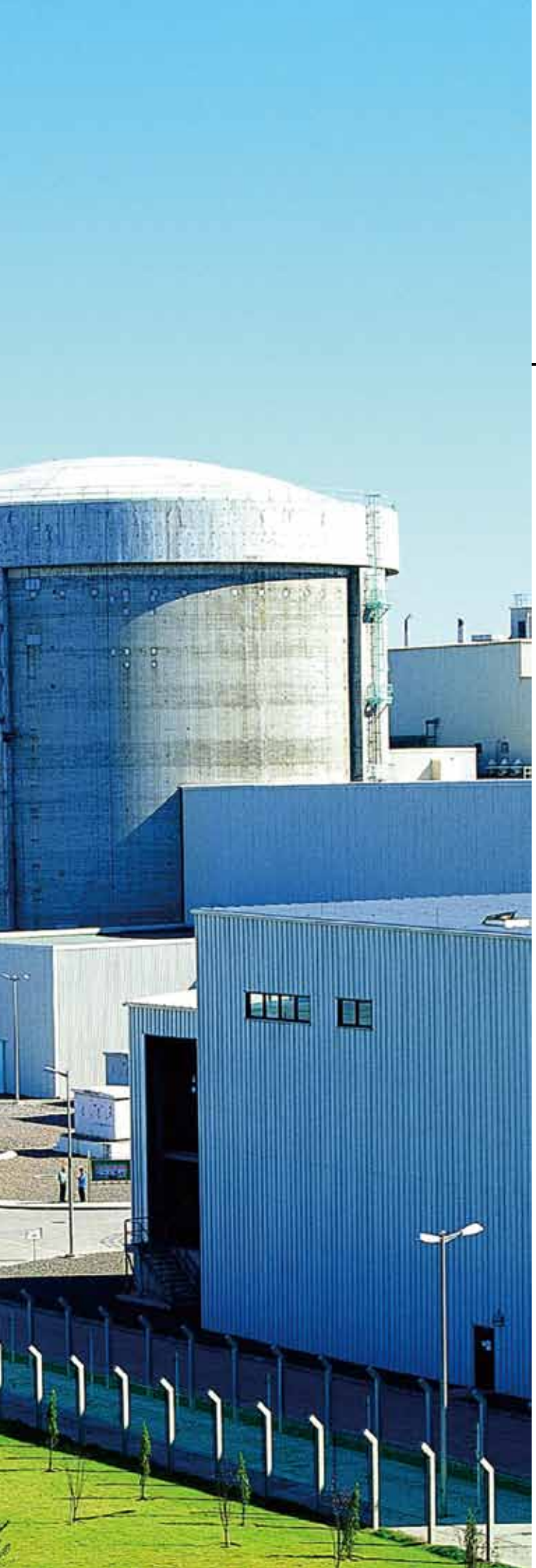
The People's Republic of China

National Nuclear Safety Administration

2015 Annual Report



Contents

1 General Description

China's civilian nuclear facilities showed good performance on operation safety and construction quality in 2015, and no level 1 or above incidents or accidents of the International Nuclear and Radiological Event Scale (INES) occurred in operating nuclear power plants (NPPs), research reactors, fuel cycle facilities, radioactive waste storage and disposal facilities, and the radioactive material transportation. The lower level events in operating and constructing nuclear facilities were handled properly.

The quality of radiation environment nationwide was generally good in 2015. The levels of environmental ionizing radiation remained within the fluctuant ranges of radioactive backgrounds, and there were no evident changes on the radiation levels around nuclear facilities and nuclear technology utilization projects. The overall condition of environmental electromagnetic radiation was good, and there were no evident changes on the radiation levels around facilities with emission of electromagnetic radiation.

Reformation of Administrative Review and Approval

According to the unified arrangement made by the State Council, 6 authorizations in the area of nuclear materials, nuclear equipment, and personnel qualification were adjusted and optimized. Ministry of Environmental Protection (National Nuclear Safety Administration) [hereinafter referred to as MEP (NNSA)] developed regulatory requirements on the qualification management of personnel of non-destructive tests (NDT) for civilian nuclear safety equipment, and the qualification management of research reactor operators. MEP (NNSA) drafted the Rules of Qualification Management of Radiation Environment Monitoring Organizations.

MEP (NNSA) properly reduced or adjusted the rank of environment impact assessment on the wireless telecommunication, the power transmission and distribution, the geological exploration and decommissioning and treatment of uranium, and some nuclear technology application projects. Excepting ±500kV and above direct current transmission projects and 500kV and above alternating current transmission projects

which across borders, provinces, regions and municipalities, the review and approval power over environment impact assessments on power transmission and distribution projects were delegated. Users of cabinet X-ray luggage checkout facilities in public places were exempted. Enterprises manufacturing short half-life radiopharmaceuticals were not demanded to acquire the ownership of manufacturing site.

Capability Building

Significant developments were made in the construction of National Technology R&D Base for Nuclear and Radiation Safety Regulation. The preliminary design and the budgetary estimate were approved. MEP (NNSA) obtained the permit to use of state-owned land, the planning permit of construction project, and the planning permit of construction engineering. The construction supervision and the public bidding for general construction contractor were completed. Water and electricity on the spot are temporarily available. The National Technology R&D Base for Nuclear and Radiation Safety Regulation was in the preparatory stage of site construction.

The radiation monitoring capability was strengthened. The project of Remold of Major Nuclear Facilities Peripheral Radiation Environment Monitoring System (namely, the 21 monitoring points controlled by state) was completed, so that the monitoring data could steadily transfer to the national center for data aggregation. MEP (NNSA) issued the National Radiation Environment Monitoring Plan in 2015, carried out the regulatory monitoring for 42 major nuclear facilities under state regulation, and basically realized the Omni-bearing monitoring and early warning for national radiation environment qualities and major nuclear facilities. MEP (NNSA) enhanced the capability of monitoring team, and organized the training of monitoring key personnel and the operation training of various monitoring skills.

Regulation Strengthening

MEP (NNSA) strengthened efforts and frequentness of oversights and inspections, and strengthened the normalization of regulation. Progress was made in the development of regulations, standards and rules. The level of nuclear and radiation safety was further improved.

MEP (NNSA) approved the construction of 8 nuclear power units, approved the initial fuel loading of 6 units, and accepted siting applications of 12 units. The frame of NPPs regulation document system was formed, and the normalization of nuclear safety regulation was constantly improved. MEP (NNSA) creatively established the joint review team to ensure that reviews on the indigenously designed Chinese NPPs demonstration

project, such as HPR1000 (Hua-long Pressurized Reactor), High Temperature Gas-Cooled Reactor (HTGR), CAP1400, to be in order. MEP (NNSA) explored how to set up a new regulation mechanism for AP1000 and EPR NPPs, and well prepared for the oversight on commissioning of new type NPPs.

MEP (NNSA) coordinated and promoted the seismic evaluation of relevant facilities in The 404 Co., Ltd CNNC, and accelerated the establishment of categorizing principles and basic safety requirements for nuclear fuel cycle facilities. MEP (NNSA) carried forward the treatment and disposal of radioactive wastes left in the past, and promoted the implementation of overall planning on the decommissioning of “two plants and three institutes” and the management and disposal of their radioactive wastes. MEP (NNSA) promoted special projects of Radiation Environment Status Investigation and Assessment of Nationwide Nuclear Bases and Nuclear Facilities, and made orderly progress and phased achievements in all projects. MEP (NNSA) actively put forward the siting and constructing of low and intermediate level waste disposal sites. MEP (NNSA) upgraded the National Radiation Safety Management System of Nuclear Technology Utilization, and coordinated and improved the security level of national urban radioactive waste Storages. MEP (NNSA) closely followed the design and construction of large Chinese spent fuel assembly transport cask.

Post-Fukushima improvement actions were well implemented, and all safety improvement requirements on NPPs and research reactors were completed. Improvement actions on the nuclear fuel cycle and the nuclear technology utilization covered new projects and were basically completed.

MEP (NNSA) carried out the regulation on nuclear safety equipment with strict discipline and in accordance with the law, revised the process and system of regulation, improved the procedure of review and approval, and enhanced the access threshold of equipment license. The number of nuclear safety equipment licensee will be kept at about 200. MEP (NNSA) dealt with violation behavior of nuclear safety equipment manufactures in accordance with the law.

MEP (NNSA) actively explored and optimized the mechanism of personnel qualification management, further simplified review and approval procedures, improved review and approval links, and enhanced the efficiency. MEP (NNSA) carried out extensive surveys, and made comments and suggestions on the psychological evaluations and mental health management of Chinese operators in NPPs. MEP (NNSA) strengthened the technical ability education for regulator staff, and held the first NDT training class in the nuclear safety system.

MEP (NNSA) developed the Public Communication Work Program of Nuclear and Radiation Safety, put forward establishing a sound public communication mechanism for integrating the popularization of science, the information transparency, the public participation, and the public sentiments response into a four-in-one system. MEP (NNSA) urged planned nuclear power projects to communicate with local governments efficiently and effectively, ensured the public rights of knowing the facts, participating, and overseeing, so as to steadily perform the licensing of planned nuclear power projects.

MEP (NNSA) timely gave feedback the lessons learned from the Tianjin 8/12 major hazardous chemical substance safety accident, carried out nuclear and radiation safety inspections on nuclear facilities, nuclear technology application, nuclear equipment manufacture, and uranium mining and milling facilities, timely found and eliminated potential safety hazards, and made a comprehensive supervision on the nuclear and radiation safety regulation task implemented by the department of environmental protection in some provinces.

Development of Nuclear Safety Culture

MEP (NNSA) carried out a one-year special action on the publicity of nuclear safety culture, developed the nuclear safety culture evaluation system, and laid the foundation for following evaluation activities and improvements of licensees' nuclear safety culture.

2 Policies, Plans, Regulations and Standards

In 2015, MEP (NNSA) actively suppported Environment and Resources Committee of National People's Congress to develop the Nuclear Safety Act (Draft for Experts Comments), in order to effectively promote the process of legislation of Nuclear Safety Act. Nuclear safety regulation coordination mechanism was further improved, MEP (NNSA) respectively set up the communication and coordination mechanism with National Energy Administration and Administration of Science, Technology and Industry for National Defense. MEP(NNSA) formed the 13th Five-Year Plan and 2025 Long-Term Goals on Nuclear Safety and Radioactive Pollution Prevention and Control (Draft for Experts Comments), and prepared for the final assessment of the 12th five-year planning of nuclear safety. MEP (NNSA) actively cooperated with Ministry of Science and Technology to complete the development of Key Implementation Plans of Nuclear Safety and Advanced Nuclear Energy Technology, which is under the national plans of research and development. The preparation of relevant contents of nuclear safety in the 13th Five-Year Technology Plan of MEP was completed. MEP (NNSA) further improved the standard system and the management mechanism of nuclear and radiation safety, and prepared the 13th Five-Year Plan of Nuclear and Radiation Safety Standards (First Draft).

Nuclear Safety Legislation

MEP (NNSA) held seminars on nuclear safety legislation, and carried out four research projects, including nuclear safety responsibilities, nuclear safety standards, nuclear security, and nuclear damage compensation. MEP (NNSA) also carried out research on foreign nuclear energy management system and regulation system, and completed the research report which was a part of legislation basis of nuclear safety act, MEP (NNSA) supported Environment and Resources Committee of National People's Congress to prepare the Nuclear Safety Act.

System Innovation

MEP (NNSA) strengthened the nuclear

safety regulatory cooperation, and signed the memorandum with Administration of Science, Technology and Industry for National Defense to clarify the regulation scope and to enhance communication and coordination, so as to consolidate the foundation of performing national nuclear safety regulatory responsibilities and guaranteeing the safe and healthy development of nuclear industry. MEP (NNSA) also set up a regular coordination mechanism with Administration of Science, Technology and Industry for National Defense to strengthen the information sharing and the cooperation and coordination.

Policy Research

MEP (NNSA) carried out research on nuclear safety policy system , and continued to carry out innovation research on theory system of nuclear and radiation safety, to build a theoretical framework of the Modernization of Nuclear and Radiation Safety Regulation System and Abilities, and to enrich the theoretical conceptions of nuclear and radiation safety regulation system.

Nuclear Safety Planning

MEP (NNSA) carried out research projects on 10 fields related to the 13th five-year planning, including radioactive pollution prevention of associated radioactive minerals, spent fuel reprocessing, application of risk-informed nuclear safety regulation strategy, nuclear safety personnel training, etc., and formed research documents. A plan developing group was established, which included 13 organizations such as China Academy of Engineering Physics, China National Nuclear Corporation, China General Nuclear Power Corporation, State Nuclear Power Technology Corporation, China Nuclear Energy Association, and Tsinghua University. The group completed concentrated writing for 3 times, and formed the 13th Five-Year Plan and 2025 Long-Term Goals on Nuclear Safety and Radioactive Pollution Prevention and Control (Draft for Experts Comments). MEP (NNSA) actively participated in the writing of the 13th Five-Year Plan on National Ecological Environment Protection, and carried out technical preparation for final assessment of the 12th five-year planning of nuclear safety, and formed evaluation guidance documents.

The Development of Regulations and Standards

MEP (NNSA) prepared the Five-Year Plan of developing Nuclear and Radiation Safety Regulations (2016-2020), and held four meetings of the expert committee for reviewing nuclear and radiation safety regulations and standards (see Table 1 to Table 4), on which 46 drafts of department rules, guides, standards, and technical documents were reviewed. MEP (NNSA) quarterly published the Status Report on Nuclear and Radiation Safety Regulations .

MEP (NNSA) solved the issue of standard management mechanism. After the positive communication with Science and Technology Department of MEP, Department of Nuclear Facility Safety Regulation of MEP formed the specific working ideas of nuclear and radiation safety standard management, and determined duties and key points of the follow-up work. MEP (NNSA) promoted endorsements of nuclear power standards in energy industry, and endorsed the Requirements on Overpressure Analysis for Reactor Coolant System and Main Steam System of Pressurized Water Reactor Nuclear Power Plant (NB/T 20100), MEP (NNSA) further improved the standard system of nuclear and radiation safety, and developed the draft of 13th Five-Year Plan of Nuclear and Radiation Safety Standards, and clarified the current national standards of nuclear and radiation safety. MEP (NNSA) completed approvals for 4 standards, including the Content and Format of Environment Impact Assessment Documents of Nuclear Technology Utilization Construction Projects, the Radiation Safety Technical Specification on Electron Linear Accelerator IndusTrial CT, the High Integrity Container for Low-and-Medium Level Radioactive Wastes, and Safety Standards on the Low-and-Medium Level Radioactive Solid Waste Package.

Table 1. The First Review Meeting of Nuclear and Radiation Safety Regulations and Standards in 2015

Title	Category	Stage	Author	Review Group	Result
Safety Rules of Nuclear Power Plant Quality Assurance	Department rule	Draft for review	Nuclear and Radiation Safety Center, MEP	Nuclear safety group	Agreed
Safety Rules of Decommissioning	Department rule	First draft for approval	Nuclear and Radiation Safety Center, MEP	General committee	Agreed
Requirements on Regulation for Non-conformance Items in Civilian Nuclear Safety Equipment Manufacture Stage (Trial)	Normative document	—	China Productivity Center for Machinery	General committee	Agreed
Manufacturing Organization Qualification of Pressure Vessel at Nuclear Class 2 and 3 of Civilian Nuclear Safety Equipment (Trial)	Normative document	—	Nuclear and Radiation Safety Center, MEP	General committee	Agreed

continued

Title	Category	Stage	Author	Review Group	Result
Manufacturing Organization Qualification of Nuclear Class Pipe Fittings of Civilian Nuclear Safety Equipment (Trial)	Normative document	—	Nuclear and Radiation Safety Center, MEP	General committee	Agreed
Manufacturing Organization Qualification of Shell-and-Tube Exchanger at Nuclear Class 2 and 3 of Civilian Nuclear Safety Equipment (Trial)	Normative document	—	Nuclear and Radiation Safety Center, MEP	General committee	Agreed
Design and Manufacturing Organization Qualification of Cable at 1E Class of Civilian Nuclear Safety Equipment (Trial)	Normative document	—	Nuclear and Radiation Safety Center, MEP	General committee	Agreed
Program on Nondestructive Test Technical Competence Verification of In-service Inspection for Nuclear Power Plant (Trial)	Normative document	—	North China Regional Office of NNSA	General committee	Agreed
Concrete Container of High Integrity for Low-and-Medium Level Solid Radioactive Wastes	Standard	First draft for approval	China Nuclear Power Engineering Co., Ltd	General committee	Agreed
Ductile Cast Iron Container of High Integrity for Low-and-Medium Level Solid Radioactive Wastes	Standard	First draft for approval	China Nuclear Power Engineering Co., Ltd	General committee	Agreed
Cross Linked High Density polyethylene Container of High Integrity for Low-and-Medium Level Solid Radioactive Wastes	Standard	First draft for approval	China General Nuclear Power Corporation	General committee	Agreed
Radioactive Waste Minimization of Nuclear Power Plants	Guide	Draft for review	China Nuclear Power Engineering Co., Ltd	Radiation safety group	Agreed
Emergency Response Plan and Preparation for Radioactive Material Transportation Accident	Guide	Draft for review	Institute for Standardization of Nuclear Industry	Radiation safety group	Agreed
Technical Guide for Radiation Monitoring of Radioactive Material Transportation Package and Transportation Vehicle	Technical document	First draft for approval	Beijing Radiation Safety Technology Center	General committee	Agreed

Table 2. The Second Review Meeting of Nuclear and Radiation Safety Regulations and Standards in 2015

Title	Category	Stage	Author	Review Group	Result
Classification Principles and Basic Safety Requirements on Civilian Nuclear Fuel Cycle Facilities (Trial)	Department rule	First draft for approval	Nuclear and Radiation Safety Center, MEP	General committee	Agreed
Criteria for Selecting Emergency Relative Parameters of Research Reactors	Standard	Draft for review	Nuclear and Radiation Safety Center, MEP	Radiation safety group	Agreed
Criteria for Selecting Emergency Relative Parameters of Pressurized Water Reactor Nuclear Power Plants	Standard	Draft for review	Nuclear and Radiation Safety Center, MEP	Radiation safety group	Agreed
Criteria for Selecting Emergency Relative Parameters of Nuclear Fuel Cycle Facilities	Standard	Draft for review	Nuclear and Radiation Safety Center, MEP	Radiation safety group	Agreed
Physical Protection for Nuclear Facilities	Guide	Draft for review	Beijing Research Institute of Chemical Engineering and Metallurgy	Nuclear safety group	Rejected
Development and Application of Safety Analysis Computer Software of Nuclear Power Plant	Guide	Draft for review	State Nuclear Power Research Institute	Nuclear safety group	Agreed
Emergency Preparedness and Emergency Response of Radioactive Material Transportation Accident	Guide	First draft for approval	Institute for Standardization of Nuclear Industry	General committee	Agreed
Video Monitoring System of Physical Protection for Nuclear Facilities	Guide	Draft for approval	Nuclear and Radiation Safety Center, MEP	General committee	Agreed
Five-Year Plan of Developing Nuclear and Radiations Safety Regulations (2016-2020)	—	Draft for review	Department of Nuclear Facility Safety Regulation of MEP	General committee	Agreed

Table 3. The Third Review Meeting of Nuclear and Radiation Safety Regulations and Standards in 2015

Title	Category	Stage	Author	Review Group	Result
Rules of Qualification Managenot of Nondestructive Test Personnel of Civilian Nuclear Safety Equipment	Department rule	Draft for review	Nuclear and Radiation Safety Center, MEP	Nuclear equipment group	Agreed
Rules of License Management for Operators of Research Reactors	Department rule	Draft for review	China Institute of Atomic Energy	Nuclear safety group	Agreed

continued

Title	Category	Stage	Author	Review Group	Result
Safety Rules of Nuclear Power Plant Quality Assurance	Department rule	First draft for approval	Nuclear and Radiation Safety Center, MEP	General committee	Agreed
Technical Guidelines for Environmental Impact Assessment - Format and Content of Environmental Impact Reports for Nuclear Power Plants	Standard	Draft for review	Nuclear and Radiation Safety Center, MEP	Radiation safety group	Agreed
Technical Specifications for Environmental Radiological Background Survey before Operation for Nuclear Power Plants	Standard	Draft for review	Nuclear and Radiation Safety Center, MEP	Radiation safety group	Agreed
Emergency Relative Parameters Selecting for Pressurized Water Reactor Nuclear Power Plants	Standard	First draft for approval	Nuclear and Radiation Safety Center, MEP	General committee	Agreed
Selecting Emergency Relative Parameters for Research Reactors	Standard	First draft for approval	Nuclear and Radiation Safety Center, MEP	General committee	Rejected
Selecting Emergency Relative Parameters for Nuclear Fuel Cycle Facilities	Standard	First draft for approval	Nuclear and Radiation Safety Center, MEP	General committee	Rejected
Requirements on Safety and Protection System of City Radioactive Waste storages	Guide	Draft for review	The Fourth Research and Design Engineering Corporation of CNNC	Radiation safety group	Agreed
Radioactive Waste Minimization of Nuclear Power Plants	Guide	First draft for approval	China Nuclear Power Engineering Co., Ltd	General committee	Agreed
Development and Application of Safety Analysis Computer Software of Nuclear Power Plants	Guide	First draft for approval	State Nuclear Power Research Institute	General committee	Agreed
Five-Year Plan of Developing Nuclear and Radiation Safety Regulations (2016-2020)	—	—	Department of Nuclear Facility Safety Regulation of MEP	General committee	Agreed

Table 4. The Fourth Review Meeting of Nuclear and Radiation Safety Regulations and Standards in 2015

Title	Category	Stage	Author	Review Group	Result
Rules of License Management for Operators of Research Reactors	Department rule	First draft for approval	China Institute of Atomic Energy	General committee	Agreed
Rules of Qualification Managemot of Nondestructive Test Personnel of Civilian Nuclear Safety Equipment	Department rule	First draft for approval	Nuclear and Radiation Safety Center, MEP	General committee	Agreed
Requirements on Safety and Protection System of City Radioactive Waste storges	Guide	First draft for approval	The Fourth Research and Design Engineering Corporation of CNNC	General committee	Agreed
Technical Guidelines for Environmental Impact Assessment Format and Content of Environmental Impact Reports for Nuclear Power Plants	Standard	First draft for approval	Nuclear and Radiation Safety Center, MEP	General committee	Agreed
Emergency Related Parameters for Research Reactors	Standard	First draft for approval	Nuclear and Radiation Safety Center, MEP	General committee	Agreed
Emergency Related Parameters for Nuclear Fuel Cycle Facilities	Standard	First draft for approval	Nuclear and Radiation Safety Center, MEP	General committee	Agreed
Requirement on Anti-seismic Margin Assessment for Pressurized Water Reactor Nuclear Power Plants	NB Standard	—	Nuclear and Radiation Safety Center, MEP	General committee	confirmed
Single Failure Criteria for Safety-Important Fluid Systems of Pressurized Water Reactor Nuclear Power Plants	NB Standard	—	Nuclear and Radiation Safety Center, MEP	General committee	confirmed
Sub-compartment Pressure and Temperature Transient Analysis in Pressurized Water Reactor Nuclear Power Plants	NB Standard	—	Nuclear and Radiation Safety Center, MEP	General committee	confirmed
Pressure and Temperature Transient Analysis for Pressurized Water Reactor Nuclear Power Plant Containments	NB Standard	—	Nuclear and Radiation Safety Center, MEP	General committee	confirmed
Containment Isolation Device for Fluid System after Loss of Coolant Accident	NB Standard	—	Nuclear and Radiation Safety Center, MEP	General committee	confirmed

Nuclear Safety Scientific Research

MEP (NNSA) cooperated with Ministry of Science and Technology and developed the Implementation Plan of Nuclear Safety and Advanced Nuclear Energy Technologies which was under national key research and development plans. MEP (NNSA) developed nuclear safety related contents of the 13th Five-Year Science and Technology Plan of MEP, and organized key technology researches on safety review of large advanced pressurized water reactor, modular small reactor, and the fourth generation advanced reactor.

3 Safety Regulation on Nuclear Power Plants

In 2015, operating NPPs had no radioactive events endangering the safety of the public and the environment. The monitoring indicators over the year showed that the integrity of safety barriers was in good condition.

The operating data of NPPs in 2015 is shown in Table 5, and the issuance and renewal of NPP operator license in 2015 is shown in Table 6.

Vice Minister of MEP, Administrator of NNSA, Li Ganjie, Inspected Fuqing NPP

Table 5. Operating Data of NPPs in 2015

NPP Name	Generated Energy (TWh)	Unit	Unit No.	Nominal Power (MWe)	Unit Generated Energy (TWh)	Unit Load Factor (%)	Unit Capacity Factor (%)
Qinshan	2.571,6	1	CN01	310	2.571,6	91.74	90.92
Qinshan Phase II	20.285,3	1	CN04	650	5.085,6	89.31	88.93
		2	CN05	650	5.196,7	91.27	90.84
		3	CN14	660	4.829,2	83.53	85.60
		4	CN15	660	5.173,8	89.49	90.65
Qinshan Phase III	11.234,9	1	CN08	728	5.144,6	80.67	83.17
		2	CN09	728	6.090,3	95.50	97.47
Fangjiashan	15.168,2	1	CN24	1,089	7.634,4	80.03	83.68
		2	CN25	1,089	7.533,8	82.78	93.89
Daya Bay	15.425	1	CN02	984	6.866	79.65	78.83
		2	CN03	984	8.559	99.30	98.65
Ling'ao	32.279	1	CN06	990	7.491	86.37	86.80
		2	CN07	990	7.893	91.01	93.64
		3	CN12	1,086	8.458	88.90	90.10
		4	CN13	1,086	8.437	88.69	90.29

continued

NPP Name	Generated Energy (TWh)	Unit	Unit No.	Nominal Power (MWe)	Unit Generated Energy (TWh)	Unit Load Factor (%)	Unit Capacity Factor (%)
Tianwan	15.61	1	CN10	1,060	8.43	91.68	91.07
		2	CN11	1,060	7.18	88.99	88.22
Hongyanhe	14.246,1	1	CN16	1,119	8.092,4	82.57	87.75
		2	CN17	1,119	3.847,7	39.26	69.53
		3	CN26	1,119	2.306	22.95	99.97
Ningde	20.231,5	1	CN18	1,089	8.197,5	85.93	88.22
		2	CN19	1,089	7.033	73.72	80.73
		3	CN34	1,089	5.001	81.67	94.37
Fuqing	8.339	1	CN20	1,089	6.569	69.05	74.09
		2	CN21	1,089	1.770	89.09	99.06
Yangjiang	12.957,3	1	CN22	1,086	7.502,5	78.86	79.45
		2	CN23	1,086	5.444,8	99.94	99.64
Changjiang	0.437,3	1	CN36	650	0.437,3	65.95	100

Table 6. NPP Operator License Issuance and Renewal in 2015

NPP Name	Fresh (individuals)		Renewal (individuals)		Subtotal (individuals)
	Operators	Advanced Operators	Operators	Advanced Operators	
Qinshan	0	7	35	15	57
Qinshan Phase II	10	7	21	52	90
Qinshan Phase III	7	13	25	28	73
Fangjiashan	0	0	0	0	0
Daya Bay	14	8	17	26	65
Ling'ao NPP Unit 1 and Unit 2	21	10	16	22	69
Ling'ao NPP Unit 3 and Unit 4	21	10	18	31	80
Tianwan NPP Unit 1 and Unit 2	9	37	36	30	112
Hongyanhe NPP Unit 1 and Unit 2	6	17	12	2	37
Ningde NPP Unit 1 and Unit 2	17	15	2	0	34
Total	105	124	182	206	617

Qinshan NPP

In 2015, Qinshan NPP was kept in stable operation and in safety state. Safety barriers were kept intact. The failure of fuel element, the leakage rate of primary loop pressure boundary, and the leakage rate of containment were all within the specified limits. The 16th refueling overhaul was completed.

Nuclear safety-related regulatory approvals for Qinshan NPP are shown in Table 7, and inspection activities for Qinshan NPP are shown in Table 8. One operating event occurred in Qinshan NPP, as shown in Table 9. The radiation protection doses of Qinshan NPP are shown in Table 10.

Table 7. Nuclear Safety-Related Regulatory Approvals for Qinshan NPP in 2015

Approval Date	Document No.	Document Title
02/16/15	NNSA[2015]37	Notification of Approving the Design Function Modification on Valve of NaOH Addition in Spray System of Qinshan NPP
05/14/15	NNSA[2015]102	Notification of Approving the Type Modification for the Rapid Response Platinum Resistance Thermometer for Bypass Main System of Qinshan NPP
05/29/15	NNSA[2015]109	Notification of Approving the Domestic Alternative of the O-shape Seal Spacer for RPV of Qinshan NPP
06/19/15	NNSA[2015]116	Notification of Approving the Modification of Nuclear grade Iodine Exhaust Radiation Monitoring System of Qinshan NPP
06/19/15	NNSA[2015]117	Notification of Approving the Modification of On-site Control Box for Isolate Valve on Auxiliary Feed water Outlet Branch of Qinshan NPP
07/01/15	NNSA[2015]125	Notification of Approving the Output Function Optimization of Nuclear Instrument System outside the Reactor and Upgrade of Software Platform for Reactor Digital Protection System of Qinshan NPP
07/01/15	NNSA[2015]126	Notification of Approving the Change for Damaged Fuel Radiation Monitoring System of Qinshan NPP
07/01/15	NNSA[2015]127	Notification of Approving of the Type Modification for Root Valve on Main Pipeline Coolant of Qinshan NPP
08/18/15	NNSA[2015]166	Notification of Approving of the Type Modification for Nitrogen Valve of Safety Injection Tank of Qinshan NPP
09/15/15	NNSA[2015]192	Notification of Approving the Modification for the Pressurizer Water Level Setting by Choosing High Average Temperature of Qinshan NPP
11/23/15	NNSA Notice[2015]125	Reply to Approve the Quality Assurance Programs of Operation of Qinshan NPP, Qinshan NPP Phase II, III, and Fangjiashan NPP

Table 8. Inspection Activities for Qinshan NPP in 2015

Start Date	Item	Main Contents of the Inspection
05/04/15	Special inspection on emergency diesel system and AAC power system of Qinshan NPP	System operation, checking and assurance of system safety function and safety settings, implementation of technical specifications, treatment for system abnormal items and events, prevention maintenance, implementation of periodic tests, operation procedures, temporary design documents change and temporary operation procedures management, spare components management, design changes and technological modification
07/27/15	Special inspection on the protection for adverse weather in Qinshan Nudear Power Base	Preparation of the off-site and backup AC power system in summer, assessment for seasonal extreme weather preparation, assessment for the coming adverse weather preparation, assessment for the extreme flood preparation

continued

Start Date	Item	Main Contents of the Inspection
08/10/15	Special inspection on the use of fasteners	Checking the investigation result of fasteners in Qinshan Base manufactured by Zhejiang Gaoqiang Fasteners Company, checking the investigation result of fasteners in Qinshan Base manufactured by Shaoxing Shannai Fasteners Company, and investigation results of other fastener manufactures and experience feedback
08/17/15	Routine inspection on preparation of the 106 refueling overhaul of Qinshan NPP	Preparation on the 16th refueling overhaul, implementation of safety management requirements since the 15th refueling overhaul, questions to discussin the 16th refueling overhaul report
09/21/15	Regulatory inspection before re-criticality after the 106 refueling overhaul of Qinshan NPP	Unit operation during the last cycle, quality assurance and quality control management of nuclear safety during the overhaul, emergency preparedness, radiation protection and radioactive waste management during the overhaul, implementation of refueling overhaul, implementation of technical specifications and important abnormal event during the overhaul, preparation of re-criticality after the overhaul

Table 9. The Operating Event of Qinshan NPP in 2015

Event Date	Title	Cause	INES Level
05/06/15	False action of special safety equipment during the event treatment for 3#/4# trip fault of circuit breaker on 300 thousand kW unit	Equipment failure	0

Table 10. Radiation Protection Doses of Qinshan NPP in 2015

Unit	Annual Man Average Effective Dose (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man·Sv)	Normalized Collective Effective Dose (man·mSv/Gwh)
300MW Unit	0.201	4.278	0.405	0.157,0

Qinshan NPP Phase II

In 2015, 4 units of Qinshan NPP Phase II were kept in stable operation and in safety state. Safety barriers were kept intact. The failure of fuel element, the leakage rate of the primary loop pressure boundary, and the leakage rate of the containment were all within the specified limits. The 12th refueling overhaul of unit 1 and the 5th refueling overhaul of unit 3 were completed.

Nuclear safety-related regulatory approvals for Qinshan NPP Phase II are shown in Table 11, and inspection activities for Qinshan NPP Phase II are shown in Table 12. Four operating events occurred in Qinshan NPP Phase II, as shown in Table 13. The radiation protection doses of Qinshan NPP Phase II are shown in Table 14.

