71 teams, from 46 key units across the national nuclear energy industry.

### Management over Qualifications of Civil Nuclear Safety Equipment Welders

In 2024, NNSA issued two batches of examination plans for civil nuclear safety equipment welders and authorized 13 examination centers to hold 33 welder qualification exams. Ten batches of civil nuclear safety equipment welder qualification certificates were issued, and a total of 3,259 persons and 3,597 certificates were approved.

As of the end of 2024, a total of 9,346 persons held 14,446 civil nuclear safety equipment welder qualification certificates.

### Management over Qualifications of Registered Nuclear Safety Engineers

In 2024, the Unified National Examination for Registered Nuclear Safety Engineer Qualifications was conducted for the first time in two professional groups: nuclear

engineering and nuclear technology. A total of 2,790 persons took the exam, and 540 persons obtained the Registered Nuclear Safety Engineer Qualifications.

In 2024, NNSA conducted 4 batches of registration of nuclear safety engineers involving 641 persons, including 454 new registrations, 156 renewals, and 31 with changed registered organizations.

As of the end of 2024, a total of 5,567 persons obtained the certificates of the Registered Nuclear Safety Engineer Qualification, and 1,739 persons held registered nuclear safety engineer certificates.

### Professional Training for Staff in Charge of Nuclear and Radiation Safety Regulation

The 2024 Business Training Plan for Nuclear and Radiation Safety Regulators and the Plan on Further Strengthening the Business Training for Nuclear and Radiation Safety Regulators were compiled and issued. A total of 19 offline training sessions were completed, with 812 trainees in total. The 12th initial training course for nuclear and radiation safety regulators was held, with 40 trainees, 578 trainees in total have been trained. The 12th intermediate training course for nuclear and radiation safety regulators (young cadre training course) was held, with 28 trainees, 351 trainees in total have



been trained. Two sessions of leadership improvement training were held and collective learning seminars were carried out.



*Figure 37. Closing Ceremony of the Initial Training Course for Nuclear and Radiation Safety Regulators in 2024*

## XVI. International Cooperation

As of the end of 2024, NNSA signed cooperation agreements on nuclear safety with 22 national nuclear regulatory agencies and international organizations.

### Multilateral Cooperation

NNSA cooperated well with the IAEA. The two sides carried out multi-level and high-frequency cooperation. In April 2024, DONG Baotong attended the opening ceremony of the Asian Nuclear Safety Network Steering Committee and delivered a speech. During this period, he held talks with Evrard, Deputy Director General of the International Atomic Energy Agency. The two sides expressed their willingness to deepen cooperation and renewed the cooperation agreement.

DONG Baotong took over as a member of the new IAEA Commission on Safety Standards and attended the 55th Meeting. In September 2024, DONG Baotong led a delegation to attend the Senior Officials Meeting on Nuclear Safety and Security Regulation. Three institutions under MEE officially became members of the Environmental Radioactivity Measurement and Analysis Laboratory Network, which facilitates China to participate in the development of international standards and share experiences and practices in the field of radiation environment monitoring. In 2024, preparations for a new round of comprehensive IAEA regulatory assessment were launched, and IAEA experts were invited to attend self-assessment seminars in Beijing.



*Figure 38. 2024 International Exchange Conference on Modernization of Nuclear Safety Regulation*

NNSA cooperated with the OECD/NEA . In December 2024, the International Exchange Conference on Modernization of Nuclear Safety Regulation and the 2024 International Academic Conference on Nuclear and Radiation Safety were held in Xiamen, Fujian Province. DONG Baotong attended the meeting and delivered a speech. Heads and senior representatives from nuclear safety regulatory authorities of over 20 countries including France, the United Arab Emirates,

Saudi Arabia, Pakistan, Hungary and Spain, conducted exchanges regarding nuclear facility regulation, personnel training, and joint scientific research. NNSA dispatched personnel to participate in activities under mechanisms such as the NEA Multinational Design Evaluation Programme (MDEP), the Committee on Nuclear Regulatory Activities (CNRA), and the Committee on the Safety of Nuclear Installations (CSNI).