Table 11. Nuclear Safety-Related Regulatory Approvals for Qinshan NPP Phase II in 2015

Approval Date	Document No.	Document Title
01/29/15	NNSA[2015]24	Notification of Approving the Release of the Re-criticality Control Point after the 3rd Refueling Overhaul of Qinshan NPP Phase II Unit 4
02/16/15	NNSA[2015]36	Notification of Approving the Prevention Maintenance of the Cooling and Processing System Valves of the Spent Fuel Pool of Qinshan NPP Phase II
03/20/15	NNSA[2015]60	Notification of Approving to Remove Parts of the Two-Way Fence on the South of the No.1 Gantry of Unit1 during the 112 Overhaul of Qinshan NPP Phase II
04/23/15	NNSA[2015]81	Notification of Approving the Change of Corrosion Inhibitor for Cooling Water System (RRI) of Qinshan NPP Phase II Unit 3 and Unit 4
06/19/15	NNSA[2015]118	Notification of Approving the Release of Re-criticality Control Point after the 12th Refueling Overhaul of Qinshan NPP Phase II Unit 1
06/19/15	NNSA[2015]119	Notification of Approving the Inspection Requirements Modification for the Periodical Tests for Safety-Related Systems of Qinshan NPP Phase II Unit 3 and Unit 4
06/29/15	NNSA[2015]124	Notification of Approving the Addition of the Test Methods of the Dynamic Rod Scaling of Qinshan NPP Phase II
07/27/15	NNSA[2015]138	Notification of Approving the Temporary Removal of Parts of Control Zone Fences of Qinshan NPP Phase II Unit 1 and Unit 2
09/14/15	NNSA[2015]189	Notification of Approving the Addition of Physical Protection Devices and Radiation Monitoring Equipment in Control Zones of Qinshan NPP Phase II
09/14/15	NNSA[2015]191	Notification of Approving the Addition of the Second Kind of Intrusion Detector in Control Zones of Qinshan NPP Phase II Unit 1 and Unit 2
10/16/15	NNSA[2015]213	Notification of Approving the Core Temperature and Water-Level Monitoring System Transformation of Qinshan NPP Phase II Unit 1 and Unit 2
12/08/15	NNSA[2015]260	Notification of Approving the Version C of FSAR and Other License Documents of Qinshan NPP Phase II Unit 3 and Unit 4
12/18/15	NNSA[2015]269	Notification of Approving the Release of Re-criticality Control Point after the 5th Refueling Overhaul of Qinshan NPP Phase II Unit 3
12/26/15	NNSA[2015]276	Notification of Approving the Adjustment Plan for Multi-frequency Rotating Pancake Coil (MRPC) Inspection for Steam Generator Tubes of Qinshan NPP Phase II Unit 1 to Unit 4

Table 12. Inspection Activities for Qinshan NPP Phase II in 2015

Start Date	Item	Main Contents of the Inspection
01/26/15	Regulatory inspection before re-critically after the 403 refueling overhaul in Qinshan NPP Phase II	Unit operation during the last cycle, quality assurance and quality control management of nuclear safety during the overhaul, emergency preparedness, radiation protection and radioactive waste management during the overhaul, implementation of refueling overhaul, implementation of technical specifications and important events during the overhaul, preparation of re-criticality conditions after the overhaul
05/21/15	Routine inspection on preparation of the 112 refueling overhaul in Qinshan NPP Phase II	Preparation on the 12th refueling overhaul, implementation of nuclear safety requirements after the 304 refueling overhaul, questions to discuss and assure in the 12th refueling overhaul report
06/18/15	Regulatory inspection before the re-critically after the 112 refueling overhaul in Qinshan NPP Phase II	Unit operation during the last cycle, quality assurance and quality control management of nuclear safety during the overhaul, emergency preparedness, radiation protectionand radioactive waste management during the overhaul, implementation of refueling overhaul, implementation of technical specifications and important events during the overhaul, preparation of re-criticality conditions after the overhaul
08/07/15	Special inspection on ASG system of Qinshan NPP Phase II unit 3 and unit 4	System operation, checking and assurance for system safety function and safety settings, implementation of technical specifications, important system abnormal items, and events, treatment for them, prevention maintenance, implementation of periodic tests, spare components management, design changes and technological reformation
11/16/15	Special inspection on preparation of the 305 refueling overhaul of Qinshan NPP Phase II	Preparation for the 5th refueling overhaul, implementation of management requirements since the 403 refueling overhaul, questions to discuss and assure in the 12th overhaul report, disposal of solid radioactive waste, treatment, storage, and transport of radioactive waste of the 2nd factory of the China Nuclear Operation Company
12/14/15	Regulatory inspection before re-critically after the 305 refueling overhaul in Qinshan NPP Phase II	Unit operation during the last cycle, quality assurance and quality control management of nuclear safety during the overhaul, emergency preparedness, radiation protection and radioactive waste management during the overhaul, implementation of refueling overhaul, implementation of technical specifications and important events during the overhaul, preparation of re-criticality conditions after the overhaul
12/21/15	Special inspection on preparation of the 404 refueling overhaul in Qinshan NPP Phase II	Preparation for the 4th overhaul, implementation of management requirements after the 112 refueling overhaul, questions to discuss and assure in the 4th overhaul report

Table 13. Operating Events of Qinshan NPP Phase II in 2015

Event Date	Title	Cause	INES Level
06/14/15	Automated shutdown of unit 2 caused by control card failure of main feed water pump B	Equipment failure	0
07/25/15	Automated shutdown of unit 1 caused by the main steam valve fault	Equipment failure	0

continued

Event Date	Title	Cause	INES Level
09/21/15	Automated shutdown caused by the high vibration of turbine bearing of unit 3 and water quality deterioration in the second loop	Equipment failure	0
12/18/15	Shutdown breaker of column A automatically opened during the implementation of T2 logic test on unit 3 during the overhaul	Equipment failure	0

Table 14. Radiation Protection Doses of Qinshan NPP Phase II in 2015

Unit	Annual Man Average Effective Dose (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man·Sv)	Normalized Collective Effective Dose (man·mSv/Gwh)
Unit 1 and Unit 2	0.145	3.750	0.367	0.035,7
Unit 3 and Unit 4	0.119	4.244	0.316	0.031,6

Qinshan NPP Phase III

In 2015, 2 units of Qinshan NPP Phase III were kept in stable operation and in safety state. Safety barriers were kept intact. The failure of fuel element, the leakage rate of the primary loop pressure boundary, and the leakage rate of the containment were all within the specified limits. The 8th refueling overhaul of unit 1 was completed.

Nuclear safety-related regulatory approvals for Qinshan NPP Phase III are shown in Table 15, and inspection activities for Qinshan NPP Phase III are shown in Table 16. Two operating events occurred in Qinshan NPP Phase III, as shown in Table 17. The radiation protection doses are shown in Table 18.

Table 15. Nuclear Safety-Related Regulatory Approvals for Qinshan NPP Phase III in 2015

Approval Date	Document No.	Document Title
02/16/15	NNSA[2015]35	Notification of Approving to Regroup Areas of Over Power Protection of the Qinshan NPP Phase III
05/15/15	NNSA[2015]105	Notification to Release the Re-criticality Control Point after the 8th Overhaul of Qinshan NPP Phase III Unit 1
12/11/15	NNSA[2015]263	Notification of Approving the Addition of Exhaust Valve for Pump Outlet Pipe of Cooling Water Recirculation System of Qinshan NPP Phase III
12/11/15	NNSA[2015]264	Notification of Approving the Partial Revision of the Technical Specification for Qinshan NPP Phase III
12/12/15	NNSA[2015]262	Notification of Approving the Modification of Protection Device for Auxiliary Power Distribution System of Qinshan NPP Phase III

Table 16. Inspection Activities for Qinshan NPP Phase III in 2015

Start Date	Item	Main Contents of the Inspection
03/23/15	Special inspection on preparation for the 108 refueling overhaul of Qinshan NPP Phase III	Overhaul management, overhaul content, implementation of nuclear safety requirements after the 207 refueling overhaul
05/12/15	Regulatory inspection before re-criticality after the 108 overhaul of Qinshan NPP Phase III	Operation during the last cycle, quality control, quality assurance activities, and implementation of nuclear safety supervision during the overhaul, emergency preparedness during the overhaul, radiation protection and implementation of radioactive waste management during the overhaul, implementation of refueling overhaul, implementation of technical specification and important events during the overhaul, preparation of re-criticality conditions
08/17/15	Special inspection on radiation protection of Qinshan NPP Phase III	Inspection and assessment fo rtritium monitoring and control, summary and assessment for occupational exposure of tritium pollution event, tritium environmental emissions, environmental monitoring data and emission application values, environmental capacity
08/28/15	Special inspection on core cooling emergency system of Qinshan NPP Phase III	System abnormal items, events, and treatment,implementation of technical specifications, prevention maintenance, implementation of periodic tests, operation procedures and modification management of temporary design changes, management of spare components, design changes and technological reformation

Table 17. Operating Events of Qinshan NPP III in 2015

Event Date	Title	Cause	INES Level
03/06/15	The frequency of fire hydrant checks does not meet the inspection requirements of the technical specification	Human error	0
06/16/15	Timeout of unavailable time for fire alarm system for Qinshan NPP Phase III unit 2	Equipment failure	0

Table 18. Radiation Protection Doses of Qinshan NPP Phase III in 2015

Unit	Annual Man Average Effective Dose (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man·Sv)	Normalized Collective Effective Dose (man·mSv/Gwh)
Unit 1 and Unit 2	0.371	4.964	0.804	0.071,6

Qinshan NPP Expansion Project (Fangjiashan NPP)

In 2015, 2 units of Fangjiashan NPP were kept in stable operation and in safety state. Safety barriers were kept intact. The failure of fuel element, the leakage rate of the primary loop pressure boundary, and the leakage

rate of the containment were all within the specified limits. The 1st refueling overhaul of unit 1 was completed.

Nuclear safety-related regulatory approvals for Fangjiashan NPP are shown in Table 19, and inspection activities for Fangjiashan NPP are shown in Table 20. Two operating events occurred in Fangjiashan NPP, as shown in Table 21. The radiation protection doses of Fangjiashan NPP are shown in Table 22.

Table 19. Nuclear Safety-Related Regulatory Approvals for Fangjiashan NPP in 2015

Approval Date	Document No.	Document Title
08/10/15	NNSA[2015]146	Notification of Approving the Modification of On-site Junction Box for the Pressure Vessel Heater of Qinshan NPP Expansion Project
08/10/15	NNSA[2015]148	Notification of Approving the Type Modification on Shellfish Trap Isolation Valve for Qinshan NPP Expansion Project
08/25/15	NNSA[2015]176	Notification of Approving the Interruption of Spent Fuel Pool Cooling during Containment Pressure Test in Qinshan NPP Expansion Project
09/14/15	NNSA[2015]188	Notification of Approving to Increase the Enrichment of Refueling Fuel of Qinshan NPP Expansion Project Unit 1 and Unit 2
09/16/15	NNSA[2015]195	Notification of Approving the Addition of Manual Isolation Valve on Containment Spray System of Qinshan NPP Expansion Project Unit 1 and Unit 2
09/30/15	NNSA[2015]204	Notification of Approving the Addition of Engineers' Station and Associated Facilities of Qinshan NPP Expansion Project (Fangjiashan NPP) Unit 1 and Unit 2
09/30/15	NNSA[2015]205	Notification of Approving the Type Change of the Temperature Bypass Isolation Valve on Main System of Qinshan NPP Expansion Project Unit 1 and Unit 2
10/22/15	NNSA[2015]219	Notification of Approving the Software Modification for Digital Control System of Qinshan NPP Expansion Project (Fangjiashan NPP) Unit 1 and Unit 2
11/09/15	NNSA[2015]224	Notification of Approving the Refueling Project of Qinshan NPP Expansion Project (Fangjiashan NPP)
11/09/15	NNSA[2015]226	Notification of Approving the Addition of the Dynamic Rod Scaling Test Method for Qinshan NPP Expansion Project (Fangjiashan NPP)
11/10/15	NNSA[2015]229	Notification of Approving the Modification of Technical Specification of Qinshan NPP Expansion Project (Fangjiashan NPP)
11/20/15	NNSA[2015]240	Notification of Approving the Domestic Alternative for Type C Sealing Ring of PRV of Qinshan NPP Expansion Project (Fangjiashan NPP) Unit 1
11/25/15	NNSA[2015]246	Notification of Approving the Design Modification of Fixture Used in the Bottom Seal Welds of CRDM for Qinshan NPP Expansion Project (Fangjiashan NPP)
11/30/15	NNSA[2015]255	Notification of Approving the Release of the Re-criticality Control Point after the 1st Refueling Overhaul of Qinshan NPP Expansion Project (Fangjiashan NPP) Unit 1

Table 20. Inspection Activities for Fangjiashan NPP in 2015

Start Date	Item	Main Contents of the Inspection
01/26/15	Routine inspection on 97% power of Qinshan NPP Expansion Projection (Fangjiashan NPP) unit 2	Completion of commissioning project, operation management, implementation of technical specification, treatment of operation events, non-conformance items and defects treatment of system and equipment, implementation of license conditions, application documents and review problems, implementation of the safety requirements in previous inspections, completion of Post-Fukushima improvements
03/16/15	Inspection at 100% power and annual routine inspection for Qinshan NPP Expansion Projection (Fangjiashan NPP) unit 2	Completion of tests based on commissioning project after staying at 97% power, treatment of operation events, implementation of quality assurance program for Trial commissioning, implementation of technical specifications, implementation of management requirements on nuclear safety
07/27/15	Special inspection on fuel damage monitoring of Qinshan NPP Expansion Projection (Fangjiashan NPP) unit 1 and unit 2	Records of γ spectrum, gross α activity, and total β activity in reactor coolant system in the reactor coolant of unit 1 and unit 2 from the beginning of full power operation to July 26, 2015, online monitoring records, principle of identifying fuel damage of Fangjiashan NPP unit 1 and unit 2 by China Nuclear Operation Company, technical and management documents on fuel damage monitoring, availability of fuel damage online monitoring system, off-line monitoring system, online sipping system, and off-line sipping system, evaluation of fuel damage of Fangjiashan NPP unit 1and unit 2 by China Nuclear Operation Company
10/08/15	Routine inspection on preparation for the first overhaul of Qinshan NPP Expansion Projection (Fangjiashan NPP) unit 1	Overhaul management, overhaul contents, implementation of nuclear safety requirements, questions to coordinate in the 1st overhaul report review of unit 1, treatment of DCS important abnormal items and experience feedback of Fangjiashan NPP
11/11/15	Investigation on the event of unavailability of the KIC operator station of Qinshan NPP Expansion Projection (Fangjiashan NPP) unit 2	Cause of the event of unavailability of KIC operator station at Fangjiashan NPP unit 2, improvement measures,10 records related to KIC since the first cycle of unit 1 and unit 2, and abnormal defects, causes, treatment measures, and results of I0 and abnormal defects (such as software, hardware, communication problems or incompliance to the TS requirements)
11/25/15	Regulatory inspection on re-criticality after the first overhaul of Qinshan NPP Expansion Projection (Fangjiashan NPP) unit 1	Operation during the first fuel cycle, quality assurance and quality control management of nuclear safety during the overhaul, emergency preparedness, radiation protection and radioactive waste management during the overhaul, implementation of refueling overhaul, implementation of technical specification and important events during the overhaul, preparation of criticality conditions after the overhaul

continued

Start Date	Item	Main Contents of the Inspection
12/09/15	Routine inspection on preparation of first overhaul for Qinshan NPP Expansion Projection (Fangjiashan NPP) unit 1	Overhaul management, overhaul working content, implementation after the first refueling overhaul of unit 1, feedback to unit 2 after the first refueling overhaul of unit 1, questions to coordinate in the review report of the first overhaul of unit 2
12/21/15	Notification of special investigation on addition of auxiliary monitoring system at main control room of Qinshan NPP Expansion Projection (Fangjiashan NPP)	Implementation of the internal control process for additional auxiliary monitoring system, interface and function of auxiliary monitoring system in China Nuclear Operation Company

Table 21. Operating Events of Fangjiashan NPP in 2015

Event Date	Title	Cause	INES Level
01/07/15	Time used in dynamic rod scaling temporary test exceeds the expected time during the phase of start physical test of unit 2	Human error	0
10/16/15	Unavailability of KIC operator station of unit 2	Human error	0

Table 22. Radiation Protection Doses of Fangjiashan NPP in 2015

Unit	Annual Man Average Effective Dose (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man·Sv)	Normalized Collective Effective Dose (man·mSv/Gwh)
Unit 1 and unit 2	0.388	6.904	1.102	0.071,0

Daya Bay NPP

In 2015, 2 units of Daya Bay NPP were kept in stable operation and in safety state. Safety barriers were kept intact. The failure of fuel element, the leakage rate of the primary loop pressure boundary, and the leakage rate of the containment were all within the specified limits. The 17th refueling overhaul of unit 1 was completed.

Nuclear safety-related regulatory approvals for Daya Bay NPP are shown in Table 23, and inspection activities for Daya Bay NPP are shown in Table 24. One operating event occurred in Daya Bay NPP, as shown in Table 25. The radiation protection doses of Daya Bay NPP are shown in Table 26.

Table 23. Nuclear Safety-Related Regulatory Approvals for Daya Bay NPP in 2015

Approval Date	Document No.	Document Title
01/29/15	NNSA[2015]26	Notification of Approving the Revision of Final Safety Analysis Report of Daya Bay NPP
01/29/15	NNSA[2015]27	Notification of Approving the Revision of Operation Technical Specification of Daya Bay NPP
01/30/15	NNSA[2015]29	Notification of Approving the Clearance Levels of Ventilation Prefilter Framework of Daya Bay Nuclear Power Base
02/16/15	NNSA[2015]38	Notification of Approving Improvement of Measuring Instrument Threshold Adjustment of Radiation Monitoring System of Daya Bay NPP Unit 1 and Unit 2 and Ling'ao NPP Unit 1 and Unit 2
03/05/15	NNSA[2015]48	Notification of Approving the Stop of Daya Bay NPP 220kV Auxiliary Power Supply System during the 220kV Substation Transformation Line Access Construction of Daya Bay Nuclear Power Base North District
03/10/15	NNSA[2015]56	Notification of Approving the Revision of the Maintenance Program of Daya Bay NPP and Ling'ao NPP
03/24/15	NNSA[2015]63	Notification of Approving the Stop of the Spent Fuel Pool Cooling Pump and RRI Pump during Containment Pressure Test of Daya Bay NPP Unit 1
03/24/15	NNSA[2015]64	Notification of Approving the Reversion of Safety-Related System and Equipment Periodic Test Surveillance Requirements of Daya Bay NPP
05/14/15	NNSA[2015]104	Notification of Approving the Release of Reactor Criticality Control Point after the 17th Refueling Overhaul of Daya Bay NPP Unit 1
08/10/15	NNSA[2015]147	Notification of Approving the Revision of Safety-Related System and Equipment Periodic Test Regulatory Requirements of Daya Bay NPP
12/17/15	NNSA[2015]266	Notification of Approving the Revision of Final Safety Analysis Report of Daya Bay NPP and Ling'ao NPP
12/17/15	NNSA[2015]268	Notification of Approving the Revision of Operating Quality Assurance Program of Daya Bay NPP and Ling'ao NPP
12/22/15	NNSA[2015]272	Notification of Approving the Improvement of Replacement of Spent Fuel Pool Grids of Daya Bay NPP
08/10/15	MEP App[2015]186	Reply to the Environment Impact Registration Form of Construction Project of Emergency Diesel Maintenance and Repair Building of Daya Bay NPP
11/17/15	MEP App[2015]243	Reply to the Environment Impact Form of Construction Project of Comprehensive Warehouse of Daya Bay Nuclear Power Base

Table 24. Inspection Activities for Daya Bay NPP in 2015

Start Date	Item	Main Contents of the Inspection
03/17/15	Routine inspection on effectiveness of quality assurance program	The effectiveness of quality assurance program
04/22/15	Special inspection on on-site radioactive sources management of Daya Bay nuclear power base	Management of radioactive sources and operation status of radiation safety protection facilities
05/11/15	Inspection before re-criticality after the 117 overhaul of Daya Bay NPP Unit 1	The condition conformity for reactor re-criticality after the 117 overhaul of Daya Bay NPP Unit 1
05/20/15	Special inspection on containment leak monitoring system	The related procedures and work of containment leak monitoring system
06/17/15	Special inspection on the containment atmosphere monitoring system	The related procedures and work of the containment atmosphere monitoring system
07/21/15	Routine regulatory inspection on radiation protection management	The related procedures and work of radiation protection management
08/19/15	Non-routine regulatory inspection on the conversion from EOP to SOP	Preparation condition of conversion from EOP to SOP
08/25/15	Special inspection on emergency diesel system	The related procedures and work of emergency diesel system
10/13/15	Special inspection on safety injection system	The related procedures and work of safety injection system
11/10/15	Special inspection on KRT system	The related procedures and work of KRT system
11/19/15	Regulatory inspection on environment and effluent	Management and quality control of environment and effluent
12/08/15	Regulatory inspection on the on-site comprehensive nuclear emergency exercise in 2015	The condition of the on-site comprehensive nuclear emergency exercise
12/15/15	Special inspection on spare parts	The related procedures and work of spare parts

Table 25. The Operating Event of Daya Bay NPP in 2015

Event Date	Title	Cause	INES Level
10/09/15	The unavailable time of D2JPL660BA beyond the maintenance time limit required by technical specifications of Daya Bay NPP Unit 2	Human error	0

Table 26. Radiation Protection Doses of Daya Bay NPP in 2015

Unit	Annual Man Average Effective Dose (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man·Sv)	Normalized Collective Effective Dose (man·mSv/Gwh)
Unit 1 and Unit 2	0.331,0	7.190	1.035	0.067,087

Ling'ao NPP

In 2015, 4 units of Ling'ao NPP were kept in stable operation and in safety state. Safety barriers were kept intact. The failure of fuel element, the leakage rate of the primary loop pressure boundary, and the leakage rate of the containment were all within the specified limits. The 13th refueling overhaul of unit 1, the 12th refueling overhaul of unit 2, the 5th refueling overhaul of unit 3, and the 4th refueling overhaul of unit 4 were completed.

Nuclear safety-related regulatory approvals for Ling'ao NPP are shown in Table 27, and inspection activities for Ling'ao NPP are shownin Table 28. None operating events occurred in Ling'ao NPP. The radiation protection doses of Ling'ao NPP are shown in Table 29.

Table 27. Nuclear Safety-Related Regulatory Approvals for Ling'ao NPP in 2015

Approval Date	Document No.	Document Title
01/22/15	NNSA[2015]15	Notification of Approving the Release of the First Re-criticality Control Point after the 5th Refueling Overhaul of Ling'ao NPP Unit 3
03/11/15	NNSA[2015]57	Notification of Approving the Release of the First Re-criticality Control Point after the 4th Refueling Overhaul of Ling'ao NPP Unit 4
04/23/15	NNSA[2015]85	Notification of Approving the Improvement of Disturbance Treatment of Main Pump Speed Circuit of Ling'ao NPP Unit 3 and Unit 4
04/23/15	NNSA[2015]86	Notification of Approving the Improvement of Switch (FUSE) Type Replacement in 1E Class Cabinet of Safety Level Instrument Control Platform System (TXS) of Ling'ao NPP Unit 3 and Unit 4
04/30/15	NNSA[2015]92	Notification of Approving the Release of the First Re-criticality Control Point after the 12th Refueling Overhaul of Ling'ao NPP Unit 2
05/14/15	NNSA[2015]103	Notification of Approving Ling'ao NPP Unit 3 Receiving Spent Fuel Assemblies from Daya Bay NPP Unit 1 and Unit 2
06/19/15	NNSA[2015]114	Notification of Approving the Improvement of Core Cooling Monitoring System of Ling'ao NPP Unit 1 and Unit 2
06/19/15	NNSA[2015]115	Notification of Approving the Re-qualification Test and System Parameter Modification after Improving the Core Cooling Monitoring System of Ling'ao NPP Unit 1 and Unit 2
09/25/15	NNSA[2015]202	Notification of Approving the Improvement of Average Temperature Control System Parameter Optimization of Ling'ao NPP Unit 3 and Unit 4
09/30/15	NNSA[2015]207	Notification of Approving Canceling the Secondary Neutron Source Assembles of Ling'ao NPP Unit 1 and Unit 2
10/16/15	NNSA[2015]215	Notification of Approving the Improvement of Heater Power Adjustment of Main Control Room Air Conditioning System of Ling'ao NPP Unit 3 and Unit 4
10/28/15	NNSA[2015]222	Notification of Approving the Release of the First Re-criticality Control Point after the 13th Refueling Overhaul of Ling'ao NPP Unit 1

continued

Approval Date	Document No.	Document Title
11/23/15	NNSA[2015]245	Notification of Approving Autonomous Fuel Assembly Test into the Reactor of Ling'ao NPP Unit 3
12/22/15	NNSA[2015]273	Notification of Approving the Reversion of Safety-Related System and Equipment Periodic Test Oversight Requirements of Ling'ao NPP Unit 3 and Unit 4

Table 28. Inspection Activities for Ling'ao NPP in 2015

Start Date	Item	Main Contents of the Inspection
01/19/15	Regulatory inspection before re-criticality after the 305 overhaul of Ling'ao NPP	Fulfillment of reactor criticality conditions after the 305 overhaul
03/09/15	Regulatory inspection before re-criticality after the 404 overhaul of Ling'ao NPP	Fulfillment of reactor criticality conditions after the 404 overhaul
04/28/15	Regulatory inspection before re-criticality after the 212 overhaul of Ling'ao NPP	Fulfillment of reactor criticality conditions after the 212 overhaul
10/26/15	Regulatory inspection before re-criticality after the 113 overhaul of Ling'ao NPP	Fulfillment of reactor criticality conditions after the 113 overhaul

Table 29. Radiation Protection Doses of Ling'ao NPP in 2015

Unit	Annual Man Average Effective Dose (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man·Sv)	Normalized Collective Effective Dose (man·mSv/Gwh)
Unit 1 and unit 2	0.501,7	8.505	1.619	0.105,247
Unit 3 and unit 4	0.192,9	5.261	0.597	0.035,324

Tianwan NPP

In 2015, unit 1 and unit 2 of Tianwan NPP were kept in stable operation and in safety state. Safety barriers were kept intact. The failure of fuel element, the leakage rate of the primary loop pressure boundary, and the leakage rate of the containment were all within the specified limits. The 8th refueling overhaul of unit 1 and the 8th refueling overhaul of unit 2 were completed.

The first main equipment of Tianwan NPP unit 3 was hoisted in position on April 11, 2015. The nuclear island containment dome of unit 4 was hoisted on September 27, 2015. Civil construction of unit 5 started with the first concrete pouring of nuclear island on December 27, 2015.

Nuclear safety-related regulatory approvals for Tianwan NPP are shown in Table 30, and inspection activities for Tianwan NPP

are shown in Table 31. Two operating events occurred in Tianwan NPP, as shown in Table 32, and two constructing events occurred in Tianwan NPP, as shown in Table 33.The radiation protection doses of Tianwan NPP are shown in Table 34.

Table 30. Nuclear Safety-Related Regulatory Approvals for Tianwan NPP in 2015

Approval Date	Document No.	Document Title
01/13/15	NNSA[2015]3	Notification of Approving Reducing the Installation Elevation of High Pressure Safety Injection System Test Pipeline Flow Orifice Plate (2JND22CF001) of Tianwan NPP
01/13/15	NNSA[2015]4	Notification of Approving the Refueling Program (Rev. D) of Tianwan NPP
01/20/15	NNSA[2015]6	Notification of Approving the Modification of the Containment Pit Filterof Tianwan NPP Unit 1 and Unit 2
02/15/15	NNSA[2015]34	Notification of Approving the Release of the First Re-criticality Control Point after the 8th Refueling Overhaul of Tianwan NPP Unit 1
05/14/15	NNSA[2015]99	Notification of Approving the Modification of the Main Steam System Electric Valve of Tianwan NPP Unit 1 and Unit 2
05/14/15	NNSA[2015]100	Notification of Approving the Modification of Safety Injection System Check Valve of Tianwan NPP Unit 1 and Unit 2
05/14/15	NNSA[2015]101	Notification of Approving the Clearance Levels of Spent Resin of Tianwan NPP
06/10/15	NNSA[2015]113	Notification of Approving the Release of the First Re-criticality Control Point after the 8th Refueling Overhaul of Tianwan NPP Unit 2
09/25/15	NNSA[2015]198	Notification of Approving the Release of the Control Point of Nuclear Island Containment Dome Hoisting of Tianwan NPP Unit 4
11/09/15	NNSA[2015]228	Notification of Approving Replacement of Pressure Pulse Detector of Tianwan NPP Unit 1 and Unit 2
09/14/15	NNSA Notice[2015]94	Reply Letter of Approving the Report on Safety Analysis Review of Plant Siting andReview Report of Plant Siting Environmental Impact of Tianwan NPP Extension Project Unit 5 and Unit 6
09/30/15	NNSA Notice[2015]99	Reply Letter of Approving Application of In-service Inspection Acceptance Criteria and Life Assessment Procedures of Nuclear Grade Equipment and Piping of Tianwan NPP
11/09/15	NNSA Notice[2015]121	Letter of Asking for Comments on the Construction License for Tianwan NPP Unit 5 and Unit 6
11/23/15	NNSA Notice[2015]126	Letter of Issuing of the Inspection Report on Preparation before Pouring the First Tank of Concrete into Island Foundation of Tianwan NPP Unit 5
12/17/15	NNSA Notice[2015]147	Letter of Approving the Project Quality Assurance Program (design and construction phase) (Rev. D) of Tianwan NPP Unit 5 and Unit 6
12/23/15	MEP App[2015]263	Reply to Environmental Impact Report (Construction Phase) of Tianwan NPP Unit 5 and Unit 6
11/19/15	MEP NPP[2015]29	Reply Letter of Nuclear Safety Comments on Tianwan NPP Extension Project Unit 5 and Unit 6
12/31/15	MEP NPP[2015]32	Reply Letter of Periodic Safety Review Corrective Action Plan of Tianwan NPP Extension Project Unit 1 and Unit 2

Table 31. Inspection Activities for Tianwan NPP in 2015

Start Date	Item	Main Contents of the Inspection
02/12/15	Regulatory inspection before re-criticality after the 108 overhaul of Tianwan NPP	The condition conformity for reactor re-criticality after the 108 overhaul
03/23/15	Routine regulatory inspection before the first main equipment installation of unit 3	Construction preparation and quality assurance system operation before the first main equipment installation of unit 3
06/03/15	Regulatory inspection before re-criticality after the 208 overhaul of Tianwan NPP	The condition conformity for reactor re-criticality after the 208 overhaul
09/23/15	Regulatory inspection on the nuclear island containment dome hoisting control point of Tianwan NPP unit 4	The early civil engineering installation and construction management and progress, quality assurance system, quality control and experience feedback of important items and activities, treatment of construction events and important non-conformance items, and organizational management and technical preparation for the dome hoisting of unit 4
11/16/15	Regulatory inspection on control point before FCD of Tianwan NPP unit 5	Implementation of quality assurance program during design and construction phase, on-site quality control of important safety-related item installation and construction, treatment of leftover problems of early nuclear island foundation construction, and preparation for the nuclear island foundation FCD

Table 32. Operating Events of Tianwan NPP in 2015

Event Date	Title	Cause	INES Level
05/16/15	Shutdown protection action caused by cement cover slip of unit 2	Human error	0
12/13/15	Shutdown caused by low liquid level of SG1 of unit 2	Human error	0

Table 33. Constructing Events of Tianwan NPP in 2015

Event Date	Unit	Title
04/10/15	Unit 3	Low value of TK0 in the main pipeline technology evaluation test
10/22/15	Unit 4	Damage of RPV main sealing cover screw hole inner thread

Table 34. Radiation Protection Doses of Tianwan NPP Unit 1 and Unit 2 in 2015

Unit	Annual Man Average Effective Dose (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man·Sv)	Normalized Collective Effective Dose (man·mSv/Gwh)
Unit 1 and Unit 2	0.169	2.866	0.520	0.031,3

Hongyanhe NPP

In 2015, Hongyanhe NPP unit 1 and unit 2 were kept in stable operation. The Unit 3 was firstly connected to the grid on March 23, and began commercial operation on August 16. Unit 1, unit 2, and unit 3 were in safety state. Safety barriers were kept intact. The failure of fuel element, the leakage rate of the primary loop pressure boundary, and the leakage rate of the containment were all within the specified limits. The 2nd refueling overhaul of unit 1 and the 1st refueling overhaul of unit 2 were completed.

Hot function tests of unit 4 were finished on April 7, and the initial fuel loading was being prepared. The first concrete pouring of the nuclear island of unit 5 was started on March 29, and the first concrete pouring of the nuclear island of unit 6 was started on July 24.

Nuclear safety-related regulatory approvals for Hongyanhe NPP are shown in Table 35, and inspection activities for Hongyanhe NPP are shown in Table 36. Three operating events occurred in Hongyanhe NPP, as shown in Table 37, and two constructing events occurred in Hongyanhe NPP, as shown in Table 38. The radiation protection doses of Hongyanhe NPP are shown in Table 39.

Table 35. Nuclear Safety-Related Regulatory Approvals for Hongyanhe NPP in 2015

Approval Date	Document No.	Document Title
03/13/15	NNSA[2015]58	Notification of Approving the Construction License Issue of Hongyanhe NPP Unit 5 and Unit 6
03/20/15	NNSA[2015]61	Notification of Approving Oversight Requirements of Safety-Related Systems and Equipment Periodic Test (Rev. C) of Hongyanhe NPP Unit 1 and Unit 2
04/16/15	NNSA[2015]77	Notification of Approving Oversight Requirements of Startup Physical Experiment of Hongyanhe NPP Unit 1 and Unit 2
04/23/15	NNSA[2015]80	Notification of Approving the Release of the First Re-criticality Control Point after the 2nd Refueling Overhaul of Hongyanhe NPP Unit 1
07/21/15	NNSA[2015]136	Notification of Approving the Release of the FCD Control Point of Hongyanhe NPP Unit 1 and Unit 2
07/28/15	NNSA[2015]139	Notification of Approving the Release of 90% Rated Power (Thermal Power) Control Point of Hongyanhe NPP Unit 3
09/09/15	NNSA[2015]187	Notification of Approving the Release of the First Re-criticality Control Point after the 1st Refueling Overhaul of Hongyanhe NPP Unit 2
10/16/15	NNSA[2015]214	Notification of Approving the Modification of 18 Months Refueling of Hongyanhe NPP Unit 1 and Unit 2
11/30/15	NNSA[2015]256	Notification of Approving Revision of Oversight Requirements of Safety-Related Systems and Equipment Periodic Test (Rev. C) of Hongyanhe NPP Unit 1 and Unit 2

continued

Approval Date	Document No.	Document Title
08/26/15	NNSA Notice[2015]84	Official Letter of Issuing the Report of Comprehensive Nuclear Safety Inspection before the FCD of Hongyanhe NPP Unit 4
11/17/15	NNSA Notice[2015]123	Reply Letter of Approving the Quality Assurance Program during Commissioning Phase (Rev. 2) of Liaoning Hongyanhe NPP Phase I
03/13/15	MEP App[2015]61	Reply to Environmental Impact Report (Construction Phase) of Liaoning Hongyanhe NPP Phase II (Unit 5 and Unit 6)
10/16/15	MEP App[2015]219	Reply to Environmental Impact Report Form of Modification of the 18th Month Refueling of Hongyanhe NPP Unit 1 and Unit 2

Table 36. Inspection Activities for Hongyanhe NPP in 2015

Start Date	Item	Main Contents of the Inspection
03/05/15	Regulatory inspection before re-criticality after the 299 overhaul of Hongyanhe NPP	Primary loop hydraulic pressure test, CTT test, and in-service inspection, implementation of periodic test and modification project, treatment of related operation events and the main abnormal items conditions during the overhaul period, preparation for re-criticality of unit 2, implementation of nuclear safety management requirements of previous dialogues and inspections, and the other related work
04/21/15	Regulatory inspection before re-criticality after the 102 overhaul of Hongyanhe NPP	Condition conformity for reactor re-criticality after the 102 overhaul
05/27/15	Inspection on the 90% Rated Power (Thermal Power) control point of Hongyanhe NPP Unit 3	Completion status of system commissioning project after the first criticality, treatment of commissioning defects, non-conformance report (NCR) and abnormal items at maintenance stage, operation management (including the implementation of technical specifications, periodic tests, etc.), treatment of operating events, the treatment of systemic and equipment defects after handover of temporary operation, and implementation of nuclear safety management requirements
07/14/15	Regulatory Inspection on the on-site preparation for FCD of Hongyanhe NPP Unit 6	Implementation of quality assurance program during design and construction phase, on-site installation quality control of safety important items, treatment of remaining problems of early nuclear island foundation construction, preparation before FCD
08/17/15	Comprehensive regulatory inspection before the initial fueling for Hongyanhe NPP unit 4	Quality assurance, structures and nuclear safety equipment, system commission, operation preparation, radiation protection, emergency preparedness, physical protection and fuel storage, environmental protection facilities, license conditions, application documents and implementation of review problems, implementation of safety requirementsin previous inspections, and other issues such as Post-Fukushima improvements

continued

Start Date	Item	Main Contents of the Inspection
09/06/15	Regulatory inspection before re-criticality after the 201 overhaul of Hongyanhe NPP	Condition conformity for reactor re-criticality after the 201 overhaul
10/27/15	Regulatory inspection on comprehensive nuclear emergency exercises in 2015	Operation of nuclear emergency management system and the response capacity of emergency personnel, the emergency response platform and preparation of emergency facilities, equipment accessories configuration and documents, the effectiveness and operability of emergency plan and its related procedures, capacity of radiation environment emergency monitoring of nuclear facility, effectiveness and timeliness of the transfer of emergency related information such as notices and reports to off-site emergency organizations, nuclear and radiation safety information disclosure and public opinion coping capacity, reasonability of exercise scenario design and testability of exercise, and treatment of previous comprehensive nuclear emergency exercise remaining problems
11/17/15	Routine regulatory inspection in 2015	Operation management of unit 1, unit 2, and unit 3, implementation and compliance of technical specifications, periodic tests management, LOE/IOE management, important abnormal conditions and safety-related equipment unavailable (I0) management, operation related personnel training management, radiation environment monitoring, radioactive waste management, commissioning management of unit 3, implementation of test projectsin commissioning plan, system handover, treatment of important abnormal conditions during commissioning, and completion of design change during commissioning, civil construction of Hongyanhe NPP phase II, implementation and compliance of construction program, concrete and steel liner construction, preparation for construction and operation in winter, and non-conformance items management

Table 37. Operating Events of Hongyanhe NPP in 2015

Event Date	Title	Cause	INES Level
01/03/15	H2RRI001BA liquid level declined to the accident level caused by H2RRI040VN internal leakage	Human error	0
02/08/15	More than 5 I0s of second group occurred and lasted more than 1 hour at the same time caused by H0LGR211JA trip of Hongyanhe unit 2	Human error	0
08/25/15	Unexpected I0s of the first group occurred during T20 test in unit 2	Human error	0

Table 38. Constructing Events of Hongyanhe NPP in 2015

Event Date	Unit	Title
03/03/15	Unit 4	Abnormal reading of partial audio strain gauges after containment pressure test
04/20/15	Unit 4	The 3rd group of anti-vibration bars offset located at heat transfer tube elbow of SG3

Table 39. Radiation Protection Doses of Hongyanhe NPP Unit 1, Unit 2, and Unit 3 in 2015

Unit	Annual Man Average Effective Dose (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man·Sv)	Normalized Collective Effective Dose (man·mSv/Gwh)
Unit 1 and Unit 2	0.347	5.623	1.018	0.085
Unit 3	0.004	0.248	0.008	0.003

Ningde NPP

In 2015, Ningde NPP unit 1 and unit 2 were kept in stable operation. The initial fuel loading of unit 3 started on January 29, and the commercial operation of unit 3 started on June 10. Unit 1, unit 2 and unit 3 were in safety state. Safety barriers were kept intact. The failure of fuel element, the leakage rate of the primary loop pressure boundary, and the leakage rate of the containment were all within the specified limits.The 2nd refueling overhaul of unit 1 and the 1st refueling overhaul of unit 2 were completed. Hot function tests of unit 4 were finished on November 14, and the initial fuel loading of unit 4 started on December 31.

Nuclear safety-related regulatory approvals for Ningde NPP are shown in Table 40, and inspection activities for Ningde NPP are shown in Table 41. Seven operating events occurred in Ningde NPP, as shown in Table 42. The radiation protection doses of Ningde NPP are shown in Table 43.

Nuclear Safety Chief Engineer of MEP, Vice Administrator of NNSA, Liu Hua, Inspected Ningde NPP

Table 40. Nuclear Safety-Related Regulatory Approvals for Ningde NPP in 2015

Approval Date	Document No.	Document Title
01/29/15	NNSA[2015]25	Notification of Approving the Change and Improvement of Parts of the Supporting Hanger of the Additional Diesel Generator of Fujian Ningde NPP
02/28/15	NNSA[2015]41	Notification of Approving the Improvement of the First Guide Vane of the Charge Pump of Fujian Ningde NPP Unit 1 and Unit 2
02/28/15	NNSA[2015]42	Notification of Approving the Improvement of Isolation Valve of Pit Suction Pipe of Containment Spray System of Fujian Ningde NPP Unit 1 and Unit 2

continued

Approval Date	Document No.	Document Title
03/05/15	NNSA[2015]53	Notification of Approving the Special Application to Stop the RRI Pump and PTR Pump when Listening Checks at 1bar during the Containment Pressure Test of Fujian Ningde NPP
03/06/15	NNSA[2015]55	Notification of Releasing the Control Point of the 1st Criticality of Fujian Ningde NPP Unit 3
03/24/15	NNSA[2015]62	Notification of Approving to Start Upgrading the Physical Test Surveillance Requirements of Ningde NPP Unit 1 and Unit 2
04/14/15	NNSA[2015]75	Notification of Approving the Release of the Re-criticality Control Point after the 1st Refueling Overhaul of Ningde NPP Unit 2
05/08/15	NNSA[2015]96	Notification to Releasethe Control Point at 90% Rated Power (thermal power) of Fujian Ningde NPP Unit 3
07/28/15	NNSA[2015]140	Notification of Approving the Release of the Control Point before System Cold Function Tests of Fujian Ningde NPP Unit 4
08/12/15	NNSA[2015]163	Notification of Approving the Special Application to Conduct Dynamic Rod Scaling Demonstration Experiment during the Zero Power Physics Tests in the 2nd Refueling Overhaul of Fujian Ningde NPP Unit 1
10/30/15	NNSA[2015]223	Notification of Approving the Release of the Re-criticality Control Point after the 2rd Refueling Overhaul of Ningde NPP Unit 1
12/31/15	NNSA[2015]279	Notification of Issuing the Instrument of Ratification for the Initial Fuel Loading of Fujian Ningde NPP Unit 4
01/28/15	NNSA Notice[2015]19	Official Letter of Approving the Initial Fuel Loading of Ningde NPP Unit 3
07/07/15	NNSA Notice[2015]66	Reply Letter of Accepting the Commissioning Program of Fujian Ningde NPP Unit 3 and Unit 4 (Rev. C)
07/28/15	NNSA Notice[2015]71	Reply Letter of Approving the Quality Assurance Program (Operation Phase) of Fujian Ningde NPP
12/28/15	NNSA Notice[2015]154	Notification of Issuing the Report of Comprehensive Regulatory Inspection before the Initial Fuel Loading of Fujian Ningde NPP Unit 4

Table 41. Inspection Activities for Ningde NPP in 2015

Start Date	Item	Main contents of the inspection
01/21/15	Site verification for prerequisites for the initial fuel loading of Ningde NPP unit 3	Quality assurance, structures and nuclear safety equipment, system commissioning, operation preparation, radiation protection, emergency preparedness, physical protection and fuel storage, environmental protection facilities, license conditions, application documents and implementation of issues found in reviews, implementation of safety requirements in previous in spections, other issues such as Post-Fukushima improvements
02/09/15	The 1st routine regulatory inspection in 2015	Status of operation management and preparation before the 1st refueling overhaul of unit 2

continued

Start Date	Item	Main contents of the inspection
03/02/15	Regulatory inspection before the control point of the 1st criticality of Ningde NPP unit 3	Quality assurance, structures and nuclear safety equipment, system commissioning, operation preparation, radiation protection, emergency preparedness, physical protection and fuel storage, environmental protection facilities, license conditions, application documents and implementation of issues found in reviews, implementation of safety requirements in previous inspections, and other issues such as Post-Fukushima improvements
03/06/15	Inspection on the implementation of physical corrective actions of PF improvements of Ningde NPP	Implementation of PF improvements of Ningde NPP phase I
04/08/15	Regulatory inspection before re-criticality after the 201 overhaul of Ningde NPP	Fulfillment of reactor criticality conditions after the refueling overhaul
05/04/15	Inspection on 90% rated power (thermal power) control point of Ningde NPP unit 3	Completion of system commissioning project after the 1st criticality, treatment of commissioning defects and non-conformance report (NCR) and abnormal items in maintenances, operation management (including compliance with technical specification, periodic tests), treatment of operating events, treatment of system and equipment defects after temporary operating handover, implementation of nuclear safety management requirements
07/21/15	Regulatory inspection on the control point before the cold function tests of Ningde NPP unit 4	Document preparation for cold function tests, personnel preparation for cold function tests, completion of commissioning tests before the cold function tests, experience feedback related the cold function tests, treatment of non-conformance items, commissioning quality assurance management, other related contents
07/28/15	Special inspection on bad weather in Ningde	Special inspection on preparation for equipment, personnel, document resisted for bad weather in Ningde NPP base
09/10/15	Special inspection on preparation for the N102 refueling overhaul	Preparation for the 2rd refueling overhaul of unit 1
10/29/15	Regulatory inspection before the re-criticality after the 102 overhaul of Ningde NPP	Fulfillment of reactor criticality conditions after the 102 refueling overhaul
11/10/15	Inspection on the on-site comprehensive emergency exercise of Ningde NPP in 2015	On-site comprehensive emergency exercise in 2015
11/10/15	Special inspection on ASG system of Ningde NPP unit 1 and unit 2	Status of operation and maintenance of ASG system of unit 1 and unit 2

III

continued

Start Date	Item	Main contents of the inspection
12/21/15	Regulatory inspection before the initial fuel loading of Ningde NPP unit 4	Quality assurance, structures and nuclear safety equipment, system commissioning, operation preparation, radiation protection, emergency preparedness, physical protection and fuel storage, environmental protection facilities, license conditions, application documents and implementation of issues found in reviews, implementation of safety requirements in previous inspections, other issues such as Post-Fukushima improvements

Table 42. Operating Events of Ningde NPP in 2015

Event Date	Title	Cause	INES Level
03/06/15	P4 signal triggered by modification of the parameter 3RPN030MA and defect treatment of 3RCP002PO rotator rack of unit 3	Human error	0
03/22/15	Auxiliary power unavailable due to the circuit not terminated when trip signals that involved in the main transformer 0s delayed switching to the secondary transformer of No. 3 turbine of unit 3	Human error	0
04/07/15	Reactor shutdown triggered by condenser vacuum break manually because of high turbine vibration during carrying out the test that TG stops but reactor keeps working on for unit 3	Human error	0
06/24/15	Reactor shutdown triggered by complete loss of power for control rod drive of unit 3	Human error	0
08/08/15	Reactor shutdown triggered by the influx of marine organisms into the CFI drum net of unit 3	Equipment failure	0
10/10/15	1EBA damper closed unexpectedly during the 8-meter airlock doors of unit 1 both open	Human error	0
11/30/15	Inconformity between theregular inspection of DVK002/003/004/005/006/007LP for unit 1 and unit 2 and the Regulatory Requirements of safety-related system and equipment periodic tests for ningde NPP unit 1 and unit 2	Human error	0

Table 43. Radiation Protection Doses of Ningde NPP Unit 1, Unit 2, and Unit 3 in 2015

Unit	Annual Man Average Effective Dose (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man·Sv)	Normalized Collective Effective Dose (man·mSv/Gwh)
Unit 1, Unit 2, and Unit 3	0.497	12.008	1.841	0.094

Fuqing NPP

In 2015, Fuqing NPP unit 1 was kept in stable operation. The initial fuel loading of unit 2 started on May 15, and the commercial operation of unit 2 started on October 16. Unit 1 and unit 2 were in safety state. Safety barriers were kept intact. The failure of fuel

element, the leakage rate of the primary loop pressure boundary, and the leakage rate of the containment were all within the specified limits.The 1st refueling overhaul of unit 1 was completed.

Hot tests of Fuqing NPP unit 3 began from December 23. Unit 4 was in the peak period for installation. The first concrete pouring of nuclear island foundation of unit 5 and unit 6 were respectively constructed on May 7 and December 22.

Nuclear safety-related regulatory approvals for Fuqing NPP are shown in Table 44, and inspection activities for Fuqing NPP are shown in Table 45. Eleven operating events occurred in Fuqing NPP, as shown in Table 46, and five constructing events occurred in Fuqing NPP, as shown in Table 47. The radiation protection doses of Fuqing NPP are shown in Table 48.

Vice Administrator of NNSA, Director General of Department of Nuclear Power Safety Regulation of MEP, Tang Bo, Inspected NPPs

Table 44. Nuclear Safety-Related Regulatory Approvals for Fuqing NPP in 2015

Approval Date	Document No.	Document Title
04/23/15	NNSA[2015]82	Notification of Approving the Refueling Program of Fujian Fuqing NPP Unit 1 and Unit 2
04/23/15	NNSA[2015]83	Notification of Approving the Change of Equipment Selection of Radiation Monitoring System of Fujian Fuqing NPP Unit 1 and Unit 2
04/23/15	NNSA[2015]84	Notification of Approving the Design Modifications of Improving Refueling Fuel Enrichment of Fujian Fuqing NPP Unit 1 and Unit 2
05/05/15	NNSA[2015]95	Notification of Issuing the Construction License of Fujian Fuqing NPP Unit 5 and Unit 6
05/14/15	NNSA[2015]97	Notification of Issuing the Instrument of Ratification for the Initial Fuel Loading of Fujian Fuqing NPP Unit 2
07/20/15	NNSA[2015]132	Notification of Approving the Special Application to Conduct Dynamic Rod Scaling Verification Test during the First Physical Tests Phase of Fujian Fuqing NPP Unit 1 and Unit 2
07/20/15	NNSA[2015]134	Notification of Releasing the Control Point of the 1st Criticality of Fujian Fuqing NPP Unit 2
09/08/15	NNSA[2015]183	Notification of Approving the Release of Control Point before System Cold Function Tests of Fujian Fuqing NPP Unit 3
09/08/15	NNSA[2015]184	Notification of Releasing 90% Rated Power (thermal power) Control Point of Fujian Fuqing NPP Unit 2

continued

Approval Date	Document No.	Document Title
09/25/15	NNSA[2015]201	Notification of Approving the Replacement of DN50 Manual Shut-Off Valve of Nuclear Class 1 of Fujian Fuqing NPP Unit 1
12/14/15	NNSA[2015]265	Notification of Approving the Release of the Re-criticality Control Point after the 1st Refueling Overhaul of Fujian Fuqing NPP Unit 1
12/21/15	NNSA[2015]270	Notification of Approving the Release of Control Point of the First Concrete Pouring of Nuclear Island Foundation of Fujian Fuqing NPP Unit 6
01/21/15	NNSA Notice[2015]15	Reply Letter of Approving the Quality Assurance Program (Commissioning Phase) of Fujian Fuqing NPP Unit 3 and Unit 4 (Rev. 1)
04/29/15	NNSA Notice[2015]40	Notification of Issuing the Regulatory Inspection Report for the Preparation before the First Concrete Pouring of Nuclear Island Foundation of Fuqing NPP Unit 5
05/14/15	NNSA Notice[2015]48	Notification of Issuing the Comprehensive Regulatory Inspection Report before the Initial Fuel Loading of Fujian Fuqing NPP Unit 2
05/14/15	NNSA Notice[2015]49	Reply Letter of Repair Plan for the Welding Beam of the Pressurizer Vertical Support Skirt of Fujian Fuqing NPP Unit 2
06/29/15	NNSA Notice[2015]62	Reply Letter of Accepting the Commissioning Program of Fujian Fuqing NPP Unit 3 and Unit 4 (Rev. B)
09/08/15	NNSA Notice[2015]86	Notification of Issuing the Regulatory Inspection Report for Nuclear Island Foundation Pit after Evacuation of Fuqing NPP Unit 6
12/18/15	NNSA Notice[2015]150	Notification of Issuing the Regulatory Inspection Report for the Preparation before the First Concrete Pouring of Nuclear Island Foundation of Fuqing NPP Unit 6
05/05/15	MEP App[2015]111	Reply of Approving Environment Impact Report (Construction Phase) of Fujian Fuqing NPP Unit 5 and Unit 6

Table 45. Inspection Activities for Fuqing NPP in 2015

Start Date	Item	Main contents of the inspection
03/23/15	Regulatory inspection before the initial fuel loading of Fuqing NPP unit 2	Quality assurance, structures and nuclear safety equipment, system commissioning, operation preparation, radiation protection, emergency preparedness, physical protection and fuel storage, environmental protection facilities, license conditions, application documents and implementation of issues found in reviews, implementation of safety requirements in previous inspections, other issues such as Post-Fukushima improvements
04/20/15	Regulatory inspection on preparation before the first concrete pouring of the nuclear island foundation of Fuqing NPP unit 5	Construction quality control of on-site safety important items, treatment of problems left before the construction of nuclear island foundation of unit 5, on-site preparation before the first concrete pouring of the nuclear island foundation of unit 5, operation state of quality assurance system

continued

Start Date	Item	Main contents of the inspection
05/31/15	Inspection on control point before the 1st criticality of Fuqing NPP unit 2	Commissioning completion projects before the 1st criticality, unexpected event list, design modification application, preparation before the 1st criticality, implementation of technical specification after the initial fuel loading (including operating events analysis), implementation of regular tests, implementation of nuclear safety management requirements, other nuclear safety-related issues
08/24/15	Regulatory inspection on control point before cold function tests of Fuqing NPP unit 3	Quality assurance, installation of system and equipment handover and treatment of non-conformance items, treatment of implementation and commissioning defects of the cold function test projects, preparation for cold function test projects of the main system, and implementation of safety requirements in previous inspections
08/26/15	Regulatory inspection on nuclear island foundation pit after evacuation of Fuqing NPP unit 6	Construction procedures and construction records of nuclear island foundation pit after evacuation of unit 6, verification of detailed survey results of foundation pit after evacuation, construction non-conformance items and their treatment, establishment and implementation of quality assurance system
08/30/15	Inspection on control point at 90% rated power of Fuqing NPP unit 2	Completion of system commissioning project after the 1st criticality, treatment of commissioning defects and non-conformance report (NCR) and abnormal items found in maintenances, operation management (including implementation of technical specification, periodic tests, etc.), treatment of operating events, system and equipment defect repairs after temporary operating handover, implementation of nuclear safety management requirements
12/07/15	Regulatory inspection on re-criticality control point after the 101 overhaul of Fuqing NPP unit 1	Operation of the 1st circulation of unit 1, the overall implementation of the 1st overhaul of unit 1, assessment of radiation protection, treatment of events or abnormal items during the overhaul, preparation before re-criticality after the overhaul, implementation of quality assurance activities, implementation of conditions of the instrument of ratification for fuel loading and safety requirements in previous inspections, other nuclear safety-related issues
12/15/15	Regulatory inspection on preparation before the first concrete pouring of the nuclear island foundation of Fuqing NPP unit 6	Construction quality control of on-site safety important items, treatment of problems left before the construction of nuclear island foundation of unit 6, on-site preparation before the first concrete pouring of the nuclear island foundation of unit 6, operation state of quality assurance system

Table 46. Operating Events of Fuqing NPP in 2015

Event Date	Title	Cause	INES Level
01/03/15	Unplanned shutdown triggered by rod drop caused by the unintentional action of the micro switch of the R1 subgroup transfer coil rack of unit 1	Equipment failure	0
01/05/15	Shutdown triggered by NO.3 SG high-high water level caused by feed water leak response of the main feed-water pump of unit 1	Equipment failure	0

continued

Event Date	Title	Cause	INES Level
05/25/15	Mistaken activation of A column of safety injection caused by pressure low 4 safety injection signal unblocked of DAS system regulator of unit 2	Human error	0
07/01/15	The periodic test for 1RGL (rod control and rod position system) system rod position measuring channel was not performed within the cycle	Human error	0
07/14/15	Control rod drop caused by mistaken disconnection of 2RAM501JS during the 2RAM002AP insulation of unit 2	Human error	0
09/12/15	Unit 2 shutdown caused by excessively low of steam generator water level during carrying out main feed water switching test (TP2APA50)	Equipment failure	0
09/21/15	Unavailability of 4 operator stations during restarting of alternate central data processing server of KIC system of unit 1	Equipment failure	0
10/21/15	Shutdown caused by system fault of generator excitation of unit 2	Equipment failure	0
11/08/15	Broken steel rope of old control rod assembly gripper during changing related components of unit 1	Equipment failure	0
12/01/15	Outages of 220V AC continuous power switchboard 2LNP001TB caused by inverter fault of unit 2	Equipment failure	0
12/23/15	Introduction of the first set of I0 outside the scope of QSR regulatory requirements during carrying out the containment spray and B phase isolation comprehensive test of unit 1	Human error	0

Table 47. Constructing Events of Fuqing NPP in 2015

Event Date	Unit	Title
01/19/15	Unit 2	Two UT exceeding displays of ultrasonic test found in welding beam between pressurizer lower head and vertical support skirt (2F1) during production phase
02/26/15	–	Fire occurred in the cable trench in front of Fuqing NPP
05/08/15	Unit 2	2SECOO4PO and 2CFI104PO electric machine flooded caused by huge amount of seawater poured into the 2SEC004PO pump pit for error opening the 2SEC032VE valve
07/04/15	Unit 4	The 6.7-meter floor flooded of the 4KX building of Fuqing NPP unit 4
11/16/15	Unit 3	Exceeding defects found in pre-service inspection on reactor pressure vessel of Fuqing NPP unit 3

Table 48. Radiation Protection Doses of Fuqing NPP unit 1 and unit 2 in 2015

Unit	Annual Man Average Effective Dose (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man·Sv)	Normalized Collective EffectiveDose (man·mSv/Gwh)
Unit 1 and unit 2	0.258	6.072	0.781	0.094,4

Yangjiang NPP

In 2015, Yangjiang NPP unit 1 was kept in stable operation. The initial fuel loading of unit 2 started on January 25, and the commercial operation of unit 2 started on June 5. The initial fuel loading of unit 3 started on September 9, and the unit 3 was connected to the grid on October 18. Unit 1, unit 2 and unit 3 were in safety state. Safety barriers were kept intact. The failure of fuelelement, the leakage rate of the primary loop pressure boundary, and the leakage rate of the containment were all within the specified limits.The 1st refueling overhaul of unit 1 was completed.

Yangjiang NPP unit 4 was in the peak period for installation. Dome hoisting of unit 5 was finished on June 12. The installation of the equipment of unit 6 nuclear island started on November 11.

Nuclear safety-related regulatory approvals for Yangjiang NPP are shown in Table 49, and inspection activities for Yangjiang NPP are shown in Table 50. Five operating events occurred in Yangjiang NPP, as shown in Table 51. The radiation protection doses of Yangjiang NPP are shown in Table 52.

Overall View of Yangjiang NPP Unit 1 to Unit 6

Table 49. Nuclear Safety-Related Regulatory Approvals for Yangjiang NPP in 2015

Approval Date	Document No.	Document Title
01/23/15	NNSA[2015]17	Notification of Approving System Transformation of Process Control Cabinet of Safety Class of Yangjiang NPP Unit 1
01/23/15	NNSA[2015]18	Notification of Approving the Design Modification of the Pipe Bracket of the Essential Service Water System of Yangjiang NPP Unit 1
01/23/15	NNSA[2015]19	Notification of Approving the Change of Emission Control Valve Positioner for Discharging the Steam into Atmosphere System of Yangjiang NPP Unit 1 and Unit 2
01/23/15	NNSA[2015]22	Notification of Approving the Change of Pneumatic Valve for Cooling Water System of Yangjiang NPP Unit 1
01/23/15	NNSA[2015]23	Notification of Issuing the Instrument of Ratification for the Initial Fuel Loading of Yangjiang NPP Unit 2
02/28/15	NNSA[2015]43	Notification of Approving the Release of the 1st Criticality Control Point of Yangjiang NPP Unit 2
03/27/15	NNSA[2015]68	Notification of Approving the Release of the Re-criticality Control Point after the 1st Refueling Overhaul of Yangjiang NPP Unit 1

continued

Approval Date	Document No.	Document Title
04/09/15	NNSA[2015]73	Notification of Approving the Change of the Firefighting System during Improving Meter Line of the Firefighting Water Production System of Yangjiang NPP Unit 1 and Unit 2
04/29/15	NNSA[2015]89	Notification of Releasing 90% Rated Power (Thermal Power) Control Point of Yangjiang NPP Unit 2
05/04/15	NNSA[2015]93	Notification of Approving the Operation Technical Specification of Yangjiang NPP Unit 1 and Unit 2 (Rev. 11)
05/04/15	NNSA[2015]94	Notification of Approving the Maintenance Program of Yangjiang NPP (Rev. 11)
05/20/15	NNSA[2015]107	Notification of Approving the Regulatory Requirements for Periodic Tests for Safety-related System and Equipment of Yangjiang NPP Unit 1 and Unit 2 (Rev. 11)
09/08/15	NNSA[2015]185	Notification of Issuing the Instrument of Ratification for the Initial Fuel Loading of Yangjiang NPP Unit 3
09/25/15	NNSA[2015]199	Notification of Approving the Special Application to Conduct Dynamic Rod Scaling Comparative Test during the First Physical Tests Phase of Yangjiang NPP Unit 3
10/09/15	NNSA[2015]209	Notification of Releasing the Control Point of the 1st Criticality of Yangjiang NPP Unit 3
11/17/15	NNSA[2015]234	Notification of Releasing the Control Point at 90% Rated Power (Thermal Power) of Yangjiang NPP Unit 3
07/29/15	NNSA Notice[2015]72	Reply Letter of Accepting the Commissioning Program of Yangjiang NPP Unit 3 and Unit 4 (Rev. B)
08/20/15	NNSA Notice[2015]77	Notification of Issuing the Report of Comprehensive Regulatory Inspection before the Initial Fuel Loading of Yangjiang NPP Unit 3
09/08/15	MEP App[2015]196	Reply of Approving Environment Impact Report (Operation Phase) of Yangjiang NPP Unit 3 and Unit 4
03/09/15	MEP NPP[2015]7	Notification of Asking Suggestion for theEnvironment Impact Report (Operation Phase) of Yangjiang NPP Unit 3 and Unit 4

Table 50. Inspection Activities for Yangjiang NPP in 2015

Start Date	Item	Main contents of the inspection
02/26/15	Regulatory inspection on control point before the 1st criticality of Yangjiang NPP unit 2	Commissioning completion projects before the 1st criticality, unexpected event list, design modification application, preparation before the 1st criticality, implementation of technical specification after the initial fuel loading (including operating events analysis), implementation of regular tests, implementation of safety management requirements, other nuclear safety-related issues

continued

Start Date	Item	Main contents of the inspection
03/23/15	Regulatory inspection before re-criticality after the 1st overhaul of Yangjiang NPP unit 1	Operation of the 1st circulation of unit 1, the overall implementation of the 1st overhaul of unit 1, assessment of radiation protection, treatment of events or abnormal items during the overhaul, preparation before re-criticality after the overhaul, implementation of quality assurance activities, implementation of conditions of the instrument of ratification for fuel loading and safety requirements in previous inspections, other nuclear safety-related issues
04/20/15	Inspection on control point at 90% rated power (thermal power) of Yangjiang NPP unit 2	Completion of system commissioning projects after the 1st criticality, treatment of commissioning defects and non-conformance report (NCR) and abnormal items found in maintenances, operation management (including implementation of technical specification, periodic tests, etc.), treatment of operating events, system and equipment defect repairs after temporary operating handover, and implementation of safety management requirements
08/10/15	Regulatory inspection before the initial fuel loading of Yangjiang NPP unit 3	Quality assurance, structures and nuclear safety equipment, system commissioning, operation preparation, radiation protection, emergency preparedness, physical protection and fuel storage, environmental protection facilities, license conditions, application documents and implementation of problems found in reviews, implementation of safety requirements in previous inspections, other issues such as Post-Fukushima improvements
09/28/15	Regulatory inspection on control point before the 1st criticality of Yangjiang NPP unit 3	Commissioning completion projects before the 1st criticality, unexpected event list, design modification application, preparation before the 1st criticality, implementation of technical specification after the initial fuel loading (including operating events analysis), implementation of regular tests, implementation of relevant safety management requirements, other nuclear safety-related issues
11/10/15	Regulatory inspection on control point at 90% rated power (thermal power) of Yangjiang NPP unit 3	Completion of system commissioning project after the 1st criticality, treatment of commissioning defects and non-conformance report (NCR) and abnormal items found in maintenances, operation management (including implementation of technical specification, periodic tests, etc.), treatment of operating events, system and equipment defect repairs after temporary operating handover, implementation of relevant safety management requirements

Table 51. Operating Events of Yangjiang NPP in 2015

Event Date	Title	Cause	INES Level
02/24/15	Y2RGL control rod drop caused by neutron flux high signal of error source range from RPN024MA of unit 2	Equipment failure	0
03/31/15	Y2RGL control rod drop caused by protection signal which was triggered by SG low water level of unit 2	Human error	0
05/17/15	Automatic shutdown caused by tripping the main transformer which was triggered by generator asynchronous protection action of unit 2	Equipment failure	0

continued

Event Date	Title	Cause	INES Level
09/25/15	Control rod drop during the run-down pre-test for the main pump of unit 3	Human error	0
12/09/15	Shutdown caused by overspeed tripping of turbine during the load rejection to auxiliary power test of unit 3	Equipment failure	0

Table 52. Radiation Protection Doses of Yangjiang NPP Unit 1 and Unit 2 in 2015

Unit	Annual Man Average Effective Dose (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man·Sv)	Normalized Collective Effective Dose (man·mSv/Gwh)
Unit 1 and Unit 2	0.176	6.715	0.655	0.089

Sanmen NPP

In 2015, the construction and installation of Sanmen NPP unit 1 nuclear island was generally finished. The main pump arrived at the site on December 30. The top head of the steel containment of unit 2 was hoisted on July 8.

Nuclear safety-related regulatory approvals for Sanmen NPP are shown in Table 53, and inspection activities for Sanmen NPP are shown in Table 54.

Table 53. Nuclear Safety-Related Regulatory Approvals for Sanmen NPP in 2015

Approval Date	Document No.	Document Title
07/06/15	NNSA [2015]128	Notification of Releasing the Control Point of Hoisting the Top Head of the Steel Containment of Sanmen NPP Unit 2
04/30/15	NNSA Notice[2015]41	Reply Letter of Accepting the Quality Assurance Program of Sanmen NPP Phase I (Commission Phase) (Rev. 1)
04/30/15	NNSA Notice[2015]42	Reply Letter of Accepting the Quality AssuranceProgram during Commissioning Phase of Sanmen NPP Unit 1 and Unit 2 (Rev. 2)

Table 54. Inspection Activities for Sanmen NPP in 2015

Start Date	Item	Main Contents of the Inspection
03/03/15	Routine regulatory inspection on installation quality of the nuclear island of Sanmen NPP Phase I	Implementation quality assurance program, civil construction quality control and construction management, installation quality control and construction management, implementation of post-Fukushima improvements, construction license conditions and implementation of the safety requirements in previous inspections

continued

Start Date	Item	Main Contents of the Inspection
04/21/15	Routine regulatory inspection on preparation before the SGB hoisting of Sanmen NPP unit 2	Personnel and documents preparation, instruments and site preparation, preparation for the SGB itself and its supporting elements, processing the B ring groove of the No.2 main pipe, the pressure vessel side installation
06/23/15	Routine inspection before releasing the control point of hoisting in position of Sanmen NPP unit 2	Completion of the prerequisites of hoisting in position of unit 2, quality management and control of preparing for hoisting in position of unit 2
07/02/15	Regulatory inspection of control point of top head hoisting of the steel containment of Sanmen NPP unit 2	General situation of on-site civil construction, implementation of safety requirements in the construction license and previous inspections, implementation of quality assurance program, quality control of important items and activities, large equipment of the reactor in position inside the plant, the top head of the steel containment assembly, transportation and hoisting preparation of the top head of the steel containment, major non-conformities, design modification, event and experience feedback, use and evaluation of the fasteners
11/11/15	Special inspection on preparation before the steel dome hoisting of the shielding building of Sanmen NPP unit 2	Preparation before the steel dome hoisting of the shielding building, CVTH and CV four-ringgirth welding quality, concrete pouring quality of the shielding building on the 18th floor
11/24/15	Special inspection on commissioning management of Sanmen NPP unit 1	Implementation of commissioning program and quality assurance program during commissioning phase, nuclear safety-related systems, equipment installation and handover management, operation test implementation, EQ of nuclear safety-related equipment
12/21/15	Inspection on the control point before main pump installation of Sanmen NPP unit 1	Preparation of the main pump itself and its elements, preparation of the personnel, documents, and instruments for the main pump installation, preparation for construction environment for the main pump installation

Haiyang NPP

In 2015, the construction and installation of Haiyang NPP unit 1 nuclear island was generally finished. The top head of steel containment of unit 2 was hoisted on August 4.

Nuclear safety-related regulatory approvals for Haiyang NPP are shown in Table 55, and inspection activities for Haiyang NPP are shown in Table 56.

Top Head Hoisting of the Steel Containment of Haiyang NPP unit 2

Table 55. Nuclear Safety-Related Regulatory Approvals for Haiyang NPP in 2015

Approval Date	Document No.	Document Title
08/04/15	NNSA[2015]143	Notification of Releasing the Control Point of Hoisting the Top Head of the Steel Containment of Haiyang NPP Unit 2
04/23/15	NNSA Notice[2015]38	Reply Letter of Relative Issues of the Main Pipe Installation of Haiyang NPP Unit 2
08/20/15	NNSA Notice[2015]80	Reply Letter of Accepting the Program during Commissioning of Haiyang NPP Unit 1 and Unit 2 (Rev. 2)
08/20/15	NNSA Notice[2015]81	Reply Letter of Accepting the Quality Assurance Program of Haiyang NPP Unit 1 and Unit 2 (Commissioning Phase) (Rev. B)

Table 56. Inspection Activities for Haiyang NPP in 2015

Start Date	Item	Main Contents of the Inspection
03/09/15	Routine regulatory inspection on the construction installation quality of nuclear island of Haiyang NPP Phase I	Implementation of quality assurance program, civil construction quality control and construction management, installation construction quality control and construction management, implementation of Post-Fukushima improvements, implementation of safety requirements in construction license conditions and previous inspections
05/25/15	Routine regulatory inspection on the main pipe welding preparation of Haiyang NPP unit 2	Preparation of personnel and documents, welding procedure qualification and bevel fabrication, preparation of the main pipe, instruments, and welding materials and workplaces
07/04/15	Routine inspection on preparation before the SGB hoisting of Haiyang NPP unit 2	Personnel and documents preparation, instruments and workplace preparation, preparation of SGB itself and its supporting elements, processing the main pipe bevel of unit 2 and pressure vessel side installation
07/20/15	Routine inspection on preparation before the ring crane in position of Haiyang NPP unit 2	Completion of the prerequisites before the ring carne of unit 2 in position, quality management and control of preparation before the ring crane of unit 2 in position
07/27/15	Regulatory inspection on control point of top head hoisting of the steel containment of Haiyang NPP unit 2	General situation of on-site civil construction installation, implementation of safety requirements in construction license conditions and previous inspections, implementation of quality assurance program, quality control of important items and activities, large equipment of the reactor in positionin side the plant, major non-conformities, design modification, event and experience feedback, use and evaluation of the fasteners
09/09/15	Routine regulatory inspection on preparation before hoisting the steel dome of the shielding building of Haiyang NPP unit 2	Preparation before hoisting the steel dome, progresses of the steel dome assembly, quality control and management of the steel dome assembly, CVTH and CV four-ring girth welding quality, construction progresses of girth welding, quality control and management of welding under construction

continued

Start Date	Item	Main Contents of the Inspection
11/10/15	Special inspection before hoisting the CB20 module of Haiyang NPP unit 2	On-site assembly of the CB20 module, quality control of CB20 module assembly processes, the CB20 module hoisting preparation
12/01/15	Special inspection on commissioning management of Haiyang NPP unit 1	Implementation of commissioning program and quality assurance program during the commissioning phase, management of nuclear safety-related systems, equipment installation, and handover, pre-operation test implementation, EQ of nuclear safety-related equipment

Taishan NPP

Cold function tests for the primary loop of Taishan NPP unit 1 started on December 30, 2015. Unit 2 was in the stage of equipment installation.