# XVII. Performance of Obligations under International Conventions

As of the end of 2024, NNSA attended 9 sessions of the Review Meeting of the Contracting Parties to the Convention on Nuclear Safety and 5 sessions of the Review Meeting of the Contracting Parties to the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management, faithfully fulfilling international obligations and political commitments, and earnestly fulfill the conventions.

## Implementation of the Convention on Nuclear Safety

On October 14, 2024, DONG Baotong organized the first meeting of the 10th National Implementation Report Preparation and Review Committee, formally established the current National Implementation Report Preparation and Review Committee, discussed and determined the tenth implementation work plan, national

reporting framework and data collection arrangements, and promoted the preparation of the tenth national implementation report of the Convention on Nuclear Safety in an orderly manner.

## Implementation of the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management

The People's Republic of China National Report for the Eighth Review Meeting of the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management (Draft for Approval) was developed, and submitted to the State Council on July 4, 2024. After approval by the State Council, the National Report was formally submitted to the International Atomic Energy Agency in August 2024.

## XVIII. Milestones

On January 2, DONG Baotong conducted field investigation at the Lufeng NPP.

On January 3, DONG Baotong conducted field investigation at CNNC 272 Uranium Industry Co., Ltd. and Hunan Nuclear Industry Honghua Machinery Co., Ltd.

On January 7, the following national EE standards were issued: Technical Specifications for Acceptance of Environmental Protection Facilities for Completed Construction Projects -Uranium Mining and Milling (HJ 1347.1-2024), Technical Specifications for Acceptance of Environmental Protection Facilities for Completed Construction Projects - Uranium Mining and Milling Decommissioning (HJ 1347.2-2024), Technical Specifications for Acceptance of Environmental Protection Facilities for Completed Construction Projects - Satellite Up-Link Earth Station (HJ 1348-2024), and Survey and Assessment Methods for Area Electromagnetic Environment (On Trial) (HJ 1349-2024).

On January 8, the fourth nuclear safety situation analysis activity in 2023 was held

at the National Nuclear and Radiation Safety Technology R&D Base.

On January 11, the Annual Nuclear Safety Regulation Dialogue Meeting between the National Nuclear Safety Administration and the State Power Investment Corporation Limited was convened.

On January 16, DONG Baotong conducted field investigation at the Nuclear Power Institute of China.

On January 22, the Annual Nuclear Safety Regulation Dialogue Meeting between the National Nuclear Safety Administration and the China National Nuclear Corporation was convened.

On January 30, the Annual Nuclear Safety Regulation Dialogue Meeting between the National Nuclear Safety Administration and the China General Nuclear Power Corporation was convened.

On February 1, the Nuclear Emergency Plan of the Ministry of Ecology and Environment/ National Nuclear Safety Administration

and the Radiation Emergency Plan of the Ministry of Ecology and Environment/ National Nuclear Safety Administration were issued.

On February 2, the Annual Nuclear Safety Regulation Dialogue Meeting between the National Nuclear Safety Administration and China Huaneng Group was convened.

On February 7, DONG Baotong conducted field investigation at the China Institute of Atomic Energy.

On February 20, the national EE standard Design Requirements of Spent Fuel Transport Cask (HJ 1355-2024) was issued.

On February 21, the construction licenses for Fujian Zhangzhou NPP Units 3 and 4 were issued.

On February 23, the operation license for Guangxi Fangchenggang NPP Unit 4 was issued.

From February 26 to 27, DONG Baotong conducted field investigation at the Lianjiang NPP and Fangchenggang NPP.

On February 29, DONG Baotong met with H. E. Bruno Angelet, Ambassador of Belgium to China, to exchange in-depth views on the first Nuclear Energy Summit.