Nuclear safety-related regulatory approvals for Taishan NPP are shown in Table 57, and inspection activities for Taishan NPP are shown in Table 58.

The Generator Rotor of Taishan NPP Unit 2

Table 57. The Nuclear Safety-Related Regulatory Approvals for Taishan NPP in 2015

Approval Date	Document No.	Document Title
12/22/15	NNSA[2015]271	Notification of Approving the In-Service Inspection Program of Taishan NPP Unit 1 and Unit 2 (Rev.D1)
12/28/15	NNSA[2015]278	Notification of Releasing the Control Point before Cold Function Tests for the Primary Loop of Taishan NPP Unit 1
12/22/15	NNSA Notice[2015]151	Reply Letter of Accepting the Program during Commissioning of Taishan NPP Unit 1 and Unit 2 (Rev. A5)

Table 58. Inspection Activities for Taishan NPP in 2015

Start Date	Item	Main Contents of the Inspection
12/15/15	Nuclear safety inspection on the control point before cold function tests of Taishan NPP unit 1	Quality assurance, treatment of system and equipment installation handover and non-conformance items, implementation of cold function tests project and commissioning defects treatment, preparation for cold function tests of the main system, implementation of safety requirements in previous inspections

Changjiang NPP

In 2015, the initial fuel loading of Changjiang NPP unit 1 started on August 26, and the commercial operation of unit 1 started on December 25. The unit 1 was kept in safety state, and safety barriers were kept intact. The failure of the fuel element, the leakage rate of the primary loop pressure boundary, and the leakage rate of the containment were all within the specified limits. Hot function tests for unit 2 were finished on December 10, and the unit 2 was preparing for the initial fuel loading.

Nuclear safety-related Regulatory approvals for Changjiang NPP are shown in Table 59, and inspection activities for Changjiang NPP are shown in Table 60. Two operating events occurred in Changjiang NPP, as shown in Table 61, and three constructing events occurred in Changjiang NPP, as shown in Table 62. The radiation protection doses of Changjiang NPP are shown in Table 63.

View of the Nuclear Island of Changjiang NPP Unit 1 and Unit 2

Table 59. Nuclear Safety-Related Regulatory Approvals for Changjiang NPP in 2015

Approval Date	Document No.	Document Title
08/25/15	NNSA[2015]175	Notification of Issuing the Instrument of Ratification for the Initial Fuel Loading of Hainan Changjiang NPP Unit 1
08/27/15	NNSA[2015]178	Notification of Approving to Release the Control Point before the Cold Function Tests of the Main System of Hainan Changjiang NPP Unit 2
10/10/15	NNSA[2015]210	Notification of Approving to Release the Control Point of the 1st Criticality of Hainan Changjiang NPP Unit 1
12/02/15	NNSA[2015]257	Notification of Approving to Release the Control Point of 90% Nominal Power of Changjiang NPP Unit 1
03/27/15	NNSA Notice[2015]34	Reply Letter of Quality Event Report of Exceeding Display Found in the Pre-service Check for the Pressure Vessel of Hainan Changjiang NPP Unit 1
05/26/15	NNSA Notice[2015]53	Official Letter of Issuing the Report of Comprehensive Regulatory Inspection before the Initial Fuel Loading of Hainan Changjiang NPP Unit 1
10/09/15	NNSA Notice[2015]102	Official Letter of Issuing the Regulatory Inspection Report before the 1st Criticality of Changjiang NPP Unit 1
08/25/15	MEP App [2015]190	Reply to Approving the Environment Impact Report (Operation Phase) of Changjiang NPP Unit 1 and Unit 2
01/13/15	MEP NPP[2015]4	Notification of Approving the Instrument of Ratification for the First Fuel Loading of Hainan Changjiang NPP Unit 2

Table 60. Inspection Activities for Changjiang NPP in 2015

Start Date	Item	Main Contents of the Inspection
05/11/15	Regulatory inspection before the initial fuel loading of Changjiang NPP unit 1	Quality assurance, structures and nuclear safety equipment, system commissioning, operation preparation, radiation protection, emergency preparedness, physical protection and fuel storage, environmental protection facilities, implementation of license conditions, documents, and review issues, implementation of safety requirements in previous inspections, and Post-Fukushima improvements
08/16/15	Regulatory inspection before the control point of cold function tests for the main system of Changjiang NPP unit 2	Quality assurance, installation handover of system and equipment and treatment of non-conformities, project reinforcement and treatment of commissioning defects of cold function tests, preparation for cold function tests of the main system, implementation of safety requirements in previous inspections, etc.
09/22/15	Regulatory inspection on the control point before the 1st criticality of Changjiang NPP unit 1	Completion of commissioning project before the 1st criticality, application of accident event list and design modification, preparation for the 1st criticality, implementation of technical specification (including operation event analysis) after fuel loading, implementation of regular checks, implementation of nuclear safety management requirements, other safety-related issues
11/25/15	Regulatory inspection at 90% rated power (thermal power) control point of Changjiang NPP unit 1	Completion of system commissioning tests after the 1st criticality, treatment of commissioning defects, non-conformity report (NCR), and abnormalities found in small maintenances, operation management (including implementation of technical specification, regular tests, etc.), treatment of operating events, treatment of system and equipment defects after temporary operation handover, implementation of the nuclear safety management requirements

Table 61. Operating Events of Changjiang NPP in 2015

Event Date	Title	Cause	INES Level
09/16/15	The reactor shutdown caused by No. 1 main pump tripping when the No.2 main pump stopping of unit 1	Equipment failure	0
11/16/15	Unit 1 shutdown when performing the commissioning test of 30% FP turbine stopping and reactor keeping working	Human error	0

Table 62. Constructing Events of Changjiang NPP in 2015

Event Date	Unit	Title
01/07/15	Unit 1	Two exceeding defect displays found in the pre-service check of the connecting welding beads of the main steam safety valve (1VVP103VV) and the main steam pipe
07/21/15	Unit 1	Running water in the PX pump room
09/26/15	Unit 2	Exceeding defects found in pre-service check for the pressure vessel

Table 63. Radiation Protection Doses of Changjiang NPP Unit 1 in 2015

Unit	Annual Man Average Effective Dose (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man·Sv)	Normalized Collective Effective Dose (man·mSv/Gwh)
Unit 1	0.000,4	0.016	0.000,122	0.001,5

Fangchenggang NPP

In 2015, the initial fuel loading of Fangchenggang NPP unit 1 started on September 2, and the unit 1 was connected to the grid on October 25. The unit 1 was kept in safety state, and safety barriers were kept intact. The failure of the fuel element, the leakage rate of the primary loop pressure boundary, and the leakage rate of the containment were all within thespecified limits.

The hot function tests of Fangchenggang NPP unit 2 were started on December 24, and FCD for the NI of unit 3 was constructed on December 24.

Nuclear safety-related regulatory approvals for Fangchenggang NPP are shown in Table 64, and inspection activities for Fangchenggang NPP are shown in Table 65. One operating event occurred in Fangchenggang NPP, as shown in Table 66, and one constructing event occurred in Fangchenggang NPP, as shown inTable 67. The radiation protection doses of Fangchenggang NPP are shown in Table 68.

Regulatory Inspection on Fangchenggang NPP by Inspectors from MEP (NNSA)

Table 64. Nuclear Safety-Related Regulatory Approvals for Fangchenggang NPP in 2015

Approval Date	Document No.	Document Title
08/12/15	NNSA[2015]162	Notification of Approving the Release of Control Point before Primary System Cold Tests of Fangchenggang NPP Unit 2
09/02/15	NNSA[2015]181	Notification of Issuing the Instrument of Ratification for the Initial Fuel Loading of Guangxi Fangchenggang NPP Unit 1

continued

Approval Date	Document No.	Document Title
10/12/15	NNSA[2015]212	Notification of Approving the Release of the 1st Criticality Control Point of Guangxi Fangchenggang NPP Unit 1
11/23/15	NNSA[2015]243	Notification of Approving the Release of 90% Nominal Power Control Point of Guangxi Fangchenggang NPP Unit 1
12/23/15	NNSA[2015]274	Notification of Issuing the Construction License for Fangchenggang NPP Unit 3 and Unit 4
03/20/15	NNSA Notice[2015]32	Notification of the Release of Control Point before the Initial Core Fuel of Fangchenggang NPP Unit 1 Arrived at the Site
05/04/15	NNSA Notice[2015]46	Reply Letter of Accepting the Commissioning Program of Guangxi Fangchenggang NPP Unit 1 and Unit 2 (Rev. D)
08/20/15	NNSA Notice[2015]78	Notification of Issuing the Report of Comprehensive Regulatory Inspection before the Initial Fuel Loading of Guangxi Fangchenggang NPP Unit 1
12/14/15	NNSA Notice[2015]142	Notification of Issuing the Report of Comprehensive Regulatory Inspection before FCD for Nuclear Island of Fangchenggang NPP Unit 3
12/23/15	NNSA Notice[2015]152	Reply Letter of Accepting the Quality Assurance Program during the Engineering Design and Construction Phase of Fangchenggang NPP Unit 3 and Unit 4 (Rev. 1)
09/02/15	MEP App[2015]194	Reply of Approving Environment Impact Report (Operation Phase) of Guangxi Fangchenggang NPP Phase I Unit 1 and Unit 2
12/23/15	MEP App[2015]262	Reply of Approving Environment Impact Report (Construction Phase) of Guangxi Fangchenggang NPP Unit 3 and Unit 4

Table 65. Inspection Activities for Fangchenggang NPP in 2015

Start Date	Item	Main Contents of the Inspection
05/14/15	Nuclear Safety inspection on nuclear island foundation pit after excavation for Fangchenggang NPP unit 3	Construction procedure and record about nuclear island foundation pit after excavation for unit 3, detailed survey result check of the excavation, non-conformance items in construction process and its treatment, establishment and implementation of quality assurance system
05/18/15	Regulatory inspection before the initial fuel loading of Fangchenggang NPP unit 1	Quality assurance, structures and nuclear safety equipment, system commissioning, operation preparation, radiation protection, emergency preparedness, physical protection and fuel storage, environmental protection facility, license conditions, application documents and treatment of the review questions, implementation of the safety requirements in previous inspections, and other items such as Post-Fukushima improvements
08/03/15	Nuclear safety inspection of the control point before cold function tests of Fangchenggang NPPunit 2	Quality assurance, system and equipment installation delivery and handling of non-conformance items, implementation for cold function test program and defects treatment of commissioning tests, preparation on cold tests program of primary system, and implementation of the safety requirements in previous inspections

continued

Start Date	Item	Main Contents of the Inspection
10/07/15	Comprehensive regulatory inspection on nuclear safety of Fangchenggang NPP and inspection for the first criticality control point of unit 1	Operation of quality assurance system, accident management and emergency preparedness, nuclear island fire-fighting safety management, completion of commissioning projects before the1st criticality, significant abnormal items in commissioning, and design modification conditions, preparation before the 1st criticality, implementation of technical specification after the 1st fuel loading, implementation of regular tests, and other nuclear safety-related issues
11/16/15	Regulatory inspection on 90% rated power (thermal power) control point of Fangchenggang NPP unit 1	Completion of system commissioning tests after the 1st criticality, treatment of commissioning defects, NCR and abnormal items at maintenance stage, operation management (including compliance with technical specification, periodic tests, etc.), treatment of operating events, system and equipment defects repairs after temporary operating handover, and implementation of nuclear safety management requirements
11/16/15	Regulatory inspection before FCD for nuclear island of Fangchenggang NPP Unit 3	On-site quality control on safety-important items, treatment of remaining problems during nuclear island foundation construction phase of the unit 3, on-site preparations before FCD for nuclear island of Fangchenggang NPP unit 3, operation of quality assurance system

Table 66. The Operating Event of Fangchenggang NPP in 2015

Event Date	Title	Cause	INES Level
09/08/15	Abnormal shutdown of the EBA damper during opening both eight-meter air brakes of the unit 1	Human error	0

Table 67. The Constructing Event of Fangchenggang NPP in 2015

Event Date	Unit	Title
04/29/15	Unit 2	The D port of section D of the pressurizer surge line cannot meet the requirement to match the other part

Table 68. Radiation Protection Doses of Fangchenggang NPP Unit 1 in 2015

Unit	Annual Man Average Effective Dose (mSv)	Annual Maximum Individual Effective Dose (mSv)	Annual Collective Effective Dose (man·Sv)	Normalized Collective Effective Dose (man·mSv/Gwh)
Unit 1	0.004,5	0.540	0.009	—

Huaneng Shandong Shidao Bay HTR-PM NPP Demonstration Project

In 2015, the nuclear auxiliary building of Huaneng Shandong Shidao Bay HTR-PM NPP Demonstration Project was capped. The roof modules of reactor building and spent fuel building were hoisted. The turbine building was capped. Equipment installation was in fully conducted.

Nuclear safety-related regulatory approvals for Huaneng Shandong Shidao Bay HTR-PM NPP Demonstration Project are shown in Table 69, and inspection activities are shown in Table 70.

Table 69. Nuclear Safety-Related Regulatory Approvals for Huaneng Shandong Shidao Bay HTR-PM NPP Demonstration Project in 2015

Approval Date	Document No.	Document Title
07/31/15	NNSA[2015]142	Notification of Approving to Add Cobalt Pellets to Initial Fuel Elements of the HTR-PM NPP Demonstration Project
09/30/15	NNSA[2015]203	Notification of Approving to Lower Requirements for High Temperature Tensile Property of the SG Tubes of the HTR-PM NPP Demonstration Project
05/19/15	MEP NPP [2015]14	Notification of Adjusting the Construction Control Point of Huaneng Shandong Shidao Bay HTR-PM NPP Demonstration Project

Table 70. Inspection Activities for Huaneng Shandong Shidao Bay HTR-PM NPP Demonstration Project in 2015

Start Date	Item	Main Contents of the Inspection
12/23/15	Nuclear safety inspection of the control point before hoisting the RPV of Huaneng Shandong Shidao Bay HTR-PM NPP Demonstration Project	Preparation of civil engineering phase to equipment installation phase, quality control of hoisting, preparation of staff and documents, hoisting simulation and practice, preparation of hoisting equipment, tools, and places, construction record, treatment of non-conformance items during construction

Zhangzhou NPP Phase I (Unit 1-Unit 4)

MEP (NNSA) accepted the Safety Analysis Report on Plant Siting and the Environmental Impact Report (Siting Stage) of Fujian Zhangzhou NPP Phase I (unit 1-unit 4), and organized technical reviews.

Ningde NPP Unit 5 and Unit 6

MEP (NNSA) accepted the Safety Analysis Report on Plant Siting and the Environmental Impact Report (Siting Stage) of Ningde NPP unit 5 and unit 6, and organized technical reviews.

Lufeng NPP Unit 1 and Unit 2

MEP (NNSA) organized technical reviews on the Preliminary Safety Analysis Report and the Environmental Impact Report (Construction Stage) of Lufeng NPP Unit 1 and Unit 2.

Taipingling NPP Unit 1 and Unit 2

MEP (NNSA) accepted the Safety Analysis Report on Plant Siting and the Environmental Impact Report (Siting Stage) of Taipingling NPP Unit 1 and Unit 2, and organized technical reviews.

4 Safety Regulation on Research Reactors

In 2015, among the 19 in-service research reactors, 12 were in operation, 5 were in long-term shutdown, and 2 were not in operation (see Table 71). There were 7 operating events in 2015 (see Table 72), and 3 of them were shutdown events, which occurred in C stage during commissioning phase of China Experimental Fast Neutron Reactor, and the other 4 events occurred in High Flux Engineering Test Reactor and 10MW High Temperature Gas-Cooled Reactor.

Table 71. Operation Status of Research Reactors in 2015

Facility Name	Design Power	Operating Organization	Operating Status
101 Heavy Water Reactor (101HWR)	10MW	China Institute of Atomic Energy	Long-term shutdown (permanently closed)
China Experimental Fast Neutron Reactor (CEFR)	65MW	China Institute of Atomic Energy	1,583.5h
China Advanced Research Reactor (CARR)	60MW	China Institute of Atomic Energy	297.3h
49-2 Swimming Pool Reactor (49-2SPR)	3.5MW	China Institute of Atomic Energy	72.8h
Miniature Neutron Source Reactor (MNSR)	27kW	China Institute of Atomic Energy	1 time
Miniature Reactor Zero Power Facility (CFMNSR)	—	China Institute of Atomic Energy	1 time
Zirconium Hydride Solid Critical Facility (SSZR)	—	China Institute of Atomic Energy	Long-term shutdown
DF-VI Fast Neutron Criticality Facility (DF-VI CFFR)	—	China Institute of Atomic Energy	Long-term shutdown
Pilot Plant Nuclear Criticality Safety Experiment Facility (UCF)	—	China Institute of Atomic Energy	19 times
Shielding Experiment Reactor (SER)	1MW	Institute of Nuclear and New Energy Technology of Tsinghua University	Long-term shutdown

continued

Facility Name	Design Power	Operating Organization	Operating Status
5MW Experimental Low Temperature Nuclear Heating Reactor (5MW-NHR)	5MW	Institute of Nuclear and New Energy Technology of Tsinghua University	Not in operation
10MW High Temperature Gas-Cooled Reactor (10MW-HTGR)	10MW	Institute of Nuclear and New Energy Technology of Tsinghua University	2,160h
High Flux Engineering Test Reactor (HFETR)	125MW	Nuclear Power Institute of China	241d
High Flux Engineering Test Reactor Experimental Facility (HFETR)	—	Nuclear Power Institute of China	Long-term shutdown
China Burst Reactor (CRP)	1MW	Nuclear Power Institute of China	3 times
Minjiang Test Reactor (MJTR)	5MW	Nuclear Power Institute of China	Not in operation
18-5 Critical Facility	—	Nuclear Power Institute of China	3 times
Miniature Neutron Source Reactor of Shenzhen University (MNSR)	30kW	Joint Institute of Applied Nuclear Technology of Shenzhen University	4 times
In-Hospital Neutron Irradiator (IHNI)	30kW	Beijing Capture Technology Co., Ltd	19 times

Table 72. Operating Events of Research Reactors in 2015

Event Date	Facility Name	Title	Cause	Level
01/18/15	HFETR	Transient voltage loss of section II of off-site power supply	Equipment failure	0
04/01/15	10MW-HTGR	Protective shutdown induced by fluctuation of off-site power grid	Equipment failure	0
07/03/15	HFETR	1#N16 monitor failure	Equipment failure	0
07/31/15	HFETR	Electricity loss of high voltage section I	Equipment failure	0
11/10/15	CEFR	Protective shutdown caused by stopping the 1#main feed-water pump	Equipment failure	0
11/22/15	CEFR	Protective shutdown caused by fluctuation of off-site power grid	Equipment failure	0
12/16/15	CEFR	Shutdown induced by abnormal closedown of SG pneumatic isolating valves	Human error	0

In 2015, one construction license and one operating license of research reactor were issued; one environmental impact report of construction project was approved, and 2 environmental acceptance surveys were completed, and 9 nuclear safety permits were preceded. Reviews and endorsements of quality assurance programs for 1 research reactor were completed. Nuclear safety-related approvals for research reactors are shown in Table 73, and inspection activities are shown in Table 74.

Table 73. Nuclear Safety-Related Approvals for Research Reactors in 2015

Approval Date	Document No.	Document Title
03/05/15	NNSA[2015]54	Notification of Approving the Partial Amendment of Operating Limits and Conditions of 49-2 Reactor
04/30/15	NNSA[2015]90	Notification of Issuing Operating License to MNSR of Shenzhen University
06/03/15	NNSA[2015]110	Notification of Approving Safety Analysis Reports of Devices for Online Neutron Activation Analysis and Neutron Radiography Experiment of CARR
08/10/15	NNSA[2015]144	Reply letterto the Application of Exemption from Inspection or Alternative Inspection of In-service Inspection Equipment of CEFR
08/27/15	NNSA[2015]179	Notification of Approving Discharging Storage of Highly Enriched Assembly of MNSR
11/25/15	NNSA[2015]247	Notice of Approving the Inspection on Fuel Rods from Daya Bay NPP by Using Hot Cell of CEFR
11/25/15	NNSA[2015]248	Notice of Approving to Use Neutron Tube for Criticality and Sub-criticality Facilities of China Institute of Atomic Energy
01/13/15	NNSA Notice[2015]8	Reply Letter of Approving the Operating Quality Assurance Program of CARR (Stage of Trial Operation)
11/26/15	NNSA Notice[2015]128	Reply Letter of Pre-work Issues about Thorium Molten Salt Reactor (TMSR) as a Research Reactor of Category II
05/05/15	MEP App[2015]110	Reply Letter to Environmental Impact Report of Security Guard Building of INET/TU

Table74. Inspection Activities for Research Reactors in 2015

Start Date	Item	Main Contents of the Inspection
08/27/15	nationwide comprehensive regulatory inspection on NPPs and research reactors —Tsinghua University	Quality assurance system, emergency and accident management, fire protection and hazardous chemical management, development of nuclear safety culture, radioactive waste management and nuclear technology utilization, implementation of requirements from previous inspections

continued

Start Date	Item	Main Contents of the Inspection
08/28/15	Nationwide comprehensive regulatory inspection on NPPs and research reactors — China Institute of Atomic Energy	Quality assurance system, emergency and accident management, fire protection and hazardous chemical management, development of nuclear safety culture, radioactive waste management and nuclear technology utilization, implementation of requirements from previous inspections
09/22/15	Nationwide comprehensive regulatory inspection on NPPs and research reactors — Nuclear Power Institute of China	Quality assurance system, emergency and accident management, fire protection and hazardous chemical management, development of nuclear safety culture, radioactive waste management and nuclear technology utilization, implementation of requirements from previous inspections
12/29/15	Nuclear safety inspection on INTCA of Shenzhen University	Reactor safety management, implementation of quality assurance program, training management of operators, regular tests, inspection and maintenance, implementation of requirements for nuclear safety management in recent years

5 Safety Regulation on Nuclear Fuel Cycle Facilities

In 2015, in-service facilities for producing, fabricating, storing, and reprocessing nuclear fuel (see Table 75) were maintained in safe operation, and the quality of facilities under construction was effectively controlled. The nuclear fuel cycle facilities were kept good safety records, while their environmental impacts were attenuated continually, and no unacceptable nuclear and radiation harm to the personnel, the public, or the environment ever happened.

In 2015, there were one operation license was issued, one environmental impact report / form and 6 nuclear safety technical modifications were replied to, and 2 environmental acceptance surveys for construction projects were completed. Regulatory approvals for nuclear fuel cycle facilities in 2015 are shown in Table 76, and inspection activities for nuclear fuel cycle facilities in 2015 are shown in Table 77.

Vice Minister of MEP, Administrator of NNSA, Li Ganjie, Inspected the China Institute of Atomic Energy

Table 75. Major Facilities for Producing, Fabricating, Storing, and Reprocessing Civilian Nuclear Fuel

Facility/Project Name	Operating Organization	Product Form	Current Status
Chemical Conversion Dry Fabrication Line	CNNC Jianzhong Nuclear Fuel Co., Ltd	UO_2 powder	In operation
Powder Metallurgical Fabrication Line	CNNC Jianzhong Nuclear Fuel Co., Ltd	Gd_2O_3 and UO_2 sintered pellet	In operation
Nuclear Fuel Assembly Fabrication Line	CNNC Jianzhong Nuclear Fuel Co., Ltd	PWR fuel assembly	In operation
IDR Process Research and Equipment Production Line	CNNC Jianzhong Nuclear Fuel Co., Ltd	UO_2 powder	In operation

continued

Facility/Project Name	Operating Organization	Product Form	Current Status
Project of Extension and Technical Reformation of Nuclear Fuel Elements Fabrication Line	CNNC Jianzhong Nuclear Fuel Co., Ltd	PWR nuclear fuel assembly	In operation
HWR Nuclear Fuel Elements Fabrication Line	China Northern Nuclear Fuel Co., Ltd, CNNC	HWR nuclear fuel assembly	In operation
PWR Nuclear Fuel Elements Fabrication Line	China Northern Nuclear Fuel Co., Ltd, CNNC	PWR nuclear fuel assembly	In operation
AP1000 Nuclear Fuel Elements Fabrication Line	China Northern Nuclear Fuel Co., Ltd, CNNC	AP1000 nuclear fuel assembly	Under construction
Extension of PWR Nuclear Fuel Elements Fabrication Line	China Northern Nuclear Fuel Co., Ltd, CNNC	PWR fuel pellet	Under construction
High Temperature Gas-Cooled Reactor Fuel Elements Fabrication Line	China Northern Nuclear Fuel Co., Ltd, CNNC	High temperature gas-cooled reactor sphere fuel element	Under construction
The project of 405-1A	Shaanxi Uranium Co., Ltd CNNC	Low enrichment UF_6	In operation
Phase IV Centrifugation Project	Shaanxi Uranium Co., Ltd CNNC	Low enrichment UF_6	In operation
North Region Centrifuge Extension Project, Phase I	Shaanxi Uranium Co., Ltd CNNC	Low enrichment UF_6	In operation
North Region Centrifuge Extension Project, Phase II	Shaanxi Uranium Co., Ltd CNNC	Low enrichment UF_6	Under construction
Centrifuge Project	Lanzhou Uranium Co., Ltd CNNC	Low enrichment UF_6	In operation
Domestic Centrifuge Commercial Paradigm Project	Lanzhou Uranium Co., Ltd CNNC	Low enrichment UF_6	In operation
Uranium Enrichment Project, Phase III	Lanzhou Uranium Co., Ltd CNNC	Low enrichment UF_6	In operation
Temporary Dry Storage Facility for Spent Fuel of Qinshan NPP, Phase III	Nuclear Power Operation and Management Co., Ltd CNNC	—	In operation

Table 76. Regulatory Approvals for Nuclear Fuel Cycle Facilities in 2015

Approval Date	Document No.	Document Title
05/27/15	NNSA[2015]108	Notification of Approving to Dismantle Parts of Equipment of the 110-2 Subproject of the Energy Saving and Emission Reduction and Infrastructure Project of CNNC Jianzhong Nuclear Fuel Co., Ltd

continued

Approval Date	Document No.	Document Title
06/23/15	NNSA[2015]121	Notification of Issuing the Operating License of the Extension and Technical Modification of Nuclear Fuel Elements Fabrication Line of CNNC Jianzhong Nuclear Fuel Co., Ltd
06/30/15	NNSA[2015]123	Notification of Approving the Safety Analysis Report of Nuclear Materials Store Room of the 2128 Subproject of CNNC Jianzhong Nuclear Fuel Co., Ltd
09/08/15	NNSA[2015]186	Notification of Approving the Air-Cooled Feeding Material and Extension and Renovation of Centrifugal Project of Lanzhou Uranium Co., Ltd CNNC
09/14/15	NNSA[2015]190	Notification of Approving the Liquefaction Homogeneous System Process Optimization of the 405-1A Project of Shaanxi Uranium Co., Ltd CNNC
11/25/15	NNSA[2015]250	Notification of Approving the Building Reinforcement Plan of the 120 and 140 Subprojects of CNNC Jianzhong Nuclear Fuel Co., Ltd
11/27/15	NNSA[2015]254	Notification of Approving the Conversion Device Optimization Modification of Pellets Disk from Kazakhstan of CNNC Jianzhong Nuclear Fuel Co., Ltd
02/05/15	MEP App[2015]34	Reply to the Environmental Impact Form of the Centrifugal Supporting Project (Lean Material Containers Storage) of Shaanxi Uranium Co., Ltd CNNC
05/28/15	MEP Acc[2015]120	Official Letter of the Environmental Acceptance Survey Comments on Expansion and Technical Modification Project Completion of the Fuel Assembly Fabrication Line of CNNC Jianzhong Nuclear Fuel Co., Ltd
06/12/15	MEP Acc[2015]128	Official Letter of the Environmental Acceptance Survey Comments on the Project of Nuclear Facilities Physical Protection of CNNC Jianzhong Nuclear Fuel Co., Ltd

Table 77. Inspection Activities for Nuclear Fuel Cycle Facilities in 2015

Start Date	Activity Item	Main Contents of the Inspection
04/01/15	Comprehensive Safety Inspection before Loading of Fuel Element Fabrication Line AP1000 Nuclear Power Plant of China Northern Nuclear Fuel Co., Ltd, CNNC	Nuclear safety inspection
04/01/15	Comprehensive Safety Inspection before Loading of Fuel Element Fabrication Line Expansion Project of PWR Nuclear Power Plant of China Northern Nuclear Fuel Co., Ltd, CNNC	Nuclear safety inspection
05/05/15	Environmental Acceptance Survey on Expansion and Technical Modification Project Completion of the Fuel Assembly Fabrication Line of CNNC Jianzhong Nuclear Fuel Co., Ltd	Environmental acceptance survey for project completion
05/05/15	Environmental Acceptance Survey Comments on the Project of Nuclear Facilities Physical Protection of CNNC Jianzhong Nuclear Fuel Co., Ltd	Environmental acceptance survey for project completion

continued

Start Date	Activity Item	Main Contents of the Inspection
08/28/15	Nuclear and Radiation Safety Inspection of China Institute of Atomic Energy	Comprehensive regulatory inspection
09/06/15	Nuclear and Radiation Safety Inspection of CNNC Jianzhong Nuclear Fuel Co., Ltd	Comprehensive regulatory inspection
09/28/15	Comprehensive Safety Inspection before Loading of the Fuel Element Fabrication Line of Nuclear Power Plant Pilot Project of High Temperature Gas-Cooled Reactor of China Northern Nuclear Fuel Co., Ltd, CNNC	Nuclear safety inspection
09/28/15	Nuclear and Radiation Safety Inspection of China Northern Nuclear Fuel Co., Ltd, CNNC	Comprehensive regulatory inspection

6 Radiation Environment Regulation on Exploitation and Utilization of Uranium and the Associated Radioactive Minerals

The reviews and approvals of the environmental impact report for 5 construction projects were completed by MEP (NNSA), including the In-Situ Uranium Leach Mining Project of Bayannur of Inner Mongolia Uranium Deposit of Shaoguan Jinhong Uranium Co., Ltd CNNC, and the In-Situ Leaching Uranium Mining Expansion Project (Phase Ⅱ) of Mengqigur Uranium Deposit of Xinjiang Tianshan Uranium Co., Ltd CNNC, etc. The environmental acceptance surveys for 4 projects completion were finished, including the Uranium Purification Production Line Safety Environmental Protection Modification Project of the 272 Uranium Industry Co., Ltd CNNC, the Project of Energy Saving and Emission Reduction Technology Renovation of the 272 Uranium Industry Co., Ltd CNNC, etc. Radiation environment regulatory approvals for exploitation and utilization of uranium and the associated radioactive minerals in 2015 are shown in Table 78.

Table 78. Radiation Environment Regulatory Approvals for Exploitation and Utilization of Uranium and the Associated Radioactive Minerals in 2015

Approval Date	Document No.	Document Title
02/05/15	MEP App[2015]33	Reply to the Environmental Impact Report of the In-Situ Leaching Uranium Mining Project of Uranium Deposit of Bayannur, Inner Mongolia of Shaoguan Jinhong Uranium Co.,Ltd CNNC
08/25/15	MEP App[2015]191	Reply to the Environmental Impact Report of the In-Situ Leaching Uranium Mining Expansion Project (Phase II) of Mengqigur Uranium Deposit of Xinjiang Tianshan Uranium Co., Ltd CNNC
10/08/15	MEP App[2015]207	Reply to the Environmental Impact Report of the Decommissioning and Modification Project of Uranium Deposit of the Danfeng Mountain Temple
11/18/15	MEP App[2015]245	Reply to the Environmental Impact Report of Extension of the Test Site of the In-Situ Leaching Uranium Mining of the Uranium Deposit of Ordos Naling Basin

continued

Approval Date	Document No.	Document Title
12/11/15	MEP App[2015]254	Reply to the Environmental Impact Report of the In-Situ Leaching Uranium Test of Barun Uranium Deposit
01/21/15	MEP Acc[2015]37	Official Letter of Environmental Acceptance Survey Comments on Project Completion of the Environmental Protection Modification Project the Uranium Purification Fabrication Line Safety of the 272 Uranium Industry Co., Ltd CNNC
01/21/15	MEP Acc[2015]38	Official Letter of Environmental Acceptance Survey Comments on Project Completion of Energy Saving and Emission Reduction Technical Modification of the 272 Uranium Industry Co., Ltd CNNC
11/13/15	MEP Acc[2015]215	Official Letter of Environmental Acceptance Survey Comments on Project Completion of the Comprehensive Technical Modification (Lantian Mining Area) of Xi'an Blue Sky Uranium Co., Ltd CNNC
12/08/15	MEP Acc[2015]220	Official Letter of Environmental Acceptance Survey Comments on Project Completion of the Comprehensive Technical Modification (Prevention for Risks) of Shaoguan Jinhong Uranium Co., Ltd CNNC

Streamlining Administration and Delegating Power

To precisely implement the requirements of the central government about the power decentralizing, in the Classification Directory of Environmental Impact Report for Construction Projects, the requirement have been changed to prepare environmental impact form all projects in the kind of the uranium deposit geological exploration and the decommissioning and remediation.

Regulatory Inspections

In accordance with the overall deployment and requirements of the Notification of Performing Nationwide Nuclear and Radiation Safety Comprehensive Regulatory Inspections and supervision (MEP Notice[2015]1437), combined with the annual routine inspection plan of each province, MEP (NNSA) carried out nationwide comprehensive regulatory inspections for uranium mining and milling radiation environment. MEP (NNSA) selectively performed inspections focusing on the Shaoguan Jinhong Uranium Co.,Ltd CNNC, China Northern Uranium Co., Ltd CNNC, the 738 Factory of Xinjiang Tianshan Uranium Co., Ltd CNNC, and Fuzhou Jin'an Uranium Co., Ltd CNNC. The other uranium mines were inspected by the regional offices.

Petitions and Complaints

There were 3 petitions and complaints were solved timely.

Inspector Training

In July 2015, MEP (NNSA) held the first uranium mining and milling inspector

training, 80 leaders and inspectors from the regional offices and environmental protection departments at the provincial level attended the training. Experts of nuclear industry were invited to give speeches on the present development situation, regulations and standards, environmental monitoring, technical review, three wastes emissions and treatment, facilities decommissioning, and tailing storage security of uranium mining and milling. The training achieved good results.

Environmental Management of Associated Radioactive Minerals

MEP (NNSA) officers were assigned to pay visits to Jiangxi and Inner Mongolia, in order to investigate the treatment situation of associated radioactive mineral tailings, to talk with local environmental protection departments. They also conducted field investigation of tantalum niobium ore development enterprises, rare earth smelting enterprises, and rare earth waste tailing storages discussed about challenges that the radioactive waste tailing management faced, searched responding measures, and formed investigating results.

7 Safety Regulation on Radioactive Wastes

According to the Act of the Prevention and Control of Radioactive Pollution, the Safety Regulation on Radioactive Wastes, and other department rules and standards, MEP (NNSA) enhanced the regulation of radioactive wastes. The development of safety regulations on radioactive wastes were carried forward, and safety regulation on construction and operation of radioactive waste disposal sites was implemented. Treatment and disposal of left radioactive wastes were pushed forward, and the specific work about investigation and evaluation of present radiation environment around national nuclear bases and nuclear facilities was carried out.

Safety Regulation on Construction and Operation of Radioactive Waste Disposal Sites

In 2015, the Northwest Low-and-Medium Level Waste Disposal Site accepted 1,433.3m^3 low and medium level wastes, 2,466 barrels or boxes with the total radioactivity of 2.24E+14Bq. By the end of 2015, the Northwest Low-and-Medium Level Waste Disposal Site had accepted 11,308.9m^3 wastes, 20,893 barrels or boxes with the total radioactivity of 4.81E+14Bq.

In 2015, the Guangdong Beilong Low-and-Medium Level Waste Disposal Site accepted 280 radioactive packages, which were generated by Daya Bay NPP and Ling'ao NPP. Radioactive packages including C1 and C4 type concrete barrels 150 and 130 packages respectively, with the total volume of 461.2m^3 and total radioactivity of 3.64E+13 Bq. By the end of 2015, the Guangdong Beilong Low-and-Medium Level Waste Disposal Site had accepted 1,064 waste packages, with the total volume of 2,056.1m^3, and the total radioactivity of 9.33E+13Bq.

In 2015, the Feifengshan Low-and-Medium Level Waste Disposal Site completed construction and partial correction of the 1st phase project. MEP (NNSA) was reviewing the safety analysis report and environmental impact report of its operation phase.

Vice Administrator of NNSA, Director General of Department of Radiation Source Safety Regulation of MEP, Ye Min, Inspected China General Nuclear Power Group for Siting of Radioactive Waste Disposal Site

Treatment and Disposal of Left Radioactive Wastes

Ten environmental impact report related documents were replied to, and six environmental acceptance surveys were completed, and five regulatory requirement documents were issued by MEP (NNSA).

The acceptance survey of environment investigation and evaluation project of Shenxiandong waste storage inTonglu county of Zhejiang province was completed.

Investigation and Evaluation of Radiation Environment around National Nuclear Bases and Nuclear Facilities

MEP (NNSA) organized the third leadership group meeting and work promotion meeting about investigation and evaluation of radiation environment around national nuclear bases and nuclear facilities, and carried out investigation and evaluation for 21 projects. MEP (NNSA) organized training courses of monitoring technology and evaluation technology, and carried out two comparison activities between laboratories.

8 Safety Regulation on Radioisotopes and Irradiation Devices

Until December 31, 2015, there were 65,531 organizations producing, selling or using radioisotopes and irradiation devices in China. Among them, there were 14,466 organizations producing, selling, or using radioisotopes, and the number of the radioactive sources in service was 122,417 (12,193 of category I, 14,520 of category II, 1,938 of category III, and 93,766 of others). There were 51,065 organizations producing, selling, or using irradiation devices, and the number of irradiation devices was 137,309. There were 36,376 waste radioactive sources, which were accepted by provincial urban rodioactive waste storages, and 127,993 waste radioactive sources transferred to or accepted by the national radioactive sources centralized temporary storage .

The number of organizations regulated by MEP(NNSA) was 237 in total, which producing radioisotopes (except for making Positron Emission Tomography radiopharmaceuticals for self-use only), selling and using radioactive sources of category I (except for medical radioactive sources of category I), selling (including installation) and using irradiation devices of category I, and the unsealed radioactive material workplaces of class Jia.

Deepening Administration Streamlining and Power Delegating on Nuclear Technology Utilization

MEP (NNSA) revised and published the part of nuclear technology utilization projects in the Classification Directory of Environmental Impact Assessment for Construction Projects to exempt from environmental impact assessment for adding special workplaces. MEP (NNSA) published the Notification of Nuclear Technology Utilization Projects Exempted from Environmental Impact Documents in the Classification Directory of Environmental Impact Assessment for Construction Projects, to explain relative issues, and to normalize regulation in the field of nuclear technology utilization.

MEP (NNSA) optimized radiation safety management measures for package checking devices, and published the Notification of

Exemption of Organizations with Box X-Ray Package Checking Devices in Public Places, to exempt organizations using box X-ray package checking devices in public places.

In order to promote the radiation safety regulation procedure of Radio-pharmacy to be more scientific and specific, MEP (NNSA) issued Notice of Radiation Safety Management of Radio-pharmacy.

Carry Out Comprehensive Regulatory Inspection and Supervision on Nuclear and Radiation Safety

Based on the Notification of Performing Nationwide Nuclear and Radiation Safety Comprehensive Regulatory Inspection and Supervision, MEP (NNSA) performed nationwide special radiation safety inspections in the field of nuclear technology utilization for urban radioactive waste storages, and organizations using radioactive sources higher than category III and using irradiation devices higher than category II (not for hospitals or radioactive medicine production enterprises), and the unsealed radioactive material workplaces of class Jia etc. Illegal actions to radiation environment were timely corrected, and safety conditions were significantly improved. Safety consciousness of organizations was further improved, and more barriers to protect nuclear and radiation safety were build up.

Improve Nuclear Safety Culture in the Field of Nuclear Technology Utilization

Based on the work demand of “two full coverage, and two zero tolerances”, MEP (NNSA) keep promoting special activities on publicity of nuclear safety culture in the field of nuclear technology utilization. MEP (NNSA) also held trainings for preaching on nuclear safety culture in the field of nuclear technology utilization, to propagate nuclear safety culture policy statement and requirements on nuclear safety culture in the field of nuclear technology utilization, etc.

Strengthen Public Communication

MEP (NNSA) established public communication mechanism in the field of nuclear technology utilization, and published the Public Communication Guidance on Nuclear Technology Utilization Projects (Trail), in order to guide relative organizations of nuclear technology utilization projects to carry out public communication, and so as to protect the Public rights of knowing the fact, participating, and overseeing.

Licensing and Inspection

In 2015, radiation safety licenses were issued to 13 nuclear technology utilization organizations, licenses of 25 organizations

were modified, licenses of 14 organizations were renewed, and licenses of 10 organizations were added new items (see Table 79).

Environmental impact reports for 2 decommissioning nuclear technology utilization projects were reviewed and approved. Acceptance surveys for 2 renewed, modified, and expanded projects were completed. The final environmental protection acceptance survey for one decommissioning nuclear technology utilization project were completed, and exemption from regulation for 7 organizations was reviewed and approved (see Table 80).

Review and Approval of Radioisotope Imports and Exports

There were totally 1,570 applications for radioactive source (unsealed radioactive materials) imports and exports which were approved in 2015, including 1,165 applications for imported radioactive sources and 405 applications for exported radioactive sources (unsealed radioactive materials) respectively. The total number of imported radioactive sources was 4,976, and the total number of exported radioactive sources was 1,623. The total radioactivity of imported unsealed radioactive materials was 1.72E+16Bq, and the total radioactivity of exported unsealed radioactive materials was 5.08E+10Bq.

Training of Radiation Safety and Radiation Protection

Quality control and on-site oversights for the primary and intermediate training courses of radiation safety and radiation protection held by recommended training institutes were undertaken continually for enhancing training quality. In 2015, 149 training courses of radiation safety and radiation protection of different levels were held by 8 training institutions, including 31 intermediate classes with 3,494 trainees, 79 primary classes with 10,319 trainees, and 39 refreshment classes with 3,872 trainees. These courses greatly contributed to improving the quality of the staff in nuclear technology utilization organizations, and to fostering their nuclear safety culture.

In order to strengthen the training, to consolidate the foundation, and to improve the professional abilities of nuclear safety regulatory staff, 3 radiation safety regulation courses of nuclear technology utilization were held. More than 450 trainees from provincial environmental protection departments participated in the training, including over 20 trainees from the army for enhancing the professional abilities and regulatory capabilities of the related military personnel.

Radiation Accidents

In 2015, there were 3 radiation accidents nationwide. All of them were ordinary accidents of loss or theft, involving 10

radioactive sources (all of them are ^{241}Am radioactive sources of category IV). Until December 31, 2015, 2 of them had been recovered.

Urban Radioactive Waste Storages

The urban radioactive waste storages were all in normal operation in 2015.

Table 79. List of Approved Radiation Safety Licenses in 2015

No.	Organization	Type
1	Tongfu (Sichuan) CNNC Radiation Technology Co., Ltd	Fresh application
2	Dalian CNNC Radiation Technology Co., Ltd	Fresh application
3	Tongfu (Changchun) CNNC Radiation Technology Co., Ltd	Fresh application
4	Shanxi Ruidesheng Technology Co., Ltd	Fresh application
5	Luohe Longxiang Radiation Technology Co., Ltd	Fresh application
6	Beijing Beike Radiation Technology and Trade Co., Ltd	Fresh application
7	Zhejiang Andy Kezheng Electronic Technology Co., Ltd	Fresh application
8	Sichuan HTA Co., Ltd	Fresh application
9	Senke (Nanjing) Pharmaceutical Technology Co., Ltd	Fresh application
10	Guangzhou Chuangyi Biotechnology Co., Ltd	Fresh application
11	Fuzhou Jiayi Pharmaceutical Co., Ltd	Fresh application
12	Chengdu Engineering Company of Nuclear Power Institute of China	Fresh application
13	Lanzhou Kejin Taiji Corporation, Ltd	Fresh application
14	Chongqing Radiation Environment Monitoring Station	Modification
15	National Institute of Metrology, China	Modification
16	Jiangxi Radiation Environment Monitoring Station	Modification
17	Wuhan Zhongjin Irradiation Incorporated Company	Modification
18	Hunan Nuclear Industry Honghua Machinery Co., Ltd	Modification
19	Tianjin Atom High-Tech Radioisotope Pharmaceutical Co., Ltd	Modification
20	Suzhou Company of Shanghai Xinke Pharmaceutical Co., Ltd	Modification
21	Jiangsu Huayi Technology Co., Ltd	Modification
22	Shanghai Radiation Environment Monitoring Station	Modification
23	Chengdu Zhongjin Irradiation Incorporated Company	Modification
24	Tianjin Jinpengyuan Radiation Technology Co., Ltd	Modification
25	Jining Radiation Co., Ltd	Modification
26	University of Science and Technology of China	Modification
27	Institute of Nuclear and New Technology, Tsinghua University	Modification
28	Zhengzhou Hongyuan Biotechnology Co., Ltd	Modification

continued

No.	Organization	Type
29	Ningbo Jun'an Pharmaceutical Technology Co., Ltd	Modification
30	Shandong Quangang Radiation Technology Co., Ltd	Modification
31	Beijing Zhibo Hi-Tech Co., Ltd	Modification
32	Qingyuan Environmental Technology Co., Ltd CNNC	Modification
33	Nanjing Xiyue Radiation Technology Co., Ltd	Modification
34	Anhui Radiation Environment Monitoring Station	Modification
35	Chengdu Gaotong Radioisotope Co., Ltd CNNC	Modification
36	Hunan Radiation Environment Monitoring Station	Modification
37	Anhui Union Radiation Chemical., Ltd	Modification
38	Hefei Institutes of Physical Science, Chinese Academy of Sciences	Modification
39	Gansu Nuclear and Radiation Safety Administration	Renewal
40	Zhengzhou Tianhong Lvyuan Radiation Co., Ltd	Renewal
41	Beijing BINE Hi-Tech Co., Ltd	Renewal
42	Beijing Sanqiang Nuclear Power and Radiation Engineering Technology Co., Ltd	Renewal
43	Beijing Atom High-Tech Gold-Bri LTD	Renewal
44	Ningxia Hui Autonomous Region Nuclear and Radiation Safety Administration	Renewal
45	Jiangsu Nuclear and Radiation Safety Administration	Renewal
46	Shanghai Yuanzi Kexing Pharmaceutical Co., Ltd	Renewal
47	East China University of Science and Technology	Renewal
48	Tongxing (Beijing) Nuclear Technology Development Co., Ltd CNNC	Renewal
49	Tibet Autonomous Region Radiation Environment Monitoring Station	Renewal
50	Chongqing Jian'an Instrument Co., Ltd	Renewal
51	Heilongjiang Radiation Environment Monitoring Station	Renewal
52	Baoding HLY Radiation Co., Ltd	Renewal
53	Atom High-Tech Co., Ltd	Addition
54	Shandong Xinhua Medical Instrument Co., Ltd	Addition
55	Guangzhou Huada Biotechnology Co., Ltd	Addition
56	Soochow University	Addition
57	Shaanxi Fangyuan Co., Ltd	Addition
58	Hefei Institutes of Physical Science, Chinese Academy of Sciences	Addition
59	China Institute for Radiation Protection	Addition
60	Luohe Longxiang Radiation Technology Co., Ltd	Addition
61	Nanjing University of Aeronautics and Astronautics	Addition
62	China Nuclear Energy Industry Company	Addition

Table 80. Environmental Protection Approvals and Acceptance Surveys in the Field of Safety Regulation on Radioisotopes and Irradiation Devices in 2015

Approval Date	Document No.	Organization	Document Title
10/08/2015	MEP App [2015]206	Yangzhou University	Reply to the Environmental Impact Report of the Decommissioning Project of 100,000 Curie Cobalt Radioactive Source Irradiation Device of Yangzhou University
10/14/2015	MEP App [2015]216	Cixi Radiation Center	Reply to the Environmental Impact Report of the Decommissioning Project of Cobalt Radioactive Source Irradiation Device of Cixi Radiation Center
02/28/2015	MEP Acc [2015]74	Anhui Union Radiation Chemical., Ltd	Official Letter of the Environmental Acceptance Survey Comments on Project Completion of Anhui Union Radiation Chemical., Ltd Irradiation Processing Center
09/23/2015	MEP Acc [2015]193	China Institute of Atomic Energy	Official Letter of the Environmental Acceptance Survey Comments on Project Completion of Upgrading the HI-13 Tandem Accelerator of the China Institute of Atomic Energy
11/23/2015	MEP Acc [2015]216	Yangzhou University	Official Letter of the Environmental Acceptance Survey Comments on the Final State of the Decommissioning Project of 100,000 Curie Cobalt Radioactive Source Irradiation Device of Yangzhou University
01/06/2015	MEP Notice [2015]23	Bruker (Beijing) Technology Co., Ltd	Reply Letter of Exempting the Nickel-63 Radioactive Source in the RAID Series Ion Mobility Spectrometer and Scion Series Gas Chromatograph of Bruker (Beijing) Technology Co., Ltd
04/03/2015	MEP Notice [2015]486	Zhejiang Fuli Analytical Instrument Co., Ltd	Reply Letter of Exempting the Nickel-63 Radioactive Source in Three Types of Gas Chromatographs including GC790 of Zhejiang Fuli Analytical Instrument Co., Ltd
04/08/2015	MEP Notice [2015]505	Shanghai Spectris Instrument System Co., Ltd	Reply Letter of Exempting the Nickel-63 Radioactive Source in Three Types of Ion Mobility Spectrometers including Airsentry II Ammonia of Shanghai Spectris Instrument System Co., Ltd
07/08/2015	MEP Notice [2015]1119	Focused Photonics (Hangzhou) Inc.	Reply Letter of Exempting the Nickel-63 Radioactive Source in the PANs-100 Online Gas Chromatograph of Focused Photonics (Hangzhou) Inc.
11/02/2015	MEP Notice [2015]1759	Beijing Yuanheng Liye Technology Co., Ltd	Reply Letter of Exempting the Americium-241 Radioactive Source in the DELTA EC-912 Ion Meter of Beijing Yuanheng Liye Technology Co., Ltd
11/27/2015	MEP Notice [2015]1949	Shanghai Shangji Qunli Analytical Instrument Co., Ltd	Reply Letter of Exempting the Nickel-63 Radioactive Source in the GC-2000 Ⅲ and GC-3010 Gas Chromatograph of Shanghai Shangji Qunli Analytical Instrument Co., Ltd
12/14/2015	MEP Notice [2015]2101	Changzhou Panna Instrument Co., Ltd	Reply Letter of Exempting the Nickel-63 Radioactive Source in the A91 Gas Chromatograph of Changzhou Panna Instrument Co., Ltd

9 Nuclear Material Control and Physical Protection for Nuclear Facilities

In 2015, according to the Act on the Prevention and Control of Radioactive Pollution, the Safety Regulation on Civilian Nuclear Facilities, the Regulation on Nuclear Material Control, and relevant laws and regulations, MEP (NNSA) executed its responsibilities for regulatory inspections, technical reviews on nuclear material control and physical protection of nuclear facilities, and for nuclear material license verification. MEP (NNSA) continuously enhanced the development of related regulations, standards, and guides.

Nuclear Material License Verification and Approval

MEP (NNSA) undertook technical reviews on the application documents of nuclear material license of Chinese Academy of Sciences, and the evaluation comments of Nuclear Material Control Office of CAEA.

Reviews and Inspections on Physical Protection of Nuclear Facilities

MEP (NNSA) undertook regulatory inspections on the unclear material control and physical protection systems of Nuclear Power Institute of China and CNNC Jianzhong Nuclear Fuel Co., Ltd. MEP (NNSA) also started using the Verification Procedure of Civilian Nuclear Material License (Internal Work Procedure).

Regulatry approvals for nuclear material control in 2015 are shown in Table 81.

Table 81. Administrative Reviews and Approvals Related to Nuclear Material Control in 2015

Approval Date	Document No.	Document Title
01/21/15	NNSA Notice [2015]16	Official Letter of Issuing the Regulatory Inspection Report on NuclearMaterial Control of CNNC Jianzhong Nuclear Fuel Co., Ltd
01/21/15	NNSA Notice [2015]17	Official Letter of Issuing the Regulatory Inspection Report on NuclearMaterial Control of NPIC
08/26/15	NNSA Notice [2015]83	Reply Letter of Issuing Nuclear Material License to Hefei Institutes of Physical Science, Chinese Academy of Sciences

10 Safety Regulation on Transportation of Radioactive Materials

In 2015, the transportation activities of radioactive materials were safely implemented without occurrence of nuclear and radiation accidents or incidents. The performance evaluation of the Regulation on the Safety Management of Transportation of Radioactive Materials was finished. The preparations of the Implementation Rules of Transportation Safety Regulation on Radioactive Materials (department rule, draft for approval), and the Periodical Safety Performance Evaluation Guide for Radioactive Material Transportation Cask (technical document, draft for approval) were finished. The preparations of the Design Structure Review Handbook of Radioactive Material Transportation Cask and the Emergency Preparedness and Response on Radioactive Material Transportation were finished.

In 2015, MEP (NNSA) replied to 7 Safety Analysis Reports on radioactive material transportation, issued 2 design ratifications of radioactive material transportation cask, and approved the appliance of 59 imported casks.

Regulatory approvals in the field of safety regulation on radioactive material transportation are shown in Table 82, and inspection activities are shown in Table 83.

Table 82. Regulatory Approvals in the Field of Safety Regulation on Radioactive Material Transportation in 2015

Approval Date	Document No.	Document Title
01/13/15	NNSA[2015]1	Notification of Approving the Nuclear and Radiation Safety Analysis Report on Transportation on Domestic Road for Spent Fuel Rods of Daya Bay NPP
01/13/15	NNSA[2015]2	Notification of Approving the F-127 Transportation Cask of Nordion (Canada) in P. R. China
01/21/15	NNSA[2015]11	Notification of Approving the Renewal of the Design Ratification of Transportation Cask of GY-20,GY-40 Cobalt Radioactive Source
02/11/15	NNSA[2015]33	Notification of Approving Nuclear and Radiation Safety Analysis Report of Road Transportation for Fuel Assemblies of Fangchenggang NPP

continued

Approval Date	Document No.	Document Title
03/03/15	NNSA[2015]44	Notification of Approving the Nuclear and Radiation Safety Analysis Report of Transportation (Railway-Road) for Fuel Assemblies of Fangchenggang NPP
03/05/15	NNSA[2015]46	Notification of Issuing the Ratification for TK-C5-M New Fuel Transportation Cask of Jiangsu Nuclear Power Co., Ltd
04/15/15	NNSA[2015]76	Notification of Approving the Ratification Renewal of NAC-STC Spent Fuel Transportation Cask
06/30/15	NNSA[2015]122	Notification of Approving the Nuclear and Radiation Safety Analysis Report of Transportation by SY-I(A) Caskfor ^{60}Co Radioactive Source of Beijing Shuangyuan Radioisotope Technology Co., Ltd
07/21/15	NNSA[2015]135	Notification of Approving the Nuclear and Radiation Safety Analysis Report of Railway Transportation for UF_6 Products imported of China Nuclear Energy Industry Corporation, CNEIC
08/12/15	NNSA[2015]152	Notification of Approving the Nuclear and Radiation Safety Analysis Report for FCTC10 Cobalt Radioactive Source Transportation Cask of Tongxing Nuclear Technology Co.,Ltd (Beijing) CNNC
08/12/15	NNSA[2015]153	Notification of Approving the Nuclear and Radiation Safety Analysis Report for Road Transportation of IndusTrial ^{60}Co Radioactive Source of Beijing Beike Nuclear Source Technology & Trade Co.,Ltd
11/25/15	NNSA[2015]249	Notification of Approving Adding a kind of Use of Transportation Cask for Radioactive Material (Category I) of Russian National Science Center Atomic Reactor Science Research Institute for Use in China

Table 83. Inspection Activities in the Field of Safety

Regulation on Radioactive Material Transportation in 2015

Start Date	Activity	Main Contents of the Inspection
03/23/15	Witness On-Site for Mechanical Test and Heat Test of Transportation Cask for YJ-1 New Fuel of China Institute of Atomic Energy	Cask Witness
04/27/15	Witness On-Site for Water Immersion Test and Penetration Test of Transportation Cask for MOX New Fuel Assembles of China Institute of Atomic Energy	Cask Witness
05/04/15	Witness On-Site for Mechanical Test of Transportation Cask for MOX New Fuel of China Institute of Atomic Energy	Cask Witness
06/24/15	Witness On-Site for Design Test for Special Radioactive Materials of HTA Co., Ltd	Cask Witness
07/06/15	Witness On-Site for Heating Test of Transportation Cask for MOX New Fuel of China Institute of Atomic Energy	Cask Witness
07/21/15	Witness On-Site for Drop Test of 3m^3 Transportation Cask (Adding the Heat Shield) for UF_6 of CNNC Xinneng Nuclear Engineering Co., Ltd	Cask Witness

continued

Start Date	Activity	Main Contents of the Inspection
11/09/15	Witness On-Site Before Issuing the Design Approval of Transportation Cask for YJ-1 New Fuel of China Institute of Atomic Energy	Nuclear Safety Inspection
11/11/15	Witness On-Site Before Issuing Manufacturing License of Transportation Cask for Category I Radioactive Materials of Sichuan Kexin Mechanical Equipment Co., Ltd	Nuclear Safety Inspection
12/10/15	Witness On-Site Before Issuing the Manufacturing License of Transportation Cask for Category I Radioactive Materials of Shanghai APOLLO Machinery Co., Ltd	Nuclear Safety Inspection

11 Regulation on Civilian Nuclear Safety Equipment

Regulatory Approvals

In 2015, MEP (NNSA) received and reviewed 86 fresh applications for the civilian nuclear safety equipment license. MEP (NNSA) approved 43 applications, of which 4 for fresh license (see Table 84), 9 for expansion (see Table 85), and 30 for renewal (see Table 86). At the same time, MEP (NNSA) finished the technical reviews on modification application of licensee's activity sites and technical abilities, etc. By the end of 2015, 186 licenses were issued for the design, manufacture, installation, and NDT of nuclear safety equipment (see Table 87), including 140 for mechanical equipment (design and manufacture), 43 for electrical equipment (design and manufacture), 4 for NDT, and 13 for installation.

In 2015, 44 applications for registration of civilian nuclear safety equipment import were received and reviewed, 36 were approved (see Table 88). By the end of 2015, the total number of organizations having registration confirmation for design, manufacture or NDT of nuclear safety equipment reached 268, among which 6 for comprehensive registration, 184 for mechanical equipment, 73 for electrical equipment, and 5 for NDT.

Vice Administrator of NNSA, Director General of Department of Nuclear Facility Safety Regulation of MEP, Guo Chengzhan, Inspected the DongFang Electric Machinery

Table 84. Issuance of Fresh License for Civilian Nuclear Safety Equipment in 2015

Approval Date	Document No.	Document Title
08/19/15	NNSA[2015]171	Notification of Issuing the Design and Manufacture License for Civilian Nuclear Safety Equipment of Zhengchao Electric Co., Ltd

continued

Approval Date	Document No.	Document Title
11/18/15	NNSA[2015]239	Notification of Issuing the Manufacture License for Civilian Nuclear Safety Equipment of Vallourec Nuclear Power Tubes (Guangzhou) Co., Ltd
11/23/15	NNSA[2015]241	Notification of Issuing the Design and Manufacture License for Civilian Nuclear Safety Equipment of Zhejiang Shuangyang Fan Co., Ltd
11/27/15	NNSA[2015]253	Notification of Issuing the Manufacture License for Civilian Nuclear Safety Equipment of Shenzhen Fitok Industry Co., Ltd

Table 85. Approvals of License Expansion for Civilian Nuclear Safety Equipment in 2015

Approval Date	Document No.	Document Title
03/27/15	NNSA[2015]65	Notification of Approving Activity Scope Expansion of the Design and Manufacture License for Civilian Nuclear Safety Equipment of Dalian Dagao Valve Co., Ltd
03/27/15	NNSA[2015]66	Notification of Approving Activity Scope Expansion of the Design and Manufacture License for Civilian Nuclear Safety Equipment of Zhejiang Jindun Fans Holding Co., Ltd
03/27/15	NNSA[2015]67	Notification of Approving Activity Scope Expansion of the Design License for Civilian Nuclear Safety Equipment of Tsinghua University
04/10/15	NNSA[2015]74	Notification of Approving Activity Scope Expansion of the Design and Manufacture License for Civilian Nuclear Safety Equipment of Kiamusze Electric Machine Co., Ltd
08/19/15	NNSA[2015]169	Notification of Approving Activity Scope Expansion of the Installation License for Civilian Nuclear Safety Equipment of China Nuclear Industry 24 Construction Co., Ltd
08/19/15	NNSA[2015]172	Notification of Approving Activity Scope Expansion of the Design and Manufacture License for Civilian Nuclear Safety Equipment of Anhui Cable Co., Ltd
08/19/15	NNSA[2015]173	Notification of Approving Activity Scope Expansion of the Design and Manufacture License for Civilian Nuclear Safety Equipment of NPIC
10/20/15	NNSA[2015]216	Notification of Approving Activity Scope Expansion of the Design and Manufacture License for Civilian Nuclear Safety Equipment of Harbin Electric Corporation (QHD) Heavy Equipment Co., Ltd
11/11/15	NNSA[2015]230	Notification of Approving Activity Scope Expansion of the Design and Manufacture License for Civilian Nuclear Safety Equipment of CNNC Sufa Technology Industry Co., Ltd

Table 86. Approvals of License Renewal for Civilian Nuclear Safety Equipment in 2015

Approval Date	Document No.	Document Title
01/21/15	NNSA[2015]8	Notification of Approving Renewal of the Manufacture License for Civilian Nuclear Safety Equipment of Jiangsu Yinhuan Precision Steel Piping Co., Ltd
01/21/15	NNSA[2015]9	Notification of Approving Renewal of the Manufacture License for Civilian Nuclear Safety Equipment of Shenyang Kejin Special Material Co., Ltd
01/21/15	NNSA[2015]10	Notification of Approving Renewal of the Design and Manufacture License for Civilian Nuclear Safety Equipment of Jiangsu Electric Power Equipment Co., Ltd
01/23/15	NNSA[2015]20	Notification of Approving Renewal of the Design and Manufacture License for Civilian Nuclear Safety Equipment of NPIC
01/23/15	NNSA[2015]21	Notification of Approving Renewal of the Manufacture License for Civilian Nuclear Safety Equipment of Shanghai Foxboro Co., Ltd
03/03/15	NNSA[2015]45	Notification of Approving Renewal of the Design and Manufacture License for Civilian Nuclear Safety Equipment of Nanyang Explosion Protection Group Co., Ltd
03/05/15	NNSA[2015]49	Notification of Approving Renewal of the Design and Manufacture License for Civilian Nuclear Safety Equipment of Chongqing Chuanyi Automation Co., Ltd
03/05/15	NNSA[2015]50	Notification of Approving Renewal of the Design and Manufacture License for Civilian Nuclear Safety Equipment of Shanghai Guanghua Instrument Co., Ltd
03/05/15	NNSA[2015]51	Notification of Approving Renewal of the Design and Manufacture License for Civilian Nuclear Safety Equipment of Shanghai Electric Group Shanghai Electric Machine Factory
03/05/15	NNSA[2015]52	Notification of Approving Renewal of the Design and Manufacture License for Civilian Nuclear Safety Equipment of Zhejiang Shangfeng Industry Co., Ltd
03/16/15	NNSA[2015]59	Notification of Approving Renewal of the Design and Manufacture License for Civilian Nuclear Safety Equipment of Shenyang Northeast Storage Battery Co., Ltd
08/11/15	NNSA[2015]145	Notification of Approving Renewal of the Manufacture License for Civilian Nuclear Safety Equipment of Zhejiang Hanyuan Power Equipment Manufacture Co., Ltd
08/11/15	NNSA[2015]149	Notification of Approving Renewal of the Manufacture License for Civilian Nuclear Safety Equipment of Harbin Electric Corporation (QHD) Heavy Equipment Co., Ltd
08/11/15	NNSA[2015]150	Notification of Approving Renewal of the Manufacture License for Civilian Nuclear Safety Equipment of Baoyin Special Steel Piping Co., Ltd
08/12/15	NNSA[2015]154	Notification of Approving Renewal of the Design and Manufacture License for Civilian Nuclear Safety Equipment of China Techenergy Co., Ltd

continued

Approval Date	Document No.	Document Title
08/12/15	NNSA[2015]156	Notification of Approving Renewal of the Design and Manufacture License for Civilian Nuclear Safety Equipment of Chongqing Pump Factory Ltd
08/12/15	NNSA[2015]157	Notification of Approving Renewal of the Manufacture License for Civilian Nuclear Safety Equipment of Jiangsu Haida Pipe Fitting Ltd
08/12/15	NNSA[2015]158	Notification of Approving Renewal of the Design License for Civilian Nuclear Safety Equipment of Nuclear Industry Engineering Research Design Co., Ltd
08/12/15	NNSA[2015]159	Notification of Approving Renewal of the Design and Manufacture License for Civilian Nuclear Safety Equipment of Wujiang City Dongwu Machinary Co., Ltd
08/12/15	NNSA[2015]160	Notification of Approving Renewal of the Design and Manufacture License for Civilian Nuclear Safety Equipment of the 719th Research Institute of China Shipbuilding Industry Corporation
08/12/15	NNSA[2015]161	Notification of Approving Renewal of the Design and Manufacture License for Civilian Nuclear Safety Equipment of Sichuan Star Cable Co., Ltd
08/19/15	NNSA[2015]167	Notification of Approving the Design and Manufacture License Renewal for Civilian Nuclear Safety Equipment of Hoppecke Power System (Wuhan) Co., Ltd
08/19/15	NNSA[2015]168	Notification of Approving Renewal of the Manufacture License for Civilian Nuclear Safety Equipment of Shandong Nuclear Power Equipment Manufacture Co., Ltd
08/19/15	NNSA[2015]170	Notification of Approving Renewal and License Scope Expansion of the Manufacture for Civilian Nuclear Safety Equipment of Harbin Electric Power Equipment Co., Ltd
09/15/15	NNSA[2015]194	Notification of Approving Renewal of the Manufacture License and License Scope Expansion for Civilian Nuclear Safety Equipment of Dongfang (Guangzhou) Heavy Machinery Co., Ltd
11/11/15	NNSA[2015]232	Notification of Approving Renewal of the Design and Manufacture License for Civilian Nuclear Safety Equipment of Shanghai East Heavy Machinery Co., Ltd CSSC
11/11/15	NNSA[2015]233	Notification of Approving the Design License Renewal for Civilian Nuclear Safety Equipment of China Nuclear Power Engineering Co., Ltd
11/18/15	NNSA[2015]237	Notification of Approving Renewal of the Manufacture License for Civilian Nuclear Safety Equipment of Bohai Shipbuilding Factory Group Co., Ltd CISC
11/18/15	NNSA[2015]238	Notification of Approving Renewal of the Installation License for Civilian Nuclear Safety Equipment of Anhui Electric Power Construction No.2 Engineering Company of China Energy Engineering Group Co., Ltd
11/23/15	NNSA[2015]242	Notification of Approving Renewal of the Design License for Civilian Nuclear Safety Equipment of Shenzhen Zhongguang Nuclear Engineering Design Co., Ltd

Table 87. List of Licensees Holding the Civilian Nuclear Safety Equipment License