On March 21, the Work Plan for Brand Building of Public Communication regarding

Nuclear Safety was issued.

From March 25 to 28, LIU Lu, Deputy Administrator of National Nuclear Safety Administration and Director of the Department of Radiation Source Safety Regulation, attended the fifth extraordinary meeting and the eighth review meeting of contracting parties to the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management in Vienna.

From March 29 to 31, HUANG Runqiu, Minister of Ecology and Environment, investigated ecological and environmental protection and nuclear and radiation safety in Jilin Province.

On April 1, MEE/NNSA organized nuclear safety situation analysis activity in Beijing for the first quarter of 2024.

On April 14, the Guangdong-based Nuclear Safety Publicity Campaign for 2024 National Security Education Day for All was jointly held at the Daya Bay Nuclear Power Base by the Department of Ecology and Environment of Guangdong Province, the MEE Southern Regional Office of Nuclear and Radiation Safety Inspection, the China Communist Youth League Committee of Guangdong Province, and the China General Nuclear Power Corporation.

On April 15, the 415 National Security Education Day nuclear safety themed



event was held at the National Nuclear and Radiation Safety Technology R&D Base. DONG Baotong attended the event and delivered a speech. The nuclear and radiation safety regulation history hall and scientific popularization hall were put into use, and the public communication brand system of "Nuclear Safety for a Better Life" was officially released.

On April 15, DONG Baotong attended the opening ceremony of the IAEA International Conference on Nuclear Power Operation Safety and delivered a keynote report. He also held talks with Fabrice Fourcade, President of the Conference and Vice President of Électricité de France.

On April 16, DONG Baotong attended the opening ceremony of the Asian Nuclear Safety Network Steering Committee and delivered a speech. During this period, he held talks with Lydia Evrard, Deputy Director General of the International Atomic Energy Agency, and renewed the cooperation agreement.

On April 17, the siting permit for Jiangsu Xuwei Nuclear Energy Heating Plant Phase I Project was issued.

On April 18, the Notice on Carrying Out a National Special Campaign for Radioactive Materials Transportation Safety Inspection was issued.

On May 13, DONG Baotong conducted field

investigation at the Jinqimen NPP.

From May 18 to 19, DONG Baotong conducted field investigation at Qinshan Nuclear Power Base.

On May 22, HUANG Runqiu, Minister of Ecology and Environment, and DONG Baotong conducted field investigation at the Changjiang NPP.

On May 23, MEE/NNSA organized the first centralized experience feedback analysis activity of 2024 in Beijing.

From May 28 to 30, DONG Baotong attended the 55th Meeting of the IAEA Commission on Safety Standards. He held bilateral talks with Rafael Mariano Grossi, Director General of the International Atomic Energy Agency, Lydia Evrard, Deputy Director General of the International Atomic Energy Agency, Luc Lachaume, Commissioner of the French Nuclear Safety Authority, Ferapontov, Deputy Chairman of Rostekhnadzor (Federal Environmental, Industrial and Nuclear Supervision Service of Russia), Maqbul, Deputy Chairman of Pakistan Nuclear Regulatory Authority, etc.

On May 29, the national radioactive pollution prevention and control standard Technical Regulations for Radiation Environmental Management of Radioactive Wastes from Uranium Mining and Milling (GB 14585-2024) was issued.

On June 5, ZHANG Qingwei, Vice Chairman of the Standing Committee of the National People's Congress, led an investigating group to conduct a survey on the legislation for the Atomic Energy Law, and held a symposium to solicit opinions at the Nuclear and Radiation Safety Center of MEE.

From June 25 to 26, the 2024 national radiation safety regulation work symposium was held in Zunyi, Guizhou Province.

On June 30, DONG Baotong, conducted field investigation at the Tianwan NPP.

From July 1 to 8, DONG Baotong led a delegation to attend the China-Russia Joint Coordination Meeting on Nuclear Safety in Russia and visited Saudi Arabia, and visited nuclear-related institutions in the two countries.

On July 10, the nuclear safety situation analysis activity for the second quarter in 2024 was held at the National Nuclear and Radiation Safety Technology R&D Base.

On July 11, the application for change of construction license for Hainan Changjiang NPP Units 3 and 4 was approved.

On July 17, DONG Baotong attended the "Characteristics of Trustworthy Nuclear Regulators" seminar and leadership improvement training.

On July 19, the operation license for Unit 1

of the CAP1400 demonstration project was issued.

On July 22, DONG Baotong attended the closing event of the training course for nuclear and radiation safety regulators (young cadre training course) of the MEE/ NNSA in 2024.

On July 23, the construction licenses for the Phase I Expansion Project of Shandong Shidao Bay NPP Units 1 and 2 and Fujian Ningde NPP Units 5 and 6 were issued.

From July 26 to 27, the 6th Key Inspection Exchange Activity of regional offices of nuclear and radiation safety inspection was held in Jiayuguan City, Gansu Province. DONG Baotong attended it and delivered a speech.

On July 27, DONG Baotong conducted field investigation at the State Nuclear Power Demonstration Plant Co., Ltd.

On July 28, DONG Baotong presented the construction license to the Shidao Bay NPP for the Shidao Bay NPP Expansion Project and attended the commencement ceremony.

On July 28, the ministerial rule, Regulations on Nuclear Safety Reporting of Research Reactor Licensees (Order No.34 of the Ministry of Ecology and Environment) was issued.

On July 30, DONG Baotong met with

Christer Viktorsson, Director General of the United Arab Emirates' Federal Nuclear Regulatory Authority. Both sides exchanged views on strengthening experience feedback, public communication, and cooperation between technical support organizations for nuclear safety regulation.

On August 12, the nuclear safety guides In-Service Inspection in Nuclear Power Plants (HAD103/07-2024) and Aging Management for Nuclear Power Plants (HAD103/12-2024) were issued.

On August 16, DONG Baotong attended the feedback meeting of the MEE Leading Party Committee's First Inspection Team on the inspection of the Sub-party Group of the North-Eastern Regional Office of Nuclear and Radiation Safety Inspection.

On August 17, DONG Baotong conducted field investigation at the Hongyanhe NPP and on living and working of the resident inspectors.

On August 17, DONG Baotong conducted field investigation at Dalian Dagao Valve Co., Ltd. and Dalian Baoyuan Nuclear Equipment Co., Ltd.

On August 19, the column "Nuclear Safety Protects a Better Life" on the website of the National Nuclear Safety Administration was officially released.

On August 23, the second centralized

experience feedback analysis activity of 2024 was held at the National Nuclear and Radiation Safety Technology R&D Base.

On September 5, DONG Baotong met with ZHENG Likang, Malaysian Minister of Science, Technology and Innovation. The two sides introduced the nuclear safety regulatory organization, current situation and scientific research.

On September 6, DONG Baotong conducted field investigation at CNNC Shaanxi Uranium Enrichment Co., Ltd.

On September 10, the siting permit for Shandong Haiyang Integrated Small Reactor Demonstration Project was issued.

On September 11, DONG Baotong conducted field investigation at the Changbai Mountain Base and provided on-site guidance on the special training on radiation environment emergency monitoring on the northeast border and surrounding areas.

On September 12, the Letter on Public Solicitation of Comments on the Regulatory Requirements for Grading and Categorizing of Fusion Facilities (Draft for Comments) was issued.

On September 12, DONG Baotong conducted field investigation at the State Nuclear Power Demonstration Plant Co., Ltd.

On September 13, the 2024 Nuclear



Power Plant and Research Reactor Safety Management Experience Exchange Meeting was held in Weihai, Shandong.

From September 17 to 21, DONG Baotong led a delegation to attend the Senior Officials Conference on Nuclear Safety Regulation held during the 68th IAEA General Conference in Austria.