No.	Organization	License Type	Equipment Type
1	Shanghai Nuclear Power Engineering and Design Institute	Design	Electric, Machinery
2	Shenzhen Zhongguang Nuclear Engineering Design Co., Ltd	Design	Electric, Machinery
3	China Nuclear Power Technology Research Institute	Design, Manufacture	Electric, Machinery
4	China Nuclear Power Operation Technology Corporation, LTD	Design, NDT	Machinery
5	China Institute of Atomic Energy	Manufacture	Machinery
		Design	Electric, Machinery
6	Nuclear Power Institute of China	Design, Manufacture, NDT	Electric, Machinery
7	Institute of Nuclear and New Energy Technology of Tsinghua University	Design	Electric, Machinery
8	Shanghai Morimatsu Pressure Vessel Co., Ltd	Manufacture	Machinery
9	Yantai Taihai Marnoir Nuclear Equipment Co., Ltd	Manufacture	Machinery
10	Shanghai Power Equipment Research Institute	Design, Manufacture	Electric
11	Shaanxi Diesel Engine Heavy Industry Co., Ltd	Design, Manufacture	Electric
12	Changzhou Bayi Cable Co., Ltd	Design, Manufacture	Electric
13	Jiangsu Huaguang Cable and Electrical Equipment Co., Ltd	Design, Manufacture	Electric
14	Jiangsu Shangshang Cable Group Co., Ltd	Design, Manufacture	Electric
15	Nanjing Chenguang Dongluo Bellows Co., Ltd	Design, Manufacture	Machinery
16	Shanghai Apollo Machinery Co., Ltd	Design, Manufacture	Machinery
17	Shanghai Xinmin Heavy Forging Co., Ltd	Manufacture	Machinery
18	Wuxi Flange Forging Co., Ltd	Manufacture	Machinery
19	Anhui Yingliu Group Huoshan Casting Co., Ltd	Manufacture	Machinery
20	BaoSteel Special Steel Co., Ltd	Manufacture	Machinery
21	Dongfang Areva Nuclear Pump Co., Ltd	Manufacture	Machinery
22	Xi 'an Nuclear Instrument Factory	Design, Manufacture	Electric
23	Shanghai Automation Instrumentation Co., Ltd	Design, Manufacture	Electric, Machinery
24	Suzhou East-Instrument Automation Control Equipment Co., Ltd	Design, Manufacture	Electric
25	Anhui Cable Co., Ltd	Design, Manufacture	Electric
26	Jiangsu Shentong Valve Co., Ltd	Design, Manufacture	Machinery
27	China Nuclear Power Equipment Co.,Ltd	Manufacture	Machinery
28	Nanfang Ventilator Co., Ltd	Design, Manufacture	Machinery

continued

No.	Organization	License Type	Equipment Type
29	Beijing Jingcheng Compressor Co., Ltd	Design, Manufacture	Machinery
30	Harbin Electric Corporation Jiamusi Electric Machine Co., Ltd	Design, Manufacture	Electric, Machinery
31	Harbin Electric Power Equipment Co., Ltd	Manufacture	Machinery
32	Shenyang Northeast Storage Battery Co., Ltd	Design, Manufacture	Electric
33	Yangzhou Electric Power Equipment Manufacture Factory Co., Ltd	Design, Manufacture	Electric
34	Changzhou Electric Power Station Auxiliary Equipment Works Ltd	Design, Manufacture	Electric
35	Nanyang Explosion Protection Group Co., Ltd	Design, Manufacture	Electric
36	Zhejiang Jiuli Hi-Tech Metals Co., Ltd	Manufacture	Machinery
37	Jiangsu Haida Pipe Fitting Ltd	Manufacture	Machinery
38	Jiangsu Yinhuan Precision Steel Piping Co., Ltd	Manufacture	Machinery
39	Chongqing Pump Factory Ltd	Design, Manufacture	Machinery
40	Wujiang Dongwu Machine Co., Ltd	Design, Manufacture	Machinery
41	Shanghai Electric Power Generation Equipment Co.,Ltd	Design, Manufacture	Machinery
42	Shenyang Kejin Special Material Co., Ltd	Manufacture	Machinery
43	Shandong Nuclear Power Equipment Manufacture Co., Ltd	Manufacture	Machinery
44	Jiangsu Electric Power Equipment Co., Ltd	Design, Manufacture	Machinery
45	Shanghai Guanghua Instrument Co., Ltd	Design, Manufacture	Electric
46	Chongqing Chuanyi Automation Co., Ltd	Design, Manufacture	Electric
47	Shanghai Foxboro Co., Ltd	Manufacture	Electric
48	Shanghai Electric Machine Factory of Shanghai Electric	Design, Manufacture	Electric
49	Zhejiang Shangfeng Industry Co., Ltd	Design, Manufacture	Machinery
50	Nuclear Industry Engineering Research Design Co., Ltd	Design	Machinery
51	Dongfang (Guangzhou) Heavy Machinery Co., Ltd	Manufacture	Machinery
52	Zhejiang HanYuan Power Equipment Manufacture Co., Ltd	Manufacture	Machinery
53	Harbin Electric Corporation (QHD) Heavy Equipment Co., Ltd	Manufacture	Machinery
54	China Techenergy Co., Ltd	Design, Manufacture	Electric
55	The 719th Research Institute of China Shipbuilding Industry Corporation	Design, Manufacture	Electric, Machinery
56	Suzhou Neway Valve Co., Ltd	Design, Manufacture	Machinery
57	Shanghai Shenjiang Forging Co., Ltd	Manufacture	Machinery
58	Sichuan Star Cable Co., Ltd	Design, Manufacture	Electric

continued

No.	Organization	License Type	Equipment Type
59	Hoppecke Power System (Wuhan) Co., Ltd	Design, Manufacture	Electric
60	Baoyin Special Steel Piping Co., Ltd	Manufacture	Machinery
61	Sichuan Great Wall Steel Piping Co., Ltd	Manufacture	Machinery
62	Dalian Deep Blue Pump Co., Ltd	Design, Manufacture	Machinery
63	China Nuclear Power Engineering Co., Ltd	Design	Electric, Machinery
64	Jiangsu Xinghe Valve Co., Ltd	Manufacture	Machinery
65	Bohai Shipbuilding Factory Group Co., Ltd	Manufacture	Machinery
66	Shenyang Cable Industry Corporation Limited	Design, Manufacture	Electric
67	Shanghai East Heavy Machinery Co., Ltd	Design, Manufacture	Electric
68	Angang Steel Heavy Machine Co., Ltd	Manufacture	Machinery
69	Dongfang Electric Corporation (Wuhan) Nuclear Equipment Co., Ltd	Manufacture	Machinery
70	Yuancheng Cable Co.,Ltd	Design, Manufacture	Electric
71	Sufa Technology Industry Co., Ltd CNNC	Design, Manufacture	Machinery
72	Zhejiang Sanfang Group Co., Ltd	Design, Manufacture	Machinery
73	Dalian Dagao Valve Co., Ltd	Design, Manufacture	Machinery
74	Yangzhou Huayu Pipe Fitting Co., Ltd	Manufacture	Machinery
75	Shanghai No. 1 Machine Tool Works Co., Ltd	Manufacture	Machinery
76	Gelin (Changzhou) Electrical Power Machine-building Co., Ltd	Design, Manufacture	Machinery
77	Lanzhou Lanshi Heat-exchanger Equipment Co., Ltd	Design, Manufacture	Machinery
78	Zhejiang Jindun Fans Holding Co., Ltd	Design, Manufacture	Machinery
79	Shanghai Electric KSB Nuclear Pump & Valve Co., Ltd	Design, Manufacture	Machinery
80	Pangang Group Chengdu Iron and Vanadium Co., Ltd	Manufacture	Machinery
81	Dongfang Electric Corporation Dongfang Turbine Co., Ltd	Manufacture	Machinery
82	Shanghai Kaiquan Pump Co., Ltd	Design, Manufacture	Machinery
83	Shanghai Electric Valve Co., Ltd	Design, Manufacture	Machinery
84	The 718th Research Institute of China Shipbuilding Industry Corporation	Design, Manufacture	Electric
85	Fangda Carbon New Material Technology Co., Ltd	Manufacture	Machinery
86	Dalian Hitachi Machinery and Equipment Co., Ltd	Manufacture	Machinery
87	Henan Kaifeng High Pressure Valve Co.,Ltd	Design, Manufacture	Machinery
88	China First Heavy Industries Co., Ltd	Manufacture	Machinery
89	Shanxi North MTU Engine Co., Ltd	Manufacture	Electric

continued

No.	Organization	License Type	Equipment Type
90	Shanghai No. 5 Valve Factory Co., Ltd	Design, Manufacture	Machinery
91	Shanghai Lianggong Valve Factory Co., Ltd	Design, Manufacture	Machinery
92	Sichuan Kexin Mechanical and Electrical Equipment Co., Ltd	Manufacture	Machinery
93	Nantong China International Marine Containers Tank Equipment Co., Ltd	Manufacture	Machinery
94	Jilin Zhongyi Nuclear Piping Manufacture Co., Ltd	Manufacture	Machinery
95	Siping THT Plate Heat Transfer Co., Ltd	Design, Manufacture	Machinery
96	Taiyuan Heavy Industry Co., Ltd	Manufacture	Machinery
97	Xi'an Nuclear Equipment Co., Ltd	Manufacture	Machinery
98	Zhongxing Energy Equipment Co., Ltd	Manufacture	Machinery
99	Wuxi Xitang Nuclear Equipment Co., Ltd	Manufacture	Machinery
100	Shenyang Xintong Power Station Equipment Manufacture Co., Ltd	Design, Manufacture	Machinery
101	Dalian Sulzer Pump & Compressor Co., Ltd	Design, Manufacture	Machinery
102	Guizhou Hangtian Xinli Forging & Casting Co., Ltd	Manufacture	Machinery
103	Suzhou Hailu Heavy Industry Co., Ltd	Manufacture	Machinery
104	Nantong Dart-Pollrich Fan Co., Ltd	Design, Manufacture	Machinery
105	Dongfang Electric Co., Ltd	Design	Machinery
106	Shenyang Shengshi High & Middle Pressure Valve Co., Ltd	Design, Manufacture	Machinery
107	Shijiazhuang Valve No.1 Factory Co., Ltd	Design, Manufacture	Machinery
108	China Erzhong Group (Deyang) Heavy Industries Co., Ltd	Manufacture	Machinery
109	Shanghai Heavy Machinery Factory Co., Ltd	Manufacture	Machinery
110	Dalian Baoyuan Nuclear Equipment Co., Ltd	Manufacture	Machinery
111	Shenyang Blower Works Group Nuclear Pump Co., Ltd	Design, Manufacture	Machinery
112	Lisega Pipeline Bearer Technology (Shanghai) Co., Ltd	Manufacture	Machinery
113	Dalian Teikoku Canned Motor Pump Co., Ltd	Design, Manufacture	Machinery
114	Baosheng Science and Technology Innovation Co., Ltd	Design, Manufacture	Electric
115	TBEA Shenyang Transformer Group Co., Ltd	Design, Manufacture	Electric
116	Baoding Tianwei Baobian Electric Co., Ltd	Design, Manufacture	Electric
117	Xi'an XD Transformer Co., Ltd	Design, Manufacture	Electric
118	TBEA Hengyang Transformer Co., Ltd	Design, Manufacture	Electric
119	Zhangjiagang Chemical Equipment Co., Ltd	Manufacture	Machinery
120	QHD Hefeng Equipment Co., Ltd	Manufacture	Machinery

continued

No.	Organization	License Type	Equipment Type
121	PENTAIR Valves & Controls (Shanghai)	Design, Manufacture	Machinery
122	Shangyu Special Fan Co., Ltd	Design, Manufacture	Machinery
123	Jiangsu Xingyang Pipe Fitting Co., Ltd	Manufacture	Machinery
124	Tai'an Shankou Forging and Casting Co., Ltd	Manufacture	Machinery
125	Bohai Heavy Industry Pipeline Co., Ltd	Manufacture	Machinery
126	Shanghai Eho Valve Manufacture Co., Ltd	Design, Manufacture	Machinery
127	Shandong Hongda Technology Group Co., Ltd	Manufacture	Machinery
128	Shanghai Toyo Tanso Carbon Material Industry Co., Ltd	Manufacture	Machinery
129	Inner Mongolia North Heavy Industries Group Co., Ltd	Manufacture	Machinery
130	Hebei Hongrun Heavy Industry Group Co., Ltd	Manufacture	Machinery
131	Jiangsu Biaoxin Kubota Industry Co., Ltd	Manufacture	Machinery
132	Shanghai Electric Nuclear Power Equipment Co., Ltd	Manufacture	Machinery
133	Wuhan Heavy Machinery Casting and Forging Co., Ltd	Manufacture	Machinery
134	Changshu Huaxin Special Steel Co., Ltd	Manufacture	Machinery
135	Jiangsu Xinhengji Special Equipment Co., Ltd	Manufacture	Machinery
136	Sichuan Sanzhou SCMP Nuclear Equipment Manufacture Incorporation	Manufacture	Machinery
137	Hunan XCMC Changsha Pump Casting Co., Ltd	Design, Manufacture	Machinery
138	Jiangnan Valve Co., Ltd	Design, Manufacture	Machinery
139	Shanghai Valve Factory Co., Ltd	Design, Manufacture	Machinery
140	Jiangsu Huayang Pipe Fittings Co., Ltd	Manufacture	Machinery
141	Dongfang Electric Corporation Dongfang Boiler Co., Ltd	Manufacture	Machinery
142	Anshan Electromagnetic Valve Co., Ltd	Design, Manufacture	Machinery
143	Shanghai Ruiniu Machinery and Equipment Manufacturing Co., Ltd	Design, Manufacture	Machinery
144	Jiangsu Runyang Pipe Fitting Co., Ltd	Manufacture	Machinery
145	Zhejiang Zhongda Special Steel Co., Ltd	Manufacture	Machinery
146	Jiangsu Wujin Stainless Steel Pipe Group Co., Ltd	Manufacture	Machinery
147	Dalian Shipbuilding Heavy Industry Group Co., Ltd	Manufacture	Machinery
148	Hengyang Valin Steel Tube Co., Ltd	Manufacture	Machinery
149	Tianding Nuclear Power Equipment Co., Ltd AVIC Xi'an Aviation Engine Group	Manufacture	Machinery
150	Sichuan Huadu Nuclear Equipment Manufacture Co., Ltd	Manufacture	Machinery
151	Wuxi Huatex Machinery Manufacture Co., Ltd	Manufacture	Machinery

continued

No.	Organization	License Type	Equipment Type
152	China-Kinwa High Technology Co.,Ltd	Design, Manufacture	Electric
153	Anhui A-Line Electric Pumps Co., Ltd	Design, Manufacture	Machinery
154	Jiangsu Haishi Pump Manufacturing Co., Ltd	Design, Manufacture	Machinery
155	Qingdao Lanshi Heavy Machinery Co., Ltd	Manufacture	Machinery
156	Wuxi Xinfeng Pipe Fittings Corp	Manufacture	Machinery
157	Yangzhou Shuguang Cable Co., Ltd	Design, Manufacture	Electric
158	Harbin Boiler Co., Ltd	Manufacture	Machinery
159	Shandong Beichen Mechanical and Electrical Equipment Co., Ltd	Manufacture	Machinery
160	Special Equipment Co.,LtdCSIC	Design, Manufacture	Machinery
161	Alfa Laval (Jiangyin) Equipment Manufactory Co., Ltd	Manufacture	Machinery
162	China Nuclear Control System Engineering Co., Ltd	Design, Manufacture	Electric
163	Nantong Kunlun Air Conditioning Co., Ltd	Design, Manufacture	Machinery
164	Hebei Canghai Nuclear Equipment Technique Co., Ltd	Manufacture	Machinery
165	Harbin Electric Company Limited	Design	Machinery
166	Yangzhou Chengde Steel Pipe Co., Ltd	Manufacture	Machinery
167	Nanjing Duble Metal Equipment Engineering Co., Ltd	Design, Manufacture	Machinery
168	ZhengChao Electric Co., Ltd	Design, Manufacture	Electric
169	Vallourec Tubes (Guangzhou)	Manufacture	Machinery
170	Zhejiang Shuangyang Fan Co.,Ltd	Design, Manufacture	Machinery
171	Shenzhen FitokIndustry Co., Ltd	Manufacture	Machinery
172	State Nuclear Power Plant Service Company	NDT	Machinery
173	CGNPC Inspection Technology Co.,Ltd	NDT	Machinery
174	China Nuclear Industry Fifth Construction Co.,Ltd	Installation	Electric, Machinery
		Manufacture	Machinery
175	China Nuclear Industry 23 Construction Co., Ltd	Manufacture, Installation	Machinery
176	China Nuclear Industry Huaxing Construction Company Limited	Installation	Machinery
177	China Nuclear Industry 22 Construction Co., Ltd	Installation	Machinery
178	China Nuclear Industry 24 Construction Co., Ltd	Installation	Machinery
179	Guangdong Power Engineering Corporation	Installation	Electric, Machinery
180	Zhejiang Thermal Power Company	Installation	Electric, Machinery
181	Jiangsu Electric Power Construction No.3 Company	Installation	Machinery

continued

No.	Organization	License Type	Equipment Type
182	Anhui No.2 Electric Power Engineering and Construction Corporation	Installation	Machinery
183	Tianjin Electric Power Construction Co., Ltd	Installation	Machinery
184	Hunan Provincial Thermal Power Construction Company	Installation	Machinery
185	Hebei No.1 Electric Power Engineering and Construction Corporation	Installation	Machinery
186	China Construction Second Engineering Bureau Ltd	Installation	Machinery

Table 88. Registration Confirmation of Foreign Enterprises Involving Civilian Nuclear Safety Equipment Activities in 2015

Approval Date	Document No.	Document Title
01/21/15	NNSA[2015]7	Notification of Issuing the Civilian Nuclear Safety Equipment Foreign Enterprise Registration Confirmation for German SEMPELL GmbH and Another Enterprise
03/05/15	NNSA[2015]47	Notification of Issuing the Civilian Nuclear Safety Equipment Foreign Enterprise Registration Confirmation for German SIPOS Aktorik GmbH and Other 2 Enterprises
03/30/15	NNSA[2015]70	Notification of Issuing the Civilian Nuclear Safety Equipment Foreign Enterprise Registration Confirmation for American DRESSER, INC and Other 13 Enterprises
08/12/15	NNSA[2015]155	Notification of Issuing the Civilian Nuclear Safety Equipment Foreign Enterprise Registration Confirmation for Japanese Nippon Steel Sumitomo Metal and Other 5 Enterprises
08/19/15	NNSA[2015]165	Notification of Issuing the Civilian Nuclear Safety Equipment Foreign Enterprise Registration Confirmation for German Kühme Armaturen GmbH and Other 5 Enterprises
11/24/15	NNSA[2015]244	Notification of Issuing the Civilian Nuclear Safety Equipment Foreign Enterprise Registration Confirmation for CHOTT AG and Other 4 Enterprises

Safety Inspections on Imported Equipment

In 2015, MEP (NNSA) took regulatory inspections on the imported nuclear safety equipment according to related regulations. In the field of applied inspection at the Customs, application documents of 796 batches of imported equipment were reviewed, including 526 batches of mechanical equipment, while 270 batches of electrical equipment. Among the applications, 773 batches were signed for releasing, 23 batches were denied. In the field of opening package inspection, applications of 855 batches were received, including 549 batches of mechanical equipment, and 306

batches of electrical equipment. Among the inspections, 805 batches were accepted, while 50 batches were denied. MEP (NNSA) participated in 121 batches opening and witness.

Regulatory Inspection on Civilian Nuclear Safety Equipment

In 2015, according to the regulatory inspection program and plan, MEP (NNSA) took 20 comprehensive inspections (see Table 89) and 26 special inspections (see Table 90) on domestic enterprises, and 1 comprehensive inspection and 1 special inspection on foreign enterprises (see Table 91). Through these inspections, correction requirements for discovered problems were raised in time, and experts were invited to review and perform special inspections on major non-conformities affecting nuclear safety. In 2015, the quality of design, manufacture, installation, and non-destructive test of civilian nuclear safety equipment was basically under control.

Table 89. Comprehensive Inspections on Domestic Enterprises of Civilian Nuclear Safety Equipment in 2015

Start Date	Inspected Enterprise
03/02/15	Shenyang Cable Industry Corporation
03/10/15	Shanghai Electric Power Generation Equipment Co.,Ltd
03/16/15	Shanghai Automation Instrumentation Co., Ltd
03/17/15	Dongfang Electric Corporation (Wuhan) Nuclear Equipment Co., Ltd
03/17/15	The 719th Research Institute of China Shipbuilding Industry Corporation
04/21/15	Hunan XCMC Changsha Pump Casting Co., Ltd
04/21/15	Suzhou East-Instrument Automation Control Equipment Co., Ltd
05/12/15	Alfa Laval (Jiangyin) Equipment Manufactory Co., Ltd
05/18/15	Fangda Carbon New Material Technology Co., Ltd
05/19/15	Jilin Zhongyi Nuclear Piping Manufacture Co., Ltd
05/25/15	Hoppecke Power System (Wuhan) Co., Ltd
06/09/15	Yangzhou Huayu Pipe Fitting Co., Ltd
06/16/15	Dalian Hitachi Machinery and Equipment Co., Ltd
07/06/15	Dongfang Electric Corporation Dongfang Boiler Co., Ltd
07/21/15	Pangang Group Chengdu Iron and Vanadium Co., Ltd
07/27/15	China Nuclear Control System Engineering Co., Ltd
09/15/15	Sichuan Star Cable Co., Ltd
11/09/15	Nantong Dart-Pollrich Fan Co., Ltd
11/30/15	Nuclear Power Institute of China
12/08/15	China Nuclear Power Technology Research Institute

Table 90. Special Inspections on Domestic Enterprises of Civilian Nuclear Safety Equipment in 2015

Start Date	Inspected Enterprise
03/16/15	Shanghai Automation Instrumentation Co., Ltd
04/16/15	Nuclear Power Institute of China
04/20/15	Changzhou Electric Power Station Auxiliary Equipment Works Ltd
06/16/15	Shenzhen Zhongguang Nuclear Engineering Design Co., Ltd
06/24/15	Institute of Nuclear and New Energy Technology of Tsinghua University
06/25/15	Shandong Nuclear Power Equipment Manufacture Co., Ltd
07/06/15	Yangzhou Electric Power Equipment Manufacture Factory Co., Ltd
07/08/15	Shanghai Automation Instrumentation Co., Ltd
07/21/15	Suzhou Neway Valve Co., Ltd
07/21/15	Dalian Dagao Valve Co., Ltd
07/28/15	Zhejiang Sanfang Group Co., Ltd
08/03/15	Dalian Deep Blue Pump Co., Ltd
08/04/15	Zhejiang Hanyuan Power Equipment Manufacture Co., Ltd
08/10/15	Shanghai Apollo Machinery Co., Ltd
08/12/15	Wujiang Dongwu Machine Co., Ltd
08/17/15	State Nuclear Power Plant Service Company
08/17/15	China Nuclear Power Engineering Co., Ltd
08/17/15	China Techenergy Co., Ltd
08/18/15	Sufa Technology Industry Co., Ltd CNNC
08/18/15	Jiangsu Shangshang Cable Group Co., Ltd
08/18/15	Shanghai Morimatsu Pressure Vessel Co., Ltd
08/19/15	CGNPC Inspection Technology Co.,Ltd
08/24/15	Shanghai Electric Nuclear Power Equipment Co., Ltd
08/25/15	Wuxi Xinfeng Pipe Fittings Corp
11/09/15	Dongfang Electric Corporation Dongfang Turbine Co., Ltd
11/12/15	Sichuan Huadu Nuclear Equipment Manufacture Co., Ltd

Table 91. Regulatory Inspections on Foreign Enterprises of Civilian Nuclear Safety Equipment in 2015

Started Date	Inspected Enterprise	Inspection Type
07/13/15	American EMD Company	Special inspection
09/08/15	Russian Central Design Bureau of Machining Building	Comprehensive inspection

12 Regulation on Electromagnetic Environment

MEP (NNSA) developed the Guide for Public Communication of Electric Power Transmission and Distribution Project (Trial), which integrated the popularization of science, the information transparency, the public participation, the public sentiments response, and the petitions handling into a five-in-one system, and issued this document on October 28, 2015. MEP (NNSA) accomplished reviews and approvals of environmental impact reports of 19 construction projects, and accomplished environmental acceptance surveys for 56 projects, see Table 92, MEP (NNSA) properly handled 22 petitions.

MEP (NNSA) effectively implemented power delegating, and adjusted and simplified the environmental impact assessment category of electromagnetic project in the Classification Directory of Environmental Impact Assessment for Construction Projects. All of the wireless communication was modified to prepare the Environmental Impact Form, according to the actual environmental impact of mobile communication base station, and combining the implementation of the national strategy of Broadband China. MEP (NNSA) changed "other electric power transmission and distribution projects" which were required to prepare the Form into "others (excluding those under 100kV)", making it clear that the electric power transmission and distribution projects under 100kV do not need to prepare Environmental Impact Documents. This is consistent with the scope of exemption in Controlling Limits for Electromagnetic Environment (GB 8702-2014).

Table 92. Regulatory Approvals in the Field of Regulation on Electromagnetic Environment in 2015

Approval Date	Document No.	Document Title
02/05/15	MEP App[2015]35	Reply to the Environmental Impact Report for Shaanxi Yuheng 750kV Substation #2 Main Transformer Extension Project
04/10/15	MEP App[2015]82	Reply to the Environmental Impact Report for Qinghai Hainan Tara 750kV Electric Power Transmission and Distribution Project

continued

Approval Date	Document No.	Document Title
04/15/15	MEP App[2015]83	Reply to the Environmental Impact Report for Xinjiang Turpan 750kV Substation #1 Main Transformer Extension Project
04/15/15	MEP App[2015]84	Reply to the Environmental Impact Report for Xinjiang Wusu 750kV Substation Phase II Extension Project
04/30/15	MEP App[2015]108	Reply to the Environmental Impact Report for Shanxi Jinbei-Jiangsu Nanjing ±800kV DC UHV Electric Power Transmission Project
05/15/15	MEP App[2015]116	Reply to the Environmental Impact Report for Yunnan Weixin Power Plant-Zhenxiong Power Plant-Duole 500kV Electric Power Transmission and Distribution Project
05/21/15	MEP App[2015]121	Reply to the Environmental Impact Report for Xinjiang Yandun 750kV Substation Extension Project
05/21/15	MEP App[2015]122	Reply to the Environmental Impact Report for Xinjiang Tianshan Convertor Station 750kV Interconnecting Transformer Extension Project
05/29/15	MEP App[2015]126	Reply to the Environmental Impact Report for Zhangjiakou Yuxian County Power Plant 500kV Output Electric Power Transmission and Distribution Project
06/11/15	MEP App[2015]137	Reply to the Environmental Impact Report for Xinjiang Zhunbei 750kV Electric Power Transmission and Distribution Project
06/11/15	MEP App[2015]138	Reply to the Environmental Impact Report for Xinjiang Turpan-Hami 750kV Line Modification Project
06/11/15	MEP App[2015]139	Reply to the Environmental Impact Report for Shanghaimiao-Shandong ±800kV DC UHV Electric Power Transmission Project
06/16/15	MEP App[2015]141	Reply to the Environmental Impact Report for Inner-Mongolia Ximeng-Jiangsu Taizhou ±800kV DC UHV Electric Power Transmission Project
07/08/15	MEP App[2015]160	Reply to the Environmental Impact Report for Beijing East 500kV UHV Station Matching Electric Power Transmission and Distribution Project
09/15/15	MEP App[2015]203	Reply to the Environmental Impact Report for Xinjiang Zhundong-Huaidong (Anhui South) ±1100kV DC UHV Electric Power Transmission Project
11/16/15	MEP App[2015]239	Reply to the Environmental Impact Report for Beijing Fangshan-Tianjin Nancai 500kV Electric Power Transmission and Distribution Project
11/18/15	MEP App[2015]244	Reply to the Environmental Impact Report for Shanxi Yuxian Power Plant 2×1000MW Units Output Project
12/10/15	MEP App[2015]252	Reply to the Environmental Impact Report for Yunnan Northwest-Guangdong DC UHV Electric Power Transmission Project
12/28/15	MEP App[2015]264	Reply to the Environmental Impact Report for Hebei Zhangnan-Beijing Changping Phase III 500kV Electric Power Transmission and Distribution Project

continued

Approval Date	Document No.	Document Title
01/21/15	MEP Acc[2015]39	Official Letter of the Environmental Acceptance Survey of Guangdong Shangzhai (Heyuan) 500kV Electric Power Transmission and Distribution Project
03/13/15	MEP Acc[2015]75	Official Letter of the Environmental Acceptance Survey of Longtan Hydropower Station Output Electric Power Transmission and Distribution Project
03/16/15	MEP Acc[2015]78	Official Letter of the Environmental Acceptance Survey of Yunnan South Output Channel (Yanshan to Nanning) 500kV Electric Power Transmission and Distribution Project
04/20/15	MEP Acc[2015]92	Official Letter of the Environmental Acceptance Survey of Fugu 330kV Electric Power Transmission and Distribution Project
05/12/15	MEP Acc[2015]111	Official Letter of the Environmental Acceptance Survey of Qingdao Converter Station 500kV Matching Power Transmission Project
05/26/15	MEP Acc[2015]117	Official Letter of the Environmental Acceptance Survey of Longquanyi 500kV Electric Power Transmission and Distribution Project
05/26/15	MEP Acc[2015]118	Official Letter of the Environmental Acceptance Survey of 750kV Yongdeng (Wusheng)-Jinchang (Hexi)-Jiuquan-Anxi (Dunhuang) Electric Power Transmission and Distribution Project
05/28/15	MEP Acc[2015]121	Official Letter of the Environmental Acceptance Survey of Jinping-Sunan ±800kV DC Electric Power Transmission Project of Jinping-Huadong Level 1 and 2 Output ±800kV DC Electric Power Transmission Project
05/28/15	MEP Acc[2015]122	Official Letter of the Environmental Acceptance Survey of Huainan-Shanghai AC UHV Electric Power Transmission Demonstration Project of Anhui E.P. East Transmission Project
06/09/15	MEP Acc[2015]125	Official Letter of the Environmental Acceptance Survey of Hulun Buir-Liaoning DC Electric Power Transmission Project
06/10/15	MEP Acc[2015]126	Official Letter of the Environmental Acceptance Survey of Qaidam 750kV Substation Main Transformer Extension Project
06/10/15	MEP Acc[2015]127	Official Letter of the Environmental Acceptance Survey of Lanzhou-Xining-Golmud Electric Railway Power Supply Project in Qinghai (330kV Section)
06/23/15	MEP Acc[2015]130	Official Letter of the Environmental Acceptance Survey of Hengshan 330kV Electric Power Transmission and Distribution Project
06/23/15	MEP Acc[2015]131	Official Letter of the Environmental Acceptance Survey of 330kV Xi'an Southern Suburbs Substation Changing Main Transformer Project
06/23/15	MEP Acc[2015]132	Official Letter of the Environmental Acceptance Survey of 330kV Jinsuo Substation Capacity Expansion and Renovation Project
06/23/15	MEP Acc[2015]133	Official Letter of the Environmental Acceptance Survey of Shaanxi Guojiawan 330kV Output Electric Power Transmission and Distribution Project
06/23/15	MEP Acc[2015]134	Official Letter of the Environmental Acceptance Survey of 330kV Xigaoming Substation Capacity Expansion and Modification Project

continued

Approval Date	Document No.	Document Title
06/23/15	MEP Acc[2015]135	Official Letter of the Environmental Acceptance Survey of 330kV Xigaoming #2 Substation Capacity Expansion and Modification Project
06/23/15	MEP Acc[2015]136	Official Letter of the Environmental Acceptance Survey of Gaolan 330kV Electric Power Transmission and Distribution Project
06/23/15	MEP Acc[2015]137	Official Letter of the Environmental Acceptance Survey of Pingliang Power Plant-Meixian Substation Circuit III 330kV Electric Power Transmission Line Project
06/29/15	MEP Acc[2015]143	Official Letter of the Environmental Acceptance Survey of Dabaodang 330kV Electric Power Transmission and Distribution Project
06/29/15	MEP Acc[2015]144	Official Letter of the Environmental Acceptance Survey of Jingbian 330kV Electric Power Transmission and Distribution Project
06/29/15	MEP Acc[2015]145	Official Letter of the Environmental Acceptance Survey of 750kV Xining-Yongdeng-Baiyin Electric Power Transmission and Distribution Project
06/29/15	MEP Acc[2015]146	Official Letter of the Environmental Acceptance Survey of Chongqing 500kV Loop Network Strengthening Electric Power Transmission and Distribution Project
06/29/15	MEP Acc[2015]147	Official Letter of the Environmental Acceptance Survey of Project Completion of 750kV Yan'an-Yuheng Electric Power Transmission and Distribution Project
06/29/15	MEP Acc[2015]148	Official Letter of the Environmental Acceptance Survey of 500kV Pingdu Electric Power Transmission and Distribution Project
06/29/15	MEP Acc[2015]149	Official Letter of the Environmental Acceptance Survey of 500kV Zhucheng Electric Power Transmission and Distribution Project
06/29/15	MEP Acc[2015]150	Official Letter of the Environmental Acceptance Survey of China Huadian Corporation Shaanxi Yuheng Power Plant Phase I 750kV Output Project
07/02/15	MEP Acc[2015]155	Official Letter of the Environmental Acceptance Survey of Xinjiang-Northwest Main Power Grid Interconnection 750kV Second Channel Electric Power Transmission and Distribution Project
07/02/15	MEP Acc[2015]156	Official Letter of the Environmental Acceptance Survey of Fujian Longyan 500kV Electric Power Transmission and Distribution Project
07/02/15	MEP Acc[2015]157	Official Letter of the Environmental Acceptance Survey of Shanghai 500kV Shanghai West (Fengjing) Convertor Station-Liantang Electric Power Transmission and Distribution Project
07/02/15	MEP Acc[2015]158	Official Letter of the Environmental Acceptance Survey of 500kV Shengquan (Xipeng) Electric Power Transmission and Distribution Project
07/02/15	MEP Acc[2015]159	Official Letter of the Environmental Acceptance Survey of 750kV Fenghuang-Wusu-Yili Electric Power Transmission and Distribution Project
07/02/15	MEP Acc[2015]160	Official Letter of the Environmental Acceptance Survey of Fujian Putian LNG Power Plant-Putian 500kV Circuit I Transmission Line Project
07/02/15	MEP Acc[2015]161	Official Letter of the Environmental Acceptance Survey of Shanghai 500kV Liantang Electric Power Transmission and Distribution Project

continued

Approval Date	Document No.	Document Title
07/02/15	MEP Acc[2015]162	Official Letter of the Environmental Acceptance Survey of 500kV Yueqing Power Plant Output Project
07/02/15	MEP Acc[2015]163	Official Letter of the Environmental Acceptance Survey of Qinghai-Tibet ±400kV DC Power Grid Interconnection Project
07/02/15	MEP Acc[2015]164	Official Letter of the Environmental Acceptance Survey of Yunnan East Power Plant Phase II 500kV Output Project
07/02/15	MEP Acc[2015]165	Official Letter of the Environmental Acceptance Survey of Yunnan 500kV Tongbao Electric Power Transmission and Distribution Project
07/03/15	MEP Acc[2015]166	Official Letter of the Environmental Acceptance Survey of Chongxin Power Plant Phase I 750kV Output Project
07/03/15	MEP Acc[2015]167	Official Letter of the Environmental Acceptance Survey of Pingliang Power Plant Phase II 750kV Output Project
07/03/15	MEP Acc[2015]168	Official Letter of the Environmental Acceptance Survey of Xinyang (Shihe) 500kV Substation Extension Project
07/03/15	MEP Acc[2015]169	Official Letter of the Environmental Acceptance Survey of 500kV Yingzhou Substation-Luohe Power Plant Line π Accessing Huainan Switch Station Project
07/03/15	MEP Acc[2015]170	Official Letter of the Environmental Acceptance Survey of 500kV China Huadian Corporation Wuhu Power Plant-Ma'anshan Substation Double-Circuit Transmission Line on the Same Tower Project
07/03/15	MEP Acc[2015]171	Official Letter of the Environmental Acceptance Survey of Gaoling-Tianma Circuit III 500kV Electric Power Transmission and Distribution Project
07/03/15	MEP Acc[2015]172	Official Letter of the Environmental Acceptance Survey of China Northwest-Central China Power Grid Interconnection Lingbao Back-to-Back Extension Project
07/03/15	MEP Acc[2015]173	Official Letter of the Environmental Acceptance Survey of Dandong Substation-Pushi River Pumped-Storage Hydroplant 500kV Transmission Line Project
07/03/15	MEP Acc[2015]174	Official Letter of the Environmental Acceptance Survey of Dalian Yanshui Switch Station Booster Extension Project
07/03/15	MEP Acc[2015]175	Official Letter of the Environmental Acceptance Survey of Yinchuan East 750kV Substation Main Transformer Extension Project
07/06/15	MEP Acc[2015]176	Official Letter of the Environmental Acceptance Survey of Beijiang Power Plant 500kV Output Electric Power Transmission and Distribution Project
07/06/15	MEP Acc[2015]177	Official Letter of the Environmental Acceptance Survey of Baotou North-Hohhot East (Qixiaying) 500kV Electric Power Transmission and Distribution Project
07/06/15	MEP Acc[2015]178	Official Letter of the Environmental Acceptance Survey of Hubei-Jiangxi Circuit III 500kV Electric Power Transmission and Distribution Project
07/06/15	MEP Acc[2015]179	Official Letter of the Environmental Acceptance Survey of Xiangjiaba Hydropower Station 500kV AC Output Project

continued

Approval Date	Document No.	Document Title
09/28/15	MEP Acc[2015]200	Official Letter of the Environmental Acceptance Survey of Tibet Changdu-Sichuan Power Grid Interconnection Electric Power Transmission and Distribution Project
12/01/15	MEP Acc[2015]217	Official Letter of the Environmental Acceptance Survey of Hami-Henan (Zhengzhou) ±800kV DC UHV Electric Power Transmission Project
12/21/15	MEP Acc[2015]233	Official Letter of the Environmental Acceptance Survey of 750kV Hami-Anxi Electric Power Transmission and Distribution Project

13 Radiation Environment Monitoring

Environmental Ionizing Radiation

In 2015, the nationwide environmental ionizing radiation level remained fluctuation range of the natural background. The real-time continuous air-absorbed dose rates (see Figure 1) from radiation environment automatic monitoring station were all in the fluctuation range of the local natural background. Aerosols, activity concentrations of radionuclides in fallout, and tritium activity concentrations in the air had no abnormal phenomena. Natural radionuclide activity concentrations in the Yangtse River, the Yellow River, the Pearl River, the Songhua River, the Huai River, the Hai River, the Liao River, rivers in Zhejiang and Fujian, rivers in the Southwest, rivers in the Northwest, and major lakes (reservoirs) were at the same level as the investigation result of nationwide environmental natural radioactive level from 1983 to 1990. The artificial radionuclide activity concentrations had no abnormal phenomena. The gross α and gross β activity concentrations in the water from centralized potable water sources in cities and potable ground water were lower than specified limits in the Potable Water Hygienic Standard (GB 5749-2006). Natural radionuclide activity concentrations in seawater from offshore marine areas and in marine lives were at the background level, and artificial radionuclide activity concentrations had no abnormal phenomena. Among them, ^{90}Sr and ^{137}Cs activity concentrations (see Figure 2) in seawater were lower than specified limits in the Seawater Quality Standard (GB 3097-1997). Natural radionuclide activity concentrations in soil were at the same level as the investigation result of nationwide environmental natural radioactive level from 1983 to 1990, and artificial radionuclide activity concentrations had no abnormal phenomena.