On September 20, China and Japan reached Agreement on Ocean Discharge of Fukushima Nuclear-contaminated Water.

From September 21 to 22, the Unified National Examination for Registered Nuclear Safety Engineer Qualifications was held by specialty for the first time.

From September 22 to 23, HUANG Runqiu, Minister of Ecology and Environment, conducted field investigation at Fujian Zhangzhou and Fuqing NPPs.

On September 24, the Pressurized Water Reactor Nuclear Power Plant Safety Analysis Report Format and Content - Chapter 6 (On Trial) was issued.

On September 25, the State Council Information Office of the People's Republic of China held a series of press conferences on the theme of "Promoting High-Quality Development" (Ministry of Ecology and Environment). DONG Baotong attended the press conference and introduced the nuclear safety regulation.

From September 25 to 27, the 4th Non-destructive Testing Vocational Skills Competition on National Nuclear Energy System was successfully held.

On September 29, the 40th anniversary theme publicity event of "Zheli Fuan" was held in Haiyan, Jiaxing. DONG Baotong attended the event and delivered a speech.

On October 8, DONG Baotong met with Halvorsen, Director of the Norwegian Center for International Climate and Environmental Research, to introduce experience in application of nuclear power plants, especially small modular reactors, and nuclear safety regulation in China.

On October 12, the operation license for Fujian Zhangzhou NPP Unit 1 was issued.

On October 12, the third-quarter nuclear safety situation analysis activity in 2024 was held at the National Nuclear and Radiation Safety Technology R&D Base.

On October 14, the National Report Review Committee (NRRC) for the Tenth Review Meeting of Convention on Nuclear Safety was established formally. DONG Baotong attended its first meeting.

On October 16, a symposium on nuclear and radiation safety regulation was held in Beijing to summarize and review the 40-year history of nuclear and radiation safety regulation and promote high-quality

development of the nuclear industry with high-level nuclear safety. SUN Jinlong, Secretary of the Leading Party Committee of MEE, and HUANG Ruiqiu, Minister of Ecology and Environment, attended the meeting and delivered a speech. DONG Baotong, Vice Minister of Ecology and Environment and Administrator of National Nuclear Safety Administration, presided over the meeting.

On October 18, the siting permit of Sanmen NPP Units 5 and 6 was issued.

From October 27 to 28, the national final of the 3rd National Ecological and Environmental Monitoring Skills Competition of Technical Professionals was successfully held in Nantong, Jiangsu. This event was jointly sponsored by the Ministry of Ecology and Environment, the Ministry of Human Resources and Social Security of the People's Republic of China, the All-China Federation of Trade Unions, the Central Committee of the Communist Youth League of China, the All-China Women's Federation, and the State Administration for Market Regulation. HUANG Runqiu, Minister of Ecology and Environment, attended the event and delivered a speech, and DONG Baotong presided over it.

On October 31, DONG Baotong conducted field investigation at China First Heavy Industries.

On November 2, the siting permit of Haiyang

NPP Units 5 and 6 was issued.

On November 5, the Nuclear and Radiation Emergency Implementation Plan of the Ministry of Ecology and Environment/ National Nuclear Safety Administration was issued.

On November 13, LIAO Xiyuan, Chief Inspector of Central Commission for Discipline Inspection (CCDI) Inspector's Office and Chief Supervisor of the State Supervisory Commission (SSC) Supervisor's Office at the Ministry of Ecology and Environment, conducted field investigation at China Huaneng Group. A symposium on the nuclear and radiation safety "group-group" coordinated supervision was held with the Discipline Inspection & Supervision Team of Huaneng Group.

On November 16, GUO Fang, Vice Minister of Ecology and Environment, conducted field investigation at the Tianwan NPP.

On November 20, Safety Design for Alternative Shutdown of NPPs in Response to Cyberattack, the world's first regulatory requirements for alternative shutdowns of nuclear power plants in response to cyberattack, was issued formally.

On November 21, MEE/NNSA organized the third centralized experience feedback analysis activity of 2024 in Beijing.

On November 21, DONG Baotong attended

the closing event of the training course for nuclear and radiation safety regulators (initial training course) of the MEE/NNSA in 2024.

On November 25, the operation license for CGN Advanced Fuel Development Center was issued.

From November 25 to 28, DONG Baotong conducted field investigation at Nuclear Power Institute of China, Sichuan Haitong Isotope Technology Co., Ltd., CNNC Jianzhong Nuclear Fuel Co., Ltd., etc.

On December 1, the national radioactive pollution prevention and control standard Regulations for Disposal of Solid Radioactive Wastes in Rock Cavities was issued.

On December 2, DONG Baotong met with Trembitsky, Chairman of Rostekhnadzor (Federal Environmental, Industrial and Nuclear Supervision Service of Russia), to exchange views on strengthening bilateral nuclear safety regulation cooperation and other matters.

From December 3 to 4, DONG Baotong attended the International Exchange Conference on Modernization of Nuclear Safety Regulation in Xiamen. During the conference, he held talks with representatives from the Nuclear Energy Agency, the International Atomic Energy Agency, and regulatory authorities of the United Arab Emirates, France, Saudi Arabia, etc. He co-chaired the 12th Meeting of the

China-Pakistan Nuclear Safety Cooperation Steering Committee with the Chairman of the Pakistan Nuclear Regulatory Authority and signed a cooperation action plan with the United Arab Emirates' Federal Nuclear Regulatory Authority.

On December 12, MEE/NNSA organized a comprehensive nuclear accident emergency exercise for 2024. DONG Baotong as the emergency chief commander, participated in the exercise together with more than 100 representatives from other nuclear emergency organizations.

On December 13, the MEE Leading Party Committee listened to the reports on nuclear safety and other related work and deployed the key tasks for 2025.

On December 20, the national EE standards Determination of Tritium in Water Vapor in Atmosphere - The Collecting Method by Adsorption Sampling with Molecular Sieve (HJ 1383-2024), and Technical Specification for Continuous Monitoring of Fixed NaI (TI) Gamma Spectrometer (HJ 1384-2024) were issued.

On December 22, the construction license of Tianhong research reactor was issued.

On December 23, the national EE standard Safety Requirements of Lifting and Tie-Down Devices of Packaging for Radioactive Material (HJ 1385-2024) was issued.



On December 25, the Nuclear Safety Guide Operating Limits and Conditions for Research Reactors (HAD202/10-2024) was issued.

On December 26, DONG Baotong, attended the radiation standard seminar and leadership improvement training.

On December 27, the Work Plan for Improving Scientific Cognition of Nuclear Energy and Nuclear Safety (2025-2029) was issued.

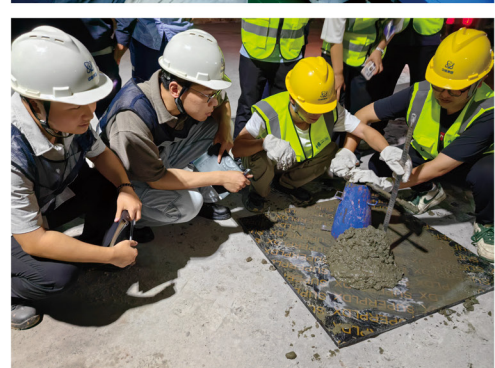
On December 27, the siting permit for China

Huaneng Xiapu NPP PWR Phase I Project was issued.

On December 31, the siting permit for Liaoning Zhuanghe Nuclear Power Plant Phase I Project was issued.

On December 31, the Notice on Re-issuing the Solid Radioactive Waste Storage License to the 404 Company Limited, CNNC and the Notice on Issuing the Operation License for the New Radioactive Waste Repository of the 404 Company Limited, CNNC were issued.









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