Environment Ionizing Radiation around Nuclear Power Bases in Operation

In 2015, the real-time continuous air-absorbed dose rates of radiation environmental automatic monitoring stations around nuclear power bases in operation remained fluctuation range of the local natural background. The activity concentrations of radionuclide other than tritium in air, water, soil, biology around nuclear power bases had no abnormal phenomena. The tritium activity

concentrations in partial environmental media around Qinshan Nuclear Power Base, Daya Bay Nuclear Power Base, Yangjiang Nuclear Power Base, and Tianwan Nuclear Power Base increased, compared with the background level before NPP operating, but the evaluation result showed that the radiation doses to the public were much lower than national limits.

Environmental Ionizing Radiation around Civil Research Reactors

The ambient environmental γ radiation air-absorbed dose rates and radionuclide activity concentrations in aerosol, fallout, water, and soil around Miniature Neutron Source Reactors and other research facilities of Institute of Nuclear and New Energy Technology of Tsinghua University and Shenzhen University had no abnormal phenomena. Trace amounts of ^{131}I and other artificial radionuclides were detected from partial environmental media around China Institute of Atomic Energy and Nuclear Power Institute of China, but the evaluation result showed that the radiation doses to the public were much lower than national limits.

Environment Ionizing Radiation around Nuclear Fuel Cycle Facilities and Waste Disposal Facilities

The ambient environmental γ radiation air-absorbed dose rates around the nuclear fuel cycle facilities of Lanzhou Uranium Co., Ltd CNNC, Shaanxi Uranium Co., Ltd CNNC, China Northern Nuclear Fuel Co., Ltd CNNC, CNNC Jianzhong Nuclear Fuel Co., Ltd, and The 404 Co., Ltd CNNC, as well as those around the Northwest Low-and-Medium Level Solid Radioactive Waste Disposal Site, and Guangdong Beilong Low-and-Medium Level Solid Radioactive Waste Disposal Site, were within the fluctuation of local natural background level, and the radionuclide activity concentrations in the environmental media associated with the activities of above enterprises had no abnormal phenomena.

Ambient Ionizing Radiation of the Uranium Mining and Milling Facilities

The radioactive environmental qualities around uranium mining and Milling facilities were generally stable, the ambient environmental γ radiation air-absorbed dose rates, activity concentrations of radon in air, gross α activity concentrations in aerosols, and gross concentrations of uranium and ^{226}Ra in surface water were at the same level as those of the previous years. Gross concentrations of uranium and ^{226}Ra in surrounding drinking water were lower than limits specified in the Rules of Radiation Protection and Environment Protection for Uranium Mining and Milling (GB 23727-2009).

Electromagnetic Radiation

The environmental electromagnetic radiation level in the provincial capital cities were much lower than the public exposure limits of 12 V/m, (frequency range from 30MHz to 3,000MHz) specified in the Electromagnetic Environment Control Limits (GB 8702-2014). The electromagnetic radiation level of the monitored environmental sensitive sites around large electromagnetic radiation facilities and mobile communication base station antennas, and the work frequency electric field intensities and magnetic induction intensities of the monitored environmental sensitive sites around electric transmission lines and substations were all lower than the public exposure limits specified in the GB 8702-2014.

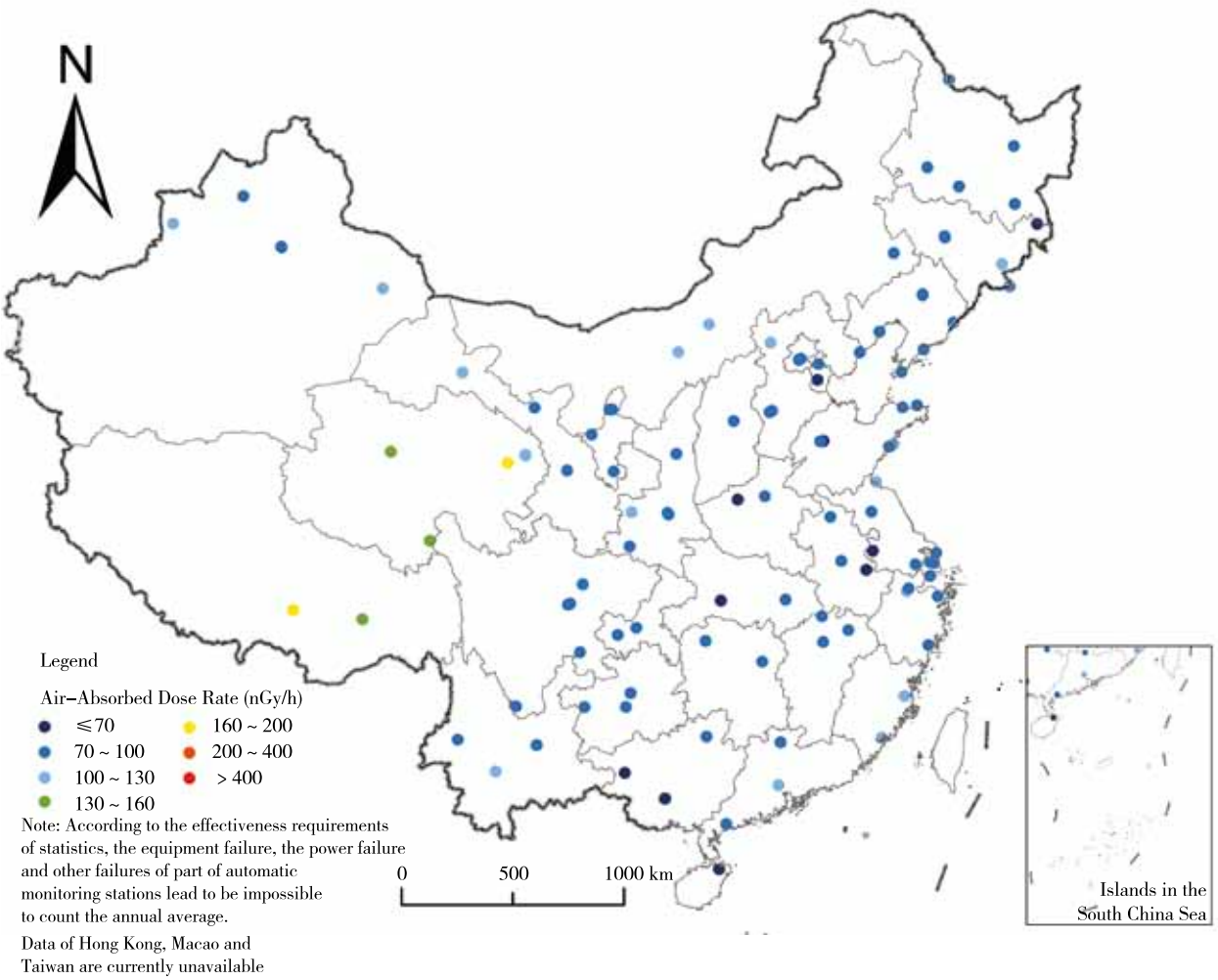


Figure 1. Distribution Map of National Radiation Environment Automatic Monitoring Stations for Real-Time Continuous Air-Absorbed Dose Rate in 2015

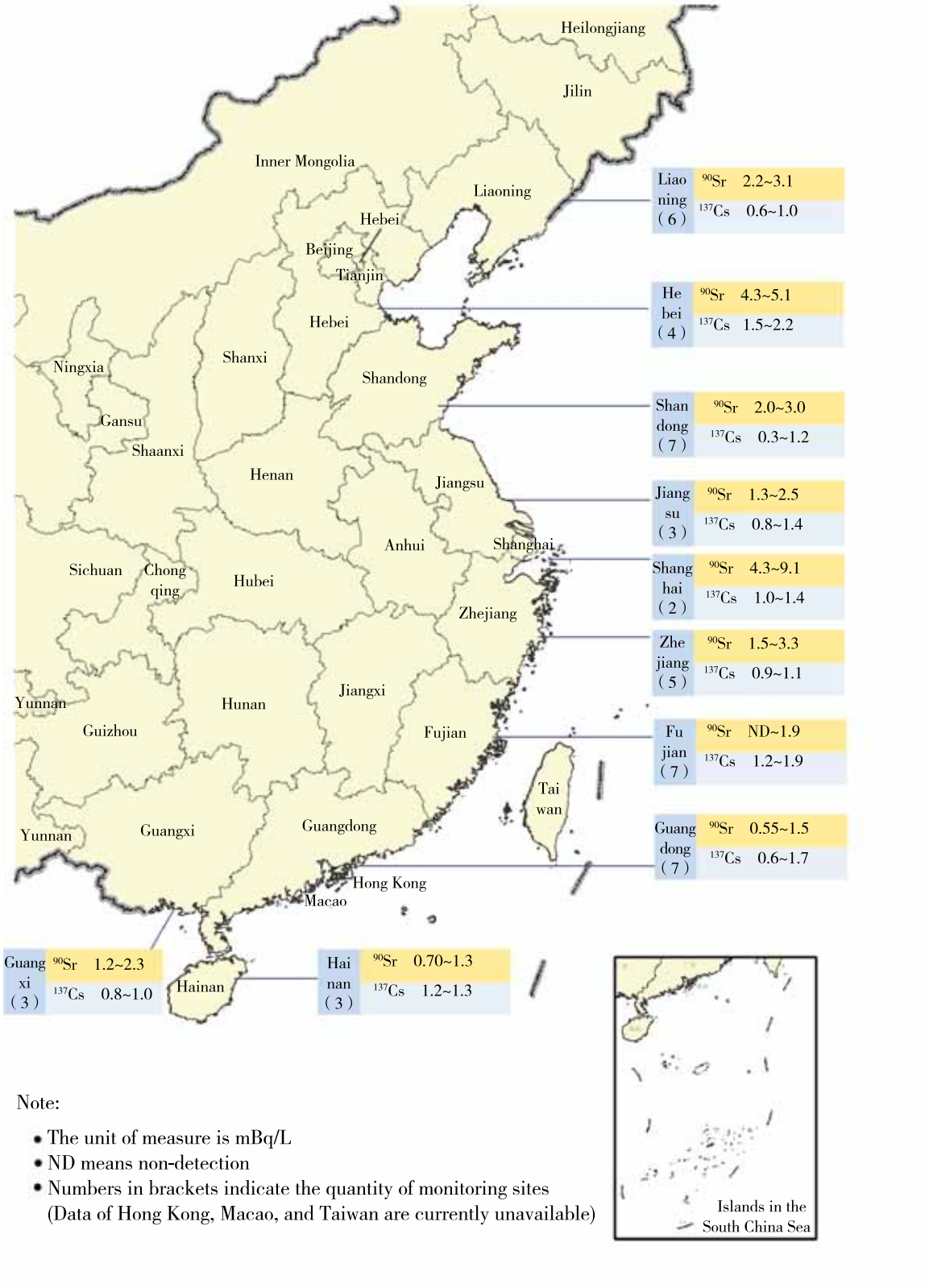


Figure 2. ^{90}Sr and ^{137}Cs Activity Concentrations in Offshore Marine Areas of China in 2015

14 Emergency Management of Nuclear and Radiation Accidents

In 2015, according to the laws and regulations, MEP (NNSA) conducted reviews and re-reviews of the on-site emergency response plans, conducted regulatory inspections on daily emergency preparedness, and carried out oversights and assessments on the on-site comprehensive emergency exercises, so as to effectively enhance the regulation on civilian nuclear facility emergency preparedness. MEP (NNSA) coordinated and guided on the provincial radiation accident emergency exercises in practical mode, and achieved new improvements. MEP (NNSA) continually strengthened its capability of emergency preparedness and emergency response, and accomplished many nuclear and radiation emergency response tasks, thus maintained highly efficient emergency response capabilities.

Regulation on NPP Emergency Preparedness

MEP (NNSA) completed oversights and assessments on nuclear emergency exercises before the initial fuel loading of Changjiang NPP, Yangjiang NPP, and Fangchenggang NPP, and completed oversights and assessments on nuclear emergency exercises of Ningde NPP, and Qinshan Nuclear Power Base. The issuance of inspection reports on the on-site comprehensive nuclear emergency exercises in 2015 are shown in Table 93.

Approval of Emergency Plan

In 2015, MEP (NNSA) reviewed and approved the emergency plan of Hainan Nuclear Power Co., Ltd, Guangxi Fangchenggang Nuclear Power Co., Ltd, Yangjiang Nuclear Power Co., Ltd, Daya Bay Nuclear Power Operation and Management Co., Ltd, Institute of Nuclear and New Energy Technology of Tsinghua University, and China Northern Nuclear Fuel Co., Ltd. See Table 94.

Nuclear and Radiation Emergency Preparedness, Counter-Terrorism and Security

According to the unified deployment, MEP (NNSA) successfully completed the security guarding of nuclear and radiation safety

emergency during a series of activities of commemorating the 70th anniversary of victory in the War of Resistance Against Japan.

Construction of Nuclear Emergency Response Supporting Forces in the Nuclear Power Industry

According to the requirements of the Report on the Comprehensive inspections on Nationwide Civilian Nuclear Facilities and the 12th Five-Year Plan and 2020 Long-Term Goals on Nuclear Safety and Radioactive Pollution Prevention, MEP (NNSA) guided the nuclear power group companies to carry out construction of NPP nuclear accident emergency supporting forces and team capabilities. After CNNC and CGNPC founded their nuclear accident emergency supporting teams at nuclear power group level respectively, relying on Qinshan Nuclear Power Base and Guangdong Daya Bay Nuclear Power Base, SPIC established real supporting base for emergency in Yantai, Shandong Province in May 2015, and established a nuclear accident emergency supporting team.

MEP (NNSA) organized the 4th Symposium on Nuclear Accident Emergency supporting of Nuclear Power Groups. With continuous efforts of all parties, the nuclear emergency supporting work of Chinese nuclear power group achieved significant progress. An effective emergency cooperation platform was established, and the objective of nationwide capability co-construction and resource sharing of NPP nuclear accident emergency were basically realized.

Guiding Departments of Environmental Protection at Provincial Level to Enhance Radiation Accident Emergency Exercises

MEP (NNSA) guided regional offices to supervise the implementation of comprehensive radiation accident emergency exercises of 6 provincial and municipal environmental protection departments such as Beijing, Jilin, Jiangsu, and so on. By means of exercises, the local government paid more attention to radiation accident emergency, their main responsibilities were implemented, the personnel was trained, the emergency plan and facilities were examined, the emergency response and handling capabilities were improved, and the radiation safety regulation was further promoted. Meanwhile, by means of on-site visit and video viewing, the emergency experience exchange between provinces was strengthened, the effects of replacing training by exercise, fanning out from point to area, exemplary demonstration, and mutual learning were achieved, and provided a model

for the continuous development of radiation emergency exercises in the future.

Effectively Maintaining the Emergency Response Capability

MEP (NNSA) continued to carried out sound work on nuclear and radiation accident emergency response. A 24-hour on duty emergency system was implemented, in order to ensure the effective operation and smooth communication of the nuclear and radiation emergency response system. The system of nuclear and radiation emergency decision-making supporting and command dispatching and the emergency monitoring dispatching platform were integrated. Emergency training for nuclear and radiation safety regulation system was carried out scientifically.

Table 93. Inspection Reports on the On-Site Comprehensive Exercises of Nuclear Emergency in 2015

Approval Date	Document No.	Document Title
03/09/15	NNSA Notice [2015]27	Official Letter of Issuing the Inspection Report of On-Site Comprehensive Nuclear Emergency Exercise and Nuclear Emergency Preparedness before the Initial Fuel Loading of Fangchenggang NPP Unit 1
03/31/15	NNSA Notice [2015]35	Official Letter of Issuing the Inspection Report of On-Site Comprehensive Nuclear Emergency Exercise and Nuclear Emergency Preparedness before the Initial Fuel Loading of Hainan Changjiang NPP Unit 1
04/24/15	NNSA Notice [2015]37	Official Letter of Issuing the Inspection Report of On-Site Comprehensive Nuclear Emergency Exercise and Nuclear Emergency Preparedness before the Initial Fuel Loading of Yangjiang NPP Unit 3
11/27/15	NNSA Notice [2015]129	Official Letter of Issuing the Inspection Report of On-Site Comprehensive Nuclear Emergency Exercise of Ningde NPP in 2015
12/09/15	NNSA Notice [2015]137	Official Letter of Issuing the Inspection Report of On-Site Comprehensive Nuclear Emergency Exercise of Qinshan Nuclear Power Base, CNNC in 2015

Table 94. Official Replies to Nuclear Emergency Plan in 2015

Approval Date	Document No.	Document Title
05/11/15	NNSA Notice [2015]47	Reply Letter of the Agreement about On-site Emergency Plan of Hainan Changjiang NPP Unit 1 and Unit 2
05/15/15	NNSA Notice [2015]51	Reply Letter of the Agreement about On-site Emergency Plan (Rev. D) of Nuclear Facilities of INET/TU
08/21/15	NNSA Notice [2015]79	Reply Letter of the Agreement about On-site Emergency Plan of Guangxi Fangchenggang NPP Unit 1 and Unit 2
08/31/15	NNSA Notice [2015]85	Reply Letter of the Agreement about On-site Emergency Plan (Rev. 8) of Guangdong Daya Bay NPP / Ling'ao NPP
09/08/15	NNSA Notice [2015]87	Reply Letter of the Agreement about On-site Emergency Plan (Rev. 12) of Yangjiang NPP
10/08/15	NNSA Notice [2015]98	Reply Letter of the Agreement about Emergency Plan (EP03-2015) of Civilian Nuclear Facility Fuel Element Fabrication Line Accident

15 Personnel Qualification

Qualification Management of Operators in Civilian Nuclear Facilities

According to the document issued by the State Council, MEP (NNSA) is in charge of the personnel qualification management of nuclear research reactors. In order to be adapted with the regulatory duty changes and to clarify requirements for training, examinations, and license management, etc., MEP (NNSA) developed the Rules of Personnel License management for Nuclear Research Reactors.

In 2015, 4 meetings of civilian nuclear facility operator qualification approval committee were held, and 788 civilian nuclear facilitiy operator licenses were issued. Among them, 684 licenses were issued to nuclear power plant operators, while 104 licenses were issued to civilian research reactor operators (see Table 95).

By the end of 2015, 2,075 operators hold the nuclear power plant operator license (see Table 96). Among them, 952 operators hold the senior operator license, and 1,123 operators hold the operator license. Meanwhile, 517 operators hold the research reactor operator license (see Table 97). Among them, 251 operators hold the senior operator license, and 266 operators hold the operator license.

Table 95. Regulatory Approvals of Civilian Nuclear Facility Operator License in 2015

Approval Date	Document No.	Document Title
04/23/2015	NNSA[2015]87	Notification of Issuing the First Batch of Civilian Nuclear Facilities Operator Licenses (NPPs) in 2015
04/23/2015	NNSA[2015]88	Notification of Issuing the First Batch of Civilian Nuclear Facilities Operator Licenses (Nuclear Research Reactors) in 2015
07/20/2015	NNSA[2015]133	Notification of Issuing the Second Batch of Civilian Nuclear Facilities Operator Licenses (Nuclear Research Reactors) in 2015
07/28/2015	NNSA[2015]141	Notification of Issuing the Second Batch of Civilian Nuclear Facilities Operator Licenses (NPPs) in 2015
11/16/2015	NNSA[2015]227	Notification of Issuing the Third Batch of Civilian Nuclear Facilities Operator Licenses (Nuclear Research Reactors) in 2015

continued

Approval Date	Document No.	Document Title
11/16/2015	NNSA[2015]235	Notification of Issuing the Third Batch of Civilian Nuclear Facilities Operator Licenses (NPPs) in 2015

Table 96. Statistics of Operator Licenses of NPPs (as of December 2015)

Operating Organization	Nuclear Facilities	Senior Operators	Operators	Subtotal
Nuclear Power Operation Management Co., Ltd CNNC	Qinshan NPP	36	42	78
	Qinshan NPP Phase II unit 1 and unit 2	60	32	92
	Qinshan NPP Phase II unit 3 and unit 4	54	31	85
	Qinshan NPP Phase III unit 1 and unit 2	51	57	108
	Fangjiashan NPP unit 1 and unit 2	35	38	73
Daya Bay Nuclear Power Operation and Management Co., Ltd	Daya Bay NPP unit 1 and 2	66	53	119
	Ling'ao NPP unit 1 and unit 2	70	62	132
	Ling'ao NPP unit 3 and unit 4	86	70	156
Jiangsu Nuclear Power Co., Ltd	Tianwan NPP unit 1 and unit 2	100	86	186
Fujian Ningde Nuclear Power Co., Ltd	Ningde NPP unit 1 and unit 2	72	75	147
	Ningde NPP unit 3 and unit 4	34	49	83
Liaoning Hongyanhe Nuclear Power Co., Ltd	Hongyanhe NPP unit 1 and unit 2	73	86	159
	Hongyanhe NPP unit 3 and unit 4	38	47	85
Yangjiang Nuclear Power Co., Ltd	Yangjiang NPP unit 1 and unit 2	42	80	122
	Yangjiang NPP unit 3 and unit 4	22	67	89
Fujian Fuqing Nuclear Power Co., Ltd	Fuqing NPP unit 1 and unit 2	64	73	137
	Fuqing NPP unit 3 and unit 4	0	27	27
Guangxi Fangchenggang Nuclear Power Co., Ltd	Fangchenggang NPP unit 1 and unit 2	22	86	108
Hainan Nuclear Power Co., Ltd	Changjiang NPP unit 1 and unit 2	27	62	89
Total	—	952	1,123	2,075

Table 97. Statistics of Operator Licenses of Civilian Research Reactor (as of December 2015)

Operating Organization	Nuclear Facility	Senior Operators	Operators	Subtotal
China Institute of Atomic Energy	Swimming Pool Reactor	18	6	24
	DF-VI Fast Neutron Criticality Facility	8	4	12
	Reprocessing Pilot Plant Uranium Solution Criticality Facility	3	5	8
	Miniature Reactor Zero Power Facility	2	1	3
	China Experimental Fast Neutron Reactor	40	30	70
	China Advanced Research Reactor	18	15	33
Nuclear Power Institute of China	High Flux Engineering Test Reactor	28	28	56
	Minjiang Test Reactor	8	5	13
	China Burst Reactor	6	4	10
	High Flux Engineering Test Reactor Experimental Facility	3	15	18
	18-5 Critical Facility	6	5	11
Institute of Nuclear and New Technology of Tsinghua University	5MW Experimental Low Temperature Nuclear Heating Reactor	18	29	47
	10MW High Temperature Gas-Cooled Reactor	76	98	174
	Shielding Experimental Reactor	7	7	14
Northwest Institute of Nuclear Technology	Xi'an Burst Reactor	10	7	17
Shenzhen University	Shenzhen Miniature Reactor	0	4	4
Beijing Capture Technology Co., Ltd	In-hospital Neutron Irradiator	0	3	3
Total		251	266	517

Qualification Management of Nondestructive Testers of Civilian Nuclear Safety Equipment

In order to adopt the rearrangement of regulatory duty on nondestructive testers, MEP (NNSA) revised the Rules of Qualification Management of Nondestructive Testers of Civilian Nuclear Safety Equipment (HAF 602). MEP (NNSA) is in charge of the qualification management of nondestructive testers of civilian nuclear safety equipment and the qualification examination and approval of nondestructive testers in foreign organizations. There were 2 qualification examination plans for nondestructive testers of civilian nuclear safety equipment in 2015 (see Table 98). MEP (NNSA) organized 5 nondestructive tester qualification examination centers to hold 90 batches exams, and issued 9 batches of nondestructive tester certificates (see Table 99), amounting to 2,006 people and 2,621

items. MEP (NNSA) approved 2 batches of nondestructive tester qualification for foreign organizations, amounting to 27 people and 32 items (see Table 100). By December 2015, 12,710 certificates of nondestructive tester of civilian nuclear safety equipment had been issued to 5,991 people. Among them, 258 certificates for high level (Class III), 9,680 certificates for intermediate level (Class II), and 2,772 certificates for primary level (Class I).

Based on the inspection program and work plan, MEP (NNSA) performed 5 on-site inspections and 4 witness inspections on 5 examination centers of nondestructive tester of civilian nuclear safety equipment, and proposed corrective requirements timely for problems found in the inspections. Generally, the examination quality of personnel qualification of nondestructive testers of civilian nuclear safety equipment was under control in 2015.

Table 98. Examination Plans for Nondestructive Testers of Civilian Nuclear Safety Equipment in 2015

Approval Date	Document No.	Document Title
12/10/2014	NNSA Notice[2014]179	Notification of Issuing First Batch of Examination Plan of Nondestructive Testers of Civilian Nuclear Safety Equipment in 2015
06/10/2015	NNSA Notice[2015]60	Notification of Issuing Second Batch of Examination Plan of Nondestructive Testers of Civilian Nuclear Safety Equipment in 2015

Table 99. Administrative Reviews and Approvals in the Field of Qualification of Nondestructive Testers of Civilian Nuclear Safety Equipment in 2015

Approval Date	Document No.	Document Title
04/30/2015	NNSA[2015]91	Notification of Issuing the First Batch of Certificates for Nondestructive Testers of Civilian Nuclear Safety Equipment in 2015
05/11/2015	NNSA[2015]106	Notification of Issuing the Second Batch of Certificates for Nondestructive Testers of Civilian Nuclear Safety Equipment in 2015
06/10/2015	NNSA[2015]120	Notification of Issuing the Third Batch of Certificates for Nondestructive Testers of Civilian Nuclear Safety Equipment in 2015
07/07/2015	NNSA[2015]137	Notification of Issuing the Fourth Batch of Certificates for Nondestructive Testers of Civilian Nuclear Safety Equipment in 2015
08/14/2015	NNSA[2015]177	Notification of Issuing the Fifth Batch of Certificates for Nondestructive Testers of Civilian Nuclear Safety Equipment in 2015
09/15/2015	NNSA[2015]206	Notification of Issuing the Sixth Batch of Certificates for Nondestructive Testers of Civilian Nuclear Safety Equipment in 2015
10/12/2015	NNSA[2015]218	Notification of Issuing the Seventh Batch of Certificates for Nondestructive Testers of Civilian Nuclear Safety Equipment in 2015
11/10/2015	NNSA[2015]252	Notification of Issuing the Eighth Batch of Certificates for Nondestructive Testers of Civilian Nuclear Safety Equipment in 2015
12/09/2015	NNSA[2015]267	Notification of Issuing the Ninth Batch of Certificates for Nondestructive Testers of Civilian Nuclear Safety Equipment in 2015

Table 100. Examination and Approvals of Nondestructive Testers in Foreign Organizations in 2015

Approval Date	Document No.	Document Title
02/28/2015	NNSA Notice[2015]29	Reply Letter of Approving the First Batch of Nondestructive Testers of Civilian Nuclear Safety Equipment in Foreign Organizations in 2015
06/19/2015	NNSA Notice[2015]61	Reply Letter of Approving the Second Batch of Nondestructive Testers of Civilian Nuclear Safety Equipment in Foreign Organizations in 2015

Qualification Management of Welder and Welding Operator of Civilian Nuclear Safety Equipment

MEP (NNSA) is in charge of the qualification management of welder and welding operator of civilian nuclear safety equipment. There was one theory test plan for welders and welding operators of civilian nuclear safety equipment in 2015 (see Table 101). MEP (NNSA) organized 14 examination centers of welder and welding operator of civilian nuclear safety equipment to hold 23 tests on basic theories and 248 professional tests. MEP (NNSA) issued 14 Batches of certificates of welder and welding operator of civilian nuclear safety equipment for 3,739 people with 6,252 items (see Table 102). MEP (NNSA) issued 11 groups of name lists and numbers of theory test examination for welder and welding operator of civilian nuclear safety equipment for 2,058 people (see Table 103). MEP (NNSA) also finished selection of 12 organizations for renewing as examination centers for welder and welding operator of civilian nuclear safety equipment (see Table 104). MEP (NNSA) approved the application of 3 organizations for type Y tests, and the application of test range extension for one organization (see Table 105). By December 2015, 17,943 certificates of welder and welding operator of civilian nuclear safety equipment had been issued to 8,001 people.

Based on the inspection program and work plan, MEP (NNSA) performed 14 on-site inspections and 36 witness inspections for 14 examination centers, and proposed corrective requirements timely for issues found in the inspections. Generally, the examination quality of welder and welding operator of civilian nuclear safety equipment was under control in 2015.

In order to keep promoting nuclear safety culture cultivation and to build welder and welding operator test platform as the long term stage of nuclear safety culture propagation, MEP (NNSA) developed the Training Guide of Theory Tests for Welder and Welding Operator of Civilian Nuclear Safety Equipment, and also revised the question bank for welder theory tests, and increased the percentage of questions related to nuclear safety culture.

Table 101. The Theory Test Plan for Welders and Welding Operators of Civilian Nuclear Safety Equipment in 2015

Approval Date	Document No.	Document Title
12/04/2014	NNSA Notice[2014]178	Notification of Theory Test Plan for Welders and Welding Operators of Civilian Nuclear Safety Equipment in 2015

Table 102. Administrative Reviews and Approvals in the Field of the Qualification for Welders and Welding Operators of Civilian Nuclear Safety Equipment in 2015

Approval Date	Document No.	Document Title
01/08/2015	NNSA[2015]12	Notification of Issuing the First Group of Certificates for Welders and Welding Operators of Civilian Nuclear Safety Equipment in 2015
02/06/2015	NNSA[2015]39	Notification of Issuing the Second Group of Certificates for Welders and Welding Operators of Civilian Nuclear Safety Equipment in 2015
03/25/2015	NNSA[2015]72	Notification of Issuing the Third Group of Certificates for Welders and Welding Operators of Civilian Nuclear Safety Equipment in 2015
04/09/2015	NNSA[2015]79	Notification of Issuing the Fourth Group of Certificates for Welders and Welding Operators of Civilian Nuclear Safety Equipment in 2015
05/05/2015	NNSA[2015]98	Notification of Issuing the Fifth Group of Certificates for Welders and Welding Operators of Civilian Nuclear Safety Equipment in 2015
05/31/2015	NNSA[2015]111	Notification of Issuing the Sixth Group of Certificates for Welders and Welding Operators of Civilian Nuclear Safety Equipment in 2015
06/23/2015	NNSA[2015]130	Notification of Issuing the Seventh Group of Certificates for Welders and Welding Operators of Civilian Nuclear Safety Equipment in 2015
07/20/2015	NNSA[2015]151	Notification of Issuing the Eighth Group of Certificates for Welders and Welding Operators of Civilian Nuclear Safety Equipment in 2015
08/20/2015	NNSA[2015]182	Notification of Issuing the Ninth Group of Certificates for Welders and Welding Operators of Civilian Nuclear Safety Equipment in 2015
09/15/2015	NNSA[2015]196	Notification of Issuing the Tenth Group of Certificates for Welders and Welding Operators of Civilian Nuclear Safety Equipment in 2015
10/15/2015	NNSA[2015]217	Notification of Issuing the Eleventh Group of Certificates for Welders and Welding Operators of Civilian Nuclear Safety Equipment in 2015
10/28/2015	NNSA[2015]231	Notification of Issuing the Twelfth Group of Certificates for Welders and Welding Operators of Civilian Nuclear Safety Equipment in 2015
11/23/2015	NNSA[2015]258	Notification of Issuing the Thirteenth Group of Certificates for Welders and Welding Operators of Civilian Nuclear Safety Equipment in 2015
01/07/2016	NNSA[2016]3	Notification of Issuing the Fourteenth Group of Certificates for Welders and Welding Operators of Civilian Nuclear Safety Equipment in 2015

Table 103. Issuance of Name Lists and Numbers of Theory Test Qualifications for Welders and Welding Operators of Civilian Nuclear Safety Equipment in 2015

Approval Date	Document No.	Document Title
03/02/2015	MEP Equipment [2015]6	Notification of Issuing Name Lists and Numbers of Theory Test Qualifications for Welders and Welding Operators of Civilian Nuclear Safety Equipment (L-1501-CNI, L-1502-SWC)
03/17/2015	MEP Equipment [2015]9	Notification of Issuing Name Lists and Numbers of Theory Test Qualifications for Welders and Welding Operators of Civilian Nuclear Safety Equipment (L-1503-HEQ, L-1504-DLB)
04/29/2015	MEP Equipment [2015]22	Notification of Issuing Name Lists and Numbers of Theory Test Qualifications for Welders and Welding Operators of Civilian Nuclear Safety Equipment (L-1505-CNI, L-1506-HEE)
06/01/2015	MEP Equipment [2015]27	Notification of Issuing Name Lists and Numbers of Theory Test Qualifications for Welders and Welding Operators of Civilian Nuclear Safety Equipment (L-1508-SEM, L-1510-YHK)
06/03/2015	MEP Equipment [2015]26	Notification of Issuing Name Lists and Numbers of Theory Test Qualifications for Welders and Welding Operators of Civilian Nuclear Safety Equipment (L-1507-FCW, L-1509-JSH)
07/01/2015	MEP Equipment [2015]30	Notification of Issuing Name Lists and Numbers of Theory Test Qualifications for Welders and Welding Operators of Civilian Nuclear Safety Equipment (L-1511-CNF, L-1512-CNI)
07/17/2015	MEP Equipment [2015]31	Notification of Issuing Name Lists and Numbers of Theory Test Qualifications for Welders and Welding Operators of Civilian Nuclear Safety Equipment (L-1513-DFN, L-1514-HXC)
09/07/2015	MEP Equipment [2015]39	Notification of Issuing Name Lists and Numbers of Theory Test Qualifications for Welders and Welding Operators of Civilian Nuclear Safety Equipment (L-1515-CNI, L-1517-CNI, L-1523-DNF)
10/10/2015	MEP Equipment [2015]44	Notification of Issuing Name Lists and Numbers of Theory Test Qualifications for Welders and Welding Operators of Civilian Nuclear Safety Equipment (L-1516-SAP, L-1518-CNF, L-1519-XNE)
11/03/2015	MEP Equipment [2015]48	Notification of Issuing Name Lists and Numbers of Theory Test Qualifications for Welders and Welding Operators of Civilian Nuclear Safety Equipment (L-1520-YHK)
12/22/2015	MEP Equipment [2015]61	Notification of Issuing Name Lists and Numbers of Theory Test Qualifications for Welders and Welding Operators of Civilian Nuclear Safety Equipment (L-1521-CNI, L-1522-SWC)

Table 104. Selection of Organizations as examination Centers for Welders and Welding Operators of Civilian Nuclear Safety Equipment in 2015

Approval Date	Document No.	Document Title
08/31/2015	NNSA[2015]180	Notification of Selecting 12 Organizations Including China Nuclear Industry 23 Construction Co., Ltd as Examination Centers for Welders and Welding Operators of Civilian Nuclear Safety Equipment

Table 105. The Test Range Extension of Examination Centers for Welders and Welding Operators of Civilian Nuclear Safety Equipment in 2015

Approval Date	Document No.	Document Title
05/26/2015	NNSA Notice[2015]54	Reply Letter of Approving the Test Range Extension of Welders and Welding Operators of Civilian Nuclear Safety Equipment for the Examination Center of China Nuclear Industry 23 Construction Co., Ltd
06/23/2015	NNSA Notice[2015]65	Reply Letter of Approving the Addition of Type Y Test of Welders and Welding Operators of Civilian Nuclear Safety Equipment for the Examination Center of Dongfang Electric Corporation Dongfang Boiler Co.,Ltd
07/23/2015	NNSA Notice[2015]74	Reply Letter of Approving the Addition of Type Y Test of Welders and Welding Operators of Civilian Nuclear Safety Equipment for the Examination Center of Jiangsu Province 3rd Electric Power Construction Company of China Energy Engineering Group Co.,Ltd
11/10/2015	NNSA Notice[2015]124	Reply Letter of Approving the Addition of Type Y Test of China Nuclear Industry Fifth Construction Company in Sufa Technology Industry Co., Ltd CNNC.

The Qualification Management of Registered Nuclear Safety Engineer

In 2015, a total number of 2,331 applicants signed up the Registered Nuclear Safety Engineer Test, and 1,377 applicants actually took the test, 257 applicants were qualified as Registered Nuclear Safety Engineers. MEP (NNSA) approved 923 registration applications (see Table 106), and among them, 433 people were fresh appliers, and 490 applications were for renewal. By the end of 2015, there are a total number of 3,733 individuals successfully acquired practice qualification certificate of Registered Nuclear Safety Engineer nationwide, and 1,905 Registered Nuclear Safety Engineers in 247 organizations in total.

There were 8 sessions of registered nuclear safety engineer continuing education training classes held (including nuclear safety professional skills classes), including 3 sessions of Nuclear Quality Assurance and Nuclear Safety Culture, which trained 358 people, and 3 sessions of Radiation Protection, which trained 391 people, and 2 sessions of Nuclear Emergency and Nuclear Security, which trained 105 people.

Table 106. Administrative Reviews and Approvals in the Field of Registered Nuclear Safety Engineer Qualification in 2015

Approval Date	Document No.	Document Title
04/16/2015	NNSA[2015]78	Notification of Publishing the Name List of the First Group of Registered Nuclear Safety Engineer Qualification in 2015
08/20/2015	NNSA[2015]174	Notification of Publishing the Name List of the Second Group of Registered Nuclear Safety Engineer Qualification in 2015
11/26/2015	NNSA[2015]251	Notification of Publishing the Name List of the Third Group of Registered Nuclear Safety Engineer Qualification in 2015
11/20/2015	MEP Notice[2015]1903	Notification of Canceling 7 Registered Nuclear Safety Engineers from the Nuclear Technology Utilization Organizations.

Training Nuclear and Radiation Safety Regulatory Inspectors

In order to improve the pertinence and effectiveness of the trainings, MEP (NNSA) developed the NNSA Professional Training Plan of 2015, and held 3 sessions of nuclear and radiation safety regulatory inspector qualification training (see Table 107) and 64 sessions of on-job training with more than 3,800 participants trained.

Table 107. Qualification Training Statistics of Nuclear and Radiation Safety Regulatory Inspectors in 2015

Start Date	Name of the Session	Number of Participants
05/12/2015	Advanced Class of Radiation Safety Regulation Staff at Provincial Level	32
06/02/2015	Primary Class of Radiation Safety Regulation Staff at Provincial Level	39
10/20/2015	The 8th NNSA Primary Class	24

By December 2015, 8 sessions of NNSA primary classes had been held and 429 people participated, and graduated from the classes. MEP (NNSA) held 8 sessions of nuclear power classes (nuclear and radiation safety intermediate class), and 257 people participated, and graduated from the classes. MEP (NNSA) held 4 sessions of advanced classes of radiation safety regulation staff at provincial level, and 116 people participated, and graduated from the classes. MEP (NNSA) also held one session of primary class of radiation safety regulation staff at provincial level, and 126 people participated, and graduated from the classes. Cooperated with Tsinghua University, the Engineering Master Program of radiation protection and environment protection major in the field of nuclear power and nuclear technology engineering has been held for 6 sessions with

162 students.

The Third Session of the Nuclear and Radiation Safety Regulation Seminar had been held. The activity was from the bottom to the top with half of year with 230 participants in total. The Proceedings of the Third Session of the Nuclear and Radiation Safety Regulation Seminar was compiled, including 104 papers and reports.

16 International Cooperation

Supporting nuclear power to Go Abroad

On August 21, 2015, the Symposiumon on Strengthening International Cooperation in Nuclear Safety Regulation and Supporting Nuclear Power to Go Abroad was held in Beijing. The Vice Minister of MEP, Administrator of NNSA, Li Ganjie, attended the symposium, and made a concluding speech. Nuclear Safety Chief Engineer of MEP, Vice Administrator of NNSA, Liu Hua, hosted over the symposium. The Work Program of Strengthening International Cooperation in Nuclear Safety Regulation and Supporting Nuclear Power to Go Abroad was presented by International Cooperation Department of MEP. National Energy Administration, State Administration of Science, and superintendents of nuclear power groups and leading nuclear power equipment enterprises attended the symposium, and made speeches. After this meeting, responsible departments for each content sector of the working plan were further clarified, and the liaisons mechanism with operation departments of MEP, Nuclear and Radiation Safety Center and the domestic nuclear power enterprises was established.

Vice Minister of MEP, Administrator of NNSA, Li Ganjie, attended the symposium on supporting nuclear power to Go Abroad

Work on the Implementation of Conventions

Convention on Nuclear Safety

The diplomatic conference of Parties to the Convention on Nuclear Safety was held on February 9, 2015 in Vienna, Austria. MEP (NNSA) organized the Chinese delegation to attend the conference. The Chinese delegation was headed by Nuclear Safety Chief Engineer of MEP, Vice Administrator of NNSA, Liu Hua.

According to the revision proposal introduced in Switzerland, the Vienna Declaration on Nuclear Safety was adopted on the basis of consensus. The Chinese delegation participated the whole process of a series of activities during the preparation of diplomatic conference, and played a key role during the adoption of the Vienna Declaration on Nuclear Safety as a great nuclear power country, and made an important contribution to achieving positive results of diplomatic conference. The conference started preparing the work during the 7th implementation cycle of the Convention on Nuclear Safety, including changing the editorial review board of national report, preparing the national report, and attending organizational conference of the parties on October 15 in Austria, and attending technical conference of the parties from November 14 to 20 in Argentina.

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

From May 11 to 22, 2015, the 5th review conference of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management was held in Vienna. Vice Administrator of NNSA, Director General of Department of Radiation Source Safety Regulation of MEP, Ye Min, led the Chinese government delegation to attend the conference, and successfully completed convention implementation work.

Multilateral Cooperation in Nuclear Safety

Cooperation with IAEA

Fixed mechanism activities with IAEA were continually enhanced. There were 42 persons who participated in technical communication conferences for 21 times totally in 2015, including conferences with IAEA Nuclear Safety Standards Committee and its sub-committees, Asian nuclear safety network, global nuclear safety and nuclear security network, etc. After IAEA carried out the Integrated Regulatory Review Service (IRRS) to China in 2010, MEP (NNSA) formally invited IAEA in 2015 to carry out IRRS Follow-up in the second quarter of 2016. The IAEA international review team was invited to review ten relevant areas in the nuclear and radiation safety regulation system of China, and response actions and improvements of the nuclear safety regulation in China made after Fukushima nuclear accident, and the implementation of 39 recommendations and 40 suggestions in IRRS 2010 report for China. In order to fully prepare for the IRRS Follow-up, MEP (NNSA) had made IRRS Follow-up preparation plan, and developed self-assessment report draft. MEP (NNSA) also invited IAEA experts to carry out one-week IRRS Follow-up training activity from June, 29 to July, 3 in China.

IAEA experts were invited to come to China

from March, 30 to April 2, 2015 to assist MEP (NNSA) in setting up the nuclear safety regulation web portal under the framework of Global Nuclear Safety and Security Network (GNSSN). The fundamental construction of the portal had been finished by 2015, which covers related information about nuclear safety, including the existing nuclear safety regulation system in China, nuclear and radiation facilities and activities, regulations system, national report for conventions, peer-review reports, event evaluation and experience feedback system, etc. Not only can the GNSSN nuclear safety portal act as an information-sharing platform and international cooperation window with other nuclear safety regulatory organizations, but also can broadcast good practice of nuclear safety regulation in China.

Cooperation with OECD-NEA

MEP (NNSA) made full use of the cooperation mechanism with OECD-NEA, and enhanced international communication and cooperation in the field of nuclear safety. The Vice Minister of MEP, Administrator of NNSA, Li Ganjie, met the Director General of OECD-NEA, William Magwood, and the former Director General of OECD-NEA, Luis Echavarri, respectively. They had exchanged views on strengthening nuclear safety cooperation with OECD-NEA. MEP (NNSA) took the lead to organize and take part in policy group meeting and guidance committee meeting of the Multinational Design Evaluation Program (MDEP), and carried out activities of professional work group. MEP (NNSA) also took part in related activities of Committee on Nuclear Regulation and Committee on the Safety of Nuclear Facilities, and compiled and implemented the work plan on strengthening nuclear safety cooperation with OECD-NEA.

Regional Cooperation in Nuclear Safety

Northeast Asian Cooperation in Nuclear Safety

MEP (NNSA) continually promoted Northeast Asian cooperation in nuclear safety, and actively participated in various activities under the mechanism of Top Regulators Meeting. From October 21 to 23, 2015, the Nuclear Safety Chief Engineer of MEP, Vice Administrator of NNSA, Liu Hua, led a delegation attending the 8th Northeast Asian Top Regulators Meeting on Nuclear Safety and the 3rd seminar of the Top Regulators Meeting in the name of Northeast Asian International Forum on Nuclear Safety. China, Japan, and the Republic of Korea (ROK) communicated on the latest progress on nuclear safety regulation, and passed plans of two working groups under the framework of the Top Regulators Meeting, including human resource development and online information sharing, and approved the establishment

of emergency preparedness and response working group. They also discussed technical issues on spent fuel management, Post-Fukushima improvements of nuclear power plant safety, and nuclear power restart review in Japan, etc. MEP (NNSA) also attended the 8th Top Regulators Video Meeting, the 4th Coordinators' Meeting for the Top Regulators Meeting, and the Human Resource Development Working Group Meeting, and also resigned staff members to the joint nuclear emergency exercises in Japan.

Nuclear Safety Chief Engineer of MEP, Vice Administrator of NNSA, Liu Hua, Attended the 8th Northeast Asian Top Regulators Meeting on Nuclear Safety

Bilateral Cooperation in Nuclear Safety

China-US Cooperation in Nuclear Safety

In 2015, the Vice Minister of MEP, Administrator of NNSA, Li Ganjie, visited the U.S. Nuclear Regulatory Commission (NRC) headquarters upon invitation, and met Jeff Burns, the Commissioner of NRC during the time attending the 7th China-US Strategic and Economic Dialogue. He also met the Chairman of US Terra Energy Company, Bill Gates, and the president and CEO of Westinghouse, Rory Read, respectively in Beijing to exchange views on cooperation of nuclear power and nuclear safety.

The Nuclear Safety Chief Engineer of MEP, Vice Administrator of NNSA, Liu Hua, attended the 2015 China-US Nuclear Safety Cooperation Steering Committee Meeting, and signed meeting minutes by both sides. The two parties identified design modifications, manufacture and identification of main pump and explosion valve, and commissioning oversights of the first AP1000 reactor as essential contents of China-US cooperation in nuclear safety.

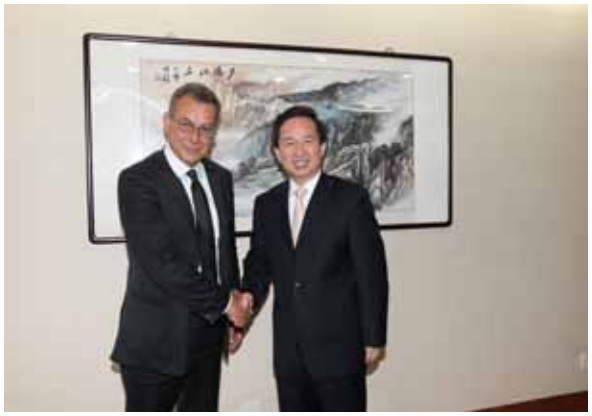
MEP (NNSA) assigned officers to attend the 27th Regulatory Information Conference from March 9 to 14, 2015, and the 10th Joint Coordinators' Meeting of the China-US Peaceful Uses of Nuclear Technology Agreement from May 6 to 7, 2015.

China-France Cooperation in Nuclear Safety

The Vice Minister of MEP, Administrator of NNSA, Li Ganjie, and President of the French Nuclear Safety Authority (ASN), Pierre-Franck CHEVET, chaired the China-France Nuclear Safety Cooperation Steering Committee

Meeting together, and signed meeting minutes in Beijing. The two parties agreed to further strengthen nuclear safety cooperation in EPR project, safety improvements of NPP in operation, personnel training, inspector communication, public communication, post processing project, and other related fields. The two parties also convened technical seminar on nuclear safety. After the seminar, French delegates visited Taishan NPP and Daya Bay NPP.

The Vice Minister of MEP, Administrator of NNSA, Li Ganjie, met the Chairman and CEO of Électricité de France (EDF), Jean-Bernard Lévy, and Asia-Pacific President of Areva Group, Rémy Autebert, respectively.



Vice Minister of MEP, Administrator of NNSA, Li Ganjie, Met the President of the French Nuclear Safety Authority, Pierre-Franck Chevet

China-Korea Cooperation in Nuclear Safety

The Vice Minister of MEP, Administrator of NNSA, Li Ganjie, met the Chairman of South Korea's Nuclear Safety and Security Commission (NSSC), Lee Unchul, on November 26, 2015 in Beijing. The NNSA and NSSC signed the Memorandum of Understanding to Strengthen the Cooperation in Nuclear Safety between the NNSA and the NSSC and the Specific Agreement on Environmental Radiation Monitoring between the NNSA and the NSSC. Nuclear and Radiation Safety Center, MEP signed the Memorandum of Technical Cooperation in Nuclear Safety with the NSSC.

From May 28 to 29, 2015, Nuclear and Radiation Safety Center, MEP attended the 12th Ministerial Conference and Group Meeting of the Joint Committee of China-Korea Nuclear Power Cooperation in Korea, and reviewed the implementation of cooperation projects in the year of 2014-2015, and discussed the cooperation project plans for the year of 2015-2016.

China-EU Cooperation in Nuclear Safety

MEP (NNSA) continued to promote the China-EU cooperation program in nuclear safety. The first phase project of 2 million-euro was well progresed, while the second phase project of 3 million-euro was going to be started. Since the implementation of the first phase project, MEP (NNSA) had invited more than 60 European experts to China, and held 10 training courses, and also sent 14 Chinese staff members to Europe for trainings in 50 person-months. There were 500 person-times

in total who participated in the implementation of the first phase project.

China-Russia Cooperation in Nuclear Safety

MEP (NNSA) signed the Cooperation Agreement on Peaceful Uses of Nuclear Energy in the Field of Nuclear and Radiation Safety Regulation with Federal Environmental, Industrial and Nuclear Regulation Service of Russia, and attended the 19th Meeting of Nuclear Subcommittee of China-Russia Intergovernmental Joint Commission for Regular Meetings of Premiers from September 7 to 13, 2015 in Russia.

China-Canada Cooperation in Nuclear Safety

During the 5th Review Meeting of the Joint Convention on the Safety of Spent Fuel Management and Radioactive Waste Management in May 2015, and the IAEA 55th General Conference in September 2015, the head of Chinese delegation, the head of Canadian delegation, and the Executive Vice President of the Canadian Nuclear Safety Commission (CNSC) held a bilateral meeting to exchange views on the framework of agreement on China-Canada nuclear safety regulators' cooperation, regulations and technical exchanges on nuclear and radiation safety, and other cooperation issues. The two parties completed drafting the China-Canada memorandum of understanding on nuclear safety cooperation, waiting for a chance to sign in the future.

China-Pakistan Cooperation in Nuclear Safety

The Vice Minister of MEP, Administrator of NNSA, Li Ganjie, met the delegation led by Ansar Parvez, Chairman of Pakistan Atomic Energy Commission in Beijing on March 5, 2015. Both sides exchanged views on issues of common concern including China-Pakistan cooperation in nuclear power and nuclear safety, and the nuclear power technology of Hua-long Pressurized Reactor.

Form May 11 to 12, 2015, the 8th China-Pakistan Nuclear Safety Cooperation Steering Committee Meeting was held in China. The Vice Minister of MEP, Administrator of NNSA, Li Ganjie, together with the Chairman of Pakistan Nuclear Regulatory Board, Anwar Habib, hosted over the meeting, and signed the meeting minute. Both sides agreed to develop cooperation in the fields of regulatory practice of independent verification on Hua-long Pressurized Reactor nuclear safety review, review principles of delimitation method and population statistics of emergency planning zone of the third generation nuclear power reactor, technical support of qualification of non-destructive testing organizations, regulation on the front end of nuclear fuel cycle, and joint research

and development, etc.

Vice Minister of MEP, Administrator of NNSA, Li Ganjie, Signed the Meeting Minute with Chairman of Pakistan Nuclear Regulatory Authority, Anwar Habib

China-South Africa Cooperation in Nuclear Safety

The Vice Minister of MEP, Administrator of NNSA, Li Ganjie met the Chief Executive Officer of the National Nuclear Regulator (NNR) of South Africa, Mzubanzi Bismark Tyobeka, in Beijing on November 12, 2015. The two parties signed the China-South Africa Memorandum of Understanding on Information Exchange and Technical Cooperation in the Field of Nuclear Regulation. The two parties also held China-South Africa technical seminar on nuclear safety regulation. The NNR delegation went for an on-site visit to the CAP1400 NPP after the seminar. The two parties agreed to develop cooperation in the fields of on-site inspections for NPPs and nuclear facilities, personnel training, capacity building of nuclear technical support, licensing procedures of research reactors, and regulations and standards, etc.

China-Romania Cooperation in Nuclear Safety

MEP (NNSA) completed discussion of drafting the Agreement on Nuclear Safety Cooperation and Technical Information Communication with Romanian National Commission for Nuclear Activities Control (CNCAN). Both sides agreed to sign the document by exchanging.

China-Argentina Cooperation in Nuclear Safety

During the diplomatic conference of the Convention on Nuclear Safety on February 10, 2015, the Nuclear Safety Chief Engineer of MEP, Vice Administrator of NNSA, Liu Hua, on invitation, met the Argentine Ambassador at the United Nations and other international organizations, Raphael Groszy, in Vienna. They reached a preliminary plan on establishing channels for bilateral nuclear safety cooperation. During the 59th IAEA General Conference, the head of Chinese delegation met the Director General of Division for Nuclear Services of Argentine Nuclear Regulatory Authority, and followed up the progress of various activities on China-Argentina's cooperation.

During the Seminar on Implementing the Vienna Declaration on Nuclear Safety held in Argentina from November 16 to 17, the Deputy Director General of International Cooperation Department of MEP, Zhang Lei, talked with the Director General of Argentine Nuclear Regulatory Authority, Diego Hurtado, and exchanged views on the signing of China-Argentina nuclear safety cooperation agreement and personnel exchange program, and other cooperation issues. The two parties completed discussion of drafting the cooperation agreement. The Director General of Argentine Nuclear Regulatory Authority planned to visit China in 2016 and to sign the agreement.

Under the framework of the Ministry of Science and Technology's Exchange Program of China-Latin America Young Scientists in 2015, MEP took effort to win the Ministry of Science and Technology's support for personnel of Argentine Nuclear Regulators coming to Nuclear and Radiation Safety Center, MEP for technical communication. The Argentine personnel were planned to come to China in March, 2016.

China-Turkey Cooperation in Nuclear Safety

During the 59th IAEA General Conference from September 14 to 18, 2015, the head of MEP (NNSA) delegation met the President of Turkish Atomic Energy Authority, Zafer Alper. The two parties exchanged their views on cooperation issues, and discussed about the China-Turkey Agreement on Nuclear Safety Regulation Cooperation. Both parties have completed their own approval procedures on the agreement, waiting for the chance to sign in the future.

17 Memorabilia

On January 9, 2015, the Notice of Radiation Safety Management of Radio-pharmaceuticals was issued, in which the approval of valid period of import and transfer of radio-pharmaceuticals and its raw materials was extended from six months to one year, and manufacturing enterprises of short half-life radio-pharmaceuticals were no longer compulsively required to obtain the ownership of the production site.

On January 13, 2015, use of Canadian Nordion's F-127 Transportation Cask within P.R. China was approved.

On January 23, 2015, the permission for the initial fuel loading of Yangjiang NPP unit 2 was issued.

From February 9 to 10, 2015, the diplomatic conference of parties to the Convention on Nuclear Safety was held at the IAEA headquarters in Vienna, Austria. The Nuclear Safety Chief Engineer of MEP, Vice Administrator of NNSA, Liu Hua, led the Chinese government delegation attending the conference, and made an important speech. On the basis of consensus, the Vienna Declaration on Nuclear Safety was approved in the conference.

On March 5, 2015, the permission for the TK-C5-M new fuel transportation cask of Jiangsu Nuclear Power Co., Ltd was issued.

On March 13, 2015, the construction licenses of Hongyanhe NPP unit 5 and unit 6 were issued.

On March 25, 2015, the Reply to Preliminary Design and Financial Estimate of Construction Project of National Technology R&D Base for Nuclear and Radiation Safety Regulation was issued, which marks all the approval processes of National Development and Reform Commission before construction of the R&D Base were completed.

On March 31, 2015, the centralized training of warning education and prevention of nuclear and radiation safety regulation confidential cases was held in Beijing to enhance the confidentiality consciousness of nuclear and radiation safety regulation staff, and to improve their confidentiality and prevention skills. The Vice Minister of MEP, Administrator of NNSA, Li Ganjie, attended the training, and made a summary statement. The Nuclear Safety Chief Engineer of MEP, Vice Administrator of NNSA, Liu Hua, also attended the training.

On April 28, 2015, the Symposium on Radiation Environment Management and Supervision was held in Beijing, on which the development situation and practical experience of radiation environment management and supervision are summarized and exchanged. The Vice Minister of MEP, Administrator of NNSA, Li Ganjie, attended the symposium, and made a summary statement. The Nuclear Safety Chief Engineer of MEP, Vice Administrator of NNSA, Liu Hua, also attended the symposium.

On May 5, 2015, the construction licenses of Fuqing NPP unit 5 and unit 6 were issued.

From May 11 to 12, 2015, the 8th China-Pakistan Nuclear Safety Cooperation Steering Committee Meeting was held in Rongcheng, Shandong Province. The Vice Minister of MEP, Administrator of NNSA, Li Ganjie, and the Chairman of Pakistan Nuclear Regulatory Authority (PNRA), Anwar Habib, attended and together hosted the meeting. The two sides reviewed achievements of China-Pakistan nuclear safety cooperation over the past year, and determined cooperation activities for the next stage, and signed Minutes of the 8th China-Pakistan Nuclear Safety Cooperation Steering Committee Meeting.

From May 11 to 22, 2015, the 5th Review Conference of Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management was held at the IAEA headquarters. The Vice Administrator of NNSA, Director General of Department of Radiation Source Safety Regulation of MEP, Ye Min, led the Chinese government delegation attending the conference.

On May 13, 2015, the Vice Minister of MEP, Administrator of NNSA, Li Ganjie, participated in the foundation activity of on-site nuclear accident emergency supporting base and supporting team for NPPs of SPIC. He also attended the 4th Nuclear Power Groups' Nuclear Emergency Supporting High-level Symposium, and made a summary statement.

On May15, 2015, the permission for the initial fuel loading of Fuqing NPP unit 2 was issued.

On May 18, 2015, the Nuclear Safety Chief Engineer of MEP, Vice Administrator of NNSA, Liu Hua, attended the 2015 Annual China-US Nuclear Safety Cooperation Steering Committee Meeting, discussed and determined nuclear safety cooperation issues for the next stage with the US.

On May 29, 2015, the Notice of Exemption of Organizations with Box X-ray Package Checking Devices in Public Places was issued, in which exemption of organizations with box X-ray package checking devices in public places was carried.

On June 8, 2015, MEP (NNSA) officially replied to the environment impact report (siting stage) of Fangchenggang NPP unit 3 and unit 4.

On June 23, 2015, the operation license was issued to the extension and technical modification project of nuclear fuel elements fabrication line of Jianzhong Nuclear Fuel Co., Ltd CNNC.

On June 26, 2015, MEP (NNSA) participated in the organization of the national nuclear accident emergency exercise named as SHIELD-2015, which was carried out as an off-site overall emergency in a NPP on the background of loss of external power supply and leakage of radioactive material to the external environment caused by the combination of the No.1 SG heat-exchanging tube rupture and earthquake. The Nuclear Safety Chief Engineer of MEP, Vice Administrator of NNSA, Liu Hua, participated in this exercise.

On July 15, 2015, the website of NNSA went online for test run.

From July 20 to 21, 2015, the 2015 Annual China-France Nuclear Safety Cooperation Steering Committee Meeting was held in Beijing, chaired by the Vice Minister of MEP, Administrator of NNSA, Li Ganjie, together with the Chairman of French ASN, Pierre CHEVET. The two sides reviewed achievements of China-France nuclear safety cooperation since the last steering committee meeting, and confirmed the key points of cooperation in next stage, and exchanged views on issues including nuclear power development and nuclear safety regulation in China, etc. Before this meeting, the Nuclear Safety Chief Engineer of MEP, Vice Administrator of NNSA, Liu Hua, attended the China-France Nuclear Safety Technical Seminar held in Beijing.

On August 21, 2015, the Symposium on Strengthening International Cooperation of Nuclear Safety Regulation and Supporting Nuclear Power to Go Abroad was held in Beijing. The Vice Minister of MEP, Administrator of NNSA, Li Ganjie, attended the symposium, and made an important speech. The Nuclear Safety Chief Engineer of MEP, Vice Administrator of NNSA, Liu Hua, hosted the symposium. The speech by the Vice Minister of MEP, Administrator of NNSA, Li Ganjie, in the symposium and the Work Program of Strengthening International Cooperation in Nuclear Safety Regulation and Supporting Nuclear Power to Go Abroad were issued after the symposium.

On August 25, 2015, the permission for the initial fuel loading of Changjiang NPP unit 1 was issued.

On September 2, 2015, the permission for the initial fuel loading of Fangchenggang NPP unit 1 was issued.

On September 8, 2015, the permission for the initial fuel loading of Yangjiang NPP unit 3 was issued.

From September to November, 2015, MEP (NNSA) carried out comprehensive

inspections on nuclear and radiation safety of nuclear facilities, nuclear technology utilization, nuclear equipment manufacturing, and uranium mining and milling facilities, and timely discovered and eliminated all kinds of potential hazards of nuclear and radiation safety.

From September to November, 2015, MEP (NNSA) organized supervisions on implementation of the comprehensive inspection of nuclear and radiation safety for environmental protection departments of 8 provinces including Liaoning, Jiangxi, Henan, Hunan, Guangdong, Hainan, Guizhou, and Gansu.

From October 16 to 24, 2015, the Nuclear Safety Chief Engineer of MEP, Vice Administrator of NNSA, Liu Hua, led a delegation attending the 8th Northeast Asian Top Regulators Meeting on Nuclear Safety and Northeast Asian International Forum on Nuclear Safety held in Korea. During the meetings, the Nuclear Safety Chief Engineer of MEP, Vice Administrator of NNSA, Liu Hua, also conducted bilateral communication with the Vice Chairman of Korean Nuclear Safety and Security Committee, Kim Young Hwan, and exchanged opinions on the topics of common interests.

On October 19, 2015, the Official Wechat Platform of NNSA went online for test run.

On October 29, 2015, the Summary Video Meeting of Special Activity of propagating Nuclear Safety Culture was held in Beijing. The meeting summarized the good practice, and showed great achievements of propagation activities. The future direction of nuclear safety culture was formed after sufficient communication and discussion on the nuclear safety culture development. The Vice Minister of MEP, Administrator of NNSA, Li Ganjie, the Nuclear Safety Chief Engineer of MEP, Vice Administrator of NNSA, Liu Hua, and delegates from National Energy Administration, and State Administration of Science, Technology and Industry for National Defense attended the meeting, and made statements.

On November 2, 2015, the Official Letter of Related Explanation about the Nuclear Technology Utilization Projects Exempted from Developing Environmental Impact Documents in the Classification Inventory of Environmental Impact Assessment for Construction Projects was issued, in which the nuclear technology utilization projects exempted from developing environmental impact documents in the Classification Inventory of Environmental Impact Assessment for Construction Projects were explained, and typical cases were provided.

On November 12, 2015, the Vice Minister of MEP, Administrator of NNSA, Li Ganjie, met the Chief Executive Officer of the National Nuclear Regulator (NNR) of South Africa,

Mzubanzi Bismarck Thobeka, in Beijing. The two sides exchanged views on China-South Africa nuclear safety cooperation and other issues of common concern, and signed the China-South Africa Nuclear Safety Cooperation Agreement.

On November 25, 2015, the online strengthening plan for buildings of subprojects 120 and 140 of Jianzhong Nuclear Fuel Co., Ltd CNNC was approved.

On November 26, 2015, the Vice Minister of MEP, Administrator of NNSA, Li Ganjie, met the South Korea's Nuclear Safety and Security Commission (NSSC), Lee Unchul, in Beijing, and signed the China-Korea Nuclear Safety Cooperation Agreement.

On November 26, 2015, the Final Overall Acceptance Meeting of the Radiation Environment Automatic Monitoring Station Project of Nuclear and Radiation Emergency Monitoring and Dispatching Platform and Quick Response Ability Construction Project for Key Provinces and Cities Funded by the Special Funds for Major Pollutant Emission Reduction by Governmental Budget of 2011 was held by MEP (NNSA) in Hangzhou.

On December 23, 2015, the construction licenses of Fangchenggang NPP unit 3 and unit 4 were issued.

On December 23, 2015, the construction licenses of Tianwan NPP unit 5 and unit 6 were issued.

On December 31, 2015, the permission for the initial fuel loading of Ningde NPP unit 4 was issued.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